



February 14, 2017

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

Regarding: Notice of Exempt Modification – Swap of 3 Antennas and addition of 3 TMA's and associated lines

Property Address: Noroton Heights Railroad Station/Hallow Tree Road, Darien, CT (the "Property", AT&T Site # CT5011)

Applicant: AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 90 foot utility tower ("tower") at the above-referenced address, latitude 41.06901111, longitude -73.499025. AT&T's facility consists of three (3) wireless telecommunications antennas at 85 feet. The tower is controlled and owned by Eversource Energy. Assessor's information is attached hereto.

AT&T desires to modify its existing telecommunications facility by swapping three (3) antennas and adding (3) TMA's and associated lines. The centerline height of said antennas is and will remain at 85 feet.

Please accept this application as notification pursuant to R.C.S.A. § 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 the First Selectman of the Town of Darien and the Planning & Zoning Director of the Town of Darien. A copy of this letter is also being sent to Eversource, Energy, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas, TMA's and associated lines will be installed at 85 foot level of the 90 foot utility tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.



4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Centek Engineering January 25, 2017).

For the foregoing reasons AT&T respectfully requests that the proposed swap of 3 antennas and addition of 3 TMAs and associated lines be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Nicole Caplan  
Site Acquisition Specialist  
Empire Telecom

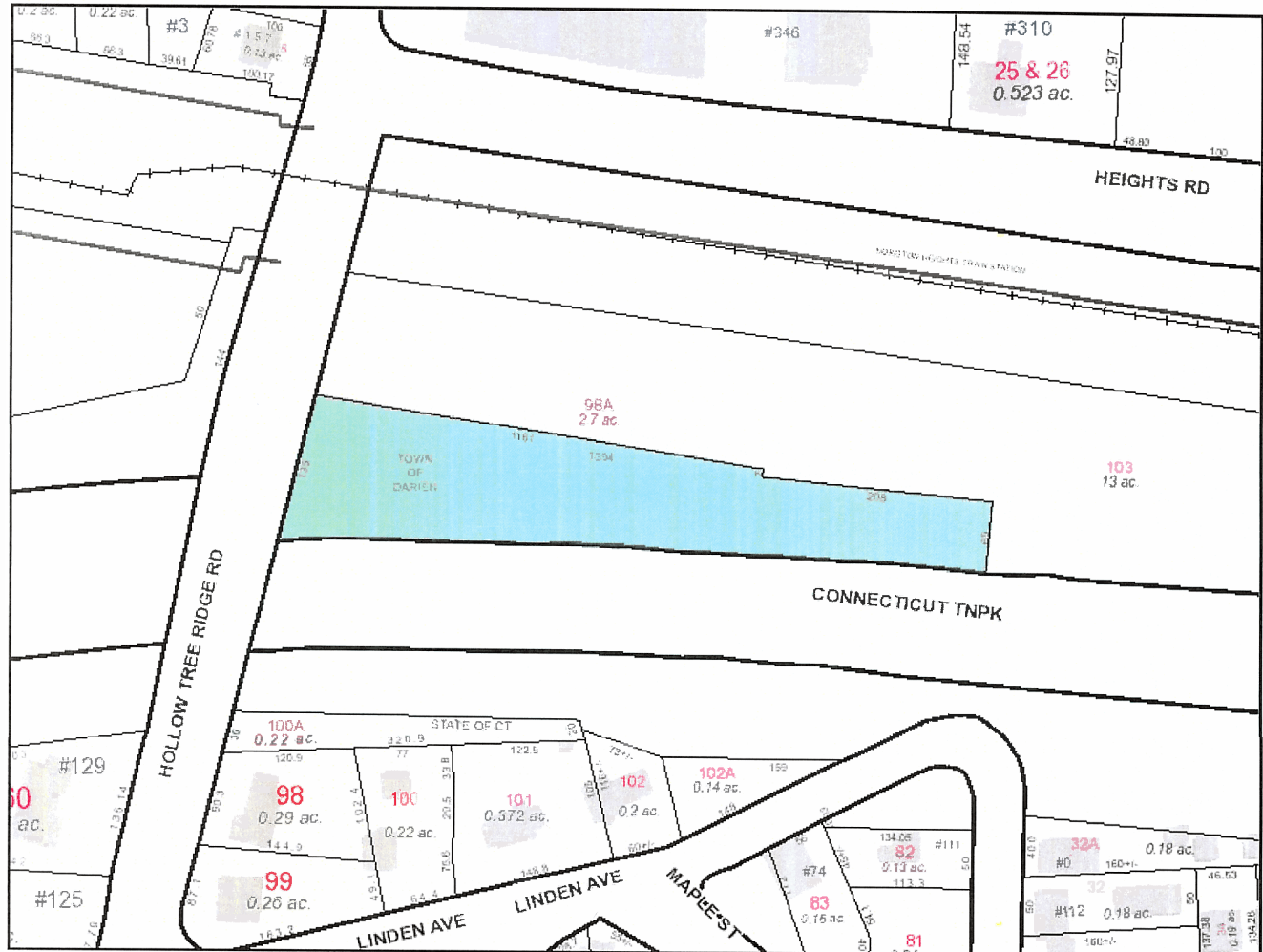
CC: The Honorable Jayme Stevenson, First Selectman, Town of Darien  
Jeremy Ginsberg, Planning & Zoning Director, Town of Darien  
Eversource Energy, c/o Robert Gray

16 Esquire Road, Billerica, MA 01862      Phone 978-284-3906      Email: [ncaplan@empiretelecomm.com](mailto:ncaplan@empiretelecomm.com)

PARID: 29144

STATE OF CONNECTICUT DOT OFFICE OF RAILS

150 HOLLOW TREE RIDGE ROAD

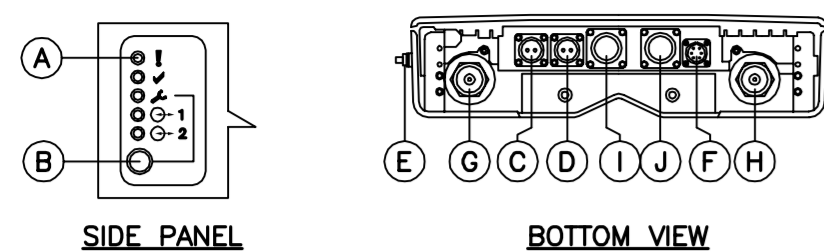


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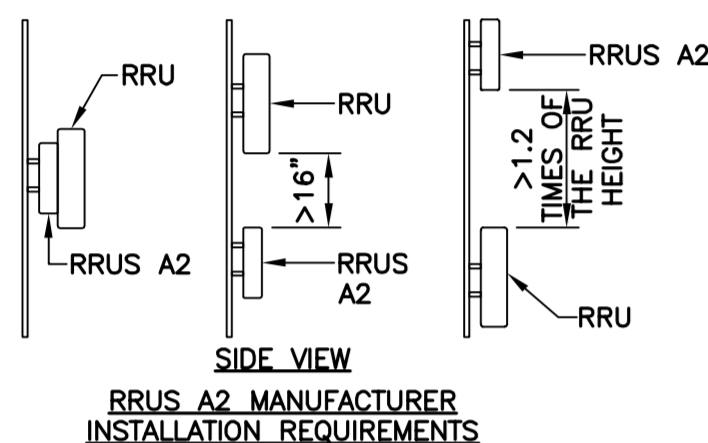




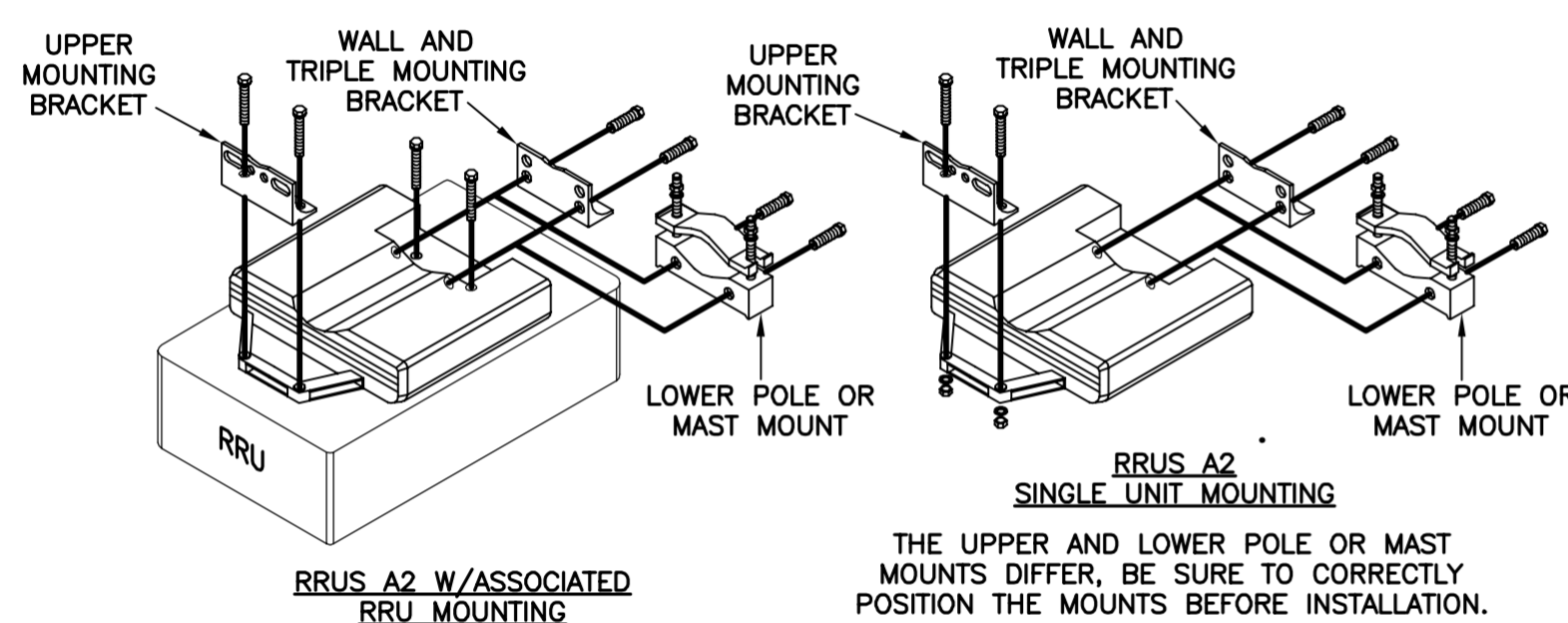
CONNECTION INTERFACE

POSITION (ID)	DESCRIPTION	MARKING
A	OPTICAL INDICATORS	O-1, O-2
B	MAINTENANCE	▲
C	-48V DC POWER SUPPLY	POW IN
D	-48V DC POWER SUPPLY TO RRU	POW OUT
E	GROUNDING	⊥
F	RET	RET
G	ANTENNA B	▲ - B
H	ANTENNA A	▲ - A
I	OPTICAL CABLE 1	O-1
J	OPTICAL CABLE 2	O-2

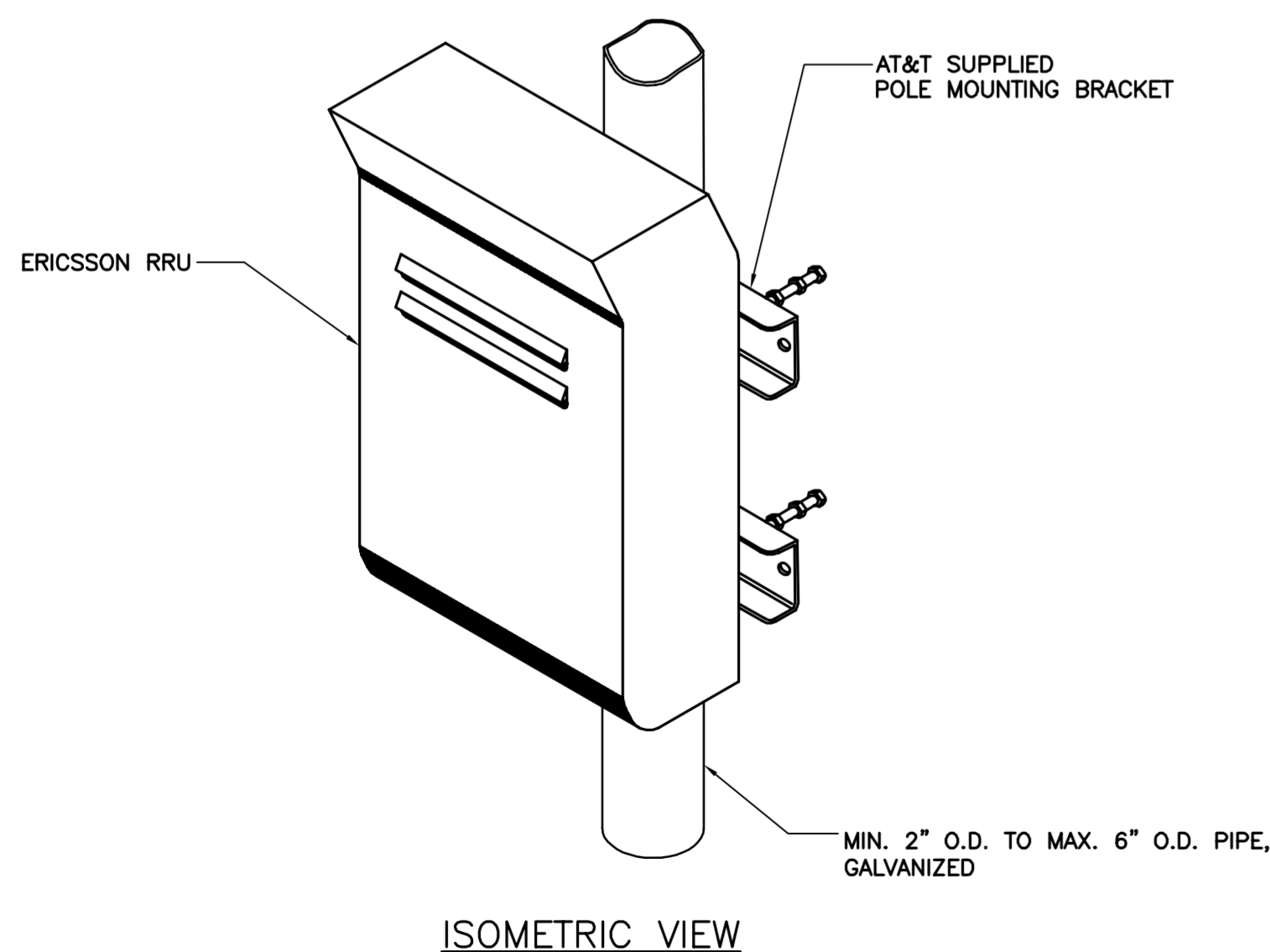
- NOTES:
1. STACKING OF RRU's IS NOT PERMITTED.
  2. NO PAINTING OF RRU OR THE SOLAR SHIELD IS ALLOWED.
  3. A SINGLE RRU A2 CAN BE INSTALLED AS A STAND ALONE UNIT OR MOUNTED TO THE BACK OF ITS ASSOCIATED RRU.



RRU A2 MANUFACTURER INSTALLATION REQUIREMENTS

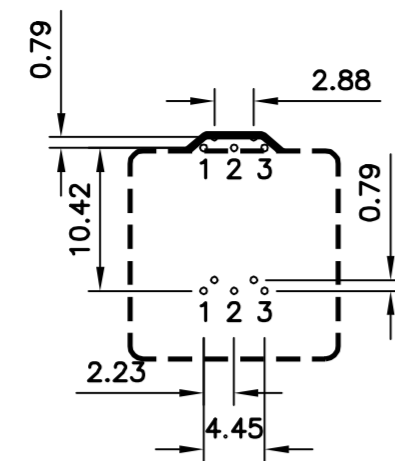


1 ERICSSON RRU A2 DETAILS  
N-1 NOT TO SCALE



- NOTES:
1. AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
  2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

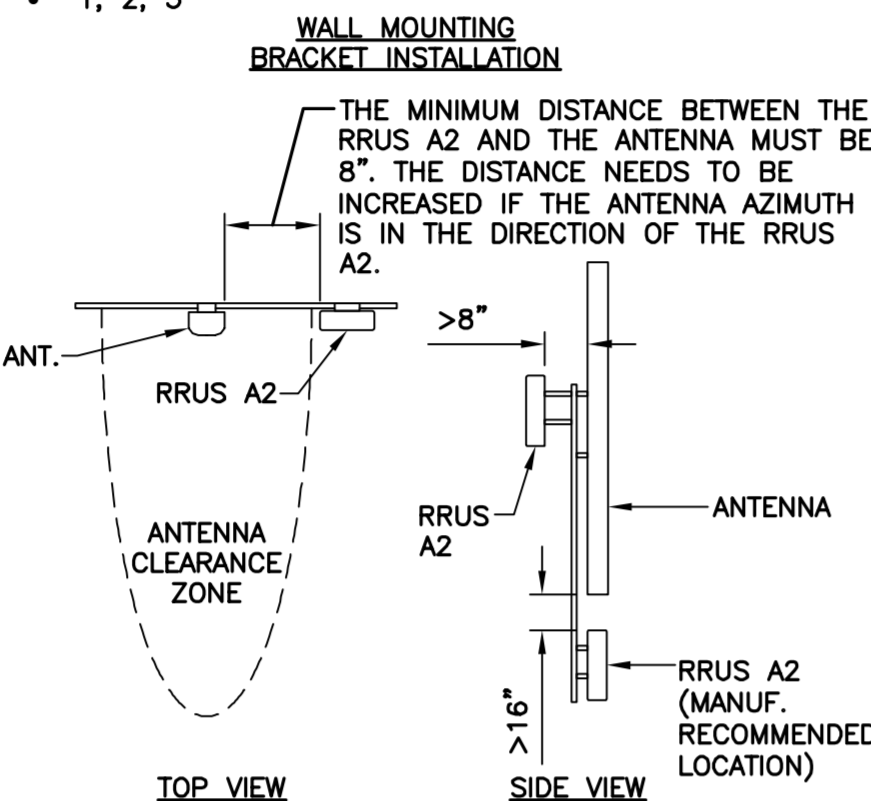
2 TYPICAL RRU MOUNTING DETAILS  
N-1 SCALE: NTS



THE NUMBER OF BOLT HOLES DEPENDS ON THE WALL MATERIAL AS SPECIFIED BY THE SITE ENGINEER. A MINIMUM OF TWO BOLT HOLES ARE RECOMMENDED FOR EACH BRACKET.

ONE OF THE FOLLOWING SOLUTIONS FOR HOLE POSITIONS MUST BE USED:

- 1, 3
- 1, 2, 3



TOP VIEW

SIDE VIEW

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

DESIGN CRITERIA:

ANTENNA MAST:

- WIND LOAD: PER EIA/TIA 222 G-05 (ANTENNA MOUNTS): 93 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 7-10 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.

PROFESSIONAL ENGINEER SEAL

DATE: 10/12/16  
REV. 0

at&t  
EMPIRE telecom

CENTEK engineering  
Centered on Solutions™  
203) 488-0360  
203) 488-8387 / Fax  
63-2 North Branford Road  
Branford, CT 06405  
www.CentekEng.com

AT&T MOBILITY  
WIRELESS COMMUNICATIONS FACILITY  
DARIEN  
CT15011 - LTE BWE  
NOROTON HEIGHTS RAILROAD STATION  
DARIEN, CT 06820

DATE: 10/04/16  
SCALE: AS NOTED  
JOB NO. 16071.53

NOTES AND SPECIFICATIONS

N-1

Sheet No. 2 of 7



TOP OF EXISTING TRANSMISSION TOWER  
EL. ±90' AGL

AT&T ANTENNAS  
EL. ±85' AGL

EXISTING INSULATOR

EXISTING CROSS ARM

**TOWER STRUCTURAL NOTES:**

- REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 16071.53, DATED NOVEMBER 10, 2016 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL AT&T RF DATA SHEET.

**NOTES:**

- OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
- A.G.L. = ABOVE GRADE LEVEL

NOTE:  
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

EXISTING ±90' TALL TRANSMISSION TOWER

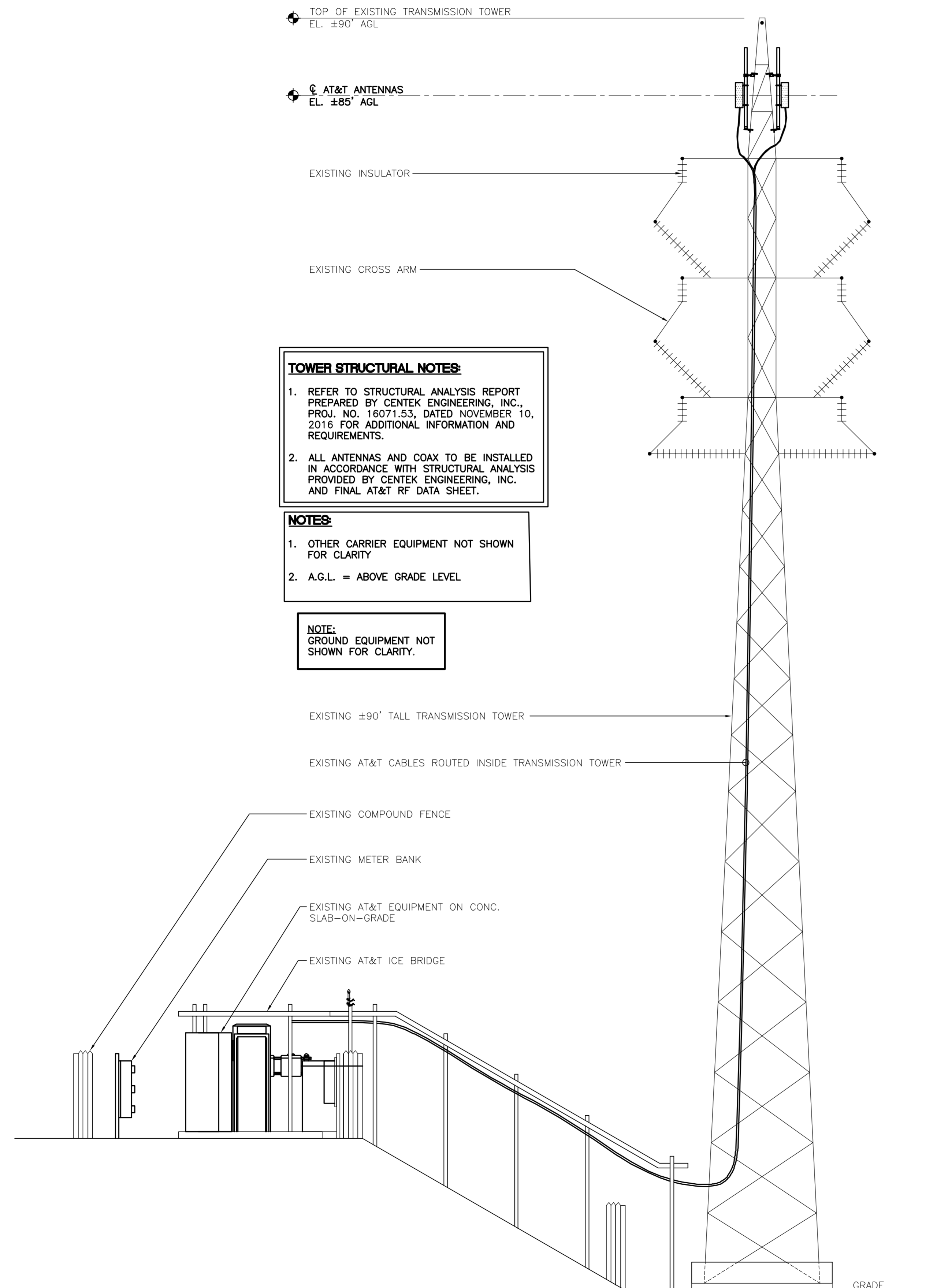
EXISTING AT&T CABLES ROUTED INSIDE TRANSMISSION TOWER

EXISTING COMPOUND FENCE

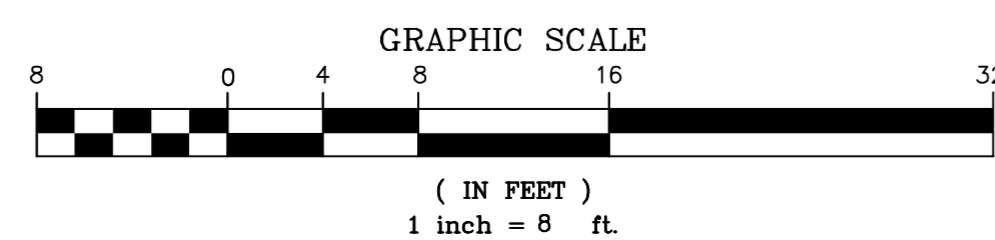
EXISTING METER BANK

EXISTING AT&T EQUIPMENT ON CONC. SLAB-ON-GRADE

EXISTING AT&T ICE BRIDGE



**3 TOWER ELEVATION**  
SCALE: 1/8" = 1'-0"

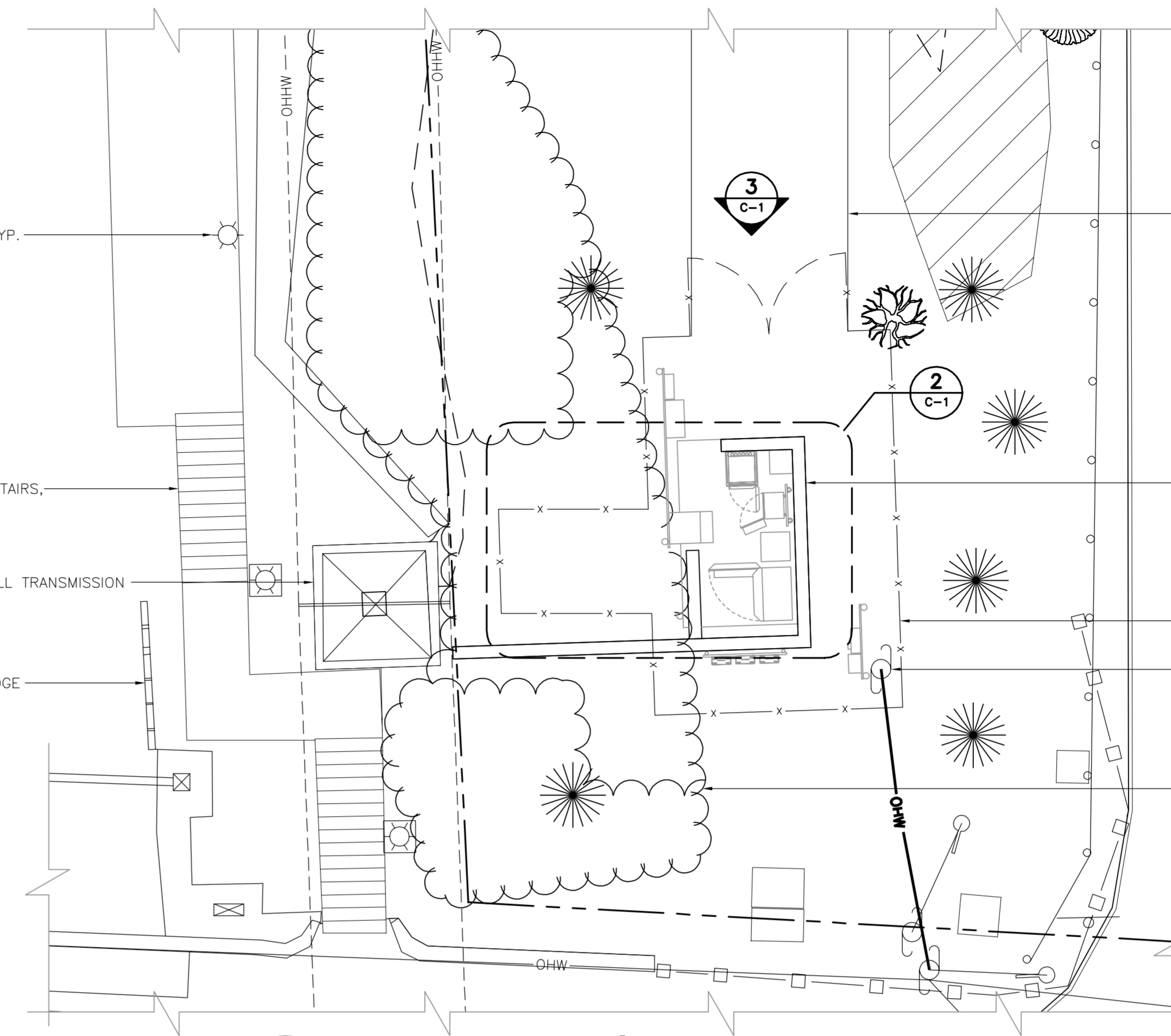


EXISTING LIGHT, TYP.

EXISTING CONC. STAIRS, TYP.

EXISTING ±90' TALL TRANSMISSION TOWER

EXISTING ICE BRIDGE



**1 COMPOUND PLAN**  
SCALE: 1/8" = 1'-0"  
TRUE NORTH

EXISTING ELECTRICAL PANEL

EXISTING TELCO CABINET

EXISTING PURCELL CABINET

EXISTING ±90' TALL TRANSMISSION TOWER

EXISTING ICE BRIDGE

EXISTING GRAVEL DRIVE, TYP.

EXISTING AT&T EQUIPMENT ON CONC. SLAB-ON-GRADE

EXISTING COMPOUND FENCE

EXISTING UTILITY POLE, TYP.

EXISTING TREE LINE, TYP.

