QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

April 10, 2020

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT5090
2891 Nichols Ave, Trumbull, CT 06611
N 41.23285833
W 73.15933333

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 101-foot level of the existing 91-foot Utility Pole at 2891 Nichols Ave, Trumbull, CT. The tower and property are controlled by Eversource. AT&T now intends to remove three (3) CCI antennas and replace them with three (3) KMW EPBQ-654L8H6-L2 antennas. AT&T will also replace six (6) CCI TMAs with six (6) new Kaelus TMAs. These new antennas and TMAs will also be installed at the 101-foot level on the existing antenna mount.

This facility was approved by the Siting Council on November 7, 2001 in Petition # 527. The approval included no further conditions. Since no changes are proposed to the overall tower height, this modification complies with the aforementioned approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Vicki Tesoro, First Selectman of the Town of Trumbull, and the Trumbull Planning & Zoning Office, as well as the tower and property owner.

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

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

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

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

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

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

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

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

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

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Vicki Teroso - Elected Official
Rob Librandi – Town Planner
Eversource - Tower Owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0%
AT&T UMTS	2	414	101	0.0660	850	0.5667	1.16%
AT&T UMTS	2	656	101	0.0523	1900	1.0000	0.52%
AT&T LTE	2	940	101	0.0749	700	0.4667	1.43%
AT&T LTE	2	1791	101	0.1427	1900	1.0000	1.61%
Site Total							4.72%

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

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

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0%
AT&T UMTS	1	273	101	0.0109	850	0.5667	0.19%
AT&T LTE	1	1476	101	0.0588	700	0.4667	1.26%
AT&T LTE	1	1000	101	0.0398	850	0.5667	0.70%
AT&T 5G	1	1000	101	0.0398	850	0.5667	0.70%
AT&T LTE	2	7329	101	0.5841	1900	1.0000	5.84%
AT&T LTE	1	1285	101	0.0512	2300	1.0000	0.51%
Site Total							9.21%

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

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

WIRELESS COMMUNICATIONS FACILITY
CT5090 - LTE 3C WCS /4C 850/700 BC
TRUMBULL SOUTH EAST
2891 NICHOLS AVENUE
TRUMBULL, CT 06611

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA–222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2018 CONNECTICUT FIRE SAFETY CODE AND, 2017 NATIONAL ELECTRICAL CODE AND LOCAL CODES.

2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.

3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.

4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.

5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.

6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.

7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.

8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.

9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.

10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.

13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.

15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.

16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.

17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB–CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.

19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.

