QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
QCDevelopment9068@gmail.com

March 21, 2015

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)
7 Stony Hill Road, Bethel, CT 06801
N 41-24-56.99
W 73-24-05.28

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 145-foot level of the existing 140-foot Utility Structure at 7 Stony Hill Road, Bethel, CT. The tower is owned by Eversource. The property is also owned by Eversource (CONN LIGHT & POWER CO). AT&T now intends to replace three (3) of its existing antennas with three (3) new Quintel antennas. These antennas would be installed at the 145-foot level of the structure on a new T-Arm mount, which will replace the existing standoff mount. AT&T also intends to install six (6) new Kaelus TMAs for a total of twelve (12) TMAs.

This facility was approved by the Connecticut Siting Council, Petition No. 479 on September 19, 2000. This approval included no condition(s) that could feasibly be violated by this modification. This modification therefore complies with the aforementioned approval.

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 Matt Knickerbocker, First Selectman for the Town of Bethel, as well as the property and structure owner.

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

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

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

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

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

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

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

For the foregoing reasons, AT&T 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).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Matt Knickerbocker - as elected official (via e-mail)
Eversource - as structure and property owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.27%
AT&T LTE	10	427	145	0.0795	1900	1.0000	0.79%
AT&T GSM	1	500	145	0.0093	880	0.5867	0.16%
AT&T UMTS	2	500	145	0.0186	1900	1.0000	0.19%
AT&T LTE	1	500	145	0.0093	740	0.4933	0.19%
Site Total							1.60%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.27%
AT&T LTE	2	1791	145	0.0667	2300	1.0000	0.67%
AT&T LTE	2	1104	145	0.0411	734	0.4893	0.84%
AT&T LTE	2	2203	145	0.0820	1900	1.0000	0.82%
AT&T GSM	2	422	145	0.0157	1900	1.0000	0.16%
AT&T UMTS	2	419	145	0.0156	880	0.5867	0.27%
AT&T UMTS	2	817	145	0.0304	1900	1.0000	0.30%
Site Total							3.32%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

at&t

WIRELESS COMMUNICATIONS FACILITY
CT5176 - LTE 3C
EVERSOURCE STRUCT. NO. 10254
STONY HILL
7 STONY HILL RD.
BETHEL, CT 06801

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. 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.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. 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.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. 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.
20. 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 PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

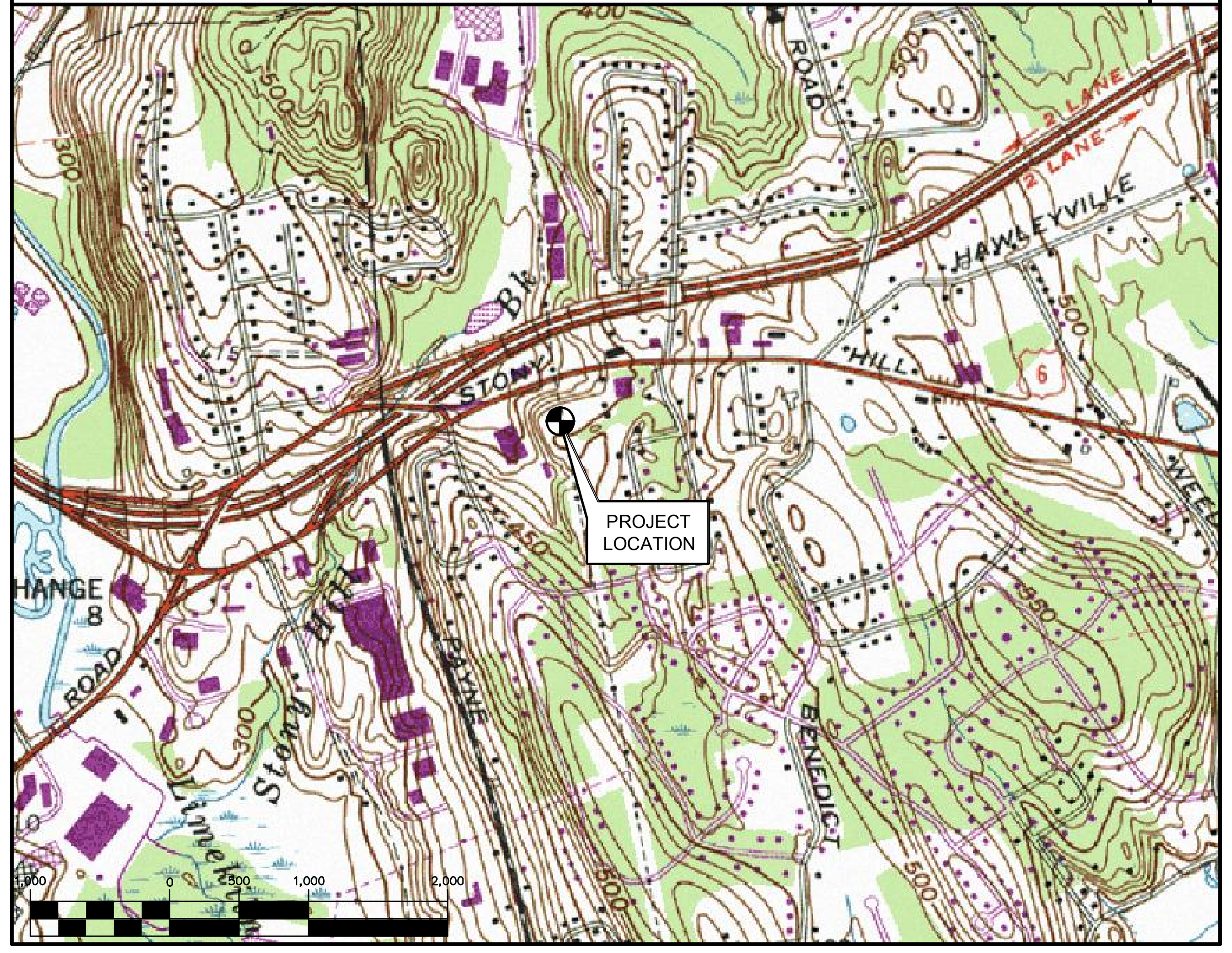
TO: 7 STONY HILL ROAD
BETHEL, CT 06801

1.	START OUT GOING NE ON ENTERPRISE DRIVE TOWARD CAPITOL BLVD;	0.4 mi
2.	TURN LEFT ONTO CAPITOL BLVD;	0.3 mi
3.	TURN LEFT ON WEST STREET;	0.3 mi
4.	MERGE ONTO I-91 S VIA RAMP ON THE LEFT TOWARD NEW HAVEN;	9.1 mi
5.	MERGE ONTO I-691 W VIA EXIT 18 TOWARD MERIDEN/DANBURY;	7.9 mi
6.	MERGE ONTO I-84 W VIA EXIT 1 ON THE LEFT TOARD WATERBURY/DANBURY;	32.1 mi
7.	TAKE EXIT 8 TOWARD NEWTOWN RD/BETHEL;	0.2 mi
8.	TURN SLIGHT RIGHT ON US-6 W;	0.1 mi
9.	TURN SLIGHT LEFT ONTO NEWTOWN RD.;	0.5 mi
10.	TURN SHARP LEFT ONTO US-6 E.	0.7 mi
11.	7 STONY HILL ROAD IS ON THE RIGHT.	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   A. INSTALL (3) PROPOSED AT&T PANEL ANTENNAS QUINTEL MODEL QS66512-3, (1) PER SECTOR POSITION 4. RELOCATE POSITION 3 PANEL ANTENNA TO POSITION 2. REMOVE EXISTING MOUNT & REPLACE WITH NEW T-ARM MOUNT.
   B. REMOVE & REPLACE (3) EXISTING RRUS-12 (1900 MHZ) FOR (3) NEW RRUS-32 B2. INSTALL (3) NEW RRUS-32 MOUNTED ON NEW FRAME SUPPORT BY GROUND EQUIPMENT.
   C. INSTALL (6) NEW TMA'S MODEL NUMBER KAELUS TMA2117F001-1, (2) PER SECTOR.
   D. REMOVE (2) EXISTING TDMA CABINETS AND INSTALL (1) NEW PURCELL FLX16WS CABINET WITH ERICSSON RBS 6601+DUS41 & NEW RRU RACK FRAME MOUNTED ON EXISTING CONCRETE SLAB-ON-GRADE.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5176
AT&T SITE NAME:	STONY HILL
SITE ADDRESS:	EVERSOURCE STRUCT. NO. 10254 7 STONY HILL RD. BETHEL, CT 06801
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
CONTACT PERSON:	TIM BURKS SAI COMMUNICATIONS (860) 989-0001
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-24'-56.9" N LONGITUDE: 73°-24'-06.1" W GROUND ELEVATION: ±430' AMSL

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
N-1	NOTES AND SPECIFICATIONS	0
C-1	PLANS, ELEVATION AND DETAILS	1
C-2	LTE 2C EQUIPMENT DETAILS	2
E-1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E-2	LTE WIRING DIAGRAM	0
E-3	TYPCAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	02/24/16	DRA	CAG	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	02/22/16	DRA	CAG	CONSTRUCTION DRAWINGS - ISSUED FINAL
0	02/05/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

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

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
STONY HILL
CT5176 - LTE 3C
7 STONY HILL RD.
BETHEL, CT 06801

DATE:	01/20/16
SCALE:	AS NOTED
JOB NO.	15267.003

TITLE SHEET

T-1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   ANTENNA MAST
   - WIND LOAD: PER EIA/TIA 222 F–96 (ANTENNA MOUNTS): 80 MPH (FASTEST MILE), EQUIVALENT TO 105 MPH (3 SECOND GUST).

   TRANSMISSION TOWER
   - WIND LOAD: PER NESC C2–2012 SECTION 25 RULE 250C (TOWER & FOUNDATION) 110 MPH (3 SECOND GUST)
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–02 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

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

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

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

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:
   A. SHERWIN WILLIAMS POLANE–B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH–PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON–PETROLEUM–BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

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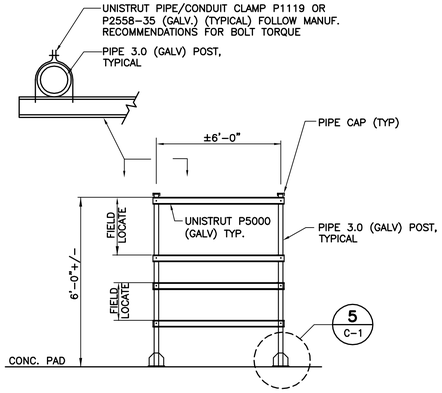
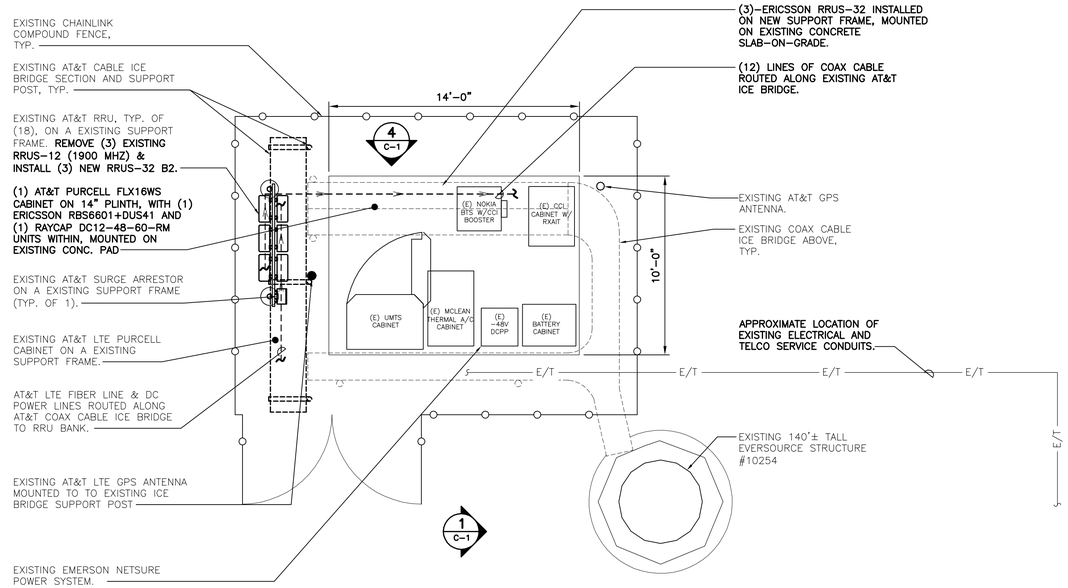
SCALE: AS NOTED
JOB NO. 15267.003

NOTES AND SPECIFICATIONS

N-1



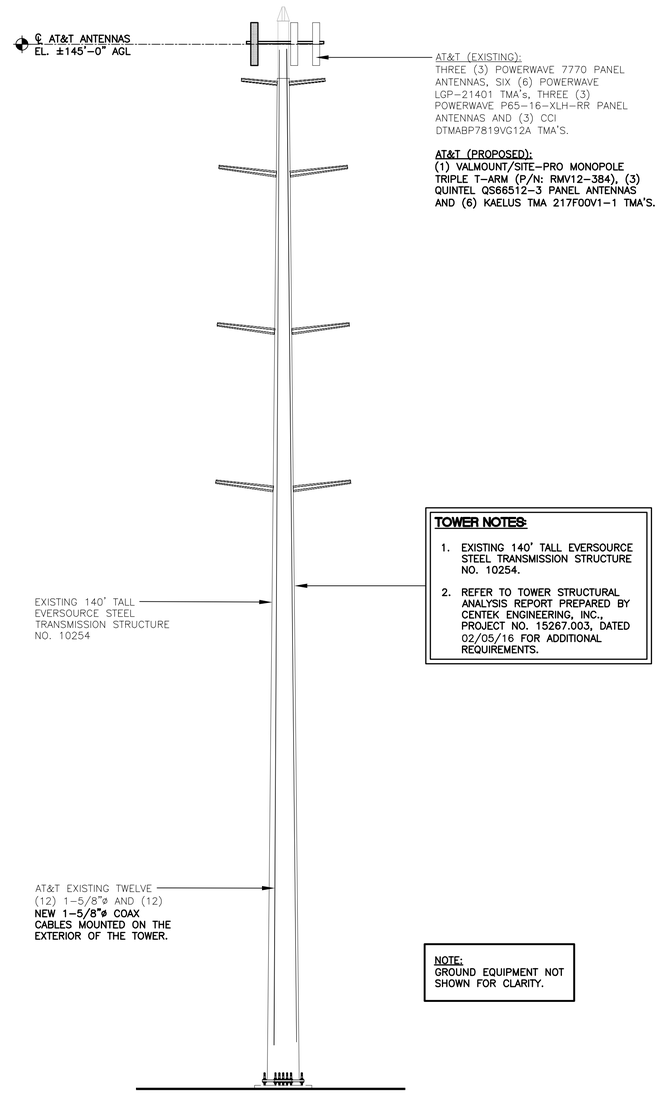
3 C-1 **EQUIPMENT MOUNTING FRAME DETAIL**
NOT TO SCALE



2 C-1 **COMPOUND PLAN**
SCALE: 1/4" = 1'- 0"

TRUE NORTH

GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)



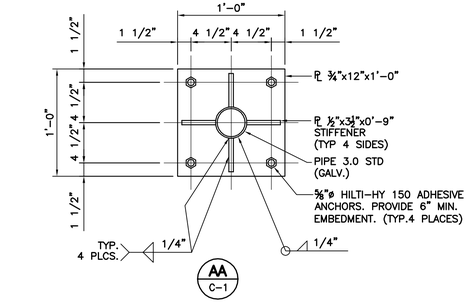
TOWER NOTES:

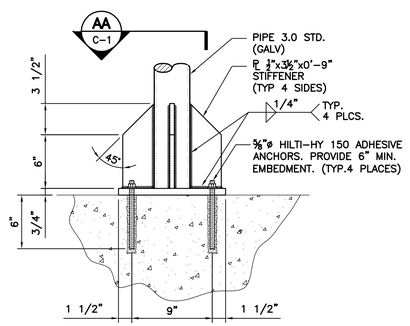
1. EXISTING 140' TALL EVERSOURCE STEEL TRANSMISSION STRUCTURE NO. 10254.
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 15267.003, DATED 02/05/16 FOR ADDITIONAL REQUIREMENTS.

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

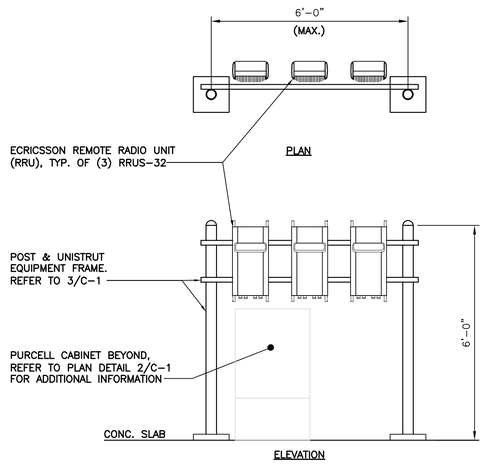
1 C-1 **TOWER ELEVATION**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.





5 C-1 **FRAME TO CONCRETE CONNECTION DETAIL**
NOT TO SCALE



4 C-1 **EQUIPMENT MOUNTING FRAME DETAIL**
NOT TO SCALE

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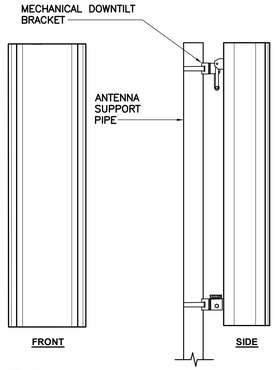
PLANS, ELEVATION AND DETAILS

C-1

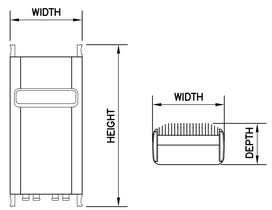
Sheet No. 3 of 7



ALPHA/BETA/GAMMA ANTENNA			
EQUIPMENT		DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS66512-3		72"H x 12"W x 9.6"D	112-LBS

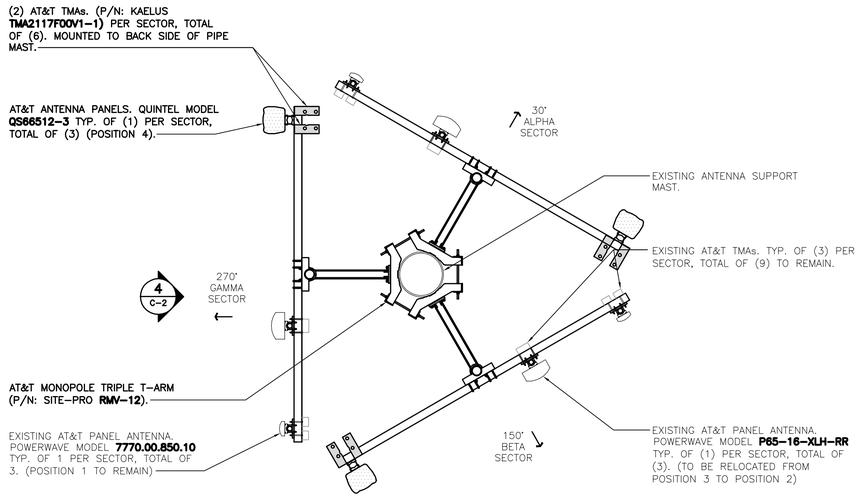
7 C-2 **PROPOSED ANTENNA DETAIL**
SCALE: NTS

NOTES:
1. INSTALL ANTENNA TO EXISTING PIPE MAST USING MANUFACTURERS SUPPLIED BRACKETS AND MOUNTING HARDWARE
2. SET MECHANICAL DOWNTILT TO VALUE SPECIFIED IN LATEST RFDS



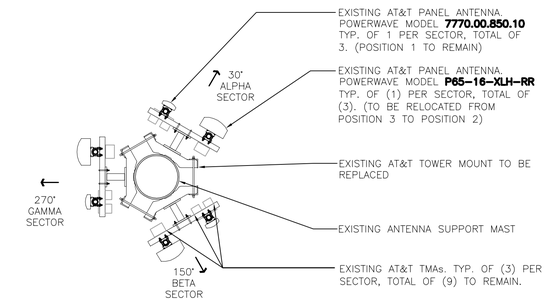
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 32	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.			

8 C-2 **ERICSSON RRUS 32 DETAIL**
SCALE: 1" = 1'-0"

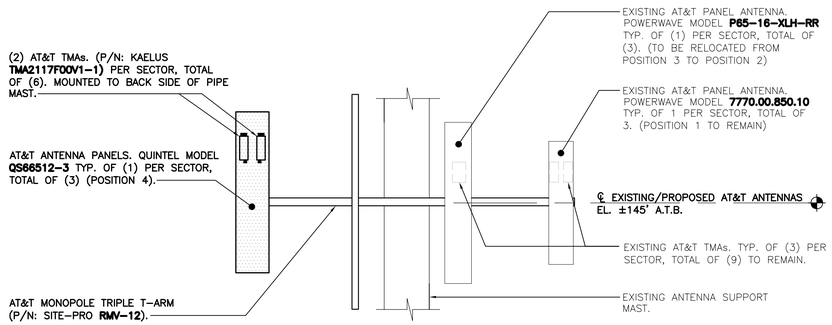


2 C-2 **PROPOSED ANTENNA PLAN**
SCALE: 3/8" = 1'-0"

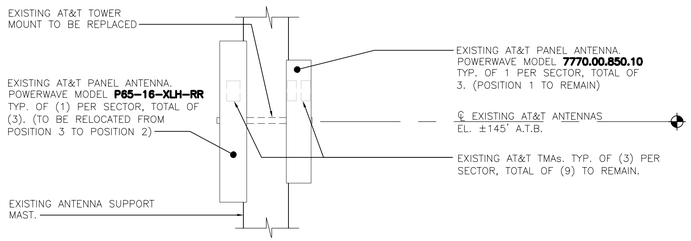
NOTE:
REFER TO STRUCTURAL ANALYSIS FOR TMA MODEL NUMBERS AND QUANTITIES.



1 C-2 **EXISTING ANTENNA PLAN**
SCALE: 3/8" = 1'-0"

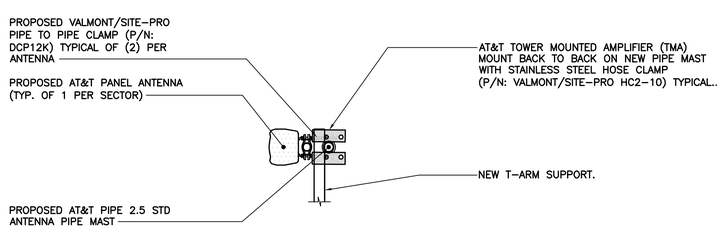


4 C-2 **PROPOSED ANTENNA SECTOR ELEVATION**
SCALE: 3/8" = 1'-0"

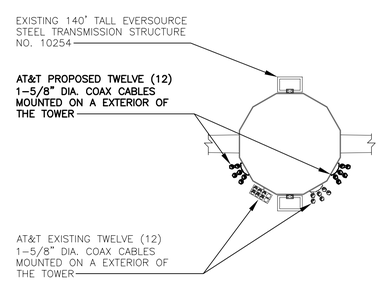


3 C-2 **EXISTING ANTENNA SECTOR ELEVATION**
SCALE: 3/8" = 1'-0"

NOTES:
1. PROVIDE MOUNTING PIPES, CROSSOVERS & ASSOCIATED HARDWARE TO COMPLETE THE PROPOSED UPGRADE.
2. REFER TO STRUCTURAL ANALYSIS AND FINAL AT&T RF DATA SHEET PRIOR TO INSTALLATION OF TOWER MOUNTED LTE RELATED ANTENNAS, CABLES AND RELATED EQUIPMENT



6 C-2 **PROPOSED TMA MOUNTING PLAN**
1/2" = 1'-0"



5 C-2 **COAX CABLE PLAN**
NOT TO SCALE

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2	2/24/16	DRA	CAG	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
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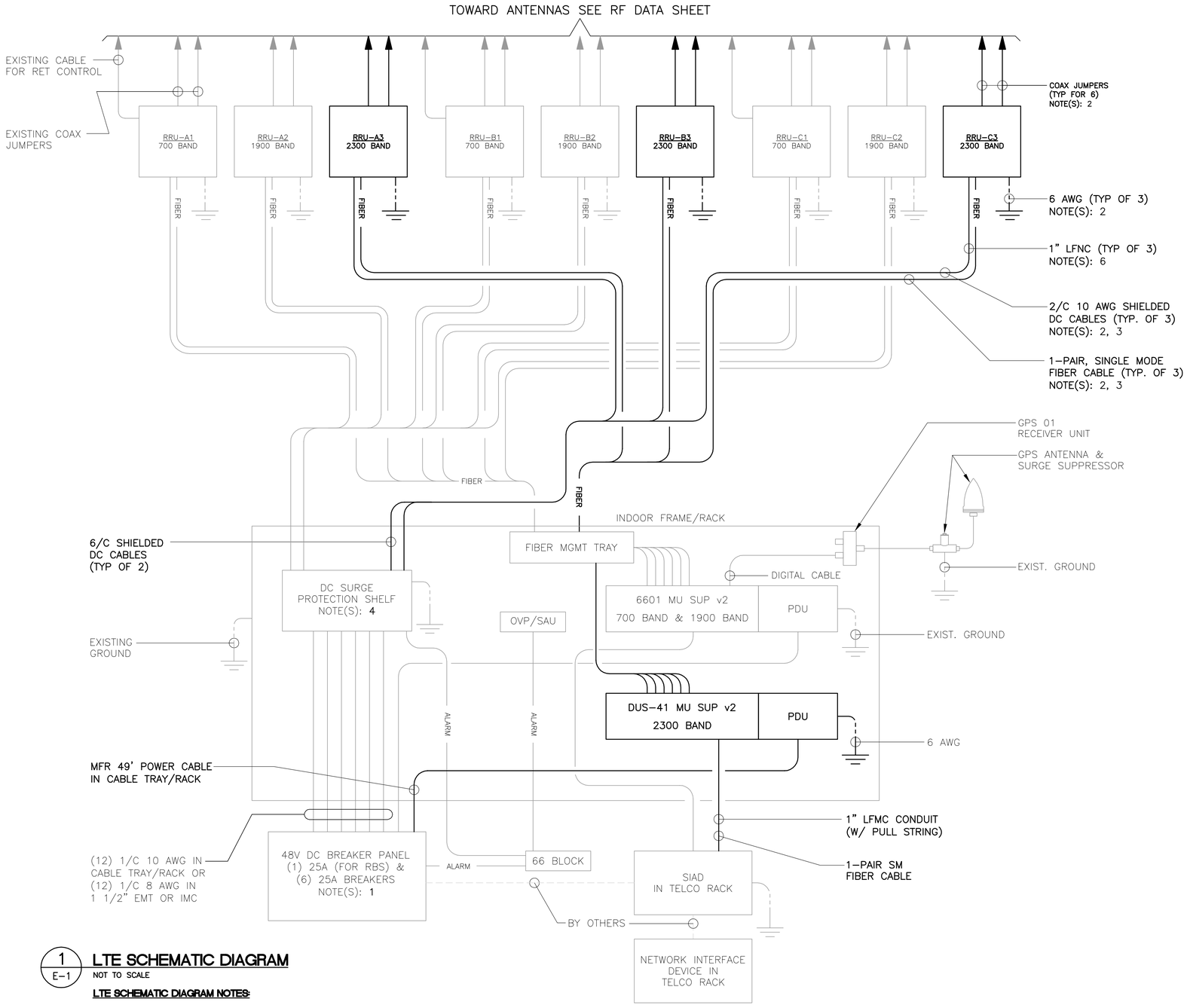
LTE 2C EQUIPMENT DETAILS

C-2
Sheet No. 4 of 7



1 / E-1

LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F. SEE DETAIL 1410 OR 1410B FOR INTERNAL WIRING DIAGRAM.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6AWG UNLESS NOTED OTHERWISE.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. 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:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. 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.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. 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.
16. 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.
17. 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.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

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: 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. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM 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.

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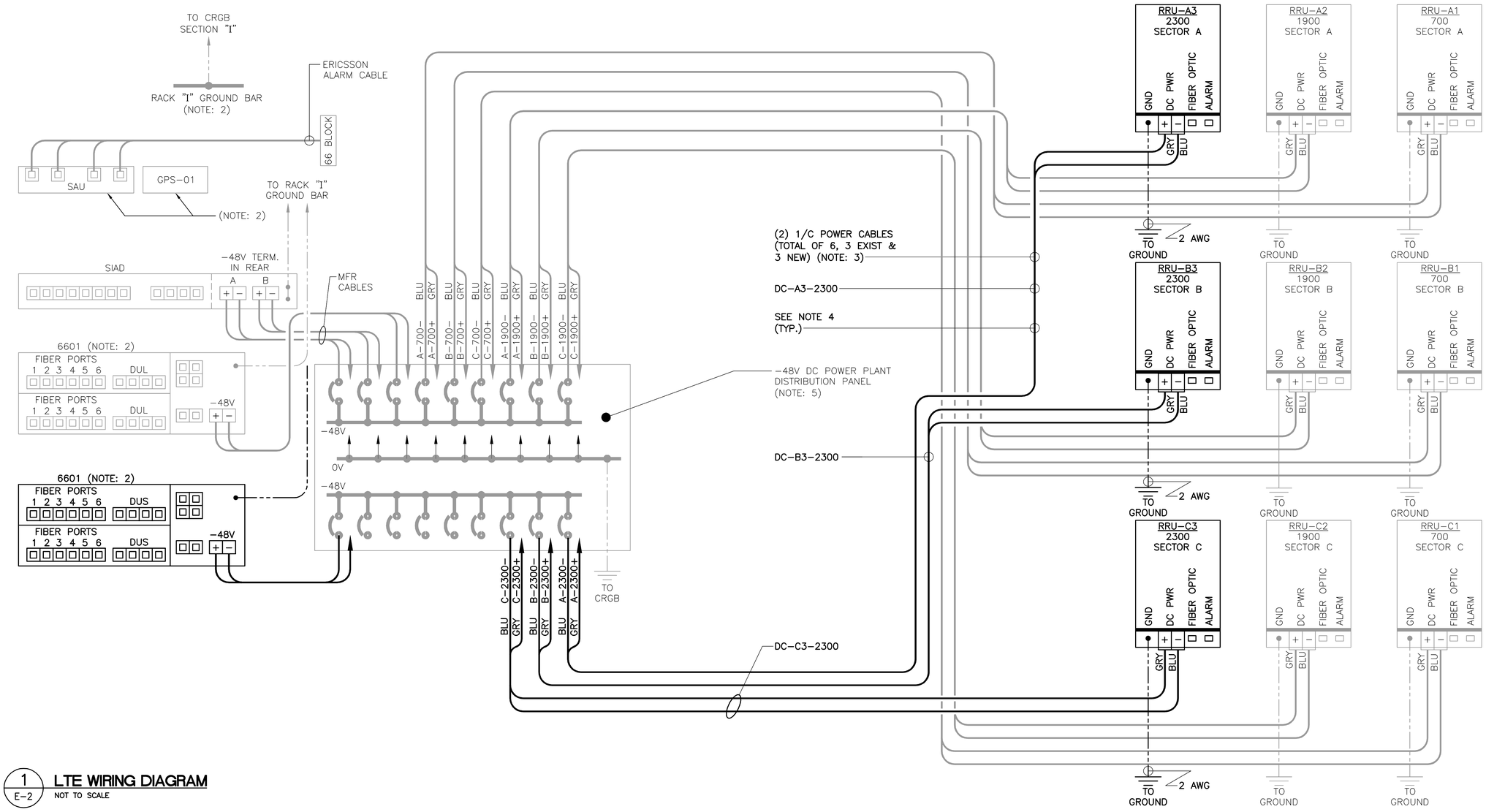
LTE SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 5 of 7



1 E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-2300+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. MAXIMUM CABLE LENGTH IS 49 FEET WITHOUT SURGE PROTECTION AT RRU. INCREASE CONDUCTOR SIZE TO 10 OR 8 AWG WHERE BREAKER RATING IS GREATER THAN 20A.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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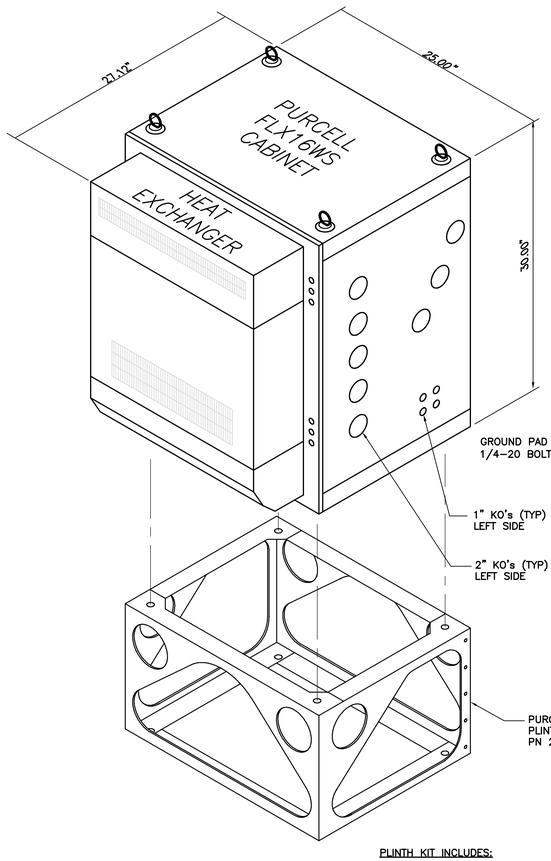
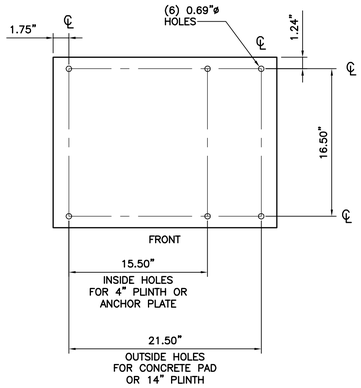
LTE WIRING DIAGRAM

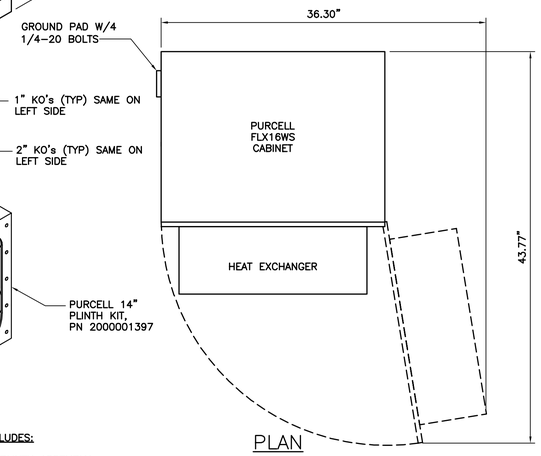
E-2

Sheet No. 6 of 7





DRILL PATTERN



PLAN

PLINTH KIT INCLUDES:

(1) 14", HIGH PLINTH ASSEMBLY
(8) 1/2-13, 1.25" LONG STAINLESS STEEL HEX BOLTS
(16) 1/2 STAINLESS STEEL FLAT WASHERS
(12) 1.2 STAINLESS STEEL SPLIT LOCK WASHERS
(4) 1/2-13, 1.5" LONG STAINLESS STEEL HEX BOLTS
(8) LOAD SPREADING WASHERS

WEIGHT:

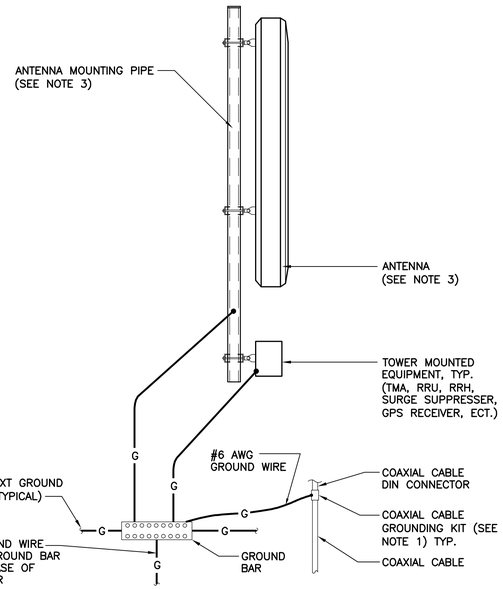
EMPTY W/BLANK DOOR = 80lbs
EMPTY W/ HEAT EXCHANGER = 120lbs
EQUIPMENT (VARIES) = 400/lbs MAX
CABINET TOTAL (MAX) = 600lbs

NOTES:

1. DOOR HINGE MAY BE REVERSED
2. MINIMUM ANCHOR SIZE MUST BE 1/2"DIA.
3. AN ISOLATOR BASE IS REQUIRED WHEN MOUNTING CABINET DIRECTLY ON CONCRETE PAD.

6 E-3 PURCELL FLX16WS CABINET WITH 14" PLINTH

1 1/2" = 1'-0"

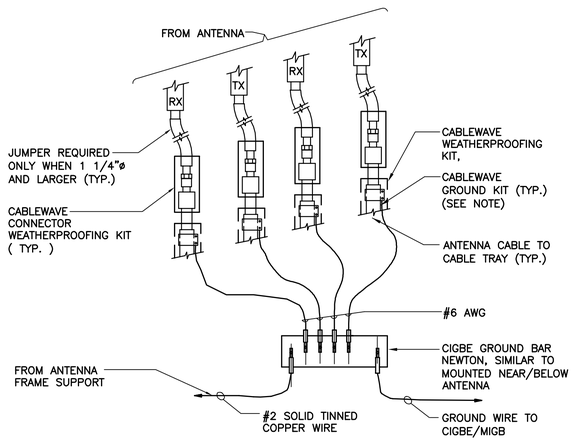


NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

2 E-3 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

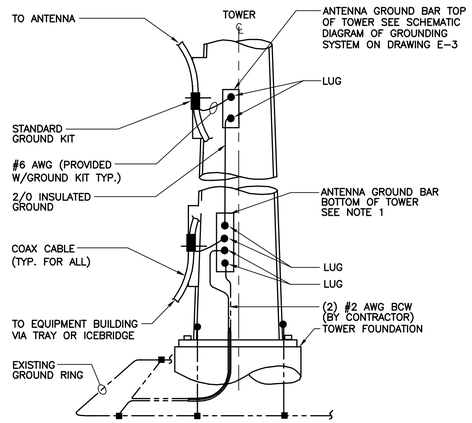


NOTE:

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

5 E-3 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE

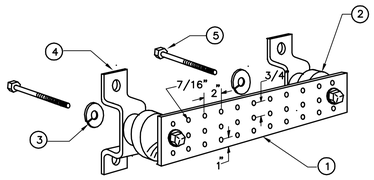


NOTES:

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

1 E-3 ANTENNA CABLE GROUNDING - TOWER

NOT TO SCALE

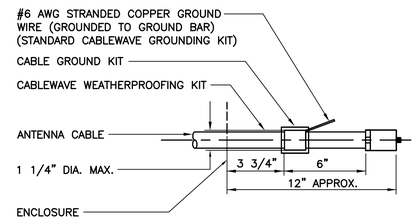


LEGEND

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

3 E-3 GROUND BAR DETAIL

NOT TO SCALE



NOTE:

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

4 E-3 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	02/05/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

CENTEK engineering
Centered on Solutions℠
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AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

STONY HILL

CT5176 - LTE 3C

7 STONY HILL RD.
BETHEL, CT 06801

DATE: 01/20/16
SCALE: AS NOTED
JOB NO. 15267.003

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 7 of 7

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Pole

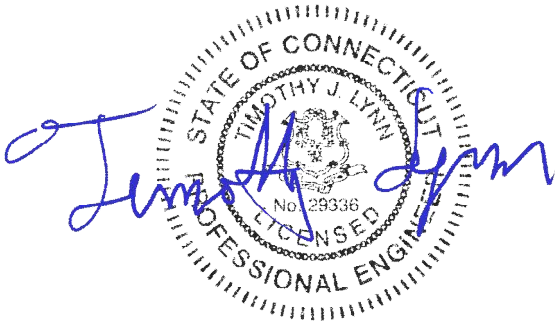
AT&T Site Ref: CT5176

Eversource Structure No. 10254
140' Electric Transmission Pole

7 Stony Hill Road
Bethel, CT

CENTEK Project No. 15267.003

~~Date: February 2, 2016~~
Rev 1: February 5, 2016



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Table of Contents

Introduction

The purpose of this report is to analyze the existing mast and 140' utility pole located at 7 Stony Hill Road in Bethel, CT for the proposed antenna and equipment upgrade by AT&T.

The existing/proposed loads consist of the following:

- AT&T (Existing to Remain):
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the exterior of the pole.
  Mast: HSS 4"x0.237" 2' long pipe flange connected to a HSS18"x0.375" x 8' long pipe.
- AT&T (Existing to Relocate):
  Antennas: Three (3) Powerwave 7770 panel antennas, three (3) Powerwave P65-16-XLH-RR panel antennas, six (6) Powerwave LGP-21401 TMAs and three (3) CCI DTMABP7819VG12A TMAs relocated to new antenna mount with a RAD center elevation of 145-ft above grade level.
- AT&T (Existing to Remove):
  Antennas: Three (3) Valmont Dual Standoff Mounts P/N B1827.
- **AT&T (Proposed):**
  Antennas: Three (3) Quintel QS66512-3 panel antennas and six (6) Kaelus TMA2117F00V1-1 TMAs mounted on a Site Pro Triple T-Arm Mount P/N RMV12-372 to the existing mast with a RAD center elevation of 145-ft above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the exterior of the CL&P pole as indicated in section 4 of this report.

Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9th edition for analysis of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 72, "Design of Steel Transmission Pole Structures Second Edition", defines allowable steel stresses for evaluation of the CL&P utility pole.
- All utility pole members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- Pipe mast will be properly installed and maintained.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Pipe mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

A n a l y s i s

Structural analysis of the existing *Mast* was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc.

The existing mast consisting of a HSS4"x0.237" x 2' long pipe conforming to ASTM A500 Grade B (Fy = 42ksi) flange connected to a HSS18"x0.375" x 8' long pipe conforming to ASTM A500 Grade B (Fy = 42ksi) connected at one point to the existing pole was analyzed for its ability to resist loads prescribed by the TIA/EIA 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 CL&P pole structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA/EIA loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

An envelope solution was first made to determine maximum and minimum forces, stresses, and deflections to confirm the selected section as adequate. Additional analyses were then made to determine the NESC forces to be applied to the CL&P pole structure.

The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized. The forces calculated in RISA-3D using NESC guidelines were then applied to the CL&P pole using PLS-Pole. Maximum usage for the pole was calculated considering the additional forces from the mast and associated appurtenances.

D e s i g n B a s i s

Our analysis was performed in accordance with TIA/EIA-222-F-1996, ASCE Manual No. 72 – "Design of Steel Transmission Pole Structures Second Edition", NESC C2-2007 and Northeast Utilities Design Criteria.

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility pole to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 72.

  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"

- MAST ASSEMBLY ANALYSIS

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

  Load cases considered:

  Load Case 1:
  Wind Speed……... 85 mph [(2)]
  Radial Ice Thickness…..……. 0”

  Load Case 2:
  Wind Pressure..……. 75% of 85 mph wind pressure
  Radial Ice Thickness…..…….. 0.5”

  Note 2: Per NU Mast Design Criteria Exception 1.

R e s u l t s

- MAST ASSEMBLY

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

Member	Stress Ratio (% of capacity)	Result
HSS 18”x0.375” pipe x 8-ft long	15.4%	**PASS**
3/4” ∅ ASTM A325 Bolt	42.89%	**PASS**

- UTILITY POLE

  This analysis finds that the subject utility pole is adequate to support the proposed antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE Manual No. 72, “Design of Steel Transmission Pole Structures Second Edition”, for the applied NESC Heavy and NESC 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 **96.15%** occurs in the utility pole base plate under the **NESC Extreme** loading condition.

  POLE SECTION:

  The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	0’-41.17’ (AGL)	88.39%	**PASS**

  BASE PLATE:
  The base plate was found to be within allowable limits from the PLS output based on 24 bend lines.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	96.15%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of a 8-ft ∅ x 20.5-ft long reinforced concrete caisson. The base of the tower is connected to the foundation by means of (20) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 9-ft into the concrete foundation structure. Foundation information was obtained from NUSCO drawing # 01143-60001. A 16-ft ∅ x 12-ft deep area of soil was previously jet grouted in order to decrease the amount of deflection of the caisson.

BASE REACTIONS:

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

Load Case	Shear	Axial	Moment
NESC Heavy Wind	35.55 kips	103.07 kips	3891.05 ft-kips
NESC Extreme Wind	50.50 kips	52.28 kips	5094.36 ft-kips

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

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	75.13%	**PASS**

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading (1)	Result
Reinforced Concrete Caisson	Moment Capacity	62.5% (2)	**PASS**
	Lateral Deflection	2.78 in. (3) (4)	**PASS**

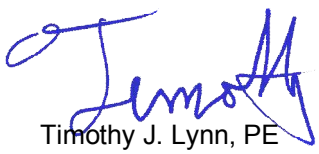
Note 1: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.
Note 2: Based on existing 8-ft ∅ x 20.5-ft long concrete caisson.
Note 3: Based on 8-ft of the caisson taken as 16-ft ∅ due to effects of soil jet grouting. Top 4-ft of jet grouted soil ignored per Northeast Utilities.
Note 4: Lateral deflection less than previously approved value of 3.09 in by Northeast Utilities on 1/25/2012.