EXISTING POWER CABINET

EXISTING AT&T RXAIT CABINET

EXISTING PURCELL CABINET MOUNTED TO H-FRAME

EXISTING AT&T NOKIA GSM CABINET

EXISTING AT&T UMTS CABINET

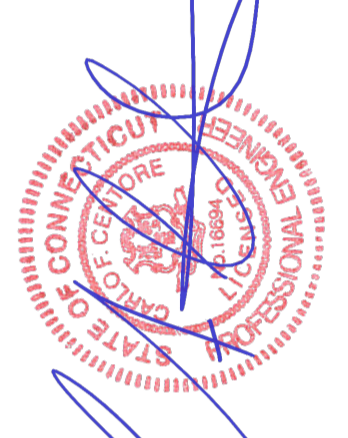
EXISTING METER BANK

AT&T RRUS-12+A2, TYP. OF (1) PER SECTOR/(3) TOTAL, MOUNTED ON EXISTING H-FRAME

EXISTING AT&T RRUS-11, TYP. OF (1) PER SECTOR/(3) TOTAL, MOUNTED ON EXISTING H-FRAME

**2 EQUIPMENT LAYOUT PLAN**  
SCALE: 3/16" = 1'-0"  
TRUE NORTH

PROFESSIONAL ENGINEER SEAL



**CEN TEK** engineering  
Centered on Solutions™  
(203) 488-0380  
(203) 488-8387 Fax  
63-2 North Branford Road  
Branford, CT 06405  
www.CentekEng.com

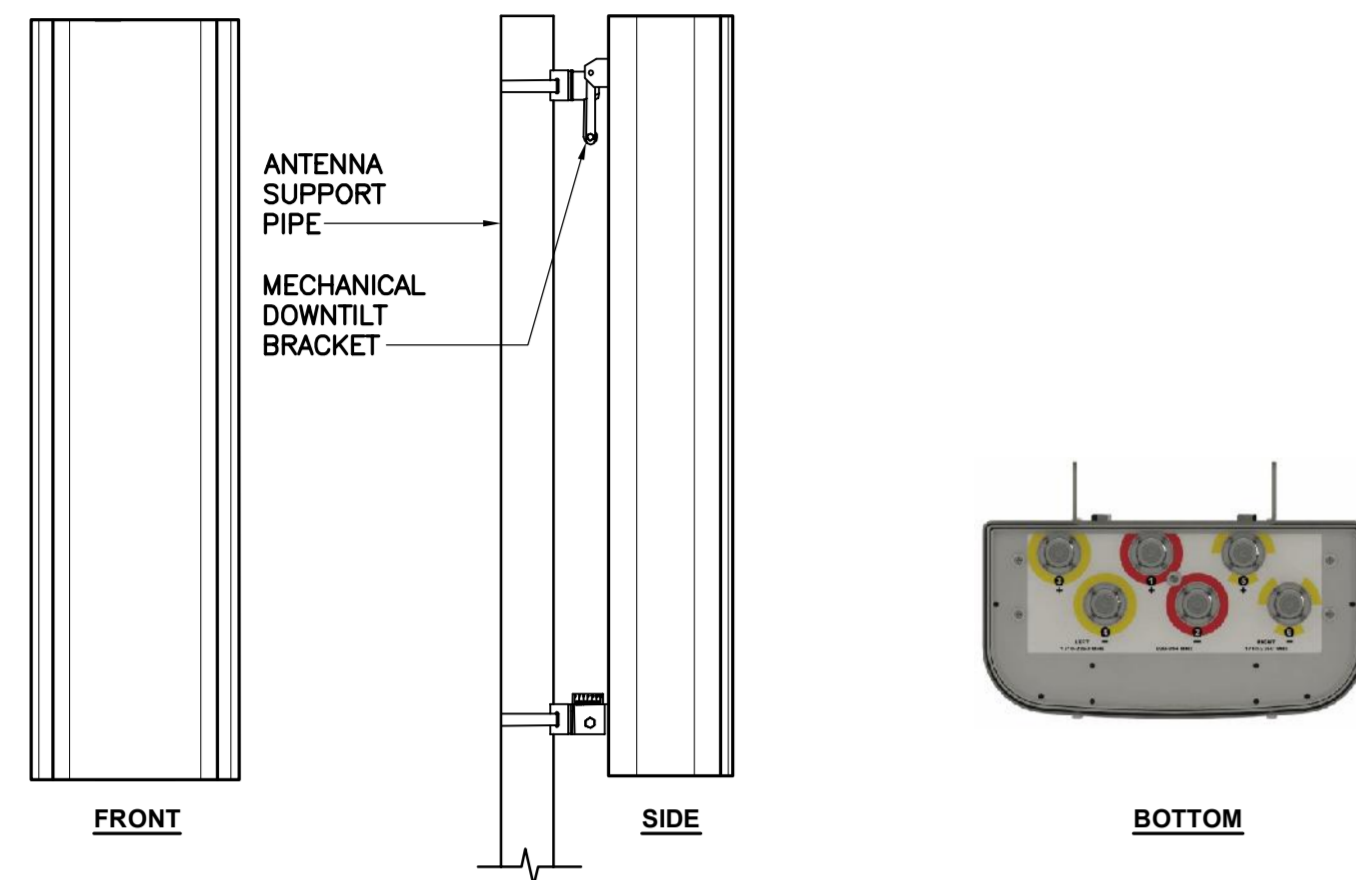
AT&T MOBILITY  
WIRELESS COMMUNICATIONS FACILITY  
**DARIEN**  
CT5011 - LTE BWE  
NOROTON HEIGHTS RAILROAD STATION  
DARIEN, CT 06820

DATE: 10/04/16  
SCALE: AS NOTED  
JOB NO. 16071.53

PLANS, ELEVATION AND DETAILS

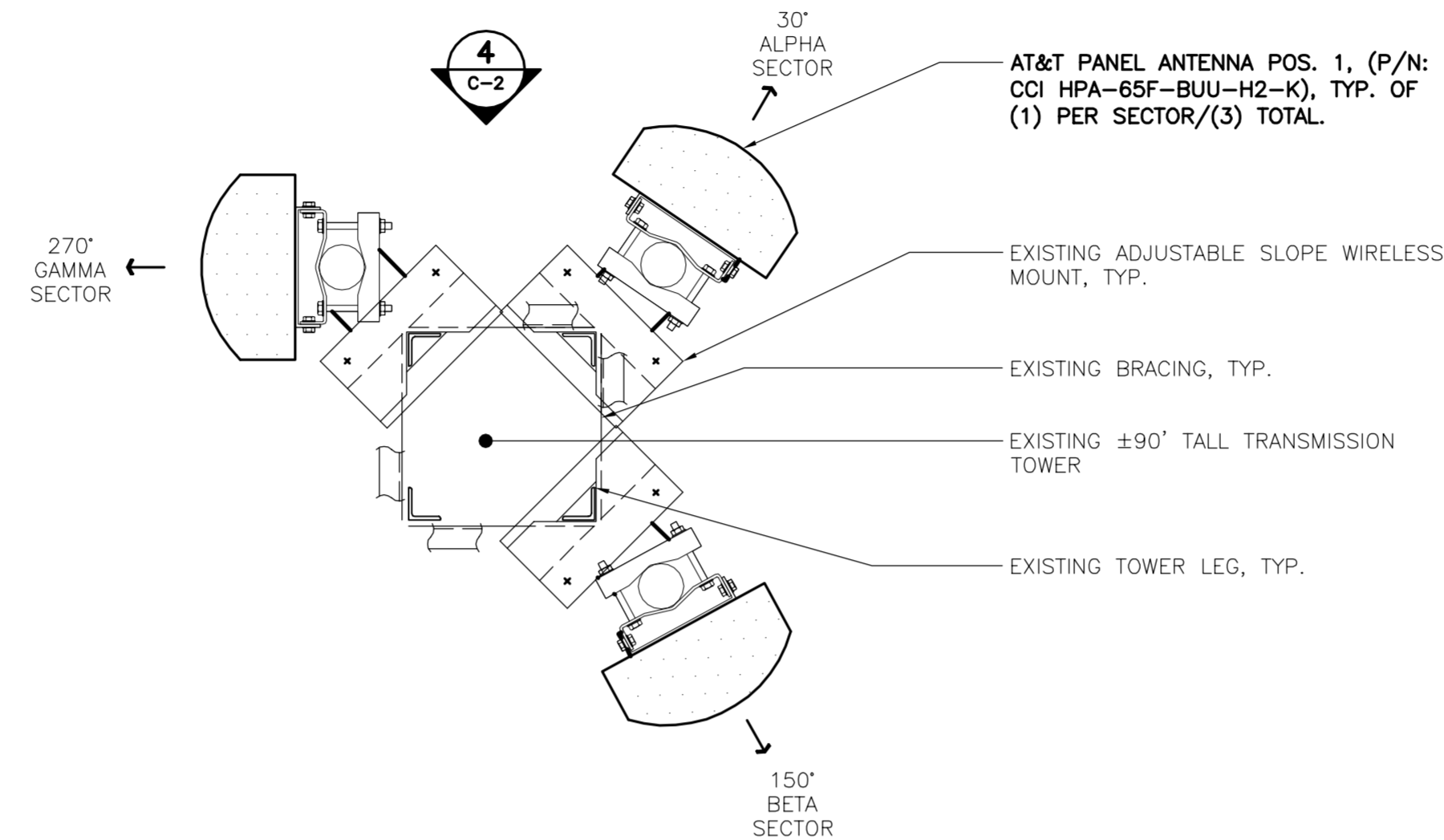
**C-1**  
Sheet No. 3 of 7

REV. DATE 10/12/16  
DRAWN BY JTD  
CHECKED BY CAG  
CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW

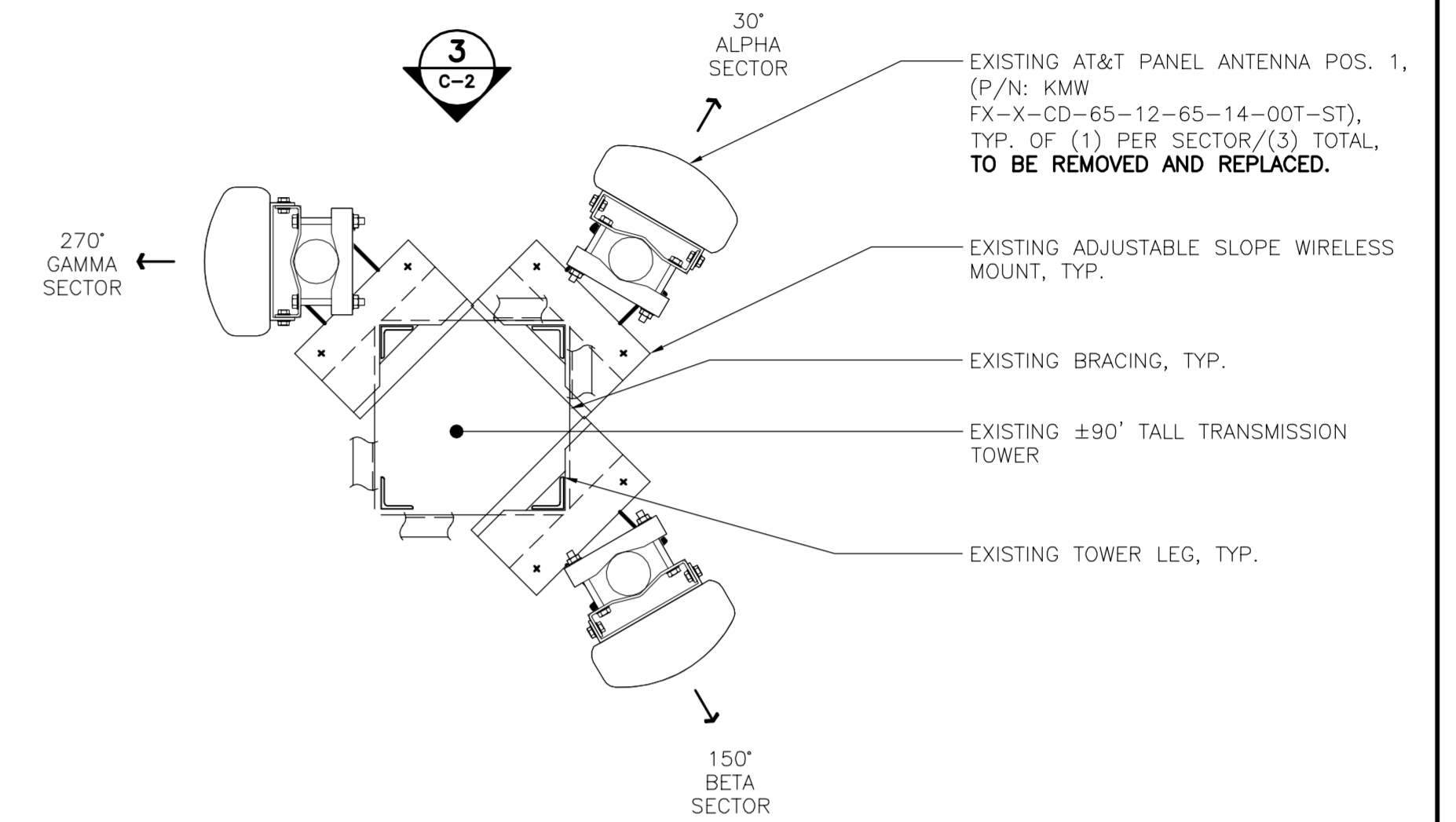


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: HPA-65F-BUU-H2-K	21.4"L x 14.4"W x 7.3"D	13.8 LBS.

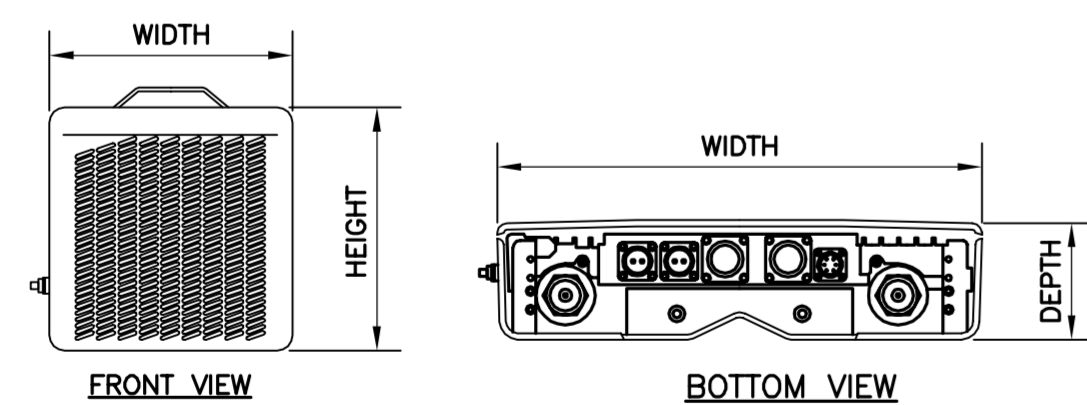
**5 PROPOSED ANTENNA DETAIL**  
SCALE: 1/2" = 1'-0"



**2 PROPOSED ANTENNA PLAN**  
SCALE: 1" = 1'-0" NORTH



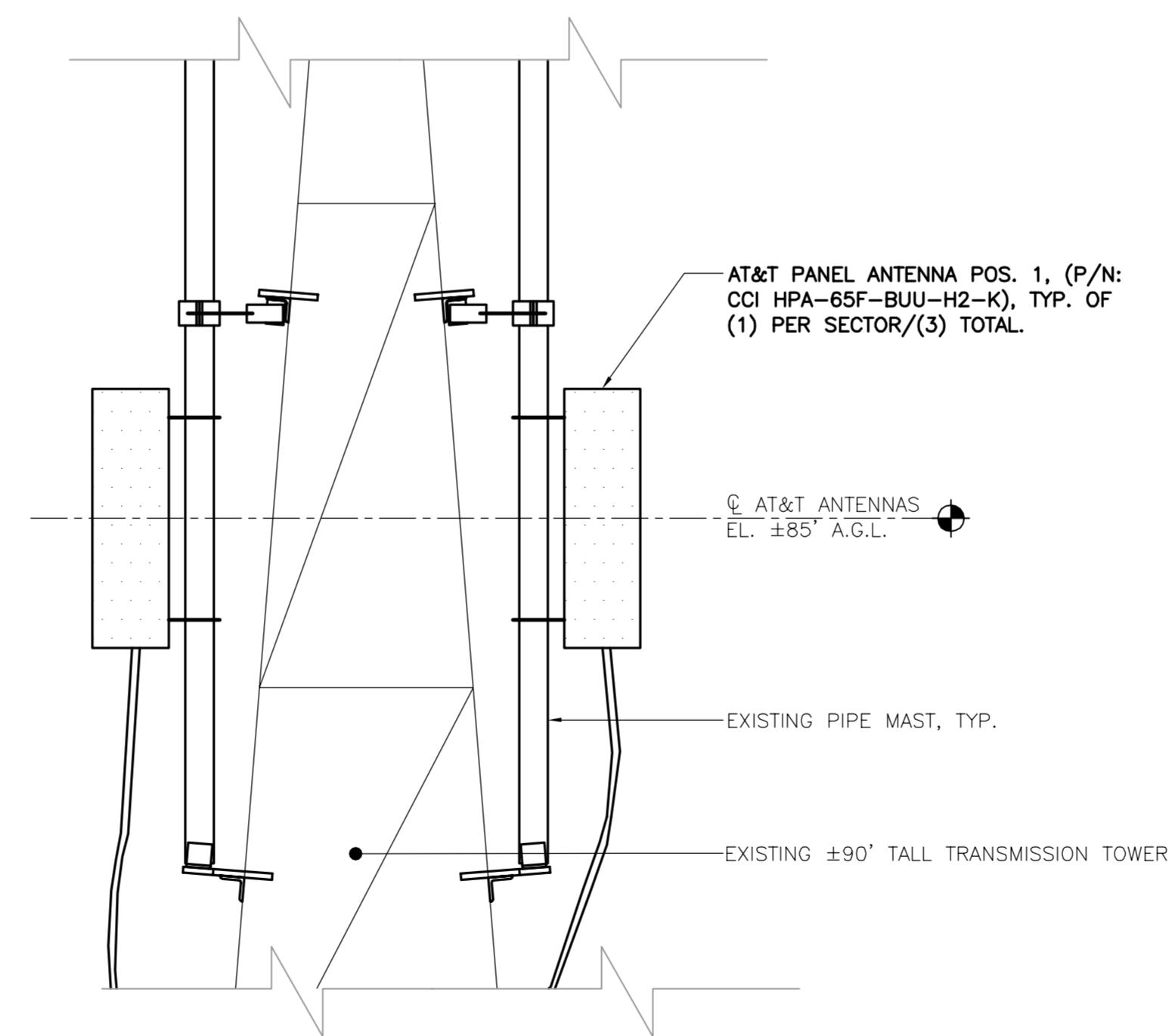
**1 EXISTING ANTENNA PLAN**  
SCALE: 1" = 1'-0" NORTH



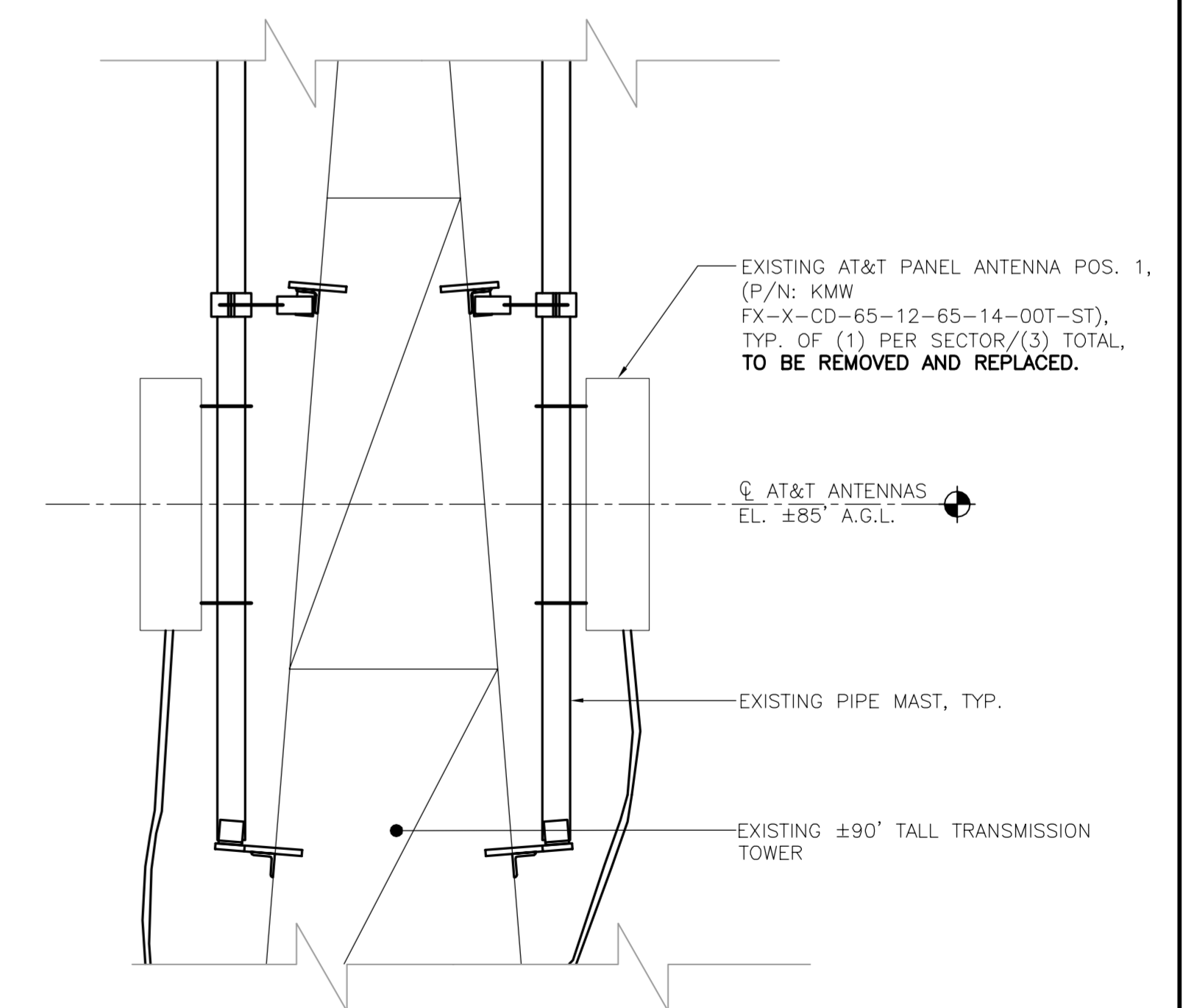
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS A2	16.42"L x 15.19"W x 3.35"D	22.05 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

**6 ERICSSON RRUS A2 DETAIL**  
SCALE: 1" = 1'-0"



**4 PROPOSED ANTENNA ELEVATION**  
SCALE: 1" = 1'-0"



**3 EXISTING ANTENNA ELEVATION**  
SCALE: 1" = 1'-0"



**CENITEK** engineering  
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AT&T MOBILITY  
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**DARIEN**  
CT15011 - LTE BWE  
NOROTON HEIGHTS RAILROAD STATION  
DARIEN, CT 06820

DATE: 10/04/16  
SCALE: AS NOTED  
JOB NO. 16071.53

LTE BWE  
EQUIPMENT  
DETAILS

**C-2**  
Sheet No. 4 of 7

REV.	DATE	DATE	JTD	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW
0	10/12/16				















**Structural Analysis of Tower**

*AT&T Site Ref: CT5011*

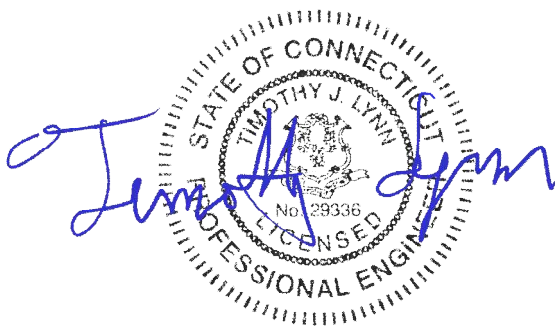
*Eversource Structure 1182  
90' Electric Transmission Lattice Tower*

*Norton Heights Railroad Station  
Darien, CT*

*CEN TEK Project No. 16071.53*

~~*Date: November 10, 2016*~~

*Rev 1: January 25, 2017*



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



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## Introduction

The purpose of this report is to analyze the existing 90' utility tower located at the Noroton Heights Railroad Station in Darien, CT for the proposed antenna and equipment upgrade by AT&T.

The existing and proposed loads consist of the following:

- **AT&T (Existing to Remain):**  
**Coax Cables:** Six (6) 7/8"  $\varnothing$  coax cables running on a leg of the existing tower.
- **AT&T (Existing to Remove):**  
**Antennas:** Three (3) KMW FX-X-CD-65-12-65-14-00T panel antennas leg mounted with a RAD center elevation of 85-ft above tower base.
- **AT&T (Proposed):**  
**Antennas:** Three (3) CCI HPA-65F-BUU-H2 panel antennas and three (3) Kaelus TMA2117F00V1-1 TMAs leg mounted with a RAD center elevation of 85-ft above tower base.  
**Coax Cables:** Six (6) 7/8"  $\varnothing$  coax cables running on a leg of the existing tower.

## Primary assumptions used in the analysis

- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines steel stresses for evaluation of the utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the antenna mast unless specified otherwise.
- Antenna mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Antenna mast and utility tower will be in plumb condition.
- Utility tower 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 utility tower structure was completed using the current version of PLS-Tower computer program licensed to CENTEK Engineering, Inc. The program contains a library of all AISC angle shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing 90-ft tall lattice tower was analyzed for its ability to resist loads prescribed by the NESC standard. Maximum usage for the tower was calculated considering the additional forces from the antenna mast and associated appurtenances. Section 5 of this report details these gravity and lateral wind loads.

## D e s i g n B a s i s

Our analysis was performed in accordance with TIA-222-G, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

### ▪ UTILITY TOWER ANALYSIS

The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

Load cases considered:

#### Load Case 1: NESC Heavy

Wind Pressure.....	4.0 psf
Radial Ice Thickness.....	0.5"
Vertical Overload Capacity Factor.....	1.50
Wind Overload Capacity Factor.....	2.50
Wire Tension Overload Capacity Factor.....	1.65

#### Load Case 2: NESC Extreme

Wind Speed.....	110 mph <sup>(1)</sup>
Radial Ice Thickness.....	0"

Note 1: NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)



## Results

### ▪ UTILITY TOWER

This analysis finds that the subject utility structure is adequate to support the proposed antenna mast and related appurtenances. The tower stresses meet the requirements set forth by the ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 8 of this report. The analysis results are summarized as follows:

A maximum usage of **86.42%** occurs in the utility tower under the **NESC Extreme** loading condition.

#### TOWER SECTION:

The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g50X	86.42%	<b>PASS</b>

### ▪ FOUNDATION AND ANCHORS

The existing foundation consists of one (1) 9-ft square x 11-ft-6-in long reinforced concrete.

#### BASE REACTIONS:

From PLS-Tower analysis of utility tower based on NESC/NU prescribed loads.

Load Case	Leg	Shear	Uplift	Compression
NESC Heavy Wind	Uplift Leg A	2.79 kips	30.23 kips	NA
	Uplift Leg B	2.79 kips	30.24 kips	NA
	Compression Leg A	3.86 kips	NA	42.58 kips
	Compression Leg B	3.86 kips	NA	42.57 kips
NESC Extreme Wind	Uplift Leg A	6.33 kips	65.26 kips	NA
	Uplift Leg B	6.33 kips	65.27 kips	NA
	Compression Leg A	6.81 kips	NA	71.14 kips
	Compression Leg B	6.81 kips	NA	71.14 kips

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

#### FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Required FS <sup>(1)</sup>	Proposed Loading FS <sup>(2)</sup>	Result
Reinf. Conc. Pier	OTM	1.0	1.09	<b>PASS</b>

Note 1: FS denotes Factor of Safety

Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

C o n c l u s i o n

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

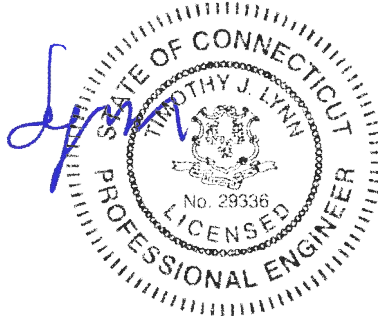
The analysis is based, in part on the information provided to this office by Eversource and AT&T. If the existing conditions are different than the information in this report, CEN TEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE  
Structural Engineer





STANDARD CONDITIONS FOR FURNISHING OF  
PROFESSIONAL ENGINEERING SERVICES ON  
EXISTING STRUCTURES

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

## GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS - TOWER

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

### Modeling Features:

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

### Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as drag coefficients according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):



- ASCE Standard 10-90
- AS 3995 (Australian Standard 3995)
- BS 8100 (British Standard 8100)
- EN50341-1 (CENELEC, both empirical and analytical methods are available)
- ECCS 1985
- NGT-ECCS
- PN-90/B-03200
- EIA/TIA 222-F
- ANSI/TIA 222-G
- CSA S37-01
- EDF/RTE Resal
- IS 802 (India Standard 802)

Results Features:

- Design summaries printed for each group of members
  - Easy to interpret text, spreadsheet and graphics design summaries
  - Automatic determination of allowable wind and weight spans
  - Automatic determination of interaction diagrams between allowable wind and weight spans
  - Capability to batch run multiple tower configurations and consolidate the results
  - Automated optimum angle member size selection and bolt quantity determination
- Tool for interactive angle member sizing and bolt quantity determination.

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

*Introduction*

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

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

ANSI Standard C2-2007 (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.



## PCS Mast

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

## ELECTRIC TRANSMISSION TOWER

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 V (MPH)	Pressure Q (PSF)	Height Factor Kz	Gust Factor Gh	Load or Stress Factor	Force Coef - Shape Factor	
<b>Ice Condition</b>	<b>TIA/EIA</b>	Antenna Mount	TIA	TIA (.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA	
	<b>NESC Heavy</b>	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						
<b>High Wind Condition</b>	<b>TIA/EIA</b>	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA	
	<b>NESC Extreme Wind</b>	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						
<b>NESC Extreme Ice with Wind Condition*</b>		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

### Communication Antennas on Transmission Structures (CL&P & WMECo Only)

<b>Northeast Utilities</b> Approved by: KMS (NU)	<b>Design</b> NU Confidential Information	OTRM 059	<b>Rev.1</b> 03/17/2011
		Page 7 of 9	





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.



Job :

Description:

Spec. Number

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Sheet of

Date 7/15/08

Date

**INPUT DATA**

TOWER ID: 1182

Structure Height (ft) : 90

Wind Zone : Central CT (green)

Wind Speed : 110 mph

Tower Type :  Suspension  
 Strain

Extreme Wind Model : PCS Addition

**Shield Wire Properties:**

	BACK	AHEAD
NAME =	4/0 Cu	4/0 Cu
DESCRIPTION =	4/0	4/0
STRANDING =	7.000 Cu	7.000 Cu
DIAMETER =	0.522 in	0.522 in
WEIGHT =	0.653 lb/ft	0.653 lb/ft

**Conductor Properties:**

		BACK	AHEAD		
NAME =		ARBUTUS	ARBUTUS		
Number of Conductors per phase	<span style="border: 1px solid black; padding: 2px;">1</span>	795	795	<span style="border: 1px solid black; padding: 2px;">1</span>	Number of Conductors per phase
		37 A. Al	37 A. Al		
DIAMETER =		1.026 in	1.026 in		
WEIGHT =		0.745 lb/ft	0.745 lb/ft		

Insulator Weight = 200 lbs

Broken Wire Side = AHEAD SPAN

**Horizontal Line Tensions:**

	BACK		AHEAD	
	Shield	Conductor	Shield	Conductor
NESC HEAVY =	4,500 ✓	6,000 ✓	4,500 ✓	6,000 ✓
EXTREME WIND =	3,511 ✓	5,431 ✓	3,609 ✓	5,843 ✓
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	2,199 ✓	2,075 ✓	2,067 ✓	2,084 ✓

**Line Geometry:**

	BACK:		AHEAD:		SUM
LINE ANGLE (deg) =	BACK:	1	AHEAD:	1	1 ✓
WIND SPAN (ft) =	BACK:	176 ✓	AHEAD:	213 ✓	389 ✓
WEIGHT SPAN (ft) =	BACK:	255 ✓	AHEAD:	311 ✓	566 ✓



Job :  
Description:

Spec. Number  
Computed by  
Checked by

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Date 7/15/08  
Date

**WIRE LOADING AT ATTACHMENTS**

TOWER ID: 1182

Wind Span = 389 ft  
Weight Span = 566 ft  
Total Angle = 1 degrees

Broken Wire Span = AHEAD SPAN  
Type of Insulator Attachment = STRAIN

**1. NESC RULE 250B Heavy Loading:**

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
Shield Wire =	623 lb	0 lb	1,095 lb	288 lb	7,425 lb	493 lb
Conductor =	830 lb	0 lb	2,039 lb	383 lb	9,900 lb	948 lb

**2. NESC RULE 250C Transverse Extreme Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	580 lb	98 lb	370 lb
Conductor =	1,117 lb	412 lb	822 lb

**3. NESC RULE 250C Longitudinal Extreme Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	370 lb
Conductor =	#VALUE!	#VALUE!	822 lb

**4. NESC RULE 250D Extreme Ice & Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	1,442 lb
Conductor =	#VALUE!	#VALUE!	2,249 lb

**5. NESC RULE 250B w/o OLF's**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	730 lb
Conductor =	#VALUE!	#VALUE!	1,359 lb

**6. 60 Deg. F. No Wind**

	Horizontal	Longitudinal	Vertical
Shield Wire =	37 lb	132 lb	370 lb
Conductor =	36 lb	9 lb	822 lb

**7. Construction**

	Horizontal	Longitudinal	Vertical
Shield Wire =	56 lb	198 lb	555 lb
Conductor =	54 lb	13 lb	1,233 lb

**NOTE: All loads include required overload factors (OLF's).**



⊕ AT&T ANTENNAS  
EL. ±85'-0" AGL

AT&T (EXISTING TO REMOVE): THREE (3) KMW FX-X-CD-65-12-65-14 PANEL ANTENNAS.

AT&T (PROPOSED): THREE (3) CCI HPA-65F-BUU-H2 PANEL ANTENNAS AND THREE (3) KAEIUS TMA2117F00V1-1 TMAs.