21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

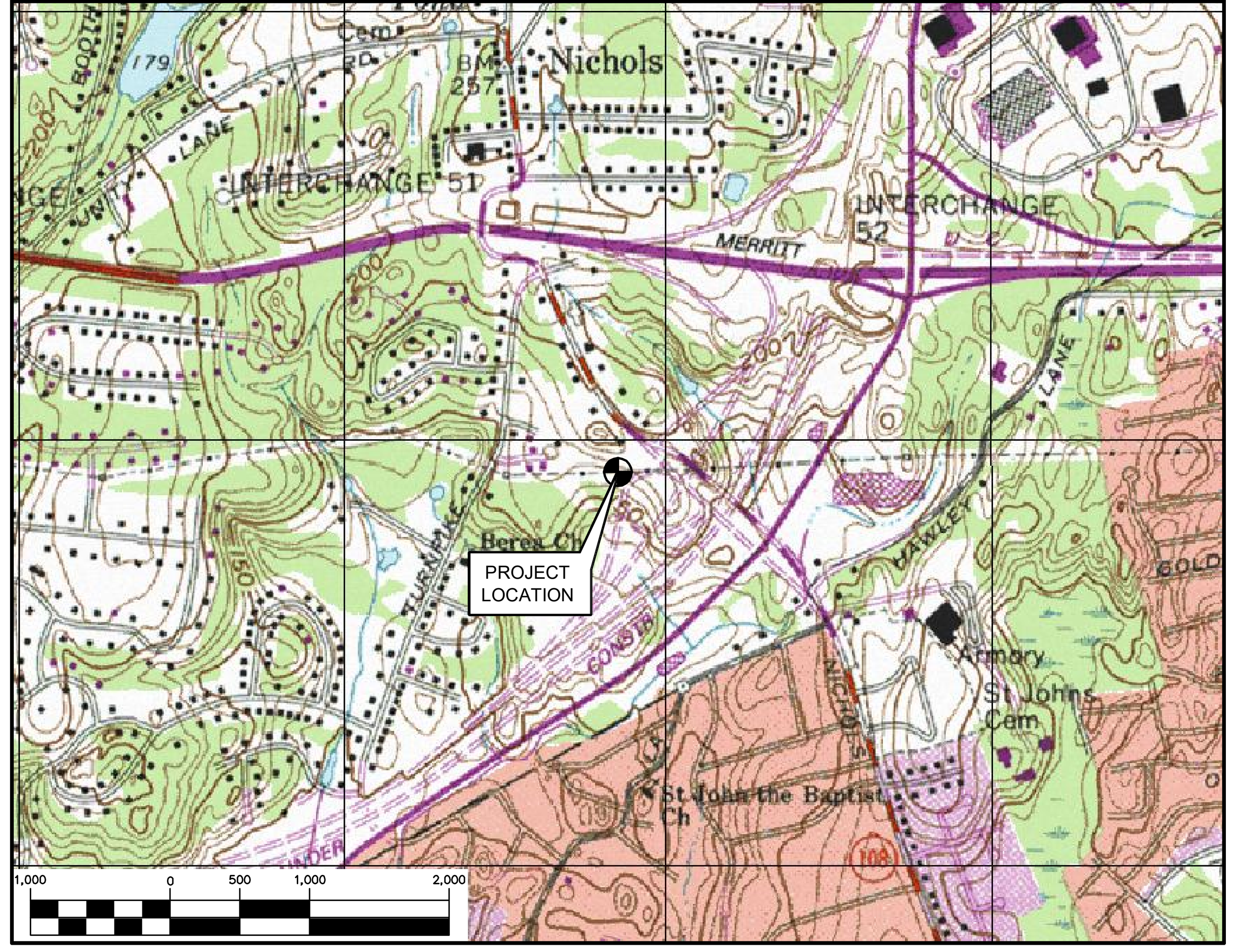
TO: 2891 NICHOLS AVENUE
TRUMBULL, CT 06611

1.	HEAD SOUTHEAST TOWARD CAPITAL BLVD.	0.50 MI
2.	TURN LEFT ONTO CAPITAL BLVD.	0.20 MI
3.	USE THE LEFT 2 LANES TO TURN LEFT ONTO STATE HWY 411.	0.30 MI
4.	TURN LEFT TO MERGE ONTO I–91 S TOWARD.	0.30 MI
5.	MERGE ONTO I–91 S.	9.40 MI
6.	TAKE EXIT 17 TO MERGE ONTO CT–15 S/WILBUR CROSS PKWY.	30.20 MI
7.	TAKE EXIT 52 FOR STATE ROUTE 108 S/STATE ROUTE 8 S TOWARD BRIDGEPORT.	0.60 MI
8.	KEEP RIGHT, FOLLOW SIGNS FOR CT–108/STRATFORD.	0.20 MI
9.	TURN LEFT ONTO CT–108 W/NICHOLS AVE.	0.05 MI

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

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

   A. WORK AT ALPHA/BETA/GAMMA SECTORS:
   - REMOVE (6) EXISTING TMA'S FOR (6) NEW TMA'S (2) PER SECTOR AT POS.4
   - REMOVE (3) EXISTING ANTENNAS, FOR (3) NEW ANTENNAS (1) PER SECTOR AT POS.4

   B. WORK AT EXISTING EQUIPMENT LOCATION AT GRADE:
   - INSTALL NEW EQUIPMENT RACK WITH (3) NEW RRU'S AND ASSOCIATED RRU SURGE ARRESTORS. INSTALL A DC12 ARRESTOR UNIT ON PROPOSED BACKBOARD.
   - REMOVE AND REPLACE (9) EXISTING RRU'S FOR (9) NEW RRU'S AND ASSOCIATED SURGE ARRESTORS.
   - REMOVE (6) EXISTING DIPLEXERS FOR (12) NEW DIPLEXERS
   - SWAP BB WITH 5216 AND INSTALL (1) NEW RBS 6630 WITHIN EXISTING LTE PURCELL CABINET