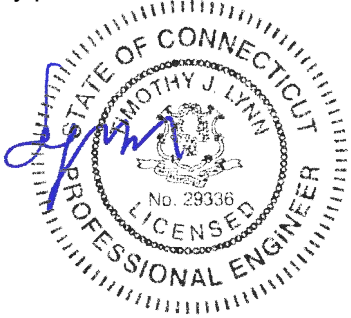
C o n c l u s i o n

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

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

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.

G E N E R A L D E S C R I P T I O N O F S T R U C T U R A L A N A L Y S I S P R O G R A M ~ R I S A - 3 D

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-POLE

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

Modeling Features:

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

Analysis Features:

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

Results Features:

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

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

Introduction

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

ANSI Standard TIA/EIA-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 C2-2007 (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/EIA Standard 222 with two exceptions:

1. An 85 mph extreme wind speed shall be used for locations in all counties throughout the NU system.
2. The allowable stress increase of TIA Section 3.1.1.1 is allowed for mast section, but is disallowed for the mast to CL&P structure connection.
3. The combined wind and ice condition shall consider ½" radial ice in combination with the wind load (0.75 Wi) as specified in TIA section 2.3.16.

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

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

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

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

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

Attachment A

NU Design Criteria

			Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (.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	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	-----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
High Wind Condtion	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	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
		* Only for Structures Installed after 2007						

Shape Factor Criteria shall be per TIA Shape Factors.

2) STEP 2 - The electric transmission structure analysis and evaluation shall be performed in accordance with NESC requirements and shall include the mast and antenna loads determined from NESC applied loading conditions (not TIA/EIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "NU 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 NU).

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

iii) When Coaxial Cables are mounted along side 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	1.3

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

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

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

05/19/2000

NEXTEL - BETHEL
CL&P # 10254

CONDUCTOR LOADS
Original Cable Parameters

sub-cond [redacted]

DIAM = [redacted] in.
WEIGHT [redacted] lb/ft

LOADING PARAMETERS
743 RS

	NESC	1" ICE	HI WIND
WIND (PSF	4	0	20
ICE (IN)	0.5	1	0
OLF ANG	1.65	1.15	1.15
OLF WIND	2.5	1.15	1.15
OLF WT	1.5	1.15	1.15
TENS (#) **	[redacted]	[redacted]	[redacted]

STR		ANGLE	SPAN	WIND SPAN	WGT SPAN	NESC H	NESC V	1" ICE H	1" ICE V	HI WIND H	HI WIND V
10254	A	1.5		820	805	4069	6229	765	8051	4709	2651

05/19/2000

TITLE Nextel Bethel Site

STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	4,200	BACK	4,200

LOADCASE	NESC HEAVY
WIND (PSF)	4
ICE (IN)	0.50
OLF ANG	1.65
OLF WIND	2.50
OLF WT	1.50

STR	ANGLE	WIND SPAN	WGT SPAN	NESC HEAVY H	L	V
BACK	.75	410	403	564	-6929	491
AHEAD	.75	410	403	564	6929	491
TOTALS	1.5	820	806	1128	0	982

05/19/2000

TITLE Nextel Bethel Site

STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	5,615	BACK	5,615

LOADCASE	1" RAD ICE
WIND (PSF)	0
ICE (IN)	1.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	1" RAD ICE H	L	V
BACK	.75	410	403	85	-6457	920
AHEAD	.75	410	403	85	6457	920
TOTALS	1.5	820	806	169	0	1839

TITLE Nextel Bethel Site

05/19/2000

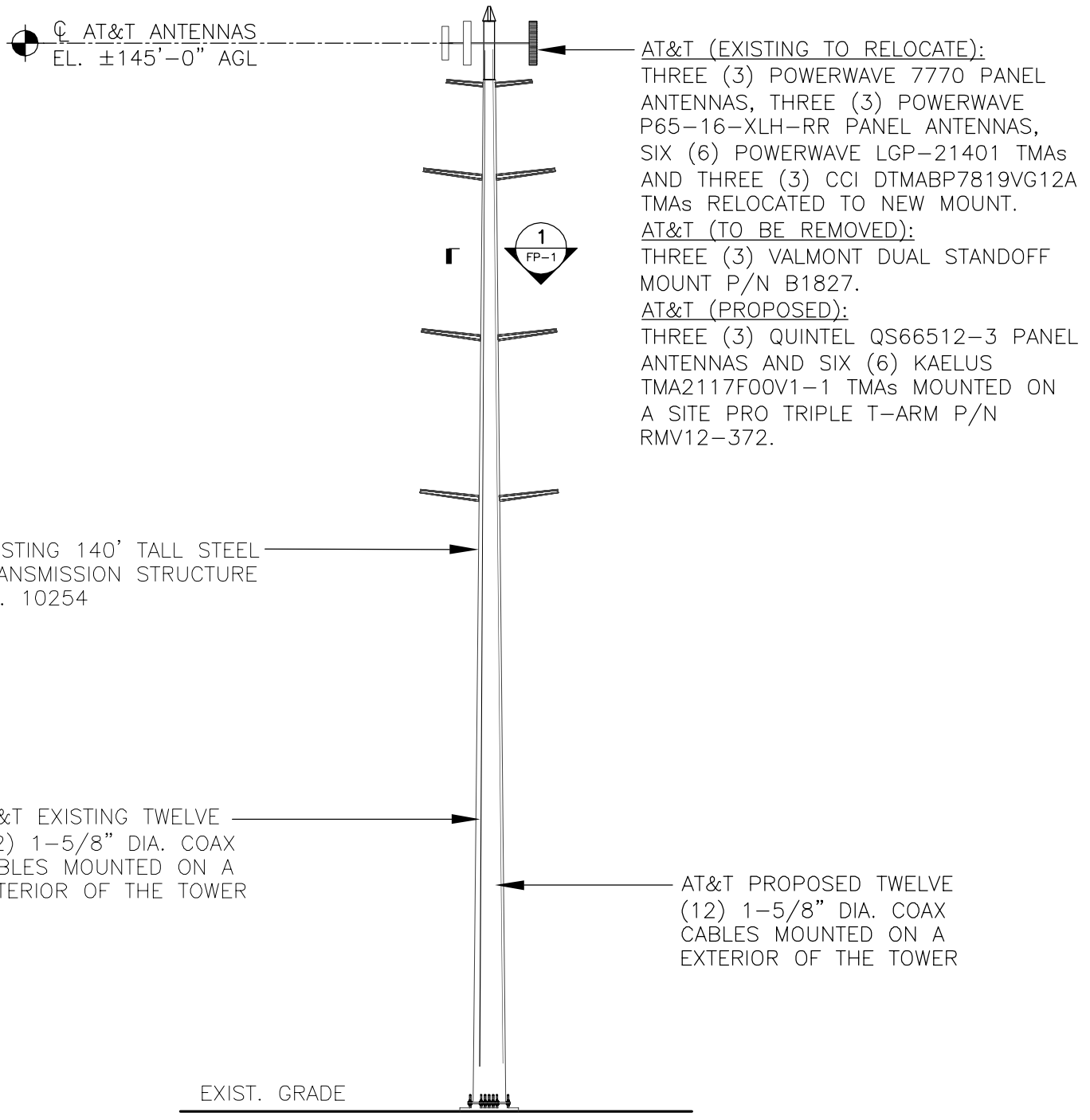
STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	2,583	BACK	2,583

LOADCASE	HI WIND
WIND (PSF)	20
ICE (IN)	0.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	HI WIND H	HI WIND L	HI WIND V
BACK	.75	410	403	341	-2970	121
AHEAD	.75	410	403	341	2970	121
TOTALS	**1.5**	**820**	**806**	**683**	**0**	**243**



1 / EL-1 TOWER & MAST ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
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CT5176
STONY HILL
EVERSOURCE 10254

7 STONY HILL ROAD
BETHEL, CT 06801

PROJECT NO:	15267.000
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	2/2/16

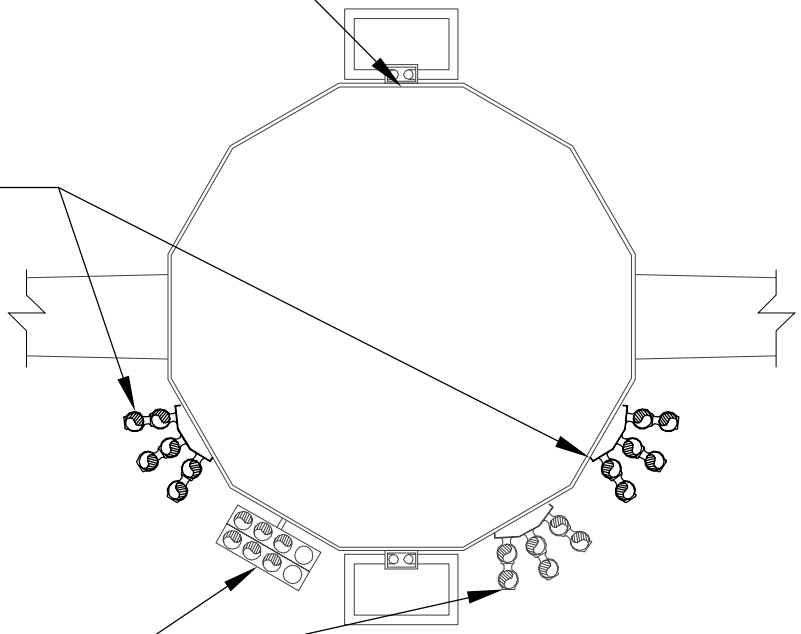
TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 2

EXISTING 140' TALL CL&P
STEEL TRANSMISSION
STRUCTURE NO. 10254

AT&T PROPOSED TWELVE
(12) 1–5/8" DIA. COAX
CABLES MOUNTED ON A
EXTERIOR OF THE TOWER



AT&T EXISTING TWELVE
(12) 1–5/8" DIA. COAX
CABLES MOUNTED ON A
EXTERIOR OF THE TOWER

1 / FP–1 COAX CABLE PLAN

SCALE: NOT TO SCALE

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STONY HILL
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BETHEL, CT 06801

PROJECT NO:	15267.000
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	2/2/16

FEEDLINE PLAN

FP-1

DWG. 2 OF 2

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA/EIA

Wind Speeds

Basic Wind Speed	$V := 85$	mph	(User Input per NU Mast Design Criteria Exception 1)
Basic Wind Speed with Ice	$V_i := 74$	mph	(User Input per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Mast 1	$z_{mast1} := 144$	ft	(User Input)
Mast 2	$z_{mast2} := 149$	ft	(User Input)
AT&T	$z_{att} := 145$	ft	(User Input)
Coax Cable	$z_{coax} := 145$	ft	(User Input)

Exposure Coefficients, kz

(per TIA/EIA-222-F Section 2.3.3)

Mast 1: $Kz_{mast1} := \left(\frac{z_{mast1}}{33}\right)^{\frac{2}{7}} = 1.523$

Mast 2: $Kz_{mast2} := \left(\frac{z_{mast2}}{33}\right)^{\frac{2}{7}} = 1.538$

AT&T: $Kz_{att} := \left(\frac{z_{att}}{33}\right)^{\frac{2}{7}} = 1.526$

Coax Cable: $Kz_{coax} := \left(\frac{z_{coax}}{33}\right)^{\frac{2}{7}} = 1.526$

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Velocity Pressure without ice, qz (per TIA/EIA-222-F Section 2.3.3)

Mast 1 $qz_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V^2 = 28.177$

Mast 2 $qz_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V^2 = 28.453$

AT&T $qz_{att} := 0.00256 \cdot Kz_{att} \cdot V^2 = 28.233$

Coax Cable $qz_{coax} := 0.00256 \cdot Kz_{coax} \cdot V^2 = 28.233$

Velocity Pressure with ice, qzICE (per TIA/EIA-222-F Section 2.3.3)

Mast 1 $qzICE_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V_i^2 = 21.356$

Mast 2 $qzICE_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V_i^2 = 21.565$

AT&T $qzICE_{att} := 0.00256 \cdot Kz_{att} \cdot V_i^2 = 21.398$

Coax Cable $qzICE_{coax} := 0.00256 \cdot Kz_{coax} \cdot V_i^2 = 21.398$

TIA/EIA Common Factors:

Gust Response Factor =	$G_H := 1.69$		(User Input per TIA/EIA-222-F Section 2.3.4)
Gust Response Factor Multiplier =	$m := 1.25$		(User Input per TIA/EIA-222-F Section 2.3.4.4)
Radial Ice Thickness =	$Ir := 0.50$	in	(User Input per TIA/EIA-222-F Section 2.3.1)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)

Development of Wind & Ice Load on Mast (per TIA/EIA-222-F-1996 Criteria)

Mast Data: (HSS18x0.375) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 18$ in (User Input)

Mast Length = $L_{mast} := 8$ ft (User Input)

Mast Thickness = $t_{mast} := 0.375$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 5.3$

Mast Force Coefficient = $Ca_{mast} = 0.8$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.5$ sf/ft

Total Mast Wind Force = $qz_{mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 57$ plf **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.58$ sf/ft

Total Mast Wind Force w/ Ice = $qzICE_{mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 46$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 29.1$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 11$ plf **BLC 3**

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on Mast (per TIA/EIA-222-F-1996 Criteria)

Mast Data: (HSS4.5x0.237) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 4.5$ in (User Input)

Mast Length = $L_{mast} := 2$ ft (User Input)

Mast Thickness = $t_{mast} := 0.237$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 5.3$

Mast Force Coefficient = $Ca_{mast} = 0.8$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.375$ sf/ft

Total Mast Wind Force = $qz_{mast2} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 14$ plf **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.46$ sf/ft

Total Mast Wind Force w/ Ice = $qzICE_{mast2} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 13$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 7.9$ sq in

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

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Subject: Load Analysis of Pipe Mast on Structure # 10254

Location: Bethel, CT

Rev. 0: 2/2/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Antenna Data: (AT&T)

Antenna Model =	Powerwave 7770			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55$	in	(User Input)	
Antenna Width =	$W_{ant} := 11$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 35$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 5.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 842$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 709$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 105$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 98$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Antenna Data: (AT&T)

Antenna Model =	Powerwave P65-16-XLH-RR			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 12$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 50$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1202$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1001$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5184$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1459$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 47$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 142$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Antenna Data: (AT&T)

Antenna Model =	Qunitel QS66512-3			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 12$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 9.6$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 112$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1202$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1001$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 336$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8294$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1765$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 57$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 172$	lbs	**BLC 3**

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on TMA's (per TIA/EIA-222-F-1996 Criteria)

TMA Data: (AT&T)

TMA Model =	Powerwave LGP 21401			
TMA Shape =	Flat		(User Input)	
TMA Height =	$L_{TMA} := 9.2$	in	(User Input)	
TMA Width =	$W_{TMA} := 14.4$	in	(User Input)	
TMA Thickness =	$T_{TMA} := 2.6$	in	(User Input)	
TMA Weight =	$WT_{TMA} := 15$	lbs	(User Input)	
Number of TMA's =	$N_{TMA} := 6$		(User Input)	
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 0.6$			
TMA Force Coefficient =	$Ca_{TMA} = 1.4$		(per TIA/EIA-222-F Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.5$	sf	
Total TMA Wind Force =	$F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 369$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.1$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 6.5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 331$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 90$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 344$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 221$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 43$	lbs	**BLC 3**

Development of Wind & Ice Load on TMA's (per TIA/EIA-222-F-1996 Criteria)

TMA Data: (AT&T)

TMA Model = CCI DTMABP7819VG12A

TMA Shape = Flat (User Input)

TMA Height = $L_{TMA} := 14.25$ in (User Input)

TMA Width = $W_{TMA} := 11.46$ in (User Input)

TMA Thickness = $T_{TMA} := 4.17$ in (User Input)

TMA Weight = $WT_{TMA} := 25$ lbs (User Input)

Number of TMA's = $N_{TMA} := 3$ (User Input)

TMA Aspect Ratio = $Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.2$

TMA Force Coefficient = $Ca_{TMA} = 1.4$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 1.1$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 3.4$ sf

Total TMA Wind Force = $F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 227$ lbs **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.3$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 4$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 200$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All TMA's = $WT_{TMA} \cdot N_{TMA} = 75$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 681$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 301$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 10$ lbs

Weight of Ice on All TMA's = $W_{ICETMA} \cdot N_{TMA} = 29$ lbs **BLC 3**

CENTEK engineering
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Branford, CT 06405 F: (203) 488-8587

Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on TMA's (per TIA/EIA-222-F-1996 Criteria)

TMA Data: (AT&T)

TMA Model =	Kaelus TMA2117F00V1-1			
TMA Shape =	Flat		(User Input)	
TMA Height =	$L_{TMA} := 8.46$	in	(User Input)	
TMA Width =	$W_{TMA} := 11.81$	in	(User Input)	
TMA Thickness =	$T_{TMA} := 4.21$	in	(User Input)	
TMA Weight =	$WT_{TMA} := 18$	lbs	(User Input)	
Number of TMA's =	$N_{TMA} := 6$		(User Input)	
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 0.7$			
TMA Force Coefficient =	$Ca_{TMA} = 1.4$		(per TIA/EIA-222-F Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.7$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 4.2$	sf	
Total TMA Wind Force =	$F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 278$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.8$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 256$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 108$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 421$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 211$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 41$	lbs	**BLC 3**

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on Antenna Mounts (per TIA/EIA-222-F-1996 Criteria)

Mount Data:

Mount Type:	Site Pro Triple T-Arm RMV 12-372			
Platform Shape =	Flat		(User Input)	
Platform Area =	$A_{plt} := 18$	sq ft	(User Input)	
Platform Area w/ Ice =	$A_{ICE.plt} := 22$	sq ft	(User Input)	
Platform Weight =	$WT_{plt} := 1160$	lbs	(User Input)	
Platform Weight w/ Ice =	$WT_{ICE.plt} := 1400$	lbs	(User Input)	
Platform Force Coefficient =	$Ca_{plt} := 1.4$		(User Input)	(per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force =	$F_{plt} := qz_{att} \cdot G_H \cdot Ca_{plt} \cdot A_{plt} = 1202$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force w/ Ice =	$Fi_{plt} := qzICE_{att} \cdot G_H \cdot Ca_{plt} \cdot A_{ICE.plt} = 1114$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of Platform =	$WT_{plt} = 1160$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform =	$WT_{ICE.plt} - WT_{plt} = 240$	lbs	**BLC 3**

CENTEK engineering, INC.	Subject:	**Analysis of TIA/EIA Wind and Ice Loads for Analysis of Mast Only**			
Consulting Engineers		**Tabulated Load Cases**			
63-2 North Branford Road					
Branford, CT 06405	Location:	**Bethel, CT**			
Ph. 203-488-0580 / Fax. 203-488-8587	Date: 2/2/16	Prepared by: T.J.L.	Checked by: C.F.C.	Job No. 15267.000	

Load Case	Description
1	Self Weight (Mast)
2	Weight of Appurtenances
3	Weight of Ice Only on Antenna Structure (1)
4	TIA/EIA Wind with Ice on Antenna Structure (1)
5	TIA/EIA Wind on Antenna Structure (1)

Footnotes:
(1) Antenna Structure includes: Mast and Appurtenances

CENTEK engineering, INC.
Consulting Engineers
63-2 North Branford Road
Branford, CT 06405
Ph. 203-488-0580 / Fax. 203-488-8587

Subject: **Analysis of TIA/EIA Wind and Ice Loads for Analysis of Mast Only Load Combinations Table**

Location: **Bethel, CT**

Date: 2/2/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	TIA/EIA Wind + Ice on Antenna Structure		1		1	1	2	1	3	1	4	1		
2	TIA/EIA Wind on Antenna Structure		1		1	1	2	1	5	1				

Footnotes:
(1) BLC = Basic Load Case
(2) Antenna Structure includes: Mast and Appurtenances

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Increase Nailing Capacity for Wind?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automaticly Iterate Stiffness for Walls?	No
Maximum Iteration Number 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 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building

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, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct Z	.035
Ct X	.035
T Z (sec)	Not Entered
T X (sec)	Not Entered
R Z	8.5
R X	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Seismic Detailing Code	ASCE 7-05
Om Z	1
Om X	1
Rho Z	1
Rho X	1

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	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 (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Leng...	Lbyy[ft]	Lbzz[ft]	Lcomp ...	Lcomp ...	Kyy	Kzz	Cm...	Cm...	Cb	y s...	z s...	Functi...
1	M1	Existing Lower Mast	8												Lateral
2	M2	Existing Upper Mast	2												Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Lower Mast	HSS18x0.375	Beam	Pipe	A500 Gr.42	Typical	19.4	754	754	1510
2	Existing Upper Mast	4.5" Mast w/ Stiffe...	Beam	Pipe	A500 Gr.42	Typical	7.37	74.86	74.86	14.465

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N2	N3			Existing Lower Mast	Beam	Pipe	A500 Gr.42	Typical
2	M2	N3	N4			Existing Upper Mast	Beam	Pipe	A500 Gr.42	Typical
3	M3	N1	N2			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From D...
1	N1	0	0	0	0	
2	N2	0	1.5	0	0	
3	N3	0	9.5	0	0	
4	N4	0	11.5	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]	Footing
1	N2		Reaction					
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.105	5
2	M1	Y	-.15	5
3	M1	Y	-.336	5
4	M1	Y	-.09	5
5	M1	Y	-.075	5
6	M1	Y	-.108	5
7	M1	Y	-1.16	5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.098	5
2	M1	Y	-.142	5
3	M1	Y	-.172	5
4	M1	Y	-.043	5
5	M1	Y	-.029	5
6	M1	Y	-.041	5

Member Point Loads (BLC 3 : Weight of Ice Only on Antenna St) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
7	M1	Y	-.24	5

Member Point Loads (BLC 4 : TIA/EIA Wind with Ice on Antenna)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.709	5
2	M1	X	1.001	5
3	M1	X	1.001	5
4	M1	X	.331	5
5	M1	X	.2	5
6	M1	X	.256	5
7	M1	X	1.114	5

Member Point Loads (BLC 5 : TIA/EIA Wind on Antenna Structur)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.842	5
2	M1	X	1.202	5
3	M1	X	1.202	5
4	M1	X	.369	5
5	M1	X	.227	5
6	M1	X	.278	5
7	M1	X	1.202	5

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
No Data to Print ...			

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.011	-.011	0	0
2	M2	Y	-.003	-.003	0	0

Member Distributed Loads (BLC 4 : TIA/EIA Wind with Ice on Antenna)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.046	.046	0	0
2	M2	X	.013	.013	0	0

Member Distributed Loads (BLC 5 : TIA/EIA Wind on Antenna Structur)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.057	.057	0	0
2	M2	X	.014	.014	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight (Antenna Mast)	None		-1						
2	Weight of Appurtenances	None					7			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
3	Weight of Ice Only on Antenna St	None					7	2		
4	TIA/EIA Wind with Ice on Antenna	None					7	2		
5	TIA/EIA Wind on Antenna Structur	None					7	2		

Load Combinations

	Description	Sol...	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
1	TIA/EIA Wind + Ice on Ant...	Yes			1	1	2	1	3	1	4	1										
2	TIA/EIA Wind on Antenna ...	Yes			1	1	2	1	5	1												
3	Self Weight				1	1																

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
1	M1	1	max	3.461	1	5.806	2	0	1	0	1	0	1	28.686	2
2			min	2.602	2	5.006	1	0	1	0	1	0	1	24.766	1
3		2	max	3.307	1	5.692	2	0	1	0	1	0	1	17.188	2
4			min	2.47	2	4.914	1	0	1	0	1	0	1	14.846	1
5		3	max	3.153	1	5.578	2	0	1	0	1	0	1	5.918	2
6			min	2.338	2	4.822	1	0	1	0	1	0	1	5.11	1
7		4	max	.21	1	.142	2	0	1	0	1	0	1	.198	2
8			min	.182	2	.118	1	0	1	0	1	0	1	.17	1
9		5	max	.056	1	.028	2	0	1	0	1	0	1	.028	2
10			min	.05	2	.026	1	0	1	0	1	0	1	.026	1
11	M2	1	max	.056	1	.028	2	0	1	0	1	0	1	.028	2
12			min	.05	2	.026	1	0	1	0	1	0	1	.026	1
13		2	max	.042	1	.021	2	0	1	0	1	0	1	.016	2
14			min	.038	2	.02	1	0	1	0	1	0	1	.015	1
15		3	max	.028	1	.014	2	0	1	0	1	0	1	.007	2
16			min	.025	2	.013	1	0	1	0	1	0	1	.006	1
17		4	max	.014	1	.007	2	0	1	0	1	0	1	.002	2
18			min	.013	2	.007	1	0	1	0	1	0	1	.002	1
19		5	max	0	1	0	1	0	1	0	1	0	1	0	1
20			min	0	1	0	1	0	1	0	1	0	1	0	1
21	M3	1	max	0	1	5.806	2	0	1	0	1	0	1	37.395	2
22			min	0	1	5.006	1	0	1	0	1	0	1	32.275	1
23		2	max	0	1	5.806	2	0	1	0	1	0	1	35.218	2
24			min	0	1	5.006	1	0	1	0	1	0	1	30.398	1
25		3	max	0	1	5.806	2	0	1	0	1	0	1	33.041	2
26			min	0	1	5.006	1	0	1	0	1	0	1	28.521	1
27		4	max	0	1	5.806	2	0	1	0	1	0	1	30.863	2
28			min	0	1	5.006	1	0	1	0	1	0	1	26.643	1
29		5	max	0	1	5.806	2	0	1	0	1	0	1	28.686	2
30			min	0	1	5.006	1	0	1	0	1	0	1	24.766	1

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	.178	1	.599	2	0	1	-3.547	1	4.109	2	0	1	0	1
2			min	.134	2	.516	1	0	1	-4.109	2	3.547	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
3		2	max	.17	1	.587	2	0	1	-2.126	1	2.462	2	0	1	0	1
4			min	.127	2	.507	1	0	1	-2.462	2	2.126	1	0	1	0	1
5		3	max	.163	1	.575	2	0	1	-.732	1	.848	2	0	1	0	1
6			min	.121	2	.497	1	0	1	-.848	2	.732	1	0	1	0	1
7		4	max	.011	1	.015	2	0	1	-.024	1	.028	2	0	1	0	1
8			min	.009	2	.012	1	0	1	-.028	2	.024	1	0	1	0	1
9		5	max	.003	1	.003	2	0	1	-.004	1	.004	2	0	1	0	1
10			min	.003	2	.003	1	0	1	-.004	2	.004	1	0	1	0	1
11	M2	1	max	.008	1	.008	2	0	1	-.009	1	.01	2	0	1	0	1
12			min	.007	2	.007	1	0	1	-.01	2	.009	1	0	1	0	1
13		2	max	.006	1	.006	2	0	1	-.005	1	.006	2	0	1	0	1
14			min	.005	2	.005	1	0	1	-.006	2	.005	1	0	1	0	1
15		3	max	.004	1	.004	2	0	1	-.002	1	.003	2	0	1	0	1
16			min	.003	2	.004	1	0	1	-.003	2	.002	1	0	1	0	1
17		4	max	.002	1	.002	2	0	1	0	1	0	2	0	1	0	1
18			min	.002	2	.002	1	0	1	0	2	0	1	0	1	0	1
19		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
20			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
21	M3	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
22			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
23		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
24			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
25		3	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
26			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
27		4	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
28			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
29		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
30			min	0	1	0	1	0	1	0	1	0	1	0	1	0	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	N2	max	0	1	3.461	1	0	1	0	1	0	1	0	1
2		min	0	1	2.602	2	0	1	0	1	0	1	0	1
3	N1	max	-5.006	1	0	1	0	1	0	1	0	1	37.395	2
4		min	-5.806	2	0	2	0	1	0	1	0	1	32.275	1
5	Totals:	max	-5.006	1	3.461	1	0	1						
6		min	-5.806	2	2.602	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
1	N1	max	0	2	0	2	0	1	0	1	0	1	0	1
2		min	0	1	0	1	0	1	0	1	0	1	0	2
3	N2	max	0	2	0	2	0	1	0	1	0	1	0	1
4		min	0	1	0	1	0	1	0	1	0	1	0	2
5	N3	max	.039	2	0	2	0	1	0	1	0	1	-4.124e-4	1
6		min	.034	1	0	1	0	1	0	1	0	1	-4.775e-4	2
7	N4	max	.051	2	0	2	0	1	0	1	0	1	-4.135e-4	1
8		min	.044	1	0	1	0	1	0	1	0	1	-4.788e-4	2

Envelope AISC ASD Steel Code Checks

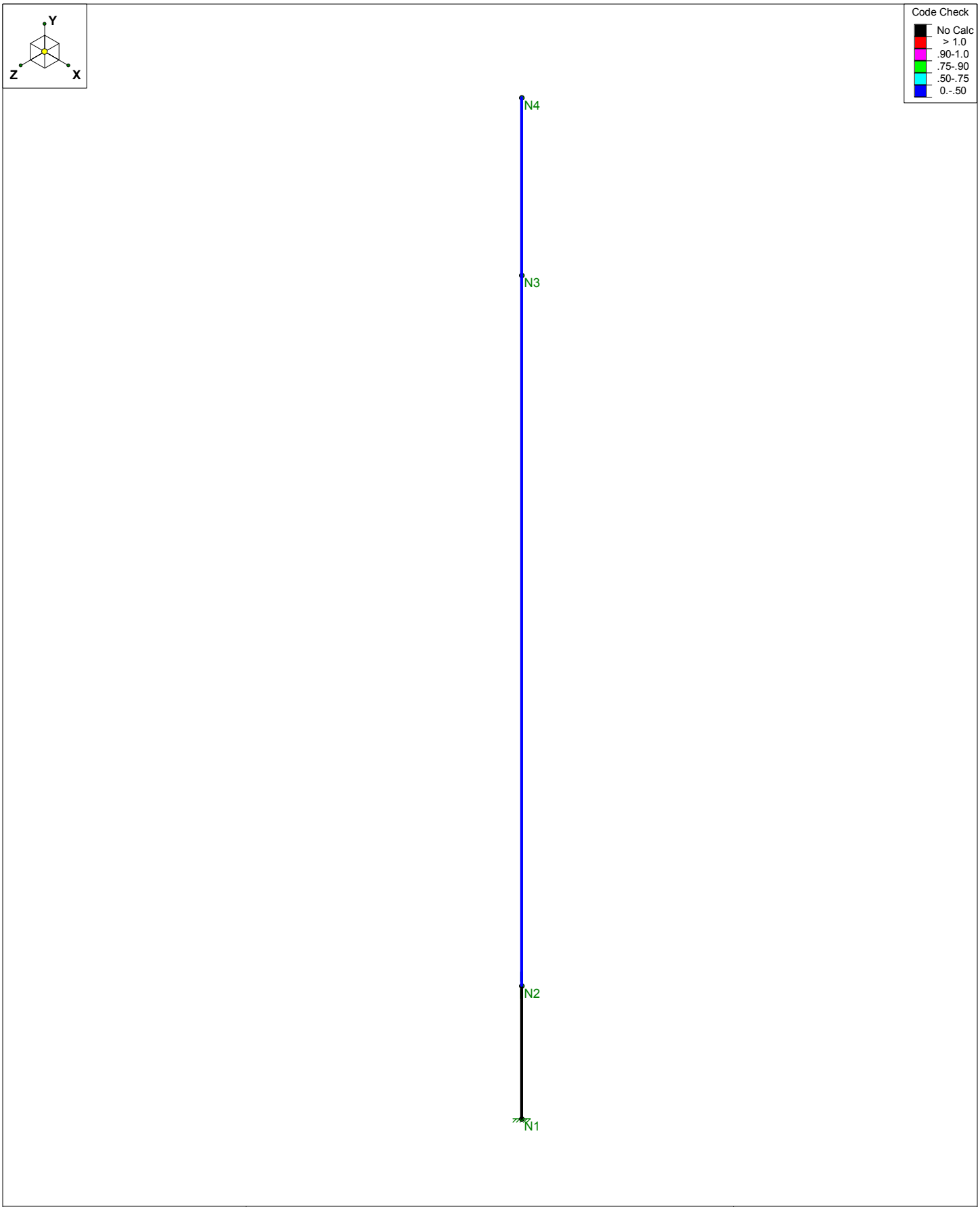
	Me...	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Fa ...	Ft [...	Fb y-y [ksi]	Fb	...	AS...
1	M1	HSS18...	.154	0	2	.036	0		2	24...	25.2	27.72	27...	.6	H1-2
2	M2	4.5" Ma...	.001	0	1	.000	0		2	24...	25.2	27.72	27...	.6	H1-2

Joint Reactions

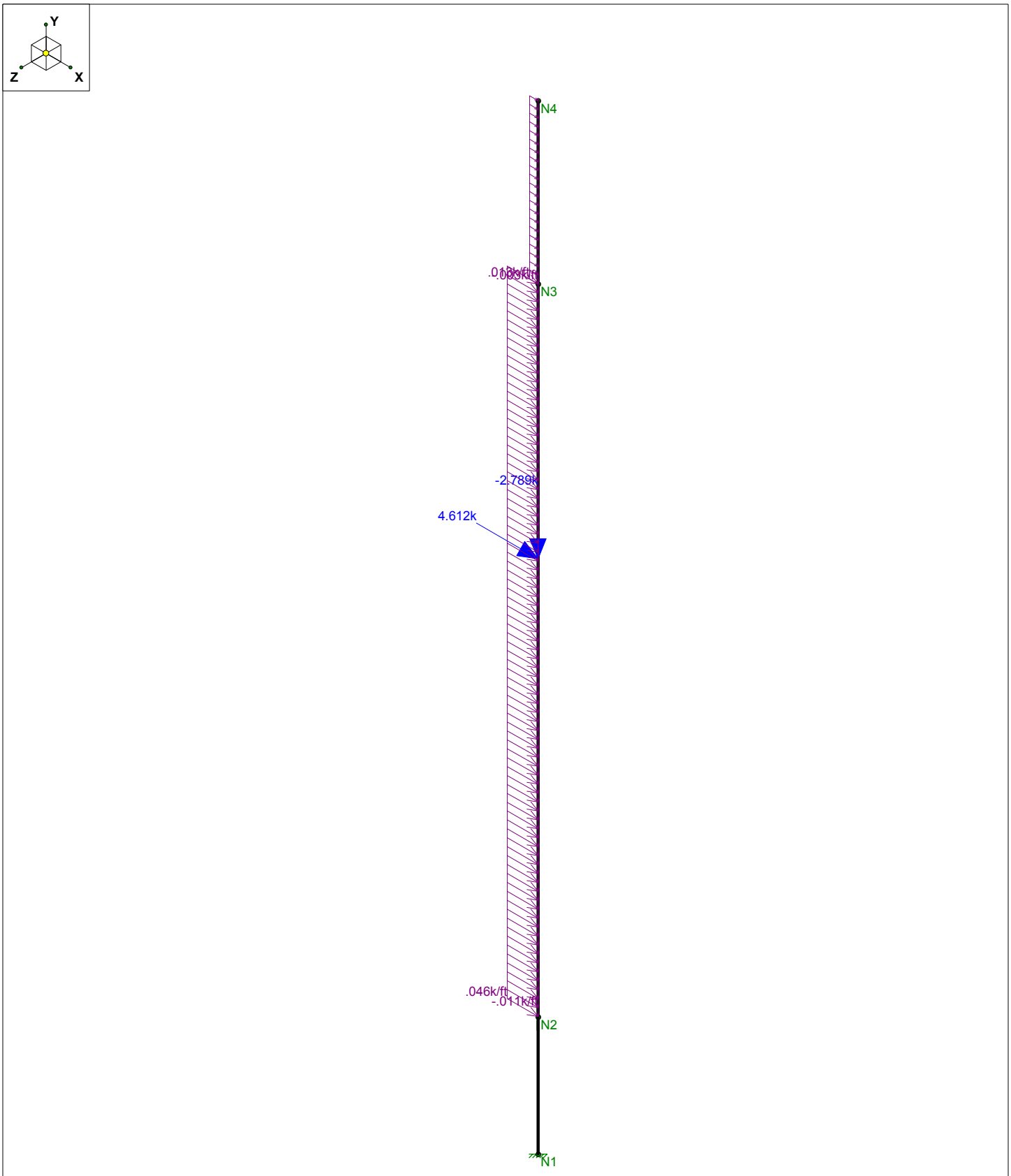
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N2	0	3.461	0	0	0	0
2	1	N1	-5.006	0	0	0	0	32.275
3	1	Totals:	-5.006	3.461	0			
4	1	COG (ft):	X: 0	Y: 6.387	Z: 0			

Joint Reactions

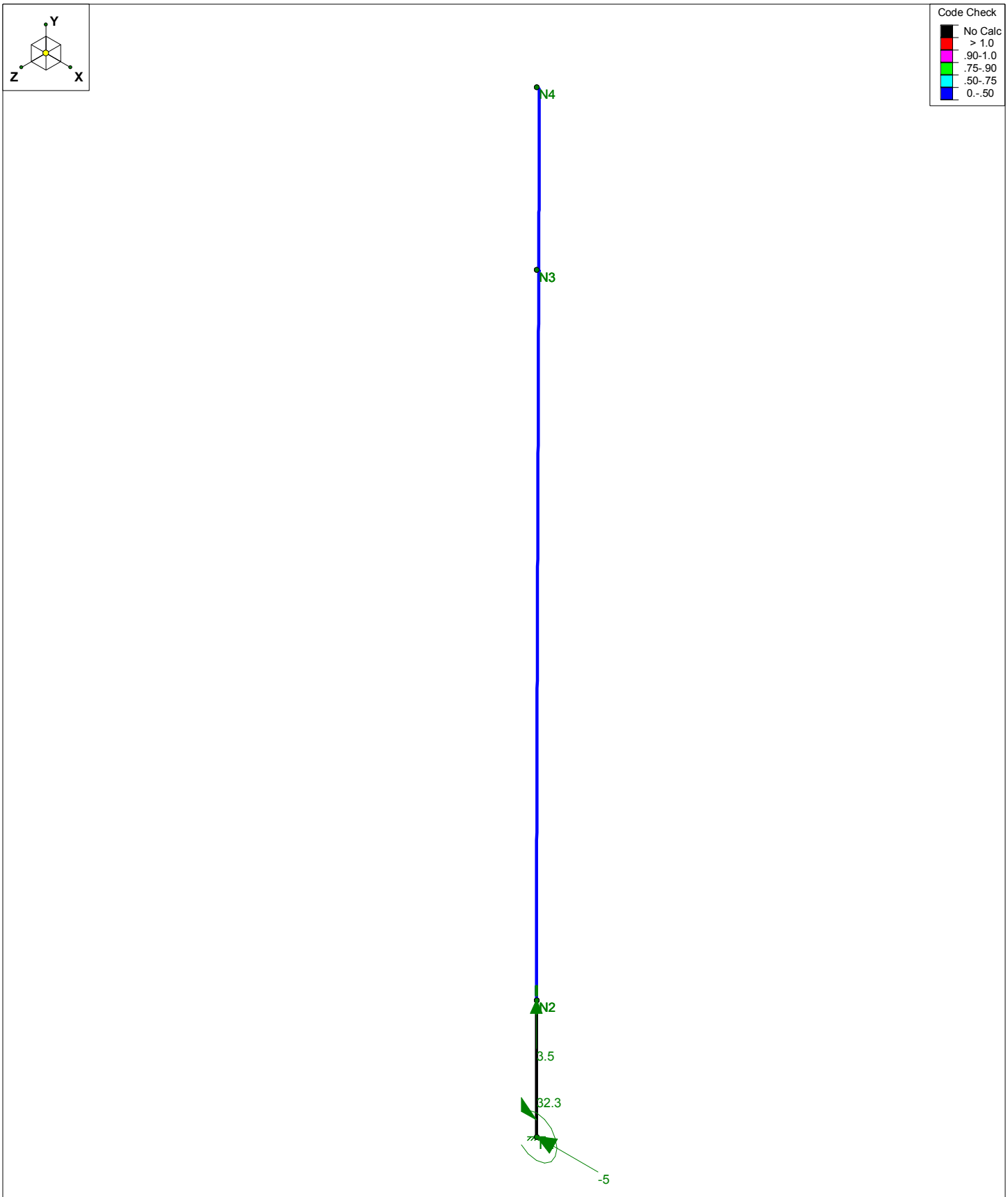
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N2	0	2.602	0	0	0	0
2	2	N1	-5.806	0	0	0	0	37.395
3	2	Totals:	-5.806	2.602	0			
4	2	COG (ft):	X: 0	Y: 6.374	Z: 0			



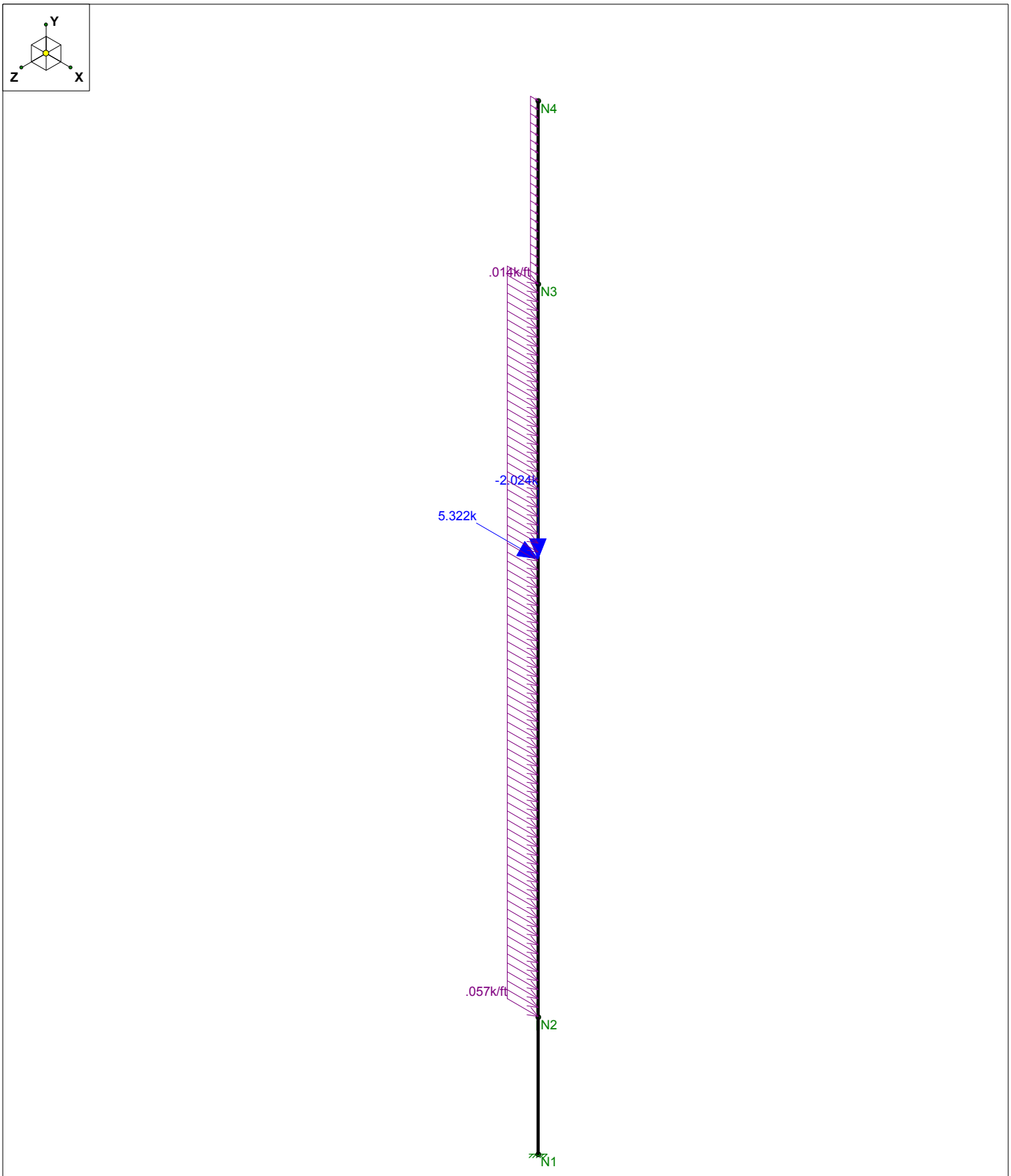
CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 1:26 PM
15267.000 /AT&T CT5176	Unity Check	5176 EIA-TIA Loading.r3d