EXISTING 90' TALL STEEL TRANSMISSION STRUCTURE NO. 1182

2  
EL-1

AT&T PROPOSED SIX (6) 7/8" DIA. COAX CABLES MOUNTED ON A COAX SUPPORT BRACKET TO THE LEG OF THE TOWER

AT&T EXISTING SIX (6) 7/8" DIA. COAX CABLES MOUNTED ON A COAX SUPPORT BRACKET TO THE LEG OF THE TOWER

AT&T PROPOSED SIX (6) 7/8" DIA. COAX CABLES MOUNTED ON A COAX SUPPORT BRACKET TO THE LEG OF THE TOWER

AT&T EXISTING SIX (6) 7/8" DIA. COAX CABLES MOUNTED ON A COAX SUPPORT BRACKET TO THE LEG OF THE TOWER

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

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

REVISIONS	
00	11/10/16 ISSUED FOR REVIEW
01	1/25/17 CONSTRUCTION

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EVERSOURCE 1182  
NORTON HEIGHTS RR STATION  
DARIEN, CT 06820

PROJECT NO: 16071.53  
DRAWN BY: TJL  
CHECKED BY: CFC  
SCALE: AS NOTED  
DATE: 11/10/16



TOWER AND MAST ELEVATION  
**EL-1**  
DWG. 1 OF 1

**Basic Components**

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

**Factors for Extreme Wind Calculation**

Elevation of Top of Mast Above Grade =	TME := 90	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 =  $K_z := 2.01 \cdot \left( \frac{TME}{900} \right)^{\frac{2}{9.5}} = 1.238$  (NESC 2007 Table 250-2)

Exposure Factor =  $E_s := 0.346 \left[ \frac{33}{(0.67 \cdot TME)} \right]^{\frac{1}{7}} = 0.317$  (NESC 2007 Table 250-3)

Response Term =  $B_s := \frac{1}{\left( 1 + 0.375 \cdot \frac{TME}{220} \right)} = 0.867$  (NESC 2007 Table 250-3)

Gust Response Factor =  $G_{rf} := \frac{\left[ 1 + \left( 2.7 \cdot E_s \cdot B_s \cdot \frac{1}{2} \right) \right]}{k_v^2} = 0.879$  (NESC 2007 Table 250-3)

Wind Pressure =  $q_z := 0.00256 \cdot K_z \cdot V^2 \cdot G_{rf} \cdot I = 33.7$  psf (NESC 2007 Section 250.C.2)

**Shape Factors**

NUS Design Criteria Issued April 12, 2007

Shape Factor for Round Members =	$C_{dR} := 1.3$	(User Input)
Shape Factor for Flat Members =	$C_{dF} := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of P de =	$C_{d_{coax}} := 1.45$	(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

**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	CCI HPA-65F-BUU-H2	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 21.4$	in (User Input)
Antenna Width =	$W_{ant} := 14.4$	in (User Input)
Antenna Thickness =	$T_{ant} := 7.3$	in (User Input)
Antenna Weight =	$WT_{ant} := 15.2$	lbs (User Input)
Number of Antennas =	$N_{ant} := 1$	(User Input) Per Leg -Total of 3

**Gravity Load (without ice)**

Weight of All Antennas =  $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 15$  lbs

**Gravity Load (ice only)**

Volume of Each Antenna =  $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2250$  cu in

Volume of Ice on Each Antenna =  $V_{ice} := (L_{ant} + 2 \cdot lr)(W_{ant} + 2 \cdot lr)(T_{ant} + 2 \cdot lr) - V_{ant} = 614$  cu in

Weight of Ice on Each Antenna =  $W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 20$  lbs

Weight of Ice on All Antennas =  $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 20$  lbs

**Wind Load (NESC Heavy)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna w/ Ice =  $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot lr) \cdot (W_{ant} + 2 \cdot lr)}{144} = 2.4$  sf

Antenna Projected Surface Area w/ Ice =  $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.4$  sf

Total Antenna Wind Force w/ Ice =  $F_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 15$  lbs

**Wind Load (NESC Extreme)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna =  $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.1$  sf

Antenna Projected Surface Area =  $A_{ant} := SA_{ant} \cdot N_{ant} = 2.1$  sf

Total Antenna Wind Force =  $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} = 144$  lbs



**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	Kaelus TMA2117F00V1-1	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 8.46$	in (User Input)
Antenna Width =	$W_{ant} := 11.81$	in (User Input)
Antenna Thickness =	$T_{ant} := 4.21$	in (User Input)
Antenna Weight =	$WT_{ant} := 17.6$	lbs (User Input)
Number of Antennas =	$N_{ant} := 1$	(User Input) Per Leg -Total of 3

**Gravity Load (without ice)**

Weight of All Antennas =  $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 18$  lbs

**Gravity Load (ice only)**

Volume of Each Antenna =  $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 421$  cu in

Volume of Ice on Each Antenna =  $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 211$  cu in

Weight of Ice on Each Antenna =  $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 7$  lbs

Weight of Ice on All Antennas =  $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 7$  lbs

**Wind Load (NESC Heavy)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna w/ Ice =  $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 0.8$  sf

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

Total Antenna Wind Force w/ Ice =  $Fi_{ant2} := p \cdot CdF \cdot A_{ICEant} = 5$  lbs

**Wind Load (NESC Extreme)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna =  $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.7$  sf

Antenna Projected Surface Area =  $A_{ant} := SA_{ant} \cdot N_{ant} = 0.7$  sf

Total Antenna Wind Force =  $F_{ant2} := qz \cdot CdF \cdot A_{ant} = 47$  lbs

**Development of Wind & Ice Load on Antenna Mounts**

**Existing Mount Data:**

Mount Type =	Valmont Adjustable Slope Wireless Mount p/n 1709	
Mount Shape =	Round	(User Input)
Pipe Mount Length =	$L_{mnt} := 60$	in (User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf (User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in (User Input)
Number of Mounting Pipes =	$N_{mnt} := 1$	(User Input) Per Leg -Total of 3
Mount Weight =	$W_{smnt} := 73$	lbs (User Input)

**Wind Load (NESC Extreme)**

Mount Projected Surface Area =	$A_{mnt} := \frac{(D_{mnt} \cdot L_{mnt})}{144} = 0.99$	sf
Total Mount Wind Force =	$F_{mnt} := qz \cdot C_d R \cdot A_{mnt} \cdot m = 54$	lbs

**Wind Load (NESC Heavy)**

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := \frac{(D_{mnt} + 1) + (L_{mnt} + 1)}{144} = 0.447$	sf
Total Mount Wind Force =	$F_{imnt} := p \cdot C_d R \cdot A_{ICEmnt} = 2$	lbs

**Gravity Loads (without ice)**

Weight Each Pipe Mount =	$W_{Tmnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 18$	lbs
Weight of All Mounts =	$Wgt_{mnt} := W_{Tmnt} \cdot N_{mnt} + W_{smnt} = 91$	lbs

**Gravity Load (ice only)**

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^2 \cdot L_{mnt} = 266$	cu in
Volume of Ice on Each Pipe =	$V_{ice} := \left[ \frac{\pi}{4} \cdot \left[ (D_{mnt} + 1)^2 \right] \cdot (L_{mnt} + 1) \right] - V_{mnt} = 280$	cu in
Weight of Ice each mount (incl. hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot \rho_{ice} = 9$	lbs
Weight of Ice on All Mounts =	$Wgt_{ice.mnt} := (W_{ICEmnt} \cdot N_{mnt} + 5) = 14$	lbs

Subject:

Load Analysis of AT&T Equipment on Structure #1182

Location:

Darien, CT

Rev. 1: 1/25/17

Prepared by: T.J.L Checked by: C.F.C.  
Job No. 16071.53

### Total Equipment Loads:

NESC Heavy Wind Vertical =

$$(W_{t_{ant1}} + W_{t_{ice.ant1}} + W_{t_{ant2}} + W_{t_{ice.ant2}} + W_{gt_{mnt}} + W_{gt_{ice.mnt}}) \cdot 1.5 = 247$$

lbs

NESC Heavy Wind Transverse =

$$(F_{i_{ant1}} + F_{i_{ant2}} + F_{i_{mnt}}) \cdot 2.5 = 58$$

lbs

NESC Extreme Wind Vertical =

$$(W_{t_{ant1}} + W_{t_{ant2}} + W_{gt_{mnt}}) = 124$$

lbs

NESC Extreme Wind Transverse =

$$(F_{ant1} + F_{ant2} + F_{mnt}) = 245$$

lbs



**Coax Cable on CL&P Tower**

Distance Between Coax Cable Attach Points =

Coaxial Cable Span =

$$\text{CoaxSpan} := \begin{pmatrix} 4.125 \\ 10.5 \\ 10.125 \\ 8.5 \\ 10.25 \\ 10.5 \\ 10 \\ 10 \\ 10 \end{pmatrix} \cdot \text{ft} \quad (\text{User Input})$$

Diameter of Coax Cable =

$$D_{\text{coax}} := 1.11 \cdot \text{in} \quad (\text{User Input})$$

Weight of Coax Cable =

$$W_{\text{coax}} := 0.54 \cdot \text{plf} \quad (\text{User Input})$$

Number of Coax Cables =

$$N_{\text{coax}} := 6 \quad (\text{User Input})$$

Number of Projected Coax Cables =

$$NP_{\text{coax}} := 3 \quad (\text{User Input})$$

Typ. of Two Tower  
 Legs - (12 tot. cables)

Extreme Wind Pressure =

$$qz := 33.7 \cdot \text{psf} \quad (\text{User Input})$$

Heavy Wind Pressure =

$$p := 4 \cdot \text{psf} \quad (\text{User Input})$$

Radial Ice Thickness =

$$I_r := 0.5 \cdot \text{in} \quad (\text{User Input})$$

Radial Ice Density =

$$I_d := 56 \cdot \text{pcf} \quad (\text{User Input})$$

Shape Factor =

$$C_{d_{\text{coax}}} := 1.45 \quad (\text{User Input})$$

Overload Factor for NESC Heavy Wind Load =

$$OF_{\text{HW}} := 2.5 \quad (\text{User Input})$$

Overload Factor for NESC Extreme Wind Load =

$$OF_{\text{EW}} := 1.0 \quad (\text{User Input})$$

Overload Factor for NESC Heavy Vertical Load =

$$OF_{\text{HV}} := 1.5 \quad (\text{User Input})$$

Overload Factor for NESC Extreme Vertical Load =

$$OF_{\text{EV}} := 1.0 \quad (\text{User Input})$$

Wind Area with Ice =

$$A_{\text{ice}} := (NP_{\text{coax}} \cdot D_{\text{coax}} + 2 \cdot I_r) = 4.33 \cdot \text{in}$$

Wind Area without Ice =

$$A := (NP_{\text{coax}} \cdot D_{\text{coax}}) = 3.33 \cdot \text{in}$$

Ice Area per Linear Ft =

$$A_{i_{\text{coax}}} := \frac{\pi}{4} \cdot \left[ (D_{\text{coax}} + 2 \cdot I_r)^2 - D_{\text{coax}}^2 \right] = 0.018 \text{ft}^2$$

Weight of Ice on All Coax Cables =

$$W_{\text{ice}} := A_{i_{\text{coax}}} \cdot I_d \cdot N_{\text{coax}} = 5.901 \cdot \text{plf}$$

Heavy Vertical Load =

$$\text{Heavy}_{\text{Vert}} := \left[ \left( N_{\text{coax}} \cdot W_{\text{coax}} + W_{\text{ice}} \right) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HV}} \right]$$

Heavy Transverse Load =

$$\text{Heavy}_{\text{Trans}} := \left( p \cdot A_{\text{ice}} \cdot C_{d_{\text{coax}}} \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HW}} \right)$$

$$\text{Heavy}_{\text{Vert}} = \begin{pmatrix} 57 \\ 144 \\ 139 \\ 117 \\ 141 \\ 144 \\ 137 \\ 137 \\ 137 \end{pmatrix} \text{ lb}$$

$$\text{Heavy}_{\text{Trans}} = \begin{pmatrix} 22 \\ 55 \\ 53 \\ 44 \\ 54 \\ 55 \\ 52 \\ 52 \\ 52 \end{pmatrix} \text{ lb}$$

Extreme Vertical Load =

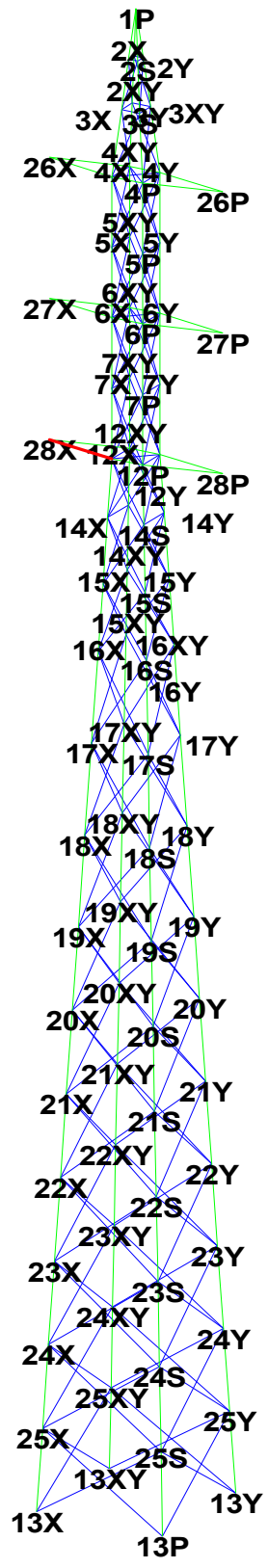
$$\text{Extreme}_{\text{Vert}} := \left[ \left( N_{\text{coax}} \cdot W_{\text{coax}} \right) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EV}} \right]$$

Extreme Transverse Load =

$$\text{Extreme}_{\text{Trans}} := \left[ \left( qz \cdot A \cdot C_{d_{\text{coax}}} \right) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EW}} \right]$$

$$\text{Extreme}_{\text{Vert}} = \begin{pmatrix} 13 \\ 34 \\ 33 \\ 28 \\ 33 \\ 34 \\ 32 \\ 32 \\ 32 \end{pmatrix} \text{ lb}$$

$$\text{Extreme}_{\text{Trans}} = \begin{pmatrix} 56 \\ 142 \\ 137 \\ 115 \\ 139 \\ 142 \\ 136 \\ 136 \\ 136 \end{pmatrix} \text{ lb}$$





Project Name : 11009.CO9 - Darien, CT  
 Project Notes: CL&P Structure # 1182 / AT&T 5011  
 Project File : J:\Jobs\1607100.WI\53\_Darien CT5011\04\_Structural\Backup Documentation\Rev (1)\Calcs\PLS Tower\Darien - 1182.tow  
 Date run : 1:47:41 PM Wednesday, January 25, 2017  
 by : Tower Version 12.50  
 Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

w/t equals 26.30 for member "g80P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g80X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g80XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g80Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g81P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g81Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g82P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g82X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g82XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g82Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g83P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g83Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g84P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g84X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g84XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g84Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g85P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 26.30 for member "g85Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g94P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g94X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g95P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g95X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g96P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 w/t equals 33.30 for member "g96X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
 The model has 24 warnings. ??

Member check option: ASCE 10  
 Connection rupture check: ASCE 10  
 Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]  
 Included angle check: None  
 Climbing load check: None  
 Redundant members checked with: Actual Force

Loads from file: j:\jobs\1607100.wi\53\_darien ct5011\04\_structural\backup documentation\rev (1)\calcs\pls tower\darien - 1182.lca

\*\*\* Analysis Results:

Maximum element usage is 86.42% for Angle "g50X" in load case "NESC Extreme"  
 Maximum insulator usage is 4.50% for Clamp "2" in load case "NESC Heavy"

**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	13P	-2.60	-2.85	-42.58	3.86	0.24	-0.32	0.40	-0.00	0.00
NESC Heavy	13X	1.87	-2.07	30.23	2.79	0.18	0.23	0.29	-0.01	0.00
NESC Heavy	13XY	-1.87	-2.07	30.24	2.79	0.18	-0.23	0.29	0.01	0.00
NESC Heavy	13Y	2.60	-2.85	-42.57	3.86	0.24	0.32	0.40	0.00	0.00

NESC Extreme	13P	-4.32	-5.26	-71.14	6.81	0.45	-0.54	0.70	-0.01	0.00
NESC Extreme	13X	4.07	-4.84	65.26	6.33	0.46	0.48	0.66	-0.01	0.00
NESC Extreme	13XY	-4.08	-4.84	65.27	6.33	0.46	-0.48	0.66	0.01	0.00
NESC Extreme	13Y	4.33	-5.26	-71.14	6.81	0.45	0.54	0.70	0.01	0.00

Summary of Joint Support Reactions For All Load Cases in Direction of Leg:

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg Dir.	Residual Perpendicular	Residual Horizontal	Residual Horizontal	Residual Horizontal	Total Long.	Total Tran.	Total Vert.
				(kips)	To Leg (kips)	To Leg - Res. (kips)	To Leg - Long. (kips)	To Leg - Tran. (kips)	(kips)	(kips)	(kips)
NESC Heavy	13P	25S	g24P	42.746	0.885	0.887	0.491	0.739	-2.60	-2.85	-42.58
NESC Heavy	13X	25X	g24X	-30.355	0.683	0.684	-0.371	0.575	1.87	-2.07	30.23
NESC Heavy	13XY	25XY	g24XY	-30.366	0.682	0.684	0.372	0.574	-1.87	-2.07	30.24
NESC Heavy	13Y	25Y	g24Y	42.738	0.885	0.887	-0.492	0.738	2.60	-2.85	-42.57
NESC Extreme	13P	25S	g24P	71.444	1.901	1.905	0.795	1.731	-4.32	-5.26	-71.14
NESC Extreme	13X	25X	g24X	-65.545	1.804	1.808	-0.835	1.604	4.07	-4.84	65.26
NESC Extreme	13XY	25XY	g24XY	-65.550	1.802	1.806	0.839	1.599	-4.08	-4.84	65.27
NESC Extreme	13Y	25Y	g24Y	71.440	1.899	1.903	-0.799	1.727	4.33	-5.26	-71.14

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Resultant Moment (ft-k)
NESC Heavy	600.729	0.077	600.729
NESC Extreme	1125.370	0.038	1125.370

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Top Width (ft)	Face Tran. Bot Width (ft)	Face Tran. Gross Area (ft^2)	Long. Top Width (ft)	Face Long. Bot Width (ft)	Face Long. Gross Area (ft^2)
1	90.000	59.500	39	124	0.00	2.35	51.608	0.00	2.35	109.983
2	59.500	40.500	20	48	2.35	4.23	62.504	2.35	4.23	62.504
3	40.500	0.000	36	96	4.23	8.25	252.763	4.23	8.25	252.763

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress  
 Printed capacities do not include the strength factor entered for each load case.  
 The Group Summary reports on the member and load case that resulted in maximum usage  
 which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group L/R	Group KL/R Length	Group Curve	Angle No.	Angle	Steel Strength	Max Usage	Max Cont-	Comp. In Member	Comp. Control	Comp. Force	Comp. Control	L/R Capacity	Comp. Connect.	Comp. Connect.	RLX	RLY	RLZ
Label	Desc.	Type		Size	(ksi)	%	Use	Use	Case	(kips)	(kips)	(kips)	(kips)	(kips)			
Comp. No.	Of						rol	In	Member	Load	Shear	Bearing					
Member	Bolts							Comp.		Case	Capacity	Capacity					
Comp. (ft)																	

Leg1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	15.81	Comp	15.81	g3P	-4.465	NESC Ext	28.236	36.400	56.250	1.000	1.000	1.000
98.73	98.73	4.040	1	4 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g3P g3X g3XY g3Y ??												
Leg2	L4x4x1/4	SAE	4X4X0.25	33.0	83.41	Comp	83.41	g14P	-45.541	NESC Ext	57.260	54.600	84.375	1.000	1.000	1.000
60.53	60.53	4.010	1	6 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g4P g4X g4XY g4Y g5P g5X g5XY g5Y g6P g6X g6XY g6Y g78P g78X g78XY g78Y g12P g12X g12XY g12Y ??												
Leg3	L4x4x5/16	SAE	4X4X0.3125	33.0	86.35	Comp	86.35	g18P	-56.989	NESC Ext	66.000	91.000	175.781	1.000	1.000	1.000
76.04	76.04	5.012	1	10												
Leg4	L4x4x3/8	SAE	4X4X0.375	33.0	83.97	Comp	83.97	g22P	-65.940	NESC Ext	78.530	91.000	210.937	1.000	1.000	1.000
76.33	76.33	5.012	1	10												
Leg5	L5x5x5/16	SAE	5X5X0.3125	33.0	78.05	Comp	78.05	g24P	-69.807	NESC Ext	89.437	91.000	175.781	1.000	1.000	1.000
60.51	60.51	5.012	1	10												
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	23.75	Tens	13.18	g27P	-1.200	NESC Ext	12.655	9.100	10.547	1.000	1.000	1.000
110.08	115.04	3.146	3	1												
Diag2	L2x1.5x1/4	SAU	2X1.5X0.25	33.0	50.64	Cross	50.64	g87P	-7.298	NESC Ext	14.412	18.200	28.125	0.500	1.000	0.500
130.47	126.44	4.697	6	2												
Diag3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.42	Tens	71.06	g50P	-6.466	NESC Ext	13.824	9.100	10.547	1.000	0.545	0.545
92.15	106.07	4.124	3	1												
Horz1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	6.71	Tens	4.33	g77P	-0.394	NESC Ext	17.529	9.100	10.547	1.000	1.000	1.000
20.99	70.50	0.600	3	1												
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	63.69	Tens	49.20	g79X	-4.478	NESC Ext	20.749	9.100	10.547	1.000	1.000	1.000
56.21	88.10	2.000	3	1												
ARM	CH5x6.7	Ch	C5x6.7	33.0	4.69	Tens	3.39	g84P	-0.616	NESC Ext	22.496	18.200	21.375	1.000	1.000	1.000
117.20	118.60	4.776	3	2 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g80XY g80Y g81P g81Y g82P g82X g82XY g82Y g83P g83Y g84P g84X g84XY g84Y g85P g85Y ??												
InnBrace	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	5.43	Tens	0.00	g93X	0.000		13.392	9.100	10.547	1.000	1.000	1.000
98.95	109.48	2.828	3	1												
Horz3	CH7x9.8	Ch	C7x9.8	33.0	33.45	Tens	20.77	g96X	-4.836	NESC Ext	23.284	27.300	35.437	1.000	1.000	1.000
48.73	84.37	2.347	3	3												

Group Summary (Tension Portion):

Group No.	Hole Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Max Usage Cont-rol	Max Tension Use	Tension Control In Member	Tension Force Control	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Tension Length (ft)	No. Of Bolts
(in)								Tens. %		(kips)		Capacity (kips)	Capacity (kips)	Capacity (kips)		Tens.

Leg1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	15.81	Comp	12.94	g3XY	3.614	NESC Ext	27.926	36.400	56.250	62.500	4.040	4
2.000	0.6875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g3P g3X g3XY g3Y ??														
Leg2	L4x4x1/4	SAE	4X4X0.25	33.0	83.41	Comp	78.36	g14XY	41.280	NESC Ext	52.676	54.600	84.375	93.750	4.010	6
2.000	0.6875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g4P g4X g4XY g4Y g5P g5X g5XY g5Y g6P g6X g6XY g6Y g78P g78X g78XY g78Y g12P g12X g12XY g12Y ??														
Leg3	L4x4x5/16	SAE	4X4X0.3125	33.0	86.35	Comp	80.59	g18XY	52.397	NESC Ext	65.020	91.000	175.781	195.312	5.012	10
2.000	0.6875															
Leg4	L4x4x3/8	SAE	4X4X0.375	33.0	83.97	Comp	78.44	g22XY	60.685	NESC Ext	77.364	91.000	210.937	220.588	5.012	10
2.000	0.6875															
Leg5	L5x5x5/16	SAE	5X5X0.3125	33.0	78.05	Comp	74.83	g24XY	64.211	NESC Ext	85.810	91.000	175.781	195.312	5.012	10
2.000	0.6875															
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	23.75	Tens	23.75	g25P	1.649	NESC Ext	14.585	9.100	10.547	6.943	3.146	1
1.000	0.6875															

1.000	Diag2	L2x1.5x1/4	SAU	2X1.5X0.25	33.0	50.64	Cross	36.76	g87X	6.690	NESC Ext	18.952	18.200	28.125	25.000	4.697	2
1.000	Diag3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.42	Tens	86.42	g50X	6.000	NESC Ext	14.585	9.100	10.547	6.943	4.124	1
1.000	Horz1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	6.71	Tens	6.71	g89Y	0.466	NESC Ext	14.585	9.100	10.547	6.943	1.200	1
1.000	Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	63.69	Tens	63.69	g79P	4.915	NESC Ext	17.444	9.100	10.547	7.717	2.000	1
2.000	ARM	CH5x6.7	Ch	C5x6.7	33.0	4.69	Tens	4.69	g85P	0.853	NESC Hea	50.750	18.200	21.375	21.375	2.000	2
0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g80XY g80Y g81P g81Y g82P g82X g82XY g82Y g83P g83Y g84P g84X g84XY g84Y g85P g85Y ??																	
1.000	InnBrace	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	5.43	Tens	5.43	g93X	0.377	NESC Hea	14.585	9.100	10.547	6.943	2.828	1
3.000	Horz3	CH7x9.8	Ch	C7x9.8	33.0	33.45	Tens	33.45	g95P	5.268	NESC Ext	72.375	27.300	35.437	15.750	2.000	3

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	55.25	g14P	Angle
NESC Extreme	86.42	g50X	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	4.49	NESC Heavy	0.0
2	Clamp	4.50	NESC Heavy	0.0
3	Clamp	4.49	NESC Heavy	0.0
4	Clamp	4.50	NESC Heavy	0.0
5	Clamp	4.49	NESC Heavy	0.0
6	Clamp	4.50	NESC Heavy	0.0
9	Clamp	0.31	NESC Extreme	0.0
10	Clamp	0.56	NESC Heavy	0.0
12	Clamp	0.56	NESC Heavy	0.0
13	Clamp	0.45	NESC Extreme	0.0
14	Clamp	0.58	NESC Heavy	0.0
15	Clamp	0.59	NESC Extreme	0.0
16	Clamp	0.59	NESC Heavy	0.0
17	Clamp	0.60	NESC Heavy	0.0
18	Clamp	0.63	NESC Heavy	0.0
19	Clamp	2.60	NESC Heavy	0.0
20	Clamp	0.74	NESC Extreme	0.0
21	Clamp	0.74	NESC Extreme	0.0
22	Clamp	0.74	NESC Extreme	0.0
23	Clamp	0.31	NESC Extreme	0.0
24	Clamp	0.56	NESC Heavy	0.0
25	Clamp	0.56	NESC Heavy	0.0
26	Clamp	0.45	NESC Extreme	0.0



27	Clamp	0.58	NESC Heavy	0.0
28	Clamp	0.59	NESC Extreme	0.0
29	Clamp	0.59	NESC Heavy	0.0
30	Clamp	0.60	NESC Heavy	0.0
31	Clamp	0.63	NESC Heavy	0.0

\*\*\* Weight of structure (lbs):  
Weight of Angles\*Section DLF: 5535.7  
Total: 5535.7

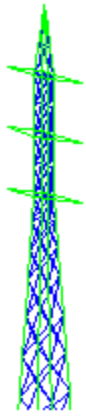
\*\*\* End of Report

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\*  
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\*  
\*\*\*\*\*

Project Name : 11009.CO9 - Darien, CT  
Project Notes: CL&P Structure # 1182 / AT&T 5011  
Project File : J:\Jobs\1607100.WI\53\_Darien CT5011\04\_Structural\Backup Documentation\Rev (1)\Calcs\PLS Tower\Darien - 1182.tow  
Date run : 1:47:40 PM Wednesday, January 25, 2017  
by : Tower Version 12.50  
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

w/t equals 26.30 for member "g80P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g80X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g80XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g80Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g81P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g81Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g82P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g82X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g82XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g82Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g83P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g83Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g84P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g84X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g84XY" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g84Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g85P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 26.30 for member "g85Y" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g94P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g94X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g95P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g95X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g96P" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
w/t equals 33.30 for member "g96X" which exceeds ASCE 10 section 3.7.1 limit of 25. ??  
The model has 24 warnings. ??



Nonlinear convergence parameters: Use Standard Parameters  
 Member check option: ASCE 10  
 Connection rupture check: ASCE 10  
 Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]  
 Included angle check: None  
 Climbing load check: None  
 Redundant members checked with: Actual Force

**Joints Geometry:**

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
1P	None	0	0	90	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	1	1	80	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	1	1	75.75	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	1	1	71.5	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	1	1	67.25	Free	Free	Free	Free	Free	Free
12P	XY-Symmetry	1	1	63	Free	Free	Free	Free	Free	Free
13P	XY-Symmetry	4.125	4.125	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
26P	X-Symmetry	0	5.67	80	Free	Free	Free	Free	Free	Free
27P	X-Symmetry	0	5.67	71.5	Free	Free	Free	Free	Free	Free
28P	X-Symmetry	0	5.67	63	Free	Free	Free	Free	Free	Free
4X	X-GenXY	1	-1	80	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-1	-1	80	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-1	1	80	Free	Free	Free	Free	Free	Free
5X	X-GenXY	1	-1	75.75	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-1	-1	75.75	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-1	1	75.75	Free	Free	Free	Free	Free	Free
6X	X-GenXY	1	-1	71.5	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-1	-1	71.5	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-1	1	71.5	Free	Free	Free	Free	Free	Free
7X	X-GenXY	1	-1	67.25	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-1	-1	67.25	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-1	1	67.25	Free	Free	Free	Free	Free	Free
12X	X-GenXY	1	-1	63	Free	Free	Free	Free	Free	Free

12XY	XY-GenXY	-1	-1	63	Free	Free	Free	Free	Free	Free
12Y	Y-GenXY	-1	1	63	Free	Free	Free	Free	Free	Free
13X	X-GenXY	4.125	-4.125	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
13XY	XY-GenXY	-4.125	-4.125	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
13Y	Y-GenXY	-4.125	4.125	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
26X	X-Gen	0	-5.67	80	Free	Free	Free	Free	Free	Free
27X	X-Gen	0	-5.67	71.5	Free	Free	Free	Free	Free	Free
28X	X-Gen	0	-5.67	63	Free	Free	Free	Free	Free	Free

Secondary Joints:

Joint Label	Symmetry Code	Origin Joint	End Joint	Fraction	Elevation	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
(ft)											
2S	XY-Symmetry	1P	4P	0	87	Free	Free	Free	Free	Free	Free
3S	XY-Symmetry	1P	4P	0	84	Free	Free	Free	Free	Free	Free
14S	XY-Symmetry	12P	13P	0	59.5	Free	Free	Free	Free	Free	Free
15S	XY-Symmetry	12P	13P	0	55.5	Free	Free	Free	Free	Free	Free
16S	XY-Symmetry	12P	13P	0	51.5	Free	Free	Free	Free	Free	Free
17S	XY-Symmetry	12P	13P	0	46	Free	Free	Free	Free	Free	Free
18S	XY-Symmetry	12P	13P	0	40.5	Free	Free	Free	Free	Free	Free
19S	XY-Symmetry	12P	13P	0	35	Free	Free	Free	Free	Free	Free
20S	XY-Symmetry	12P	13P	0	30	Free	Free	Free	Free	Free	Free
21S	XY-Symmetry	12P	13P	0	25	Free	Free	Free	Free	Free	Free
22S	XY-Symmetry	12P	13P	0	20	Free	Free	Free	Free	Free	Free
23S	XY-Symmetry	12P	13P	0	15	Free	Free	Free	Free	Free	Free
24S	XY-Symmetry	12P	13P	0	10	Free	Free	Free	Free	Free	Free
25S	XY-Symmetry	12P	13P	0	5	Free	Free	Free	Free	Free	Free
2X	X-GenXY	1P	4P	0	87	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	1P	4P	0	87	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	1P	4P	0	87	Free	Free	Free	Free	Free	Free
3X	X-GenXY	1P	4P	0	84	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	1P	4P	0	84	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	1P	4P	0	84	Free	Free	Free	Free	Free	Free
14X	X-GenXY	12P	13P	0	59.5	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	12P	13P	0	59.5	Free	Free	Free	Free	Free	Free
14Y	Y-GenXY	12P	13P	0	59.5	Free	Free	Free	Free	Free	Free
15X	X-GenXY	12P	13P	0	55.5	Free	Free	Free	Free	Free	Free
15XY	XY-GenXY	12P	13P	0	55.5	Free	Free	Free	Free	Free	Free
15Y	Y-GenXY	12P	13P	0	55.5	Free	Free	Free	Free	Free	Free
16X	X-GenXY	12P	13P	0	51.5	Free	Free	Free	Free	Free	Free
16XY	XY-GenXY	12P	13P	0	51.5	Free	Free	Free	Free	Free	Free
16Y	Y-GenXY	12P	13P	0	51.5	Free	Free	Free	Free	Free	Free
17X	X-GenXY	12P	13P	0	46	Free	Free	Free	Free	Free	Free
17XY	XY-GenXY	12P	13P	0	46	Free	Free	Free	Free	Free	Free
17Y	Y-GenXY	12P	13P	0	46	Free	Free	Free	Free	Free	Free
18X	X-GenXY	12P	13P	0	40.5	Free	Free	Free	Free	Free	Free
18XY	XY-GenXY	12P	13P	0	40.5	Free	Free	Free	Free	Free	Free
18Y	Y-GenXY	12P	13P	0	40.5	Free	Free	Free	Free	Free	Free
19X	X-GenXY	12P	13P	0	35	Free	Free	Free	Free	Free	Free
19XY	XY-GenXY	12P	13P	0	35	Free	Free	Free	Free	Free	Free
19Y	Y-GenXY	12P	13P	0	35	Free	Free	Free	Free	Free	Free
20X	X-GenXY	12P	13P	0	30	Free	Free	Free	Free	Free	Free
20XY	XY-GenXY	12P	13P	0	30	Free	Free	Free	Free	Free	Free
20Y	Y-GenXY	12P	13P	0	30	Free	Free	Free	Free	Free	Free
21X	X-GenXY	12P	13P	0	25	Free	Free	Free	Free	Free	Free
21XY	XY-GenXY	12P	13P	0	25	Free	Free	Free	Free	Free	Free
21Y	Y-GenXY	12P	13P	0	25	Free	Free	Free	Free	Free	Free



22X	X-GenXY	12P	13P	0	20	Free	Free	Free	Free	Free	Free
22XY	XY-GenXY	12P	13P	0	20	Free	Free	Free	Free	Free	Free
22Y	Y-GenXY	12P	13P	0	20	Free	Free	Free	Free	Free	Free
23X	X-GenXY	12P	13P	0	15	Free	Free	Free	Free	Free	Free
23XY	XY-GenXY	12P	13P	0	15	Free	Free	Free	Free	Free	Free
23Y	Y-GenXY	12P	13P	0	15	Free	Free	Free	Free	Free	Free
24X	X-GenXY	12P	13P	0	10	Free	Free	Free	Free	Free	Free
24XY	XY-GenXY	12P	13P	0	10	Free	Free	Free	Free	Free	Free
24Y	Y-GenXY	12P	13P	0	10	Free	Free	Free	Free	Free	Free
25X	X-GenXY	12P	13P	0	5	Free	Free	Free	Free	Free	Free
25XY	XY-GenXY	12P	13P	0	5	Free	Free	Free	Free	Free	Free
25Y	Y-GenXY	12P	13P	0	5	Free	Free	Free	Free	Free	Free

The model contains 31 primary and 56 secondary joints for a total of 87 joints.

**Steel Material Properties:**

Steel Material Label	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Member All. Stress Hyp. 1 (ksi)	Member All. Stress Hyp. 2 (ksi)	Member Rupture Hyp. 1 (ksi)	Member Rupture Hyp. 2 (ksi)	Member Bearing Hyp. 1 (ksi)	Member Bearing Hyp. 2 (ksi)
A7	2.9e+004	33	60	0	0	0	0	0	0

**Bolt Properties:**

Bolt Label	Bolt Diameter (in)	Hole Diameter (in)	Ultimate Shear Capacity (kips)	Default End Distance (in)	Default Bolt Spacing (in)	Shear Capacity Hyp. 1 (kips)	Shear Capacity Hyp. 2 (kips)
5/8 A394	0.625	0.6875	9.1	1.125	1.5	0	0

**Number Bolts Used By Type:**

Bolt Type	Number Bolts
5/8 A394	410

**Angle Properties:**

Angle Type	Angle Size (in)	Long Leg (in)	Short Leg (in)	Thick. (in)	Unit Weight (lbs/ft)	Gross Area (in^2)	w/t Ratio	Radius of Gyration Rx (in)	Radius of Gyration Ry (in)	Radius of Gyration Rz (in)	Number of Angles	Wind Width (in)	Short Edge Dist. (in)	Long Edge Dist. (in)	Optimize Cost Factor	Section Modulus (in^3)
SAE	5X5X0.3125	5	5	0.3125	10.3	3.03	13.4	1.57	1.57	0.994	1	5	2.5	0	1.0000	0
SAE	4X4X0.375	4	4	0.375	9.8	2.86	8.67	1.23	1.23	0.788	1	4	2	0	1.0000	0
SAE	4X4X0.3125	4	4	0.3125	8.2	2.4	10.6	1.24	1.24	0.791	1	4	2	0	1.0000	0
SAE	4X4X0.25	4	4	0.25	6.6	1.94	13.5	1.25	1.25	0.795	1	4	2	0	1.0000	0
SAE	2.5X2.5X0.25	2.5	2.5	0.25	4.1	1.19	7.75	0.769	0.769	0.491	1	2.5	1.25	0	1.0000	0
SAE	1.75X1.75X0.1875	1.75	1.75	0.1875	2.12	0.62	6	0.537	0.537	0.343	1	1.75	0.875	0	1.0000	0
SAU	2.5X2X0.1875	2.5	2	0.1875	2.75	0.81	10.67	0.793	0.6	0.427	1	2.5	1	0	1.0000	0
SAU	2X1.5X0.25	2	1.5	0.25	2.77	0.81	6	0.623	0.432	0.32	1	2	0.75	0	1.0000	0
Ch	C5x6.7	5	1.75	0.19	6.7	1.97	26.3	0.489	1.95	0.489	1	5	0	0	1.0000	0
Ch	C7x9.8	7	2.09	0.21	9.8	2.87	33.3	0.578	2.72	0.578	1	7	0	0	1.0000	0

**Angle Groups:**

Group Label	Group Description	Angle Type	Material Size	Material Type	Element Type	Group Type	Optimize Group	Allow. Angle	Add. Width For Optimize (in)
Leg1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Beam	Leg	None	0.000	
Leg2	L4x4x1/4	SAE	4X4X0.25	A7	Beam	Leg	None	0.000	
Leg3	L4x4x5/16	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000	
Leg4	L4x4x3/8	SAE	4X4X0.375	A7	Beam	Leg	None	0.000	
Leg5	L5x5x5/16	SAE	5X5X0.3125	A7	Beam	Leg	None	0.000	
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000	
Diag2	L2x1.5x1/4	SAU	2X1.5X0.25	A7	Truss	Crossing Diagonal	None	0.000	
Diag3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000	
Horz1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000	
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000	
ARM	CH5x6.7	Ch	C5x6.7	A7	Beam	Other	None	0.000	
InnBrace	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000	
Horz3	CH7x9.8	Ch	C7x9.8	A7	Truss	Other	None	0.000	

**Aggregate Angle Information:**

Note: Estimate of surface area reported for painting purposes, not wind loading.