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5090
AT&T SITE NAME:	TRUMBULL SOUTHEAST
SITE ADDRESS:	2891 NICHOLS AVENUE TRUMBULL, CT 06611
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
AT&T PACE JOB:	PACE JOB 1 – MRCTB033554 PACE JOB 2 – MRCTB033718 PACE JOB 3 – MRCTB033889
AT&T FA LOCATION CODE:	10092214
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°–13'–58.37" N LONGITUDE: 73°–09'–33.44" W GROUND ELEVATION: ±167' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	08/5/19	TJL	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
0	05/31/19	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · TIMOTHY J. LYNN · No. 28336 · LICENSED · PROFESSIONAL ENGINEER

at&t

CENTERLINE COMMUNICATIONS

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Centered on Solutions℠
(203) 488-0580
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Branford, CT 06405
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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
TRUMBULL SOUTHEAST
CT5090 – LTE 3C WCS/4C 850/700 BC
2891 NICHOLS AVENUE
TRUMBULL, CT 06611

DATE:	03/21/19
SCALE:	AS NOTED
JOB NO.	19047.00

TITLE SHEET

T–1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CT STATE BUILDING CODE.

1. DESIGN CRITERIA:
   ANTENNA MAST
   - WIND LOAD: PER ANSI/TIA 222 G (ANTENNA MAST): 97 MPH (NOMINAL)

   SELF-SUPPORTING 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 EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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 REPAIR WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) TMA/DIPLEXER/TRIPLEXER (QTY)	(E/P) RRU (QTY)	FEEDER TYPE (QTY)/LENGTH	(E/P) RAYCAP (QTY)
A1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	101'	30°	(E) PWAV: TMA LGP17201 (DUAL BAND) (2), (E) PWAV: DIPLEXER LGP21901 (2)		ANDREW 7/8"ø (850) ±135' (2)	(P) RAYCAP DC12-48-60-0-25E (1) (E) RAYCAP DC6-48-60-18E (2)
A4	PROPOSED	LTE 700BC/PCS/850/WCS	KMW (EPBQ-654L8H6-L2)	73 x 21 x 6.3	101'	30°	(P) TMA TMA2117F00V1-1 (2), (P) DIPLEXER QBC0007F1V51-1 (4)	(P) B5/B12 4449 (1), (P) RRUS-12 (2), (P) RRUS-32 (1)	ANDREW 7/8"ø ±135' (4)	
B1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	101'	150°	(E) PWAV: TMA LGP17201 (DUAL BAND) (2), (E) PWAV: DIPLEXER LGP21901 (2)		ANDREW 7/8"ø ±135' (850) (2)	
B4	PROPOSED	LTE 700BC/PCS/850/WCS	KMW (EPBQ-654L8H6-L2)	73 x 21 x 6.3	101'	150°	(P) TMA TMA2117F00V1-1 (2), (P) DIPLEXER QBC0007F1V51-1 (4)	(P) B5/B12 4449 (1), (P) RRUS-12 (2), (P) RRUS-32 (1)	ANDREW 7/8"ø ±135' (4)	
C1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	101'	260°	(E) PWAV: TMA LGP17201 (DUAL BAND) (2), (E) PWAV: DIPLEXER LGP21901 (2)		ANDREW 7/8"ø ±135' (850) (2)	
C4	PROPOSED	LTE 700BC/PCS/850/WCS	KMW (EPBQ-654L8H6-L2)	73 x 21 x 6.3	101'	270°	(P) TMA TMA2117F00V1-1 (2), (P) DIPLEXER QBC0007F1V51-1 (4)	(P) B5/B12 4449 (1), (P) RRUS-12 (2), (P) RRUS-32 (1)	ANDREW 7/8"ø ±135' (4)	

RRU	SIZE (INCHES) (L x W x D)
RRUS-12	20.4 x 18.5 x 7.5
RRUS-32	27.2 x 12.1 x 7
B5/B12 4449	17.9 x 13.2 x 9.5