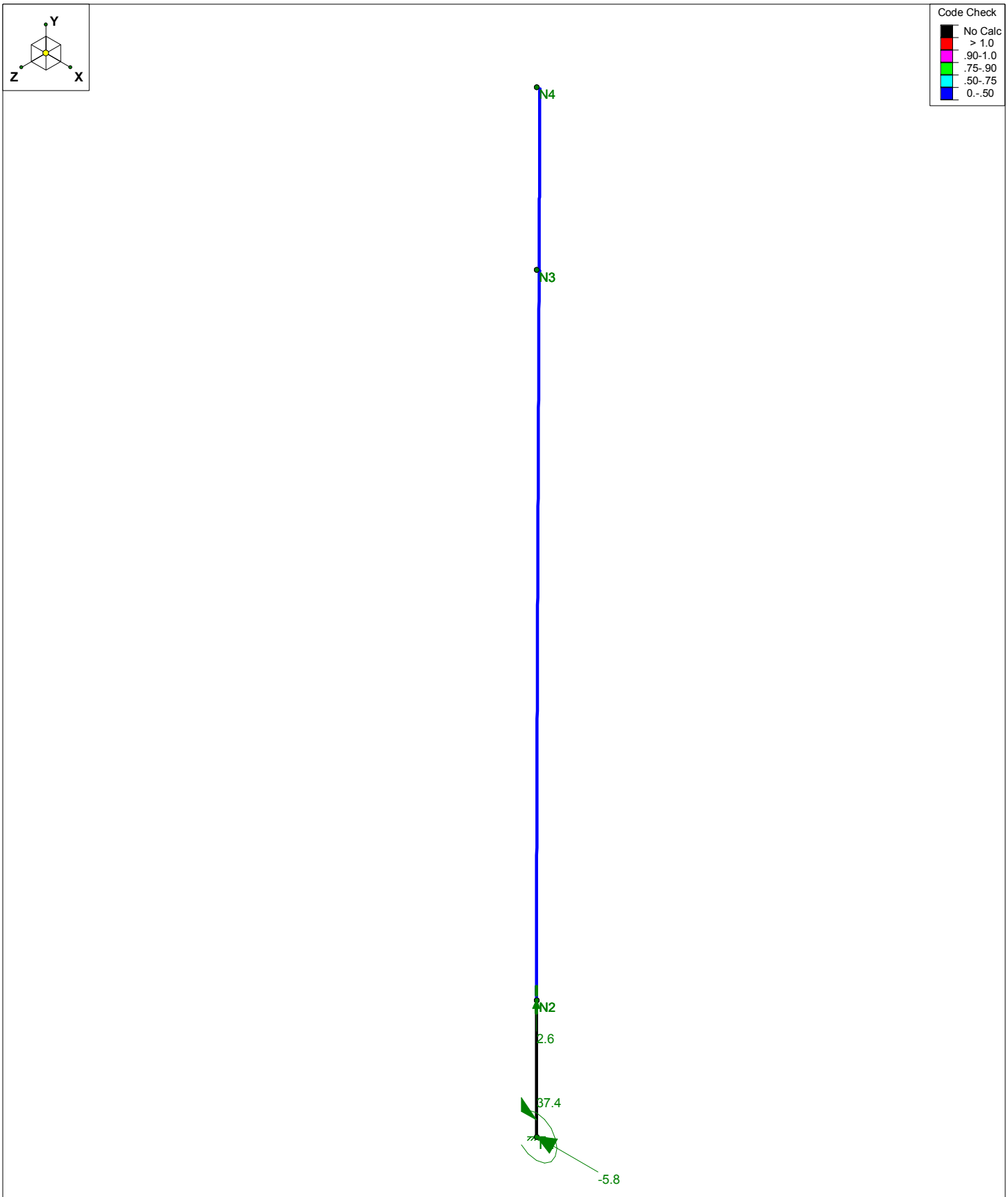
CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 1:26 PM
15267.000 /AT&T CT5176	LC #1 Loads	5176 EIA-TIA Loading.r3d



CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 1:27 PM
15267.000 /AT&T CT5176	LC #1 Reactions and Deflected Shape	5176 EIA-TIA Loading.r3d



CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 1:27 PM
15267.000 /AT&T CT5176	LC #2 Loads	5176 EIA-TIA Loading.r3d



CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 1:28 PM
15267.000 /AT&T CT5176	LC #2 Reactions and Deflected Shape	5176 EIA-TIA Loading.r3d

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Subject:	Connection of Mast to Pole # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.003

Mast Connection to Pole:

Reactions:

Moment =	Moment := 37.4·kip·ft	(Input From Risa-3D)
Vertical =	Vertical := 0·kips	(Input From Risa-3D)
Horizontal x-dir =	Horizontal := 5.8·kips	(Input From Risa-3D)

Bolt Data:

Bolt Type =	ASTM A325	(User Input)
Bolt Diameter =	D := 0.75·in	(User Input)
Number of Bolts Per Angle =	$N_b := 4$	(User Input)
Allowable Tensile Strength =	$F_t := 19.9 \cdot kips$	(User Input)
Allowable Shear Strength =	$F_v := 10.6 \cdot kips$	(User Input)
Distance Between Bolts =	$D_{bolt} := 25 \cdot in$	(User Input)

Shear Force =

$$f_v := \sqrt{\left(\frac{Horizontal}{N_b \cdot 2}\right)^2 + \left(\frac{Moment}{D_{bolt} \cdot N_b}\right)^2} = 4.5 \cdot kips$$

Bolt Shear % of Capacity =

$$\frac{f_v}{F_v} = 42.89 \cdot \%$$

Check Bolt Shear =

$$Bolt\_Shear := if\left(\frac{f_v}{F_v} \le 1.00, "OK", "Overstressed"\right)$$

Bolt_Shear = "OK"

Tension Force =

$$f_t := \frac{Horizontal}{N_b} = 1.5 \cdot kips$$

Bolt Tenison % of Capacity =

$$\frac{f_t}{F_t} = 7.29 \cdot \%$$

Check Bolt Tension =

$$Bolt\_Tension := if\left(\frac{f_t}{F_t} \le 1.00, "OK", "Overstressed"\right)$$

Bolt_Tension = "OK"

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
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Subject: Load Analysis of Pipe Mast on Structure # 10254

Location: Bethel, CT

Rev. 0: 2/2/16 Prepared by: T.J.L Checked by: C.F.C.
Job No. 15267.000

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2007 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 100	mph	(User Input NESC 2007 Figure 250-2(e))
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of PCS Mast Above Grade =	TME := 162.67	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.402$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.292$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.783$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.83$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 29.8$ psf (NESC 2007 Section 250.C.2)

Shape Factors

NUS Design Criteria Issued April 12, 2007

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.45$	(User Input)

Overload Factors

NU Design Criteria Table

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

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on Mast

Mast Data: (HSS 18.0x0.375)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 18$	in	(User Input)
Mast Length =	$L_{mast} := 8$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.5$ sf/ft

Total Mast Wind Force = $qz \cdot Cd_R \cdot A_{mast} \cdot m = 73$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.583$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{mast} = 8$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 29.1$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 11$ plf **BLC 3**

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Subject:	Load Analysis of Pipe Mast on Structure # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 15267.000

Development of Wind & Ice Load on Mast

Mast Data: (HSS 4.5x0.237)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 4.5$	in	(User Input)
Mast Length =	$L_{mast} := 2$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.237$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.375$ sf/ft

Total Mast Wind Force = $qz \cdot Cd_R \cdot A_{mast} \cdot m = 18$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.458$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{mast} = 2$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 7.9$ sq in

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

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Powerwave 7770		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55$	in	(User Input)
Antenna Width =	$W_{ant} := 11$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 35$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 751$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 90$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 105$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 98$	lbs	**BLC 3**

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Subject: Load Analysis of Pipe Mast on Structure # 10254

Location: Bethel, CT

Rev. 0: 2/2/16

Prepared by: T.J.L Checked by: C.F.C.
Job No. 15267.000

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Powerwave P65-16-XLH-RR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 50$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1072$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 127$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5184$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1459$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 47$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 142$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Qunitel QS66512-3		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 9.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 112$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1072$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 127$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 336$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8294$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1765$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 57$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 172$	lbs	**BLC 3**

Development of Wind & Ice Load on TMA's

TMA Data: (AT&T)

TMA Model =	Powerwave LGP 21401		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 9.2$	in	(User Input)
TMA Width =	$W_{TMA} := 14.4$	in	(User Input)
TMA Thickness =	$T_{TMA} := 2.6$	in	(User Input)
TMA Weight =	$WT_{TMA} := 15$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.5$	sf	
Total TMA Wind Force =	$F_{TMA} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 329$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.1$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 6.5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := p \cdot Cd_F \cdot A_{ICETMA} = 42$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 90$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 344$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 221$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 43$	lbs	**BLC 3**

Development of Wind & Ice Load on TMA's

TMA Data: (AT&T)

TMA Model =	CCI DTMABP7819VG12A		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 14.25$	in	(User Input)
TMA Width =	$W_{TMA} := 11.46$	in	(User Input)
TMA Thickness =	$T_{TMA} := 4.17$	in	(User Input)
TMA Weight =	$WT_{TMA} := 25$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 1.1$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 3.4$	sf	
Total TMA Wind Force =	$F_{TMA} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 203$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.3$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 4$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := p \cdot Cd_F \cdot A_{ICETMA} = 25$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 75$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 681$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 301$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 10$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 29$	lbs	**BLC 3**

Development of Wind & Ice Load on TMA's

TMA Data: (AT&T)

TMA Model =	Kaelus TMA2117F00V1-1		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 8.46$	in	(User Input)
TMA Width =	$W_{TMA} := 11.81$	in	(User Input)
TMA Thickness =	$T_{TMA} := 4.21$	in	(User Input)
TMA Weight =	$WT_{TMA} := 18$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.7$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 4.2$	sf	
Total TMA Wind Force =	$F_{TMA} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 248$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.8$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := p \cdot Cd_F \cdot A_{ICETMA} = 32$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 108$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 421$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 211$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 41$	lbs	**BLC 3**

Development of Wind & Ice Load on Mounts

Mount Data: (AT&T)

Mount Type =	Site Pro Triple T-Arm RMV 12-372		
Mount Shape =	Flat		(User Input)
Mount Area =	$A_{mnt} := 18$	sq ft	(User Input)
Mount Area w/ Ice =	$A_{ICEmnt} := 22$	sq ft	(User Input)
Mount Weight =	$WT_{mnt} := 1160$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{ICEmnt} := 1400$	lbs	(User Input)

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 1072$ lbs **BLC 5**

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 141$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Mount = $WT_{mnt} = 1160$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Mount = $WT_{ICEmnt} - WT_{mnt} = 240$ lbs **BLC 3**

CENTEK engineering, INC.
Consulting Engineers
63-2 North Branford Road
Branford, CT 06405
Ph. 203-488-0580 / Fax. 203-488-8587

Subject: **Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining Antenna Structure Reactions Applied to CL&P Pole Tabulated Load Cases**

Location: **Bethel, CT**

Date:2/2/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Load Case	Description
1	Self Weight (Mast)
2	Weight of Appurtenances
3	Weight of Ice Only on Antenna Structure (1)
4	NESC Heavy Wind on Antenna Structure(1)
5	NESC Extreme Wind on Antenna Structure(1)

Footnotes:
(1) Antenna Structure includes: Mast and Appurtenances

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Subject: **Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining Antenna Structure Reactions Applied to CL&P Pole Load Combinations Table**

Location: **Bethel, CT**

Date: 2/2/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15267.000

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	NESC Heavy Wind on Antenna Structure		1		1	1.5	2	1.5	3	1.5	4	2.5		
2	NESC Extreme Wind on Antenna Structure		1		1	1	2	1	5	1				

Footnotes:
(1) BLC = Basic Load Case
(2) Antenna Structure includes: Mast and Appurtenances

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Increase Nailing Capacity for Wind?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automaticly Iterate Stiffness for Walls?	No
Maximum Iteration Number 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 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building

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, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct Z	.035
Ct X	.035
T Z (sec)	Not Entered
T X (sec)	Not Entered
R Z	8.5
R X	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Seismic Detailing Code	ASCE 7-05
Om Z	1
Om X	1
Rho Z	1
Rho X	1

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	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 (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Leng...	Lbyy[ft]	Lbzz[ft]	Lcomp ...	Lcomp ...	Kyy	Kzz	Cm...	Cm...	Cb	y s...	z s...	Functi...
1	M1	Existing Lower Mast	8												Lateral
2	M2	Existing Upper Mast	2												Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Lower Mast	HSS18x0.375	Beam	Pipe	A500 Gr.42	Typical	19.4	754	754	1510
2	Existing Upper Mast	4.5" Mast w/ Stiffe...	Beam	Pipe	A500 Gr.42	Typical	7.37	74.86	74.86	14.465

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N2	N3			Existing Lower Mast	Beam	Pipe	A500 Gr.42	Typical
2	M2	N3	N4			Existing Upper Mast	Beam	Pipe	A500 Gr.42	Typical
3	M3	N1	N2			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From D...
1	N1	0	0	0	0	
2	N2	0	1.5	0	0	
3	N3	0	9.5	0	0	
4	N4	0	11.5	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]	Footing
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N2		Reaction					

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.105	5
2	M1	Y	-.15	5
3	M1	Y	-.336	5
4	M1	Y	-.09	5
5	M1	Y	-.075	5
6	M1	Y	-.108	5
7	M1	Y	-1.16	5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.098	5
2	M1	Y	-.142	5
3	M1	Y	-.172	5
4	M1	Y	-.043	5
5	M1	Y	-.029	5
6	M1	Y	-.041	5

Member Point Loads (BLC 3 : Weight of Ice Only on Antenna St) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
7	M1	Y	-.24	5

Member Point Loads (BLC 4 : NESC Wind with Ice on Antenna St)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.09	5
2	M1	X	.127	5
3	M1	X	.127	5
4	M1	X	.042	5
5	M1	X	.025	5
6	M1	X	.032	5
7	M1	X	.141	5

Member Point Loads (BLC 5 : NESC Wind on Antenna Structure)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.751	5
2	M1	X	1.072	5
3	M1	X	1.072	5
4	M1	X	.329	5
5	M1	X	.203	5
6	M1	X	.248	5
7	M1	X	1.072	5

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
No Data to Print ...			

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.011	-.011	0	0
2	M2	Y	-.003	-.003	0	0

Member Distributed Loads (BLC 4 : NESC Wind with Ice on Antenna St)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	0
2	M2	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : NESC Wind on Antenna Structure)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.073	.073	0	0
2	M2	X	.018	.018	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight (Antenna Mast)	None		-1						
2	Weight of Appurtenances	None					7			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
3	Weight of Ice Only on Antenna St	None					7	2		
4	NESC Wind with Ice on Antenna...	None					7	2		
5	NESC Wind on Antenna Structure	None					7	2		

Load Combinations

	Description	Sol...	PDelta	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	NESC Heavy Wind on Ant...	Yes			1	1.5	2	1.5	3	1.5	4	2.5								
2	NESC Extreme Wind on A...	Yes			1	1	2	1	5	1										
3	Self Weight				1	1														

Envelope Joint Reactions

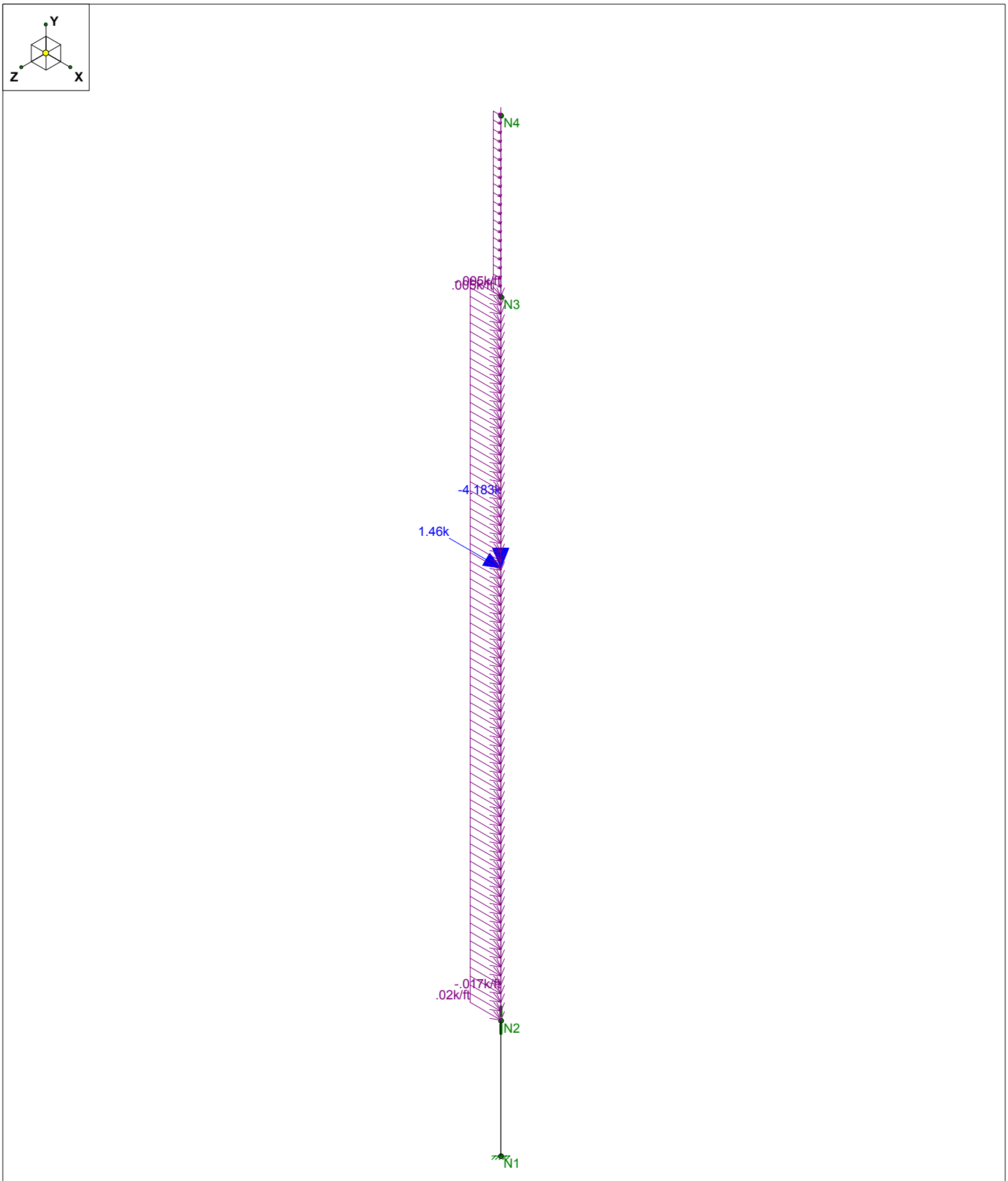
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	-1.63	1	0	1	0	1	0	1	0	1	34.446	2
2		min	-5.367	2	0	2	0	1	0	1	0	1	10.475	1
3	N2	max	0	1	5.192	1	0	1	0	1	0	1	0	1
4		min	0	1	2.602	2	0	1	0	1	0	1	0	1
5	Totals:	max	-1.63	1	5.192	1	0	1						
6		min	-5.367	2	2.602	2	0	1						

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-1.63	0	0	0	0	10.475
2	1	N2	0	5.192	0	0	0	0
3	1	Totals:	-1.63	5.192	0			
4	1	COG (ft):	X: 0	Y: 6.387	Z: 0			

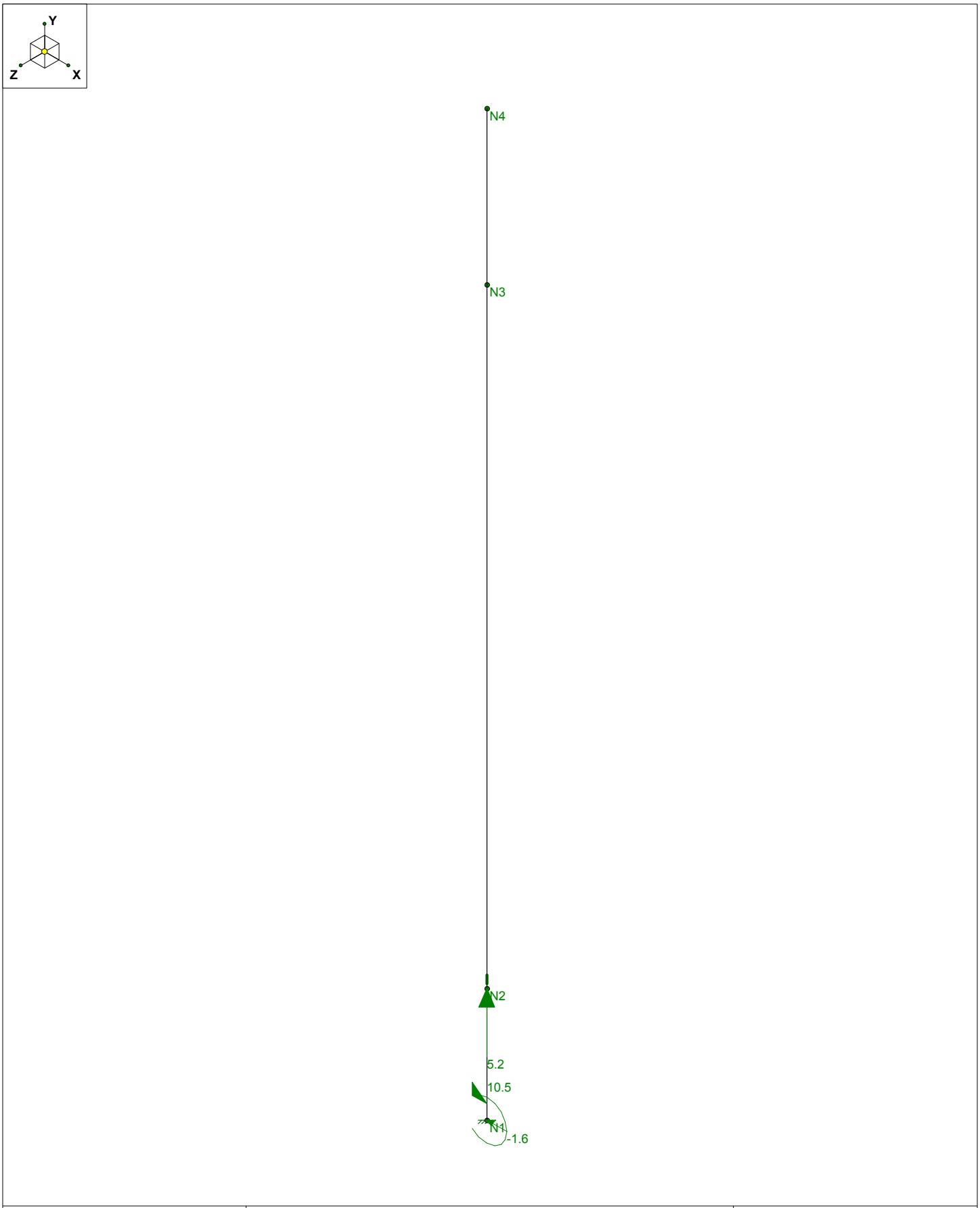
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-5.367	0	0	0	0	34.446
2	2	N2	0	2.602	0	0	0	0
3	2	Totals:	-5.367	2.602	0			
4	2	COG (ft):	X: 0	Y: 6.374	Z: 0			

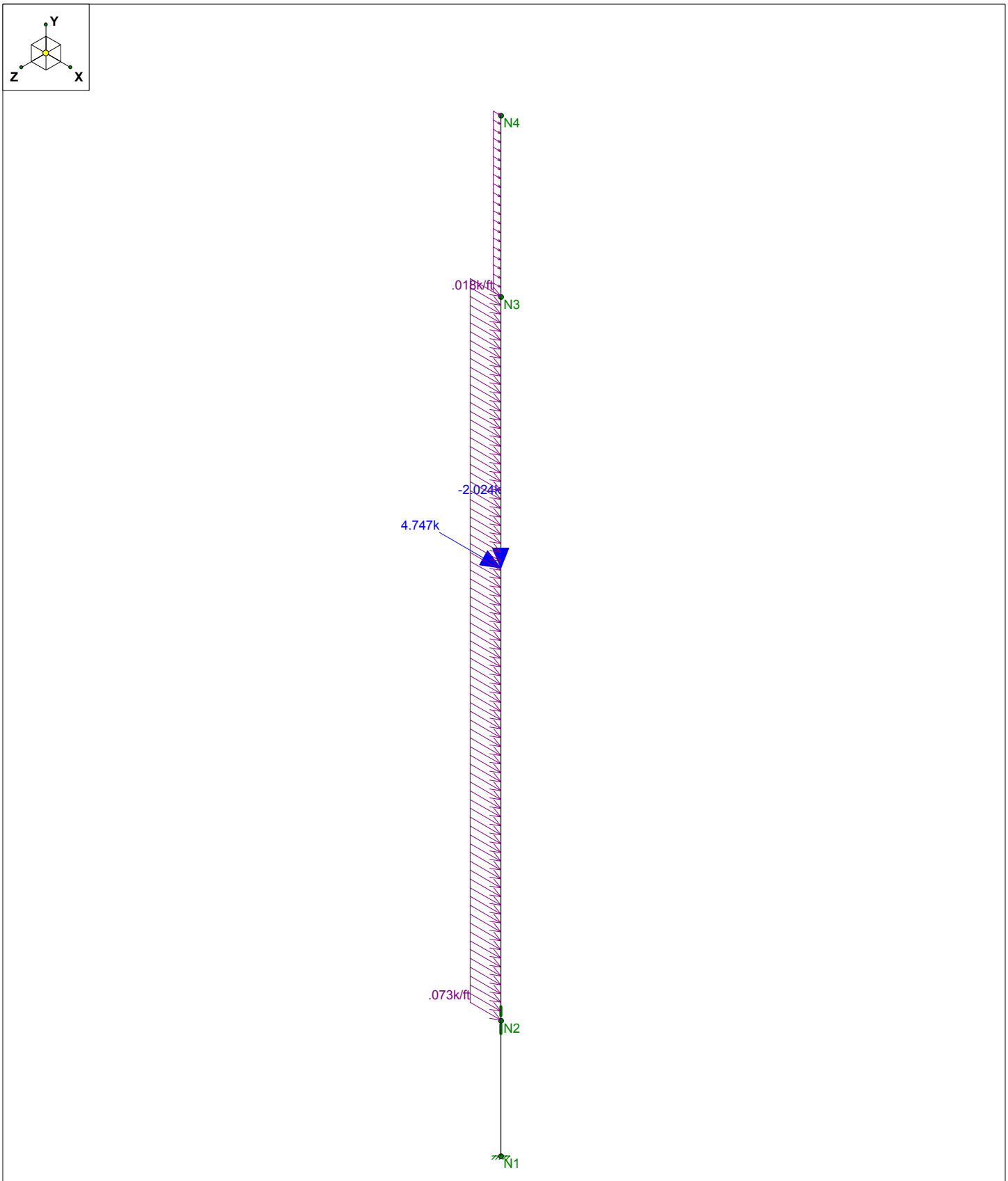


Loads: LC 1, NESC Heavy Wind on Antenna Structure

CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 12:24 PM
15267.000 /AT&T CT5176	LC #1 Loads	5176 NESC Loading.r3d

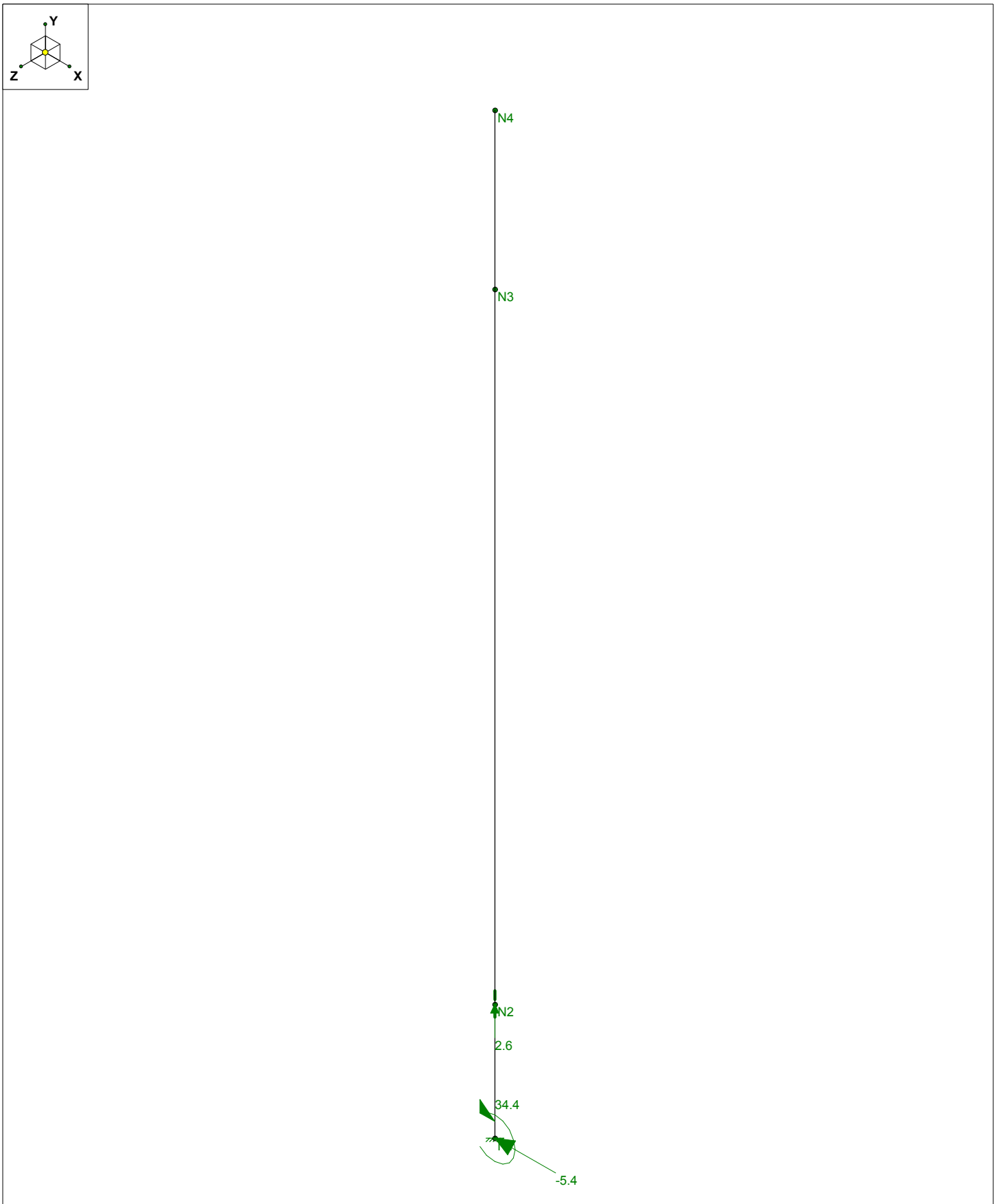


CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 12:25 PM
15267.000 /AT&T CT5176	LC #1 Reactions	5176 NESC Loading.r3d



Loads: LC 2, NESC Extreme Wind on Antenna Structure

CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 12:24 PM
15267.000 /AT&T CT5176	LC #2 Loads	5176 NESC Loading.r3d



CENTEK Engineering, INC.		
tjl, cfc	Structure # 10254 - Mast	Feb 2, 2016 at 12:26 PM
15267.000 /AT&T CT5176	LC #2 Reactions	5176 NESC Loading.r3d

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Subject:	Coax Cable on Pole # 10254
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 15267.000

Coax Cable on Pole

Distance Between Coax Cable Attach Points =

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

Diameter of Coax Cable = $D_{coax1} := 1.98 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax1} := 1.04 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax1} := 24$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax1} := 4$ *(User Input)*

Extreme Wind Pressure = $qz := 29.8 \cdot psf$ *(User Input)*

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

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

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

Shape Factor = $Cd_{coax} := 1.45$ *(User Input)*

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

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

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

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

Wind Area with Ice = $A_{ice} := \left(NP_{coax1} \cdot D_{coax1} + 2 \cdot Ir\right) = 8.92 \cdot in$

Wind Area without Ice = $A := \left(NP_{coax1} \cdot D_{coax1}\right) = 7.92 \cdot in$

Ice Area per Liner Ft = $Ai_{coax1} := \frac{\pi}{4} \cdot \left[\left(D_{coax1} + 2 \cdot Ir\right)^2 - D_{coax1}^2\right] = 0.027\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax1} \cdot Id \cdot N_{coax1} = 36 \cdot plf$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HV}\right]}$$

Heavy Transverse Load =

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

$$Heavy_{Vert} = \begin{pmatrix} 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \\ 108 \end{pmatrix} lb$$

Extreme Vertical Load =

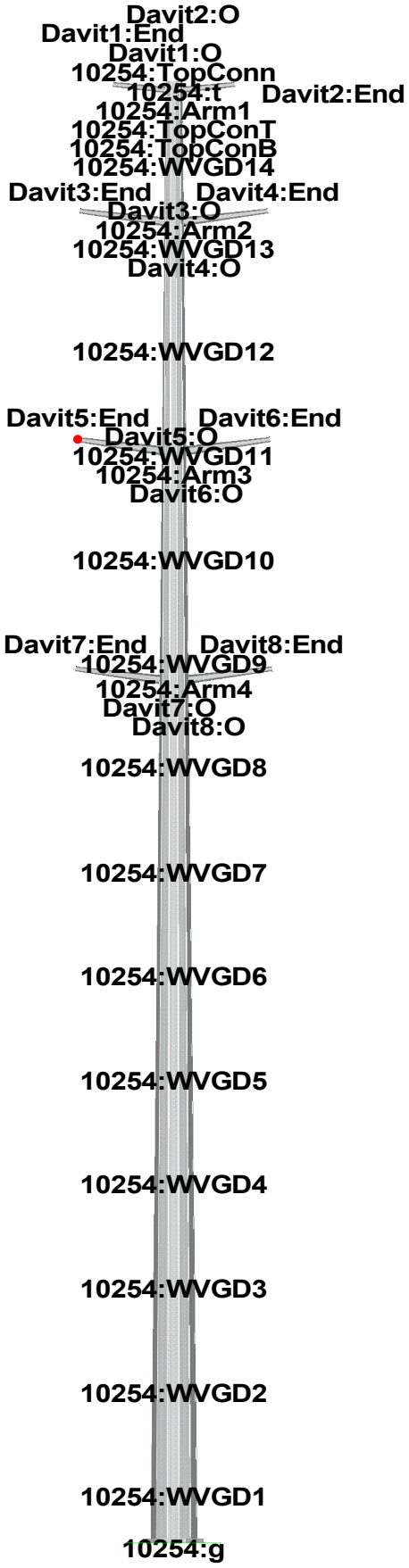
$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

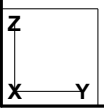
Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \\ 285 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "cl&p structure # 10254"
PLS-POLE Version 12.50, 11:26:05 AM Tuesday, February 02, 2016
Undeformed geometry displayed





Project Name : 15267.000 - Bethel, CT
Project Notes: Structure # 10254 / AT&T CT5176
Project File : J:\Jobs\1526700.WI\003_Stony Hill\04_Structural\Backup Documentation\PLS-Pole\cl&p structure # 10254.pol
Date run : 11:07:11 AM Tuesday, February 02, 2016
by : PLS-POLE Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: j:\jobs\1526700.wi\003_stony hill\04_structural\backup documentation\pls-pole\cl&p #10254.lca

*** Analysis Results:

Maximum element usage is 96.15% for Base Plate "10254" in load case "NESC Extreme"
Maximum insulator usage is 43.06% for Clamp "Clamp25" in load case "NESC Extreme"

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	10254:g	-0.15	-35.55	-103.07	35.55	3891.03	-9.75	3891.05	-0.00	0.00
NESC Extreme	10254:g	-0.05	-50.50	-52.28	50.50	5094.36	-2.95	5094.36	-0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: postive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC Heavy	10254:t	0.17	88.17	-3.14	88.22	0.01	-5.41	0.00
NESC Extreme	10254:t	0.05	113.91	-5.18	114.03	0.00	-7.13	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
10254	1	5023	NESC Extreme	72.32	1034.27
10254	2	10059	NESC Extreme	85.02	3102.27
10254	3	10117	NESC Extreme	88.39	5094.36

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
10254	88.39	NESC Extreme	37	28299.2

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	13.03	NESC Heavy	1	61.2
Davit2	16.73	NESC Heavy	1	61.2
Davit3	68.63	NESC Heavy	1	121.4
Davit4	80.82	NESC Heavy	1	121.4
Davit5	69.37	NESC Heavy	1	121.4
Davit6	81.35	NESC Heavy	1	121.4
Davit7	70.50	NESC Heavy	1	121.4
Davit8	82.16	NESC Heavy	1	121.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.16	Davit8	Tubular Davit
NESC Extreme	96.15	10254	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy	68.84	10254	37
NESC Extreme	88.39	10254	37

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	10254	12	40.000	99.970	3891.033	-9.747	45.045	264.325	5	143.102	2.816	75.07
NESC Extreme	10254	12	40.000	49.182	5094.357	-2.954	57.688	338.516	5	183.128	3.187	96.15

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy	82.16	Davit8	1
NESC Extreme	37.17	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.87	NESC Heavy	0.0
Clamp2	Clamp	1.87	NESC Heavy	0.0
Clamp3	Clamp	9.30	NESC Heavy	0.0

Clamp4	Clamp	9.30	NESC Heavy	0.0
Clamp5	Clamp	9.30	NESC Heavy	0.0
Clamp6	Clamp	9.30	NESC Heavy	0.0
Clamp7	Clamp	9.30	NESC Heavy	0.0
Clamp8	Clamp	9.30	NESC Heavy	0.0
Clamp9	Clamp	6.49	NESC Heavy	0.0
Clamp10	Clamp	1.16	NESC Heavy	0.0
Clamp11	Clamp	1.16	NESC Heavy	0.0
Clamp12	Clamp	1.16	NESC Heavy	0.0
Clamp13	Clamp	1.16	NESC Heavy	0.0
Clamp14	Clamp	1.16	NESC Heavy	0.0
Clamp15	Clamp	1.16	NESC Heavy	0.0
Clamp16	Clamp	1.16	NESC Heavy	0.0
Clamp17	Clamp	1.16	NESC Heavy	0.0
Clamp18	Clamp	1.16	NESC Heavy	0.0
Clamp19	Clamp	1.16	NESC Heavy	0.0
Clamp20	Clamp	1.16	NESC Heavy	0.0
Clamp21	Clamp	1.16	NESC Heavy	0.0
Clamp22	Clamp	1.16	NESC Heavy	0.0
Clamp23	Clamp	1.16	NESC Heavy	0.0
Clamp24	Clamp	6.71	NESC Extreme	0.0
Clamp25	Clamp	43.06	NESC Extreme	0.0
Clamp26	Clamp	43.06	NESC Extreme	0.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	850.8
Weight of Steel Poles:	28299.2
Total:	29150.0