Angle Type	Angle Material Size	Material Type	Total Length (ft)	Total Surface Area (ft^2)	Total Weight (lbs)
SAE	2.5X2.5X0.25	A7	40.40	33.67	165.63
SAE	4X4X0.25	A7	114.11	152.15	753.15
SAE	4X4X0.3125	A7	86.21	114.95	706.93
SAE	4X4X0.375	A7	80.20	106.93	785.93
SAE	5X5X0.3125	A7	40.10	66.83	413.01
SAE	1.75X1.75X0.1875	A7	789.11	460.31	1672.90
SAU	2X1.5X0.25	A7	150.31	87.68	416.35
SAU	2.5X2X0.1875	A7	12.00	9.00	33.00
Ch	C5x6.7	A7	69.31	77.97	464.38
Ch	C7x9.8	A7	12.69	19.23	124.41

**Sections:**

The adjustment factors below only apply to dead load and wind areas that are calculated for members in the model. They do not apply to equipment or to manually input dead load and drag areas.

Section Label	Joint Defining Section	Dead Load Adjust. Factor	Transverse Drag x Area Factor For Face	Longitudinal Drag x Area Factor For Face	Transverse Area Factor (CD From Code)	Longitudinal Area Factor (CD From Code)	Af Factor For Face	Flat Only	Ar Factor For Face	Round Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Drag x Area Factor	Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	14X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	None
2	18X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	None
3	13X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	None

**Angle Member Connectivity:**

Member Label Path	Group Label Path	Section Label	Symmetry Code	Origin Joint	End Joint	Ecc. Code	Rest. Code	Ratio RLX	Ratio RLY	Ratio RLZ	Bolt Type	# Bolts	# Holes	Bolt # Shear Planes	Connect Leg	Short Edge	Long Edge	End Dist.	Bolt Spacing	

Length														Dist. Dist.				
(in)	(in)													(in)	(in)	(in)	(in)	
0	g1P	Leg1	XY-Symmetry	1P	2S	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g1X	Leg1	X-GenXY	1P	2X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g1XY	Leg1	XY-GenXY	1P	2XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g1Y	Leg1	Y-GenXY	1P	2Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g2P	Leg1	XY-Symmetry	2S	3S	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g2X	Leg1	X-GenXY	2X	3X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g2XY	Leg1	XY-GenXY	2XY	3XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g2Y	Leg1	Y-GenXY	2Y	3Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g3P	Leg1	XY-Symmetry	3S	4P	1	4	1	1	1 5/8	A394	4	2	1	Both 1.15625	0	1.25	3
0	g3X	Leg1	X-GenXY	3X	4X	1	4	1	1	1 5/8	A394	4	2	1	Both 1.15625	0	1.25	3
0	g3XY	Leg1	XY-GenXY	3XY	4XY	1	4	1	1	1 5/8	A394	4	2	1	Both 1.15625	0	1.25	3
0	g3Y	Leg1	Y-GenXY	3Y	4Y	1	4	1	1	1 5/8	A394	4	2	1	Both 1.15625	0	1.25	3
0	g4P	Leg2	XY-Symmetry	4P	5P	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g4X	Leg2	X-GenXY	4X	5X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g4XY	Leg2	XY-GenXY	4XY	5XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g4Y	Leg2	Y-GenXY	4Y	5Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g5P	Leg2	XY-Symmetry	5P	6P	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g5X	Leg2	X-GenXY	5X	6X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g5XY	Leg2	XY-GenXY	5XY	6XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g5Y	Leg2	Y-GenXY	5Y	6Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g6P	Leg2	XY-Symmetry	6P	7P	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g6X	Leg2	X-GenXY	6X	7X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g6XY	Leg2	XY-GenXY	6XY	7XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g6Y	Leg2	Y-GenXY	6Y	7Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g78P	Leg2	XY-Symmetry	7P	12P	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g78X	Leg2	X-GenXY	7X	12X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	
0	g78XY	Leg2	XY-GenXY	7XY	12XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	

0	0	0																	
0	g78Y	Leg2	Y-GenXY	7Y	12Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g12P	Leg2	XY-Symmetry	12P	14S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g12X	Leg2	X-GenXY	12X	14X	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g12XY	Leg2	XY-GenXY	12XY	14XY	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g12Y	Leg2	Y-GenXY	12Y	14Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g13P	Leg2	XY-Symmetry	14S	15S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g13X	Leg2	X-GenXY	14X	15X	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g13XY	Leg2	XY-GenXY	14XY	15XY	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g13Y	Leg2	Y-GenXY	14Y	15Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g14P	Leg2	XY-Symmetry	15S	16S	1	4	1	1	1 5/8	A394	6	2	1	Both	1.75	0	1.25	4
0	0	0																	
0	g14X	Leg2	X-GenXY	15X	16X	1	4	1	1	1 5/8	A394	6	2	1	Both	1.75	0	1.25	4
0	0	0																	
0	g14XY	Leg2	XY-GenXY	15XY	16XY	1	4	1	1	1 5/8	A394	6	2	1	Both	1.75	0	1.25	4
0	0	0																	
0	g14Y	Leg2	Y-GenXY	15Y	16Y	1	4	1	1	1 5/8	A394	6	2	1	Both	1.75	0	1.25	4
0	0	0																	
0	g15P	Leg3	XY-Symmetry	16S	17S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g15X	Leg3	X-GenXY	16X	17X	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g15XY	Leg3	XY-GenXY	16XY	17XY	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g15Y	Leg3	Y-GenXY	16Y	17Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g16P	Leg3	XY-Symmetry	17S	18S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g16X	Leg3	X-GenXY	17X	18X	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g16XY	Leg3	XY-GenXY	17XY	18XY	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g16Y	Leg3	Y-GenXY	17Y	18Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g17P	Leg3	XY-Symmetry	18S	19S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g17X	Leg3	X-GenXY	18X	19X	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g17XY	Leg3	XY-GenXY	18XY	19XY	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g17Y	Leg3	Y-GenXY	18Y	19Y	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	
0	0	0																	
0	g18P	Leg3	XY-Symmetry	19S	20S	1	4	1	1	1 5/8	A394	10	2	1	Both	1.375	0	1.25	2.25
0	0	0																	
0	g18X	Leg3	X-GenXY	19X	20X	1	4	1	1	1 5/8	A394	10	2	1	Both	1.375	0	1.25	2.25
0	0	0																	
0	g18XY	Leg3	XY-GenXY	19XY	20XY	1	4	1	1	1 5/8	A394	10	2	1	Both	1.375	0	1.25	2.25
0	0	0																	
0	g18Y	Leg3	Y-GenXY	19Y	20Y	1	4	1	1	1 5/8	A394	10	2	1	Both	1.375	0	1.25	2.25
0	0	0																	
0	g19P	Leg4	XY-Symmetry	20S	21S	1	4	1	1	1 5/8	A394	0	2	0		0	0	0	



0	0	0																	
0	g19X	Leg4	X-GenXY	20X	21X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g19XY	Leg4	XY-GenXY	20XY	21XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g19Y	Leg4	Y-GenXY	20Y	21Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g20P	Leg4	XY-Symmetry	21S	22S	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g20X	Leg4	X-GenXY	21X	22X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g20XY	Leg4	XY-GenXY	21XY	22XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g20Y	Leg4	Y-GenXY	21Y	22Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g21P	Leg4	XY-Symmetry	22S	23S	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g21X	Leg4	X-GenXY	22X	23X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g21XY	Leg4	XY-GenXY	22XY	23XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g21Y	Leg4	Y-GenXY	22Y	23Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g22P	Leg4	XY-Symmetry	23S	24S	1	4	1	1	1 5/8	A394	10	2	1	Both	1	0	1.25	2.5
0	0	0																	
0	g22X	Leg4	X-GenXY	23X	24X	1	4	1	1	1 5/8	A394	10	2	1	Both	1	0	1.25	2.5
0	0	0																	
0	g22XY	Leg4	XY-GenXY	23XY	24XY	1	4	1	1	1 5/8	A394	10	2	1	Both	1	0	1.25	2.5
0	0	0																	
0	g22Y	Leg4	Y-GenXY	23Y	24Y	1	4	1	1	1 5/8	A394	10	2	1	Both	1	0	1.25	2.5
0	0	0																	
0	g23P	Leg5	XY-Symmetry	24S	25S	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g23X	Leg5	X-GenXY	24X	25X	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g23XY	Leg5	XY-GenXY	24XY	25XY	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g23Y	Leg5	Y-GenXY	24Y	25Y	1	4	1	1	1 5/8	A394	0	2	0	0	0	0	0	
0	0	0																	
0	g24P	Leg5	XY-Symmetry	25S	13P	1	4	1	1	1 5/8	A394	10	2	1	Both	1.65625	0	1.25	2.875
0	0	0																	
0	g24X	Leg5	X-GenXY	25X	13X	1	4	1	1	1 5/8	A394	10	2	1	Both	1.65625	0	1.25	2.875
0	0	0																	
0	g24XY	Leg5	XY-GenXY	25XY	13XY	1	4	1	1	1 5/8	A394	10	2	1	Both	1.65625	0	1.25	2.875
0	0	0																	
0	g24Y	Leg5	Y-GenXY	25Y	13Y	1	4	1	1	1 5/8	A394	10	2	1	Both	1.65625	0	1.25	2.875
0	0	0																	
0	g25P	Diag1	None	2S	3X	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g26P	Diag1	None	2X	3XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g27P	Diag1	None	2XY	3Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g28P	Diag1	None	2Y	3S	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g29P	Diag1	None	3S	4X	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g30P	Diag1	None	3X	4XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g31P	Diag1	None	3XY	4Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0

0	0	0																	
0	g32P	Diag1	None	3Y	4P	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g33P	Diag2	XY-Symmetry	4X	5P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g33X	Diag2	X-GenXY	4P	5X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g33XY	Diag2	XY-GenXY	4Y	5XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g33Y	Diag2	Y-GenXY	4XY	5Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g34P	Diag2	XY-Symmetry	4P	5Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g34X	Diag2	X-GenXY	4X	5XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g34XY	Diag2	XY-GenXY	4XY	5X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g34Y	Diag2	Y-GenXY	4Y	5P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g35P	Diag2	XY-Symmetry	5X	6P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g35X	Diag2	X-GenXY	5P	6X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g35XY	Diag2	XY-GenXY	5Y	6XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g35Y	Diag2	Y-GenXY	5XY	6Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g36P	Diag2	XY-Symmetry	5P	6Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g36X	Diag2	X-GenXY	5X	6XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g36XY	Diag2	XY-GenXY	5XY	6X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g36Y	Diag2	Y-GenXY	5Y	6P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g37P	Diag2	XY-Symmetry	6X	7P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g37X	Diag2	X-GenXY	6P	7X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g37XY	Diag2	XY-GenXY	6Y	7XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g37Y	Diag2	Y-GenXY	6XY	7Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g38P	Diag2	XY-Symmetry	6P	7Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g38X	Diag2	X-GenXY	6X	7XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g38XY	Diag2	XY-GenXY	6XY	7X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g38Y	Diag2	Y-GenXY	6Y	7P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.4375
0	0	0																	
0	g86P	Diag2	XY-Symmetry	7X	12P	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.5
0	0	0																	
0	g86X	Diag2	X-GenXY	7P	12X	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.5
0	0	0																	
0	g86XY	Diag2	XY-GenXY	7Y	12XY	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.5
0	0	0																	
0	g86Y	Diag2	Y-GenXY	7XY	12Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	2.5
0	0	0																	
0	g87P	Diag2	XY-Symmetry	7P	12Y	2	5	0.5	0.75	0.5 5/8	A394	2	1	1	Long only	0.875	0	1	3.6875

0	0	0																		
0	g87X	Diag2	X-GenXY	7X	12XY	2	5	0.5	0.75	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	3.6875
0	g87XY	Diag2	XY-GenXY	7XY	12X	2	5	0.5	0.75	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	3.6875
0	g87Y	Diag2	Y-GenXY	7Y	12P	2	5	0.5	0.75	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	3.6875
0	g49P	Diag3	XY-Symmetry	12X	14S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g49X	Diag3	X-GenXY	12P	14X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g49XY	Diag3	XY-GenXY	12Y	14XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g49Y	Diag3	Y-GenXY	12XY	14Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g50P	Diag3	XY-Symmetry	12P	14Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g50X	Diag3	X-GenXY	12X	14XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g50XY	Diag3	XY-GenXY	12XY	14X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g50Y	Diag3	Y-GenXY	12Y	14S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g51P	Diag3	XY-Symmetry	14X	15S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g51X	Diag3	X-GenXY	14S	15X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g51XY	Diag3	XY-GenXY	14Y	15XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g51Y	Diag3	Y-GenXY	14XY	15Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g52P	Diag3	XY-Symmetry	14S	15Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g52X	Diag3	X-GenXY	14X	15XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g52XY	Diag3	XY-GenXY	14XY	15X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g52Y	Diag3	Y-GenXY	14Y	15S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g53P	Diag3	XY-Symmetry	15X	16S	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g53X	Diag3	X-GenXY	15S	16X	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g53XY	Diag3	XY-GenXY	15Y	16XY	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g53Y	Diag3	Y-GenXY	15XY	16Y	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g54P	Diag3	XY-Symmetry	15S	16Y	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g54X	Diag3	X-GenXY	15X	16XY	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g54XY	Diag3	XY-GenXY	15XY	16X	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g54Y	Diag3	Y-GenXY	15Y	16S	2	4	0.769	0.539	0.539	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g55P	Diag3	XY-Symmetry	16X	17S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g55X	Diag3	X-GenXY	16S	17X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g55XY	Diag3	XY-GenXY	16Y	17XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0

0	0	0																		
0	g55Y	Diag3	Y-GenXY	16XY	17Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g56P	Diag3	XY-Symmetry	16S	17Y	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g56X	Diag3	X-GenXY	16X	17XY	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g56XY	Diag3	XY-GenXY	16XY	17X	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g56Y	Diag3	Y-GenXY	16Y	17S	2	4	0.773	0.545	0.545	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g57P	Diag3	XY-Symmetry	17X	18S	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g57X	Diag3	X-GenXY	17S	18X	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g57XY	Diag3	XY-GenXY	17Y	18XY	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g57Y	Diag3	Y-GenXY	17XY	18Y	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g58P	Diag3	XY-Symmetry	17S	18Y	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g58X	Diag3	X-GenXY	17X	18XY	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g58XY	Diag3	XY-GenXY	17XY	18X	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g58Y	Diag3	Y-GenXY	17Y	18S	2	4	0.769	0.537	0.537	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g59P	Diag3	XY-Symmetry	18X	19S	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g59X	Diag3	X-GenXY	18S	19X	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g59XY	Diag3	XY-GenXY	18Y	19XY	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g59Y	Diag3	Y-GenXY	18XY	19Y	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g60P	Diag3	XY-Symmetry	18S	19Y	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g60X	Diag3	X-GenXY	18X	19XY	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g60XY	Diag3	XY-GenXY	18XY	19X	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g60Y	Diag3	Y-GenXY	18Y	19S	2	4	0.766	0.531	0.531	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g61P	Diag3	XY-Symmetry	19X	20S	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g61X	Diag3	X-GenXY	19S	20X	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g61XY	Diag3	XY-GenXY	19Y	20XY	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g61Y	Diag3	Y-GenXY	19XY	20Y	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g62P	Diag3	XY-Symmetry	19S	20Y	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g62X	Diag3	X-GenXY	19X	20XY	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g62XY	Diag3	XY-GenXY	19XY	20X	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g62Y	Diag3	Y-GenXY	19Y	20S	2	4	0.763	0.527	0.527	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g63P	Diag3	XY-Symmetry	20X	21S	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0

0	0	0																		
0	g63X	Diag3	X-GenXY	20S	21X	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g63XY	Diag3	XY-GenXY	20Y	21XY	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g63Y	Diag3	Y-GenXY	20XY	21Y	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g64P	Diag3	XY-Symmetry	20S	21Y	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g64X	Diag3	X-GenXY	20X	21XY	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g64XY	Diag3	XY-GenXY	20XY	21X	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g64Y	Diag3	Y-GenXY	20Y	21S	2	4	0.762	0.524	0.524	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g65P	Diag3	XY-Symmetry	21X	22S	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g65X	Diag3	X-GenXY	21S	22X	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g65XY	Diag3	XY-GenXY	21Y	22XY	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g65Y	Diag3	Y-GenXY	21XY	22Y	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g66P	Diag3	XY-Symmetry	21S	22Y	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g66X	Diag3	X-GenXY	21X	22XY	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g66XY	Diag3	XY-GenXY	21XY	22X	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g66Y	Diag3	Y-GenXY	21Y	22S	2	4	0.761	0.522	0.522	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g67P	Diag3	XY-Symmetry	22X	23S	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g67X	Diag3	X-GenXY	22S	23X	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g67XY	Diag3	XY-GenXY	22Y	23XY	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g67Y	Diag3	Y-GenXY	22XY	23Y	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g68P	Diag3	XY-Symmetry	22S	23Y	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g68X	Diag3	X-GenXY	22X	23XY	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g68XY	Diag3	XY-GenXY	22XY	23X	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g68Y	Diag3	Y-GenXY	22Y	23S	2	4	0.76	0.52	0.52	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g69P	Diag3	XY-Symmetry	23X	24S	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g69X	Diag3	X-GenXY	23S	24X	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g69XY	Diag3	XY-GenXY	23Y	24XY	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g69Y	Diag3	Y-GenXY	23XY	24Y	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g70P	Diag3	XY-Symmetry	23S	24Y	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g70X	Diag3	X-GenXY	23X	24XY	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	g70XY	Diag3	XY-GenXY	23XY	24X	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0



0	0	0																		
0	g70Y	Diag3	Y-GenXY	23Y	24S	2	4	0.759	0.518	0.518	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g71P	Diag3	XY-Symmetry	24X	25S	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g71X	Diag3	X-GenXY	24S	25X	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g71XY	Diag3	XY-GenXY	24Y	25XY	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g71Y	Diag3	Y-GenXY	24XY	25Y	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g72P	Diag3	XY-Symmetry	24S	25Y	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g72X	Diag3	X-GenXY	24X	25XY	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g72XY	Diag3	XY-GenXY	24XY	25X	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g72Y	Diag3	Y-GenXY	24Y	25S	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g73P	Diag3	XY-Symmetry	25X	13P	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g73X	Diag3	X-GenXY	25S	13X	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g73XY	Diag3	XY-GenXY	25Y	13XY	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g73Y	Diag3	Y-GenXY	25XY	13Y	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g74P	Diag3	XY-Symmetry	25S	13Y	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g74X	Diag3	X-GenXY	25X	13XY	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g74XY	Diag3	XY-GenXY	25XY	13X	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g74Y	Diag3	Y-GenXY	25Y	13P	2	4	0.758	0.517	0.517	5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																		
0	g75P	Horz2	X-Symmetry	4P	4Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g75X	Horz2	X-Gen	4X	4XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g76P	Horz2	X-Symmetry	6P	6Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g76X	Horz2	X-Gen	6X	6XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g79P	Horz2	X-Symmetry	12P	12Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g79X	Horz2	X-Gen	12X	12XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0
0	0	0																		
0	g80P	ARM	XY-Symmetry	26X	4X	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g80X	ARM	X-GenXY	26P	4P	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g80XY	ARM	XY-GenXY	26P	4Y	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g80Y	ARM	Y-GenXY	26X	4XY	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g81P	ARM	Y-Symmetry	4X	4P	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g81Y	ARM	Y-Gen	4XY	4Y	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																		
0	g82P	ARM	XY-Symmetry	27X	6X	3	5	1	1	1	5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0

0	0	0																	
0	g82X	ARM	X-GenXY	27P	6P	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g82XY	ARM	XY-GenXY	27P	6Y	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g82Y	ARM	Y-GenXY	27X	6XY	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g83P	ARM	Y-Symmetry	6X	6P	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g83Y	ARM	Y-Gen	6XY	6Y	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g84P	ARM	XY-Symmetry	28X	12X	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g84X	ARM	X-GenXY	28P	12P	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g84XY	ARM	XY-GenXY	28P	12Y	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g84Y	ARM	Y-GenXY	28X	12XY	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g85P	ARM	Y-Symmetry	12X	12P	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g85Y	ARM	Y-Gen	12XY	12Y	3	5	1	1	1 5/8	A394	2	2	1	Long only	1.75	4.25	2.125	0
0	0	0																	
0	g77P	Horz1	Y-Symmetry	2X	2S	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g77Y	Horz1	Y-Gen	2XY	2Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g88P	Horz1	X-Symmetry	2S	2Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g88X	Horz1	X-Gen	2X	2XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g89P	Horz1	Y-Symmetry	3X	3S	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g89Y	Horz1	Y-Gen	3XY	3Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g90P	Horz1	X-Symmetry	3S	3Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g90X	Horz1	X-Gen	3X	3XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g91P	InnBrace	X-Symmetry	4X	4Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g91X	InnBrace	X-Gen	4P	4XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g92P	InnBrace	X-Symmetry	6X	6Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g92X	InnBrace	X-Gen	6P	6XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g93P	InnBrace	X-Symmetry	12X	12Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g93X	InnBrace	X-Gen	12P	12XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.75	0	1	0
0	0	0																	
0	g94P	Horz3	X-Symmetry	5P	5Y	3	5	1	1	1 5/8	A394	3	3	1	Long only	1.625	5.625	0.9375	0.875
0	0	0																	
0	g94X	Horz3	X-Gen	5X	5XY	3	5	1	1	1 5/8	A394	3	3	1	Long only	1.625	5.625	0.9375	0.875
0	0	0																	
0	g95P	Horz3	X-Symmetry	7P	7Y	3	5	1	1	1 5/8	A394	3	3	1	Long only	1.625	5.625	0.9375	0.875
0	0	0																	
0	g95X	Horz3	X-Gen	7X	7XY	3	5	1	1	1 5/8	A394	3	3	1	Long only	1.625	5.625	0.9375	0.875
0	0	0																	
0	g96P	Horz3	X-Symmetry	14S	14Y	3	5	1	1	1 5/8	A394	3	3	1	Long only	1.625	5.625	0.9375	0.875

0 0 0  
 0 g96X Horz3 X-Gen 14X 14XY 3 5 1 1 1 5/8 A394 3 3 1 Long only 1.625 5.625 0.9375 0.875  
 0 0 0

Member Capacities and Overrides:

Member Override Label Comp. Capacity	Group Override Label Comp. Control Capacity	Design Override Comp. Tension Capacity	Comp. Override Control Tension Criterion Control Capacity	Design Override Tension Face Capacity Member	Tension Control Criterion	L/r	Length (ft)	L/r	Connection Comp. Capacity	Connection Shear Capacity	Connection Bearing Capacity	Net Section Tension Capacity	Rupture Tension Capacity	RTE Dist. Tension	End Dist. Tension	Edge Dist. Tension	Warnings or Errors	Override Comp. Capacity
Unsup. (kips)	Criterion (kips)	Criterion (kips)	ship (kips)						(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)		(kips)
0.000	g1P	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g1X	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g1XY	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g1Y	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g2P	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g2X	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g2XY	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g2Y	Leg1	33.063	L/r	27.926	Net Sect	74	3.03	33.063	0.000	0.000	27.926	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g3P	Leg1	28.236	L/r	27.926	Net Sect	99	4.04	28.236	36.400	56.250	27.926	62.500	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g3X	Leg1	28.236	L/r	27.926	Net Sect	99	4.04	28.236	36.400	56.250	27.926	62.500	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g3XY	Leg1	28.236	L/r	27.926	Net Sect	99	4.04	28.236	36.400	56.250	27.926	62.500	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g3Y	Leg1	28.236	L/r	27.926	Net Sect	99	4.04	28.236	36.400	56.250	27.926	62.500	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g4P	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g4X	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g4XY	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g4Y	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g5P	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g5X	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g5XY	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g5Y	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic														
0.000	g6P	Leg2	56.426	L/r	52.676	Net Sect	64	4.25	56.426	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000	0.000



0.000		0.000	Automatic											
g17Y	Leg3	63.228	L/r 65.020	Net Sect	84	5.51	63.228	0.000	0.000	65.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g18P	Leg3	66.000	L/r 65.020	Net Sect	76	5.01	66.000	91.000	175.781	65.020	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g18X	Leg3	66.000	L/r 65.020	Net Sect	76	5.01	66.000	91.000	175.781	65.020	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g18XY	Leg3	66.000	L/r 65.020	Net Sect	76	5.01	66.000	91.000	175.781	65.020	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g18Y	Leg3	66.000	L/r 65.020	Net Sect	76	5.01	66.000	91.000	175.781	65.020	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g19P	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g19X	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g19XY	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g19Y	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g20P	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g20X	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g20XY	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g20Y	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g21P	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g21X	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g21XY	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g21Y	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	0.000	0.000	77.364	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g22P	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	91.000	210.937	77.364	220.588	0.000	0.000	0.000
0.000		0.000	Automatic											
g22X	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	91.000	210.937	77.364	220.588	0.000	0.000	0.000
0.000		0.000	Automatic											
g22XY	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	91.000	210.937	77.364	220.588	0.000	0.000	0.000
0.000		0.000	Automatic											
g22Y	Leg4	78.530	L/r 77.364	Net Sect	76	5.01	78.530	91.000	210.937	77.364	220.588	0.000	0.000	0.000
0.000		0.000	Automatic											
g23P	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	0.000	0.000	85.810	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g23X	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	0.000	0.000	85.810	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g23XY	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	0.000	0.000	85.810	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g23Y	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	0.000	0.000	85.810	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
g24P	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	91.000	175.781	85.810	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g24X	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	91.000	175.781	85.810	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g24XY	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	91.000	175.781	85.810	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g24Y	Leg5	89.437	L/r 85.810	Net Sect	61	5.01	89.437	91.000	175.781	85.810	195.312	0.000	0.000	0.000
0.000		0.000	Automatic											
g25P	Diag1	9.100	Shear 6.943	Rupture	110	3.15	12.655	9.100	10.547	14.585	6.943	0.000	0.000	0.000











0.000		0.000	Automatic											
g69X	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g69XY	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g69Y	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g70P	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g70X	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g70XY	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g70Y	Diag3	7.282	L/r 6.943	Rupture	156	8.61	7.282	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g71P	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g71X	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g71XY	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g71Y	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g72P	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g72X	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g72XY	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g72Y	Diag3	6.664	L/r 6.943	Rupture	163	9.02	6.664	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g73P	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g73X	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g73XY	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g73Y	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g74P	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g74X	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g74XY	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g74Y	Diag3	6.088	L/r 6.943	Rupture	171	9.44	6.088	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000		0.000	Automatic											
g75P	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
g75X	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
g76P	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
g76X	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
g79P	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
g79X	Horz2	9.100	Shear 7.717	Rupture	56	2.00	20.749	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000	Automatic											
<b>g80P</b>	<b>ARM</b>	<b>18.200</b>	<b>Shear 18.200</b>	<b>Shear</b>	<b>117</b>	<b>4.78</b>	<b>22.496</b>	<b>18.200</b>	<b>21.375</b>	<b>50.750</b>	<b>21.375</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>





g93P InnBrace	9.100	Shear	6.943	Rupture	99	2.83	13.392	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000	0.000	Automatic												
g93X InnBrace	9.100	Shear	6.943	Rupture	99	2.83	13.392	9.100	10.547	14.585	6.943	0.000	0.000	0.000
0.000	0.000	Automatic												
g94P Horz3	23.393	L/r	15.750	Rupture	42	2.00	23.393	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g94P"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			
g94X Horz3	23.393	L/r	15.750	Rupture	42	2.00	23.393	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g94X"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			
g95P Horz3	23.393	L/r	15.750	Rupture	42	2.00	23.393	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g95P"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			
g95X Horz3	23.393	L/r	15.750	Rupture	42	2.00	23.393	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g95X"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			
g96P Horz3	23.284	L/r	15.750	Rupture	49	2.35	23.284	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g96P"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			
g96X Horz3	23.284	L/r	15.750	Rupture	49	2.35	23.284	27.300	35.437	72.375	15.750	0.000	0.000	0.000
0.000	0.000	Automatic		w/t equals	33.30	for member "g96X"	which exceeds ASCE	10	section 3.7.1	limit of 25.	??			

The model contains 268 angle members.