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1	08/5/19	TJL	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/31/19	DMD	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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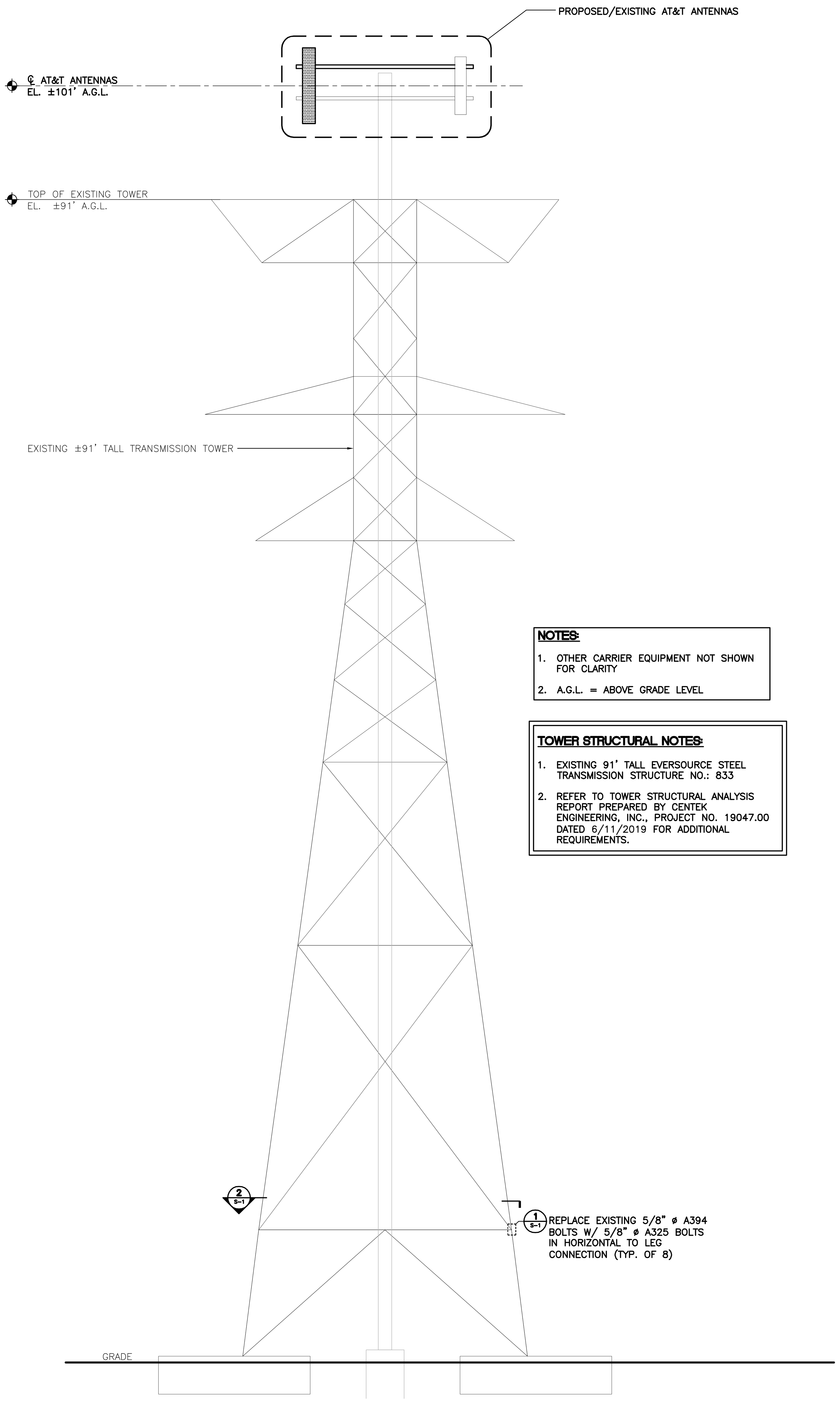
NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE

N-1



NOTES:

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

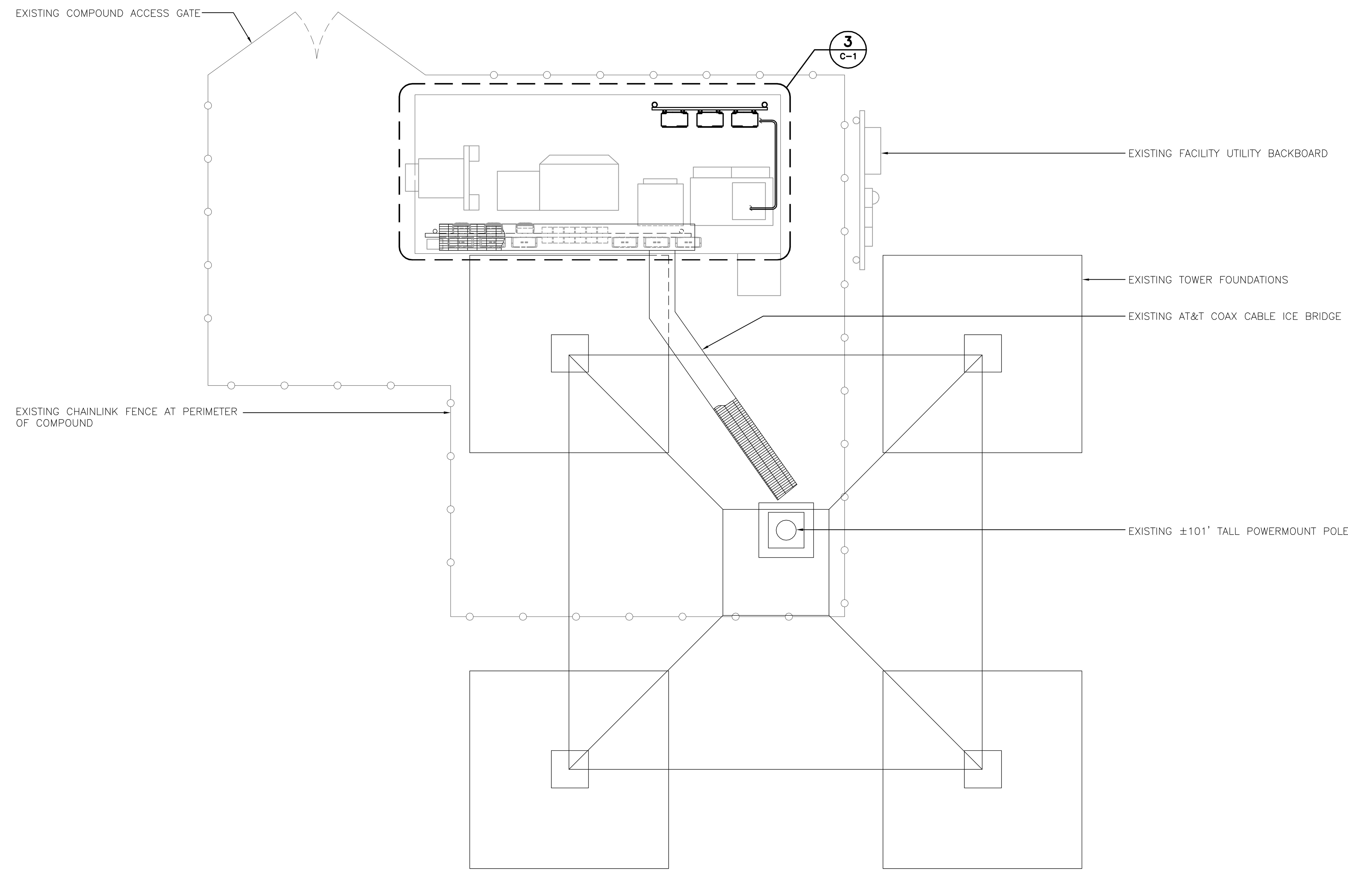
TOWER STRUCTURAL NOTES:

1. EXISTING 91' TALL EVERSOURCE STEEL TRANSMISSION STRUCTURE NO.: 833
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 19047.00 DATED 6/11/2019 FOR ADDITIONAL REQUIREMENTS.

2 / C-1 **TOWER ELEVATION - PROPOSED**

SCALE: 1/8" = 1'-0"