*** End of Report

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

Project Name : 15267.000 - Bethel, CT
Project Notes: Structure # 10254 / AT&T CT5176
Project File : J:\Jobs\1526700.WI\003_Stony Hill\04_Structural\Backup Documentation\PLS-Pole\cl&p structure # 10254.pol
Date run     : 11:07:11 AM Tuesday, February 02, 2016
by           : PLS-POLE Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.
```

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


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

Steel Pole Properties:

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

Label	Length (ft)	Length (ft)		(in)	(in)	Coef. (in/ft)		Override (ksi)	Override (lbs/ft^3)	Base	Type	Tip (ft)	Trans. Load (kips)	Long. Load (kips)
CL&P10254	10254	140.00	0	Yes	12F	20.19	53.5	0	1.3	3 tubes	0	0	Calculated	0.000	0.0000	0.0000

Steel Tubes Properties:

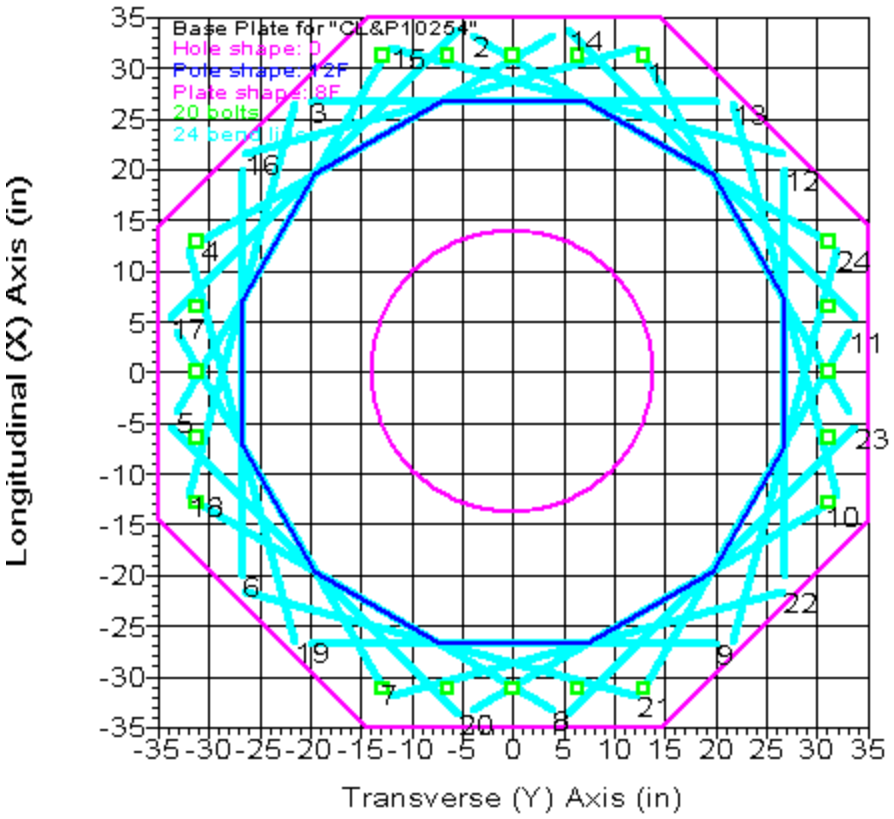
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Lap Length (ft)	Diam. Actual Overlap (ft)
CL&P10254	1	55	0.3125	4.670	0.000	0.000	65.000	0.000	5023	29.85	0.24866	20.19	33.86	4.155	4.670
CL&P10254	2	54.67	0.4375	6.170	0.000	0.000	65.000	0.000	10059	28.95	0.24866	32.08	45.67	5.600	6.170
CL&P10254	3	41.17	0.46875	0.000	0.000	0.000	65.000	0.000	10117	21.32	0.24866	43.26	53.50	0.000	0.000

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
CL&P10254	70.000	8F	3.250	3100	40.000	28.000	0	490.00	60.000	2.250	62.375	20	41968.80	41968.80

Base Plate Bolt Coordinates for Property "CL&P10254":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0	1	0
1	0.2064	0
1	0.4128	0
0.4128	1	0
0.2064	1	0
1	0	0



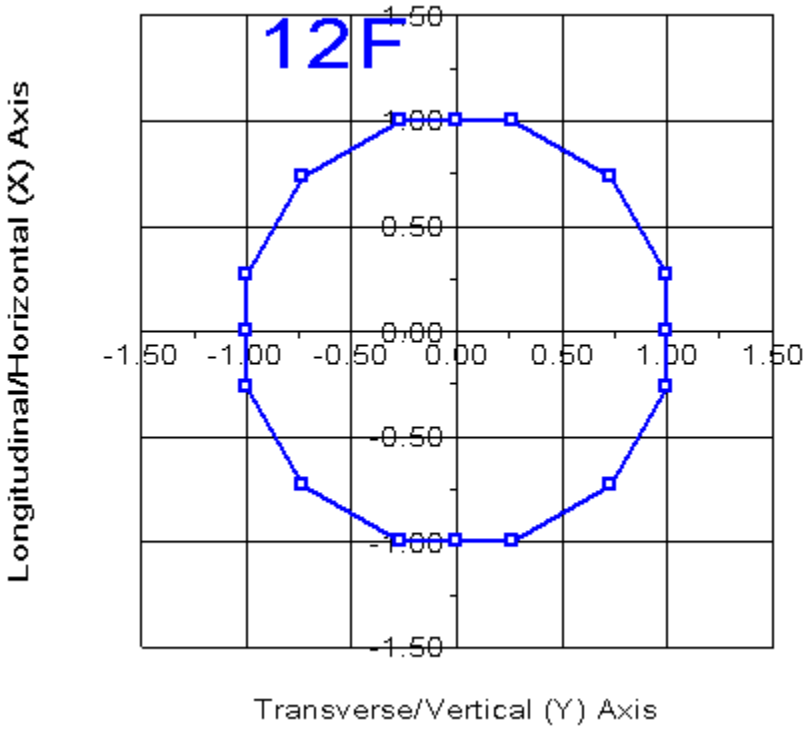
Steel Pole Connectivity:

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)
10254			0	0	0	0	0	CL&P10254	21 labels		0.00	0

Relative Attachment Labels for Steel Pole "10254":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
10254:Arm1	0.00	139.30
10254:Arm2	0.00	126.63
10254:Arm3	0.00	104.63
10254:Arm4	0.00	82.63
10254:TopConn	0.00	138.50

10254:WVGD1	0.00	5.00
10254:WVGD2	0.00	15.00
10254:WVGD3	0.00	25.00
10254:WVGD4	0.00	35.00
10254:WVGD5	0.00	45.00
10254:WVGD6	0.00	55.00
10254:WVGD7	0.00	65.00
10254:WVGD8	0.00	75.00
10254:WVGD9	0.00	85.00
10254:WVGD10	0.00	95.00
10254:WVGD11	0.00	105.00
10254:WVGD12	0.00	115.00
10254:WVGD13	0.00	125.00
10254:WVGD14	0.00	135.00
10254:TopConT	0.00	139.00
10254:TopConB	0.00	138.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
10254	10254:t	10254:t Ori	0.00	20.19	19.97	1009.93	1009.93	0.00	14.6	65.00	65.00	541.96	541.96

10254	10254:Arm1	10254:Arm1	End	0.70	20.36	20.15	1036.69	1036.69	0.00	14.8	65.00	65.00	551.57	551.57
10254	10254:Arm1	10254:Arm1	Ori	0.70	20.36	20.15	1036.69	1036.69	0.00	14.8	65.00	65.00	551.57	551.57
10254	10254:TopConT	10254:TopConT	End	1.00	20.44	20.22	1048.30	1048.30	0.00	14.8	65.00	65.00	555.71	555.71
10254	10254:TopConT	10254:TopConT	Ori	1.00	20.44	20.22	1048.31	1048.31	0.00	14.8	65.00	65.00	555.71	555.71
10254	10254:TopConn	10254:TopConn	End	1.50	20.56	20.35	1067.85	1067.85	0.00	14.9	65.00	65.00	562.65	562.65
10254	10254:TopConn	10254:TopConn	Ori	1.50	20.56	20.35	1067.85	1067.85	0.00	14.9	65.00	65.00	562.65	562.65
10254	10254:TopConB	10254:TopConB	End	2.00	20.68	20.47	1087.64	1087.64	0.00	15.1	65.00	65.00	569.63	569.63
10254	10254:TopConB	10254:TopConB	Ori	2.00	20.68	20.47	1087.64	1087.64	0.00	15.1	65.00	65.00	569.63	569.63
10254	10254:WVGD14	10254:WVGD14	End	5.00	21.43	21.22	1211.53	1211.53	0.00	15.7	65.00	65.00	612.43	612.43
10254	10254:WVGD14	10254:WVGD14	Ori	5.00	21.43	21.22	1211.53	1211.53	0.00	15.7	65.00	65.00	612.43	612.43
10254	#10254:0	Tube 1	End	9.19	22.47	22.27	1399.69	1399.69	0.00	16.6	65.00	65.00	674.76	674.76
10254	#10254:0	Tube 1	Ori	9.19	22.47	22.27	1399.69	1399.69	0.00	16.6	65.00	65.00	674.76	674.76
10254	10254:Arm2	10254:Arm2	End	13.38	23.51	23.31	1606.40	1606.40	0.00	17.5	65.00	65.00	740.12	740.12
10254	10254:Arm2	10254:Arm2	Ori	13.38	23.51	23.31	1606.40	1606.40	0.00	17.5	65.00	65.00	740.12	740.12
10254	10254:WVGD13	10254:WVGD13	End	15.00	23.92	23.72	1691.79	1691.79	0.00	17.8	65.00	65.00	766.29	766.29
10254	10254:WVGD13	10254:WVGD13	Ori	15.00	23.92	23.72	1691.79	1691.79	0.00	17.8	65.00	65.00	766.29	766.29
10254	#10254:1	Tube 1	End	20.00	25.16	24.97	1973.41	1973.41	0.00	18.9	65.00	65.00	849.68	849.68
10254	#10254:1	Tube 1	Ori	20.00	25.16	24.97	1973.41	1973.41	0.00	18.9	65.00	65.00	849.68	849.68
10254	10254:WVGD12	10254:WVGD12	End	25.00	26.40	26.22	2284.67	2284.67	0.00	20.0	65.00	65.00	937.38	937.38
10254	10254:WVGD12	10254:WVGD12	Ori	25.00	26.40	26.22	2284.67	2284.67	0.00	20.0	65.00	65.00	937.38	937.38
10254	#10254:2	Tube 1	End	30.00	27.65	27.47	2627.05	2627.05	0.00	21.0	65.00	65.00	1029.38	1029.38
10254	#10254:2	Tube 1	Ori	30.00	27.65	27.47	2627.05	2627.05	0.00	21.0	65.00	65.00	1029.38	1029.38
10254	10254:WVGD11	10254:WVGD11	End	35.00	28.89	28.72	3002.04	3002.04	0.00	22.1	65.00	65.00	1125.70	1125.70
10254	10254:WVGD11	10254:WVGD11	Ori	35.00	28.89	28.72	3002.04	3002.04	0.00	22.1	65.00	65.00	1125.70	1125.70
10254	10254:Arm3	10254:Arm3	End	35.38	28.98	28.81	3031.52	3031.52	0.00	22.2	65.00	65.00	1133.09	1133.09
10254	10254:Arm3	10254:Arm3	Ori	35.38	28.98	28.81	3031.52	3031.52	0.00	22.2	65.00	65.00	1133.09	1133.09
10254	#10254:3	Tube 1	End	40.19	30.18	30.01	3427.14	3427.14	0.00	23.2	65.00	65.00	1230.17	1230.17
10254	#10254:3	Tube 1	Ori	40.19	30.18	30.01	3427.14	3427.14	0.00	23.2	65.00	65.00	1230.17	1230.17
10254	10254:WVGD10	10254:WVGD10	End	45.00	31.38	31.21	3855.77	3855.77	0.00	24.2	65.00	65.00	1331.24	1331.24
10254	10254:WVGD10	10254:WVGD10	Ori	45.00	31.38	31.21	3855.77	3855.77	0.00	24.2	65.00	65.00	1331.24	1331.24
10254	#10254:4	Tube 1	End	47.67	32.04	31.88	4107.81	4107.81	0.00	24.8	65.00	65.00	1388.93	1388.93
10254	#10254:4	Tube 1	Ori	47.67	32.04	31.88	4107.81	4107.81	0.00	24.8	65.00	65.00	1388.93	1388.93
10254	#10254:5	SpliceT	End	50.33	32.70	32.55	4370.60	4370.60	0.00	25.4	65.00	65.00	1447.84	1447.84
10254	#10254:5	SpliceT	Ori	50.33	32.70	32.55	4370.60	4370.60	0.00	25.4	65.00	65.00	1447.84	1447.84
10254	10254:WVGD9	10254:WVGD9	End	55.00	33.24	46.14	6355.40	6355.40	0.00	17.7	65.00	65.00	2071.37	2071.37
10254	10254:WVGD9	10254:WVGD9	Ori	55.00	33.24	46.14	6355.40	6355.40	0.00	17.7	65.00	65.00	2071.37	2071.37
10254	10254:Arm4	10254:Arm4	End	57.38	33.83	46.97	6704.85	6704.85	0.00	18.0	65.00	65.00	2147.12	2147.12
10254	10254:Arm4	10254:Arm4	Ori	57.38	33.83	46.97	6704.86	6704.86	0.00	18.0	65.00	65.00	2147.12	2147.12
10254	#10254:6	Tube 2	End	61.19	34.78	48.31	7292.22	7292.22	0.00	18.6	65.00	65.00	2271.56	2271.56
10254	#10254:6	Tube 2	Ori	61.19	34.78	48.31	7292.22	7292.22	0.00	18.6	65.00	65.00	2271.56	2271.56
10254	10254:WVGD8	10254:WVGD8	End	65.00	35.73	49.64	7912.93	7912.93	0.00	19.2	65.00	65.00	2399.50	2399.50
10254	10254:WVGD8	10254:WVGD8	Ori	65.00	35.73	49.64	7912.93	7912.93	0.00	19.2	65.00	65.00	2399.50	2399.50
10254	#10254:7	Tube 2	End	70.00	36.97	51.39	8779.05	8779.05	0.00	20.0	65.00	65.00	2572.61	2572.61
10254	#10254:7	Tube 2	Ori	70.00	36.97	51.39	8779.05	8779.05	0.00	20.0	65.00	65.00	2572.61	2572.61
10254	10254:WVGD7	10254:WVGD7	End	75.00	38.21	53.14	9706.17	9706.17	0.00	20.7	65.00	65.00	2751.75	2751.75
10254	10254:WVGD7	10254:WVGD7	Ori	75.00	38.21	53.14	9706.17	9706.17	0.00	20.7	65.00	65.00	2751.75	2751.75
10254	#10254:8	Tube 2	End	80.00	39.46	54.89	10696.37	10696.37	0.00	21.5	65.00	65.00	2936.92	2936.92
10254	#10254:8	Tube 2	Ori	80.00	39.46	54.89	10696.37	10696.37	0.00	21.5	65.00	65.00	2936.92	2936.92
10254	10254:WVGD6	10254:WVGD6	End	85.00	40.70	56.64	11751.73	11751.73	0.00	22.2	65.00	65.00	3128.12	3128.12
10254	10254:WVGD6	10254:WVGD6	Ori	85.00	40.70	56.64	11751.73	11751.73	0.00	22.2	65.00	65.00	3128.12	3128.12
10254	#10254:9	Tube 2	End	90.00	41.94	58.39	12874.33	12874.33	0.00	23.0	65.00	65.00	3325.35	3325.35
10254	#10254:9	Tube 2	Ori	90.00	41.94	58.39	12874.33	12874.33	0.00	23.0	65.00	65.00	3325.35	3325.35
10254	10254:WVGD5	10254:WVGD5	End	95.00	43.19	60.13	14066.23	14066.23	0.00	23.8	65.00	65.00	3528.61	3528.61
10254	10254:WVGD5	10254:WVGD5	Ori	95.00	43.19	60.13	14066.23	14066.23	0.00	23.8	65.00	65.00	3528.61	3528.61
10254	#10254:10	SpliceT	End	98.83	44.14	61.47	15027.40	15027.40	0.00	24.4	65.00	65.00	3688.39	3688.39
10254	#10254:10	SpliceT	Ori	98.83	44.14	61.47	15027.40	15027.40	0.00	24.4	65.00	65.00	3688.39	3688.39
10254	#10254:11	Tube 2	End	101.92	44.03	65.66	15947.74	15947.74	0.00	22.5	65.00	65.00	3923.87	3923.87
10254	#10254:11	Tube 2	Ori	101.92	44.03	65.66	15947.74	15947.74	0.00	22.5	65.00	65.00	3923.87	3923.87
10254	10254:WVGD4	10254:WVGD4	End	105.00	44.80	66.81	16805.12	16805.12	0.00	22.9	65.00	65.00	4064.02	4064.02

10254	10254:WVGD4	10254:WVGD4 Ori	105.00	44.80	66.81	16805.13	16805.13	0.00	22.9	65.00	65.00	4064.02	4064.02
10254	#10254:12	Tube 3 End	110.00	46.04	68.69	18259.08	18259.08	0.00	23.6	65.00	65.00	4296.39	4296.39
10254	#10254:12	Tube 3 Ori	110.00	46.04	68.69	18259.09	18259.09	0.00	23.6	65.00	65.00	4296.39	4296.39
10254	10254:WVGD3	10254:WVGD3 End	115.00	47.28	70.56	19794.58	19794.58	0.00	24.3	65.00	65.00	4535.22	4535.22
10254	10254:WVGD3	10254:WVGD3 Ori	115.00	47.28	70.56	19794.58	19794.58	0.00	24.3	65.00	65.00	4535.22	4535.22
10254	#10254:13	Tube 3 End	120.00	48.53	72.43	21413.84	21413.84	0.00	25.1	65.00	65.00	4780.51	4780.51
10254	#10254:13	Tube 3 Ori	120.00	48.53	72.43	21413.84	21413.84	0.00	25.1	65.00	65.00	4780.51	4780.51
10254	10254:WVGD2	10254:WVGD2 End	125.00	49.77	74.31	23119.09	23119.09	0.00	25.8	65.00	65.00	5032.27	5032.27
10254	10254:WVGD2	10254:WVGD2 Ori	125.00	49.77	74.31	23119.09	23119.09	0.00	25.8	65.00	65.00	5032.27	5032.27
10254	#10254:14	Tube 3 End	130.00	51.01	76.18	24912.54	24912.54	0.00	26.5	65.00	65.00	5290.48	5290.48
10254	#10254:14	Tube 3 Ori	130.00	51.01	76.18	24912.55	24912.55	0.00	26.5	65.00	65.00	5290.48	5290.48
10254	10254:WVGD1	10254:WVGD1 End	135.00	52.26	78.06	26796.44	26796.44	0.00	27.2	65.00	65.00	5555.16	5555.16
10254	10254:WVGD1	10254:WVGD1 Ori	135.00	52.26	78.06	26796.44	26796.44	0.00	27.2	65.00	65.00	5555.16	5555.16
10254	10254:g	10254:g End	140.00	53.50	79.93	28772.99	28772.99	0.00	27.9	65.00	65.00	5826.30	5826.30

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Steel Density Override (lbs/ft^3)
ARM1	6T	0.1875	6.4	5	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0
ARM2	6T	0.1875	9	5	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	5	-0.5

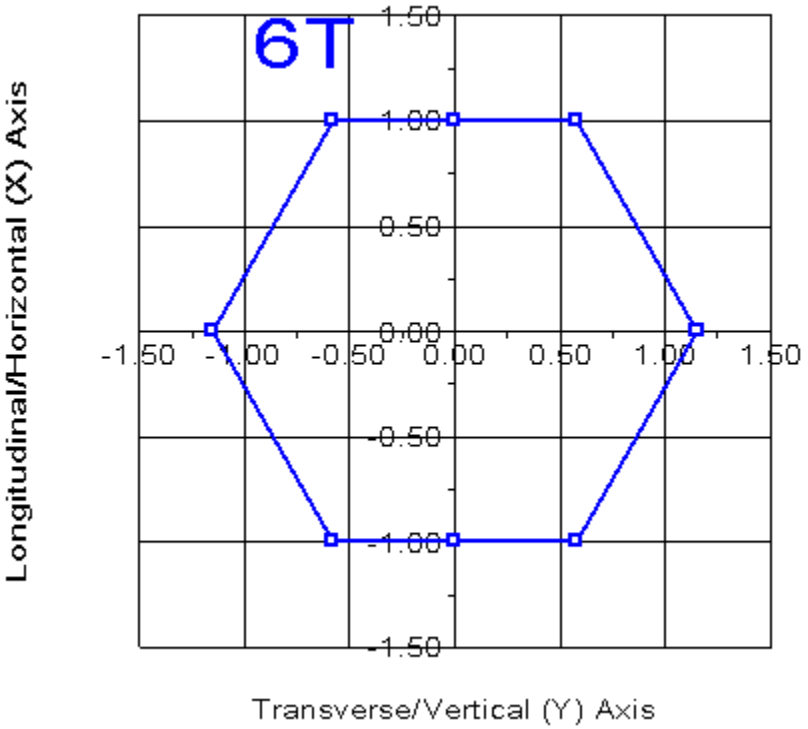
Intermediate Joints for Davit Property "ARM2":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	8	-1

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	10254:Arm1	ARM1	180
Davit2	10254:Arm1	ARM1	0
Davit3	10254:Arm2	ARM2	180
Davit4	10254:Arm2	ARM2	0
Davit5	10254:Arm3	ARM2	180
Davit6	10254:Arm3	ARM2	0
Davit7	10254:Arm4	ARM2	180

Davit8 10254: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	6.40	4.04	21.65	21.65	0.00	13.9	65.00	65.00	31.74	36.64
Davit1	#Davit1:0	End	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit1	#Davit1:0	Origin	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit1	Davit1:End	End	5.02	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit2	Davit2:O	Origin	0.00	6.40	4.04	21.65	21.65	0.00	13.9	65.00	65.00	31.74	36.64
Davit2	#Davit2:0	End	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit2	#Davit2:0	Origin	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit2	Davit2:End	End	5.02	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit3	Davit3:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit3	#Davit3:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit3	#Davit3:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit3	Davit3:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit4	Davit4:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35

Davit4	#Davit4:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit4	#Davit4:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit4	Davit4:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit5	Davit5:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit5	#Davit5:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit5	#Davit5:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit5	Davit5:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit6	Davit6:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit6	#Davit6:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit6	#Davit6:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit6	Davit6:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit7	Davit7:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit7	#Davit7:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit7	#Davit7:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit7	Davit7:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit8	Davit8:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit8	#Davit8:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit8	#Davit8:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit8	Davit8:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82

*** Insulator Data

Clamp Properties:

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

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit
Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	10254:t	clamp	No Limit
Clamp10	10254:WVGD1	clamp	No Limit
Clamp11	10254:WVGD2	clamp	No Limit
Clamp12	10254:WVGD3	clamp	No Limit
Clamp13	10254:WVGD4	clamp	No Limit
Clamp14	10254:WVGD5	clamp	No Limit
Clamp15	10254:WVGD6	clamp	No Limit
Clamp16	10254:WVGD7	clamp	No Limit
Clamp17	10254:WVGD8	clamp	No Limit
Clamp18	10254:WVGD9	clamp	No Limit

Clamp19	10254:WVGD10	clamp	No Limit
Clamp20	10254:WVGD11	clamp	No Limit
Clamp21	10254:WVGD12	clamp	No Limit
Clamp22	10254:WVGD13	clamp	No Limit
Clamp23	10254:WVGD14	clamp	No Limit
Clamp24	10254:TopConn	clamp	No Limit
Clamp25	10254:TopConT	clamp	No Limit
Clamp26	10254:TopConB	clamp	No Limit

*** Loads Data

Loads from file: j:\jobs\1526700.wi\003_stony hill\04_structural\backup documentation\pls-pole\cl&p #10254.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)	140.00	(ft)	
Structure height	140.00	(ft)	
Structure height above ground	140.00	(ft)	

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Towers	SF for Wood Poles	SF for Conc. Poles	SF for Conc. Ult.	SF for First Crack	SF for Zero Tens.	SF for Guys and Cables	SF for Tubular Arms	SF For Non Tubular Arms	SF for Braces	SF for Insuls.	SF for Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	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	1.0000	1.0000	1.0000	26 loads	Wind on All	4	0	0.500	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	1.0000	1.0000	1.0000	26 loads	NESC 2007	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	982	1128	0	Shield Wire
Davit2:End	982	1128	0	Shield Wire
Davit3:End	6229	4069	0	Conductor
Davit4:End	6229	4069	0	Conductor
Davit5:End	6229	4069	0	Conductor
Davit6:End	6229	4069	0	Conductor
Davit7:End	6229	4069	0	Conductor
Davit8:End	6229	4069	0	Conductor
10254:WVGD1	920	108	0	Coax Cable
10254:WVGD2	920	108	0	Coax Cable
10254:WVGD3	920	108	0	Coax Cable
10254:WVGD4	920	108	0	Coax Cable
10254:WVGD5	920	108	0	Coax Cable
10254:WVGD6	920	108	0	Coax Cable
10254:WVGD7	920	108	0	Coax Cable
10254:WVGD8	920	108	0	Coax Cable

10254:WVGD9	920	108	0 Coax Cable
10254:WVGD10	920	108	0 Coax Cable
10254:WVGD11	920	108	0 Coax Cable
10254:WVGD12	920	108	0 Coax Cable
10254:WVGD13	920	108	0 Coax Cable
10254:WVGD14	920	108	0 Coax Cable
10254:t	5192	0	0
10254:TopConn	0	1630	0
10254:TopConT	0	10475	0
10254:TopConB	0	-10475	0

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

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

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
10254	10254:t	10254:Arm1	140.00	139.30	139.65	20.275	9.6e+005	1.300	10.00	0.50	71.67	15.38	8.87	0.76	16.13	0.00
10254	10254:Arm1	10254:TopConT	139.30	139.00	139.15	20.399	9.66e+005	1.300	10.00	0.50	30.91	6.63	3.83	0.33	6.95	0.00
10254	10254:TopConT	10254:TopConn	139.00	138.50	138.75	20.498	9.71e+005	1.300	10.00	0.50	51.76	11.10	6.41	0.54	11.65	0.00
10254	10254:TopConn	10254:TopConB	138.50	138.00	138.25	20.623	9.76e+005	1.300	10.00	0.50	52.08	11.17	6.45	0.54	11.71	0.00
10254	10254:TopConB	10254:WVGD14	138.00	135.00	136.50	21.058	9.97e+005	1.300	10.00	0.50	319.19	68.44	39.50	3.25	71.69	0.00
10254	10254:WVGD14		135.00	130.81	132.91	21.951	1.04e+006	1.300	10.00	0.50	464.73	99.59	57.47	4.54	104.12	0.00
10254		10254:Arm2	130.81	126.63	128.72	22.993	1.09e+006	1.300	10.00	0.50	487.09	104.31	60.20	4.54	108.85	0.00
10254	10254:Arm2	10254:WVGD13	126.63	125.00	125.81	23.715	1.12e+006	1.300	10.00	0.50	195.04	41.75	24.09	1.76	43.51	0.00
10254	10254:WVGD13		125.00	120.00	122.50	24.539	1.16e+006	1.300	10.00	0.50	621.26	132.93	76.71	5.42	138.34	0.00
10254		10254:WVGD12	120.00	115.00	117.50	25.782	1.22e+006	1.300	10.00	0.50	653.14	139.66	80.60	5.42	145.08	0.00
10254	10254:WVGD12		115.00	110.00	112.50	27.026	1.28e+006	1.300	10.00	0.50	685.02	146.40	84.48	5.42	151.81	0.00
10254		10254:WVGD11	110.00	105.00	107.50	28.269	1.34e+006	1.300	10.00	0.50	716.90	153.13	88.37	5.42	158.55	0.00
10254	10254:WVGD11	10254:Arm3	105.00	104.63	104.81	28.937	1.37e+006	1.300	10.00	0.50	55.05	11.76	6.78	0.41	12.16	0.00
10254	10254:Arm3		104.63	99.81	102.22	29.582	1.4e+006	1.300	10.00	0.50	722.43	154.24	89.01	5.21	159.45	0.00
10254		10254:WVGD10	99.81	95.00	97.41	30.779	1.46e+006	1.300	10.00	0.50	751.97	160.48	92.61	5.21	165.69	0.00
10254	10254:WVGD10		95.00	92.34	93.67	31.709	1.5e+006	1.300	10.00	0.50	429.12	91.55	52.83	2.89	94.44	0.00
10254			92.34	89.67	91.00	32.371	1.53e+006	1.300	10.00	0.50	438.18	93.46	53.94	2.89	96.35	0.00
10254		10254:WVGD9	89.67	85.00	87.34	32.971	1.56e+006	1.300	10.00	0.50	1870.09	166.81	96.27	5.06	171.87	0.00
10254	10254:WVGD9	10254:Arm4	85.00	82.63	83.81	33.534	1.59e+006	1.300	10.00	0.50	564.40	86.29	49.79	2.57	88.86	0.00
10254	10254:Arm4		82.63	78.81	80.72	34.303	1.62e+006	1.300	10.00	0.50	927.06	141.69	81.77	4.13	145.82	0.00
10254		10254:WVGD8	78.81	75.00	76.91	35.251	1.67e+006	1.300	10.00	0.50	953.01	145.60	84.03	4.13	149.73	0.00
10254	10254:WVGD8		75.00	70.00	72.50	36.347	1.72e+006	1.300	10.00	0.50	1289.19	196.89	113.62	5.42	202.31	0.00
10254		10254:WVGD7	70.00	65.00	67.50	37.590	1.78e+006	1.300	10.00	0.50	1333.83	203.63	117.51	5.42	209.04	0.00
10254	10254:WVGD7		65.00	60.00	62.50	38.834	1.84e+006	1.300	10.00	0.50	1378.46	210.36	121.40	5.42	215.78	0.00
10254		10254:WVGD6	60.00	55.00	57.50	40.077	1.9e+006	1.300	10.00	0.50	1423.10	217.10	125.28	5.42	222.51	0.00
10254	10254:WVGD6		55.00	50.00	52.50	41.320	1.96e+006	1.300	10.00	0.50	1467.73	223.83	129.17	5.42	229.25	0.00
10254		10254:WVGD5	50.00	45.00	47.50	42.564	2.02e+006	1.300	10.00	0.50	1512.37	230.57	133.06	5.42	235.98	0.00
10254	10254:WVGD5		45.00	41.17	43.09	43.661	2.07e+006	1.300	10.00	0.50	1188.67	181.17	104.55	4.15	185.32	0.00
10254			41.17	38.09	39.63	44.084	2.09e+006	1.300	10.00	0.50	2001.23	147.34	85.03	3.34	150.68	0.00
10254		10254:WVGD4	38.09	35.00	36.54	44.413	2.1e+006	1.300	10.00	0.50	2036.01	148.44	85.66	3.34	151.78	0.00
10254	10254:WVGD4		35.00	30.00	32.50	45.419	2.15e+006	1.300	10.00	0.50	1729.01	246.03	141.98	5.42	251.45	0.00
10254		10254:WVGD3	30.00	25.00	27.50	46.662	2.21e+006	1.300	10.00	0.50	1776.83	252.76	145.87	5.42	258.18	0.00
10254	10254:WVGD3		25.00	20.00	22.50	47.905	2.27e+006	1.300	10.00	0.50	1824.66	259.50	149.75	5.42	264.92	0.00
10254		10254:WVGD2	20.00	15.00	17.50	49.148	2.33e+006	1.300	10.00	0.50	1872.48	266.23	153.64	5.42	271.65	0.00
10254	10254:WVGD2		15.00	10.00	12.50	50.392	2.39e+006	1.300	10.00	0.50	1920.31	272.97	157.53	5.42	278.39	0.00
10254		10254:WVGD1	10.00	5.00	7.50	51.635	2.44e+006	1.300	10.00	0.50	1968.13	279.70	161.41	5.42	285.12	0.00
10254	10254:WVGD1	10254:g	5.00	0.00	2.50	52.878	2.5e+006	1.300	10.00	0.50	2015.95	286.44	165.30	5.42	291.86	0.00

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	243	683	0	Shield Wire
Davit2:End	243	683	0	Shield Wire
Davit3:End	2651	4709	0	Conductor
Davit4:End	2651	4709	0	Conductor
Davit5:End	2651	4709	0	Conductor
Davit6:End	2651	4709	0	Conductor
Davit7:End	2651	4709	0	Conductor
Davit8:End	2651	4709	0	Conductor
10254:WVGD1	250	285	0	Coax Cable
10254:WVGD2	250	285	0	Coax Cable
10254:WVGD3	250	285	0	Coax Cable
10254:WVGD4	250	285	0	Coax Cable
10254:WVGD5	250	285	0	Coax Cable
10254:WVGD6	250	285	0	Coax Cable
10254:WVGD7	250	285	0	Coax Cable
10254:WVGD8	250	285	0	Coax Cable
10254:WVGD9	250	285	0	Coax Cable
10254:WVGD10	250	285	0	Coax Cable
10254:WVGD11	250	285	0	Coax Cable
10254:WVGD12	250	285	0	Coax Cable
10254:WVGD13	250	285	0	Coax Cable
10254:WVGD14	250	285	0	Coax Cable
10254:t	2602	0	0	
10254:TopConn	0	5367	0	
10254:TopConT	0	34446	0	
10254:TopConB	0	-34446	0	

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

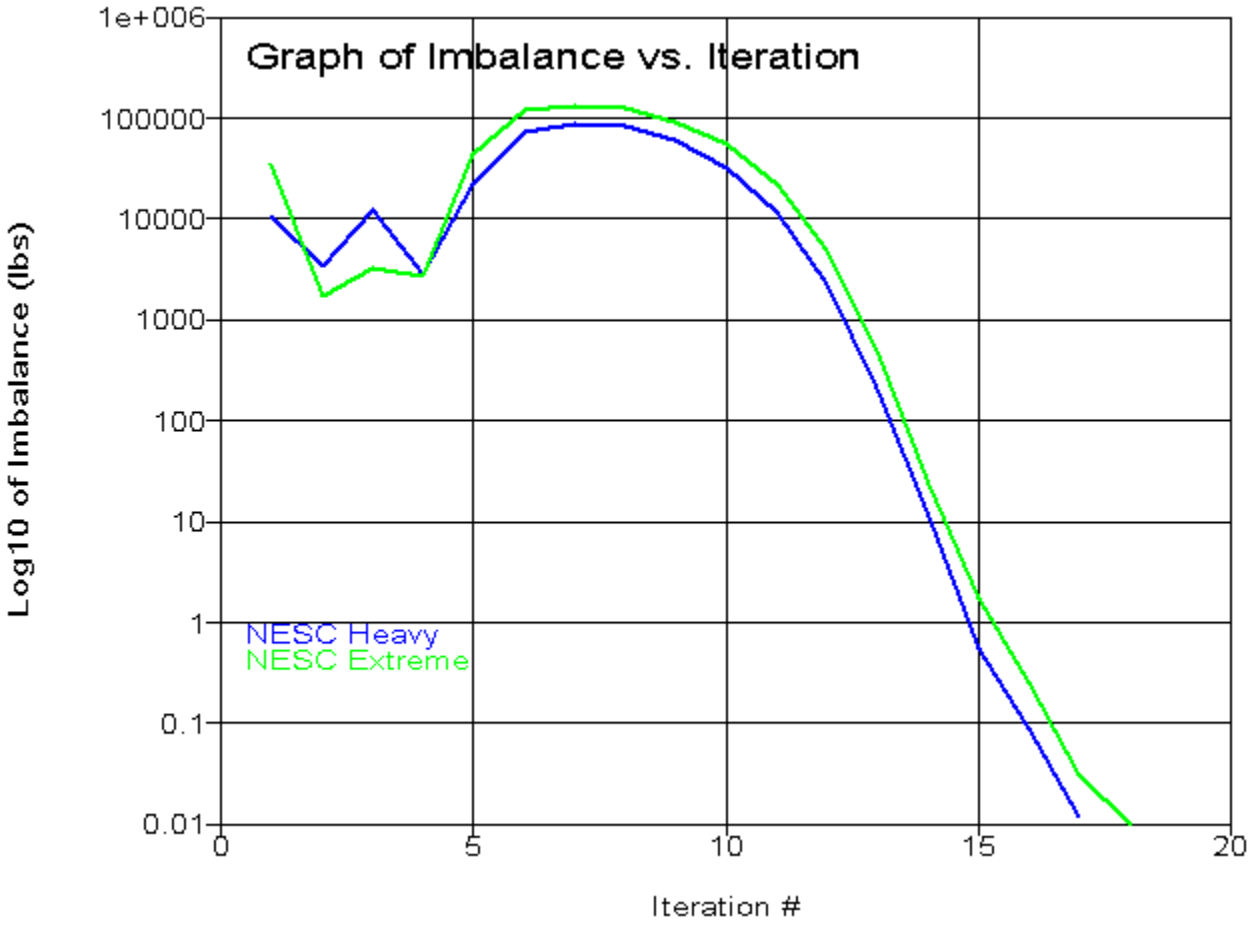
Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

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)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
10254	10254:t	10254:Arm1	140.00	139.30	139.65	20.275	1.57e+006	1.000	26.91	0.00	47.78	31.83	0.00	0.00	31.83	0.00
10254	10254:Arm1	10254:TopConT	139.30	139.00	139.15	20.399	1.58e+006	1.000	26.91	0.00	20.60	13.72	0.00	0.00	13.72	0.00
10254	10254:TopConT	10254:TopConn	139.00	138.50	138.75	20.498	1.59e+006	1.000	26.91	0.00	34.51	22.98	0.00	0.00	22.98	0.00
10254	10254:TopConn	10254:TopConB	138.50	138.00	138.25	20.623	1.6e+006	1.000	26.91	0.00	34.72	23.12	0.00	0.00	23.12	0.00
10254	10254:TopConB	10254:WVGD14	138.00	135.00	136.50	21.058	1.64e+006	1.000	26.91	0.00	212.79	141.67	0.00	0.00	141.67	0.00
10254	10254:WVGD14		135.00	130.81	132.91	21.951	1.7e+006	1.000	26.91	0.00	309.82	206.14	0.00	0.00	206.14	0.00
10254		10254:Arm2	130.81	126.63	128.72	22.993	1.79e+006	1.000	26.91	0.00	324.73	215.92	0.00	0.00	215.92	0.00
10254	10254:Arm2	10254:WVGD13	126.63	125.00	125.81	23.715	1.84e+006	1.000	26.91	0.00	130.03	86.42	0.00	0.00	86.42	0.00
10254	10254:WVGD13		125.00	120.00	122.50	24.539	1.91e+006	1.000	26.91	0.00	414.17	275.15	0.00	0.00	275.15	0.00
10254		10254:WVGD12	120.00	115.00	117.50	25.782	2e+006	1.000	26.91	0.00	435.43	289.09	0.00	0.00	289.09	0.00
10254	10254:WVGD12		115.00	110.00	112.50	27.026	2.1e+006	1.000	26.91	0.00	456.68	303.03	0.00	0.00	303.03	0.00
10254		10254:WVGD11	110.00	105.00	107.50	28.269	2.2e+006	1.000	26.91	0.00	477.94	316.97	0.00	0.00	316.97	0.00
10254	10254:WVGD11	10254:Arm3	105.00	104.63	104.81	28.937	2.25e+006	1.000	26.91	0.00	36.70	24.33	0.00	0.00	24.33	0.00
10254	10254:Arm3		104.63	99.81	102.22	29.582	2.3e+006	1.000	26.91	0.00	481.62	319.26	0.00	0.00	319.26	0.00
10254		10254:WVGD10	99.81	95.00	97.41	30.779	2.39e+006	1.000	26.91	0.00	501.31	332.17	0.00	0.00	332.17	0.00
10254	10254:WVGD10		95.00	92.34	93.67	31.709	2.46e+006	1.000	26.91	0.00	286.08	189.50	0.00	0.00	189.50	0.00

10254			92.34	89.67	91.00	32.371	2.51e+006	1.000	26.91	0.00	292.12	193.46	0.00	0.00	193.46	0.00
10254		10254:WVGD9	89.67	85.00	87.34	32.971	2.56e+006	1.000	26.91	0.00	1246.73	345.29	0.00	0.00	345.29	0.00
10254	10254:WVGD9	10254:Arm4	85.00	82.63	83.81	33.534	2.6e+006	1.000	26.91	0.00	376.26	178.60	0.00	0.00	178.60	0.00
10254	10254:Arm4		82.63	78.81	80.72	34.303	2.66e+006	1.000	26.91	0.00	618.04	293.28	0.00	0.00	293.28	0.00
10254		10254:WVGD8	78.81	75.00	76.91	35.251	2.74e+006	1.000	26.91	0.00	635.34	301.39	0.00	0.00	301.39	0.00
10254	10254:WVGD8		75.00	70.00	72.50	36.347	2.82e+006	1.000	26.91	0.00	859.46	407.55	0.00	0.00	407.55	0.00
10254		10254:WVGD7	70.00	65.00	67.50	37.590	2.92e+006	1.000	26.91	0.00	889.22	421.49	0.00	0.00	421.49	0.00
10254	10254:WVGD7		65.00	60.00	62.50	38.834	3.02e+006	1.000	26.91	0.00	918.97	435.43	0.00	0.00	435.43	0.00
10254		10254:WVGD6	60.00	55.00	57.50	40.077	3.11e+006	1.000	26.91	0.00	948.73	449.37	0.00	0.00	449.37	0.00
10254	10254:WVGD6		55.00	50.00	52.50	41.320	3.21e+006	1.000	26.91	0.00	978.49	463.31	0.00	0.00	463.31	0.00
10254		10254:WVGD5	50.00	45.00	47.50	42.564	3.31e+006	1.000	26.91	0.00	1008.25	477.25	0.00	0.00	477.25	0.00
10254	10254:WVGD5		45.00	41.17	43.09	43.661	3.39e+006	1.000	26.91	0.00	792.44	375.01	0.00	0.00	375.01	0.00
10254			41.17	38.09	39.63	44.084	3.42e+006	1.000	26.91	0.00	1334.15	304.98	0.00	0.00	304.98	0.00
10254		10254:WVGD4	38.09	35.00	36.54	44.413	3.45e+006	1.000	26.91	0.00	1357.34	307.26	0.00	0.00	307.26	0.00
10254	10254:WVGD4		35.00	30.00	32.50	45.419	3.53e+006	1.000	26.91	0.00	1152.67	509.27	0.00	0.00	509.27	0.00
10254		10254:WVGD3	30.00	25.00	27.50	46.662	3.62e+006	1.000	26.91	0.00	1184.56	523.21	0.00	0.00	523.21	0.00
10254	10254:WVGD3		25.00	20.00	22.50	47.905	3.72e+006	1.000	26.91	0.00	1216.44	537.15	0.00	0.00	537.15	0.00
10254		10254:WVGD2	20.00	15.00	17.50	49.148	3.82e+006	1.000	26.91	0.00	1248.32	551.09	0.00	0.00	551.09	0.00
10254	10254:WVGD2		15.00	10.00	12.50	50.392	3.91e+006	1.000	26.91	0.00	1280.20	565.03	0.00	0.00	565.03	0.00
10254		10254:WVGD1	10.00	5.00	7.50	51.635	4.01e+006	1.000	26.91	0.00	1312.09	578.97	0.00	0.00	578.97	0.00
10254	10254:WVGD1	10254:g	5.00	0.00	2.50	52.878	4.11e+006	1.000	26.91	0.00	1343.97	592.91	0.00	0.00	592.91	0.00

*** Analysis Results:

Maximum element usage is 96.15% for Base Plate "10254" in load case "NESC Extreme"
Maximum insulator usage is 43.06% for Clamp "Clamp25" 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)
10254:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10254:t	0.01386	7.347	-0.2617	-5.4148	0.0092	0.0001	0.01386	7.347	139.7
10254:Arm1	0.01374	7.281	-0.2585	-5.4148	0.0092	0.0001	0.01374	7.281	139

10254:TopConT	0.0137	7.253	-0.2572	-5.4146	0.0092	0.0001	0.0137	7.253	138.7
10254:TopConn	0.01362	7.206	-0.2549	-5.4138	0.0092	0.0001	0.01362	7.206	138.2
10254:TopConB	0.01354	7.158	-0.2527	-5.4121	0.0092	0.0001	0.01354	7.158	137.7
10254:WVGD14	0.01306	6.876	-0.2393	-5.3945	0.0092	0.0001	0.01306	6.876	134.8
10254:Arm2	0.01172	6.094	-0.2026	-5.3075	0.0091	0.0001	0.01172	6.094	126.4
10254:WVGD13	0.01146	5.944	-0.1956	-5.2814	0.0091	0.0001	0.01146	5.944	124.8
10254:WVGD12	0.009893	5.043	-0.1546	-5.0264	0.0088	0.0001	0.009893	5.043	114.8
10254:WVGD11	0.008386	4.196	-0.1184	-4.6704	0.0084	0.0001	0.008386	4.196	104.9
10254:Arm3	0.008331	4.165	-0.1171	-4.6559	0.0084	0.0001	0.008331	4.165	104.5
10254:WVGD10	0.006968	3.418	-0.08757	-4.2252	0.0078	0.0001	0.006968	3.418	94.91
10254:WVGD9	0.005663	2.723	-0.06294	-3.7443	0.0071	0.0001	0.005663	2.723	84.94
10254:Arm4	0.00537	2.57	-0.05791	-3.6465	0.0070	0.0000	0.00537	2.57	82.57
10254:WVGD8	0.004472	2.106	-0.04345	-3.3154	0.0065	0.0000	0.004472	2.106	74.96
10254:WVGD7	0.0034	1.566	-0.02844	-2.8559	0.0058	0.0000	0.0034	1.566	64.97
10254:WVGD6	0.002461	1.108	-0.01748	-2.3858	0.0050	0.0000	0.002461	1.108	54.98
10254:WVGD5	0.001663	0.7321	-0.009954	-1.9177	0.0041	0.0000	0.001663	0.7321	44.99
10254:WVGD4	0.001016	0.437	-0.005149	-1.4607	0.0033	0.0000	0.001016	0.437	34.99
10254:WVGD3	0.0005235	0.22	-0.002354	-1.0206	0.0024	0.0000	0.0005235	0.22	25
10254:WVGD2	0.0001909	0.07831	-0.0009085	-0.5982	0.0014	0.0000	0.0001909	0.07831	15
10254:WVGD1	2.206e-005	0.008761	-0.0002234	-0.1947	0.0005	0.0000	2.206e-005	0.008761	5
Davit1:O	0.01376	7.285	-0.1785	-5.4148	0.0092	0.0001	0.01376	6.437	139.1
Davit1:End	0.01393	7.353	0.2817	-5.2450	0.0092	0.0002	0.01393	1.504	140.1
Davit2:O	0.01373	7.277	-0.3386	-5.4148	0.0092	0.0001	0.01373	8.126	139
Davit2:End	0.01372	7.302	-0.8251	-5.6361	0.0092	0.0001	0.01372	13.15	139
Davit3:O	0.01173	6.098	-0.112	-5.3075	0.0091	0.0001	0.01173	5.118	126.5
Davit3:End	0.01202	6.2	0.5051	-3.8418	0.0092	0.0002	0.01202	-2.779	128.1
Davit4:O	0.0117	6.09	-0.2933	-5.3075	0.0091	0.0001	0.0117	7.07	126.3
Davit4:End	0.0117	6.151	-1.181	-7.0351	0.0091	0.0001	0.0117	15.13	126.4
Davit5:O	0.008347	4.169	-0.01908	-4.6559	0.0084	0.0001	0.008347	2.962	104.6
Davit5:End	0.008589	4.253	0.5067	-3.1737	0.0084	0.0001	0.008589	-4.954	106.1
Davit6:O	0.008315	4.161	-0.2151	-4.6559	0.0084	0.0001	0.008315	5.369	104.4
Davit6:End	0.008333	4.221	-1.012	-6.3956	0.0084	0.0001	0.008333	13.43	104.6
Davit7:O	0.005382	2.573	0.03174	-3.6465	0.0070	0.0000	0.005382	1.163	82.66
Davit7:End	0.005562	2.631	0.4158	-2.1392	0.0070	0.0001	0.005562	-6.779	84.04
Davit8:O	0.005358	2.567	-0.1476	-3.6465	0.0070	0.0000	0.005358	3.977	82.48
Davit8:End	0.005393	2.622	-0.8038	-5.4047	0.0070	0.0000	0.005393	12.03	82.82

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. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
10254:g	-0.15	0.0	-35.55	0.0	0.0	-103.07	0.0	0.0	109.03	0.0	3891.03	0.0	-9.7	0.0	0.0	-0.00	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. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
10254	10254:t	Origin	0.00	88.17	0.17	-3.14	-0.00	-0.00	0.0	-5.21	0.50	-0.00	-0.26	0.00	0.05	0.00	0.28	0.4	5
10254	10254:Arm1	End	0.70	87.37	0.16	-3.10	0.35	-0.00	0.0	-5.21	0.50	-0.00	-0.26	0.04	0.01	0.00	0.30	0.5	2
10254	10254:Arm1	Origin	0.70	87.37	0.16	-3.10	1.55	-0.00	0.0	-7.19	2.97	-0.00	-0.36	0.05	0.29	0.00	0.65	1.0	4
10254	10254:TopConT	End	1.00	87.03	0.16	-3.09	2.44	-0.00	0.0	-7.19	2.97	-0.00	-0.36	0.21	0.21	0.00	0.67	1.0	3
10254	10254:TopConT	Origin	1.00	87.03	0.16	-3.09	2.44	-0.00	0.0	-6.25	13.41	-0.00	-0.31	0.00	1.35	0.00	2.36	3.6	5
10254	10254:TopConn	End	1.50	86.47	0.16	-3.06	9.14	-0.00	0.0	-6.25	13.41	-0.00	-0.31	0.00	1.34	0.00	2.35	3.6	5
10254	10254:TopConn	Origin	1.50	86.47	0.16	-3.06	9.14	-0.00	0.0	-6.15	15.05	-0.00	-0.30	0.00	1.51	0.00	2.63	4.0	5

10254	10254:TopConB	End	2.00	85.90	0.16	-3.03	16.67	-0.00	0.0	-6.15	15.05	-0.00	-0.30	0.51	1.45	0.00	2.64	4.1	4
10254	10254:TopConB	Origin	2.00	85.90	0.16	-3.03	16.67	-0.00	0.0	-7.35	4.68	-0.00	-0.36	1.90	0.12	0.00	2.27	3.5	2
10254	10254:WVGD14	End	5.00	82.51	0.16	-2.87	30.71	-0.01	0.0	-7.35	4.68	-0.00	-0.35	3.26	0.12	0.00	3.61	5.6	2
10254	10254:WVGD14	Origin	5.00	82.51	0.16	-2.87	30.71	-0.01	0.0	-8.70	5.00	-0.01	-0.41	3.26	0.13	0.00	3.68	5.7	2
10254	Tube 1	End	9.19	77.80	0.15	-2.65	51.64	-0.04	0.0	-8.70	5.00	-0.01	-0.39	4.98	0.12	0.00	5.37	8.3	2
10254	Tube 1	Origin	9.19	77.80	0.15	-2.65	51.64	-0.04	0.0	-9.23	5.15	-0.01	-0.41	4.98	0.12	0.00	5.39	8.3	2
10254	10254:Arm2	End	13.38	73.13	0.14	-2.43	73.20	-0.08	0.0	-9.23	5.15	-0.01	-0.40	6.43	0.12	0.00	6.83	10.5	2
10254	10254:Arm2	Origin	13.38	73.13	0.14	-2.43	81.28	-0.08	0.0	-21.63	14.54	-0.01	-0.93	7.14	0.33	0.00	8.09	12.4	2
10254	10254:WVGD13	End	15.00	71.33	0.14	-2.35	104.91	-0.10	0.0	-21.63	14.54	-0.01	-0.91	8.90	0.33	0.00	9.83	15.1	2
10254	10254:WVGD13	Origin	15.00	71.33	0.14	-2.35	104.91	-0.10	0.0	-23.01	14.84	-0.02	-0.97	8.90	0.33	0.00	9.89	15.2	2
10254	Tube 1	End	20.00	65.85	0.13	-2.10	179.11	-0.18	0.0	-23.01	14.84	-0.02	-0.92	13.71	0.31	0.00	14.64	22.5	2
10254	Tube 1	Origin	20.00	65.85	0.13	-2.10	179.11	-0.18	0.0	-23.76	14.99	-0.02	-0.95	13.71	0.32	0.00	14.67	22.6	2
10254	10254:WVGD12	End	25.00	60.51	0.12	-1.86	254.07	-0.28	0.0	-23.76	14.99	-0.02	-0.91	17.62	0.30	0.00	18.54	28.5	2
10254	10254:WVGD12	Origin	25.00	60.51	0.12	-1.86	254.07	-0.28	0.0	-25.45	15.33	-0.02	-0.97	17.62	0.31	0.00	18.60	28.6	2
10254	Tube 1	End	30.00	55.34	0.11	-1.63	330.69	-0.40	0.0	-25.45	15.33	-0.02	-0.93	20.89	0.30	0.00	21.82	33.6	2
10254	Tube 1	Origin	30.00	55.34	0.11	-1.63	330.69	-0.40	0.0	-26.29	15.47	-0.03	-0.96	20.89	0.30	0.00	21.85	33.6	2
10254	10254:WVGD11	End	35.00	50.35	0.10	-1.42	408.02	-0.54	0.0	-26.29	15.47	-0.03	-0.92	23.57	0.28	0.00	24.49	37.7	2
10254	10254:WVGD11	Origin	35.00	50.35	0.10	-1.42	408.02	-0.54	0.0	-27.65	15.72	-0.03	-0.96	23.57	0.29	0.00	24.54	37.7	2
10254	10254:Arm3	End	35.38	49.98	0.10	-1.41	413.92	-0.55	0.0	-27.65	15.72	-0.03	-0.96	23.75	0.29	0.00	24.72	38.0	2
10254	10254:Arm3	Origin	35.38	49.98	0.10	-1.41	421.87	-0.55	0.0	-40.25	24.92	-0.03	-1.40	24.21	0.46	0.00	25.62	39.4	2
10254	Tube 1	End	40.19	45.39	0.09	-1.22	541.81	-0.72	0.0	-40.25	24.92	-0.03	-1.34	28.64	0.44	0.00	29.99	46.1	2
10254	Tube 1	Origin	40.19	45.39	0.09	-1.22	541.81	-0.72	0.0	-41.17	25.00	-0.04	-1.37	28.64	0.44	0.00	30.02	46.2	2
10254	10254:WVGD10	End	45.00	41.01	0.08	-1.05	662.10	-0.90	0.0	-41.17	25.00	-0.04	-1.32	32.34	0.42	0.00	33.67	51.8	2
10254	10254:WVGD10	Origin	45.00	41.01	0.08	-1.05	662.10	-0.90	0.0	-42.82	25.22	-0.04	-1.37	32.34	0.43	0.00	33.72	51.9	2
10254	Tube 1	End	47.67	38.69	0.08	-0.96	729.30	-1.01	0.0	-42.82	25.22	-0.04	-1.34	34.14	0.42	0.00	35.49	54.6	2
10254	Tube 1	Origin	47.67	38.69	0.08	-0.96	729.30	-1.01	0.0	-43.37	25.25	-0.04	-1.36	34.14	0.42	0.00	35.51	54.6	2
10254	SpliceT	End	50.33	36.44	0.08	-0.88	796.57	-1.13	0.0	-43.37	25.25	-0.04	-1.33	35.78	0.41	0.00	37.11	57.1	2
10254	SpliceT	Origin	50.33	36.44	0.08	-0.88	796.57	-1.13	0.0	-44.67	25.33	-0.05	-1.37	35.78	0.41	0.00	37.15	57.2	2
10254	10254:WVGD9	End	55.00	32.68	0.07	-0.76	914.86	-1.36	0.0	-44.67	25.33	-0.05	-0.97	28.72	0.29	0.00	29.69	45.7	2
10254	10254:WVGD9	Origin	55.00	32.68	0.07	-0.76	914.86	-1.36	0.0	-46.94	25.59	-0.05	-1.02	28.72	0.29	0.00	29.74	45.8	2
10254	10254:Arm4	End	57.38	30.84	0.06	-0.69	975.63	-1.48	0.0	-46.94	25.59	-0.05	-1.00	29.55	0.29	0.00	30.55	47.0	2
10254	10254:Arm4	Origin	57.38	30.84	0.06	-0.69	983.38	-1.48	0.0	-60.09	34.57	-0.06	-1.28	29.78	0.39	0.00	31.07	47.8	2
10254	Tube 2	End	61.19	27.99	0.06	-0.60	1115.18	-1.69	0.0	-60.09	34.57	-0.06	-1.24	31.92	0.38	0.00	33.17	51.0	2
10254	Tube 2	Origin	61.19	27.99	0.06	-0.60	1115.18	-1.69	0.0	-61.21	34.60	-0.06	-1.27	31.92	0.38	0.00	33.20	51.1	2
10254	10254:WVGD8	End	65.00	25.27	0.05	-0.52	1247.10	-1.92	0.0	-61.21	34.60	-0.06	-1.23	33.80	0.37	0.00	35.04	53.9	2
10254	10254:WVGD8	Origin	65.00	25.27	0.05	-0.52	1247.10	-1.92	0.0	-63.46	34.80	-0.06	-1.28	33.80	0.37	0.00	35.08	54.0	2
10254	Tube 2	End	70.00	21.91	0.05	-0.42	1421.08	-2.25	0.0	-63.46	34.80	-0.06	-1.23	35.92	0.36	0.00	37.16	57.2	2
10254	Tube 2	Origin	70.00	21.91	0.05	-0.42	1421.08	-2.24	0.0	-65.03	34.82	-0.07	-1.27	35.92	0.36	0.00	37.19	57.2	2
10254	10254:WVGD7	End	75.00	18.80	0.04	-0.34	1595.18	-2.59	0.0	-65.03	34.82	-0.07	-1.22	37.70	0.35	0.00	38.92	59.9	2
10254	10254:WVGD7	Origin	75.00	18.80	0.04	-0.34	1595.18	-2.59	0.0	-67.56	34.99	-0.07	-1.27	37.70	0.35	0.00	38.97	60.0	2