**Sum of Unfactored Dead Load and Drag Areas From Equipment, Input and Calculated:**

Joint Label	Dead Load (kips)	X-Drag Area (ft^2)	Y-Drag Area (ft^2)
1P	0.0248	1.256	1.256
4P	0.0684	3.701	2.749
5P	0.0639	2.908	3.491
6P	0.0825	4.443	3.470
7P	0.0639	2.908	3.491
12P	0.0758	4.129	3.156
13P	0.0458	2.096	2.096
26P	0.032	1.946	0.417
27P	0.032	1.946	0.417
28P	0.032	1.946	0.417
4X	0.0684	3.722	2.728
4XY	0.0684	3.701	2.749
4Y	0.0684	3.722	2.728
5X	0.0639	2.908	3.491
5XY	0.0639	2.908	3.491
5Y	0.0639	2.908	3.491
6X	0.0825	4.443	3.470
6XY	0.0825	4.443	3.470
6Y	0.0825	4.443	3.470
7X	0.0639	2.908	3.491
7XY	0.0639	2.908	3.491
7Y	0.0639	2.908	3.491
12X	0.0758	4.129	3.156
12XY	0.0758	4.129	3.156
12Y	0.0758	4.129	3.156
13X	0.0458	2.096	2.096
13XY	0.0458	2.096	2.096
13Y	0.0458	2.096	2.096
26X	0.032	1.946	0.417
27X	0.032	1.946	0.417
28X	0.032	1.946	0.417
2S	0.017	0.900	0.892
3S	0.025	1.354	1.342
14S	0.0551	2.445	3.130

15S	0.0471	2.627	2.627
16S	0.0601	3.113	3.113
17S	0.0733	3.605	3.605
18S	0.0747	3.651	3.651
19S	0.0733	3.554	3.554
20S	0.076	3.459	3.459
21S	0.0815	3.512	3.512
22S	0.0831	3.568	3.568
23S	0.0848	3.625	3.625
24S	0.0878	3.893	3.893
25S	0.0908	4.162	4.162
2X	0.017	0.892	0.900
2XY	0.017	0.900	0.892
2Y	0.017	0.892	0.900
3X	0.025	1.342	1.354
3XY	0.025	1.354	1.342
3Y	0.025	1.342	1.354
14X	0.0551	2.445	3.130
14XY	0.0551	2.445	3.130
14Y	0.0551	2.445	3.130
15X	0.0471	2.627	2.627
15XY	0.0471	2.627	2.627
15Y	0.0471	2.627	2.627
16X	0.0601	3.113	3.113
16XY	0.0601	3.113	3.113
16Y	0.0601	3.113	3.113
17X	0.0733	3.605	3.605
17XY	0.0733	3.605	3.605
17Y	0.0733	3.605	3.605
18X	0.0747	3.651	3.651
18XY	0.0747	3.651	3.651
18Y	0.0747	3.651	3.651
19X	0.0733	3.554	3.554
19XY	0.0733	3.554	3.554
19Y	0.0733	3.554	3.554
20X	0.076	3.459	3.459
20XY	0.076	3.459	3.459
20Y	0.076	3.459	3.459
21X	0.0815	3.512	3.512
21XY	0.0815	3.512	3.512
21Y	0.0815	3.512	3.512
22X	0.0831	3.568	3.568
22XY	0.0831	3.568	3.568
22Y	0.0831	3.568	3.568
23X	0.0848	3.625	3.625
23XY	0.0848	3.625	3.625
23Y	0.0848	3.625	3.625
24X	0.0878	3.893	3.893
24XY	0.0878	3.893	3.893
24Y	0.0878	3.893	3.893
25X	0.0908	4.162	4.162
25XY	0.0908	4.162	4.162
25Y	0.0908	4.162	4.162
Total	5.54	267.548	254.103

**Unadjusted Dead Load and Drag Areas by Section:**

Section	Unfactored	X-Drag	Y-Drag	X-Drag	Y-Drag
Label	Dead Load	Area All	Area All	Area Face	Area Face

	(kips)	(ft^2)	(ft^2)	(ft^2)	(ft^2)
1	1.930	98.867	85.422	40.844	32.872
2	0.963	49.853	49.853	19.378	19.378
3	2.643	118.828	118.828	47.587	47.587
Total	5.536	267.548	254.103	107.809	99.836

**Angle Member Weights and Surface Areas by Section:**

Section Label	Unfactored Weight (kips)	Factored Weight (kips)	Unfactored Surface Area (ft^2)	Factored Surface Area (ft^2)
1	1.930	1.930	387.710	387.710
2	0.963	0.963	208.806	208.806
3	2.643	2.643	532.204	532.204
Total	5.536	5.536	1128.720	1128.720

**Section Joint Information:**

Section Label	Joint Label	Joint Elevation (ft)
1	1P	90.000
1	2S	87.000
1	2X	87.000
1	2XY	87.000
1	2Y	87.000
1	3S	84.000
1	3X	84.000
1	3XY	84.000
1	3Y	84.000
1	4P	80.000
1	4X	80.000
1	4XY	80.000
1	4Y	80.000
1	5P	75.750
1	5X	75.750
1	5XY	75.750
1	5Y	75.750
1	6P	71.500
1	6X	71.500
1	6XY	71.500
1	6Y	71.500
1	7P	67.250
1	7X	67.250
1	7XY	67.250
1	7Y	67.250
1	12P	63.000
1	12X	63.000
1	12XY	63.000
1	12Y	63.000
1	14S	59.500
1	14X	59.500
1	14XY	59.500
1	14Y	59.500
1	26X	80.000
1	26P	80.000

1	27X	71.500
1	27P	71.500
1	28X	63.000
1	28P	63.000
2	14S	59.500
2	15S	55.500
2	14X	59.500
2	15X	55.500
2	14XY	59.500
2	15XY	55.500
2	14Y	59.500
2	15Y	55.500
2	16S	51.500
2	16X	51.500
2	16XY	51.500
2	16Y	51.500
2	17S	46.000
2	17X	46.000
2	17XY	46.000
2	17Y	46.000
2	18S	40.500
2	18X	40.500
2	18XY	40.500
2	18Y	40.500
3	18S	40.500
3	19S	35.000
3	18X	40.500
3	19X	35.000
3	18XY	40.500
3	19XY	35.000
3	18Y	40.500
3	19Y	35.000
3	20S	30.000
3	20X	30.000
3	20XY	30.000
3	20Y	30.000
3	21S	25.000
3	21X	25.000
3	21XY	25.000
3	21Y	25.000
3	22S	20.000
3	22X	20.000
3	22XY	20.000
3	22Y	20.000
3	23S	15.000
3	23X	15.000
3	23XY	15.000
3	23Y	15.000
3	24S	10.000
3	24X	10.000
3	24XY	10.000
3	24Y	10.000
3	25S	5.000
3	25X	5.000
3	25XY	5.000
3	25Y	5.000
3	13P	0.000
3	13X	0.000
3	13XY	0.000
3	13Y	0.000

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Z Count	Member Count	Tran. Top (ft)	Face Width (ft)	Tran. Bot (ft)	Face Width (ft)	Tran. Face Gross Area (ft^2)	Long. Top (ft)	Face Width (ft)	Long. Bot (ft)	Face Width (ft)	Long. Face Gross Area (ft^2)
1	90.000	59.500	39	124	0.00		2.35		51.608	0.00		2.35		109.983
2	59.500	40.500	20	48	2.35		4.23		62.504	2.35		4.23		62.504
3	40.500	0.000	36	96	4.23		8.25		252.763	4.23		8.25		252.763

\*\*\* Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)
C-EX1		5e+004

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Vertical Load (uplift) (lbs)	Required
1	26P	C-EX1	No	Limit
2	26X	C-EX1	No	Limit
3	27P	C-EX1	No	Limit
4	27X	C-EX1	No	Limit
5	28P	C-EX1	No	Limit
6	28X	C-EX1	No	Limit
9	3XY	C-EX1	No	Limit
10	5XY	C-EX1	No	Limit
12	12XY	C-EX1	No	Limit
13	15XY	C-EX1	No	Limit
14	17XY	C-EX1	No	Limit
15	19XY	C-EX1	No	Limit
16	21XY	C-EX1	No	Limit
17	23XY	C-EX1	No	Limit
18	25XY	C-EX1	No	Limit
19	1P	C-EX1	No	Limit
20	2S	C-EX1	No	Limit
21	2X	C-EX1	No	Limit
22	2Y	C-EX1	No	Limit
23	3X	C-EX1	No	Limit
24	5X	C-EX1	No	Limit
25	12X	C-EX1	No	Limit
26	15X	C-EX1	No	Limit
27	17X	C-EX1	No	Limit
28	19X	C-EX1	No	Limit
29	21X	C-EX1	No	Limit
30	23X	C-EX1	No	Limit
31	25X	C-EX1	No	Limit

\*\*\* Loads Data

Loads from file: j:\jobs\1607100.wi\53\_darien ct5011\04\_structural\backup documentation\rev (1)\calcs\pls tower\darien - 1182.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) 90.00 (ft)  
 Structure height 90.00 (ft)  
 Structure height above ground 90.00 (ft)  
 Tower Shape Rectangular

Load distributed evenly among joints in section for section based load cases

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Towers	SF for Tubular Arms and Cables	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)	Ice Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	28 loads	Wind on Face	4	0	0.000	0.000	0.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	28 loads	NESC 2012	31	0	0.000	0.000	0.0	

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1P	1095	623	0	Shield Wire (4/0 Cu)
26P	2039	830	0	Conductor (Arbutus)
26X	2039	830	0	Conductor (Arbutus)
27P	2039	830	0	Conductor (Arbutus)
27X	2039	830	0	Conductor (Arbutus)
28P	2039	830	0	Conductor (Arbutus)
28X	2039	830	0	Conductor (Arbutus)
3XY	57	22	0	Coax Cable
5XY	144	55	0	Coax Cable
12XY	139	53	0	Coax Cable
15XY	114	44	0	Coax Cable
17XY	141	54	0	Coax Cable
19XY	144	55	0	Coax Cable
21XY	137	52	0	Coax Cable
23XY	137	52	0	Coax Cable
25XY	137	52	0	Coax Cable
3X	57	22	0	Coax Cable
5X	144	55	0	Coax Cable
12X	139	53	0	Coax Cable
15X	114	44	0	Coax Cable



17X	141	54	0	Coax Cable
19X	144	55	0	Coax Cable
21X	137	52	0	Coax Cable
23X	137	52	0	Coax Cable
25X	137	52	0	Coax Cable
2S	247	58	0	AT&T Antenna
2X	247	58	0	AT&T Antenna
2Y	247	58	0	AT&T Antenna

Section Load Case Information (Standard) for "NESC Heavy":

Section Label	Z of Top	Z of Bottom	Ave. Elev. of Ground	Res. Wind Pres.	Tran. Wind Pres.	Tran. Drag Coef	Tran. Wind Load	Long. Wind Adj. Pres.	Long. Drag Coef	Long. Wind Load	Ice Weight	Total Weight
	(ft)	(ft)	(ft)	(psf)	(psf)		(lbs)	(psf)		(lbs)	(lbs)	(lbs)
1	90.00	59.50	74.75	10.00	10.00	3.200	1051.9	0.00	3.200	0.0	0	2895
2	59.50	40.50	50.00	10.00	10.00	3.200	620.1	0.00	3.200	0.0	0	1445
3	40.50	0.00	20.25	10.00	10.00	3.200	1522.8	0.00	3.200	0.0	0	3964

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1P	370	580	0	Shield Wire (4/0 Cu)
26P	822	1117	0	Conductor (Arbutus)
26X	822	1117	0	Conductor (Arbutus)
27P	822	1117	0	Conductor (Arbutus)
27X	822	1117	0	Conductor (Arbutus)
28P	822	1117	0	Conductor (Arbutus)
28X	822	1117	0	Conductor (Arbutus)
3XY	13	56	0	Coax Cable
5XY	34	142	0	Coax Cable
12XY	33	137	0	Coax Cable
15XY	28	115	0	Coax Cable
17XY	33	139	0	Coax Cable
19XY	34	142	0	Coax Cable
21XY	32	136	0	Coax Cable
23XY	32	136	0	Coax Cable
25XY	32	136	0	Coax Cable
3X	13	56	0	Coax Cable
5X	34	142	0	Coax Cable
12X	33	137	0	Coax Cable
15X	28	115	0	Coax Cable
17X	33	139	0	Coax Cable
19X	34	142	0	Coax Cable
21X	32	136	0	Coax Cable
23X	32	136	0	Coax Cable
25X	32	136	0	Coax Cable
2S	124	245	0	AT&T Antenna
2X	124	245	0	AT&T Antenna
2Y	124	245	0	AT&T Antenna

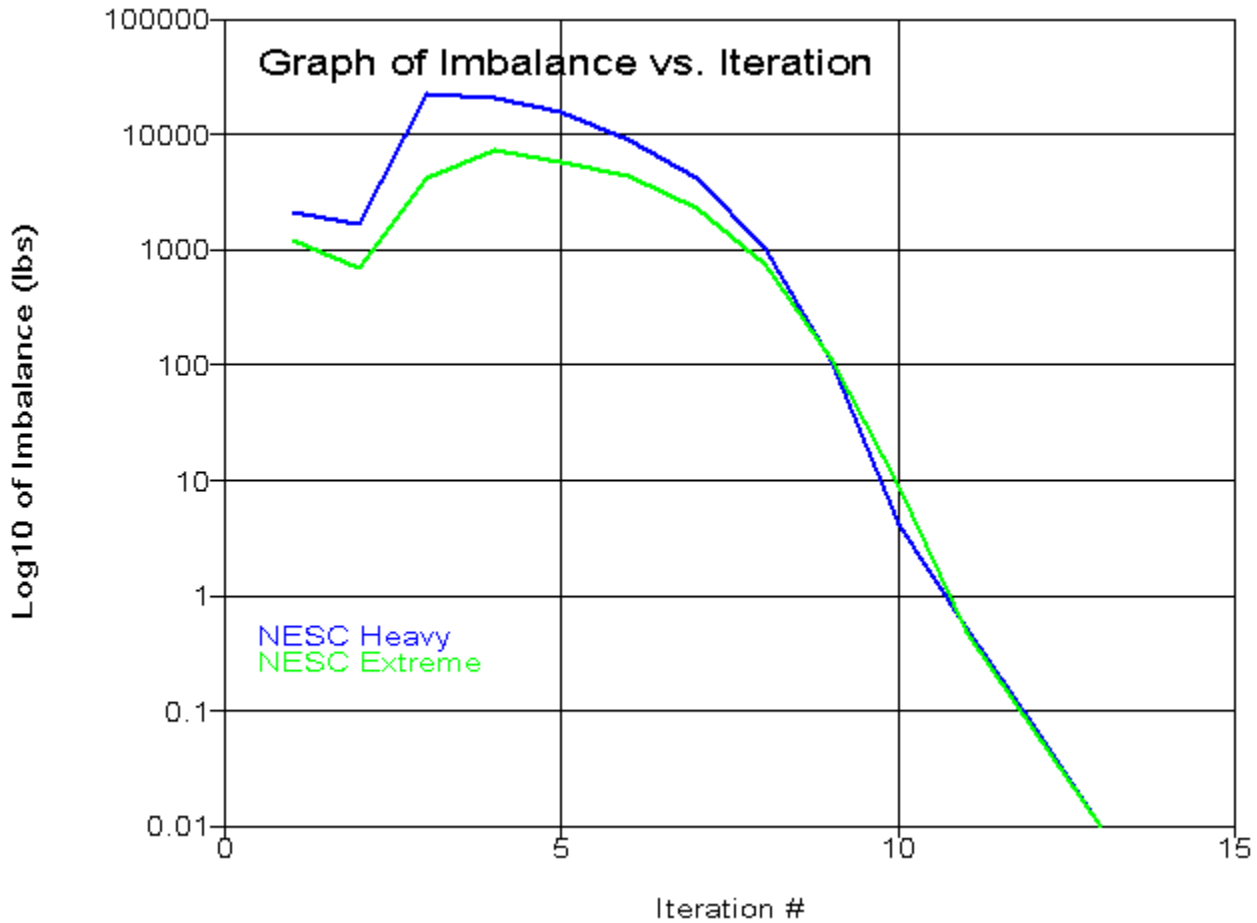
Section Load Case Information (Code) for "NESC Extreme":

Section	Z	Z	Ave.	Res.	Tran	Tran	Tran	Tran	Tran	Tran	Long	Long	Long	Long	Long	Long	Ice	Total
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Label	of Top	of Bottom	Elev. Above Ground	Adj. Wind Pres.	Adj. Wind Pres.	Angle Face Area	Gross Area	Soli- dity Ratio	Angle Drag Coef	Wind Load	Adj. Wind Pres.	Angle Face Area	Gross Area	Soli- dity Ratio	Angle Drag Coef	Wind Load	Weight	Weight
	(ft)	(ft)	(ft)	(psf)	(psf)	(ft^2)	(ft^2)			(lbs)	(psf)	(ft^2)	(ft^2)			(lbs)	(lbs)	(lbs)
1	90.00	59.50	74.75	30.99	30.99	32.87	51.61	0.637	3.200	3259.3	0.00	40.84	109.98	0.371	3.200	0.0	0	1930
2	59.50	40.50	50.00	30.99	30.99	19.38	62.50	0.310	3.200	1921.4	0.00	19.38	62.50	0.310	3.200	0.0	0	963
3	40.50	0.00	20.25	30.99	30.99	47.59	252.76	0.188	3.200	4718.4	0.00	47.59	252.76	0.188	3.200	0.0	0	2643

\*\*\* Analysis Results:

Maximum element usage is 86.42% for Angle "g50X" in load case "NESC Extreme"  
 Maximum insulator usage is 4.50% for Clamp "2" in load case "NESC Heavy"



Angle Forces For All Load Cases:

Positive for tension - negative for compression

Group Label	Angle Label	Max. Usage For All LC %	Max. Tens. For All LC (kips)	Max. Comp. For All LC (kips)	LC 1 (kips)	LC 2 (kips)
Leg1	g1P	5.21	0.000	-1.723	-1.723	-1.512
Leg1	g1X	5.28	1.474	0.000	1.281	1.474
Leg1	g1XY	5.81	1.622	0.000	1.239	1.622
Leg1	g1Y	6.00	0.000	-1.985	-1.911	-1.985

Leg1	g2P	9.91	0.000	-3.276	-2.452	-3.276
Leg1	g2X	4.50	1.258	0.000	1.013	1.258
Leg1	g2XY	9.73	2.717	0.000	1.518	2.717
Leg1	g2Y	6.46	0.000	-2.137	-2.137	-2.120
Leg1	g3P	15.81	0.000	-4.465	-2.765	-4.465
Leg1	g3X	9.92	2.770	0.000	1.422	2.770
Leg1	g3XY	12.94	3.614	0.000	1.634	3.614
Leg1	g3Y	11.55	0.000	-3.262	-2.431	-3.262
Leg2	g4P	10.06	0.000	-5.676	-3.819	-5.676
Leg2	g4X	9.19	4.842	0.000	1.859	4.842
Leg2	g4XY	8.84	4.654	0.000	1.817	4.654
Leg2	g4Y	9.63	0.000	-5.435	-3.693	-5.435
Leg2	g5P	17.64	0.000	-9.952	-6.262	-9.952
Leg2	g5X	17.17	9.047	0.000	4.107	9.047
Leg2	g5XY	17.11	9.013	0.000	4.122	9.013
Leg2	g5Y	17.50	0.000	-9.876	-6.204	-9.876
Leg2	g6P	28.51	0.000	-16.089	-10.666	-16.089
Leg2	g6X	26.97	14.206	0.000	6.245	14.206
Leg2	g6XY	27.04	14.242	0.000	6.289	14.242
Leg2	g6Y	28.51	0.000	-16.087	-10.636	-16.087
Leg2	g78P	40.76	0.000	-22.999	-14.838	-22.999
Leg2	g78X	39.96	21.048	0.000	10.274	21.048
Leg2	g78XY	40.00	21.073	0.000	10.313	21.073
Leg2	g78Y	40.74	0.000	-22.987	-14.805	-22.987
Leg2	g12P	52.25	0.000	-30.744	-19.626	-30.744
Leg2	g12X	54.15	28.527	0.000	14.486	28.527
Leg2	g12XY	54.19	28.544	0.000	14.519	28.544
Leg2	g12Y	52.22	0.000	-30.726	-19.593	-30.726
Leg2	g13P	66.87	0.000	-38.288	-25.161	-38.288
Leg2	g13X	66.25	34.901	0.000	17.297	34.901
Leg2	g13XY	66.28	34.916	0.000	17.327	34.916
Leg2	g13Y	66.84	0.000	-38.271	-25.130	-38.271
Leg2	g14P	83.41	0.000	-45.541	-30.167	-45.541
Leg2	g14X	78.34	41.267	0.000	20.133	41.267
Leg2	g14XY	78.36	41.280	0.000	20.158	41.280
Leg2	g14Y	83.38	0.000	-45.526	-30.140	-45.526
Leg3	g15P	73.65	0.000	-46.570	-30.095	-46.570
Leg3	g15X	66.11	42.983	0.000	21.676	42.983
Leg3	g15XY	66.12	42.994	0.000	21.698	42.994
Leg3	g15Y	73.63	0.000	-46.558	-30.072	-46.558
Leg3	g16P	81.46	0.000	-51.506	-33.358	-51.506
Leg3	g16X	72.69	47.262	0.000	23.420	47.262
Leg3	g16XY	72.70	47.271	0.000	23.439	47.271
Leg3	g16Y	81.44	0.000	-51.495	-33.338	-51.495
Leg3	g17P	85.10	0.000	-53.809	-34.305	-53.809
Leg3	g17X	76.17	49.527	0.000	24.679	49.527
Leg3	g17XY	76.19	49.536	0.000	24.696	49.536
Leg3	g17Y	85.09	0.000	-53.799	-34.287	-53.799
Leg3	g18P	86.35	0.000	-56.989	-36.017	-56.989
Leg3	g18X	80.57	52.389	0.000	25.748	52.389
Leg3	g18XY	80.59	52.397	0.000	25.763	52.397
Leg3	g18Y	86.33	0.000	-56.981	-36.001	-56.981
Leg4	g19P	75.55	0.000	-59.326	-37.085	-59.326
Leg4	g19X	70.51	54.553	0.000	26.657	54.553
Leg4	g19XY	70.52	54.560	0.000	26.671	54.560
Leg4	g19Y	75.54	0.000	-59.319	-37.071	-59.319
Leg4	g20P	78.51	0.000	-61.651	-38.207	-61.651
Leg4	g20X	73.31	56.718	0.000	27.388	56.718
Leg4	g20XY	73.32	56.724	0.000	27.400	56.724
Leg4	g20Y	78.50	0.000	-61.645	-38.194	-61.645

Leg4	g21P	81.54	0.000	-64.033	-39.333	-64.033
Leg4	g21X	76.09	58.863	0.000	28.203	58.863
Leg4	g21XY	76.09	58.869	0.000	28.215	58.869
Leg4	g21Y	81.53	0.000	-64.028	-39.321	-64.028
Leg4	g22P	83.97	0.000	-65.940	-40.176	-65.940
Leg4	g22X	78.43	60.679	0.000	28.749	60.679
Leg4	g22XY	78.44	60.685	0.000	28.760	60.685
Leg4	g22Y	83.96	0.000	-65.935	-40.165	-65.935
Leg5	g23P	76.57	0.000	-68.482	-41.419	-68.482
Leg5	g23X	73.33	62.928	0.000	29.563	62.928
Leg5	g23XY	73.34	62.934	0.000	29.573	62.934
Leg5	g23Y	76.57	0.000	-68.477	-41.409	-68.477
Leg5	g24P	78.05	0.000	-69.807	-41.899	-69.807
Leg5	g24X	74.82	64.206	0.000	29.876	64.206
Leg5	g24XY	74.83	64.211	0.000	29.886	64.211
Leg5	g24Y	78.05	0.000	-69.803	-41.891	-69.803
Diag1	g25P	23.75	1.649	0.000	0.454	1.649
Diag1	g26P	0.68	0.047	-0.028	-0.028	0.047
Diag1	g27P	13.18	0.000	-1.200	-0.342	-1.200
Diag1	g28P	0.76	0.000	-0.069	-0.069	-0.039
Diag1	g29P	17.38	1.207	0.000	0.279	1.207
Diag1	g30P	0.58	0.040	-0.011	-0.011	0.040
Diag1	g31P	12.29	0.000	-0.952	-0.195	-0.952
Diag1	g32P	0.57	0.000	-0.044	-0.024	-0.044
Diag2	g33P	17.10	0.000	-3.112	-2.135	-3.112
Diag2	g33X	14.08	2.562	0.000	1.050	2.562
Diag2	g33XY	14.13	2.572	0.000	1.061	2.572
Diag2	g33Y	17.08	0.000	-3.108	-2.141	-3.108
Diag2	g34P	12.27	0.000	-1.769	-1.148	-1.769
Diag2	g34X	8.25	1.501	0.000	0.586	1.501
Diag2	g34XY	7.90	1.437	0.000	0.573	1.437
Diag2	g34Y	11.48	0.000	-1.654	-1.107	-1.654
Diag2	g35P	19.41	0.000	-3.533	-2.397	-3.533
Diag2	g35X	16.26	2.960	0.000	1.224	2.960
Diag2	g35XY	16.24	2.956	0.000	1.233	2.956
Diag2	g35Y	19.46	0.000	-3.541	-2.409	-3.541
Diag2	g36P	21.19	0.000	-3.054	-1.872	-3.054
Diag2	g36X	15.37	2.798	0.000	1.272	2.798
Diag2	g36XY	14.89	2.709	0.000	1.246	2.709
Diag2	g36Y	20.66	0.000	-2.978	-1.852	-2.978
Diag2	g37P	27.24	0.000	-4.958	-3.127	-4.958
Diag2	g37X	26.06	4.744	0.000	2.639	4.744
Diag2	g37XY	25.83	4.701	0.000	2.633	4.701
Diag2	g37Y	27.00	0.000	-4.913	-3.118	-4.913
Diag2	g38P	35.12	0.000	-5.062	-3.318	-5.062
Diag2	g38X	24.58	4.473	0.000	1.962	4.473
Diag2	g38XY	24.38	4.436	0.000	1.957	4.436
Diag2	g38Y	34.85	0.000	-5.022	-3.312	-5.022
Diag2	g86P	28.18	0.000	-5.128	-3.226	-5.128
Diag2	g86X	26.92	4.899	0.000	2.734	4.899
Diag2	g86XY	26.68	4.856	0.000	2.727	4.856
Diag2	g86Y	27.93	0.000	-5.084	-3.217	-5.084
Diag2	g87P	50.64	0.000	-7.298	-4.668	-7.298
Diag2	g87X	36.76	6.690	0.000	3.264	6.690
Diag2	g87XY	36.55	6.652	0.000	3.258	6.652
Diag2	g87Y	50.37	0.000	-7.260	-4.663	-7.260
Diag3	g49P	33.09	0.000	-3.011	-3.011	-2.916
Diag3	g49X	24.36	1.692	-0.046	-0.046	1.692
Diag3	g49XY	23.92	1.661	-0.049	-0.049	1.661
Diag3	g49Y	33.00	0.000	-3.003	-3.003	-2.883

Diag3	g50P	71.06	0.000	-6.466	-4.093	-6.466
Diag3	g50X	86.42	6.000	0.000	3.042	6.000
Diag3	g50XY	85.99	5.970	0.000	3.040	5.970
Diag3	g50Y	70.70	0.000	-6.433	-4.085	-6.433
Diag3	g51P	28.06	0.000	-2.553	-1.852	-2.553
Diag3	g51X	27.49	1.909	0.000	0.815	1.909
Diag3	g51XY	27.09	1.881	0.000	0.810	1.881
Diag3	g51Y	27.77	0.000	-2.527	-1.848	-2.527
Diag3	g52P	27.79	0.000	-2.529	-1.574	-2.529
Diag3	g52X	36.81	2.556	0.000	1.352	2.556
Diag3	g52XY	36.44	2.530	0.000	1.351	2.530
Diag3	g52Y	27.48	0.000	-2.501	-1.567	-2.501
Diag3	g53P	21.01	0.000	-1.912	-0.752	-1.912
Diag3	g53X	30.64	2.127	0.000	1.551	2.127
Diag3	g53XY	30.33	2.106	0.000	1.548	2.106
Diag3	g53Y	20.78	0.000	-1.891	-0.748	-1.891
Diag3	g54P	21.48	1.491	0.000	0.980	1.491
Diag3	g54X	15.39	0.000	-1.401	-0.706	-1.401
Diag3	g54XY	15.61	0.000	-1.421	-0.708	-1.421
Diag3	g54Y	21.80	1.514	0.000	0.985	1.514
Diag3	g55P	26.05	0.000	-2.370	-1.585	-2.370
Diag3	g55X	26.51	1.840	0.000	0.734	1.840
Diag3	g55XY	26.21	1.820	0.000	0.731	1.820
Diag3	g55Y	25.82	0.000	-2.350	-1.582	-2.350
Diag3	g56P	12.52	0.000	-1.060	-0.695	-1.060
Diag3	g56X	13.61	0.945	0.000	0.460	0.945
Diag3	g56XY	13.33	0.926	0.000	0.458	0.926
Diag3	g56Y	12.26	0.000	-1.038	-0.690	-1.038
Diag3	g57P	21.53	0.000	-1.960	-0.936	-1.960
Diag3	g57X	26.46	1.838	0.000	1.104	1.838
Diag3	g57XY	26.23	1.822	0.000	1.102	1.822
Diag3	g57Y	21.36	0.000	-1.944	-0.934	-1.944
Diag3	g58P	8.53	0.592	0.000	0.382	0.592
Diag3	g58X	6.52	0.000	-0.504	-0.270	-0.504
Diag3	g58XY	6.72	0.000	-0.519	-0.271	-0.519
Diag3	g58Y	8.77	0.609	0.000	0.386	0.609
Diag3	g59P	21.87	0.000	-1.990	-1.045	-1.990
Diag3	g59X	25.25	1.753	0.000	0.726	1.753
Diag3	g59XY	25.07	1.741	0.000	0.724	1.741
Diag3	g59Y	21.73	0.000	-1.978	-1.042	-1.978
Diag3	g60P	5.08	0.000	-0.357	-0.224	-0.357
Diag3	g60X	4.03	0.280	0.000	0.145	0.280
Diag3	g60XY	3.85	0.268	0.000	0.144	0.268
Diag3	g60Y	4.89	0.000	-0.343	-0.221	-0.343
Diag3	g61P	20.47	0.000	-1.863	-0.837	-1.863
Diag3	g61X	23.94	1.662	0.000	0.772	1.662
Diag3	g61XY	23.79	1.652	0.000	0.770	1.652
Diag3	g61Y	20.36	0.000	-1.853	-0.836	-1.853
Diag3	g62P	2.36	0.164	0.000	0.101	0.164
Diag3	g62X	1.73	0.000	-0.122	-0.081	-0.122
Diag3	g62XY	1.87	0.000	-0.132	-0.081	-0.132
Diag3	g62Y	2.52	0.175	0.000	0.104	0.175
Diag3	g63P	19.28	0.000	-1.755	-0.817	-1.755
Diag3	g63X	23.82	1.654	0.000	0.686	1.654
Diag3	g63XY	23.69	1.645	0.000	0.685	1.645
Diag3	g63Y	19.18	0.000	-1.746	-0.816	-1.746
Diag3	g64P	1.01	0.000	-0.065	-0.039	-0.065
Diag3	g64X	0.32	0.022	0.000	0.017	0.022
Diag3	g64XY	0.23	0.016	0.000	0.016	0.013
Diag3	g64Y	0.86	0.000	-0.055	-0.036	-0.055

Diag3	g65P	21.21	0.000	-1.842	-0.815	-1.842
Diag3	g65X	23.71	1.646	0.000	0.686	1.646
Diag3	g65XY	23.60	1.638	0.000	0.684	1.638
Diag3	g65Y	21.12	0.000	-1.834	-0.814	-1.834
Diag3	g66P	0.73	0.000	-0.042	-0.027	-0.042
Diag3	g66X	0.69	0.048	0.000	0.008	0.048
Diag3	g66XY	0.58	0.040	0.000	0.007	0.040
Diag3	g66Y	0.58	0.000	-0.034	-0.025	-0.034
Diag3	g67P	22.19	0.000	-1.763	-0.764	-1.763
Diag3	g67X	24.43	1.696	0.000	0.691	1.696
Diag3	g67XY	24.33	1.689	0.000	0.690	1.689
Diag3	g67Y	22.11	0.000	-1.756	-0.763	-1.756
Diag3	g68P	1.69	0.117	0.000	0.069	0.117
Diag3	g68X	2.26	0.000	-0.119	-0.055	-0.119
Diag3	g68XY	2.39	0.000	-0.126	-0.056	-0.126
Diag3	g68Y	1.80	0.125	0.000	0.071	0.125
Diag3	g69P	25.86	0.000	-1.883	-0.820	-1.883
Diag3	g69X	23.98	1.665	0.000	0.646	1.665
Diag3	g69XY	23.89	1.659	0.000	0.645	1.659
Diag3	g69Y	25.77	0.000	-1.877	-0.819	-1.877
Diag3	g70P	5.22	0.000	-0.250	-0.152	-0.250
Diag3	g70X	3.37	0.234	0.000	0.097	0.234
Diag3	g70XY	3.28	0.228	0.000	0.097	0.228
Diag3	g70Y	5.08	0.000	-0.243	-0.150	-0.243
Diag3	g71P	26.78	0.000	-1.785	-0.731	-1.785
Diag3	g71X	25.63	1.780	0.000	0.724	1.780
Diag3	g71XY	25.54	1.774	0.000	0.723	1.774
Diag3	g71Y	26.69	0.000	-1.779	-0.730	-1.779
Diag3	g72P	6.41	0.445	0.000	0.268	0.445
Diag3	g72X	10.14	0.000	-0.443	-0.204	-0.443
Diag3	g72XY	10.27	0.000	-0.448	-0.204	-0.448
Diag3	g72Y	6.50	0.451	0.000	0.270	0.451
Diag3	g73P	32.28	0.000	-1.966	-0.893	-1.966
Diag3	g73X	24.27	1.685	0.000	0.613	1.685
Diag3	g73XY	24.19	1.680	0.000	0.612	1.680
Diag3	g73Y	32.20	0.000	-1.960	-0.892	-1.960
Diag3	g74P	19.13	0.000	-0.763	-0.470	-0.763
Diag3	g74X	11.23	0.780	0.000	0.342	0.780
Diag3	g74XY	11.16	0.775	0.000	0.341	0.775
Diag3	g74Y	18.99	0.000	-0.757	-0.468	-0.757
Horz2	g75P	19.61	1.513	0.000	1.400	1.513
Horz2	g75X	12.90	0.000	-1.174	-0.275	-1.174
Horz2	g76P	46.07	3.555	0.000	2.635	3.555
Horz2	g76X	34.56	0.000	-3.145	-1.368	-3.145
Horz2	g79P	63.69	4.915	0.000	3.465	4.915
Horz2	g79X	49.20	0.000	-4.478	-2.195	-4.478
ARM	g80P	3.31	0.000	-0.602	-0.431	-0.602
ARM	g80X	3.24	0.590	0.000	0.402	0.590
ARM	g80XY	3.29	0.598	0.000	0.407	0.598
ARM	g80Y	3.33	0.000	-0.607	-0.430	-0.607
ARM	g81P	2.95	0.538	0.000	0.538	0.121
ARM	g81Y	3.27	0.595	0.000	0.595	0.415
ARM	g82P	3.36	0.000	-0.611	-0.423	-0.611
ARM	g82X	3.32	0.604	0.000	0.414	0.604
ARM	g82XY	3.31	0.603	0.000	0.413	0.603
ARM	g82Y	3.34	0.000	-0.609	-0.423	-0.609
ARM	g83P	1.39	0.253	0.000	0.253	0.142
ARM	g83Y	1.38	0.252	0.000	0.252	0.144
ARM	g84P	3.39	0.000	-0.616	-0.427	-0.616
ARM	g84X	3.35	0.610	0.000	0.416	0.610



ARM	g84XY	3.35	0.610	0.000	0.416	0.610
ARM	g84Y	3.39	0.000	-0.616	-0.427	-0.616
ARM	g85P	4.69	0.853	0.000	0.853	0.270
ARM	g85Y	4.68	0.852	0.000	0.852	0.269
Horz1	g77P	4.33	0.000	-0.394	-0.283	-0.394
Horz1	g77Y	4.01	0.278	-0.085	-0.085	0.278
Horz1	g88P	0.65	0.000	-0.059	-0.059	-0.026
Horz1	g88X	0.65	0.000	-0.059	-0.059	-0.034
Horz1	g89P	3.81	0.265	-0.304	0.265	-0.304
Horz1	g89Y	6.71	0.466	0.000	0.452	0.466
Horz1	g90P	1.95	0.135	0.000	0.135	0.063
Horz1	g90X	1.86	0.129	0.000	0.129	0.033
InnBrace	g91P	4.17	0.289	0.000	0.289	0.065
InnBrace	g91X	4.60	0.319	0.000	0.319	0.149
InnBrace	g92P	4.14	0.288	0.000	0.288	0.114
InnBrace	g92X	3.99	0.277	0.000	0.277	0.088
InnBrace	g93P	5.43	0.377	0.000	0.377	0.126
InnBrace	g93X	5.43	0.377	0.000	0.377	0.126
Horz3	g94P	12.52	1.972	0.000	1.155	1.972
Horz3	g94X	7.99	0.000	-1.870	-0.922	-1.870
Horz3	g95P	33.45	5.268	0.000	3.382	5.268
Horz3	g95X	20.48	0.000	-4.790	-2.286	-4.790
Horz3	g96P	30.01	4.726	0.000	2.741	4.726
Horz3	g96X	20.77	0.000	-4.836	-2.770	-4.836