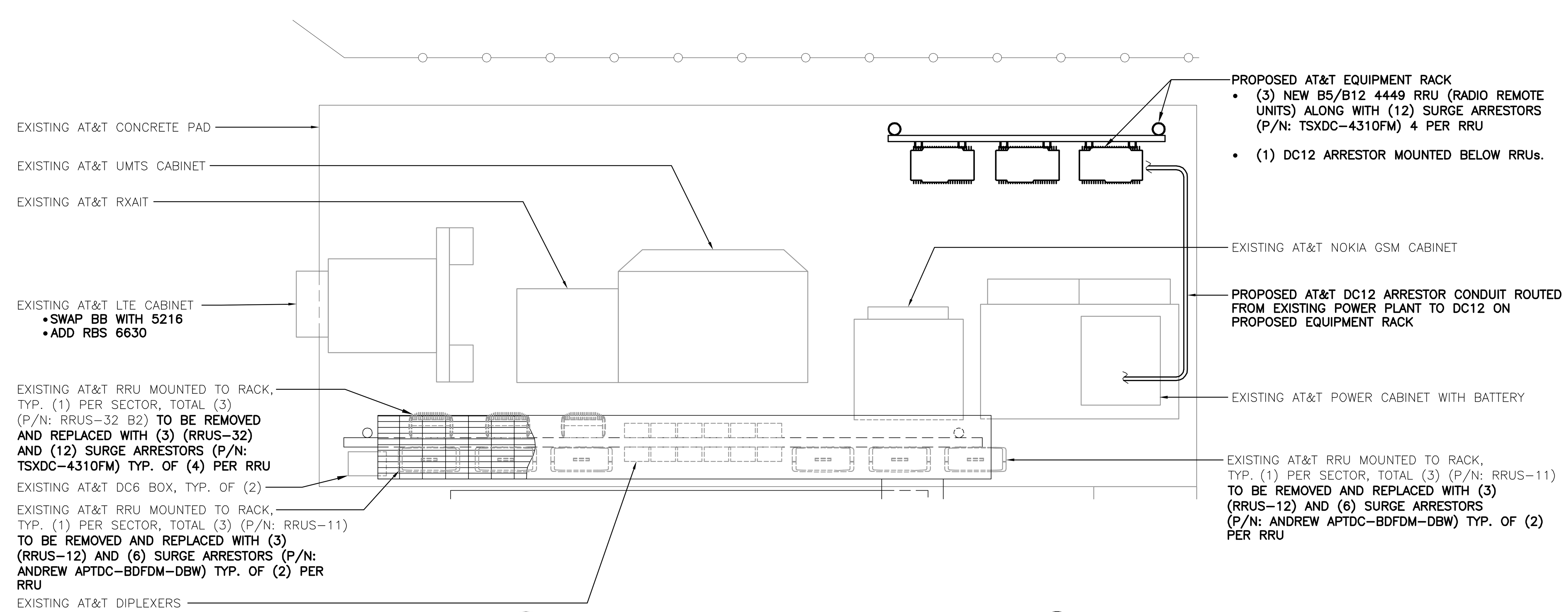
GRAPHIC SCALE 8 0 4 8 16 32 (IN FEET) 1 inch = 8 ft.



1 / C-1 **COMPOUND PLAN - PROPOSED**

SCALE: 1/4" = 1'-0"

TRUE NORTH



3 / C-1 **EQUIPMENT LAYOUT PLAN - PROPOSED**

SCALE: 1/2" = 1'-0"

TRUE NORTH

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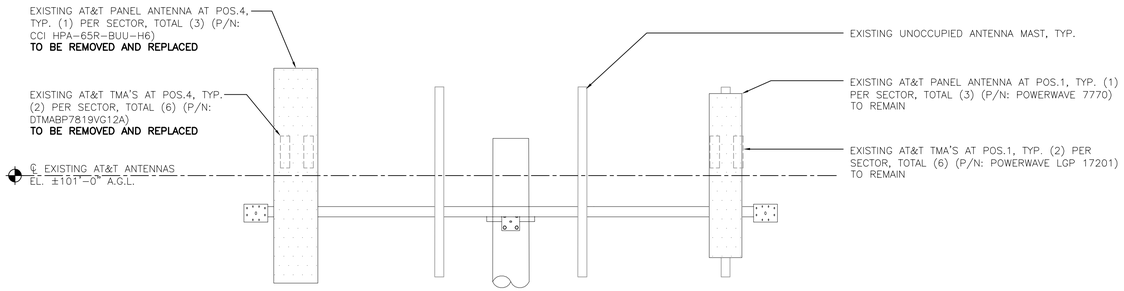
PLANS AND ELEVATION