10254	Tube 2	End	80.00	15.93	0.03	-0.27	1770.12	-2.97	0.0	-67.56	34.99	-0.07	-1.23	39.19	0.34	0.00	40.43	62.2	2
10254	Tube 2	Origin	80.00	15.93	0.03	-0.27	1770.12	-2.97	0.0	-69.22	35.00	-0.08	-1.26	39.19	0.34	0.00	40.46	62.2	2
10254	10254:WVGD6	End	85.00	13.30	0.03	-0.21	1945.10	-3.37	0.0	-69.22	35.00	-0.08	-1.22	40.44	0.33	0.00	41.66	64.1	2
10254	10254:WVGD6	Origin	85.00	13.30	0.03	-0.21	1945.10	-3.37	0.0	-71.85	35.15	-0.09	-1.27	40.44	0.33	0.00	41.71	64.2	2
10254	Tube 2	End	90.00	10.92	0.02	-0.16	2120.81	-3.80	0.0	-71.85	35.15	-0.09	-1.23	41.48	0.32	0.00	42.71	65.7	2
10254	Tube 2	Origin	90.00	10.92	0.02	-0.16	2120.81	-3.80	0.0	-73.62	35.14	-0.09	-1.26	41.48	0.32	0.00	42.74	65.8	2
10254	10254:WVGD5	End	95.00	8.79	0.02	-0.12	2296.51	-4.25	0.0	-73.62	35.14	-0.09	-1.22	42.32	0.31	0.00	43.55	67.0	2
10254	10254:WVGD5	Origin	95.00	8.79	0.02	-0.12	2296.51	-4.25	0.0	-76.13	35.27	-0.10	-1.27	42.32	0.31	0.00	43.59	67.1	2
10254	SpliceT	End	98.83	7.32	0.02	-0.09	2431.59	-4.62	0.0	-76.13	35.27	-0.10	-1.24	42.87	0.30	0.00	44.12	67.9	2
10254	SpliceT	Origin	98.83	7.32	0.02	-0.09	2431.59	-4.62	0.0	-77.92	35.28	-0.10	-1.27	42.87	0.30	0.00	44.14	67.9	2
10254	Tube 2	End	101.92	6.23	0.01	-0.08	2540.41	-4.93	0.0	-77.92	35.28	-0.10	-1.19	42.10	0.28	0.00	43.29	66.6	2
10254	Tube 2	Origin	101.92	6.23	0.01	-0.08	2540.41	-4.93	0.0	-80.11	35.29	-0.10	-1.22	42.10	0.28	0.00	43.33	66.7	2
10254	10254:WVGD4	End	105.00	5.24	0.01	-0.06	2649.29	-5.26	0.0	-80.11	35.29	-0.10	-1.20	42.40	0.28	0.00	43.60	67.1	2
10254	10254:WVGD4	Origin	105.00	5.24	0.01	-0.06	2649.29	-5.26	0.0	-83.13	35.42	-0.11	-1.24	42.40	0.28	0.00	43.64	67.1	2
10254	Tube 3	End	110.00	3.83	0.01	-0.04	2826.38	-5.80	0.0	-83.13	35.42	-0.11	-1.21	42.78	0.27	0.00	44.00	67.7	2
10254	Tube 3	Origin	110.00	3.83	0.01	-0.04	2826.38	-5.80	0.0	-85.16	35.39	-0.12	-1.24	42.78	0.27	0.00	44.03	67.7	2
10254	10254:WVGD3	End	115.00	2.64	0.01	-0.03	3003.33	-6.38	0.0	-85.16	35.39	-0.12	-1.21	43.07	0.27	0.00	44.28	68.1	2
10254	10254:WVGD3	Origin	115.00	2.64	0.01	-0.03	3003.33	-6.38	0.0	-88.16	35.49	-0.12	-1.25	43.07	0.27	0.00	44.32	68.2	2
10254	Tube 3	End	120.00	1.68	0.00	-0.02	3180.75	-6.99	0.0	-88.16	35.49	-0.12	-1.22	43.27	0.26	0.00	44.49	68.5	2

10254	Tube 3	Origin	120.00	1.68	0.00	-0.02	3180.75	-6.99	0.0	-90.29	35.45	-0.13	-1.25	43.27	0.26	0.00	44.52	68.5	2
10254	10254:WVGD2	End	125.00	0.94	0.00	-0.01	3358.01	-7.63	0.0	-90.29	35.45	-0.13	-1.22	43.40	0.25	0.00	44.62	68.6	2
10254	10254:WVGD2	Origin	125.00	0.94	0.00	-0.01	3358.01	-7.63	0.0	-93.39	35.54	-0.13	-1.26	43.40	0.25	0.00	44.66	68.7	2
10254	Tube 3	End	130.00	0.42	0.00	-0.01	3535.69	-8.30	0.0	-93.39	35.54	-0.13	-1.23	43.47	0.25	0.00	44.70	68.8	2
10254	Tube 3	Origin	130.00	0.42	0.00	-0.01	3535.69	-8.30	0.0	-95.62	35.50	-0.14	-1.26	43.47	0.25	0.00	44.72	68.8	2
10254	10254:WVGD1	End	135.00	0.11	0.00	-0.00	3713.18	-9.01	0.0	-95.62	35.50	-0.14	-1.23	43.48	0.24	0.00	44.70	68.8	2
10254	10254:WVGD1	Origin	135.00	0.11	0.00	-0.00	3713.18	-9.01	0.0	-98.82	35.57	-0.15	-1.27	43.48	0.24	0.00	44.74	68.8	2
10254	10254:g	End	140.00	0.00	0.00	0.00	3891.03	-9.75	0.0	-98.82	35.57	-0.15	-1.24	43.44	0.23	0.00	44.68	68.7	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. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	87.42	0.17	-2.14	-3.98	0.00	0.0	-1.31	0.81	-0.00	-0.32	8.15	0.00	0.00	8.47	13.0	1
Davit1	#Davit1:0	End	2.51	87.83	0.17	0.64	-1.94	0.00	0.0	-1.31	0.81	-0.00	-0.37	5.05	0.00	0.00	5.42	8.3	1
Davit1	#Davit1:0	Origin	2.51	87.83	0.17	0.64	-1.94	0.00	0.0	-1.30	0.77	-0.00	-0.36	5.05	0.00	0.00	5.41	8.3	1
Davit1	Davit1:End	End	5.02	88.23	0.17	3.38	-0.00	0.00	0.0	-1.30	0.77	-0.00	-0.42	0.00	0.53	0.00	1.00	1.5	3
Davit2	Davit2:O	Origin	0.00	87.33	0.16	-4.06	-5.17	-0.00	-0.0	1.12	1.05	0.00	0.28	10.60	0.00	0.00	10.87	16.7	1
Davit2	#Davit2:0	End	2.51	87.48	0.16	-6.95	-2.53	-0.00	-0.0	1.12	1.05	0.00	0.31	6.59	0.00	0.00	6.91	10.6	1
Davit2	#Davit2:0	Origin	2.51	87.48	0.16	-6.95	-2.53	-0.00	0.0	1.13	1.01	0.00	0.31	6.59	0.00	0.00	6.91	10.6	1
Davit2	Davit2:End	End	5.02	87.63	0.16	-9.90	0.00	0.00	0.0	1.13	1.01	0.00	0.36	0.00	0.69	0.00	1.24	1.9	3
Davit3	Davit3:O	Origin	0.00	73.18	0.14	-1.34	-43.27	0.01	0.0	-5.30	5.38	-0.00	-0.93	43.69	0.00	0.00	44.61	68.6	1
Davit3	#Davit3:0	End	4.03	73.86	0.14	2.69	-21.61	0.00	0.0	-5.30	5.38	-0.00	-1.20	36.71	0.00	0.00	37.91	58.3	1
Davit3	#Davit3:0	Origin	4.03	73.86	0.14	2.69	-21.61	0.00	0.0	-5.21	5.36	-0.00	-1.18	36.71	0.00	0.00	37.89	58.3	1
Davit3	Davit3:End	End	8.06	74.40	0.14	6.06	-0.00	0.00	0.0	-5.21	5.36	-0.00	-1.67	0.00	3.67	0.00	6.56	10.1	3
Davit4	Davit4:O	Origin	0.00	73.08	0.14	-3.52	-51.35	-0.01	-0.0	3.93	6.45	0.00	0.69	51.84	0.00	0.00	52.53	80.8	1
Davit4	#Davit4:0	End	4.03	73.44	0.14	-8.45	-25.36	-0.00	-0.0	3.93	6.45	0.00	0.89	43.09	0.00	0.00	43.98	67.7	1
Davit4	#Davit4:0	Origin	4.03	73.44	0.14	-8.45	-25.36	-0.00	0.0	4.03	6.29	0.00	0.91	43.09	0.00	0.00	44.01	67.7	1
Davit4	Davit4:End	End	8.06	73.81	0.14	-14.17	-0.00	0.00	0.0	4.03	6.29	0.00	1.29	0.00	4.30	0.00	7.56	11.6	3
Davit5	Davit5:O	Origin	0.00	50.03	0.10	-0.23	-43.76	0.01	0.0	-5.24	5.44	-0.00	-0.92	44.18	0.00	0.00	45.09	69.4	1
Davit5	#Davit5:0	End	4.03	50.60	0.10	3.26	-21.85	0.00	0.0	-5.24	5.44	-0.00	-1.18	37.12	0.00	0.00	38.31	58.9	1
Davit5	#Davit5:0	Origin	4.03	50.60	0.10	3.26	-21.85	0.00	0.0	-5.14	5.42	-0.00	-1.16	37.12	0.00	0.00	38.29	58.9	1
Davit5	Davit5:End	End	8.06	51.04	0.10	6.08	-0.00	0.00	0.0	-5.14	5.42	-0.00	-1.65	0.00	3.71	0.00	6.63	10.2	3
Davit6	Davit6:O	Origin	0.00	49.94	0.10	-2.58	-51.71	-0.01	-0.0	3.85	6.49	0.00	0.67	52.21	0.00	0.00	52.88	81.4	1
Davit6	#Davit6:0	End	4.03	50.28	0.10	-6.96	-25.54	-0.00	-0.0	3.85	6.49	0.00	0.87	43.40	0.00	0.00	44.27	68.1	1
Davit6	#Davit6:0	Origin	4.03	50.28	0.10	-6.96	-25.54	-0.00	0.0	3.96	6.34	0.00	0.90	43.40	0.00	0.00	44.30	68.1	1
Davit6	Davit6:End	End	8.06	50.65	0.10	-12.14	-0.00	0.00	0.0	3.96	6.34	0.00	1.27	0.00	4.33	0.00	7.61	11.7	3
Davit7	Davit7:O	Origin	0.00	30.87	0.06	0.38	-44.50	0.01	0.0	-5.14	5.53	-0.00	-0.90	44.93	0.00	0.00	45.83	70.5	1
Davit7	#Davit7:0	End	4.03	31.28	0.07	3.03	-22.22	0.00	0.0	-5.14	5.53	-0.00	-1.16	37.75	0.00	0.00	38.91	59.9	1
Davit7	#Davit7:0	Origin	4.03	31.28	0.07	3.03	-22.22	0.00	0.0	-5.05	5.51	-0.00	-1.14	37.75	0.00	0.00	38.89	59.8	1
Davit7	Davit7:End	End	8.06	31.57	0.07	4.99	-0.00	0.00	0.0	-5.05	5.51	-0.00	-1.61	0.00	3.77	0.00	6.72	10.3	3
Davit8	Davit8:O	Origin	0.00	30.80	0.06	-1.77	-52.25	-0.01	-0.0	3.74	6.56	0.00	0.65	52.75	0.00	0.00	53.41	82.2	1
Davit8	#Davit8:0	End	4.03	31.12	0.06	-5.31	-25.82	-0.00	-0.0	3.74	6.56	0.00	0.85	43.86	0.00	0.00	44.71	68.8	1
Davit8	#Davit8:0	Origin	4.03	31.12	0.06	-5.31	-25.82	-0.00	0.0	3.85	6.40	0.00	0.87	43.86	0.00	0.00	44.74	68.8	1
Davit8	Davit8:End	End	8.06	31.46	0.06	-9.65	-0.00	0.00	0.0	3.85	6.40	0.00	1.23	0.00	4.38	0.00	7.68	11.8	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	1.496	80.00	80.00	1.87
Clamp2	1.496	80.00	80.00	1.87
Clamp3	7.440	80.00	80.00	9.30
Clamp4	7.440	80.00	80.00	9.30
Clamp5	7.440	80.00	80.00	9.30
Clamp6	7.440	80.00	80.00	9.30
Clamp7	7.440	80.00	80.00	9.30
Clamp8	7.440	80.00	80.00	9.30
Clamp9	5.192	80.00	80.00	6.49
Clamp10	0.926	80.00	80.00	1.16
Clamp11	0.926	80.00	80.00	1.16
Clamp12	0.926	80.00	80.00	1.16
Clamp13	0.926	80.00	80.00	1.16
Clamp14	0.926	80.00	80.00	1.16
Clamp15	0.926	80.00	80.00	1.16
Clamp16	0.926	80.00	80.00	1.16
Clamp17	0.926	80.00	80.00	1.16
Clamp18	0.926	80.00	80.00	1.16
Clamp19	0.926	80.00	80.00	1.16
Clamp20	0.926	80.00	80.00	1.16
Clamp21	0.926	80.00	80.00	1.16
Clamp22	0.926	80.00	80.00	1.16
Clamp23	0.926	80.00	80.00	1.16
Clamp24	1.630	80.00	80.00	2.04
Clamp25	10.475	80.00	80.00	13.09
Clamp26	10.475	80.00	80.00	13.09

*** 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)
10254:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10254:t	0.004068	9.493	-0.4316	-7.1253	0.0027	0.0001	0.004068	9.493	139.6
10254:Arm1	0.004035	9.406	-0.4262	-7.1253	0.0027	0.0001	0.004035	9.406	138.9
10254:TopConT	0.004021	9.369	-0.4239	-7.1252	0.0027	0.0001	0.004021	9.369	138.6
10254:TopConn	0.003998	9.307	-0.42	-7.1238	0.0027	0.0001	0.003998	9.307	138.1
10254:TopConB	0.003975	9.245	-0.4161	-7.1198	0.0027	0.0001	0.003975	9.245	137.6
10254:WVGD14	0.003836	8.874	-0.3931	-7.0819	0.0027	0.0001	0.003836	8.874	134.6
10254:Arm2	0.003448	7.852	-0.3304	-6.9222	0.0026	0.0001	0.003448	7.852	126.3
10254:WVGD13	0.003373	7.656	-0.3186	-6.8794	0.0026	0.0001	0.003373	7.656	124.7
10254:WVGD12	0.002919	6.487	-0.2499	-6.5070	0.0026	0.0001	0.002919	6.487	114.8
10254:WVGD11	0.00248	5.394	-0.1899	-6.0175	0.0025	0.0000	0.00248	5.394	104.8
10254:Arm3	0.002464	5.355	-0.1878	-5.9977	0.0024	0.0000	0.002464	5.355	104.4
10254:WVGD10	0.002066	4.394	-0.1395	-5.4264	0.0023	0.0000	0.002066	4.394	94.86
10254:WVGD9	0.001683	3.503	-0.09953	-4.8013	0.0021	0.0000	0.001683	3.503	84.9
10254:Arm4	0.001597	3.307	-0.09137	-4.6750	0.0021	0.0000	0.001597	3.307	82.53
10254:WVGD8	0.001332	2.712	-0.06802	-4.2500	0.0019	0.0000	0.001332	2.712	74.93
10254:WVGD7	0.001015	2.021	-0.04386	-3.6647	0.0017	0.0000	0.001015	2.021	64.96
10254:WVGD6	0.0007367	1.432	-0.02631	-3.0675	0.0015	0.0000	0.0007367	1.432	54.97
10254:WVGD5	0.0004992	0.9483	-0.01436	-2.4719	0.0012	0.0000	0.0004992	0.9483	44.99
10254:WVGD4	0.0003056	0.5673	-0.006867	-1.8885	0.0010	0.0000	0.0003056	0.5673	34.99
10254:WVGD3	0.0001579	0.2863	-0.00269	-1.3240	0.0007	0.0000	0.0001579	0.2863	25
10254:WVGD2	5.772e-005	0.1022	-0.000764	-0.7788	0.0004	0.0000	5.772e-005	0.1022	15
10254:WVGD1	6.69e-006	0.01148	-0.0001188	-0.2544	0.0001	0.0000	6.69e-006	0.01148	5
Davit1:O	0.004041	9.413	-0.321	-7.1253	0.0027	0.0001	0.004041	8.564	139
Davit1:End	0.0041	9.513	0.2941	-7.1025	0.0027	0.0001	0.0041	3.665	140.1
Davit2:O	0.004029	9.4	-0.5314	-7.1253	0.0027	0.0001	0.004029	10.25	138.8
Davit2:End	0.004017	9.423	-1.159	-7.1790	0.0027	0.0001	0.004017	15.27	138.6
Davit3:O	0.003454	7.859	-0.2124	-6.9222	0.0026	0.0001	0.003454	6.879	126.4
Davit3:End	0.003555	8.03	0.7117	-6.5149	0.0027	0.0001	0.003555	-0.95	128.3
Davit4:O	0.003441	7.844	-0.4485	-6.9222	0.0026	0.0001	0.003441	8.824	126.2
Davit4:End	0.003431	7.907	-1.48	-7.6491	0.0026	0.0001	0.003431	16.89	126.1
Davit5:O	0.00247	5.362	-0.06162	-5.9977	0.0024	0.0000	0.00247	4.154	104.6
Davit5:End	0.002555	5.502	0.734	-5.5670	0.0025	0.0001	0.002555	-3.706	106.4
Davit6:O	0.002458	5.348	-0.314	-5.9977	0.0024	0.0000	0.002458	6.556	104.3
Davit6:End	0.002456	5.41	-1.217	-6.7451	0.0024	0.0000	0.002456	14.62	104.4
Davit7:O	0.001601	3.311	0.02351	-4.6750	0.0021	0.0000	0.001601	1.902	82.65
Davit7:End	0.001664	3.412	0.6345	-4.2109	0.0021	0.0000	0.001664	-5.997	84.26
Davit8:O	0.001592	3.302	-0.2063	-4.6750	0.0021	0.0000	0.001592	4.712	82.42
Davit8:End	0.001599	3.36	-0.9259	-5.4512	0.0021	0.0000	0.001599	12.77	82.7

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. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
10254:g	-0.05	0.0	-50.50	0.0	0.0	-52.28	0.0	0.0	72.69	0.0	5094.36	0.0	-3.0	0.0	0.0	-0.00	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. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
10254	10254:t	Origin	0.00	113.91	0.05	-5.18	-0.00	-0.00	0.0	-2.61	0.34	-0.00	-0.13	0.00	0.03	0.00	0.14	0.2	5
10254	10254:Arm1	End	0.70	112.87	0.05	-5.11	0.24	-0.00	0.0	-2.61	0.34	-0.00	-0.13	0.03	0.01	0.00	0.16	0.2	2
10254	10254:Arm1	Origin	0.70	112.87	0.05	-5.11	0.96	-0.00	0.0	-3.07	1.80	-0.00	-0.15	0.03	0.18	0.00	0.36	0.5	4
10254	10254:TopConT	End	1.00	112.43	0.05	-5.09	1.50	-0.00	0.0	-3.07	1.80	-0.00	-0.15	0.05	0.18	0.00	0.36	0.6	4
10254	10254:TopConT	Origin	1.00	112.43	0.05	-5.09	1.50	-0.00	0.0	1.18	36.00	-0.00	0.06	0.00	3.63	0.00	6.28	9.7	5
10254	10254:TopConn	End	1.50	111.68	0.05	-5.04	19.50	-0.00	0.0	1.18	36.00	-0.00	0.06	0.00	3.60	0.00	6.24	9.6	5
10254	10254:TopConn	Origin	1.50	111.68	0.05	-5.04	19.50	-0.00	0.0	1.81	41.35	-0.00	0.09	0.00	4.14	0.00	7.17	11.0	5
10254	10254:TopConB	End	2.00	110.94	0.05	-4.99	40.18	-0.00	0.0	1.81	41.35	-0.00	0.09	0.00	4.11	0.00	7.13	11.0	5
10254	10254:TopConB	Origin	2.00	110.94	0.05	-4.99	40.18	-0.00	0.0	-2.59	7.27	-0.00	-0.13	4.58	0.19	0.00	4.72	7.3	2
10254	10254:WVGD14	End	5.00	106.48	0.05	-4.72	61.98	-0.00	0.0	-2.59	7.27	-0.00	-0.12	6.58	0.18	0.00	6.71	10.3	2
10254	10254:WVGD14	Origin	5.00	106.48	0.05	-4.72	61.98	-0.00	0.0	-3.07	7.78	-0.00	-0.14	6.58	0.19	0.00	6.73	10.4	2
10254	Tube 1	End	9.19	100.32	0.04	-4.34	94.58	-0.01	0.0	-3.07	7.78	-0.00	-0.14	9.11	0.19	0.00	9.25	14.2	2
10254	Tube 1	Origin	9.19	100.32	0.04	-4.34	94.58	-0.01	0.0	-3.40	8.03	-0.00	-0.15	9.11	0.19	0.00	9.27	14.3	2
10254	10254:Arm2	End	13.38	94.22	0.04	-3.97	128.18	-0.02	0.0	-3.40	8.03	-0.00	-0.15	11.26	0.18	0.00	11.41	17.6	2
10254	10254:Arm2	Origin	13.38	94.22	0.04	-3.97	137.77	-0.02	0.0	-7.99	18.22	-0.00	-0.34	12.10	0.41	0.00	12.46	19.2	2
10254	10254:WVGD13	End	15.00	91.87	0.04	-3.82	167.37	-0.03	0.0	-7.99	18.22	-0.00	-0.34	14.20	0.41	0.00	14.55	22.4	2
10254	10254:WVGD13	Origin	15.00	91.87	0.04	-3.82	167.37	-0.03	0.0	-8.51	18.72	-0.00	-0.36	14.20	0.42	0.00	14.57	22.4	2
10254	Tube 1	End	20.00	84.76	0.04	-3.40	260.99	-0.05	0.0	-8.51	18.72	-0.00	-0.34	19.97	0.40	0.00	20.32	31.3	2
10254	Tube 1	Origin	20.00	84.76	0.04	-3.40	260.99	-0.05	0.0	-8.99	19.02	-0.01	-0.36	19.97	0.40	0.00	20.34	31.3	2
10254	10254:WVGD12	End	25.00	77.85	0.04	-3.00	356.11	-0.08	0.0	-8.99	19.02	-0.01	-0.34	24.69	0.38	0.00	25.05	38.5	2
10254	10254:WVGD12	Origin	25.00	77.85	0.04	-3.00	356.11	-0.08	0.0	-9.73	19.64	-0.01	-0.37	24.69	0.40	0.00	25.08	38.6	2
10254	Tube 1	End	30.00	71.16	0.03	-2.62	454.32	-0.11	0.0	-9.73	19.64	-0.01	-0.35	28.69	0.38	0.00	29.05	44.7	2
10254	Tube 1	Origin	30.00	71.16	0.03	-2.62	454.32	-0.11	0.0	-10.28	19.96	-0.01	-0.37	28.69	0.38	0.00	29.07	44.7	2
10254	10254:WVGD11	End	35.00	64.73	0.03	-2.28	554.10	-0.15	0.0	-10.28	19.96	-0.01	-0.36	32.00	0.37	0.00	32.36	49.8	2
10254	10254:WVGD11	Origin	35.00	64.73	0.03	-2.28	554.10	-0.15	0.0	-10.80	20.44	-0.01	-0.38	32.00	0.38	0.00	32.38	49.8	2
10254	10254:Arm3	End	35.38	64.26	0.03	-2.25	561.77	-0.15	0.0	-10.80	20.44	-0.01	-0.37	32.23	0.38	0.00	32.61	50.2	2
10254	10254:Arm3	Origin	35.38	64.26	0.03	-2.25	571.27	-0.15	0.0	-15.65	30.54	-0.01	-0.54	32.77	0.56	0.00	33.33	51.3	2
10254	Tube 1	End	40.19	58.35	0.03	-1.95	718.25	-0.20	0.0	-15.65	30.54	-0.01	-0.52	37.95	0.54	0.00	38.49	59.2	2
10254	Tube 1	Origin	40.19	58.35	0.03	-1.95	718.25	-0.20	0.0	-16.30	30.84	-0.01	-0.54	37.95	0.54	0.00	38.51	59.2	2
10254	10254:WVGD10	End	45.00	52.73	0.02	-1.67	866.64	-0.25	0.0	-16.30	30.84	-0.01	-0.52	42.32	0.52	0.00	42.85	65.9	2
10254	10254:WVGD10	Origin	45.00	52.73	0.02	-1.67	866.64	-0.25	0.0	-17.04	31.37	-0.01	-0.55	42.32	0.53	0.00	42.87	66.0	2
10254	Tube 1	End	47.67	49.75	0.02	-1.53	950.24	-0.28	0.0	-17.04	31.37	-0.01	-0.53	44.47	0.52	0.00	45.02	69.3	2
10254	Tube 1	Origin	47.67	49.75	0.02	-1.53	950.24	-0.28	0.0	-17.42	31.53	-0.01	-0.55	44.47	0.52	0.00	45.03	69.3	2
10254	SpliceT	End	50.33	46.87	0.02	-1.40	1034.27	-0.32	0.0	-17.42	31.53	-0.01	-0.54	46.44	0.51	0.00	46.98	72.3	2
10254	SpliceT	Origin	50.33	46.87	0.02	-1.40	1034.27	-0.32	0.0	-18.31	31.80	-0.01	-0.56	46.44	0.52	0.00	47.01	72.3	2
10254	10254:WVGD9	End	55.00	42.04	0.02	-1.19	1182.77	-0.38	0.0	-18.31	31.80	-0.01	-0.40	37.12	0.37	0.00	37.52	57.7	2
10254	10254:WVGD9	Origin	55.00	42.04	0.02	-1.19	1182.77	-0.38	0.0	-19.46	32.36	-0.02	-0.42	37.12	0.37	0.00	37.55	57.8	2
10254	10254:Arm4	End	57.38	39.68	0.02	-1.10	1259.63	-0.42	0.0	-19.46	32.36	-0.02	-0.41	38.14	0.37	0.00	38.56	59.3	2
10254	10254:Arm4	Origin	57.38	39.68	0.02	-1.10	1269.00	-0.42	0.0	-24.82	42.41	-0.02	-0.53	38.42	0.48	0.00	38.96	59.9	2
10254	Tube 2	End	61.19	36.03	0.02	-0.95	1430.70	-0.48	0.0	-24.82	42.41	-0.02	-0.51	40.94	0.47	0.00	41.46	63.8	2
10254	Tube 2	Origin	61.19	36.03	0.02	-0.95	1430.70	-0.48	0.0	-25.60	42.66	-0.02	-0.53	40.94	0.47	0.00	41.48	63.8	2
10254	10254:WVGD8	End	65.00	32.55	0.02	-0.82	1593.35	-0.55	0.0	-25.60	42.66	-0.02	-0.52	43.17	0.46	0.00	43.69	67.2	2
10254	10254:WVGD8	Origin	65.00	32.55	0.02	-0.82	1593.35	-0.55	0.0	-26.76	43.26	-0.02	-0.54	43.17	0.46	0.00	43.71	67.3	2
10254	Tube 2	End	70.00	28.25	0.01	-0.66	1809.65	-0.64	0.0	-26.76	43.26	-0.02	-0.52	45.73	0.45	0.00	46.25	71.2	2
10254	Tube 2	Origin	70.00	28.25	0.01	-0.66	1809.65	-0.64	0.0	-27.86	43.59	-0.02	-0.54	45.73	0.45	0.00	46.28	71.2	2
10254	10254:WVGD7	End	75.00	24.25	0.01	-0.53	2027.61	-0.75	0.0	-27.86	43.59	-0.02	-0.52	47.90	0.43	0.00	48.43	74.5	2
10254	10254:WVGD7	Origin	75.00	24.25	0.01	-0.53	2027.61	-0.75	0.0	-29.22	44.23	-0.02	-0.55	47.90	0.44	0.00	48.46	74.5	2
10254	Tube 2	End	80.00	20.56	0.01	-0.41	2248.75	-0.86	0.0	-29.22	44.23	-0.02	-0.53	49.77	0.43	0.00	50.31	77.4	2
10254	Tube 2	Origin	80.00	20.56	0.01	-0.41	2248.75	-0.86	0.0	-30.38	44.57	-0.02	-0.55	49.77	0.43	0.00	50.33	77.4	2
10254	10254:WVGD6	End	85.00	17.19	0.01	-0.32	2471.60	-0.98	0.0	-30.38	44.57	-0.02	-0.54	51.36	0.42	0.00	51.90	79.9	2
10254	10254:WVGD6	Origin	85.00	17.19	0.01	-0.32	2471.60	-0.98	0.0	-31.82	45.21	-0.03	-0.56	51.36	0.42	0.00	51.93	79.9	2
10254	Tube 2	End	90.00	14.13	0.01	-0.24	2697.65	-1.11	0.0	-31.82	45.21	-0.03	-0.54	52.74	0.41	0.00	53.29	82.0	2
10254	Tube 2	Origin	90.00	14.13	0.01	-0.24	2697.65	-1.11	0.0	-33.04	45.56	-0.03	-0.57	52.74	0.41	0.00	53.31	82.0	2
10254	10254:WVGD5	End	95.00	11.38	0.01	-0.17	2925.46	-1.25	0.0	-33.04	45.56	-0.03	-0.55	53.90	0.40	0.00	54.45	83.8	2

10254	10254:WVGD5	Origin	95.00	11.38	0.01	-0.17	2925.46	-1.25	0.0	-34.39	46.17	-0.03	-0.57	53.90	0.41	0.00	54.47	83.8	2
10254	SpliceT	End	98.83	9.48	0.01	-0.13	3102.27	-1.36	0.0	-34.39	46.17	-0.03	-0.56	54.68	0.40	0.00	55.24	85.0	2
10254	SpliceT	Origin	98.83	9.48	0.01	-0.13	3102.27	-1.36	0.0	-35.62	46.42	-0.03	-0.58	54.68	0.40	0.00	55.26	85.0	2
10254	Tube 2	End	101.92	8.09	0.00	-0.11	3245.49	-1.46	0.0	-35.62	46.42	-0.03	-0.54	53.77	0.37	0.00	54.32	83.6	2
10254	Tube 2	Origin	101.92	8.09	0.00	-0.11	3245.49	-1.46	0.0	-37.11	46.66	-0.03	-0.57	53.77	0.38	0.00	54.34	83.6	2
10254	10254:WVGD4	End	105.00	6.81	0.00	-0.08	3389.44	-1.55	0.0	-37.11	46.66	-0.03	-0.56	54.22	0.37	0.00	54.78	84.3	2
10254	10254:WVGD4	Origin	105.00	6.81	0.00	-0.08	3389.44	-1.55	0.0	-38.79	47.25	-0.03	-0.58	54.22	0.37	0.00	54.80	84.3	2
10254	Tube 3	End	110.00	4.97	0.00	-0.05	3625.71	-1.72	0.0	-38.79	47.25	-0.03	-0.56	54.86	0.36	0.00	55.43	85.3	2
10254	Tube 3	Origin	110.00	4.97	0.00	-0.05	3625.71	-1.72	0.0	-40.19	47.61	-0.04	-0.59	54.86	0.37	0.00	55.45	85.3	2
10254	10254:WVGD3	End	115.00	3.44	0.00	-0.03	3863.74	-1.90	0.0	-40.19	47.61	-0.04	-0.57	55.38	0.36	0.00	55.96	86.1	2
10254	10254:WVGD3	Origin	115.00	3.44	0.00	-0.03	3863.74	-1.90	0.0	-41.87	48.26	-0.04	-0.59	55.38	0.36	0.00	55.98	86.1	2
10254	Tube 3	End	120.00	2.19	0.00	-0.02	4105.03	-2.09	0.0	-41.87	48.26	-0.04	-0.58	55.82	0.35	0.00	56.40	86.8	2
10254	Tube 3	Origin	120.00	2.19	0.00	-0.02	4105.03	-2.09	0.0	-43.33	48.62	-0.04	-0.60	55.82	0.35	0.00	56.42	86.8	2
10254	10254:WVGD2	End	125.00	1.23	0.00	-0.01	4348.13	-2.29	0.0	-43.33	48.62	-0.04	-0.58	56.17	0.35	0.00	56.76	87.3	2
10254	10254:WVGD2	Origin	125.00	1.23	0.00	-0.01	4348.13	-2.29	0.0	-45.07	49.28	-0.04	-0.61	56.17	0.35	0.00	56.78	87.4	2
10254	Tube 3	End	130.00	0.54	0.00	-0.00	4594.52	-2.50	0.0	-45.07	49.28	-0.04	-0.59	56.46	0.34	0.00	57.05	87.8	2
10254	Tube 3	Origin	130.00	0.54	0.00	-0.00	4594.52	-2.50	0.0	-46.59	49.65	-0.04	-0.61	56.46	0.34	0.00	57.07	87.8	2
10254	10254:WVGD1	End	135.00	0.14	0.00	-0.00	4842.77	-2.72	0.0	-46.59	49.65	-0.04	-0.60	56.67	0.34	0.00	57.27	88.1	2
10254	10254:WVGD1	Origin	135.00	0.14	0.00	-0.00	4842.77	-2.72	0.0	-48.39	50.32	-0.05	-0.62	56.67	0.34	0.00	57.30	88.1	2
10254	10254:g	End	140.00	0.00	0.00	0.00	5094.36	-2.95	0.0	-48.39	50.32	-0.05	-0.61	56.84	0.33	0.00	57.45	88.4	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. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	112.95	0.05	-3.85	-0.56	0.00	0.0	-0.73	0.13	-0.00	-0.18	1.16	0.00	0.00	1.34	2.1	1
Davit1	#Davit1:0	End	2.51	113.55	0.05	-0.16	-0.25	0.00	0.0	-0.73	0.13	-0.00	-0.20	0.65	0.00	0.00	0.85	1.3	1
Davit1	#Davit1:0	Origin	2.51	113.55	0.05	-0.16	-0.25	0.00	0.0	-0.72	0.10	-0.00	-0.20	0.65	0.00	0.00	0.85	1.3	1
Davit1	Davit1:End	End	5.02	114.16	0.05	3.53	-0.00	0.00	0.0	-0.72	0.10	-0.00	-0.23	0.00	0.07	0.00	0.26	0.4	3
Davit2	Davit2:O	Origin	0.00	112.79	0.05	-6.38	-1.28	-0.00	-0.0	0.69	0.27	0.00	0.17	2.63	0.00	0.00	2.80	4.3	1
Davit2	#Davit2:0	End	2.51	112.93	0.05	-10.13	-0.60	-0.00	-0.0	0.69	0.27	0.00	0.19	1.57	0.00	0.00	1.77	2.7	1
Davit2	#Davit2:0	Origin	2.51	112.93	0.05	-10.13	-0.60	-0.00	0.0	0.69	0.24	0.00	0.19	1.57	0.00	0.00	1.77	2.7	1
Davit2	Davit2:End	End	5.02	113.07	0.05	-13.90	0.00	0.00	0.0	0.69	0.24	0.00	0.22	0.00	0.16	0.00	0.36	0.6	3
Davit3	Davit3:O	Origin	0.00	94.30	0.04	-2.55	-12.10	0.00	0.0	-5.23	1.52	-0.00	-0.91	12.22	0.00	0.00	13.13	20.2	1
Davit3	#Davit3:0	End	4.03	95.35	0.04	3.09	-5.98	0.00	0.0	-5.23	1.52	-0.00	-1.18	10.16	0.00	0.00	11.34	17.5	1
Davit3	#Davit3:0	Origin	4.03	95.35	0.04	3.09	-5.98	0.00	0.0	-5.21	1.48	-0.00	-1.18	10.16	0.00	0.00	11.34	17.4	1
Davit3	Davit3:End	End	8.06	96.36	0.04	8.54	-0.00	0.00	0.0	-5.21	1.48	-0.00	-1.67	0.00	1.01	0.00	2.42	3.7	3
Davit4	Davit4:O	Origin	0.00	94.13	0.04	-5.38	-21.68	-0.00	-0.0	4.71	2.74	0.00	0.82	21.88	0.00	0.00	22.71	34.9	1
Davit4	#Davit4:0	End	4.03	94.51	0.04	-11.41	-10.65	-0.00	-0.0	4.71	2.74	0.00	1.06	18.10	0.00	0.00	19.16	29.5	1
Davit4	#Davit4:0	Origin	4.03	94.51	0.04	-11.41	-10.65	-0.00	0.0	4.73	2.64	0.00	1.07	18.10	0.00	0.00	19.17	29.5	1
Davit4	Davit4:End	End	8.06	94.88	0.04	-17.76	-0.00	0.00	0.0	4.73	2.64	0.00	1.51	0.00	1.81	0.00	3.48	5.3	3
Davit5	Davit5:O	Origin	0.00	64.34	0.03	-0.74	-12.79	0.00	0.0	-5.20	1.60	-0.00	-0.91	12.91	0.00	0.00	13.82	21.3	1
Davit5	#Davit5:0	End	4.03	65.20	0.03	4.13	-6.33	0.00	0.0	-5.20	1.60	-0.00	-1.18	10.75	0.00	0.00	11.93	18.3	1
Davit5	#Davit5:0	Origin	4.03	65.20	0.03	4.13	-6.33	0.00	0.0	-5.18	1.57	-0.00	-1.17	10.75	0.00	0.00	11.92	18.3	1
Davit5	Davit5:End	End	8.06	66.03	0.03	8.81	-0.00	0.00	0.0	-5.18	1.57	-0.00	-1.66	0.00	1.07	0.00	2.49	3.8	3
Davit6	Davit6:O	Origin	0.00	64.18	0.03	-3.77	-22.28	-0.00	-0.0	4.67	2.81	0.00	0.82	22.49	0.00	0.00	23.31	35.9	1
Davit6	#Davit6:0	End	4.03	64.55	0.03	-9.02	-10.95	-0.00	-0.0	4.67	2.81	0.00	1.05	18.61	0.00	0.00	19.66	30.3	1
Davit6	#Davit6:0	Origin	4.03	64.55	0.03	-9.02	-10.95	-0.00	0.0	4.69	2.72	0.00	1.06	18.61	0.00	0.00	19.67	30.3	1
Davit6	Davit6:End	End	8.06	64.92	0.03	-14.61	-0.00	0.00	0.0	4.69	2.72	0.00	1.50	0.00	1.86	0.00	3.55	5.5	3
Davit7	Davit7:O	Origin	0.00	39.74	0.02	0.28	-13.77	0.00	0.0	-5.16	1.73	-0.00	-0.90	13.91	0.00	0.00	14.81	22.8	1

Davit7	#Davit7:0	End	4.03	40.36	0.02	4.05	-6.82	0.00	0.0	-5.16	1.73	-0.00	-1.17	11.59	0.00	0.00	12.75	19.6	1
Davit7	#Davit7:0	Origin	4.03	40.36	0.02	4.05	-6.82	0.00	0.0	-5.15	1.69	-0.00	-1.16	11.59	0.00	0.00	12.75	19.6	1
Davit7	Davit7:End	End	8.06	40.95	0.02	7.61	-0.00	0.00	0.0	-5.15	1.69	-0.00	-1.65	0.00	1.16	0.00	2.59	4.0	3
Davit8	Davit8:O	Origin	0.00	39.62	0.02	-2.48	-23.13	-0.00	-0.0	4.60	2.92	0.00	0.80	23.36	0.00	0.00	24.16	37.2	1
Davit8	#Davit8:0	End	4.03	39.96	0.02	-6.62	-11.38	-0.00	-0.0	4.60	2.92	0.00	1.04	19.33	0.00	0.00	20.37	31.3	1
Davit8	#Davit8:0	Origin	4.03	39.96	0.02	-6.62	-11.38	-0.00	0.0	4.62	2.82	0.00	1.04	19.33	0.00	0.00	20.38	31.3	1
Davit8	Davit8:End	End	8.06	40.32	0.02	-11.11	-0.00	0.00	0.0	4.62	2.82	0.00	1.48	0.00	1.93	0.00	3.66	5.6	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	0.725	80.00	80.00	0.91
Clamp2	0.725	80.00	80.00	0.91
Clamp3	5.404	80.00	80.00	6.75
Clamp4	5.404	80.00	80.00	6.75
Clamp5	5.404	80.00	80.00	6.75
Clamp6	5.404	80.00	80.00	6.75
Clamp7	5.404	80.00	80.00	6.75
Clamp8	5.404	80.00	80.00	6.75
Clamp9	2.602	80.00	80.00	3.25
Clamp10	0.379	80.00	80.00	0.47
Clamp11	0.379	80.00	80.00	0.47
Clamp12	0.379	80.00	80.00	0.47
Clamp13	0.379	80.00	80.00	0.47
Clamp14	0.379	80.00	80.00	0.47
Clamp15	0.379	80.00	80.00	0.47
Clamp16	0.379	80.00	80.00	0.47
Clamp17	0.379	80.00	80.00	0.47
Clamp18	0.379	80.00	80.00	0.47
Clamp19	0.379	80.00	80.00	0.47
Clamp20	0.379	80.00	80.00	0.47
Clamp21	0.379	80.00	80.00	0.47
Clamp22	0.379	80.00	80.00	0.47
Clamp23	0.379	80.00	80.00	0.47
Clamp24	5.367	80.00	80.00	6.71
Clamp25	34.446	80.00	80.00	43.06
Clamp26	34.446	80.00	80.00	43.06

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
10254	88.39	NESC Extreme	37	28299.2

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 %
10254	NESC Heavy	1	2.558	1.097	-0.329	2.764	40.000	21.164	124.192	3	142.959	1.930	3.250	35.27
10254	NESC Heavy	2	2.764	-0.329	1.097	2.558	40.000	7.511	44.077	3	61.603	1.150	3.250	12.52
10254	NESC Heavy	3	2.229	-1.667	2.229	1.667	40.000	11.060	64.900	5	61.603	1.395	3.250	18.43
10254	NESC Heavy	4	1.097	-2.558	2.764	0.329	40.000	6.167	36.187	3	-52.297	1.042	3.250	10.28
10254	NESC Heavy	5	-0.329	-2.764	2.558	-1.097	40.000	19.717	115.701	3	-133.105	1.863	3.250	32.86
10254	NESC Heavy	6	-1.667	-2.229	1.667	-2.229	40.000	41.895	245.841	5	-133.105	2.716	3.250	69.82
10254	NESC Heavy	7	-2.558	-1.097	0.329	-2.764	40.000	19.683	115.500	3	-132.962	1.861	3.250	32.80
10254	NESC Heavy	8	-2.764	0.329	-1.097	-2.558	40.000	6.070	35.616	3	-51.606	1.034	3.250	10.12
10254	NESC Heavy	9	-2.229	1.667	-2.229	-1.667	40.000	11.103	65.155	5	62.294	1.398	3.250	18.51
10254	NESC Heavy	10	-1.097	2.558	-2.764	-0.329	40.000	7.614	44.678	3	62.294	1.158	3.250	12.69
10254	NESC Heavy	11	0.329	2.764	-2.558	1.097	40.000	21.198	124.392	3	143.102	1.932	3.250	35.33
10254	NESC Heavy	12	1.667	2.229	-1.667	2.229	40.000	45.045	264.325	5	143.102	2.816	3.250	75.07
10254	NESC Heavy	13	2.207	1.798	-1.013	2.661	40.000	26.493	155.460	4	143.030	2.160	3.250	44.15
10254	NESC Heavy	14	2.810	0.453	0.453	2.810	40.000	10.052	58.987	2	142.816	1.330	3.250	16.75
10254	NESC Heavy	15	2.661	-1.013	1.798	2.207	40.000	7.389	43.359	4	61.603	1.141	3.250	12.31
10254	NESC Heavy	16	1.798	-2.207	2.661	1.013	40.000	6.187	36.305	4	-52.297	1.044	3.250	10.31
10254	NESC Heavy	17	0.453	-2.810	2.810	-0.453	40.000	9.117	53.500	2	-133.105	1.267	3.250	15.20
10254	NESC Heavy	18	-1.013	-2.661	2.207	-1.798	40.000	24.669	144.759	4	-133.105	2.084	3.250	41.12
10254	NESC Heavy	19	-2.207	-1.798	1.013	-2.661	40.000	24.639	144.583	4	-133.033	2.083	3.250	41.06
10254	NESC Heavy	20	-2.810	-0.453	-0.453	-2.810	40.000	9.069	53.218	2	-132.819	1.264	3.250	15.12
10254	NESC Heavy	21	-2.661	1.013	-1.798	-2.207	40.000	6.122	35.922	4	-51.606	1.038	3.250	10.20
10254	NESC Heavy	22	-1.798	2.207	-2.661	-1.013	40.000	7.502	44.023	4	62.294	1.149	3.250	12.50
10254	NESC Heavy	23	-0.453	2.810	-2.810	0.453	40.000	10.100	59.269	2	143.102	1.333	3.250	16.83
10254	NESC Heavy	24	1.013	2.661	-2.207	1.798	40.000	26.523	155.637	4	143.102	2.161	3.250	44.20
10254	NESC Extreme	1	2.558	1.097	-0.329	2.764	40.000	27.121	159.148	3	183.085	2.185	3.250	45.20
10254	NESC Extreme	2	2.764	-0.329	1.097	2.558	40.000	9.281	54.459	3	76.917	1.278	3.250	15.47
10254	NESC Extreme	3	2.229	-1.667	2.229	1.667	40.000	14.245	83.588	5	76.917	1.584	3.250	23.74
10254	NESC Extreme	4	1.097	-2.558	2.764	0.329	40.000	8.600	50.467	3	-72.208	1.230	3.250	14.33
10254	NESC Extreme	5	-0.329	-2.764	2.558	-1.097	40.000	26.403	154.933	3	-178.210	2.156	3.250	44.00
10254	NESC Extreme	6	-1.667	-2.229	1.667	-2.229	40.000	56.138	329.423	5	-178.210	3.144	3.250	93.56
10254	NESC Extreme	7	-2.558	-1.097	0.329	-2.764	40.000	26.392	154.872	3	-178.167	2.155	3.250	43.99
10254	NESC Extreme	8	-2.764	0.329	-1.097	-2.558	40.000	8.571	50.293	3	-71.998	1.228	3.250	14.28
10254	NESC Extreme	9	-2.229	1.667	-2.229	-1.667	40.000	14.258	83.666	5	77.126	1.584	3.250	23.76
10254	NESC Extreme	10	-1.097	2.558	-2.764	-0.329	40.000	9.312	54.641	3	77.126	1.280	3.250	15.52
10254	NESC Extreme	11	0.329	2.764	-2.558	1.097	40.000	27.131	159.209	3	183.128	2.185	3.250	45.22
10254	NESC Extreme	12	1.667	2.229	-1.667	2.229	40.000	57.688	338.516	5	183.128	3.187	3.250	96.15
10254	NESC Extreme	13	2.207	1.798	-1.013	2.661	40.000	33.943	199.181	4	183.106	2.444	3.250	56.57
10254	NESC Extreme	14	2.810	0.453	0.453	2.810	40.000	12.783	75.014	2	183.042	1.500	3.250	21.31
10254	NESC Extreme	15	2.661	-1.013	1.798	2.207	40.000	9.062	53.178	4	76.917	1.263	3.250	15.10
10254	NESC Extreme	16	1.798	-2.207	2.661	1.013	40.000	8.454	49.609	4	-72.208	1.220	3.250	14.09
10254	NESC Extreme	17	0.453	-2.810	2.810	-0.453	40.000	12.314	72.261	2	-178.210	1.472	3.250	20.52

10254	NESC Extreme	18	-1.013	-2.661	2.207	-1.798	40.000	33.040	193.883	4	-178.210	2.412	3.250	55.07
10254	NESC Extreme	19	-2.207	-1.798	1.013	-2.661	40.000	33.031	193.829	4	-178.188	2.411	3.250	55.05
10254	NESC Extreme	20	-2.810	-0.453	-0.453	-2.810	40.000	12.300	72.175	2	-178.123	1.471	3.250	20.50
10254	NESC Extreme	21	-2.661	1.013	-1.798	-2.207	40.000	8.434	49.492	4	-71.998	1.219	3.250	14.06
10254	NESC Extreme	22	-1.798	2.207	-2.661	-1.013	40.000	9.097	53.379	4	77.126	1.265	3.250	15.16
10254	NESC Extreme	23	-0.453	2.810	-2.810	0.453	40.000	12.798	75.099	2	183.128	1.501	3.250	21.33
10254	NESC Extreme	24	1.013	2.661	-2.207	1.798	40.000	33.952	199.234	4	183.128	2.445	3.250	56.59

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	13.03	NESC Heavy	1	61.2
Davit2	16.73	NESC Heavy	1	61.2
Davit3	68.63	NESC Heavy	1	121.4
Davit4	80.82	NESC Heavy	1	121.4
Davit5	69.37	NESC Heavy	1	121.4
Davit6	81.35	NESC Heavy	1	121.4
Davit7	70.50	NESC Heavy	1	121.4
Davit8	82.16	NESC Heavy	1	121.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.16	Davit8	Tubular Davit
NESC Extreme	96.15	10254	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy	68.84	10254	37
NESC Extreme	88.39	10254	37

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	10254	12	40.000	99.970	3891.033	-9.747	45.045	264.325	5	143.102	2.816	75.07
NESC Extreme	10254	12	40.000	49.182	5094.357	-2.954	57.688	338.516	5	183.128	3.187	96.15

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy	82.16	Davit8	1
NESC Extreme	37.17	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.87	NESC Heavy	0.0
Clamp2	Clamp	1.87	NESC Heavy	0.0
Clamp3	Clamp	9.30	NESC Heavy	0.0
Clamp4	Clamp	9.30	NESC Heavy	0.0
Clamp5	Clamp	9.30	NESC Heavy	0.0
Clamp6	Clamp	9.30	NESC Heavy	0.0
Clamp7	Clamp	9.30	NESC Heavy	0.0
Clamp8	Clamp	9.30	NESC Heavy	0.0
Clamp9	Clamp	6.49	NESC Heavy	0.0
Clamp10	Clamp	1.16	NESC Heavy	0.0
Clamp11	Clamp	1.16	NESC Heavy	0.0
Clamp12	Clamp	1.16	NESC Heavy	0.0
Clamp13	Clamp	1.16	NESC Heavy	0.0
Clamp14	Clamp	1.16	NESC Heavy	0.0
Clamp15	Clamp	1.16	NESC Heavy	0.0
Clamp16	Clamp	1.16	NESC Heavy	0.0
Clamp17	Clamp	1.16	NESC Heavy	0.0
Clamp18	Clamp	1.16	NESC Heavy	0.0
Clamp19	Clamp	1.16	NESC Heavy	0.0
Clamp20	Clamp	1.16	NESC Heavy	0.0
Clamp21	Clamp	1.16	NESC Heavy	0.0
Clamp22	Clamp	1.16	NESC Heavy	0.0
Clamp23	Clamp	1.16	NESC Heavy	0.0
Clamp24	Clamp	6.71	NESC Extreme	0.0
Clamp25	Clamp	43.06	NESC Extreme	0.0
Clamp26	Clamp	43.06	NESC Extreme	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	0.000	1.128	0.982	1.496
NESC Heavy	Clamp2	Clamp	Davit2:End	0.000	1.128	0.982	1.496
NESC Heavy	Clamp3	Clamp	Davit3:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp4	Clamp	Davit4:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp5	Clamp	Davit5:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp6	Clamp	Davit6:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp7	Clamp	Davit7:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp8	Clamp	Davit8:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp9	Clamp	10254:t	0.000	0.000	5.192	5.192
NESC Heavy	Clamp10	Clamp	10254:WVGD1	0.000	0.108	0.920	0.926
NESC Heavy	Clamp11	Clamp	10254:WVGD2	0.000	0.108	0.920	0.926
NESC Heavy	Clamp12	Clamp	10254:WVGD3	0.000	0.108	0.920	0.926
NESC Heavy	Clamp13	Clamp	10254:WVGD4	0.000	0.108	0.920	0.926
NESC Heavy	Clamp14	Clamp	10254:WVGD5	0.000	0.108	0.920	0.926
NESC Heavy	Clamp15	Clamp	10254:WVGD6	0.000	0.108	0.920	0.926
NESC Heavy	Clamp16	Clamp	10254:WVGD7	0.000	0.108	0.920	0.926
NESC Heavy	Clamp17	Clamp	10254:WVGD8	0.000	0.108	0.920	0.926
NESC Heavy	Clamp18	Clamp	10254:WVGD9	0.000	0.108	0.920	0.926

NESC Heavy	Clamp19	Clamp	10254:WVGD10	0.000	0.108	0.920	0.926
NESC Heavy	Clamp20	Clamp	10254:WVGD11	0.000	0.108	0.920	0.926
NESC Heavy	Clamp21	Clamp	10254:WVGD12	0.000	0.108	0.920	0.926
NESC Heavy	Clamp22	Clamp	10254:WVGD13	0.000	0.108	0.920	0.926
NESC Heavy	Clamp23	Clamp	10254:WVGD14	0.000	0.108	0.920	0.926
NESC Heavy	Clamp24	Clamp	10254:TopConn	0.000	1.630	0.000	1.630
NESC Heavy	Clamp25	Clamp	10254:TopConT	0.000	10.475	0.000	10.475
NESC Heavy	Clamp26	Clamp	10254:TopConB	0.000	-10.475	0.000	10.475
NESC Extreme	Clamp1	Clamp	Davit1:End	0.000	0.683	0.243	0.725
NESC Extreme	Clamp2	Clamp	Davit2:End	0.000	0.683	0.243	0.725
NESC Extreme	Clamp3	Clamp	Davit3:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp4	Clamp	Davit4:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp5	Clamp	Davit5:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp6	Clamp	Davit6:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp7	Clamp	Davit7:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp8	Clamp	Davit8:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp9	Clamp	10254:t	0.000	0.000	2.602	2.602
NESC Extreme	Clamp10	Clamp	10254:WVGD1	0.000	0.285	0.250	0.379
NESC Extreme	Clamp11	Clamp	10254:WVGD2	0.000	0.285	0.250	0.379
NESC Extreme	Clamp12	Clamp	10254:WVGD3	0.000	0.285	0.250	0.379
NESC Extreme	Clamp13	Clamp	10254:WVGD4	0.000	0.285	0.250	0.379
NESC Extreme	Clamp14	Clamp	10254:WVGD5	0.000	0.285	0.250	0.379
NESC Extreme	Clamp15	Clamp	10254:WVGD6	0.000	0.285	0.250	0.379
NESC Extreme	Clamp16	Clamp	10254:WVGD7	0.000	0.285	0.250	0.379
NESC Extreme	Clamp17	Clamp	10254:WVGD8	0.000	0.285	0.250	0.379
NESC Extreme	Clamp18	Clamp	10254:WVGD9	0.000	0.285	0.250	0.379
NESC Extreme	Clamp19	Clamp	10254:WVGD10	0.000	0.285	0.250	0.379
NESC Extreme	Clamp20	Clamp	10254:WVGD11	0.000	0.285	0.250	0.379
NESC Extreme	Clamp21	Clamp	10254:WVGD12	0.000	0.285	0.250	0.379
NESC Extreme	Clamp22	Clamp	10254:WVGD13	0.000	0.285	0.250	0.379
NESC Extreme	Clamp23	Clamp	10254:WVGD14	0.000	0.285	0.250	0.379
NESC Extreme	Clamp24	Clamp	10254:TopConn	0.000	5.367	0.000	5.367
NESC Extreme	Clamp25	Clamp	10254:TopConT	0.000	34.446	0.000	34.446
NESC Extreme	Clamp26	Clamp	10254:TopConB	0.000	-34.446	0.000	34.446