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)
1P	0.0005833	0.6436	-0.008244	-0.8341	0.0195	0.0102	0.0005833	0.6436	89.99
4P	0.0002392	0.5046	-0.02051	-1.1758	0.1314	-0.0502	1	1.505	79.98
5P	0.0001537	0.4474	-0.01984	-0.5939	-0.0565	-0.0478	1	1.447	75.73
6P	0.000222	0.3917	-0.019	-1.0263	0.0947	-0.0500	1	1.392	71.48
7P	0.0001243	0.3377	-0.01785	-0.5816	-0.0452	-0.0473	1	1.338	67.23
12P	0.0002099	0.2866	-0.01642	-0.9033	0.0852	-0.0480	1	1.287	62.98
13P	0	0	0	0.0000	0.0000	0.0000	4.125	4.125	0
26P	0.000121	0.4857	-0.4405	-6.7630	-0.0006	0.0008	0.000121	6.156	79.56
27P	7.173e-005	0.3739	-0.4258	-6.5848	0.0003	0.0004	7.173e-005	6.044	71.07
28P	3.866e-005	0.2698	-0.4129	-6.4582	0.0002	0.0003	3.866e-005	5.94	62.59
4X	0.0001891	0.5048	0.006208	-0.3428	0.1385	0.0359	1	-0.4952	80.01
4XY	0.0002126	0.5047	0.006221	-0.3419	-0.1396	-0.0346	-0.9998	-0.4953	80.01
4Y	0.00012	0.5046	-0.02048	-1.1753	-0.1329	0.0515	-0.9999	1.505	79.98
5X	0.0001551	0.4478	0.006449	-0.9438	-0.0566	0.0362	1	-0.5522	75.76
5XY	0.0001772	0.4478	0.006465	-0.9439	0.0583	-0.0351	-0.9998	-0.5522	75.76
5Y	0.000126	0.4474	-0.01982	-0.5940	0.0582	0.0489	-0.9999	1.447	75.73
6X	6.792e-005	0.3918	0.006507	-0.4395	0.1006	0.0318	1	-0.6082	71.51
6XY	0.0001844	0.3918	0.006523	-0.4395	-0.0998	-0.0309	-0.9998	-0.6082	71.51
6Y	-2.417e-006	0.3917	-0.01898	-1.0263	-0.0940	0.0509	-1	1.392	71.48
7X	6.829e-005	0.3374	0.006384	-0.8552	-0.0440	0.0317	1	-0.6626	67.26
7XY	0.0001232	0.3374	0.006396	-0.8551	0.0448	-0.0309	-0.9999	-0.6626	67.26
7Y	4.303e-005	0.3377	-0.01784	-0.5816	0.0459	0.0480	-1	1.338	67.23
12X	-2.165e-005	0.2867	0.00591	-0.3810	0.0848	0.0281	1	-0.7133	63.01
12XY	0.0001652	0.2867	0.005919	-0.3810	-0.0843	-0.0276	-0.9998	-0.7133	63.01
12Y	-8.513e-005	0.2866	-0.01641	-0.9033	-0.0847	0.0485	-1	1.287	62.98
13X	0	0	0	0.0000	0.0000	0.0000	4.125	-4.125	0
13XY	0	0	0	0.0000	0.0000	0.0000	-4.125	-4.125	0
13Y	0	0	0	0.0000	0.0000	0.0000	-4.125	4.125	0
26X	0.0002579	0.5153	-0.3075	5.6069	-0.0006	0.0007	0.0002579	-5.155	79.69
27X	0.0001587	0.4018	-0.2984	5.4689	0.0005	0.0004	0.0001587	-5.268	71.2
28X	9.202e-005	0.297	-0.3039	5.5168	0.0003	0.0003	9.202e-005	-5.373	62.7
2S	-0.0003188	0.6006	-0.01218	-0.8318	0.0194	-0.0003	0.2997	0.9006	86.99
3S	-0.0002774	0.5589	-0.01583	-0.6903	-0.0348	-0.0016	0.5997	1.159	83.98
14S	8.751e-005	0.2482	-0.01689	-0.5134	-0.0407	-0.0332	1.174	1.422	59.48
15S	0.002215	0.2105	-0.01669	-0.5347	-0.0028	-0.0322	1.374	1.582	55.48
16S	0.001165	0.1755	-0.01617	-0.4556	0.0050	-0.0275	1.572	1.746	51.48
17S	0.002351	0.1357	-0.01555	-0.3797	-0.0060	-0.0235	1.846	1.979	45.98
18S	0.00155	0.1016	-0.01452	-0.3213	0.0055	-0.0195	2.118	2.218	40.49
19S	0.001661	0.07375	-0.01311	-0.2580	0.0023	-0.0158	2.391	2.463	34.99
20S	0.0009587	0.05315	-0.01152	-0.2098	0.0030	-0.0128	2.638	2.69	29.99
21S	0.001066	0.03648	-0.01007	-0.1690	-0.0004	-0.0104	2.886	2.921	24.99
22S	0.0008359	0.02325	-0.008403	-0.1315	-0.0018	-0.0082	3.134	3.156	19.99
23S	0.001042	0.01313	-0.006502	-0.0976	0.0027	-0.0058	3.382	3.394	14.99
24S	0.0005884	0.006065	-0.004436	-0.0595	-0.0072	-0.0039	3.63	3.635	9.996
25S	0.00117	0.00182	-0.002248	-0.0351	0.0049	-0.0018	3.878	3.879	4.998
2X	-0.0001086	0.6006	-0.003814	-0.7856	0.0172	0.0123	0.2999	0.3006	87
2XY	-0.0001064	0.6001	-0.003616	-0.7898	-0.0005	0.0040	-0.3001	0.3001	87
2Y	-0.0003166	0.6001	-0.01202	-0.8360	-0.0013	0.0148	-0.3003	0.9001	86.99
3X	-0.0001128	0.559	0.000555	-0.8850	-0.0334	0.0051	0.5999	-0.04104	84
3XY	-0.0001214	0.5586	0.0006916	-0.8769	0.0270	0.0054	-0.6001	-0.04136	84

3Y	-0.0002864	0.5586	-0.0157	-0.6828	0.0207	0.0075	-0.6003	1.159	83.98
14X	1.883e-005	0.2493	0.007065	-0.6718	-0.0097	0.0155	1.174	-0.9243	59.51
14XY	9.693e-005	0.2493	0.007073	-0.6717	0.0101	-0.0149	-1.174	-0.9243	59.51
14Y	1.02e-005	0.2482	-0.01689	-0.5134	0.0410	0.0337	-1.174	1.422	59.48
15X	-0.001296	0.2091	0.007959	-0.5079	0.0159	0.0175	1.371	-1.163	55.51
15XY	0.001387	0.2091	0.007966	-0.5079	-0.0155	-0.0170	-1.371	-1.163	55.51
15Y	-0.002141	0.2105	-0.01668	-0.5347	0.0031	0.0326	-1.374	1.582	55.48
16X	-0.0008818	0.1758	0.008329	-0.4527	-0.0018	0.0169	1.57	-1.395	51.51
16XY	0.0009541	0.1758	0.008335	-0.4526	0.0020	-0.0165	-1.569	-1.395	51.51
16Y	-0.001109	0.1755	-0.01616	-0.4556	-0.0048	0.0278	-1.572	1.746	51.48
17X	-0.001572	0.135	0.008753	-0.3893	0.0055	0.0146	1.842	-1.708	46.01
17XY	0.001625	0.135	0.008758	-0.3892	-0.0053	-0.0143	-1.842	-1.708	46.01
17Y	-0.002313	0.1357	-0.01554	-0.3796	0.0061	0.0238	-1.846	1.979	45.98
18X	-0.001111	0.1013	0.008687	-0.3178	-0.0016	0.0136	2.115	-2.015	40.51
18XY	0.001149	0.1013	0.008692	-0.3178	0.0018	-0.0133	-2.115	-2.015	40.51
18Y	-0.001525	0.1016	-0.01452	-0.3213	-0.0054	0.0197	-2.118	2.218	40.49
19X	-0.001164	0.0734	0.00818	-0.2612	-0.0007	0.0114	2.388	-2.315	35.01
19XY	0.00119	0.0734	0.008184	-0.2612	0.0008	-0.0112	-2.388	-2.315	35.01
19Y	-0.001645	0.07375	-0.0131	-0.2580	-0.0023	0.0160	-2.391	2.463	34.99
20X	-0.000686	0.05289	0.007404	-0.2091	-0.0010	0.0095	2.636	-2.584	30.01
20XY	0.0007042	0.05288	0.007407	-0.2091	0.0010	-0.0093	-2.636	-2.584	30.01
20Y	-0.0009492	0.05315	-0.01152	-0.2098	-0.0030	0.0130	-2.638	2.69	29.99
21X	-0.0007558	0.03631	0.006635	-0.1706	0.0011	0.0075	2.884	-2.849	25.01
21XY	0.0007681	0.03631	0.006638	-0.1706	-0.0010	-0.0073	-2.884	-2.849	25.01
21Y	-0.001061	0.03648	-0.01006	-0.1690	0.0005	0.0106	-2.886	2.921	24.99
22X	-0.0006029	0.02299	0.005662	-0.1327	0.0019	0.0055	3.132	-3.11	20.01
22XY	0.0006106	0.02299	0.005664	-0.1327	-0.0018	-0.0053	-3.132	-3.11	20.01
22Y	-0.0008338	0.02325	-0.008401	-0.1315	0.0018	0.0083	-3.134	3.156	19.99
23X	-0.0007405	0.01295	0.004455	-0.0973	-0.0015	0.0035	3.38	-3.368	15
23XY	0.0007448	0.01294	0.004456	-0.0973	0.0015	-0.0034	-3.38	-3.368	15
23Y	-0.001041	0.01313	-0.006501	-0.0975	-0.0027	0.0058	-3.382	3.394	14.99
24X	-0.0004312	0.005869	0.003084	-0.0615	0.0053	0.0011	3.629	-3.623	10
24XY	0.0004332	0.005868	0.003085	-0.0615	-0.0052	-0.0011	-3.629	-3.623	10
24Y	-0.0005889	0.006064	-0.004435	-0.0595	0.0072	0.0039	-3.63	3.635	9.996
25X	-0.0008303	0.001572	0.001589	-0.0336	-0.0035	0.0007	3.876	-3.875	5.002
25XY	0.0008309	0.001571	0.00159	-0.0336	0.0035	-0.0007	-3.876	-3.875	5.002
25Y	-0.00117	0.001819	-0.002248	-0.0351	-0.0049	0.0018	-3.878	3.879	4.998

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)	Z Usage %	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 %
13P	-2.60	0.0	-2.85	0.0	0.0	-42.58	0.0	0.0	0.0	42.76	0.0	0.24	0.0	-0.3	0.0	0.0	-0.00	0.0	0.0
13X	1.87	0.0	-2.07	0.0	0.0	30.23	0.0	0.0	0.0	30.36	0.0	0.18	0.0	0.2	0.0	0.0	-0.01	0.0	0.0
13XY	-1.87	0.0	-2.07	0.0	0.0	30.24	0.0	0.0	0.0	30.37	0.0	0.18	0.0	-0.2	0.0	0.0	0.01	0.0	0.0
13Y	2.60	0.0	-2.85	0.0	0.0	-42.57	0.0	0.0	0.0	42.75	0.0	0.24	0.0	0.3	0.0	0.0	0.00	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Heavy":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.6431	-1.1323	0.0000	-0.6431	1.1323	0.0006	0.6436	-0.0082
4P	0.0000	0.0000	-0.1025	0.0000	0.0000	0.1025	0.0002	0.5046	-0.0205
5P	0.0000	0.0000	-0.0958	-0.0000	0.0000	0.0958	0.0002	0.4474	-0.0198

6P	0.0000	0.0000	-0.1238	0.0000	0.0000	0.1238	0.0002	0.3917	-0.0190
7P	0.0000	0.0000	-0.0958	-0.0000	0.0000	0.0958	0.0001	0.3377	-0.0178
12P	0.0000	0.0000	-0.1137	0.0000	0.0000	0.1137	0.0002	0.2866	-0.0164
13P	0.0000	0.0000	-0.0687	2.6030	2.8512	-42.5116	0.0000	0.0000	0.0000
26P	0.0000	0.8300	-2.0870	0.0000	-0.8300	2.0870	0.0001	0.4857	-0.4405
27P	0.0000	0.8300	-2.0870	-0.0000	-0.8300	2.0870	0.0001	0.3739	-0.4258
28P	0.0000	0.8300	-2.0870	-0.0000	-0.8300	2.0870	0.0000	0.2698	-0.4129
4X	0.0000	0.0553	-0.1025	-0.0000	-0.0553	0.1025	0.0002	0.5048	0.0062
4XY	0.0000	0.0653	-0.1025	0.0000	-0.0653	0.1025	0.0002	0.5047	0.0062
4Y	0.0000	0.0000	-0.1025	-0.0000	0.0000	0.1025	0.0001	0.5046	-0.0205
5X	0.0000	0.1441	-0.2398	-0.0000	-0.1441	0.2398	0.0002	0.4478	0.0064
5XY	0.0000	0.1441	-0.2398	0.0000	-0.1441	0.2398	0.0002	0.4478	0.0065
5Y	0.0000	0.0000	-0.0958	0.0000	0.0000	0.0958	0.0001	0.4474	-0.0198
6X	0.0000	0.0771	-0.1238	-0.0000	-0.0770	0.1238	0.0001	0.3918	0.0065
6XY	0.0000	0.0771	-0.1238	0.0000	-0.0770	0.1238	0.0002	0.3918	0.0065
6Y	0.0000	0.0000	-0.1238	-0.0000	0.0000	0.1238	-0.0000	0.3917	-0.0190
7X	0.0000	0.0891	-0.0958	-0.0000	-0.0891	0.0958	0.0001	0.3374	0.0064
7XY	0.0000	0.0891	-0.0958	0.0000	-0.0891	0.0958	0.0001	0.3374	0.0064
7Y	0.0000	0.0000	-0.0958	0.0000	0.0000	0.0958	0.0000	0.3377	-0.0178
12X	0.0000	0.1232	-0.2527	-0.0000	-0.1232	0.2527	-0.0000	0.2867	0.0059
12XY	0.0000	0.1232	-0.2527	0.0000	-0.1232	0.2527	0.0002	0.2867	0.0059
12Y	0.0000	0.0000	-0.1137	-0.0000	0.0000	0.1137	-0.0001	0.2866	-0.0164
13X	0.0000	0.0554	-0.0687	-1.8712	2.0188	30.3031	0.0000	0.0000	0.0000
13XY	0.0000	0.0554	-0.0687	1.8720	2.0188	30.3133	0.0000	0.0000	0.0000
13Y	0.0000	0.0000	-0.0687	-2.6038	2.8501	-42.5033	0.0000	0.0000	0.0000
26X	0.0000	0.8433	-2.0870	0.0000	-0.8433	2.0870	0.0003	0.5153	-0.3075
27X	0.0000	0.8433	-2.0870	0.0000	-0.8433	2.0870	0.0002	0.4018	-0.2984
28X	0.0000	0.8433	-2.0870	-0.0000	-0.8433	2.0870	0.0001	0.2970	-0.3039
2S	0.0000	0.0580	-0.2725	-0.0000	-0.0580	0.2725	-0.0003	0.6006	-0.0122
3S	0.0000	0.0000	-0.0374	-0.0000	0.0000	0.0374	-0.0003	0.5589	-0.0158
14S	0.0000	0.0000	-0.0827	-0.0000	0.0000	0.0827	0.0001	0.2482	-0.0169
15S	0.0000	0.0000	-0.0706	0.0000	0.0000	0.0706	0.0022	0.2105	-0.0167
16S	0.0000	0.0000	-0.0902	0.0000	0.0000	0.0902	0.0012	0.1755	-0.0162
17S	0.0000	0.0000	-0.1100	-0.0000	0.0000	0.1100	0.0024	0.1357	-0.0155
18S	0.0000	0.0000	-0.1120	0.0000	0.0000	0.1120	0.0016	0.1016	-0.0145
19S	0.0000	0.0000	-0.1099	-0.0000	0.0000	0.1099	0.0017	0.0738	-0.0131
20S	0.0000	0.0000	-0.1139	0.0000	0.0000	0.1139	0.0010	0.0532	-0.0115
21S	0.0000	0.0000	-0.1223	-0.0000	0.0000	0.1223	0.0011	0.0365	-0.0101
22S	0.0000	0.0000	-0.1247	0.0000	0.0000	0.1247	0.0008	0.0233	-0.0084
23S	0.0000	0.0000	-0.1272	-0.0000	0.0000	0.1272	0.0010	0.0131	-0.0065
24S	0.0000	0.0000	-0.1316	0.0000	0.0000	0.1316	0.0006	0.0061	-0.0044
25S	0.0000	0.0000	-0.1361	-0.0000	0.0000	0.1361	0.0012	0.0018	-0.0022
2X	0.0000	0.0868	-0.2725	-0.0000	-0.0868	0.2725	-0.0001	0.6006	-0.0038
2XY	0.0000	0.0215	-0.0255	0.0000	-0.0215	0.0255	-0.0001	0.6001	-0.0036
2Y	0.0000	0.0580	-0.2725	0.0000	-0.0580	0.2725	-0.0003	0.6001	-0.0120
3X	0.0000	0.0583	-0.0944	-0.0000	-0.0583	0.0944	-0.0001	0.5590	0.0006
3XY	0.0000	0.0556	-0.0944	0.0000	-0.0556	0.0944	-0.0001	0.5586	0.0007
3Y	0.0000	0.0000	-0.0374	0.0000	0.0000	0.0374	-0.0003	0.5586	-0.0157
14X	0.0000	0.0826	-0.0827	-0.0000	-0.0826	0.0827	0.0000	0.2493	0.0071
14XY	0.0000	0.0826	-0.0827	0.0000	-0.0826	0.0827	0.0001	0.2493	0.0071
14Y	0.0000	0.0000	-0.0827	0.0000	0.0000	0.0827	0.0000	0.2482	-0.0169
15X	0.0000	0.1094	-0.1846	0.0000	-0.1094	0.1846	-0.0013	0.2091	0.0080
15XY	0.0000	0.1094	-0.1846	-0.0000	-0.1094	0.1846	0.0014	0.2091	0.0080
15Y	0.0000	0.0000	-0.0706	-0.0000	0.0000	0.0706	-0.0021	0.2105	-0.0167
16X	0.0000	0.0774	-0.0902	0.0000	-0.0774	0.0902	-0.0009	0.1758	0.0083
16XY	0.0000	0.0774	-0.0902	-0.0000	-0.0774	0.0902	0.0010	0.1758	0.0083
16Y	0.0000	0.0000	-0.0902	-0.0000	0.0000	0.0902	-0.0011	0.1755	-0.0162
17X	0.0000	0.1437	-0.2510	0.0000	-0.1437	0.2510	-0.0016	0.1350	0.0088
17XY	0.0000	0.1437	-0.2510	-0.0000	-0.1437	0.2510	0.0016	0.1350	0.0088
17Y	0.0000	0.0000	-0.1100	0.0000	0.0000	0.1100	-0.0023	0.1357	-0.0155

18X	0.0000	0.0911	-0.1120	0.0000	-0.0911	0.1120	-0.0011	0.1013	0.0087
18XY	0.0000	0.0911	-0.1120	-0.0000	-0.0911	0.1120	0.0011	0.1013	0.0087
18Y	0.0000	0.0000	-0.1120	-0.0000	0.0000	0.1120	-0.0015	0.1016	-0.0145
19X	0.0000	0.1442	-0.2539	-0.0000	-0.1442	0.2539	-0.0012	0.0734	0.0082
19XY	0.0000	0.1442	-0.2539	0.0000	-0.1442	0.2539	0.0012	0.0734	0.0082
19Y	0.0000	0.0000	-0.1099	0.0000	0.0000	0.1099	-0.0016	0.0737	-0.0131
20X	0.0000	0.0873	-0.1139	0.0000	-0.0873	0.1139	-0.0007	0.0529	0.0074
20XY	0.0000	0.0873	-0.1139	-0.0000	-0.0873	0.1139	0.0007	0.0529	0.0074
20Y	0.0000	0.0000	-0.1139	-0.0000	0.0000	0.1139	-0.0009	0.0532	-0.0115
21X	0.0000	0.1410	-0.2593	0.0000	-0.1410	0.2593	-0.0008	0.0363	0.0066
21XY	0.0000	0.1410	-0.2593	-0.0000	-0.1410	0.2593	0.0008	0.0363	0.0066
21Y	0.0000	0.0000	-0.1223	0.0000	0.0000	0.1223	-0.0011	0.0365	-0.0101
22X	0.0000	0.0908	-0.1247	0.0000	-0.0908	0.1247	-0.0006	0.0230	0.0057
22XY	0.0000	0.0908	-0.1247	-0.0000	-0.0908	0.1247	0.0006	0.0230	0.0057
22Y	0.0000	0.0000	-0.1247	-0.0000	0.0000	0.1247	-0.0008	0.0233	-0.0084
23X	0.0000	0.1447	-0.2642	-0.0000	-0.1447	0.2642	-0.0007	0.0129	0.0045
23XY	0.0000	0.1447	-0.2642	0.0000	-0.1447	0.2642	0.0007	0.0129	0.0045
23Y	0.0000	0.0000	-0.1272	0.0000	0.0000	0.1272	-0.0010	0.0131	-0.0065
24X	0.0000	0.1012	-0.1316	0.0000	-0.1012	0.1316	-0.0004	0.0059	0.0031
24XY	0.0000	0.1012	-0.1316	-0.0000	-0.1012	0.1316	0.0004	0.0059	0.0031
24Y	0.0000	0.0000	-0.1316	-0.0000	0.0000	0.1316	-0.0006	0.0061	-0.0044
25X	0.0000	0.1618	-0.2731	-0.0000	-0.1618	0.2731	-0.0008	0.0016	0.0016
25XY	0.0000	0.1618	-0.2731	0.0000	-0.1618	0.2731	0.0008	0.0016	0.0016
25Y	0.0000	0.0000	-0.1361	0.0000	0.0000	0.1361	-0.0012	0.0018	-0.0022

Crossing Diagonal Check for Load Case "NESC Heavy" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	-----Original-----					-----Alternate-----							
					Supported		Unsupported			Supported		Unsupported					
					L/R	RLX	RLY	RLZ	L/R	KL/R	Curve	L/R	RLOUT	L/R	KL/R	Curve	No.
g34P	g34Y	Long only	-1.15	-1.11	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g34Y	g34P	Long only	-1.11	-1.15	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g36P	g36Y	Long only	-1.87	-1.85	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g36Y	g36P	Long only	-1.85	-1.87	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g38P	g38Y	Long only	-3.32	-3.31	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g38Y	g38P	Long only	-3.31	-3.32	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g87P	g87Y	Long only	-4.67	-4.66	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g87Y	g87P	Long only	-4.66	-4.67	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g49P	g49X	Short only	-3.01	-0.05	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g49X	g49P	Short only	-0.05	-3.01	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g49XY	g49Y	Short only	-0.05	-3.00	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g49Y	g49XY	Short only	-3.00	-0.05	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g50P	g50Y	Short only	-4.09	-4.08	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g50Y	g50P	Short only	-4.08	-4.09	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g52P	g52Y	Short only	-1.57	-1.57	14.81	0.773	0.545	0.545	90.48	97.86	2	12.93	1.000	106.04	113.02	3	
g52Y	g52P	Short only	-1.57	-1.57	14.81	0.773	0.545	0.545	90.48	97.86	2	12.93	1.000	106.04	113.02	3	
g54X	g54Y	Short only	-0.71	-0.71	14.53	0.769	0.539	0.539	93.71	100.29	2	12.59	1.000	111.05	115.53	3	
g54XY	g54X	Short only	-0.71	-0.71	14.53	0.769	0.539	0.539	93.71	100.29	2	12.59	1.000	111.05	115.53	3	
g56P	g56Y	Short only	-0.69	-0.69	11.46	0.773	0.545	0.545	123.54	123.54	4	8.47	1.000	144.78	144.78	4	
g56Y	g56P	Short only	-0.69	-0.69	11.46	0.773	0.545	0.545	123.54	123.54	4	8.47	1.000	144.78	144.78	4	
g58X	g58XY	Short only	-0.27	-0.27	10.88	0.769	0.537	0.537	127.42	127.42	4	7.73	1.000	151.56	151.56	4	
g58XY	g58X	Short only	-0.27	-0.27	10.88	0.769	0.537	0.537	127.42	127.42	4	7.73	1.000	151.56	151.56	4	
g60P	g60Y	Short only	-0.22	-0.22	10.16	0.766	0.531	0.531	132.17	132.17	4	7.02	1.000	158.99	158.99	4	
g60Y	g60P	Short only	-0.22	-0.22	10.16	0.766	0.531	0.531	132.17	132.17	4	7.02	1.000	158.99	158.99	4	
g62X	g62XY	Short only	-0.08	-0.08	10.37	0.763	0.527	0.527	130.79	130.79	4	7.06	1.000	158.52	158.52	4	
g62XY	g62X	Short only	-0.08	-0.08	10.37	0.763	0.527	0.527	130.79	130.79	4	7.06	1.000	158.52	158.52	4	

g64P	g64Y	Short only	-0.04	-0.04	9.50	0.762	0.524	0.524	136.64	136.64	4	6.40	1.000	166.55	166.55	4
g64Y	g64P	Short only	-0.04	-0.04	9.50	0.762	0.524	0.524	136.64	136.64	4	6.40	1.000	166.55	166.55	4
g66P	g66Y	Short only	-0.03	-0.02	8.68	0.761	0.522	0.522	142.96	142.96	4	5.80	1.000	174.93	174.93	4
g66Y	g66P	Short only	-0.02	-0.03	8.68	0.761	0.522	0.522	142.96	142.96	4	5.80	1.000	174.93	174.93	4
g68X	g68XY	Short only	-0.06	-0.06	7.94	0.760	0.520	0.520	149.46	149.46	4	5.27	1.000	183.58	183.58	4
g68XY	g68X	Short only	-0.06	-0.06	7.94	0.760	0.520	0.520	149.46	149.46	4	5.27	1.000	183.58	183.58	4
g70P	g70Y	Short only	-0.15	-0.15	7.28	0.759	0.518	0.518	156.11	156.11	4	4.79	1.000	192.49	192.49	4
g70Y	g70P	Short only	-0.15	-0.15	7.28	0.759	0.518	0.518	156.11	156.11	4	4.79	1.000	192.49	192.49	4
g72X	g72XY	Short only	-0.20	-0.20	6.66	0.758	0.517	0.517	163.19	163.19	4	4.37	1.000	201.61	201.61	4
g72XY	g72X	Short only	-0.20	-0.20	6.66	0.758	0.517	0.517	163.19	163.19	4	4.37	1.000	201.61	201.61	4
g74P	g74Y	Short only	-0.47	-0.47	6.09	0.758	0.517	0.517	170.73	170.73	4	3.99	1.000	210.93	210.93	4
g74Y	g74P	Short only	-0.47	-0.47	6.09	0.758	0.517	0.517	170.73	170.73	4	3.99	1.000	210.93	210.93	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	2.246	50.00	50.00	4.49
2	2.251	50.00	50.00	4.50
3	2.246	50.00	50.00	4.49
4	2.251	50.00	50.00	4.50
5	2.246	50.00	50.00	4.49
6	2.251	50.00	50.00	4.50
9	0.110	50.00	50.00	0.22
10	0.280	50.00	50.00	0.56
12	0.281	50.00	50.00	0.56
13	0.215	50.00	50.00	0.43
14	0.289	50.00	50.00	0.58
15	0.292	50.00	50.00	0.58
16	0.295	50.00	50.00	0.59
17	0.301	50.00	50.00	0.60
18	0.317	50.00	50.00	0.63
19	1.302	50.00	50.00	2.60
20	0.279	50.00	50.00	0.56
21	0.286	50.00	50.00	0.57
22	0.279	50.00	50.00	0.56
23	0.111	50.00	50.00	0.22
24	0.280	50.00	50.00	0.56
25	0.281	50.00	50.00	0.56
26	0.215	50.00	50.00	0.43
27	0.289	50.00	50.00	0.58
28	0.292	50.00	50.00	0.58
29	0.295	50.00	50.00	0.59
30	0.301	50.00	50.00	0.60
31	0.317	50.00	50.00	0.63

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)
1P	0.001252	1.144	-0.01262	-1.4232	0.0352	0.0136	0.001252	1.144	89.99
4P	8.994e-005	0.8999	-0.03319	-1.5255	0.0545	-0.0131	1	1.9	79.97
5P	3.29e-005	0.7989	-0.03156	-1.2820	-0.0239	-0.0133	1	1.799	75.72
6P	0.0001604	0.7003	-0.02966	-1.4217	0.0399	-0.0167	1	1.7	71.47
7P	6.973e-005	0.605	-0.02738	-1.2052	-0.0205	-0.0161	1	1.605	67.22
12P	0.0002136	0.5153	-0.02469	-1.2459	0.0397	-0.0181	1	1.515	62.98
13P	0	0	0	0.0000	0.0000	0.0000	4.125	4.125	0
26P	-0.0002879	0.8929	-0.2881	-3.7642	-0.0018	0.0040	-0.0002879	6.563	79.71
27P	-0.0002105	0.6938	-0.2758	-3.6513	-0.0000	0.0027	-0.0002105	6.364	71.22
28P	-0.0001289	0.5095	-0.2567	-3.4846	0.0001	0.0016	-0.0001289	6.18	62.74
4X	0.0001054	0.9004	0.01405	-1.1855	0.0577	0.0028	1	-0.09958	80.01
4XY	0.0002054	0.9003	0.01404	-1.1839	-0.0613	0.0050	-0.9998	-0.09972	80.01
4Y	-3.887e-005	0.8997	-0.03315	-1.5248	-0.0581	0.0206	-1	1.9	79.97
5X	0.00012	0.7996	0.01488	-1.4247	-0.0227	0.0025	1	-0.2004	75.76
5XY	0.000165	0.7995	0.01489	-1.4245	0.0250	0.0041	-0.9998	-0.2005	75.76
5Y	-1.448e-005	0.7988	-0.03155	-1.2817	0.0256	0.0197	-1	1.799	75.72
6X	-2.81e-005	0.7008	0.01534	-1.1828	0.0428	-0.0012	1	-0.2992	71.52
6XY	0.0002397	0.7008	0.01535	-1.1828	-0.0421	0.0067	-0.9998	-0.2992	71.52
6Y	-0.0001423	0.7002	-0.02966	-1.4216	-0.0398	0.0222	-1	1.7	71.47
7X	2.379e-005	0.6052	0.01534	-1.3167	-0.0173	-0.0017	1	-0.3948	67.27
7XY	0.0001389	0.6052	0.01535	-1.3164	0.0183	0.0061	-0.9999	-0.3948	67.27
7Y	-5.686e-005	0.6049	-0.02737	-1.2049	0.0209	0.0205	-1	1.605	67.22
12X	-0.0001293	0.5157	0.0147	-1.0326	0.0330	-0.0047	0.9999	-0.4843	63.01
12XY	0.0002519	0.5156	0.0147	-1.0325	-0.0324	0.0080	-0.9997	-0.4844	63.01
12Y	-0.0002048	0.5153	-0.02469	-1.2457	-0.0395	0.0214	-1	1.515	62.98
13X	0	0	0	0.0000	0.0000	0.0000	4.125	-4.125	0
13XY	0	0	0	0.0000	0.0000	0.0000	-4.125	-4.125	0
13Y	0	0	0	0.0000	0.0000	0.0000	-4.125	4.125	0
26X	0.0004919	0.9006	-0.02947	1.2635	-0.0017	0.0042	0.0004919	-4.769	79.97
27X	0.0003246	0.701	-0.02817	1.2505	0.0005	0.0027	0.0003246	-4.969	71.47
28X	0.0001939	0.516	-0.04165	1.4017	0.0003	0.0016	0.0001939	-5.154	62.96
2S	-0.0002756	1.07	-0.01912	-1.4200	0.0254	0.0078	0.2997	1.37	86.98
3S	-0.0005944	0.9961	-0.02532	-1.3580	-0.0161	0.0055	0.5994	1.596	83.97
14S	6.65e-005	0.4483	-0.02546	-1.0119	-0.0380	-0.0122	1.174	1.622	59.47
15S	0.003236	0.3799	-0.02538	-0.9292	-0.0121	-0.0107	1.375	1.752	55.47
16S	0.001774	0.3191	-0.02475	-0.8089	0.0068	-0.0078	1.572	1.89	51.48
17S	0.003592	0.2473	-0.02406	-0.6858	-0.0101	-0.0062	1.847	2.091	45.98
18S	0.002372	0.1867	-0.0227	-0.5767	0.0068	-0.0043	2.118	2.303	40.48
19S	0.002621	0.1361	-0.0207	-0.4709	0.0028	-0.0032	2.392	2.525	34.98
20S	0.001493	0.09881	-0.01835	-0.3836	0.0036	-0.0026	2.638	2.736	29.98
21S	0.001723	0.06813	-0.01617	-0.3127	-0.0014	-0.0024	2.887	2.953	24.98
22S	0.001329	0.0438	-0.0136	-0.2447	-0.0037	-0.0023	3.134	3.177	19.99
23S	0.001721	0.02487	-0.01061	-0.1829	0.0041	-0.0020	3.383	3.406	14.99
24S	0.0009458	0.01169	-0.007289	-0.1144	-0.0124	-0.0026	3.63	3.641	9.993
25S	0.00196	0.00343	-0.003726	-0.0684	0.0079	-0.0011	3.879	3.88	4.996
2X	-0.0002351	1.07	-0.004588	-1.4003	0.0289	0.0071	0.2998	0.77	87
2XY	-0.0002333	1.069	-0.004205	-1.4071	0.0141	0.0156	-0.3002	0.7693	87
2Y	-0.0002741	1.069	-0.01883	-1.4263	0.0122	0.0134	-0.3003	1.369	86.98
3X	-0.0004937	0.9965	0.003542	-1.4365	-0.0139	-0.0008	0.5995	0.3965	84
3XY	-0.0004957	0.996	0.003813	-1.4241	0.0063	0.0193	-0.6005	0.396	84