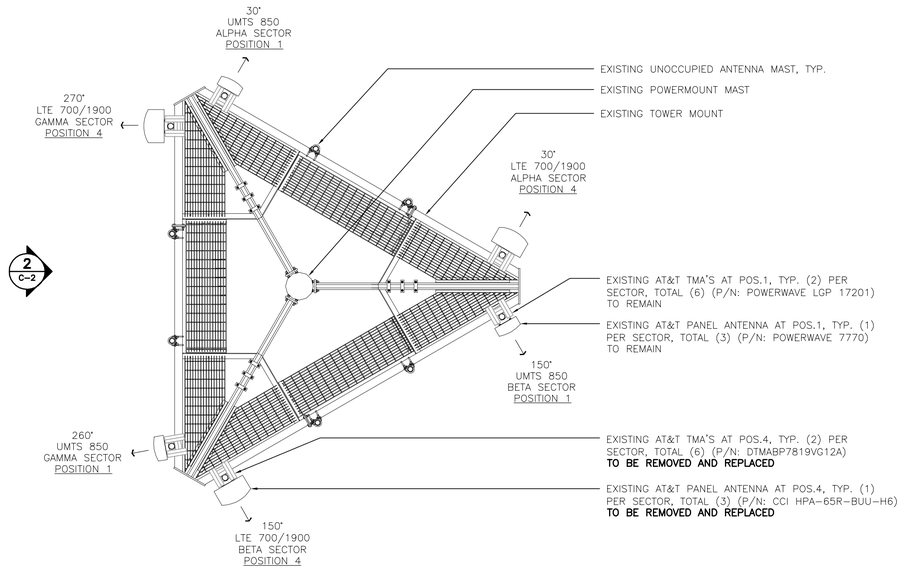
C-1

Sheet No. 3 of 9

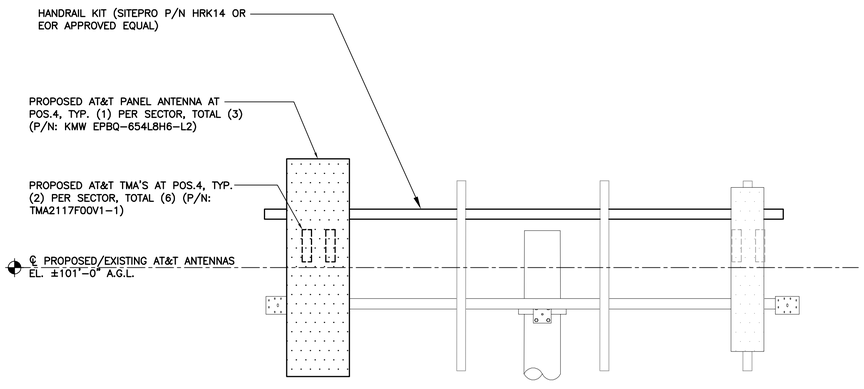


ALPHA/BETA/GAMMA SECTORS

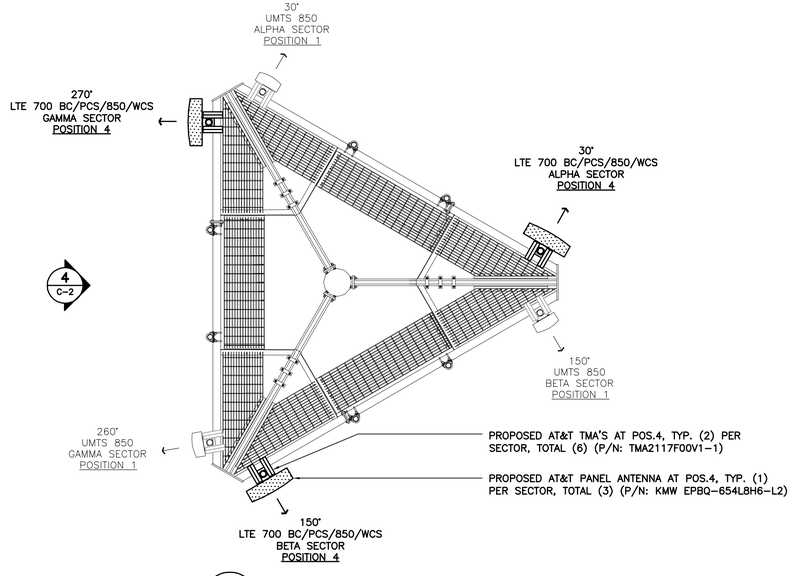
2 C-2 **EXISTING ANTENNA ELEVATION**
SCALE: 1/2" = 1'-0"



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



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



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

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ANTENNA CONFIGURATION DETAILS