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	29.812	0.000	57.410	3236.188	-0.000	-0.000
NESC Extreme	38.977	0.000	22.494	4232.371	-0.000	-0.000

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 850.8
Weight of Steel Poles: 28299.2
Total: 29150.0

*** End of Report

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Anchor Bolt Analysis Pole #10254

Location: Bethel, CT

Rev. 0: 2/2/16

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 15267.000

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 183 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use ASTM A615 Grade 75

Number of Anchor Bolts = $N := 25$ (User Input)

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

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

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

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

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

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

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

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

Bolt Tension Check:

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

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} = 75.13 \cdot \%$

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

Condition1 = "OK"

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Subject:	CAISSON FOUNDATION ANALYSIS
Location:	Bethel, CT
Rev. 0: 2/2/16	Prepared by: TJL Checked by: C.F.C. Job No. 15267.000

Caisson Foundation:

Input Data:

Shear Force =	$S := 50.5k \cdot 1.1 = 55.6 \cdot kips$	*USER INPUT-FROM PLS-Pole*
Overturning Moment =	$M := 5094.4ft \cdot k \cdot 1.1 = 5604 \cdot ft \cdot k$	*USER INPUT-FROM PLS-Pole*
Applied Axial Load =	$A1 := 52.3k \cdot 1.1 = 57.5 \cdot kips$	*USER INPUT-FROM PLS-Pole*
Bending Moment =	$Mu := 5789ft \cdot k$	*USER INPUT–FROM LPILE*
Moment Capacity =	$Mn := 9208ft \cdot k$	*USER INPUT–FROM LPILE*
Foundation Diameter =	$d := 8ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 20.5ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 38$	*USER INPUT*
Area of Rebar =	$Ar := 1.27in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3.5ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{Mn}{Mu} = 1.6$

Factor of Safety Required = $FS_{reqd} := 1.0$

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

FOSCheck = "OK"

LPILE Plus for Windows, Version 5.0 (5.0.47)

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

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\152670O.WI\003_Stony Hill\04_Structural\Backup Documentation\L-Pile\Existing Caisson\
Name of input data file: Caisson Analysis - Existing Caisson.lpd
Name of output file: Caisson Analysis - Existing Caisson.lpo
Name of plot output file: Caisson Analysis - Existing Caisson.lpp
Name of runtime file: Caisson Analysis - Existing Caisson.lpr

Time and Date of Analysis

Date: February 2, 2016 Time: 11:21:07

Problem Title

15267.000 / CT5176 - Stony Hill / Structure # 10254

Program Options

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

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum bending moment, and shear force only
- Analysis includes effects of soil movement on pile response
- Additional p-y curves computed at specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 250
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment, and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 246.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.2000	3300000.
2	246.0000	96.00000000	4169220.	7238.2000	3300000.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

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

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 90.000 in
Distance from top of pile to bottom of layer = 144.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 144.000 in
Distance from top of pile to bottom of layer = 186.000 in
p-y subgrade modulus k for top of soil layer = 225.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 225.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 186.000 in
Distance from top of pile to bottom of layer = 246.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

(Depth of lowest layer extends 0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.06700
2	90.00	0.06700
3	90.00	0.06700
4	144.00	0.06700
5	144.00	0.07500
6	186.00	0.07500
7	186.00	0.03900
8	246.00	0.03900

Shear Strength of Soils

Shear strength parameters with depth defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	30.00	------	------
2	90.000	0.00000	30.00	------	------
3	90.000	0.00000	30.00	------	------
4	144.000	0.00000	30.00	------	------
5	144.000	0.00000	40.00	------	------
6	186.000	0.00000	40.00	------	------
7	186.000	0.00000	40.00	------	------
8	246.000	0.00000	40.00	------	------

Notes:

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

Lateral Soil Movements

Profile of soil movement with depth defined using 2 points

Point No.	Depth X in	Soil Movement in
1	0.000	0.000
2	0.000	0.000

Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 57500.000 lbs
Bending moment at pile head = 67248000.000 in-lbs
Axial load at pile head = 55600.000 lbs

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

Output of p-y Curves at Specified Depths

p-y curves are generated and printed for verification at 1 depths.

Depth No.	Depth Below Pile Head in	Depth Below Ground Surface in
1	144.000	138.000

Depth of ground surface below top of pile = 6.00 in

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Number of sections = 1

Pile Section No. 1

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

Outside Diameter = 96.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 38

Area of Single Bar = 1.27000 in**2
Number of Rows of Reinforcing Bars = 19
Area of Steel = 48.260 in**2
Area of Shaft = 7238.229 in**2
Percentage of Steel Reinforcement = 0.667 percent
Cover Thickness (edge to bar center) = 3.000 in

Unfactored Axial Squash Load Capacity = 24285.76 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	44.846
2	2.540	43.623
3	2.540	41.210
4	2.540	37.672
5	2.540	33.108
6	2.540	27.640
7	2.540	21.418
8	2.540	14.611
9	2.540	7.407
10	2.540	0.000
11	2.540	-7.407
12	2.540	-14.611
13	2.540	-21.418
14	2.540	-27.640
15	2.540	-33.108
16	2.540	-37.672
17	2.540	-41.210
18	2.540	-43.623
19	2.540	-44.846

Axial Thrust Force = 57500.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
9720021.	1.555203E+13	6.250000E-07	0.00003234	51.73798227	107.31320	880.59016
19337105.	1.546968E+13	0.00000125	0.00006245	49.96108675	205.36976	1696.76785
28852016.	1.538774E+13	0.00000188	0.00009261	49.39103937	301.85512	2514.15545
38262008.	1.530480E+13	0.00000250	0.00012272	49.08925009	396.49718	3330.32754
38262008.	1.224384E+13	0.00000313	0.00007870	25.18281698	253.55467	6132.00335
38262008.	1.020320E+13	0.00000375	0.00009261	24.69488382	297.00840	7411.46675
38262008.	8.745602E+12	0.00000438	0.00010653	24.35033083	340.16803	8690.42637
38262008.	7.652402E+12	0.00000500	0.00012048	24.09541941	383.03266	9968.87800
38262008.	6.802135E+12	0.00000563	0.00013476	23.95682573	426.60262	11237.59585
38262008.	6.121921E+12	0.00000625	0.00014870	23.79129839	468.73689	12516.21944
38262008.	5.565383E+12	0.00000688	0.00016265	23.65864420	510.57904	13794.28931
38262008.	5.101601E+12	0.00000750	0.00017663	23.55066347	552.12802	15071.80142
38262008.	4.709170E+12	0.00000813	0.00019063	23.46168280	593.38281	16348.75094
38262008.	4.372801E+12	0.00000875	0.00020464	23.38764238	634.34220	17625.13492
38262008.	4.081281E+12	0.00000938	0.00021868	23.32557249	675.00515	18900.94839
38262008.	3.826201E+12	0.00001000	0.00023273	23.27324438	715.37059	20176.18676
38262008.	3.601130E+12	0.00001063	0.00024681	23.22895002	755.43728	21450.84663
38262008.	3.401067E+12	0.00001125	0.00026090	23.19136763	795.20422	22724.92240
38262008.	3.222064E+12	0.00001188	0.00027502	23.15945005	834.67024	23998.40970
38262008.	3.060961E+12	0.00001250	0.00028915	23.13235617	873.83403	25271.30543
39236412.	2.989441E+12	0.00001313	0.00030331	23.10941362	912.69459	26543.60321
41009930.	2.982540E+12	0.00001375	0.00031749	23.09006739	951.25071	27815.29863
42781393.	2.976097E+12	0.00001438	0.00033169	23.07385683	989.50107	29086.38816
44550796.	2.970053E+12	0.00001500	0.00034591	23.06040430	1027.44458	30356.86558
46318124.	2.964360E+12	0.00001563	0.00036015	23.04938936	1065.08001	31626.72612
48083361.	2.958976E+12	0.00001625	0.00037441	23.04054022	1102.40607	32895.96533
49846493.	2.953866E+12	0.00001688	0.00038869	23.03362513	1139.42144	34164.57884
51607509.	2.949001E+12	0.00001750	0.00040300	23.02844954	1176.12496	35432.56022
53366394.	2.944353E+12	0.00001813	0.00041733	23.02484179	1212.51528	36699.90512
55123136.	2.939901E+12	0.00001875	0.00043167	23.02265596	1248.59115	37966.60763
56877711.	2.935624E+12	0.00001938	0.00044605	23.02176046	1284.35109	39232.66438
58630122.	2.931506E+12	0.00002000	0.00046044	23.02204943	1319.79405	40498.06660
60380347.	2.927532E+12	0.00002063	0.00047486	23.02342272	1354.91860	41762.80978
62128360.	2.923688E+12	0.00002125	0.00048930	23.02578878	1389.72311	43026.89138
63874166.	2.919962E+12	0.00002188	0.00050376	23.02907896	1424.20660	44290.30098
65617732.	2.916344E+12	0.00002250	0.00051825	23.03321886	1458.36734	45553.03687
67359052.	2.912824E+12	0.00002313	0.00053276	23.03815126	1492.20407	46815.09121
69098108.	2.909394E+12	0.00002375	0.00054729	23.04382181	1525.71534	48076.45836
70834883.	2.906046E+12	0.00002438	0.00056185	23.05018187	1558.89967	49337.13255
74301537.	2.899572E+12	0.00002563	0.00059104	23.06480455	1624.28178	51856.37543
77758870.	2.893353E+12	0.00002688	0.00062032	23.08171892	1688.33822	54372.77208
81206754.	2.887351E+12	0.00002813	0.00064971	23.10068464	1751.05679	56886.26931
84645044.	2.881533E+12	0.00002938	0.00067919	23.12150145	1812.42479	59396.81463
87579672.	2.859744E+12	0.00003063	0.00070735	23.09705687	1869.44970	60000.00000
89897326.	2.820308E+12	0.00003188	0.00073377	23.02022123	1921.53943	60000.00000
91937735.	2.775479E+12	0.00003313	0.00075942	22.92593050	1970.85046	60000.00000

93620334.	2.723501E+12	0.00003438	0.00078399	22.80695486	2016.88754	60000.00000
95243201.	2.673493E+12	0.00003563	0.00080842	22.69252539	2061.58904	60000.00000
96561207.	2.618609E+12	0.00003688	0.00083185	22.55858374	2103.37209	60000.00000
97875331.	2.567222E+12	0.00003813	0.00085533	22.43476439	2144.26876	60000.00000
99111249.	2.517111E+12	0.00003938	0.00088139	22.38454771	2188.71627	60000.00000
1.001034E+08	2.464085E+12	0.00004063	0.00090328	22.23464155	2224.82628	60000.00000
1.010927E+08	2.414153E+12	0.00004188	0.00092522	22.09477472	2260.16361	60000.00000
1.020788E+08	2.367046E+12	0.00004313	0.00094720	21.96408033	2294.72310	60000.00000
1.028962E+08	2.318788E+12	0.00004438	0.00096842	21.82346678	2327.20958	60000.00000
1.036226E+08	2.271179E+12	0.00004563	0.00098924	21.68194056	2358.29248	60000.00000
1.043464E+08	2.226058E+12	0.00004688	0.00101010	21.54881716	2388.67172	60000.00000
1.050678E+08	2.183228E+12	0.00004813	0.00103100	21.42344713	2418.34303	60000.00000
1.057867E+08	2.142516E+12	0.00004938	0.00105195	21.30524969	2447.30230	60000.00000
1.064064E+08	2.101854E+12	0.00005063	0.00107238	21.18274641	2474.77204	60000.00000
1.069214E+08	2.061135E+12	0.00005188	0.00109226	21.05553389	2500.76011	60000.00000
1.074343E+08	2.022292E+12	0.00005313	0.00111217	20.93499041	2526.10290	60000.00000
1.079451E+08	1.985198E+12	0.00005438	0.00113212	20.82065821	2550.79656	60000.00000
1.085106E+08	1.950753E+12	0.00005563	0.00115700	20.79999876	2580.91254	60000.00000
1.090327E+08	1.917059E+12	0.00005688	0.00117665	20.68833590	2603.66382	60000.00000
1.095265E+08	1.884326E+12	0.00005813	0.00119609	20.57783461	2625.49198	60000.00000
1.100023E+08	1.852671E+12	0.00005938	0.00121544	20.47052336	2646.56085	60000.00000
1.103413E+08	1.820062E+12	0.00006063	0.00123377	20.35090971	2665.86376	60000.00000
1.106787E+08	1.788747E+12	0.00006188	0.00125214	20.23664331	2684.61596	60000.00000
1.110145E+08	1.758646E+12	0.00006313	0.00127054	20.12740660	2702.81422	60000.00000
1.113488E+08	1.729690E+12	0.00006438	0.00128898	20.02291632	2720.45595	60000.00000
1.116815E+08	1.701813E+12	0.00006563	0.00130744	19.92289782	2737.53762	60000.00000
1.120126E+08	1.674954E+12	0.00006688	0.00132594	19.82710791	2754.05641	60000.00000
1.123421E+08	1.649058E+12	0.00006813	0.00134447	19.73531771	2770.00922	60000.00000
1.126699E+08	1.624071E+12	0.00006938	0.00136303	19.64731264	2785.39278	60000.00000
1.129961E+08	1.599945E+12	0.00007063	0.00138163	19.56289530	2800.20389	60000.00000
1.133207E+08	1.576635E+12	0.00007188	0.00140026	19.48188257	2814.43936	60000.00000
1.135879E+08	1.553338E+12	0.00007313	0.00141838	19.39660978	2827.68141	60000.00000
1.138052E+08	1.530154E+12	0.00007438	0.00143605	19.30821276	2840.03102	60000.00000
1.146899E+08	1.491901E+12	0.00007688	0.00147600	19.20000029	2866.12876	60000.00000
1.147573E+08	1.445761E+12	0.00007938	0.00151450	19.08025503	2888.58290	60000.00000
1.151544E+08	1.406466E+12	0.00008188	0.00154857	18.91386938	2906.18016	60000.00000
1.155466E+08	1.369441E+12	0.00008438	0.00158277	18.75875616	2921.83040	60000.00000
1.159338E+08	1.334490E+12	0.00008688	0.00161709	18.61396265	2935.51194	60000.00000
1.163160E+08	1.301438E+12	0.00008938	0.00165153	18.47864485	2947.20261	60000.00000
1.166930E+08	1.270128E+12	0.00009188	0.00168609	18.35204744	2956.87959	60000.00000
1.169809E+08	1.239533E+12	0.00009438	0.00171951	18.21995687	2964.25999	60000.00000
1.172124E+08	1.209935E+12	0.00009688	0.00175225	18.08770037	2969.62373	60000.00000
1.174396E+08	1.181782E+12	0.00009938	0.00178510	17.96324015	2973.15959	60000.00000
1.176625E+08	1.154969E+12	0.00010188	0.00181806	17.84601831	2974.84720	60000.00000
1.178760E+08	1.129351E+12	0.00010438	0.00185115	17.73552847	2970.96525	60000.00000
1.180837E+08	1.104877E+12	0.00010688	0.00188435	17.63131571	2964.17628	60000.00000
1.180837E+08	1.079623E+12	0.00010938	0.00192500	17.59999895	2967.70697	60000.00000
1.186016E+08	1.060126E+12	0.00011188	0.00196570	17.57051611	2972.38070	60000.00000
1.187891E+08	1.038594E+12	0.00011438	0.00199767	17.46592569	2974.34592	60000.00000
1.189749E+08	1.017967E+12	0.00011688	0.00202975	17.36686277	2974.96749	60000.00000
1.191562E+08	9.981673E+11	0.00011938	0.00206209	17.27407694	2969.23605	60000.00000
1.193364E+08	9.791704E+11	0.00012188	0.00209453	17.18586874	2963.48416	60000.00000
1.195154E+08	9.609276E+11	0.00012438	0.00212706	17.10197496	2961.10342	60000.00000
1.196815E+08	9.433025E+11	0.00012688	0.00215937	17.01966333	2965.80668	60000.00000
1.197796E+08	9.258330E+11	0.00012938	0.00218995	16.92716646	2969.28690	60000.00000
1.198769E+08	9.090194E+11	0.00013188	0.00222062	16.83880663	2971.95227	60000.00000
1.199734E+08	8.928251E+11	0.00013438	0.00225137	16.75436354	2973.79286	60000.00000
1.200690E+08	8.772161E+11	0.00013688	0.00228220	16.67363119	2974.79848	60000.00000
1.201629E+08	8.621554E+11	0.00013938	0.00231317	16.59676981	2973.56999	60000.00000
1.202546E+08	8.476097E+11	0.00014188	0.00234432	16.52387381	2968.96806	60000.00000
1.203459E+08	8.335645E+11	0.00014438	0.00237553	16.45391035	2964.35330	60000.00000
1.204366E+08	8.199941E+11	0.00014688	0.00240680	16.38673353	2959.72561	60000.00000
1.205269E+08	8.068747E+11	0.00014938	0.00243813	16.32220888	2955.08480	60000.00000
1.206167E+08	7.941838E+11	0.00015188	0.00246952	16.26020479	2958.54501	60000.00000
1.207059E+08	7.819008E+11	0.00015438	0.00250097	16.20060968	2962.66374	60000.00000
1.207947E+08	7.700059E+11	0.00015688	0.00253248	16.14330626	2966.20161	60000.00000
1.208829E+08	7.584808E+11	0.00015938	0.00256406	16.08819151	2969.15245	60000.00000
1.209584E+08	7.472335E+11	0.00016188	0.00259645	16.03983450	2971.59741	60000.00000
1.210677E+08	7.365338E+11	0.00016438	0.00263000	16.00000048	2973.47502	60000.00000
1.215203E+08	7.282117E+11	0.00016688	0.00267000	16.00000048	2974.82018	60000.00000
1.219534E+08	7.200203E+11	0.00016938	0.00271000	16.00000048	2972.30248	60000.00000
1.223693E+08	7.119670E+11	0.00017188	0.00275000	16.00000048	2966.64520	60000.00000
1.227775E+08	7.041006E+11	0.00017438	0.00279000	16.00000048	2960.98792	60000.00000
1.227775E+08	6.844741E+11	0.00017938	0.00286168	15.95363760	2951.48290	60000.00000
1.227775E+08	6.659121E+11	0.00018438	0.00292905	15.88637209	2953.82880	60000.00000
1.227775E+08	6.483302E+11	0.00018938	0.00299671	15.82421064	2961.93947	60000.00000
1.227775E+08	6.316529E+11	0.00019438	0.00306208	15.75348043	2967.72093	60000.00000
1.227775E+08	6.158121E+11	0.00019938	0.00312524	15.67518854	2971.57350	60000.00000
1.227775E+08	6.007464E+11	0.00020438	0.00318862	15.60183191	2974.00572	60000.00000
1.227775E+08	5.864002E+11	0.00020938	0.00325224	15.53309011	2974.98159	60000.00000
1.227775E+08	5.727232E+11	0.00021438	0.00331651	15.47059965	2969.79811	60000.00000
1.227775E+08	5.596697E+11	0.00021938	0.00338099	15.41190004	2963.60213	60000.00000
1.227775E+08	5.471979E+11	0.00022438	0.00344558	15.35636187	2957.37954	60000.00000
1.227775E+08	5.352699E+11	0.00022938	0.00351031	15.30378485	2951.13000	60000.00000
1.227775E+08	5.238508E+11	0.00023438	0.00357515	15.25399446	2944.85274	60000.00000
1.227775E+08	5.129088E+11	0.00023938	0.00364014	15.20683050	2938.54703	60000.00000
1.227775E+08	5.024145E+11	0.00024438	0.00370525	15.16213560	2938.26777	60000.00000
1.227775E+08	4.923410E+11	0.00024938	0.00377128	15.12290812	2946.12243	60000.00000

1.227775E+08 4.826635E+11 0.00025438 0.00383968 15.09456968 2953.72286 60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 122777.53750 in-kip

p-y Curve in Sand Computed Using Reese Criteria for Static Loading Conditions

Soil Layer Number	=	2
Depth below pile head	=	144.000 in
Depth below ground surface	=	138.000 in
Equivalent Depth (see note)	=	137.951 in
Pile Diameter	=	96.000 in
Angle of Friction	=	35.000 deg.
Avg. Eff. Unit Weight	=	0.06700 pci
k	=	90.000 pci
A (static)	=	1.8041
B (static)	=	1.3040
Pst	=	6821.322 lbs/in
Psd	=	47747.930 lbs/in
Ps	=	6821.322 lbs/in
Cbar	=	7700.7203
n	=	3.2595
m	=	1705.6066
yk	=	0.5021 in
pm	=	8895.162 lbs/in
ym	=	1.6000 in
pu	=	12306.375 lbs/in
yu	=	3.6000 in
p-multiplier	=	1.00000
y-multiplier	=	1.00000

This p-y curve is computed using the equivalent depth.

y, in	p, lbs/in	
0.0000	0.0000	
0.1333333	1655.4172	*
0.2666667	3310.8343	*
0.4000000	4966.2515	*
0.5333333	6350.0414	
0.6666667	6799.9832	
0.8000000	7191.1785	
0.9333333	7539.4359	
1.0667	7854.7136	
1.2000	8143.7339	
1.3333	8411.2712	
1.4667	8660.8518	
1.6000	8895.1620	
2.6000	10600.7686	
3.6000	12306.3751	
99.6000	12306.3751	
195.6000	12306.3751	

* p value(s) computed using p = k * Eff x * y

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

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

Specified shear force at pile head	=	57500.000 lbs
Specified moment at pile head	=	67248000.000 in-lbs
Specified axial load at pile head	=	55600.000 lbs

Output Verification:

Computed forces and moments are within specified convergence limits.

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in

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

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 57500.	M= 6.72E+07	55600.0000	5.9429	6.9469E+07	-730603.

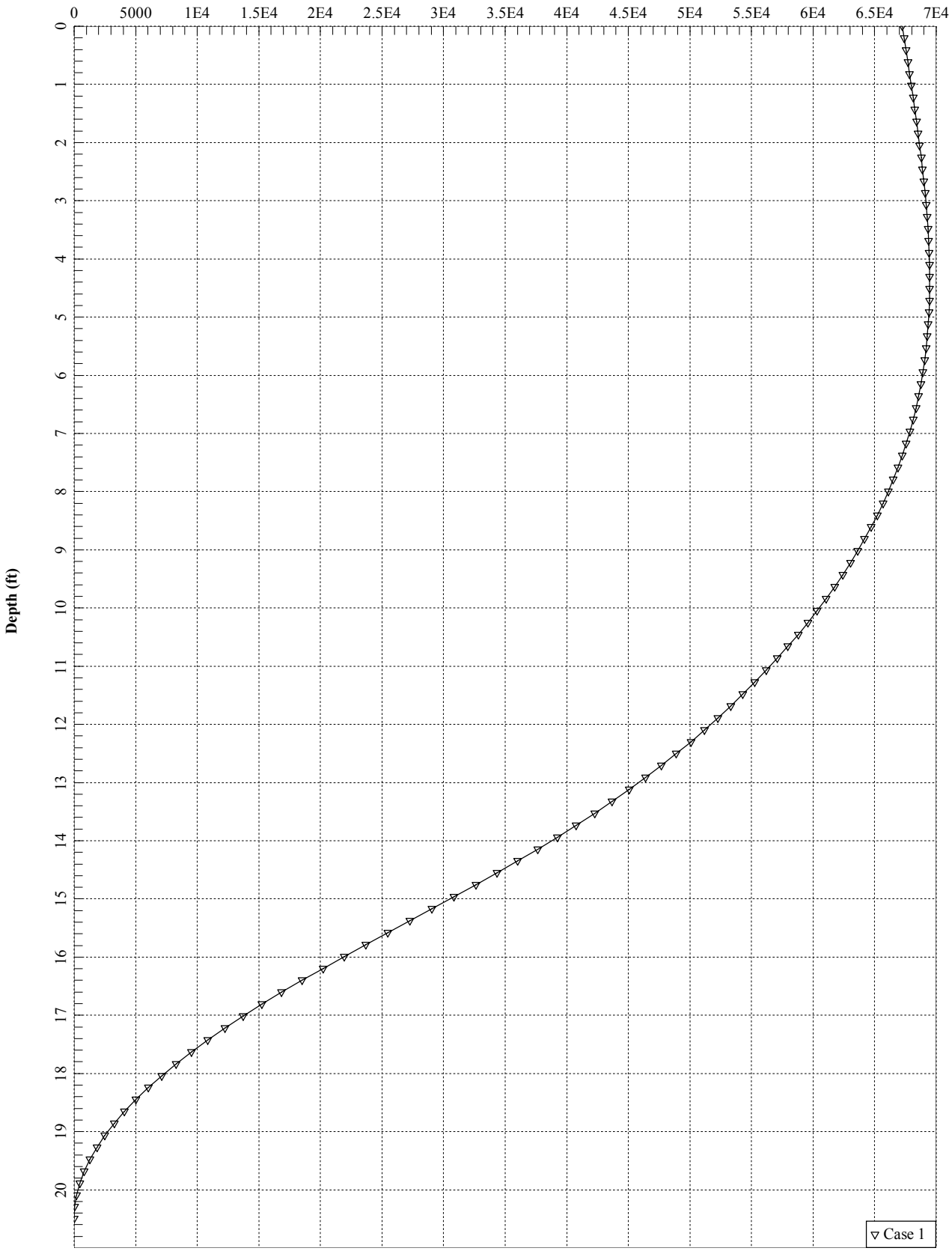
Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00232617	5750.00009	926957.10217	2471876.	3.984910E+08
0.00700246	17309.22475	2790419.	2471876.	3.984910E+08
0.01109864	27434.47215	4422709.	2471876.	3.984910E+08
0.01400493	34618.44950	5580838.	2471876.	3.984910E+08
0.01625922	40190.77525	6479152.	2471876.	3.984910E+08
0.01810111	44743.69690	7213128.	2471876.	3.984910E+08
0.01965840	48593.13730	7833696.	2471876.	3.984910E+08
0.02100739	51927.67425	8371257.	2471876.	3.984910E+08
0.02219728	54868.94429	8845419.	2471876.	3.984910E+08
0.02326168	57500.00000	9269571.	2471876.	3.984910E+08

Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00009278	36972.30030	6724800.	3.984910E+08	7.248055E+10
0.00027959	111300.52835	20243665.	3.980918E+08	7.240610E+10
0.00044373	176414.91596	32085450.	3.975693E+08	7.230789E+10
0.00056337	222621.15015	40487330.	3.951618E+08	7.186669E+10
0.00093246	259525.79876	47004335.	2.783237E+08	5.040894E+10
0.00119389	290648.24162	52329115.	2.434473E+08	4.383093E+10
0.00139260	317235.60448	56831153.	2.278002E+08	4.080926E+10
0.00155016	340271.20425	60730995.	2.195076E+08	3.917732E+10
0.00168794	360717.28753	64170900.	2.137026E+08	3.801727E+10
0.00180517	378955.80905	67248000.	2.099282E+08	3.725303E+10

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

The analysis ended normally.


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
6.5E4
7E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Case 1

LPILE Plus for Windows, Version 5.0 (5.0.47)

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

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\152670O.WI\003_Stony Hill\04_Structural\Backup Documentation\L-Pile\Manipulated Soil Diameter\
Name of input data file: Caisson Analysis - Manipulated Soil Diameter.lpd
Name of output file: Caisson Analysis - Manipulated Soil Diameter.lpo
Name of plot output file: Caisson Analysis - Manipulated Soil Diameter.lpp
Name of runtime file: Caisson Analysis - Manipulated Soil Diameter.lpr

Time and Date of Analysis

Date: February 2, 2016 Time: 11:19:28

Problem Title

15267.000 / CT5176 - Stony Hill / Structure # 10254

Program Options

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

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum bending moment, and shear force only
- Analysis includes effects of soil movement on pile response
- Additional p-y curves computed at specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 250
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment, and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 246.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 6 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.2000	3300000.
2	54.0000	96.00000000	4169220.	7238.2000	3300000.
3	54.0000	192.00000	66707523.	28952.9000	3300000.
4	150.0000	192.00000	66707523.	28952.9000	3300000.
5	150.0000	96.00000000	4169220.	7238.2000	3300000.
6	246.0000	96.00000000	4169220.	7238.2000	3300000.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

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

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 90.000 in
Distance from top of pile to bottom of layer = 144.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 144.000 in
Distance from top of pile to bottom of layer = 186.000 in
p-y subgrade modulus k for top of soil layer = 225.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 225.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 186.000 in
Distance from top of pile to bottom of layer = 246.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

(Depth of lowest layer extends 0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.06700
2	90.00	0.06700
3	90.00	0.06700
4	144.00	0.06700
5	144.00	0.07500
6	186.00	0.07500
7	186.00	0.03900
8	246.00	0.03900

Shear Strength of Soils

Shear strength parameters with depth defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	30.00	------	------
2	90.000	0.00000	30.00	------	------
3	90.000	0.00000	30.00	------	------
4	144.000	0.00000	30.00	------	------
5	144.000	0.00000	40.00	------	------
6	186.000	0.00000	40.00	------	------

7	186.000	0.00000	40.00	------	------
8	246.000	0.00000	40.00	------	------

Notes:

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

Lateral Soil Movements

Profile of soil movement with depth defined using 2 points

Point No.	Depth X in	Soil Movement in
1	0.000	0.000
2	0.000	0.000

Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 55600.000 lbs
Bending moment at pile head = 67248000.000 in-lbs
Axial load at pile head = 57500.000 lbs

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

Output of p-y Curves at Specified Depths

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p-y curves are generated and printed for verification at 1 depths.

Depth No.	Depth Below Pile Head in	Depth Below Ground Surface in
1	144.000	138.000

Depth of ground surface below top of pile = 6.00 in

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 1

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

Outside Diameter = 96.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 38
Area of Single Bar = 1.27000 in**2
Number of Rows of Reinforcing Bars = 19
Area of Steel = 48.260 in**2
Area of Shaft = 7238.229 in**2
Percentage of Steel Reinforcement = 0.667 percent
Cover Thickness (edge to bar center) = 4.000 in

Unfactored Axial Squash Load Capacity = 24285.76 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 57500.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
9681096.	1.548975E+13	6.250000E-07	0.00003234	51.73798227	107.31320	862.52706
19259256.	1.540740E+13	0.00000125	0.00006245	49.96108675	205.36976	1660.64166
28735242.	1.532546E+13	0.00000188	0.00009261	49.39103937	301.85512	2459.96617
38106310.	1.524252E+13	0.00000250	0.00012272	49.08925009	396.49718	3258.07516
38106310.	1.219402E+13	0.00000313	0.00007870	25.18281698	253.55467	6041.68788
38106310.	1.016168E+13	0.00000375	0.00009261	24.69488382	297.00840	7303.08818
38106310.	8.710014E+12	0.00000438	0.00010653	24.35033083	340.16803	8563.98471
38106310.	7.621262E+12	0.00000500	0.00012048	24.09541941	383.03266	9824.37325
38106310.	6.774455E+12	0.00000563	0.00013476	23.95682573	426.60262	11075.02800
38106310.	6.097010E+12	0.00000625	0.00014870	23.79129839	468.73689	12335.58850
38106310.	5.542736E+12	0.00000688	0.00016265	23.65864420	510.57904	13595.59528
38106310.	5.080841E+12	0.00000750	0.00017663	23.55066347	552.12802	14855.04429
38106310.	4.690007E+12	0.00000813	0.00019063	23.46168280	593.38281	16113.93072
38106310.	4.355007E+12	0.00000875	0.00020464	23.38764238	634.34220	17372.25161
38106310.	4.064673E+12	0.00000938	0.00021868	23.32557249	675.00515	18630.00198
38106310.	3.810631E+12	0.00001000	0.00023273	23.27324438	715.37059	19887.17726
38106310.	3.586476E+12	0.00001063	0.00024681	23.22895002	755.43728	21143.77404
38106310.	3.387228E+12	0.00001125	0.00026090	23.19136763	795.20422	22399.78671
38106310.	3.208952E+12	0.00001188	0.00027502	23.15945005	834.67024	23655.21092
38106310.	3.048505E+12	0.00001250	0.00028915	23.13235617	873.83403	24910.04355
38418993.	2.927161E+12	0.00001313	0.00030331	23.10941362	912.69459	26164.27824
40153586.	2.920261E+12	0.00001375	0.00031749	23.09006739	951.25071	27417.91056
41886125.	2.913817E+12	0.00001438	0.00033169	23.07385683	989.50107	28670.93700
43616603.	2.907774E+12	0.00001500	0.00034591	23.06040430	1027.44458	29923.35133
45345006.	2.902080E+12	0.00001563	0.00036015	23.04938936	1065.08001	31175.14877
47071319.	2.896697E+12	0.00001625	0.00037441	23.04054022	1102.40607	32426.32488
48795525.	2.891587E+12	0.00001688	0.00038869	23.03362513	1139.42144	33676.87530
50517617.	2.886721E+12	0.00001750	0.00040300	23.02844954	1176.12496	34926.79359
52237578.	2.882073E+12	0.00001813	0.00041733	23.02484179	1212.51528	36176.07540
53955395.	2.877621E+12	0.00001875	0.00043167	23.02265596	1248.59115	37424.71481
55671045.	2.873344E+12	0.00001938	0.00044605	23.02176046	1284.35109	38672.70847
57384531.	2.869227E+12	0.00002000	0.00046044	23.02204943	1319.79405	39920.04759
59095832.	2.865252E+12	0.00002063	0.00047486	23.02342272	1354.91860	41166.72768
60804920.	2.861408E+12	0.00002125	0.00048930	23.02578878	1389.72311	42412.74619
62511801.	2.857682E+12	0.00002188	0.00050376	23.02907896	1424.20660	43658.09270
64216443.	2.854064E+12	0.00002250	0.00051825	23.03321886	1458.36734	44902.76549
65918838.	2.850544E+12	0.00002313	0.00053276	23.03815126	1492.20407	46146.75674
67618969.	2.847114E+12	0.00002375	0.00054729	23.04382181	1525.71534	47390.06079
69316820.	2.843767E+12	0.00002438	0.00056185	23.05018187	1558.89967	48632.67189
72705624.	2.837293E+12	0.00002563	0.00059104	23.06480455	1624.28178	51115.78858
76085108.	2.831074E+12	0.00002688	0.00062032	23.08171892	1688.33822	53596.05904
79455142.	2.825072E+12	0.00002813	0.00064971	23.10068464	1751.05679	56073.43008

82815583.	2.819254E+12	0.00002938	0.00067919	23.12150145	1812.42479	58547.84922
85985784.	2.807699E+12	0.00003063	0.00070825	23.12668848	1871.33072	60000.00000
88409965.	2.773646E+12	0.00003188	0.00073521	23.06527376	1924.44437	60000.00000
90455386.	2.730729E+12	0.00003313	0.00076107	22.97570372	1974.10625	60000.00000
92203777.	2.682292E+12	0.00003438	0.00078604	22.86654711	2020.83803	60000.00000
93851300.	2.634422E+12	0.00003563	0.00081075	22.75781679	2065.96810	60000.00000
95223257.	2.582326E+12	0.00003688	0.00083454	22.63170004	2108.32946	60000.00000
96515940.	2.531566E+12	0.00003813	0.00085812	22.50814962	2149.29044	60000.00000
97830631.	2.484587E+12	0.00003938	0.00088200	22.40000010	2189.77996	60000.00000
98830399.	2.432748E+12	0.00004063	0.00090714	22.32959890	2231.40144	60000.00000
99805628.	2.383418E+12	0.00004188	0.00092921	22.19006681	2266.80198	60000.00000
1.007778E+08	2.336876E+12	0.00004313	0.00095133	22.05971575	2301.41542	60000.00000
1.016814E+08	2.291413E+12	0.00004438	0.00097316	21.93044901	2334.72341	60000.00000
1.023992E+08	2.244366E+12	0.00004563	0.00099413	21.78924608	2365.85186	60000.00000
1.031144E+08	2.199774E+12	0.00004688	0.00101515	21.65644598	2396.26598	60000.00000
1.038271E+08	2.157445E+12	0.00004813	0.00103620	21.53140783	2425.96198	60000.00000
1.045371E+08	2.117208E+12	0.00004938	0.00105729	21.41354513	2454.93519	60000.00000
1.052244E+08	2.078506E+12	0.00005063	0.00107831	21.30001688	2483.01902	60000.00000
1.057342E+08	2.038250E+12	0.00005188	0.00109835	21.17310476	2509.00747	60000.00000
1.062419E+08	1.999847E+12	0.00005313	0.00111843	21.05286455	2534.33941	60000.00000
1.067474E+08	1.963171E+12	0.00005438	0.00113855	20.93883848	2559.01088	60000.00000
1.072508E+08	1.928104E+12	0.00005563	0.00115870	20.83061743	2583.01840	60000.00000
1.076987E+08	1.893603E+12	0.00005688	0.00118300	20.79999876	2611.25720	60000.00000
1.083242E+08	1.863642E+12	0.00005813	0.00120393	20.71275473	2634.57598	60000.00000
1.088110E+08	1.832606E+12	0.00005938	0.00122360	20.60794115	2655.71827	60000.00000
1.091850E+08	1.800990E+12	0.00006063	0.00124243	20.49368334	2675.28237	60000.00000
1.095196E+08	1.770014E+12	0.00006188	0.00126100	20.37976885	2693.95159	60000.00000
1.098526E+08	1.740239E+12	0.00006313	0.00127960	20.27089262	2712.05415	60000.00000
1.101839E+08	1.711594E+12	0.00006438	0.00129824	20.16676283	2729.58674	60000.00000
1.105135E+08	1.684016E+12	0.00006563	0.00131690	20.06711340	2746.54624	60000.00000
1.108415E+08	1.657444E+12	0.00006688	0.00133561	19.97169542	2762.92933	60000.00000
1.111679E+08	1.631822E+12	0.00006813	0.00135434	19.88028288	2778.73291	60000.00000
1.114925E+08	1.607099E+12	0.00006938	0.00137312	19.79265833	2793.95337	60000.00000
1.118154E+08	1.583227E+12	0.00007063	0.00139192	19.70863008	2808.58772	60000.00000
1.121366E+08	1.560161E+12	0.00007188	0.00141076	19.62801218	2822.63240	60000.00000
1.124275E+08	1.537470E+12	0.00007313	0.00142936	19.54674196	2835.87471	60000.00000
1.126424E+08	1.514519E+12	0.00007438	0.00144724	19.45866823	2848.01719	60000.00000
1.130678E+08	1.470801E+12	0.00007688	0.00148310	19.29234552	2870.69946	60000.00000
1.139714E+08	1.435860E+12	0.00007938	0.00152400	19.20000029	2894.00567	60000.00000
1.139962E+08	1.392320E+12	0.00008188	0.00156312	19.09153605	2913.50054	60000.00000
1.143839E+08	1.355661E+12	0.00008438	0.00159784	18.93736696	2928.46304	60000.00000
1.147663E+08	1.321051E+12	0.00008688	0.00163269	18.79354620	2941.38964	60000.00000
1.151434E+08	1.288317E+12	0.00008938	0.00166767	18.65922403	2952.25626	60000.00000
1.155150E+08	1.257306E+12	0.00009188	0.00170278	18.53365374	2961.03855	60000.00000
1.158008E+08	1.227029E+12	0.00009438	0.00173678	18.40301371	2967.50082	60000.00000
1.160269E+08	1.197697E+12	0.00009688	0.00177006	18.27159262	2971.89131	60000.00000
1.162485E+08	1.169796E+12	0.00009938	0.00180346	18.14799356	2974.38524	60000.00000
1.164636E+08	1.143201E+12	0.00010188	0.00183697	18.03165579	2973.61348	60000.00000
1.166686E+08	1.117783E+12	0.00010438	0.00187062	17.92207575	2966.72863	60000.00000
1.168712E+08	1.093532E+12	0.00010688	0.00190438	17.81879568	2965.03747	60000.00000
1.170717E+08	1.070370E+12	0.00010938	0.00193828	17.72140360	2969.77201	60000.00000
1.172698E+08	1.048222E+12	0.00011188	0.00197230	17.62952471	2973.00468	60000.00000
1.172698E+08	1.025310E+12	0.00011438	0.00201300	17.59999895	2974.89078	60000.00000
1.177530E+08	1.007513E+12	0.00011688	0.00205700	17.59999895	2969.03871	60000.00000
1.179384E+08	9.879660E+11	0.00011938	0.00209021	17.50957632	2963.11907	60000.00000
1.181143E+08	9.691430E+11	0.00012188	0.00212339	17.42265558	2962.53571	60000.00000
1.182888E+08	9.510659E+11	0.00012438	0.00215667	17.34008360	2967.13585	60000.00000
1.184335E+08	9.334661E+11	0.00012688	0.00218928	17.25539446	2970.59258	60000.00000
1.185267E+08	9.161484E+11	0.00012938	0.00222058	17.16390467	2972.94048	60000.00000
1.186189E+08	8.994799E+11	0.00013188	0.00225197	17.07658052	2974.41028	60000.00000
1.187101E+08	8.834243E+11	0.00013438	0.00228346	16.99319887	2974.99049	60000.00000
1.187983E+08	8.679330E+11	0.00013688	0.00231518	16.91454077	2970.95829	60000.00000
1.188856E+08	8.529909E+11	0.00013938	0.00234698	16.83935022	2966.21343	60000.00000
1.189723E+08	8.385714E+11	0.00014188	0.00237886	16.76726389	2961.45455	60000.00000
1.190584E+08	8.246473E+11	0.00014438	0.00241079	16.69812727	2956.68142	60000.00000
1.191440E+08	8.111932E+11	0.00014688	0.00244279	16.63179445	2958.86630	60000.00000
1.192290E+08	7.981855E+11	0.00014938	0.00247486	16.56813097	2963.07545	60000.00000
1.193133E+08	7.856022E+11	0.00015188	0.00250700	16.50701094	2966.66183	60000.00000