3Y	-0.0005985	0.9957	-0.02505	-1.3468	0.0056	0.0062	-0.6006	1.596	83.97
14X	-1.586e-005	0.4491	0.01686	-1.0740	0.0160	-0.0092	1.174	-0.7245	59.52
14XY	0.0001205	0.449	0.01686	-1.0737	-0.0155	0.0122	-1.173	-0.7246	59.52
14Y	-6.679e-005	0.4483	-0.02546	-1.0116	0.0380	0.0152	-1.174	1.622	59.47
15X	-0.002771	0.3798	0.01827	-0.9188	0.0193	-0.0061	1.369	-0.9923	55.52
15XY	0.002859	0.3797	0.01827	-0.9186	-0.0188	0.0088	-1.369	-0.9923	55.52
15Y	-0.003243	0.3798	-0.02537	-0.9290	0.0122	0.0134	-1.375	1.752	55.47
16X	-0.001751	0.3194	0.01882	-0.8067	-0.0050	-0.0030	1.569	-1.251	51.52
16XY	0.001826	0.3194	0.01882	-0.8065	0.0054	0.0054	-1.569	-1.251	51.52
16Y	-0.001787	0.3191	-0.02475	-0.8088	-0.0068	0.0103	-1.572	1.89	51.48
17X	-0.00316	0.2474	0.01937	-0.6897	0.0098	-0.0028	1.84	-1.596	46.02
17XY	0.003219	0.2474	0.01938	-0.6895	-0.0095	0.0050	-1.84	-1.596	46.02
17Y	-0.003606	0.2473	-0.02405	-0.6856	0.0100	0.0084	-1.847	2.091	45.98
18X	-0.002276	0.1866	0.01902	-0.5746	-0.0051	-0.0008	2.114	-1.93	40.52
18XY	0.002322	0.1865	0.01902	-0.5745	0.0053	0.0027	-2.114	-1.93	40.52
18Y	-0.002387	0.1866	-0.0227	-0.5765	-0.0069	0.0061	-2.118	2.303	40.48
19X	-0.002321	0.1363	0.01781	-0.4725	-0.0022	-0.0006	2.387	-2.253	35.02
19XY	0.002356	0.1363	0.01781	-0.4724	0.0024	0.0021	-2.387	-2.253	35.02
19Y	-0.002636	0.136	-0.02069	-0.4707	-0.0029	0.0048	-2.392	2.525	34.98
20X	-0.00144	0.09863	0.01608	-0.3826	-0.0029	-0.0003	2.635	-2.538	30.02
20XY	0.001468	0.09861	0.01608	-0.3825	0.0030	0.0015	-2.635	-2.538	30.02
20Y	-0.001507	0.09879	-0.01835	-0.3835	-0.0037	0.0038	-2.638	2.736	29.98
21X	-0.001523	0.06831	0.01436	-0.3128	0.0014	-0.0007	2.883	-2.817	25.01
21XY	0.001545	0.0683	0.01437	-0.3127	-0.0013	0.0017	-2.883	-2.817	25.01
21Y	-0.001736	0.06811	-0.01617	-0.3126	0.0013	0.0034	-2.887	2.953	24.98
22X	-0.00128	0.04359	0.01223	-0.2455	0.0035	-0.0010	3.132	-3.089	20.01
22XY	0.001295	0.04358	0.01223	-0.2455	-0.0034	0.0018	-3.132	-3.089	20.01
22Y	-0.00134	0.04379	-0.0136	-0.2446	0.0036	0.0031	-3.134	3.177	19.99
23X	-0.001526	0.02497	0.009606	-0.1821	-0.0036	-0.0011	3.379	-3.356	15.01
23XY	0.001537	0.02496	0.009607	-0.1821	0.0037	0.0017	-3.379	-3.356	15.01
23Y	-0.00173	0.02486	-0.01061	-0.1828	-0.0042	0.0025	-3.383	3.406	14.99
24X	-0.0009318	0.01152	0.006644	-0.1152	0.0112	-0.0022	3.628	-3.617	10.01
24XY	0.0009388	0.01152	0.006645	-0.1151	-0.0111	0.0024	-3.628	-3.617	10.01
24Y	-0.0009522	0.01168	-0.007289	-0.1143	0.0124	0.0029	-3.63	3.641	9.993
25X	-0.001757	0.003406	0.003414	-0.0670	-0.0077	-0.0009	3.875	-3.874	5.003
25XY	0.001761	0.003403	0.003414	-0.0669	0.0078	0.0010	-3.875	-3.874	5.003
25Y	-0.001963	0.003427	-0.003725	-0.0684	-0.0080	0.0012	-3.879	3.88	4.996

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)	Z 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 %
13P	-4.32	0.0	-5.26	0.0	0.0	-71.14	0.0	0.0	71.47	0.0	0.45	0.0	-0.5	0.0	0.0	-0.01	0.0	0.0
13X	4.07	0.0	-4.84	0.0	0.0	65.26	0.0	0.0	65.57	0.0	0.46	0.0	0.5	0.0	0.0	-0.01	0.0	0.0
13XY	-4.08	0.0	-4.84	0.0	0.0	65.27	0.0	0.0	65.57	0.0	0.46	0.0	-0.5	0.0	0.0	0.01	0.0	0.0
13Y	4.33	0.0	-5.26	0.0	0.0	-71.14	0.0	0.0	71.47	0.0	0.45	0.0	0.5	0.0	0.0	0.01	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Extreme":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.6636	-0.4195	0.0000	-0.6636	0.4195	0.0013	1.1439	-0.0126
4P	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	0.0001	0.8999	-0.0332
5P	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	0.0000	0.7989	-0.0316

6P	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	0.0002	0.7003	-0.0297
7P	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	0.0001	0.6050	-0.0274
12P	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	0.0002	0.5153	-0.0247
13P	0.0000	0.1311	-0.0734	4.3235	5.1294	-71.0705	0.0000	0.0000	0.0000
26P	0.0000	1.2006	-0.8715	0.0000	-1.2006	0.8715	-0.0003	0.8929	-0.2881
27P	0.0000	1.2006	-0.8715	-0.0000	-1.2006	0.8715	-0.0002	0.6938	-0.2758
28P	0.0000	1.2006	-0.8715	-0.0000	-1.2006	0.8715	-0.0001	0.5095	-0.2567
4X	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	0.0001	0.9004	0.0140
4XY	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	0.0002	0.9003	0.0140
4Y	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	-0.0000	0.8997	-0.0332
5X	0.0000	0.2256	-0.0835	-0.0000	-0.2256	0.0835	0.0001	0.7996	0.0149
5XY	0.0000	0.2256	-0.0835	0.0000	-0.2256	0.0835	0.0002	0.7995	0.0149
5Y	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	-0.0000	0.7988	-0.0315
6X	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	-0.0000	0.7008	0.0153
6XY	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	0.0002	0.7008	0.0154
6Y	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	-0.0001	0.7002	-0.0297
7X	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	0.0000	0.6052	0.0153
7XY	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	0.0001	0.6052	0.0154
7Y	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	-0.0001	0.6049	-0.0274
12X	0.0000	0.2206	-0.0825	-0.0000	-0.2206	0.0825	-0.0001	0.5157	0.0147
12XY	0.0000	0.2206	-0.0825	0.0000	-0.2206	0.0825	0.0003	0.5156	0.0147
12Y	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	-0.0002	0.5153	-0.0247
13X	0.0000	0.1311	-0.0734	-4.0719	4.7098	65.3369	0.0000	0.0000	0.0000
13XY	0.0000	0.1311	-0.0734	4.0764	4.7057	65.3426	0.0000	0.0000	0.0000
13Y	0.0000	0.1311	-0.0734	-4.3281	5.1248	-71.0670	0.0000	0.0000	0.0000
26X	0.0000	1.2006	-0.8715	-0.0000	-1.2006	0.8715	0.0005	0.9006	-0.0295
27X	0.0000	1.2006	-0.8715	0.0000	-1.2006	0.8715	0.0003	0.7010	-0.0282
28X	0.0000	1.2006	-0.8715	0.0000	-1.2006	0.8715	0.0002	0.5160	-0.0416
2S	0.0000	0.3286	-0.1735	-0.0000	-0.3286	0.1735	-0.0003	1.0698	-0.0191
3S	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	-0.0006	0.9961	-0.0253
14S	0.0000	0.1796	-0.0976	-0.0000	-0.1796	0.0976	0.0001	0.4483	-0.0255
15S	0.0000	0.0961	-0.0482	-0.0000	-0.0961	0.0482	0.0032	0.3799	-0.0254
16S	0.0000	0.0961	-0.0482	0.0000	-0.0961	0.0482	0.0018	0.3191	-0.0248
17S	0.0000	0.0961	-0.0482	-0.0000	-0.0961	0.0482	0.0036	0.2473	-0.0241
18S	0.0000	0.2271	-0.1216	0.0000	-0.2271	0.1216	0.0024	0.1867	-0.0227
19S	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0026	0.1361	-0.0207
20S	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	0.0015	0.0988	-0.0183
21S	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	0.0017	0.0681	-0.0162
22S	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	0.0013	0.0438	-0.0136
23S	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0017	0.0249	-0.0106
24S	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	0.0009	0.0117	-0.0073
25S	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0020	0.0034	-0.0037
2X	0.0000	0.3286	-0.1735	-0.0000	-0.3286	0.1735	-0.0002	1.0700	-0.0046
2XY	0.0000	0.0836	-0.0495	0.0000	-0.0836	0.0495	-0.0002	1.0693	-0.0042
2Y	0.0000	0.3286	-0.1735	0.0000	-0.3286	0.1735	-0.0003	1.0691	-0.0188
3X	0.0000	0.1396	-0.0625	-0.0000	-0.1396	0.0625	-0.0005	0.9965	0.0035
3XY	0.0000	0.1396	-0.0625	0.0000	-0.1396	0.0625	-0.0005	0.9960	0.0038
3Y	0.0000	0.0836	-0.0495	-0.0000	-0.0836	0.0495	-0.0006	0.9957	-0.0251
14X	0.0000	0.1796	-0.0976	-0.0000	-0.1796	0.0976	-0.0000	0.4491	0.0169
14XY	0.0000	0.1796	-0.0976	0.0000	-0.1796	0.0976	0.0001	0.4490	0.0169
14Y	0.0000	0.1796	-0.0976	0.0000	-0.1796	0.0976	-0.0001	0.4483	-0.0255
15X	0.0000	0.2111	-0.0762	0.0000	-0.2111	0.0762	-0.0028	0.3798	0.0183
15XY	0.0000	0.2111	-0.0762	-0.0000	-0.2111	0.0762	0.0029	0.3797	0.0183
15Y	0.0000	0.0961	-0.0482	0.0000	-0.0961	0.0482	-0.0032	0.3798	-0.0254
16X	0.0000	0.0961	-0.0482	-0.0000	-0.0961	0.0482	-0.0018	0.3194	0.0188
16XY	0.0000	0.0961	-0.0482	0.0000	-0.0961	0.0482	0.0018	0.3194	0.0188
16Y	0.0000	0.0961	-0.0482	-0.0000	-0.0961	0.0482	-0.0018	0.3191	-0.0247
17X	0.0000	0.2351	-0.0812	0.0000	-0.2351	0.0812	-0.0032	0.2474	0.0194
17XY	0.0000	0.2351	-0.0812	-0.0000	-0.2351	0.0812	0.0032	0.2474	0.0194
17Y	0.0000	0.0961	-0.0482	0.0000	-0.0961	0.0482	-0.0036	0.2473	-0.0241

18X	0.0000	0.2271	-0.1216	-0.0000	-0.2271	0.1216	-0.0023	0.1866	0.0190
18XY	0.0000	0.2271	-0.1216	0.0000	-0.2271	0.1216	0.0023	0.1865	0.0190
18Y	0.0000	0.2271	-0.1216	-0.0000	-0.2271	0.1216	-0.0024	0.1866	-0.0227
19X	0.0000	0.2731	-0.1074	-0.0000	-0.2731	0.1074	-0.0023	0.1363	0.0178
19XY	0.0000	0.2731	-0.1074	0.0000	-0.2731	0.1074	0.0024	0.1363	0.0178
19Y	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0026	0.1360	-0.0207
20X	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0014	0.0986	0.0161
20XY	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0015	0.0986	0.0161
20Y	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	-0.0015	0.0988	-0.0183
21X	0.0000	0.2671	-0.1054	0.0000	-0.2671	0.1054	-0.0015	0.0683	0.0144
21XY	0.0000	0.2671	-0.1054	-0.0000	-0.2671	0.1054	0.0015	0.0683	0.0144
21Y	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	-0.0017	0.0681	-0.0162
22X	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0013	0.0436	0.0122
22XY	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0013	0.0436	0.0122
22Y	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	-0.0013	0.0438	-0.0136
23X	0.0000	0.2671	-0.1054	0.0000	-0.2671	0.1054	-0.0015	0.0250	0.0096
23XY	0.0000	0.2671	-0.1054	-0.0000	-0.2671	0.1054	0.0015	0.0250	0.0096
23Y	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0017	0.0249	-0.0106
24X	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0009	0.0115	0.0066
24XY	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	0.0009	0.0115	0.0066
24Y	0.0000	0.1311	-0.0734	-0.0000	-0.1311	0.0734	-0.0010	0.0117	-0.0073
25X	0.0000	0.2671	-0.1054	-0.0000	-0.2671	0.1054	-0.0018	0.0034	0.0034
25XY	0.0000	0.2671	-0.1054	0.0000	-0.2671	0.1054	0.0018	0.0034	0.0034
25Y	0.0000	0.1311	-0.0734	0.0000	-0.1311	0.0734	-0.0020	0.0034	-0.0037

Crossing Diagonal Check for Load Case "NESC Extreme" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	-----Original-----							-----Alternate-----					
					-----Supported-----			-----Unsupported-----				L/R RLOUT		L/R KL/R Curve		Cap. No.	
					L/R	RLX	RLY	RLZ	L/R	KL/R	Curve	L/R	RLOUT	L/R	KL/R	Curve	Cap. No.
g34P	g34Y	Long only	-1.77	-1.65	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g34Y	g34P	Long only	-1.65	-1.77	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g36P	g36Y	Long only	-3.05	-2.98	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g36Y	g36P	Long only	-2.98	-3.05	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g38P	g38Y	Long only	-5.06	-5.02	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g38Y	g38P	Long only	-5.02	-5.06	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g87P	g87Y	Long only	-7.30	-7.26	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g87Y	g87P	Long only	-7.26	-7.30	18.49	0.500	0.750	0.500	97.86	103.39	2	14.41	1.000	130.47	126.44	6	
g50P	g50Y	Short only	-6.47	-6.43	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g50Y	g50P	Short only	-6.43	-6.47	15.79	0.773	0.545	0.545	78.63	88.97	2	13.82	1.000	92.15	106.07	3	
g52P	g52Y	Short only	-2.53	-2.50	14.81	0.773	0.545	0.545	90.48	97.86	2	12.93	1.000	106.04	113.02	3	
g52Y	g52P	Short only	-2.50	-2.53	14.81	0.773	0.545	0.545	90.48	97.86	2	12.93	1.000	106.04	113.02	3	
g54X	g54Y	Short only	-1.40	-1.42	14.53	0.769	0.539	0.539	93.71	100.29	2	12.59	1.000	111.05	115.53	3	
g54Y	g54X	Short only	-1.42	-1.40	14.53	0.769	0.539	0.539	93.71	100.29	2	12.59	1.000	111.05	115.53	3	
g56P	g56Y	Short only	-1.06	-1.04	11.46	0.773	0.545	0.545	123.54	123.54	4	8.47	1.000	144.78	144.78	4	
g56Y	g56P	Short only	-1.04	-1.06	11.46	0.773	0.545	0.545	123.54	123.54	4	8.47	1.000	144.78	144.78	4	
g58X	g58Y	Short only	-0.50	-0.52	10.88	0.769	0.537	0.537	127.42	127.42	4	7.73	1.000	151.56	151.56	4	
g58Y	g58X	Short only	-0.52	-0.50	10.88	0.769	0.537	0.537	127.42	127.42	4	7.73	1.000	151.56	151.56	4	
g60P	g60Y	Short only	-0.36	-0.34	10.16	0.766	0.531	0.531	132.17	132.17	4	7.02	1.000	158.99	158.99	4	
g60Y	g60P	Short only	-0.34	-0.36	10.16	0.766	0.531	0.531	132.17	132.17	4	7.02	1.000	158.99	158.99	4	
g62X	g62Y	Short only	-0.12	-0.13	10.37	0.763	0.527	0.527	130.79	130.79	4	7.06	1.000	158.52	158.52	4	
g62Y	g62X	Short only	-0.13	-0.12	10.37	0.763	0.527	0.527	130.79	130.79	4	7.06	1.000	158.52	158.52	4	
g64P	g64Y	Short only	-0.06	-0.06	9.50	0.762	0.524	0.524	136.64	136.64	4	6.40	1.000	166.55	166.55	4	
g64Y	g64P	Short only	-0.06	-0.06	9.50	0.762	0.524	0.524	136.64	136.64	4	6.40	1.000	166.55	166.55	4	
g66P	g66Y	Short only	-0.04	-0.03	8.68	0.761	0.522	0.522	142.96	142.96	4	5.80	1.000	174.93	174.93	4	
g66Y	g66P	Short only	-0.03	-0.04	8.68	0.761	0.522	0.522	142.96	142.96	4	5.80	1.000	174.93	174.93	4	

g68X	g68XY	Short only	-0.12	-0.13	7.94	0.760	0.520	0.520	149.46	149.46	4	5.27	1.000	183.58	183.58	4
g68XY	g68X	Short only	-0.13	-0.12	7.94	0.760	0.520	0.520	149.46	149.46	4	5.27	1.000	183.58	183.58	4
g70P	g70Y	Short only	-0.25	-0.24	7.28	0.759	0.518	0.518	156.11	156.11	4	4.79	1.000	192.49	192.49	4
g70Y	g70P	Short only	-0.24	-0.25	7.28	0.759	0.518	0.518	156.11	156.11	4	4.79	1.000	192.49	192.49	4
g72X	g72XY	Short only	-0.44	-0.45	6.66	0.758	0.517	0.517	163.19	163.19	4	4.37	1.000	201.61	201.61	4
g72XY	g72X	Short only	-0.45	-0.44	6.66	0.758	0.517	0.517	163.19	163.19	4	4.37	1.000	201.61	201.61	4
g74P	g74Y	Short only	-0.76	-0.76	6.09	0.758	0.517	0.517	170.73	170.73	4	3.99	1.000	210.93	210.93	4
g74Y	g74P	Short only	-0.76	-0.76	6.09	0.758	0.517	0.517	170.73	170.73	4	3.99	1.000	210.93	210.93	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.484	50.00	50.00	2.97
2	1.484	50.00	50.00	2.97
3	1.484	50.00	50.00	2.97
4	1.484	50.00	50.00	2.97
5	1.484	50.00	50.00	2.97
6	1.484	50.00	50.00	2.97
9	0.153	50.00	50.00	0.31
10	0.241	50.00	50.00	0.48
12	0.235	50.00	50.00	0.47
13	0.224	50.00	50.00	0.45
14	0.249	50.00	50.00	0.50
15	0.293	50.00	50.00	0.59
16	0.287	50.00	50.00	0.57
17	0.287	50.00	50.00	0.57
18	0.287	50.00	50.00	0.57
19	0.785	50.00	50.00	1.57
20	0.372	50.00	50.00	0.74
21	0.372	50.00	50.00	0.74
22	0.372	50.00	50.00	0.74
23	0.153	50.00	50.00	0.31
24	0.241	50.00	50.00	0.48
25	0.235	50.00	50.00	0.47
26	0.224	50.00	50.00	0.45
27	0.249	50.00	50.00	0.50
28	0.293	50.00	50.00	0.59
29	0.287	50.00	50.00	0.57
30	0.287	50.00	50.00	0.57
31	0.287	50.00	50.00	0.57

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress  
 Printed capacities do not include the strength factor entered for each load case.  
 The Group Summary reports on the member and load case that resulted in maximum usage  
 which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group L/R	Group Label	Angle KL/R Length	Group Angle Curve No.	Angle	Steel Strength	Max Usage	Max Usage Cont-	Max Use	Comp. Control	Comp. Force	Comp. Control	L/R Capacity	Comp. Connect.	Comp. Connect.	RLX	RLY	RLZ
Comp.	No.	Of	Desc.	Type	Size	(ksi)	%	%	Member	(kips)	Load Case	(kips)	(kips)	(kips)			
Member	Bolts																
Comp.																	
(ft)	-----																
Leg1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	15.81	Comp	15.81	g3P	-4.465	NESC	Ext	28.236	36.400	56.250	1.000	1.000	1.000
98.73	98.73	4.040	1	4	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g3P g3X g3XY g3Y ??												
Leg2	L4x4x1/4	SAE	4X4X0.25	33.0	83.41	Comp	83.41	g14P	-45.541	NESC	Ext	57.260	54.600	84.375	1.000	1.000	1.000
60.53	60.53	4.010	1	6	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g4P g4X g4XY g4Y g5P g5X g5XY g5Y g6P g6X g6XY g6Y g78P g78X g78XY g78Y g12P g12X g12XY g12Y ??												
Leg3	L4x4x5/16	SAE	4X4X0.3125	33.0	86.35	Comp	86.35	g18P	-56.989	NESC	Ext	66.000	91.000	175.781	1.000	1.000	1.000
76.04	76.04	5.012	1	10													
Leg4	L4x4x3/8	SAE	4X4X0.375	33.0	83.97	Comp	83.97	g22P	-65.940	NESC	Ext	78.530	91.000	210.937	1.000	1.000	1.000
76.33	76.33	5.012	1	10													
Leg5	L5x5x5/16	SAE	5X5X0.3125	33.0	78.05	Comp	78.05	g24P	-69.807	NESC	Ext	89.437	91.000	175.781	1.000	1.000	1.000
60.51	60.51	5.012	1	10													
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	23.75	Tens	13.18	g27P	-1.200	NESC	Ext	12.655	9.100	10.547	1.000	1.000	1.000
110.08	115.04	3.146	3	1													
Diag2	L2x1.5x1/4	SAU	2X1.5X0.25	33.0	50.64	Cross	50.64	g87P	-7.298	NESC	Ext	14.412	18.200	28.125	0.500	1.000	0.500
130.47	126.44	4.697	6	2													
Diag3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.42	Tens	71.06	g50P	-6.466	NESC	Ext	13.824	9.100	10.547	1.000	0.545	0.545
92.15	106.07	4.124	3	1													
Horz1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	6.71	Tens	4.33	g77P	-0.394	NESC	Ext	17.529	9.100	10.547	1.000	1.000	1.000
20.99	70.50	0.600	3	1													
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	63.69	Tens	49.20	g79X	-4.478	NESC	Ext	20.749	9.100	10.547	1.000	1.000	1.000
56.21	88.10	2.000	3	1													
ARM	CH5x6.7	Ch	C5x6.7	33.0	4.69	Tens	3.39	g84P	-0.616	NESC	Ext	22.496	18.200	21.375	1.000	1.000	1.000
117.20	118.60	4.776	3	2	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g80XY g80Y g81P g81Y g82P g82X g82XY g82Y g83P g83Y g84P g84X g84XY g84Y g85P g85Y ??												
InnBrace	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	5.43	Tens	0.00	g93X	0.000			13.392	9.100	10.547	1.000	1.000	1.000
98.95	109.48	2.828	3	1													
Horz3	CH7x9.8	Ch	C7x9.8	33.0	33.45	Tens	20.77	g96X	-4.836	NESC	Ext	23.284	27.300	35.437	1.000	1.000	1.000
48.73	84.37	2.347	3	3													

Group Summary (Tension Portion):

Group No.	Group Label	Angle Hole	Group Angle Desc.	Angle	Steel Strength	Max Usage	Max Usage Cont-	Max Tension Use	Tension Control	Tension Force	Tension Control	Net Section	Tension Connect.	Tension Connect.	Tension Connect.	Tension Length	No. Of
Of Diameter			Type	Size	(ksi)	%	%	Member		(kips)	Load Case	(kips)	(kips)	(kips)	(kips)	Tens.	Of

Holes				rol	In	Member			Load Capacity	Shear	Bearing	Rupture	Member	Bolts	
(in)				(ksi)	%	Tens.	%	(kips)	Case	Capacity	Capacity	Capacity	(ft)	Tens.	
										(kips)	(kips)	(kips)			
Leg1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	15.81	Comp	12.94	g3XY	3.614NESC Ext	27.926	36.400	56.250	62.500	4.040	4
2.000	0.6875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g3P g3X g3XY g3Y ??													
Leg2	L4x4x1/4	SAE	4X4X0.25	33.0	83.41	Comp	78.36	g14XY	41.280NESC Ext	52.676	54.600	84.375	93.750	4.010	6
2.000	0.6875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g4P g4X g4XY g4Y g5P g5X g5XY g5Y g6P g6X g6XY g6Y g78P g78X g78XY g78Y g12P g12X g12XY g12Y ??													
Leg3	L4x4x5/16	SAE	4X4X0.3125	33.0	86.35	Comp	80.59	g18XY	52.397NESC Ext	65.020	91.000	175.781	195.312	5.012	10
2.000	0.6875														
Leg4	L4x4x3/8	SAE	4X4X0.375	33.0	83.97	Comp	78.44	g22XY	60.685NESC Ext	77.364	91.000	210.937	220.588	5.012	10
2.000	0.6875														
Leg5	L5x5x5/16	SAE	5X5X0.3125	33.0	78.05	Comp	74.83	g24XY	64.211NESC Ext	85.810	91.000	175.781	195.312	5.012	10
2.000	0.6875														
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	23.75	Tens	23.75	g25P	1.649NESC Ext	14.585	9.100	10.547	6.943	3.146	1
1.000	0.6875														
Diag2	L2x1.5x1/4	SAU	2X1.5X0.25	33.0	50.64	Cross	36.76	g87X	6.690NESC Ext	18.952	18.200	28.125	25.000	4.697	2
1.000	0.6875														
Diag3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.42	Tens	86.42	g50X	6.000NESC Ext	14.585	9.100	10.547	6.943	4.124	1
1.000	0.6875														
Horz1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	6.71	Tens	6.71	g89Y	0.466NESC Ext	14.585	9.100	10.547	6.943	1.200	1
1.000	0.6875														
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	63.69	Tens	63.69	g79P	4.915NESC Ext	17.444	9.100	10.547	7.717	2.000	1
1.000	0.6875														
ARM	CH5x6.7	Ch	C5x6.7	33.0	4.69	Tens	4.69	g85P	0.853NESC Hea	50.750	18.200	21.375	21.375	2.000	2
2.000	0.6875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g80XY g80Y g81P g81Y g82P g82X g82XY g82Y g83P g83Y g84P g84X g84XY g84Y g85P g85Y ??													
InnBrace	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	5.43	Tens	5.43	g93X	0.377NESC Hea	14.585	9.100	10.547	6.943	2.828	1
1.000	0.6875														
Horz3	CH7x9.8	Ch	C7x9.8	33.0	33.45	Tens	33.45	g95P	5.268NESC Ext	72.375	27.300	35.437	15.750	2.000	3
3.000	0.6875														

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	55.25	g14P	Angle
NESC Extreme	86.42	g50X	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	4.49	NESC Heavy	0.0
2	Clamp	4.50	NESC Heavy	0.0

3	Clamp	4.49	NESC Heavy	0.0
4	Clamp	4.50	NESC Heavy	0.0
5	Clamp	4.49	NESC Heavy	0.0
6	Clamp	4.50	NESC Heavy	0.0
9	Clamp	0.31	NESC Extreme	0.0
10	Clamp	0.56	NESC Heavy	0.0
12	Clamp	0.56	NESC Heavy	0.0
13	Clamp	0.45	NESC Extreme	0.0
14	Clamp	0.58	NESC Heavy	0.0
15	Clamp	0.59	NESC Extreme	0.0
16	Clamp	0.59	NESC Heavy	0.0
17	Clamp	0.60	NESC Heavy	0.0
18	Clamp	0.63	NESC Heavy	0.0
19	Clamp	2.60	NESC Heavy	0.0
20	Clamp	0.74	NESC Extreme	0.0
21	Clamp	0.74	NESC Extreme	0.0
22	Clamp	0.74	NESC Extreme	0.0
23	Clamp	0.31	NESC Extreme	0.0
24	Clamp	0.56	NESC Heavy	0.0
25	Clamp	0.56	NESC Heavy	0.0
26	Clamp	0.45	NESC Extreme	0.0
27	Clamp	0.58	NESC Heavy	0.0
28	Clamp	0.59	NESC Extreme	0.0
29	Clamp	0.59	NESC Heavy	0.0
30	Clamp	0.60	NESC Heavy	0.0
31	Clamp	0.63	NESC Heavy	0.0

**Loads At Insulator Attachments For All Load Cases:**

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	1	Clamp	26P	0.000	0.830	2.087	2.246
NESC Heavy	2	Clamp	26X	0.000	0.843	2.087	2.251
NESC Heavy	3	Clamp	27P	0.000	0.830	2.087	2.246
NESC Heavy	4	Clamp	27X	0.000	0.843	2.087	2.251
NESC Heavy	5	Clamp	28P	0.000	0.830	2.087	2.246
NESC Heavy	6	Clamp	28X	0.000	0.843	2.087	2.251
NESC Heavy	9	Clamp	3XY	0.000	0.056	0.094	0.110
NESC Heavy	10	Clamp	5XY	0.000	0.144	0.240	0.280
NESC Heavy	12	Clamp	12XY	0.000	0.123	0.253	0.281
NESC Heavy	13	Clamp	15XY	0.000	0.109	0.185	0.215
NESC Heavy	14	Clamp	17XY	0.000	0.144	0.251	0.289
NESC Heavy	15	Clamp	19XY	0.000	0.144	0.254	0.292
NESC Heavy	16	Clamp	21XY	0.000	0.141	0.259	0.295
NESC Heavy	17	Clamp	23XY	0.000	0.145	0.264	0.301
NESC Heavy	18	Clamp	25XY	0.000	0.162	0.273	0.317
NESC Heavy	19	Clamp	1P	0.000	0.643	1.132	1.302
NESC Heavy	20	Clamp	2S	0.000	0.058	0.273	0.279
NESC Heavy	21	Clamp	2X	0.000	0.087	0.273	0.286
NESC Heavy	22	Clamp	2Y	0.000	0.058	0.273	0.279
NESC Heavy	23	Clamp	3X	0.000	0.058	0.094	0.111
NESC Heavy	24	Clamp	5X	0.000	0.144	0.240	0.280
NESC Heavy	25	Clamp	12X	0.000	0.123	0.253	0.281
NESC Heavy	26	Clamp	15X	0.000	0.109	0.185	0.215
NESC Heavy	27	Clamp	17X	0.000	0.144	0.251	0.289
NESC Heavy	28	Clamp	19X	0.000	0.144	0.254	0.292

NESC Heavy	29	Clamp	21X	0.000	0.141	0.259	0.295
NESC Heavy	30	Clamp	23X	0.000	0.145	0.264	0.301
NESC Heavy	31	Clamp	25X	0.000	0.162	0.273	0.317
NESC Extreme	1	Clamp	26P	0.000	1.201	0.871	1.484
NESC Extreme	2	Clamp	26X	0.000	1.201	0.871	1.484
NESC Extreme	3	Clamp	27P	0.000	1.201	0.871	1.484
NESC Extreme	4	Clamp	27X	0.000	1.201	0.871	1.484
NESC Extreme	5	Clamp	28P	0.000	1.201	0.871	1.484
NESC Extreme	6	Clamp	28X	0.000	1.201	0.871	1.484
NESC Extreme	9	Clamp	3XY	0.000	0.140	0.062	0.153
NESC Extreme	10	Clamp	5XY	0.000	0.226	0.083	0.241
NESC Extreme	12	Clamp	12XY	0.000	0.221	0.082	0.235
NESC Extreme	13	Clamp	15XY	0.000	0.211	0.076	0.224
NESC Extreme	14	Clamp	17XY	0.000	0.235	0.081	0.249
NESC Extreme	15	Clamp	19XY	0.000	0.273	0.107	0.293
NESC Extreme	16	Clamp	21XY	0.000	0.267	0.105	0.287
NESC Extreme	17	Clamp	23XY	0.000	0.267	0.105	0.287
NESC Extreme	18	Clamp	25XY	0.000	0.267	0.105	0.287
NESC Extreme	19	Clamp	1P	0.000	0.664	0.419	0.785
NESC Extreme	20	Clamp	2S	0.000	0.329	0.173	0.372
NESC Extreme	21	Clamp	2X	0.000	0.329	0.173	0.372
NESC Extreme	22	Clamp	2Y	0.000	0.329	0.173	0.372
NESC Extreme	23	Clamp	3X	0.000	0.140	0.062	0.153
NESC Extreme	24	Clamp	5X	0.000	0.226	0.083	0.241
NESC Extreme	25	Clamp	12X	0.000	0.221	0.082	0.235
NESC Extreme	26	Clamp	15X	0.000	0.211	0.076	0.224
NESC Extreme	27	Clamp	17X	0.000	0.235	0.081	0.249
NESC Extreme	28	Clamp	19X	0.000	0.273	0.107	0.293
NESC Extreme	29	Clamp	21X	0.000	0.267	0.105	0.287
NESC Extreme	30	Clamp	23X	0.000	0.267	0.105	0.287
NESC Extreme	31	Clamp	25X	0.000	0.267	0.105	0.287

**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	6.655	0.000	16.370	459.506	0.074	0.017
NESC Extreme	10.295	0.000	6.216	690.132	0.037	0.074

\*\*\* Weight of structure (lbs):  
 Weight of Angles\*Section DLF: 5535.7  
 Total: 5535.7

\*\*\* End of Report



**Foundation Analysis**

**Input Data:**

Reactions at Tower Legs:

Uplift Leg A =	$Uplift_A := 65.26 \cdot 1.1 \cdot kips = 71.8 \cdot kips$	(User Input)
Uplift Leg B =	$Uplift_B := 65.27 \cdot 1.1 \cdot kips = 71.8 \cdot kips$	(User Input)
Compression Leg A =	$Comp_A := 71.14 \cdot 1.1 \cdot kips = 78.3 \cdot kips$	(User Input)
Compression Leg B =	$Comp_B := 71.14 \cdot 1.1 \cdot kips = 78.3 \cdot kips$	(User Input)
Total Shear =	$Shear := 26.28 \cdot 1.1 \cdot kips = 28.9 \cdot kips$	(User Input)

Tower Properties:

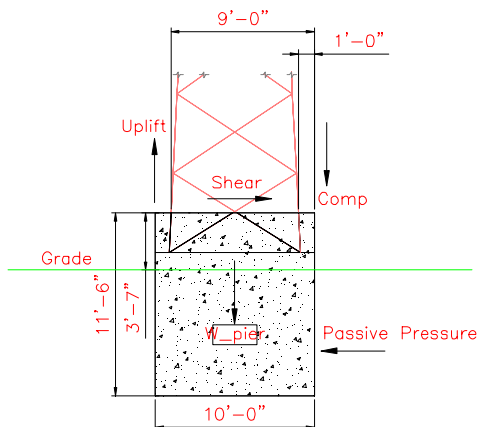
Tower Height =	$H_t := 90 \cdot ft$	(User Input)
Distance to Uplift Legs =	$D_{uplift} := 9 \cdot ft$	(User Input)
Distance to Compression Legs =	$D_{comp} := 1 \cdot ft$	(User Input)

Foundation Properties:

Pier Height =	$P_H := 11.5 \cdot ft$	(User Input)
Pier Width =	$P_W := 10 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 3.58 \cdot ft$	(User Input)
Pad Width =	$Pad_W := 0 \cdot ft$	(User Input)
Pad Thickness =	$Pad_t := 0 \cdot ft$	(User Input)
Concrete Unit Weight =	$\gamma_c := 150 \cdot pcf$	(User Input)

Subgrade Properties:

Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)
Allowable Soil Bearing Capacity =	$q_s := 3000 \cdot psf$	(User Input)
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)
Distance to Centroid of Soil =	$D_{soil} := 0 \cdot ft$	(User Input)



**Calculated Data:**

Volume of the Concrete Pad =  $V_{pad} := P_{ad_w}^2 \cdot P_{ad_t} = 0 \cdot ft^3$

Volume of the Concrete Pier =  $V_{pier} := P_H \cdot P_w^2 = 1150 \cdot ft^3$

Weight of Concrete Pad =  $W_{pad} := V_{pad} \cdot \gamma_c = 0 \cdot kips$

Weight of Concrete Pier =  $W_{pier} := V_{pier} \cdot \gamma_c = 173 \cdot kips$

Total Weight of Concrete =  $W_{conc} := W_{pier} + W_{pad} = 173 \cdot kips$

Coefficient of Lateral Soil Pressure =  $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

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

$P_{bot} := K_p \cdot \gamma_{soil} (P_H - P_P) = 2.376 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.188 \cdot ksf$

$A_p := P_w (P_H - P_P) = 79.2 \cdot ft^2$

Ultimate Shear =  $S_u := P_{ave} \cdot A_p = 94.1 \cdot kip$

Total Uplift =  $Tot_{uplift} := Uplift_A + Uplift_B = 144 \cdot kips$

Total Compression =  $Tot_{comp} := Comp_A + Comp_B = 157 \cdot kips$

Overturing Moment =  $OTM := Tot_{uplift} \cdot D_{uplift} + Shear \cdot (P_H + P_{ad_t}) = 1625 \cdot k \cdot ft$

Resisting Moment =  $RM := Tot_{comp} \cdot D_{comp} + W_{conc} \cdot \frac{P_w}{2} + 3 \cdot S_u \cdot \frac{(P_H - P_P)}{3} = 1764 \cdot k \cdot ft$

Check Overturing:

Required Factor of Safety =  $F_S := 1.0$

ActualFS =  $\frac{RM}{OTM} = 1.09$

Overturing\_Check :=  $if\left(\frac{RM}{OTM} \geq F_S, "OK", "Overstressed"\right)$

**Overturing\_Check = "OK"**

















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	FX-X-CD-65-12-65-14-00T-ST						
ANTENNA VENDOR	KMW						
ANTENNA SIZE (H x W x D)	24X11.8X6						
ANTENNA WEIGHT	15.4						
AZIMUTH	30						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	5	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (4)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA5 (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)	
ANTENNA POSITION 1	PORT 1	24475.A.850.3G.2	24475.A.850.3G.1	CTV50111	CTV50111		UMTS 850	FX-X-CD-65-12-65-14-00T-ST_850MHz_00DT	12.4		0	None	7/8" ANDREW LDF5-50A	120.030726								1		
	PORT 2	24475.A.700.4G.1	24475.A.700.4G.1	CTL05011_7A_1	CTL05011_7A_1		LTE 700	FX-X-CD-65-12-65-14-00T-ST_725MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726					1475.7065			1		
	PORT 3	24475.A.1900.3G.1	24475.A.1900.3G.1	CTU50117	CTU50117		UMTS 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	13.5		0	None	7/8" ANDREW LDF5-50A	120.030726						398.11			2	
	PORT 4	24475.A.1900.25G.1	24475.A.1900.25G.1	321P50111	321P50111		GSM 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	13.5		0	None	7/8" ANDREW LDF5-50A	120.030726	RXAIT 1900	2	1900 LLC		28.18	291.74			2	

							14-00T-ST_1930MHz_00DT					50A												
	PORT 7	24475.A.1900.4G.1	24475.A.1900.4G.1	CTL05011_9A_1	CTL05011_9A_1		LTE 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726							3664.3757		2	

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	FX-X-CD-65-12-65-14-00T-ST						
ANTENNA VENDOR	KMW						
ANTENNA SIZE (H x W x D)	24X11.8X6						
ANTENNA WEIGHT	15.4						
AZIMUTH	150						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	5	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (4)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24475.B.850.3G.2	24475.B.850.3G.1	CTV50112	CTV50112		UMTS 850	FX-X-CD-65-12-65-14-00T-ST_850MHz_00DT	12.4		0	None	7/8" ANDREW LDF5-50A	120.030726								9	
	PORT 2	24475.B.700.4G.1	24475.B.700.4G.1	CTL05011_7B_1	CTL05011_7B_1		LTE 700	FX-X-CD-65-12-65-14-00T-ST_725MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						1475.7065		9	
	PORT 3	24475.B.1900.3G.1	24475.B.1900.3G.1	CTU50118	CTU50118		UMTS 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	13.5		0	None	7/8" ANDREW LDF5-50A	120.030726						398.11		10	
	PORT 4	24475.B.1900.25G.1,24475.B.	24475.B.1900.25G.1	321P50112	321P50112		GSM 1900	FX-X-CD-65-12-65-	13.5		0	None	7/8" ANDREW LDF5-	120.030726	RXAIT 1900	2	1900 LLC		12.58	130.31		10	

		850.3G.2					14-00T-ST_1930MHz_00DT					50A												
	PORT 7	24475.B.1900.4G.1	24475.B.1900.4G.1	CTL05011_9B_1	CTL05011_9B_1		LTE 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726							3664.3757		10	

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	FX-X-CD-65-12-65-14-00T-ST						
ANTENNA VENDOR	KMW						
ANTENNA SIZE (H x W x D)	24X11.8X6						
ANTENNA WEIGHT	15.4						
AZIMUTH	270						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	4						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	5	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (4)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24475.C.850.3G.2	24475.C.850.3G.1	CTV50113	CTV50113		UMTS 850	FX-X-CD-65-12-65-14-00T-ST_850MHz_00DT	12.4		0	None	7/8" ANDREW LDF5-50A	120.030726								17	
	PORT 2	24475.C.700.4G.1	24475.C.700.4G.1	CTL05011_7C_1	CTL05011_7C_1		LTE 700	FX-X-CD-65-12-65-14-00T-ST_725MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						1475.7065		17	
	PORT 3	24475.C.1900.3G.1	24475.C.1900.3G.1	CTU50119	CTU50119		UMTS 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	13.5		0	None	7/8" ANDREW LDF5-50A	120.030726						398.11		18	
	PORT 4	24475.C.1900.25G.1	24475.C.1900.25G.1	321P50113	321P50113		GSM 1900	FX-X-CD-65-12-65-	13.5		0	None	7/8" ANDREW LDF5-	120.030726	RXAIT 1900	2	1900 LLC		28.18	291.74		18	

							14-00T-ST_1930MHz_00DT					50A													
	PORT 7	24475.C.1900.4G.1	24475.C.1900.4G.1	CTL05011_9C_1	CTL05011_9C_1		LTE 1900	FX-X-CD-65-12-65-14-00T-ST_1930MHz_00DT	12.69		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726								3664.3757		18	

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	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	30						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	2	Andrew APTDC-BDFDM-DBW Broadband					
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2_ XMU-1 - PA:PA2A:PC:PA2C:PB:PA2B:_____D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7	24475.A.1900.4G.1	24475.A.1900.4G.1	CTL05011_9A_1	CTL05011_9A_1		LTE 1900	HPA-65F-BUU-H2_1930MHZ_00DT	13		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						3664.3757		2	



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	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	150						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	2	Andrew APTDC-BDFDM-DBW Broadband					
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2_ XMU-1 - PA:PA2A:PC:PA2C:PB:PA2B:.....D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7	24475.B.1900.4G.1	24475.B.1900.4G.1	CTL05011_9B_1	CTL05011_9B_1		LTE 1900	HPA-65F-BUU-H2_1930MHZ_00DT	13		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						3664.3757		10	

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	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	270						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	4						
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	2	Andrew APTDC-BDFDM-DBW Broadband					
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2_ XMU-1 - PA:PA2A:PC:PA2C:PB:PA2B:.....D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7	24475.C.1900.4G.1	24475.C.1900.4G.1	CTL05011_9C_1	CTL05011_9C_1		LTE 1900	HPA-65F-BUU-H2_1930MHZ_00DT	13		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						3664.3757		18	

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	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	30						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	4						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	7	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (6)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA5 (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-12+RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A-7B-7C:X1P1:X1P2_ XMU-1 - PA:PA2A-PC:PA2C-PB:PA2B_ _ _ _ _D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24475.A.850.3G.2	24475.A.850.3G.1	CTV50111	CTV50111	OP State = 0	UMTS 850	HPA-65F-BUU-H2_849MHz_00DT	10.5		0	None	7/8" ANDREW LDF5-50A	120.030726								1	
	PORT 2	24475.A.700.4G.1	24475.A.700.4G.1	CTL05011_7A_1	CTL05011_7A_1		LTE 700	HPA-65F-BUU-H2_719MHz_00DT	9.9		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						1475.7065		1	
	PORT 3	24475.A.1900.3G.1	24475.A.1900.3G.1	CTU50117	CTU50117		UMTS 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726						398.11		2	
	PORT 4	24475.A.1900.25G.1	24475.A.1900.25G.1	321P50111	321P50111		GSM 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726	RXAIT 1900	2	1900 LLC		28.18	291.74		2	
	PORT 7	24475.A.1900.4G.1	24475.A.1900.4G.1	CTL05011_9A_1	CTL05011_9A_1		LTE 1900	HPA-65F-BUU-	13		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						3664.3757		2	



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	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	150						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	0						
FEEDER AMOUNT	4						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	7	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (6)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-12+RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A-7B-7C:X1P1:X1P2_ XMU-1 - PA:PA2A-PC:PA2C-PB:PA2B_ _ _ _ _D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24475.B.850.3G.2	24475.B.850.3G.1	CTV50112	CTV50112	OP State = 0	UMTS 850	HPA-65F-BUU-H2_849MHz_00DT	10.5		0	None	7/8" ANDREW LDF5-50A	120.030726								9	
	PORT 2	24475.B.700.4G.1	24475.B.700.4G.1	CTL05011_7B_1	CTL05011_7B_1		LTE 700	HPA-65F-BUU-H2_719MHz_00DT	9.9		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726						1475.7065		9	
	PORT 3	24475.B.1900.3G.1	24475.B.1900.3G.1	CTU50118	CTU50118		UMTS 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726						398.11		10	
	PORT 4	24475.B.1900.25G.1.24475.B.850.3G.2	24475.B.1900.25G.1	321P50112	321P50112		GSM 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726	RXAIT 1900	2	1900 LLC		12.58	130.31		10	
	PORT 7	24475.B.1900.4G.1	24475.B.1900.4G.1	CTL05011_9B_1	CTL05011_9B_1		LTE 1900	HPA-65F-BUU-	13		0	BOTTOM	7/8" ANDREW LDF5-	120.030726						3664.3757		10	



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

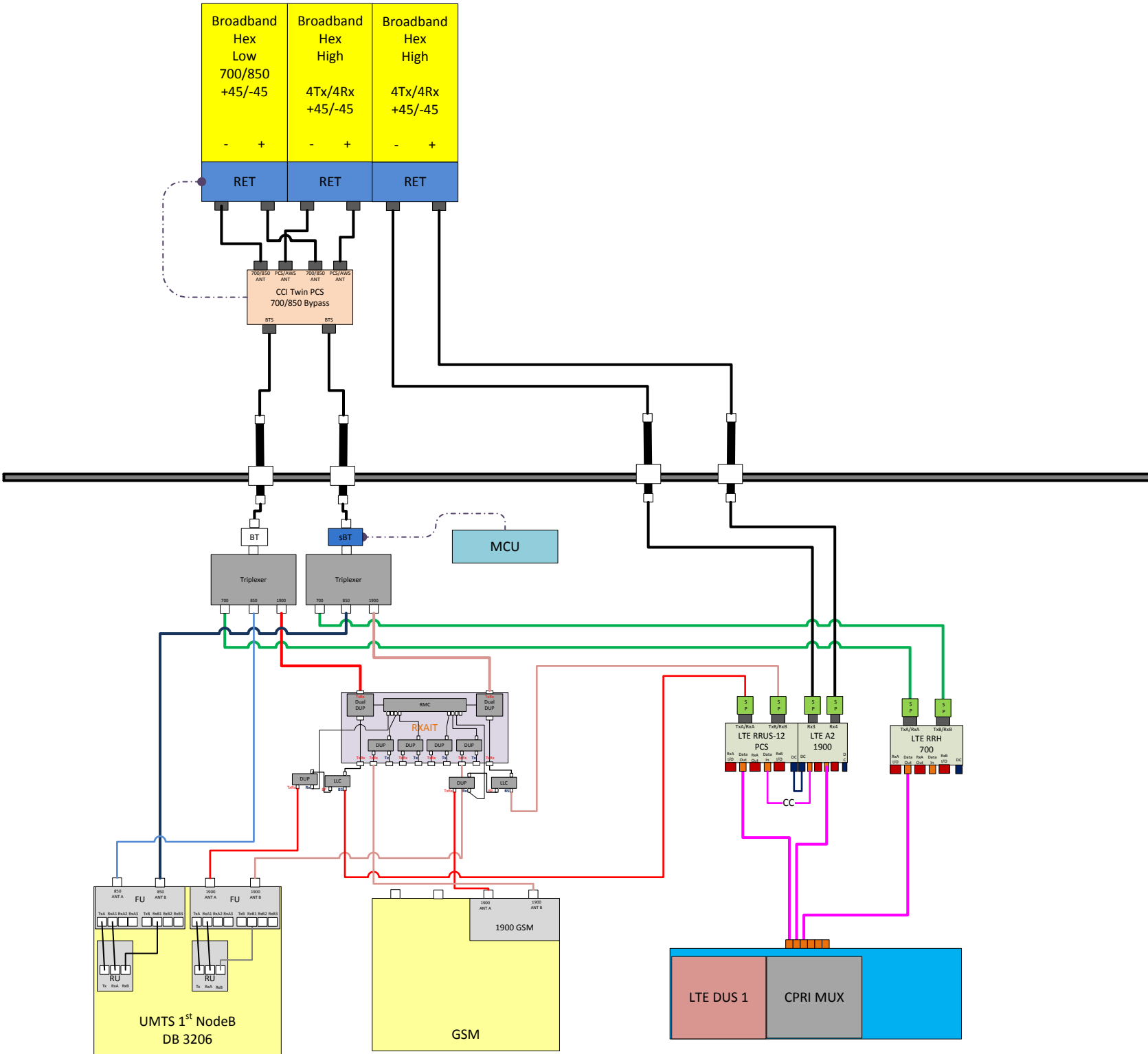
ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	HPA-65F-BUU-H2-K						
ANTENNA VENDOR	CCI Products						
ANTENNA SIZE (H x W x D)	21.4X14.4X7.3						
ANTENNA WEIGHT	13.8						
AZIMUTH	270						
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	85						
ANTENNA TIP HEIGHT	86						
MECHANICAL DOWNTILT	4						
FEEDER AMOUNT	4						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)	7	Polyphaser 1000860 (1) + Andrew APTDC-BDFDM-DBW Broadband (6)					
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-10253					
PDU FOR TMA5 (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1	RRUS-12+RRUS-A2					
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	LTE BWE - Replace existing Antenna with 2' Hex port Antenna- Add RRUS-A2 to existing LTE 1900 RRUS-12 at bottom- Add 2 Coax- Add XMU						
Local Market Note 2							
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A-7B-7C:X1P1:X1P2_ XMU-1 - PA:PA2A-PC:PA2C-PB:PA2B_ D1E:D1D						

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)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24475.C.850.3G.2	24475.C.850.3G.1	CTV50113	CTV50113	OP State = 0	UMTS 850	HPA-65F-BUU-H2_849MHz_00DT	10.5		0	None	7/8" ANDREW LDF5-50A	120.030726								17	
	PORT 2	24475.C.700.4G.1	24475.C.700.4G.1	CTL05011_7C_1	CTL05011_7C_1		LTE 700	HPA-65F-BUU-H2_719MHz_00DT	9.9		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726					1475.7065			17	
	PORT 3	24475.C.1900.3G.1	24475.C.1900.3G.1	CTU50119	CTU50119		UMTS 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726					398.11			18	
	PORT 4	24475.C.1900.25G.1	24475.C.1900.25G.1	321P50113	321P50113		GSM 1900	HPA-65F-BUU-H2_1930MHz_00DT	13		0	None	7/8" ANDREW LDF5-50A	120.030726	RXAIT 1900	2	1900 LLC		28.18	291.74		18	
	PORT 7	24475.C.1900.4G.1	24475.C.1900.4G.1	CTL05011_9C_1	CTL05011_9C_1		LTE 1900	HPA-65F-BUU-	13		0	BOTTOM	7/8" ANDREW LDF5-50A	120.030726					3664.3757			18	

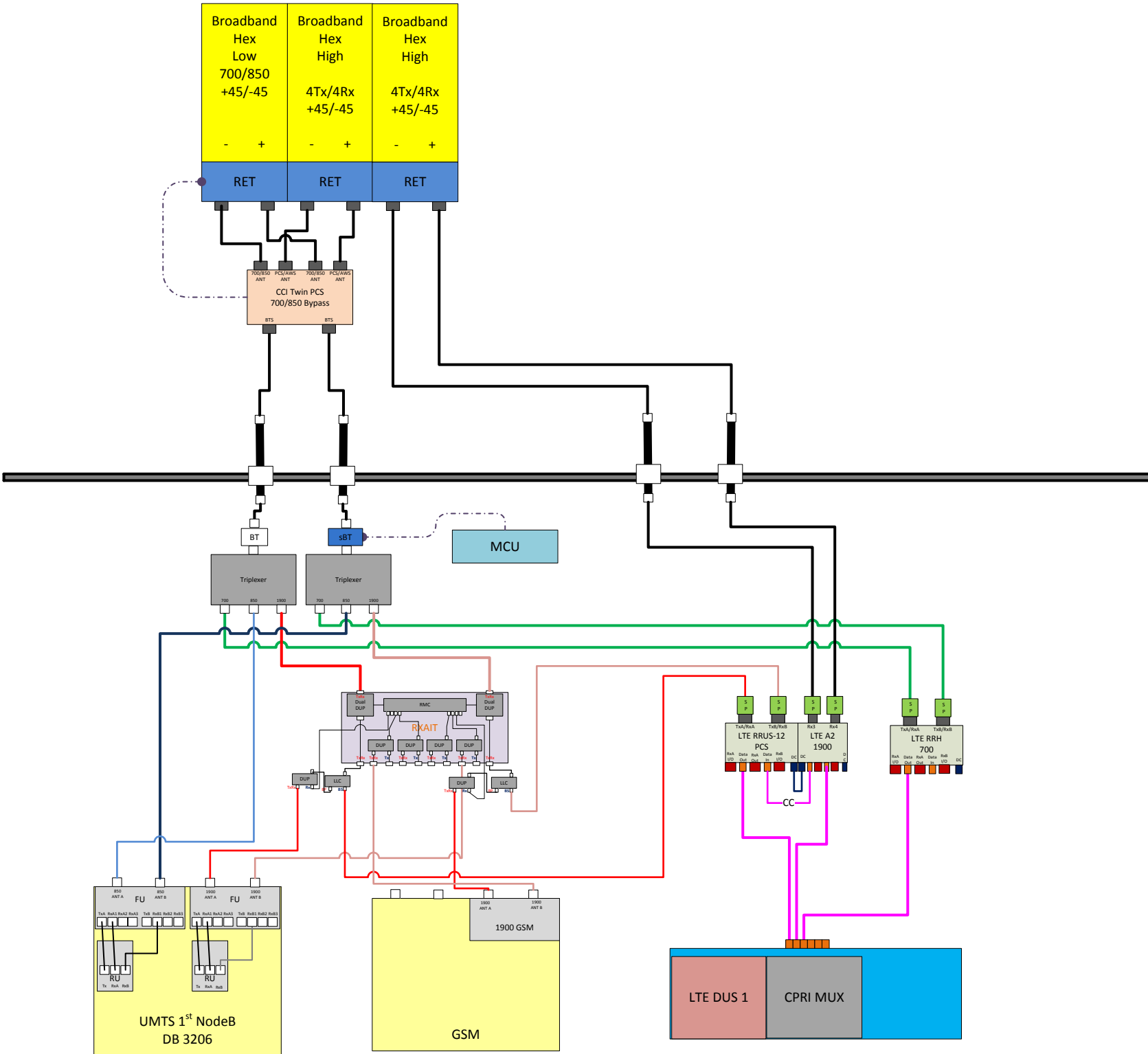




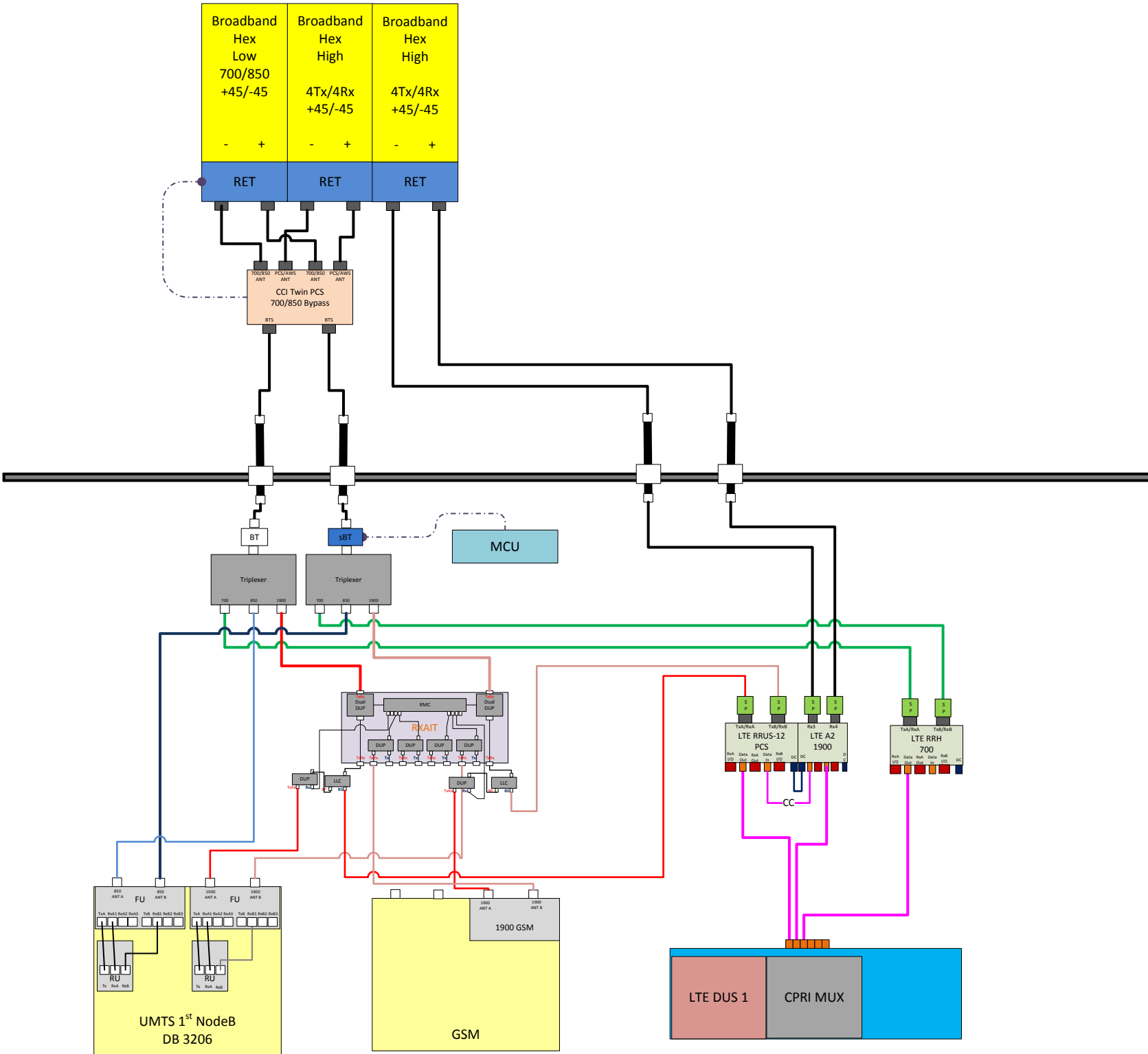
Antenna 1



Antenna 1

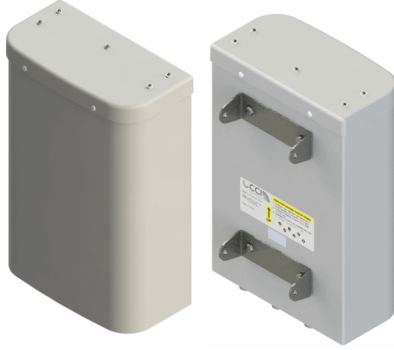


Antenna 1



WORKFLOW SUMMARY

Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments
06/01/2016	Preliminary / In Progress	om636a	Preliminary / Submitted for Approval	AB014M	Promote	LTE Preliminary RFDS
08/12/2016	Preliminary / Submitted for Approval	AB014M	Preliminary / Approved	BG144B	Promote	
08/15/2016	Preliminary / Approved	BG144B	Final / RF Approval	OM636A	Promote	Needs Final
08/17/2016	Final / RF Approval	OM636A	Final / Approved	BG144B	Promote	Final LTE RFDS



- High Band Ports include WCS Band
- Four High Band ports with two Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome
- Reduces tower loading
- Frees up space for tower mounted E-nodes
- Single radome with six ports

### Overview

The CCI Hexport Multi-Band Antenna Array has four high band ports and two low band ports, our hexport antenna is ready for 4X4 high band MIMO. Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for SMR800 and PCS 1900 MHz coverage in a single enclosure.

CCI antennas are designed and produced to ISO 9001 standards for reliability and quality in our state-of-the-art manufacturing facilities.

### Applications

- 4x4 MIMO for the high band and 2x2 MIMO for the low band
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count



## HexPort Dual-Band Antenna

HPA-65F-BUU-H2

### SPECIFICATIONS

#### Electrical

Ports	2 x Low Band Ports which cover the full range from 698-894 MHz		4 x High Band Ports which cover the full range from 1710-2360 MHz			
Frequency Range	698-806 MHz	824-894 MHz	1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	10.0 dBi	10.5 dBi	12.8 dBi	12.6 dBi	13.6 dBi	14.0 dBi
Azimuth Beamwidth (-3dB)	65°	62°	64°	66°	60°	59°
Elevation Beamwidth (-3dB)	40.0°	35.8°	17.5°	17.8°	15.8°	14.3°
Electrical Downtilt	4°	4°	3°	3°	3°	3°
Elevation Sidelobes (1st Upper)	< -15 dB	< -13 dB	< -13 dB	< -17 dB	< -13 dB	< -17 dB
Front-to-Back Ratio @180°	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Port-to-Port Isolation	> 20 dB	> 20 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

#### Mechanical

Dimensions (LxWxD)	21.4x14.4x7.3 in (544x366x185 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	66 lbs (293 N) @ 100 mph (161 kph)
Side Wind Load	34 lbs (150 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	2.6 ft <sup>2</sup> (0.2 m <sup>2</sup> )
Weight *	15.2 lbs (6.9 kg)
Connector	6 x 7-16 DIN female long neck
Mounting Pole	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting

# 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

Output IP3	+30dBm typ
Maximum input power with no damage	+12dBm max
Downlink Path, Band 2	WCS
Passband	2350 - 2360
Insertion Loss	0.5dB typ
Return Loss	18dB min
Max Average input power (W)	120
Max PEP Input Power (W)	1200
Intermodulation, 2 x 43dBm TX carriers (dBc)	-153dBc max
Uplink Path, Band 2	
Passband	2305 - 2315
Gain (dB)	2dB to 12dB in 1dB steps
Gain window	+/- 1dB max
Return Loss (dB Min, Operating)	18
Return Loss (dB Min Bypass)	12
Noise Figure	1.7dB typ
Rejection @ Freq x (dBc Min)	2324.54 - 2341.285MHz (27.5dB min)
Bypass (Insertion) Loss	3.3dB typ
Output IP3	+30dBm typ
Maximum input power with no damage	+12dBm max
Bypass Passband	698 - 896MHz
Insertion Loss	0.35dB typ
Return loss, all ports	18dB min
Continuous average power	200
Peak envelope power	2000
Intermodulation @ antenna port	-153dBc max

## CURRENT ALARM MODE (DEFAULT MODE SELECTED ON THE ABSENCE OF AISG PACKETS)

DC Supply Voltage (VDC min)	8.5
DC Supply Voltage (VDC max)	30
Supply Current, Normal operation	250 +/- 20mA 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	-40°C to +65°C   -40° to +149°F
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



# Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5011

Darien  
Noroton Heights Rail Road Station  
Darien, CT 6820

**January 19, 2017**

**Centerline Communications Project Number: 950006-024**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>4.19 %</b>



January 19, 2017

AT&T Mobility – New England  
Attn: John Benedetto, RF Manager  
550 Cochituate Road  
Suite 550 – 13&14  
Framingham, MA 06040

### Emissions Analysis for Site: **CT5011 – Darien**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **Noroton Heights Rail Road Station, Darien, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 700 and 850 MHz Bands are approximately  $467 \mu\text{W}/\text{cm}^2$  and  $567 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.



## CALCULATIONS

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

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	700 MHz	2	60
UMTS	1900 MHz (PCS)	2	30
GSM	1900 MHz (PCS)	2	30
LTE	1900 MHz (PCS)	2	60

*Table 1: Channel Data Table*



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	CCI HPA-65R-BUU-H2-K	85
B	1	CCI HPA-65R-BUU-H2-K	85
C	1	CCI HPA-65R-BUU-H2-K	85

*Table 2: Antenna Data*

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

## RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	CCI HPA-65R-BUU-H2-K	850 MHz / 700 MHz / 1900 MHz (PCS)	8.35 / 7.85 / 10.65	10	420	6,117.99	4.19
Sector A Composite MPE%							<b>4.19</b>
Antenna B1	CCI HPA-65R-BUU-H2-K	850 MHz / 700 MHz / 1900 MHz (PCS)	8.35 / 7.85 / 10.65	10	420	6,117.99	4.19
Sector B Composite MPE%							<b>4.19</b>
Antenna C1	CCI HPA-65R-BUU-H2-K	850 MHz / 700 MHz / 1900 MHz (PCS)	8.35 / 7.85 / 10.65	10	420	6,117.99	4.19
Sector C Composite MPE%							<b>4.19</b>

*Table 3: AT&T Emissions Levels*



The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

<b>Site Composite MPE%</b>	
<b>Carrier</b>	<b>MPE%</b>
AT&T – Max Sector Value	<b>4.19 %</b>
No Additional Carriers Per CSC Active Database	NA
<b>Site Total MPE %:</b>	<b>4.19 %</b>

*Table 4: All Carrier MPE Contributions*

AT&T Sector A Total:	4.19 %
AT&T Sector B Total:	4.19 %
AT&T Sector C Total:	4.19 %
<b>Site Total:</b>	<b>4.19 %</b>

*Table 5: Site MPE Summary*





Per FCC OET 65, carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T_Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
AT&T 850 MHz UMTS	2	205.17	85	2.36	850 MHz	567	0.42%
AT&T 700 MHz LTE	2	365.72	85	4.21	700 MHz	467	0.90%
AT&T 1900 MHz (PCS) UMTS	2	348.43	85	4.01	1900 MHz (PCS)	1000	0.40%
AT&T 1900 MHz (PCS) GSM	2	348.43	85	4.01	1900 MHz (PCS)	1000	0.40%
AT&T 1900 MHz (PCS) LTE	2	1,791.23	85	20.64	1900 MHz (PCS)	1000	2.06%
						Total:	4.19%

*Table 6: AT&T Maximum Sector MPE Power Values*



## Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	4.19 %
Sector B:	4.19 %
Sector C:	4.19 %
AT&T Maximum Total (per sector):	4.19 %
Site Total:	4.19 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **4.19 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

A handwritten signature in black ink, appearing to read 'Scott Heffernan', is positioned above the contact information.

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