1.193971E+08	7.734225E+11	0.00015438	0.00253921	16.44831419	2969.61831	60000.00000
1.194802E+08	7.616270E+11	0.00015688	0.00257148	16.39192915	2971.93769	60000.00000
1.195628E+08	7.501977E+11	0.00015938	0.00260383	16.33775568	2973.61269	60000.00000
1.196446E+08	7.391175E+11	0.00016188	0.00263625	16.28569365	2974.63579	60000.00000
1.197259E+08	7.283703E+11	0.00016438	0.00266874	16.23565149	2974.99935	60000.00000
1.198045E+08	7.179294E+11	0.00016688	0.00270146	16.18851614	2971.11477	60000.00000
1.198827E+08	7.077943E+11	0.00016938	0.00273424	16.14308882	2967.02912	60000.00000
1.199606E+08	6.979524E+11	0.00017188	0.00276706	16.09924650	2962.93361	60000.00000
1.200330E+08	6.883611E+11	0.00017438	0.00280028	16.05897760	2958.75022	60000.00000
1.202352E+08	6.703005E+11	0.00017938	0.00287000	16.00000048	2949.67337	60000.00000
1.209327E+08	6.559064E+11	0.00018438	0.00295000	16.00000048	2959.41401	60000.00000
1.216385E+08	6.423158E+11	0.00018938	0.00303000	16.00000048	2968.36516	60000.00000
1.223544E+08	6.294758E+11	0.00019438	0.00311000	16.00000048	2973.55107	60000.00000
1.223544E+08	6.136896E+11	0.00019938	0.00317502	15.92488718	2974.91088	60000.00000
1.223544E+08	5.986758E+11	0.00020438	0.00324060	15.85615683	2970.64839	60000.00000
1.223544E+08	5.843791E+11	0.00020938	0.00330653	15.79236460	2964.13723	60000.00000
1.223544E+08	5.707492E+11	0.00021438	0.00337260	15.73224020	2957.59380	60000.00000
1.223544E+08	5.577407E+11	0.00021938	0.00343882	15.67555189	2951.01717	60000.00000
1.223544E+08	5.453119E+11	0.00022438	0.00350521	15.62208796	2944.40646	60000.00000
1.223544E+08	5.334250E+11	0.00022938	0.00357175	15.57165384	2937.76088	60000.00000

1.223544E+08	5.220453E+11	0.00023438	0.00363846	15.52407789	2945.84714	60000.00000
1.223544E+08	5.111409E+11	0.00023938	0.00370533	15.47919989	2953.04211	60000.00000
1.223544E+08	5.006828E+11	0.00024438	0.00377239	15.43687105	2959.26229	60000.00000
1.223544E+08	4.906441E+11	0.00024938	0.00383962	15.39696264	2964.48549	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 121373.86716 in-kip

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Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 2

**** WARNING ****

An unreasonable input value for concrete cover thickness has been specified.
The input value is either smaller than 0.8 inches or larger than 8 inches.
You should check your input for correctness.

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

Outside Diameter = 192.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 38
Area of Single Bar = 1.27000 in**2
Number of Rows of Reinforcing Bars = 19
Area of Steel = 48.260 in**2
Area of Shaft = 28952.918 in**2
Percentage of Steel Reinforcement = 0.167 percent
Cover Thickness (edge to bar center) = 52.000 in

Unfactored Axial Squash Load Capacity = 88886.96 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 57500.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
71107449.	2.275438E+14	3.125000E-07	0.00003070	98.23432875	101.83991	417.63667
1.413842E+08	2.262148E+14	6.250000E-07	0.00006081	97.29002237	199.96755	818.15779
2.108319E+08	2.248874E+14	9.375000E-07	0.00009091	96.97486353	296.38908	1218.66830
2.794505E+08	2.235604E+14	0.00000125	0.00012102	96.81698084	391.10452	1619.16782
2.794505E+08	1.788483E+14	0.00000156	0.00004998	31.98559713	159.31442	4887.59296
2.794505E+08	1.490402E+14	0.00000188	0.00005888	31.40292978	187.05471	5896.79409
2.794505E+08	1.277488E+14	0.00000219	0.00006779	30.99044752	214.68426	6905.75995
2.794505E+08	1.117802E+14	0.00000250	0.00007671	30.68435240	242.20285	7914.48898
2.794505E+08	9.936016E+13	0.00000281	0.00008564	30.44919634	269.61019	8922.98002
2.794505E+08	8.942415E+13	0.00000313	0.00009457	30.26370764	296.90600	9931.23216

2.794505E+08	8.129468E+13	0.00000344	0.00010352	30.11435938	324.09007	10939.24353
2.794505E+08	7.452012E+13	0.00000375	0.00011247	29.99211931	351.16202	11947.01382
2.794505E+08	6.878781E+13	0.00000406	0.00012143	29.89075041	378.12169	12954.54083
2.794505E+08	6.387439E+13	0.00000438	0.00013040	29.80578661	404.96876	13961.82376
2.794505E+08	5.961610E+13	0.00000469	0.00013938	29.73395491	431.70292	14968.86150
2.794505E+08	5.589009E+13	0.00000500	0.00014836	29.67280340	458.32391	15975.65257
2.794505E+08	5.260244E+13	0.00000531	0.00015736	29.62045813	484.83151	16982.19530
2.794505E+08	4.968008E+13	0.00000563	0.00016636	29.57545710	511.22537	17988.48876
2.794505E+08	4.706534E+13	0.00000594	0.00017537	29.53664732	537.50519	18994.53180
2.794505E+08	4.471207E+13	0.00000625	0.00018439	29.50310755	563.67070	20000.32309
2.794505E+08	4.258293E+13	0.00000656	0.00019342	29.47409678	589.72169	21005.86036
2.794505E+08	4.064734E+13	0.00000688	0.00020246	29.44899988	615.65777	22011.14311
2.794505E+08	3.888006E+13	0.00000719	0.00021151	29.42731333	641.47867	23016.16991
2.794505E+08	3.726006E+13	0.00000750	0.00022056	29.40861654	667.18407	24020.93950
2.794505E+08	3.576966E+13	0.00000781	0.00022963	29.39256048	692.77376	25025.44968
2.794505E+08	3.439390E+13	0.00000813	0.00023870	29.37884474	718.24739	26029.69944
2.794505E+08	3.312005E+13	0.00000844	0.00024779	29.36721468	743.60464	27033.68746
2.794505E+08	3.193720E+13	0.00000875	0.00025688	29.35745001	768.84515	28037.41292
2.794505E+08	3.083591E+13	0.00000906	0.00026598	29.34936762	793.96873	29040.87325
2.794505E+08	2.980805E+13	0.00000938	0.00027509	29.34280443	818.97504	30044.06704
2.794505E+08	2.884650E+13	0.00000969	0.00028421	29.33761454	843.86367	31046.99398
2.794505E+08	2.794505E+13	0.00001000	0.00029334	29.33368063	868.63447	32049.65075
2.794505E+08	2.709823E+13	0.00001031	0.00030247	29.33088827	893.28698	33052.03742
2.794505E+08	2.630122E+13	0.00001063	0.00031162	29.32914305	917.82090	34054.15206
2.794505E+08	2.554976E+13	0.00001094	0.00032078	29.32836199	942.23599	35055.99251
2.794505E+08	2.484004E+13	0.00001125	0.00032995	29.32847071	966.53193	36057.55683
2.794505E+08	2.416869E+13	0.00001156	0.00033912	29.32939482	990.70819	37058.84576
2.794505E+08	2.353267E+13	0.00001188	0.00034831	29.33108282	1014.76471	38059.85488
2.794505E+08	2.292927E+13	0.00001219	0.00035750	29.33347464	1038.70095	39060.58466
2.794505E+08	2.181077E+13	0.00001281	0.00037592	29.34019232	1086.21162	41061.19552
2.794505E+08	2.079631E+13	0.00001344	0.00039438	29.34921026	1133.23736	43060.66649
2.794505E+08	1.987203E+13	0.00001406	0.00041288	29.36025667	1179.77545	45058.98332
2.794505E+08	1.902641E+13	0.00001469	0.00043142	29.37310839	1225.82321	47056.13078
2.794505E+08	1.824983E+13	0.00001531	0.00045000	29.38757372	1271.37767	49052.09581
2.794505E+08	1.753415E+13	0.00001594	0.00046862	29.40349245	1316.43584	51046.86473
2.794505E+08	1.687248E+13	0.00001656	0.00048728	29.42073298	1360.99485	53040.42172
2.794505E+08	1.625894E+13	0.00001719	0.00050599	29.43918085	1405.05166	55032.75196
2.794505E+08	1.568845E+13	0.00001781	0.00052473	29.45874166	1448.60332	57023.83855
2.794505E+08	1.515664E+13	0.00001844	0.00054353	29.47932959	1491.64659	59013.66689
2.794505E+08	1.465970E+13	0.00001906	0.00056198	29.48102903	1533.28265	60000.00000
2.794505E+08	1.419431E+13	0.00001969	0.00057946	29.43273211	1572.03254	60000.00000
2.794505E+08	1.375756E+13	0.00002031	0.00059642	29.36230230	1609.07939	60000.00000
2.794505E+08	1.334689E+13	0.00002094	0.00061309	29.28197336	1644.95896	60000.00000
2.794505E+08	1.296002E+13	0.00002156	0.00062930	29.18492460	1679.32643	60000.00000
2.794505E+08	1.259495E+13	0.00002219	0.00064541	29.08870840	1713.01622	60000.00000
2.794505E+08	1.224988E+13	0.00002281	0.00066115	28.98175478	1745.46367	60000.00000
2.794505E+08	1.192322E+13	0.00002344	0.00067691	28.88155031	1777.54138	60000.00000
2.794505E+08	1.161353E+13	0.00002406	0.00069300	28.79999971	1809.88410	60000.00000
2.794505E+08	1.131951E+13	0.00002469	0.00071100	28.79999971	1845.79334	60000.00000
2.794505E+08	1.104002E+13	0.00002531	0.00072900	28.79999971	1881.14053	60000.00000
2.794505E+08	1.077399E+13	0.00002594	0.00074457	28.70648146	1910.99674	60000.00000
2.794505E+08	1.052049E+13	0.00002656	0.00075906	28.57634497	1938.25298	60000.00000
2.794505E+08	1.027864E+13	0.00002719	0.00077357	28.45301771	1965.20008	60000.00000
2.794505E+08	1.004766E+13	0.00002781	0.00078794	28.33037710	1991.52820	60000.00000
2.794505E+08	9.826829E+12	0.00002844	0.00080194	28.20011759	2016.79444	60000.00000
2.794505E+08	9.615500E+12	0.00002906	0.00081596	28.07615805	2041.77050	60000.00000
2.794505E+08	9.413068E+12	0.00002969	0.00083001	27.95810080	2066.45486	60000.00000
2.794505E+08	9.218984E+12	0.00003031	0.00084407	27.84558821	2090.84639	60000.00000
2.794505E+08	9.032742E+12	0.00003094	0.00085767	27.72270441	2114.06171	60000.00000
2.794505E+08	8.853876E+12	0.00003156	0.00087126	27.60419226	2136.93997	60000.00000
2.794505E+08	8.681956E+12	0.00003219	0.00088486	27.49086142	2159.54333	60000.00000
2.794505E+08	8.516585E+12	0.00003281	0.00089849	27.38241720	2181.87049	60000.00000
2.794505E+08	8.357397E+12	0.00003344	0.00091213	27.27858782	2203.92022	60000.00000
2.794505E+08	8.204050E+12	0.00003406	0.00092546	27.16947412	2225.13014	60000.00000
2.794505E+08	8.056229E+12	0.00003469	0.00093866	27.06040049	2245.81692	60000.00000
2.794505E+08	7.913641E+12	0.00003531	0.00095187	26.95566988	2266.24262	60000.00000
2.794505E+08	7.776013E+12	0.00003594	0.00096510	26.85506487	2286.40655	60000.00000
2.794505E+08	7.643089E+12	0.00003656	0.00097835	26.75837660	2306.30764	60000.00000
2.794505E+08	7.514634E+12	0.00003719	0.00099162	26.66540766	2325.94465	60000.00000
2.794505E+08	7.270256E+12	0.00003844	0.00101757	26.47340155	2363.44361	60000.00000
2.794505E+08	7.041271E+12	0.00003969	0.00104333	26.28862524	2399.53801	60000.00000
2.794505E+08	6.826271E+12	0.00004094	0.00106915	26.11672926	2434.62936	60000.00000
2.794505E+08	6.624011E+12	0.00004219	0.00109501	25.95586538	2468.66694	60000.00000
2.794505E+08	6.433392E+12	0.00004344	0.00112014	25.78749132	2500.60844	60000.00000
2.794505E+08	6.253437E+12	0.00004469	0.00114534	25.62992048	2531.59056	60000.00000
2.794505E+08	6.083275E+12	0.00004594	0.00117600	25.59999990	2568.43440	60000.00000
2.794505E+08	5.922129E+12	0.00004719	0.00120800	25.59999990	2605.28559	60000.00000
2.794505E+08	5.769300E+12	0.00004844	0.00123814	25.56154203	2638.25784	60000.00000
2.794505E+08	5.624160E+12	0.00004969	0.00126133	25.38516569	2662.07072	60000.00000
2.794505E+08	5.486144E+12	0.00005094	0.00128457	25.21861410	2685.07368	60000.00000
2.794505E+08	5.354739E+12	0.00005219	0.00130788	25.06119204	2707.25990	60000.00000
2.794505E+08	5.229482E+12	0.00005344	0.00133125	24.91227579	2728.62282	60000.00000
2.794505E+08	5.109951E+12	0.00005469	0.00135373	24.75383234	2748.25951	60000.00000
2.794505E+08	4.995762E+12	0.00005594	0.00137625	24.60343122	2767.12917	60000.00000
2.794505E+08	4.886565E+12	0.00005719	0.00139884	24.46058607	2785.22739	60000.00000
2.794505E+08	4.782040E+12	0.00005844	0.00142148	24.32481909	2802.54775	60000.00000
2.794505E+08	4.681892E+12	0.00005969	0.00144386	24.19030809	2818.83340	60000.00000
2.794505E+08	4.585854E+12	0.00006094	0.00146571	24.05265284	2833.92069	60000.00000

2.794505E+08	4.493676E+12	0.00006219	0.00148761	23.92137480	2848.27853	60000.00000
2.794505E+08	4.405130E+12	0.00006344	0.00150957	23.79610491	2861.90116	60000.00000
2.794505E+08	4.320007E+12	0.00006469	0.00153152	23.67567587	2874.74933	60000.00000
2.794505E+08	4.238111E+12	0.00006594	0.00155271	23.54825449	2886.37616	60000.00000
2.794505E+08	4.159263E+12	0.00006719	0.00157396	23.42631197	2897.31383	60000.00000
2.796011E+08	4.085496E+12	0.00006844	0.00159525	23.30955362	2907.55696	60000.00000
2.799628E+08	4.017404E+12	0.00006969	0.00161599	23.18906736	2916.81408	60000.00000
2.802787E+08	3.951065E+12	0.00007094	0.00163653	23.06996584	2925.29893	60000.00000
2.804801E+08	3.885438E+12	0.00007219	0.00165637	22.94536543	2932.83458	60000.00000
2.806572E+08	3.821715E+12	0.00007344	0.00167614	22.82401514	2939.72409	60000.00000
2.808270E+08	3.760026E+12	0.00007469	0.00169595	22.70732260	2946.01440	60000.00000
2.809892E+08	3.700270E+12	0.00007594	0.00171581	22.59505892	2951.70092	60000.00000
2.811440E+08	3.642351E+12	0.00007719	0.00173572	22.48701525	2956.77913	60000.00000
2.816981E+08	3.591370E+12	0.00007844	0.00175700	22.40000010	2961.55123	60000.00000
2.842568E+08	3.567144E+12	0.00007969	0.00178500	22.40000010	2966.84054	60000.00000
2.867549E+08	3.542918E+12	0.00008094	0.00181300	22.40000010	2970.81514	60000.00000
2.891925E+08	3.518692E+12	0.00008219	0.00184100	22.40000010	2973.47502	60000.00000
2.915695E+08	3.494466E+12	0.00008344	0.00186900	22.40000010	2974.82017	60000.00000
2.938591E+08	3.469923E+12	0.00008469	0.00189700	22.40000010	2972.30250	60000.00000
2.938591E+08	3.419451E+12	0.00008594	0.00192256	22.37165308	2967.17528	60000.00000
2.938591E+08	3.370427E+12	0.00008719	0.00194012	22.25223684	2963.79115	60000.00000
2.938591E+08	3.276478E+12	0.00008969	0.00197535	22.02478266	2956.99571	60000.00000
2.938591E+08	3.187624E+12	0.00009219	0.00201075	21.81150198	2950.16343	60000.00000
2.938591E+08	3.103462E+12	0.00009469	0.00204632	21.61129618	2950.94447	60000.00000
2.938591E+08	3.023631E+12	0.00009719	0.00208207	21.42319536	2957.66014	60000.00000
2.938591E+08	2.947803E+12	0.00009969	0.00211799	21.24632406	2963.31723	60000.00000
2.938591E+08	2.875685E+12	0.00010219	0.00215410	21.07988691	2967.89124	60000.00000
2.938591E+08	2.807012E+12	0.00010469	0.00219040	20.92318010	2971.35715	60000.00000
2.938591E+08	2.741543E+12	0.00010719	0.00222688	20.77555704	2973.68877	60000.00000
2.938591E+08	2.679057E+12	0.00010969	0.00226356	20.63643694	2974.85906	60000.00000
2.938591E+08	2.619357E+12	0.00011219	0.00230067	20.50736761	2972.15665	60000.00000
2.938591E+08	2.562259E+12	0.00011469	0.00233813	20.38695002	2966.61730	60000.00000
2.938591E+08	2.507598E+12	0.00011719	0.00237569	20.27257204	2961.05495	60000.00000
2.938591E+08	2.455220E+12	0.00011969	0.00241336	20.16386461	2955.46937	60000.00000
2.938591E+08	2.404985E+12	0.00012219	0.00245114	20.06049299	2949.86019	60000.00000
2.938591E+08	2.356765E+12	0.00012469	0.00248903	19.96215105	2944.22702	60000.00000
2.938591E+08	2.310440E+12	0.00012719	0.00252703	19.86855555	2938.56948	60000.00000
2.938591E+08	2.265902E+12	0.00012969	0.00256515	19.77944326	2932.88725	60000.00000
2.938591E+08	2.223048E+12	0.00013219	0.00260338	19.69457960	2934.83862	60000.00000
2.938591E+08	2.181785E+12	0.00013469	0.00264173	19.61373568	2941.76307	60000.00000
2.938591E+08	2.142025E+12	0.00013719	0.00268019	19.53671408	2948.07171	60000.00000
2.938591E+08	2.103689E+12	0.00013969	0.00271878	19.46332026	2953.75202	60000.00000
2.938591E+08	2.066701E+12	0.00014219	0.00275750	19.39337969	2958.79140	60000.00000
2.938591E+08	2.030992E+12	0.00014469	0.00279634	19.32673216	2963.17689	60000.00000
2.938591E+08	1.996495E+12	0.00014719	0.00283531	19.26322603	2966.89498	60000.00000
2.938591E+08	1.963151E+12	0.00014969	0.00287441	19.20272112	2969.93174	60000.00000
2.938591E+08	1.930902E+12	0.00015219	0.00292200	19.20000029	2973.06561	60000.00000
2.938591E+08	1.899695E+12	0.00015469	0.00297000	19.20000029	2974.73206	60000.00000
2.938591E+08	1.869481E+12	0.00015719	0.00301800	19.20000029	2972.52008	60000.00000
2.938591E+08	1.840214E+12	0.00015969	0.00306600	19.20000029	2966.42762	60000.00000
2.938591E+08	1.811848E+12	0.00016219	0.00311400	19.20000029	2960.33517	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 293859.10247 in-kip

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Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 3

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

Outside Diameter = 96.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 38
Area of Single Bar = 1.27000 in**2
Number of Rows of Reinforcing Bars = 19
Area of Steel = 48.260 in**2
Area of Shaft = 7238.229 in**2
Percentage of Steel Reinforcement = 0.667 percent
Cover Thickness (edge to bar center) = 4.000 in

Unfactored Axial Squash Load Capacity = 24285.76 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 57500.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
9681096.	1.548975E+13	6.250000E-07	0.00003234	51.73798227	107.31320	862.52706
19259256.	1.540740E+13	0.00000125	0.00006245	49.96108675	205.36976	1660.64166
28735242.	1.532546E+13	0.00000188	0.00009261	49.39103937	301.85512	2459.96617
38106310.	1.524252E+13	0.00000250	0.00012272	49.08925009	396.49718	3258.07516
38106310.	1.219402E+13	0.00000313	0.00007870	25.18281698	253.55467	6041.68788
38106310.	1.016168E+13	0.00000375	0.00009261	24.69488382	297.00840	7303.08818
38106310.	8.710014E+12	0.00000438	0.00010653	24.35033083	340.16803	8563.98471
38106310.	7.621262E+12	0.00000500	0.00012048	24.09541941	383.03266	9824.37325
38106310.	6.774455E+12	0.00000563	0.00013476	23.95682573	426.60262	11075.02800
38106310.	6.097010E+12	0.00000625	0.00014870	23.79129839	468.73689	12335.58850
38106310.	5.542736E+12	0.00000688	0.00016265	23.65864420	510.57904	13595.59528
38106310.	5.080841E+12	0.00000750	0.00017663	23.55066347	552.12802	14855.04429
38106310.	4.690007E+12	0.00000813	0.00019063	23.46168280	593.38281	16113.93072
38106310.	4.355007E+12	0.00000875	0.00020464	23.38764238	634.34220	17372.25161
38106310.	4.064673E+12	0.00000938	0.00021868	23.32557249	675.00515	18630.00198
38106310.	3.810631E+12	0.00001000	0.00023273	23.27324438	715.37059	19887.17726
38106310.	3.586476E+12	0.00001063	0.00024681	23.22895002	755.43728	21143.77404
38106310.	3.387228E+12	0.00001125	0.00026090	23.19136763	795.20422	22399.78671
38106310.	3.208952E+12	0.00001188	0.00027502	23.15945005	834.67024	23655.21092
38106310.	3.048505E+12	0.00001250	0.00028915	23.13235617	873.83403	24910.04355
38418993.	2.927161E+12	0.00001313	0.00030331	23.10941362	912.69459	26164.27824
40153586.	2.920261E+12	0.00001375	0.00031749	23.09006739	951.25071	27417.91056
41886125.	2.913817E+12	0.00001438	0.00033169	23.07385683	989.50107	28670.93700
43616603.	2.907774E+12	0.00001500	0.00034591	23.06040430	1027.44458	29923.35133
45345006.	2.902080E+12	0.00001563	0.00036015	23.04938936	1065.08001	31175.14877
47071319.	2.896697E+12	0.00001625	0.00037441	23.04054022	1102.40607	32426.32488
48795525.	2.891587E+12	0.00001688	0.00038869	23.03362513	1139.42144	33676.87530
50517617.	2.886721E+12	0.00001750	0.00040300	23.02844954	1176.12496	34926.79359
52237578.	2.882073E+12	0.00001813	0.00041733	23.02484179	1212.51528	36176.07540
53955395.	2.877621E+12	0.00001875	0.00043167	23.02265596	1248.59115	37424.71481
55671045.	2.873344E+12	0.00001938	0.00044605	23.02176046	1284.35109	38672.70847
57384531.	2.869227E+12	0.00002000	0.00046044	23.02204943	1319.79405	39920.04759
59095832.	2.865252E+12	0.00002063	0.00047486	23.02342272	1354.91860	41166.72768
60804920.	2.861408E+12	0.00002125	0.00048930	23.02578878	1389.72311	42412.74619
62511801.	2.857682E+12	0.00002188	0.00050376	23.02907896	1424.20660	43658.09270
64216443.	2.854064E+12	0.00002250	0.00051825	23.03321886	1458.36734	44902.76549
65918838.	2.850544E+12	0.00002313	0.00053276	23.03815126	1492.20407	46146.75674
67618969.	2.847114E+12	0.00002375	0.00054729	23.04382181	1525.71534	47390.06079
69316820.	2.843767E+12	0.00002438	0.00056185	23.05018187	1558.89967	48632.67189
72705624.	2.837293E+12	0.00002563	0.00059104	23.06480455	1624.28178	51115.78858
76085108.	2.831074E+12	0.00002688	0.00062032	23.08171892	1688.33822	53596.05904
79455142.	2.825072E+12	0.00002813	0.00064971	23.10068464	1751.05679	56073.43008
82815583.	2.819254E+12	0.00002938	0.00067919	23.12150145	1812.42479	58547.84922
85985784.	2.807699E+12	0.00003063	0.00070825	23.12668848	1871.33072	60000.00000
88409965.	2.773646E+12	0.00003188	0.00073521	23.06527376	1924.44437	60000.00000
90455386.	2.730729E+12	0.00003313	0.00076107	22.97570372	1974.10625	60000.00000
92203777.	2.682292E+12	0.00003438	0.00078604	22.86654711	2020.83803	60000.00000
93851300.	2.634422E+12	0.00003563	0.00081075	22.75781679	2065.96810	60000.00000
95223257.	2.582326E+12	0.00003688	0.00083454	22.63170004	2108.32946	60000.00000
96515940.	2.531566E+12	0.00003813	0.00085812	22.50814962	2149.29044	60000.00000
97830631.	2.484587E+12	0.00003938	0.00088200	22.40000010	2189.77996	60000.00000
98830399.	2.432748E+12	0.00004063	0.00090714	22.32959890	2231.40144	60000.00000
99805628.	2.383418E+12	0.00004188	0.00092921	22.19006681	2266.80198	60000.00000
1.007778E+08	2.336876E+12	0.00004313	0.00095133	22.05971575	2301.41542	60000.00000
1.016814E+08	2.291413E+12	0.00004438	0.00097316	21.93044901	2334.72341	60000.00000
1.023992E+08	2.244366E+12	0.00004563	0.00099413	21.78924608	2365.85186	60000.00000
1.031144E+08	2.199774E+12	0.00004688	0.00101515	21.65644598	2396.26598	60000.00000

1.038271E+08	2.157445E+12	0.00004813	0.00103620	21.53140783	2425.96198	60000.00000
1.045371E+08	2.117208E+12	0.00004938	0.00105729	21.41354513	2454.93519	60000.00000
1.052244E+08	2.078506E+12	0.00005063	0.00107831	21.30001688	2483.01902	60000.00000
1.057342E+08	2.038250E+12	0.00005188	0.00109835	21.17310476	2509.00747	60000.00000
1.062419E+08	1.999847E+12	0.00005313	0.00111843	21.05286455	2534.33941	60000.00000
1.067474E+08	1.963171E+12	0.00005438	0.00113855	20.93883848	2559.01088	60000.00000
1.072508E+08	1.928104E+12	0.00005563	0.00115870	20.83061743	2583.01840	60000.00000
1.076987E+08	1.893603E+12	0.00005688	0.00118300	20.79999876	2611.25720	60000.00000
1.083242E+08	1.863642E+12	0.00005813	0.00120393	20.71275473	2634.57598	60000.00000
1.088110E+08	1.832606E+12	0.00005938	0.00122360	20.60794115	2655.71827	60000.00000
1.091850E+08	1.800990E+12	0.00006063	0.00124243	20.49368334	2675.28237	60000.00000
1.095196E+08	1.770014E+12	0.00006188	0.00126100	20.37976885	2693.95159	60000.00000
1.098526E+08	1.740239E+12	0.00006313	0.00127960	20.27089262	2712.05415	60000.00000
1.101839E+08	1.711594E+12	0.00006438	0.00129824	20.16676283	2729.58674	60000.00000
1.105135E+08	1.684016E+12	0.00006563	0.00131690	20.06711340	2746.54624	60000.00000
1.108415E+08	1.657444E+12	0.00006688	0.00133561	19.97169542	2762.92933	60000.00000
1.111679E+08	1.631822E+12	0.00006813	0.00135434	19.88028288	2778.73291	60000.00000
1.114925E+08	1.607099E+12	0.00006938	0.00137312	19.79265833	2793.95337	60000.00000
1.118154E+08	1.583227E+12	0.00007063	0.00139192	19.70863008	2808.58772	60000.00000
1.121366E+08	1.560161E+12	0.00007188	0.00141076	19.62801218	2822.63240	60000.00000
1.124275E+08	1.537470E+12	0.00007313	0.00142936	19.54674196	2835.87471	60000.00000
1.126424E+08	1.514519E+12	0.00007438	0.00144724	19.45866823	2848.01719	60000.00000
1.130678E+08	1.470801E+12	0.00007688	0.00148310	19.29234552	2870.69946	60000.00000
1.139714E+08	1.435860E+12	0.00007938	0.00152400	19.20000029	2894.00567	60000.00000
1.139962E+08	1.392320E+12	0.00008188	0.00156312	19.09153605	2913.50054	60000.00000
1.143839E+08	1.355661E+12	0.00008438	0.00159784	18.93736696	2928.46304	60000.00000
1.147663E+08	1.321051E+12	0.00008688	0.00163269	18.79354620	2941.38964	60000.00000
1.151434E+08	1.288317E+12	0.00008938	0.00166767	18.65922403	2952.25626	60000.00000
1.155150E+08	1.257306E+12	0.00009188	0.00170278	18.53365374	2961.03855	60000.00000
1.158008E+08	1.227029E+12	0.00009438	0.00173678	18.40301371	2967.50082	60000.00000
1.160269E+08	1.197697E+12	0.00009688	0.00177006	18.27159262	2971.89131	60000.00000
1.162485E+08	1.169796E+12	0.00009938	0.00180346	18.14799356	2974.38524	60000.00000
1.164636E+08	1.143201E+12	0.00010188	0.00183697	18.03165579	2973.61348	60000.00000
1.166686E+08	1.117783E+12	0.00010438	0.00187062	17.92207575	2966.72863	60000.00000
1.168712E+08	1.093532E+12	0.00010688	0.00190438	17.81879568	2965.03747	60000.00000
1.170717E+08	1.070370E+12	0.00010938	0.00193828	17.72140360	2969.77201	60000.00000
1.172698E+08	1.048222E+12	0.00011188	0.00197230	17.62952471	2973.00468	60000.00000
1.172698E+08	1.025310E+12	0.00011438	0.00201300	17.59999895	2974.89078	60000.00000
1.177530E+08	1.007513E+12	0.00011688	0.00205700	17.59999895	2969.03871	60000.00000
1.179384E+08	9.879660E+11	0.00011938	0.00209021	17.50957632	2963.11907	60000.00000
1.181143E+08	9.691430E+11	0.00012188	0.00212339	17.42265558	2962.53571	60000.00000
1.182888E+08	9.510659E+11	0.00012438	0.00215667	17.34008360	2967.13585	60000.00000
1.184335E+08	9.334661E+11	0.00012688	0.00218928	17.25539446	2970.59258	60000.00000
1.185267E+08	9.161484E+11	0.00012938	0.00222058	17.16390467	2972.94048	60000.00000
1.186189E+08	8.994799E+11	0.00013188	0.00225197	17.07658052	2974.41028	60000.00000
1.187101E+08	8.834243E+11	0.00013438	0.00228346	16.99319887	2974.99049	60000.00000
1.187983E+08	8.679330E+11	0.00013688	0.00231518	16.91454077	2970.95829	60000.00000
1.188856E+08	8.529909E+11	0.00013938	0.00234698	16.83935022	2966.21343	60000.00000
1.189723E+08	8.385714E+11	0.00014188	0.00237886	16.76726389	2961.45455	60000.00000
1.190584E+08	8.246473E+11	0.00014438	0.00241079	16.69812727	2956.68142	60000.00000
1.191440E+08	8.111932E+11	0.00014688	0.00244279	16.63179445	2958.86630	60000.00000
1.192290E+08	7.981855E+11	0.00014938	0.00247486	16.56813097	2963.07545	60000.00000
1.193133E+08	7.856022E+11	0.00015188	0.00250700	16.50701094	2966.66183	60000.00000
1.193971E+08	7.734225E+11	0.00015438	0.00253921	16.44831419	2969.61831	60000.00000
1.194802E+08	7.616270E+11	0.00015688	0.00257148	16.39192915	2971.93769	60000.00000
1.195628E+08	7.501977E+11	0.00015938	0.00260383	16.33775568	2973.61269	60000.00000
1.196446E+08	7.391175E+11	0.00016188	0.00263625	16.28569365	2974.63579	60000.00000
1.197259E+08	7.283703E+11	0.00016438	0.00266874	16.23565149	2974.99935	60000.00000
1.198045E+08	7.179294E+11	0.00016688	0.00270146	16.18851614	2971.11477	60000.00000
1.198827E+08	7.077943E+11	0.00016938	0.00273424	16.14308882	2967.02912	60000.00000
1.199606E+08	6.979524E+11	0.00017188	0.00276706	16.09924650	2962.93361	60000.00000
1.200330E+08	6.883611E+11	0.00017438	0.00280028	16.05897760	2958.75022	60000.00000
1.202352E+08	6.703005E+11	0.00017938	0.00287000	16.00000048	2949.67337	60000.00000
1.209327E+08	6.559064E+11	0.00018438	0.00295000	16.00000048	2959.41401	60000.00000
1.216385E+08	6.423158E+11	0.00018938	0.00303000	16.00000048	2968.36516	60000.00000
1.223544E+08	6.294758E+11	0.00019438	0.00311000	16.00000048	2973.55107	60000.00000
1.223544E+08	6.136896E+11	0.00019938	0.00317502	15.92488718	2974.91088	60000.00000
1.223544E+08	5.986758E+11	0.00020438	0.00324060	15.85615683	2970.64839	60000.00000
1.223544E+08	5.843791E+11	0.00020938	0.00330653	15.79236460	2964.13723	60000.00000
1.223544E+08	5.707492E+11	0.00021438	0.00337260	15.73224020	2957.59380	60000.00000
1.223544E+08	5.577407E+11	0.00021938	0.00343882	15.67555189	2951.01717	60000.00000
1.223544E+08	5.453119E+11	0.00022438	0.00350521	15.62208796	2944.40646	60000.00000
1.223544E+08	5.334250E+11	0.00022938	0.00357175	15.57165384	2937.76088	60000.00000
1.223544E+08	5.220453E+11	0.00023438	0.00363846	15.52407789	2945.84714	60000.00000
1.223544E+08	5.111409E+11	0.00023938	0.00370533	15.47919989	2953.04211	60000.00000
1.223544E+08	5.006828E+11	0.00024438	0.00377239	15.43687105	2959.26229	60000.00000
1.223544E+08	4.906441E+11	0.00024938	0.00383962	15.39696264	2964.48549	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 121373.86716 in-kip

p-y Curve in Sand Computed Using Reese Criteria for Static Loading Conditions

Soil Layer Number = 2
Depth below pile head = 144.000 in
Depth below ground surface = 138.000 in

Equivalent Depth (see note)	=	132.062 in
Pile Diameter	=	192.000 in
Angle of Friction	=	35.000 deg.
Avg. Eff. Unit Weight	=	0.06700 pci
k	=	90.000 pci
A (static)	=	2.3410
B (static)	=	1.7211
Pst	=	9279.623 lbs/in
Psd	=	95495.860 lbs/in
Ps	=	9279.623 lbs/in
Cbar	=	11422.4203
n	=	3.4702
m	=	1438.2221
yk	=	0.9457 in
pm	=	15970.819 lbs/in
ym	=	3.2000 in
pu	=	21723.708 lbs/in
yu	=	7.2000 in
p-multiplier	=	1.00000
y-multiplier	=	1.00000

This p-y curve is computed using the equivalent depth.

y, in	p, lbs/in	
0.0000	0.0000	
0.2666667	3169.4825	*
0.5333333	6338.9649	*
0.8000000	9508.4474	*
1.0667	11636.8430	
1.3333	12409.7128	
1.6000	13079.1461	
1.8667	13673.2403	
2.1333	14209.6370	
2.4000	14700.2123	
2.6667	15153.3810	
2.9333	15575.3449	
3.2000	15970.8195	
5.2000	18847.2638	
7.2000	21723.7080	
199.2000	21723.7080	
391.2000	21723.7080	

* p value(s) computed using p = k * Eff x * y

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

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

Specified shear force at pile head	=	55600.000 lbs
Specified moment at pile head	=	67248000.000 in-lbs
Specified axial load at pile head	=	57500.000 lbs

Output Verification:

Computed forces and moments are within specified convergence limits.

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

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

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 55600.	M= 6.72E+07	57500.0000	2.7780	6.9479E+07	-675756.

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

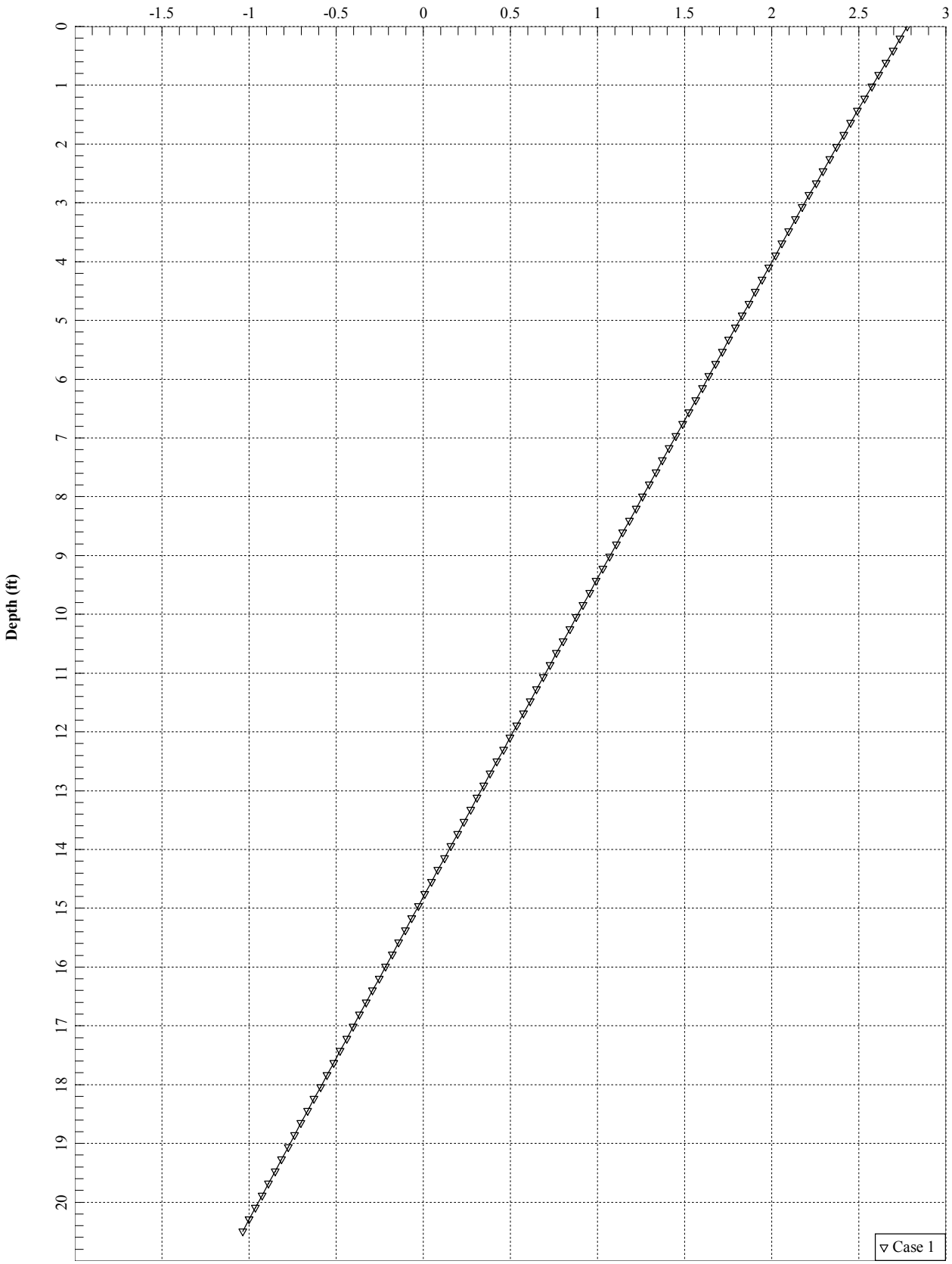
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00204328	5560.00008	925298.16947	2721110.	4.528486E+08
0.00615090	16737.26776	2785425.	2721110.	4.528486E+08
0.00974894	26527.94176	4414794.	2721110.	4.528486E+08
0.01230179	33474.53552	5570850.	2721110.	4.528486E+08
0.01428194	38862.73224	6467557.	2721110.	4.528486E+08
0.01589984	43265.20952	7200219.	2721110.	4.528486E+08
0.01726775	46987.45102	7819677.	2721110.	4.528486E+08
0.01845269	50211.80328	8356275.	2721110.	4.528486E+08
0.01949788	53055.88352	8829588.	2721110.	4.528486E+08
0.02043284	55600.00000	9252982.	2721110.	4.528486E+08

Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00007991	36188.35929	6724800.	4.528486E+08	8.415183E+10
0.00024081	108939.61030	20243665.	4.523852E+08	8.406433E+10
0.00038215	172668.56592	32085450.	4.518393E+08	8.396125E+10
0.00048605	217890.23310	40487330.	4.482864E+08	8.329845E+10
0.00086555	254199.43652	47004335.	2.936847E+08	5.430561E+10
0.00112320	284871.58232	52329115.	2.536251E+08	4.658933E+10
0.00129551	310629.26126	56831153.	2.397739E+08	4.386781E+10
0.00139399	332096.14227	60730995.	2.382338E+08	4.356622E+10
0.00147535	350926.77619	64170900.	2.378608E+08	4.349551E+10
0.00154805	367769.09462	67248000.	2.375689E+08	4.344039E+10

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

The analysis ended normally.

Summary of Warning Messages


Lateral Deflection (in)
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
▽ Case 1

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV5176	DATE:	6/19/2014	RF DESIGN ENG:	Renz C. Bautista	RF PERF ENG:	
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	508-271-8396	RF PERF PHONE:	
REVISION:	Preliminary	RF MANAGER:	CAMERON SYME	RF DESIGN EMAIL:	cb6561@att.com	RF PERF EMAIL:	
INITIATIVE / PROJECT:	LTE - WCS RRUS-32 Bronze Standard.					TRIDENT:	
						GSM FREQUENCY:	1900
						UMTS FREQUENCY:	850,1900
						LTE FREQUENCY:	700,1900,WCS
						I-PLAN JOB # 1:	NER-RCTB-15-03251
						I-PLAN JOB # 2:	
						I-PLAN JOB # 3:	
						I-PLAN JOB # 4:	

RFDS PROGRAM TYPE:	2016 LTE Next Carrier
RFDS TECHNOLOGY:	LTE 3C
State:	Preliminary
Status:	In Progress
RFDS ID:	673118
Version:	2.00
Created By:	cb6561
Date Created:	6/28/2015
Date Updated:	10/27/2015
Updated By:	nm069q
Product Group || Sub Group #1:	LTE Next Carrier || LTE 3C
Product Group || Sub Group #2:	
Product Group || Sub Group #3:	
Product Group || Sub Group #4:	

Section 2 - LOCATION INFORMATION

USID:	60443	FA LOCATION CODE:	10071269	LOCATION NAME:	BETHEL STONY HILL-AWS	ORACLE PRJT # 1:	2051A03JLA
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PRJT # 2:	
ADDRESS:	7 STONY HILL ROAD	CITY:	BETHEL	STATE:	CT	ORACLE PRJT # 3:	
ZIP CODE:	06801	COUNTY:	FAIRFIELD	MSA / RSA:		ORACLE PRJT # 4:	
LATITUDE (D-M-S):	41d 24m 56.85084s	LONGITUDE (D-M-S):	-73d -24m -6.11604s	LAT (DEC. DEG.):	41.4157919	SEARCH RING NAME:	
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	84 EAST DANBURY FOLLOW TO EXIT 8 MAKE LEFT AT THE BOTTOM OF THE RAMP FOLLOW ON STONY HILL RD SITE IS ON THE RIGHT ABOUT MILE POWER LINE MONO POLE DRIVEWAY BEFORE THE BEST WESTERN HOTEL ON THE RIGHT. DEMARC IS IN A GRAY BOX ON SITE SECURITY NO ISSUES ACCESS 24 7					SEARCH RING ID:	
						BTA:	
						LONG (DEC. DEG.):	-73.4016989
						BORDER CELL WITH CONTOUR COORD:	
						AM STUDY REQ'D (Y/N):	No
						FREQ COORD:	

PACE JOB #1:	MRCTB016785
PACE JOB #2:	
PACE JOB #3:	
PACE JOB #4:	
CASPR INITIATIVE #1:	
CASPR INITIATIVE #2:	
CASPR INITIATIVE #3:	
CASPR INITIATIVE #4:	

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:		CGSA CALL SIGNS:	
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:			
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:					

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	UTILITY	MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	141.00	FCC ASR NUMBER:	NR	MARKET LOCATION 850 MHz Band:	
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	141.00			MARKET LOCATION 1900 MHz Band:	
LIGHTING TYPE:	NOT REQUIRED					MARKET LOCATION AWS Band:	
						MARKET LOCATION WCS Band:	
						MARKET LOCATION Future Band:	

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911	CT-CONNECTICUT STATE POLICE-A TROOP	1315		INTRADO_MIAMI				
SECTOR B	BETHEL POLICE DEPARTMENT	1299		INTRADO_MIAMI				
SECTOR C	CT-CONNECTICUT STATE POLICE-A TROOP	1315		INTRADO_MIAMI				
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR_A E-911	CT-CONNECTICUT STATE POLICE-A TROOP	1315		INTRADO_MIAMI				
SECTOR B	BETHEL POLICE DEPARTMENT	1299		INTRADO_MIAMI				
SECTOR C	CT-CONNECTICUT STATE POLICE-A TROOP	1315		INTRADO_MIAMI				
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	43690		210670	257794	278028	423158			360126			
CTS COMMON ID:	321P5176		5176	CTU4176	CTU5176	CTV4176			CTL05176			
BTA/TID:	321P		321U	321V	321W	321W			321L			
4-DIGIT SITE ID:	5176		5176	4176	5176	04176			5176			
COW OR TOY?:	No		No	No	No	No			No			
CELL SITE TYPE:	SECTORIZED		SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED			SECTORIZED			
SITE TYPE:	BTS-CONVENTIONAL		MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL			MACRO-CONVENTIONAL			
BTS LOCATION ID:	GROUND		INTERNAL	INTERNAL	INTERNAL	INTERNAL			INTERNAL			
ORIGINATING CO:	CINGULAR		CINGULAR	CINGULAR	CINGULAR	CINGULAR			CINGULAR			
CELLULAR NETWORK:	GOLD		GOLD	GOLD	GOLD	GOLD			GOLD			
OPS DISTRICT:	CT SOUTH-WEST		CT SOUTH-WEST	CT-South	CT-South	CT-South			CT-South			
RF DISTRICT:	NPO Triage		Bridgeport	Bridgeport	NPO Triage	NPO Triage			NPO Triage			
OPS ZONE:	NE_CT_S_FRFD_NE_CS		NE_CT_S_FRFD_NE_CS	NE_CT_S_FRFD_NE_CS	NE_CT_S_FRFD_NW_CS	NE_CT_S_FRFD_NW_CS			NE_CT_S_FRFD_NW_CS			
RF ZONE:	Hotseat		BBP06	BBP06	Hotseat	Hotseat			Hotseat			
BASE STATION TYPE:	BASE		BASE	OVERLAY	OVERLAY	BASE			BASE			
EQUIPMENT NAME:	GSM-STONY HILL		BETHEL STONY HILL-AWS	STONY HILL	BETHEL STONY HILL-AWS	STONY HILL			BETHEL STONY HILL-AWS			
DISASTER PRIORITY:	0		0	0	0	0			3			

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	43690		210670	257794	278028	423158			360126	RFDS_11353157		
CTS COMMON ID:	321P5176		5176	CTU4176	CTU5176	CTV4176			CTL05176	CTL04176R		
BTA/TID:	321P		321U	321V	321W	321W			321L	321L		
4-DIGIT SITE ID:	5176		5176	4176	5176	04176			5176	4176		
COW OR TOY?:	No		No	No	No	No			No	No		
CELL SITE TYPE:	SECTORIZED		SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED			SECTORIZED	SECTORIZED		
SITE TYPE:	BTS-CONVENTIONAL		MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL			MACRO-CONVENTIONAL	MACRO-CONVENTIONAL		
BTS LOCATION ID:	GROUND		INTERNAL	INTERNAL	INTERNAL	INTERNAL			INTERNAL	INTERNAL		
ORIGINATING CO:	CINGULAR		CINGULAR	CINGULAR	CINGULAR	CINGULAR			CINGULAR	CINGULAR		
CELLULAR NETWORK:	GOLD		GOLD	GOLD	GOLD	GOLD			GOLD	GOLD		
OPS DISTRICT:				CT-South	CT-South	CT-South			CT-South	CT-South		
RF DISTRICT:	NPO Triage		Bridgeport	Bridgeport	NPO Triage	NPO Triage			NPO Triage	NPO Triage		
OPS ZONE:				NE_CT_S_FRFD_NE_CS	NE_CT_S_FRFD_NW_CS	NE_CT_S_FRFD_NW_CS			NE_CT_S_FRFD_NW_CS	NE_CT_S_FRFD_NW_CS		
RF ZONE:	Hotseat		BBP06	BBP06	Hotseat	Hotseat			Hotseat	Hotseat		
BASE STATION TYPE:	BASE		BASE	OVERLAY	OVERLAY	BASE			BASE	BASE		
EQUIPMENT NAME:	GSM-STONY HILL		BETHEL STONY HILL-AWS	STONY HILL	BETHEL STONY HILL-AWS	STONY HILL			BETHEL STONY HILL-AWS	BETHEL STONY HILL-AWS		
DISASTER PRIORITY:	0		0	0	0	0			3	3		

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC:												
BSC/RNC/MME POOL ID:	BRPTCTBSC06		BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03			FF01			
LAC:	05015		05995	05995	05995	05995						
RAC:												
EQUIPMENT VENDOR:	NOKIA		ERICSSON	ERICSSON	ERICSSON	ERICSSON			ERICSSON			
EQUIPMENT TYPE:	ULTRASITE		3206 INDOOR	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS			6601 INDOOR MU			
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:									CT			
AGPS:	Yes		Yes	Yes	Yes	Yes			Yes			
NODE B NUMBER:									5176			
PARENT NAME:	BRPTCTBSC06		BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03			FF01			

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC												
BSC/RNC/MME POOL ID	BRPTCTBSC06		BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03			FF01	FF01		
LAC	05015		05995	05995	05995	05995						
RAC												
EQUIPMENT VENDOR	NOKIA		ERICSSON	ERICSSON	ERICSSON	ERICSSON			ERICSSON	ERICSSON		
EQUIPMENT TYPE	ULTRASITE		3206 INDOOR	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS			6601 INDOOR MU	6601 INDOOR MU		
LOCATION												
CABINET LOCATION												
MARKET STATE CODE									CT	CT		
AGPS	Yes		Yes	Yes	Yes	Yes			Yes	Yes		
NODE B NUMBER									5176	4176		
PARENT NAME	BRIDGEPORT BSC 06		BRIDGEPORT RNC03	BRIDGEPORT RNC03	BRIDGEPORT RNC03	BRIDGEPORT RNC03						

Section 8- INDIVIDUAL CARRIER INFORMATION - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID		43690			210670	257794	423158	278028									360126		360126					
CELL ID/BCF		NYNYCT0176			CTV5176	CTV4176	CTV4176	CTV5176									CTL05176		CTL05176					
CTS COMMON ID		321P5176			5176	CTU4176	CTV4176	CTU5176									CTL05176		CTL05176					
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID																								
CELL ID/BCF																								
CTS COMMON ID																								

Section 8 - INDIVIDUAL CARRIER INFORMATION - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID		43690			210670	257794	423158	278028									360126		360126		360126			
CELL ID/BCF		NYNYCT0176			CTV5176	CTV4176	CTV4176	CTV5176									CTL05176		CTL05176		CTL05176			
CTS COMMON ID		321P5176			5176	CTU4176	CTV4176	CTU5176									CTL05176		CTL05176		CTL05176			
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID																	RFDS_1135315_7		RFDS_1135349_1		RFDS_1135349_2			
CELL ID/BCF																	CTL04176R		CTL04176R		CTL04176R			
CTS COMMON ID																	CTL04176R		CTL04176R		CTL04176R			

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)		60443.1900.25G.1			60443.850.3G.1	60443.1900.3G.1	60443.850.3G.4	60443.1900.3G.3									60443.700.4G.1		60443.1900.4G.1					
SECTOR A SOFT_SECTOR_ID		321P51761			CTV51761	CTU41767	CTV4176A	CTU51767									CTL05176_7A_1		CTL05176_9A_1					
SECTOR B		321P51762			CTV51762	CTU41768	CTV4176B	CTU51768									CTL05176_7B_1		CTL05176_9B_1					
SECTOR C		321P51763			CTV51763	CTU41769	CTV4176C	CTU51769									CTL05176_7C_1		CTL05176_9C_1					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A SOFT_SECTOR_ID																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)		60443.1900.25G.1			60443.850.3G.1	60443.1900.3G.1	60443.850.3G.4	60443.1900.3G.3									60443.700.4G.1		60443.1900.4G.1		60443.WCS.4G.111			
SECTOR A SOFT_SECTOR_ID		321P51761			CTV51761	CTU41767	CTV4176A	CTU51767									CTL05176_7A_1		CTL05176_9A_1		CTL05176_3A_1			
SECTOR B		321P51762			CTV51762	CTU41768	CTV4176B	CTU51768									CTL05176_7B_1		CTL05176_9B_1		CTL05176_3B_1			
SECTOR C		321P51763			CTV51763	CTU41769	CTV4176C	CTU51769																
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																	60443.700.4G.222		60443.1900.4G.222		60443.WCS.4G.222			
SECTOR A SOFT_SECTOR_ID																								
SECTOR B																								
SECTOR C																	CTL04176_7C_1		CTL04176_9C_1		CTL04176_3C_1			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)		60443.1900.25G.1			60443.850.3G.1	60443.1900.3G.1	60443.850.3G.4	60443.1900.3G.3									60443.700.4G.1		60443.1900.4G.1					
SECTOR A CELL NUMBER																	15		8					
SECTOR B																	16		9					
SECTOR C																	17		10					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A CELL NUMBER																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)		60443.1900.25G.1			60443.850.3G.1	60443.1900.3G.1	60443.850.3G.4	60443.1900.3G.3									60443.700.4G.1		60443.1900.4G.1		60443.WCS.4G.111			
SECTOR A CELL NUMBER																	15		8		149			
SECTOR B																	16		9		150			
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																	60443.700.4G.222		60443.1900.4G.222		60443.WCS.4G.222			
SECTOR A CELL NUMBER																								
SECTOR B																								
SECTOR C																	17		10		151			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC		51761			51761	41767	41761	51767																
SECTOR B		51762			51762	41768	41762	51768																
SECTOR C		51763			51763	41769	41763	51769																
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC		51761			51761	41767	41761	51767																
SECTOR B		51762			51762	41768	41762	51768																
SECTOR C		51763			51763	41769	41763	51769																
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 11 - CURRENT RADIO COUNTS existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
SECTOR A RADIO_COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
SECTOR A RADIO_COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 12 - CURRENT T1 COUNTS existing

	GSM 1ST Cabinet	GSM 2ND Cabinet	UMTS 1ST Cabinet	UMTS 2ND Cabinet	UMTS 3RD Cabinet	UMTS 4TH Cabinet	UMTS 5TH Cabinet	UMTS 6TH Cabinet	LTE 1ST Cabinet	LTE 2ND Cabinet	LTE 3RD Cabinet	LTE 4TH Cabinet
# T1s												
LINK PROFILE												
RF COMBINING												
FIBER or ETHERNET?												
Tx Board Model												
Tx Board Q'TY												
RAX/ECU Board Model												
RAX/ECU Board Q'TY												
BBU Board Model												
BBU Board Q'TY												
RRU - location												
FIBER JUMPER												
DC CABLE												
DC/Fiber Dem. Box												
Bundled Fiber Cable												
Bundled DC Cable												

Section 13 - NEW/PROPOSED RADIO COUNTS

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
SECTOR A RADIO_COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
SECTOR A RADIO_COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 14 - NEW/PROPOSED T1 COUNTS

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	UMTS 3rd Cabinet	UMTS 4th Cabinet	UMTS 5TH Cabinet	UMTS 6TH Cabinet	LTE 1ST Cabinet	LTE 2ND Cabinet	LTE 3RD Cabinet	LTE 4TH Cabinet
# T1s												
LINK PROFILE												
RF COMBINING												
FIBER or ETHERNET?												
Tx Board Model												
Tx Board Q'TY												
RAX/ECU Board Model												
RAX/ECU Board Q'TY												
BBU Board Model												
BBU Board Q'TY												
RRU - location												
FIBER JUMPER												
DC CABLE												
DC/Fiber Dem. Box												
Bundled Fiber Cable												
Bundled DC Cable												

Section 15A - CURRENT SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770.00.850.10		P65-16-XLH-RR				
ANTENNA VENDOR	POWERWAVE		Powerwave				
ANTENNA SIZE (H x W x D)			72X12X6				
ANTENNA WEIGHT			64				
AZIMUTH	30		30				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145				
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0				
FEEDER AMOUNT	2		2				
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020		Internal				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 CM1007-DBPXBC-003				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006		LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (DB - 850 Bypass)		1 DTMABP7819V G12A				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860		Andrew / ABT-DFDM-ADBH				
PDU FOR TMAS (QTY/MODEL)	1 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-12				
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HAT/CHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.A.850.3G.1	60443.A.850.3G.1	CTV51761			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 2	60443.A.850.3G.4	60443.A.850.3G.2	CTV4176A			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.A.1900.3G.1	60443.A.1900.3G.1	CTU51767			UMTS 1900	7770.00.1900.06	15.5		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.A.1900.3G.3	60443.A.1900.3G.2	CTU41767			UMTS 1900	7770.00.1900.06	15.5		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.A.1900.2G.1	60443.A.1900.2G.1	321P51761			GSM 1900	7770.00.1900.06	16.79		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	12.58	299.22
ANTENNA POSITION 3	PORT 1	60443.A.700.4G.1	60443.A.700.4G.1	CTL05176_7A_1			LTE 700	RR_716MHz_10DT	14.8		10	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 5	60443.A.1900.4G.1	60443.A.1900.4G.1	CTL05176_9A_1			LTE 1900	RR_1930MHz_04DT	14.8		4	Bottom	LDF7-50A_700 MHz	170.04				0				

Section 15B - CURRENT SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770.00.850.08		P65-16-XLH-RR				
ANTENNA VENDOR	POWERWAVE		Powerwave				
ANTENNA SIZE (H x W x D)			72X12X6				
ANTENNA WEIGHT			64				
AZIMUTH	150		150				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145				
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0				
FEEDER AMOUNT	2		2				
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020		Internal				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 CM1007-DBPXBC-003				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006		LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave LGP 21401		1 DTMABP7819V G12A				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860		Andrew / ABT-DFDM-ADBH				
PDU FOR TMAS (QTY/MODEL)	1 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-12				
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HAT/CHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.B.850.3G.1	60443.B.850.3G.1	CTV51762			UMTS 850	7770.00.850.08	13.5		8	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 2	60443.B.850.3G.4	60443.B.850.3G.2	CTV4176B			UMTS 850	7770.00.850.08	13.5		8	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.B.1900.3G.1	60443.B.1900.3G.1	CTU51768			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.B.1900.3G.3	60443.B.1900.3G.2	CTU41768			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.B.1900.2G.1	60443.B.1900.2G.1	321P51762			GSM 1900	7770.00.1900.04	16.79		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	11.22	266.68
ANTENNA POSITION 3	PORT 1	60443.B.700.4G.1	60443.B.700.4G.1	CTL05176_7B_1			LTE 700	RR_716MHz_03DT	14.8		3	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 5	60443.B.1900.4G.1	60443.B.1900.4G.1	CTL05176_9B_1			LTE 1900	RR_1930MHz_02DT	14.8		2	Bottom	LDF7-50A_700 MHz	170.04				0				

Section 15C - CURRENT SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770.00.850.10				P65-16-XLH-RR									
ANTENNA VENDOR	POWERWAVE				Powerwave									
ANTENNA SIZE (H x W x D)					72X12X6									
ANTENNA WEIGHT					64									
AZIMUTH	270				270									
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	145				145									
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0				0									
FEEDER AMOUNT	2				2									
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020				Internal								
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	CM1007-DBPXBC-003								
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10008				LTE RRH								
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	21401 (DB - 850 Bypass)			1	DTMABP7819V G12A								
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860				Andrew / ABT-DFDM-ADBH								
PDU FOR TMAS (QTY/MODEL)	1	(1900 AND 850 Bypass TMA)												
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)					1	RRUS-11								
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)					1	RRUS-12								
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.C.850.3G.1	60443.C.850.3G.1	CTV51763			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT2	60443.C.850.3G.4	60443.C.850.3G.2	CTV4176C			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.C.1900.3G.1	60443.C.1900.3G.1	CTU51769			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.C.1900.3G.3	60443.C.1900.3G.2	CTU41769			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.C.1900.2G.1	60443.C.1900.2G.1	321P51763			GSM 1900	7770.00.1900.04	16.79		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	17.78	422.66
ANTENNA POSITION 3	PORT 1	60443.C.700.4G.222	60443.C.700.4G.1	CTL05176_7C_1			LTE 700	RR_716MHz_08DT_	14.8		8	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 3	60443.C.1900.4G.222	60443.C.1900.4G.1	CTL05176_9C_1			LTE 1900	RR_1930MHz_07DT	14.8		7	Bottom	LDF7-50A_700 MHz	170.04				0				

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				QS66512-3			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72.0X12.0X9.6			
ANTENNA WEIGHT				105			
AZIMUTH				30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				2			
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)				4 BOFDM-DB Broadband			
DIPLEXER (QTY/MODEL)				2 CCI Pentaplexer - SPX-0726			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 TMA2117F00V1 1 (Twin PCS-			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard. Upgrade DUL to DUS 41						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 4	PORT 1	60443.A.WCS.4 G.111	60443.A.WCS.4 G.1	CTL05176_3A_ 1	CTL05176_3A_ 1		LTE WCS	QS66512-3	14.22	30		BOTTOM	Andrew 1-5/8 (B50)	170.04				0		No		

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				QS66512-3			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72.0X12.0X9.6			
ANTENNA WEIGHT				105			
AZIMUTH				150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				4			
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)				4 BOFDM-DB Broadband			
DIPLEXER (QTY/MODEL)				2 CCI Pentaplexer - SPX-0726			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 TMA2117F00V1 1 (Twin PCS-			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard. Upgrade DUL to DUS 41						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 4	PORT 1	60443.B.WCS.4 G.111	60443.B.WCS.4 G.1	CTL05176_3B_ 1	CTL05176_3B_ 1		LTE WCS	QS66512-3	14.22	150		BOTTOM	Andrew 1-5/8 (B50)	170.04				0		No		

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				QS66512-3			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72.0X12.0X9.6			
ANTENNA WEIGHT				105			
AZIMUTH				270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				4			
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)				4 BDFDM-DB Broadband			
DIPLEXER (QTY/MODEL)				2 CCI Pentaplexer - SPX-0726			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 TMA2117F00V1-1 (Twin PCS-			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard. Upgrade DUL to DUS 41						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 4	PORT 1	60443.C.WCS.4 G.222	60443.C.WCS.4 G.1	CTL05176_3C_ 1	CTL05176_3C_ 1		LTE WCS	QS66512-3	14.22	270		BOTTOM	Andrew 1-5/8 (B50)	170.04				0		No		

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770.00.850.10	P65-16-XLH-RR		QS66512-3			
ANTENNA VENDOR	POWERWAVE	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)		72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT		64		105			
AZIMUTH	30	30		30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Internal					
SURGE ARRESTOR (QTY/MODEL)				4 BDFDM-DB Broadband			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901	2 CM1007-DBPXBC-003		2 CCI Pentaplexer - SPX-0726			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006	LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (DB - 850 Bypass)	1 DTMABP7819V G12A		2 TMA2117F00V1 1 (Twin PCS-			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860	Andrew / ABT-DFDM-ADBH					
PDU FOR TMAS (QTY/MODEL)	1 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1 RRUS-12					
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard.						
Local Market Note 2	Upgrade DUL to DUS 41						
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HAT/CHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.A.850.3G.1	60443.A.850.3G.1	CTV51761			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 2	60443.A.850.3G.4	60443.A.850.3G.2	CTV4176A			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.A.1900.3G.1	60443.A.1900.3G.1	CTU51767			UMTS 1900	7770.00.1900.06	15.5		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.A.1900.3G.3	60443.A.1900.3G.2	CTU41767			UMTS 1900	7770.00.1900.06	15.5		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.A.1900.2SG.1	60443.A.1900.2SG.1	321PS1761			GSM 1900	7770.00.1900.06	16.79		6	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	12.58	299.22
ANTENNA POSITION 2	PORT 1	60443.A.700.4G.1	60443.A.700.4G.1	CTL05176_7A_1			LTE 700	RR_716MHz_10DT	14.8		10	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 3	60443.A.1900.4G.1	60443.A.1900.4G.1	CTL05176_9A_1			LTE 1900	RR_1930MHz_04DT	14.8		4	Bottom	LDF7-50A_700 MHz	170.04				0				
ANTENNA POSITION 4	PORT 5	60443.A.WCS.4G.111	60443.A.WCS.4G.1	CTL05176_3A_1	CTL05176_3A_1		LTE WCS	QS66512-3	14.22	30		BOTTOM	Andrew 1-5/8 (B50)	170.04				0		No		

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770.00.850.08	P65-16-XLH-RR		QS66512-3			
ANTENNA VENDOR	POWERWAVE	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)		72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT		64		105			
AZIMUTH	150	150		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Internal					
SURGE ARRESTOR (QTY/MODEL)				4 BDFDM-DB Broadband			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901	2 CM1007-DBPXBC-003		4 CCI Pentaplexer - SPX-0726			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006	LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave LGP 21401	1 DTMABP7819V G12A		2 TMA2117F00V1 1 (Twin PCS-			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860	Andrew / ABT-DFDM-ADBH					
PDU FOR TMAS (QTY/MODEL)	1 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1 RRUS-12					
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard.						
Local Market Note 2	Upgrade DUL to DUS 41						
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HAT/CHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.B.850.3G.1	60443.B.850.3G.1	CTV51762			UMTS 850	7770.00.850.08	13.5		8	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 2	60443.B.850.3G.4	60443.B.850.3G.2	CTV4176B			UMTS 850	7770.00.850.08	13.5		8	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.B.1900.3G.1	60443.B.1900.3G.1	CTU51768			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.B.1900.3G.3	60443.B.1900.3G.2	CTU41768			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.B.1900.2SG.1	60443.B.1900.2SG.1	321PS1762			GSM 1900	7770.00.1900.04	16.79		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	11.22	266.68
ANTENNA POSITION 2	PORT 1	60443.B.700.4G.1	60443.B.700.4G.1	CTL05176_7B_1			LTE 700	RR_716MHz_03DT	14.8		3	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 3	60443.B.1900.4G.1	60443.B.1900.4G.1	CTL05176_9B_1			LTE 1900	RR_1930MHz_03DT	14.8		2	Bottom	LDF7-50A_700 MHz	170.04				0				
ANTENNA POSITION 4	PORT 5	60443.B.WCS.4G.111	60443.B.WCS.4G.1	CTL05176_3B_1	CTL05176_3B_1		LTE WCS	QS66512-3	14.22	150		BOTTOM	Andrew 1-5/8 (B50)	170.04				0		No		

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770.00.850.10	P65-16-XLH-RR		QS66512-3			
ANTENNA VENDOR	POWERWAVE	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)		72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT		64		105			
AZIMUTH	270	270		270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal				
SURGE ARRESTOR (QTY/MODEL)				4	BDFDM-DB Broadband		
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901	2 CM1007-DBPXBC-003	4	CCI Pentaplexer - SPX-0726		
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006	LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	21401 (DB - 850 Bypass)	1 DTMABP7819V012A	2	TMA2117F00V1 1 (Twin PCS-		
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860	Andrew / ABT-DFDM-A08H				
PDU FOR TMAS (QTY/MODEL)	1	(1900 AND 850 Bypass TMA)					
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1	RRUS-12				
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add LTE 3C WCS with RRUS-32 RRH at the bottom as Bronze standard.						
Local Market Note 2	Upgrade DUL to DUS 41						
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	CABLE NUMBER	CABLE ID(cssng)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)
ANTENNA POSITION 1	PORT 1	60443.C.850.3G.1	60443.C.850.3G.1	CTV51763			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT2	60443.C.850.3G.4	60443.C.850.3G.2	CTV4176C			UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	170.04				0		No		
	PORT 3	60443.C.1900.3G.1	60443.C.1900.3G.1	CTU51769			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 4	60443.C.1900.3G.3	60443.C.1900.3G.2	CTU41769			UMTS 1900	7770.00.1900.04	15.5		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	No		
	PORT 7	60443.C.1900.2G.1	60443.C.1900.2G.1	321P51763			GSM 1900	7770.00.1900.04	16.79		4	None	Andrew 1-5/8 (1900)	170.04			CCI RxAIT 1900	1	CCI LLC 1900	Yes	17.78	422.66
ANTENNA POSITION 2	PORT 1	60443.C.700.4G.222	60443.C.700.4G.1	CTL05176_7C_1			LTE 700	RR_716MHz_08DT	14.8		8	Bottom	LDF7-50A_700 MHz	170.04				0				
	PORT 3	60443.C.1900.4G.222	60443.C.1900.4G.1	CTL05176_9C_1			LTE 1900	RR_1930MHz_07DT	14.8		7	Bottom	LDF7-50A_700 MHz	170.04				0				
ANTENNA POSITION 4	PORT 5	60443.C.WCS.4G.222	60443.C.WCS.4G.1	CTL05176_3C_1	CTL05176_3C_1		LTE WCS	QS66512-3	14.22	270		BOTTOM	Andrew 1-5/8 (850)	170.04				0		No		

Quintel®
New Dimensions in Wireless™

QS66512-3

6ft 65° XXX MultiServ™ 12-Port Antenna

2x698-787MHz / 2x824-894MHz / 2x1850-1990MHz / 2x1850-1990MHz / 2x1695-1780+2110-2400MHz / 2x1695-1780+2110-2400MHz

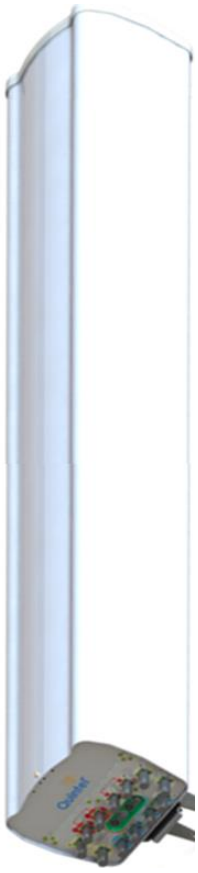
- Provides 12 antenna Ports in a slim-line form factor
- Optimized Azimuth patterns for Min Inter-Sector Interference
- Industry leading Minimal Wind-Load design

- 700, 850, PCS, AWS & WCS bands in one antenna
- AISG & 3GPP compliant internal remote electrical tilt (RET)
- AWS & PCS Cross band PIM >157dBc

The Quintel MultiServ™ Multiband 12 Port Antenna with patented QTilt™ technology uniquely delivers six independent services in a single slim-line antenna. This enables existing antenna network sites to be upgraded constraint free to add new services such as LTE for 700, 850, PCS, AWS and WCS bands with the replacement of one antenna. The QS66512-3 also provides 4x1695-1780+2110-2400MHz & 4x1850-1990MHz ports as two side-by-side (CLA-2X) arrays, each array having independent tilt to support independent service, or for connection to 2T4R/4T4R services.

Electrical Characteristics	2x Ports 1&2	2x Ports 3&4	4x Ports 5-8			4 Ports 9-12
Operating Frequency (MHz	698-787	824-894	1695-1780 and 2110-2400			1850-1990
	698-787	824-894	1695-1780	2110-2180	2300-2400	1850-1990
Azimuth beamwidth[1]	68°	67°	69°	63°	58°	69°
Elevation beamwidth[1]	12°	10°	6.5°	5.5°	4.5°	5.5°
Gain[1] (dBi)	13.0	13.5	16.0	16.5	17.0	16.0
Polarization	±45°	±45°		±45° ±45°		±45° ±45°
Electrical down-tilt range	2°-10°	2°-10°		2° – 7° 2° – 7°		2° – 7° 2° – 7°
Upper SLL (20° > mainbeam)[1]	-15dB	-15.5dB	-16dB	-16dB	-15dB	-16dB
Front to Back Ratio(180°±10°)[1]	≥26dB	≥30dB	≥27dB	≥28dB	≥28dB	≥27dB
Port to Port isolation[1]	≥28dB	≥30dB	≥28dB	≥30dB	≥30dB	≥30dB
Return loss (VSWR)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB (1.5)	14dB(1.5)
Squint[1]	<±3°	<±3°	<±3°	<±3°	<±4°	<±3°
Tracking[1]	<±2.5dB	<±3dB	<±3dB	<±3dB	<±3dB	<±4dB
X Polar Discrimination (at 0°)	>18dB	>17dB	>20dB	>20dB	>18dB	>20dB
Max Power handling (per any port)	500 watts	500 watts		250 watts		250 watts
Total Composite Power (all ports)				1750 watts		
PIM (3rd Order) (2x43dBm)	>150dBc	>150dBc		>150dBc		>150dBc
XBand PIM (3rd Order) (2x43dBm)				>157dBc		

[1] *Typical Performance across frequency and Downtilt.*



Mechanical Characteristics	
Dimensions	L 72"(1828mm) x W 12"(304mm) x D 9.6"(245mm)
Weight (excl mounting brackets)	112lbs (50.8kg)
No. of Connectors	12x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Flat Plate Area	2.96ft² (0.275m²)
Wind Load @160km/h (45m/s)	Front: 587N (132 lbs), Side: 382N (86 lbs)
Operating Temperature	-40°C to +65°C

Fully Integrated RET Characteristics	
AISG Standards	V1.1,V 2.0 and 3GPP
Factory Default	AISG 2.0
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
Device Type	SRET Type 1
AISG Data rate	9.6 kbps
RET Configuration	RET1 I/O RF Ports 1-4. RET 2 I/O RF Ports 5-12
No of connectors	RET1 1in/1out. RET2 1in/1out
Connector type	IEC 60130-9 (Ed 3.0)
MTBF	36,000 Operational moves

All specifications are subject to change without notice. Please contact your Quintel representative for complete information.

TMA2117F00V1-1

PCS / WCS Dual Band Twin TMA, with 700/850 bypass, AISG2.0

Designed to be deployed in co-located PCS & WCS systems with wideband antennas, the Kaelus TMA provides internal diplexing and gain in both bands while allowing 700/850 services to pass through to a separate antenna, thereby saving hardware costs.

PRODUCT FEATURES

- Improved base station sensitivity through gain in PCS and WCS bands
- Hardware and software configuration using AISG "Personality" upload
- High Linearity and low noise performance; Bypass provided for 700/850MHz services
- Fail safe bypass mode with lightning protection

TECHNICAL SPECIFICATIONS

Downlink Path, Band 1	PCS
Passband	1930 - 1990
Insertion Loss	0.5dB typ
Return Loss	18dB min
Max Average input power (W)	160
Max PEP Input Power (W)	2000
Intermodulation, 2 x 43dBm TX carriers (dBc)	-153dBc max
Uplink Path, Band 1	
Passband	1850 - 1910
Gain (dB)	3dB to 13dB in 1dB steps
Gain window	+/- 1dB max
Return Loss (Operating)	18dB min
Return Loss (Bypass)	12dB min
Noise Figure	1.4dB typ
Bypass Loss	2.5dB typ

Supply Current, alarm mode	320 +/- 30mA per port (programmable)

AISG MODE OF OPERATION (AUTO SELECTED ON VALID AISG 2.0 FRAMES)

AISG Version	2
AISG Supply Current	400mA @ 8.5V, 120mA @ 30V typical
AISG Connector	IEC60130-9, 8-pin female
AISG Connector Current rating	< 4A peak, 2A continuous, pin 6
Field firmware upgradable	Yes

ENVIRONMENTAL

Temperature range	-40ºC to +65ºC | -40º to +149ºF
Environmental sealing	IP67
Lightning protection	RF port: +/- 5kA max (8/20us), AISG port: +/- 2kA max (8/20us) IEC61312-1
MTBF	>1,000,000 hours
Compliance	EMC:EN301 489, Ingress ETSI EN 300 019 class 4.1, RoHS

MECHANICAL

Connectors	DIN 4.3-10 (F) x 8 long shank, AISG (F) x 1
Dimensions, H x D x W	216 x 300 x 107mm | 8.46 x 11.81 x 4.21in
Finish	Powder coated, light grey (RAL7035)
Weight	8 kg | 17.6lbs est
Mounting	Pole / wall bracket supplied with two metal clamps for 45-178 mm diameter poles

ELECTRICAL BLOCK DIAGRAM

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

February 23, 2016

Mr. Tim Burks
AT&T Wireless.
500 Enterprise Drive
Rocky Hill, CT 06067

RE: AT&T Antenna Site, CT-5176, Stony Hill Rd., Bethel CT, structure 10254.

Dear Mr. Burks:

Based on our reviews of the site drawings, the structural analysis provided by Centek Engineering and, and the foundation analyses performed by Centek Engineering, we have reviewed for acceptance this modification

Since there are no outstanding structural or site related issues to resolve at this time, please contact Mr. Green (860-665-6933) to complete the lease amendment issues.

Sincerely,

Robert Gray
Transmission Line Engineering

ref: 15267.003 - CT5176 - LTE3C CD - Rev 1.pdf
15267.003 - CT5176 Structural Analysis Rev1 16.02.05.pdf

EVERSOURCE ENERGY

107 Selden Street
Berlin, CT 06037
(860) 665-6926
michael.green@eversource.com

March 4, 2016

Mr. Tim Burks
Site Acquisition Manager- New England
SAI Communications, Consultant for
AT&T Mobility (a/k/a New Cingular Wireless
500 Enterprise Drive
Rocky Hill, CT 06067

Re: Site Permitting Authorization
7 Stony Hill Road, Bethel, CT
Telecommunications Site

Dear Mr. Burks:

Authorization is hereby given to New Cingular Wireless PCS, LLC (New Cingular), its employees and its duly authorized agents and independent contractors (hereinafter collectively referred to as "New Cingular"), to apply for any and all local municipal, state and federal licenses, permits and approvals, including but not limited to Connecticut Siting Council, building permits, zoning variances, zoning special exceptions, site plan and subdivision approvals, driveway, wetlands and terrain alteration permits, which are or may be necessary or required for New Cingular to construct, operate and maintain a wireless communications system (PCS System), and/or antenna site on the following property over which The Connecticut Light & Power Company (CL&P) has easement rights:

CT5176 - Stony Hill
CL&P Structure #10254, FA #10071269
7 Stony Hill Road
Bethel, Connecticut

The foregoing authorization is given subject to the following conditions:

1. This authorization shall be nonexclusive. Nothing herein shall prevent or restrict CL&P from authorizing any other person or entity to apply for any similar licenses, permits or approvals to construct, operate and maintain any other communication system or facility of any type on the property at any time.

2. This authorization shall not obligate CL&P to pay for or reimburse any costs or expenses or to provide any assistance of any kind in connection with any applications, or bind or obligate CL&P to agree or be responsible for any on-site or off-site improvements, development restrictions, impact fees or assessments, capital improvement charges, bonds or other security, or any other fee, assessment, charge or expense imposed or required as a condition of any license, permit or approval. New Cingular shall be solely and fully responsible for all fees, charges costs and expenses of any kind in connection with any applications. CL&P agrees to reasonably cooperate with New Cingular in signing such applications or other similar documents as may be required in order for New Cingular to apply for any license, permit or approval.

3. This authorization shall not be deemed or construed to grant or transfer to New Cingular any interest in the property, whatsoever, and shall not in any respect obligate or require CL&P to sell, lease or license the Property to New Cingular or otherwise allow New Cingular to use or occupy the property for any purpose, regardless of

whether any licenses, permits and approvals applied for by New Cingular for the property are granted. New Cingular understands and acknowledges that any and all applications filed by New Cingular for the property at New Cingular's sole risk and without any enforceable expectation that the property will be made available for New Cingular's use.

4. New Cingular shall be required to supply to CL&P, free of charge and contemporaneous with New Cingular's filing of same, a complete copy of any and all applications, plans, reports and other public filings made by New Cingular with any local, municipal, state or federal governmental or regulatory officer, agency board, bureau, commission or other person or body for any licenses, permits or approvals for the property, and to keep CL&P fully informed on a regular basis of the status of New Cingualr's applications.

5. This authorization shall automatically expire six (6) months after the date of this letter, unless extended in writing by mutual agreement of CL&P and New Cingular.

Very truly yours,

Michael J. Green, Senior Real Estate Analyst
Transmission & Distribution ROW & Survey Engineering

AGREED TO ON BEHALF OF New Cingular Wireless PCS, LLC

By: _____
Duly Authorized

Date: 3/8/2016