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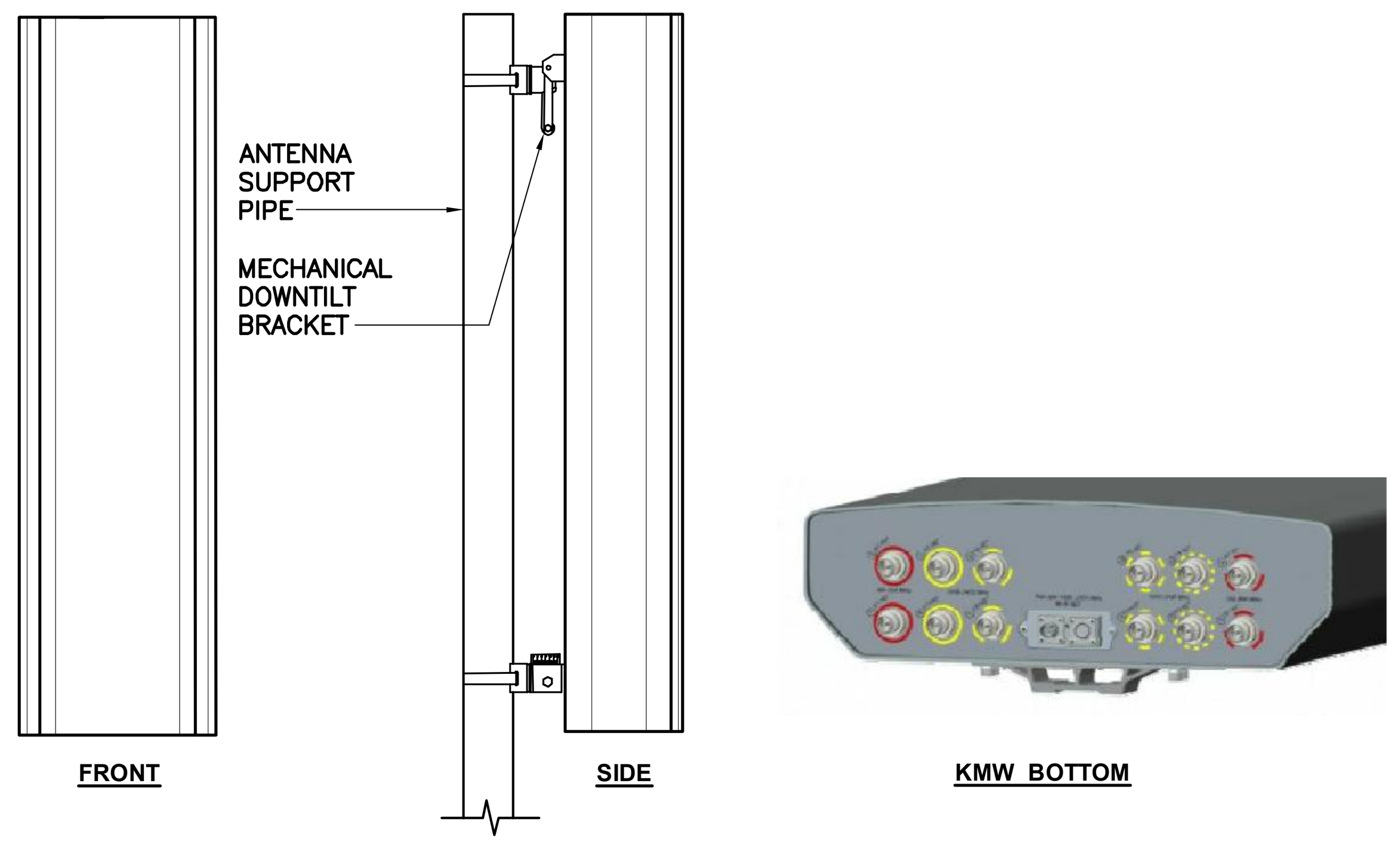


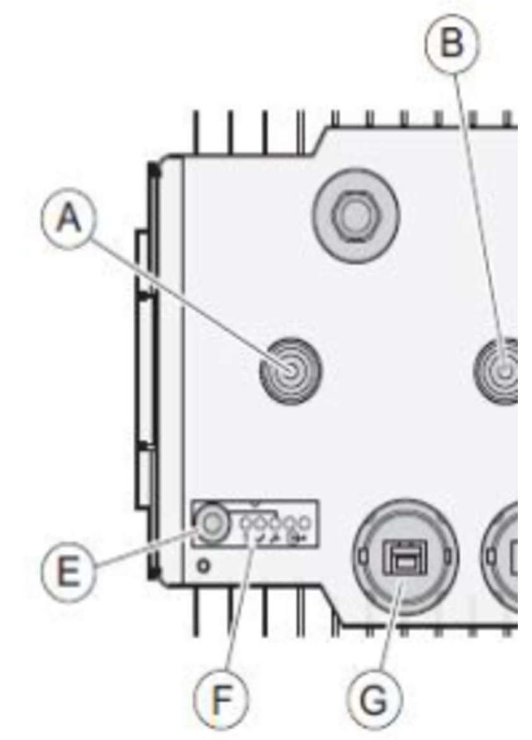
ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KMW MODEL: EPBQ-654L8H6-L2	73"L x 21"W x 6.3"D	72.8 LBS.

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

SURGE ARESSTOR		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: POLYPHASER MODEL: TSXDC-4310FM	1.81"H x 1.49"W x 2.98"D	1.32 LBS.

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

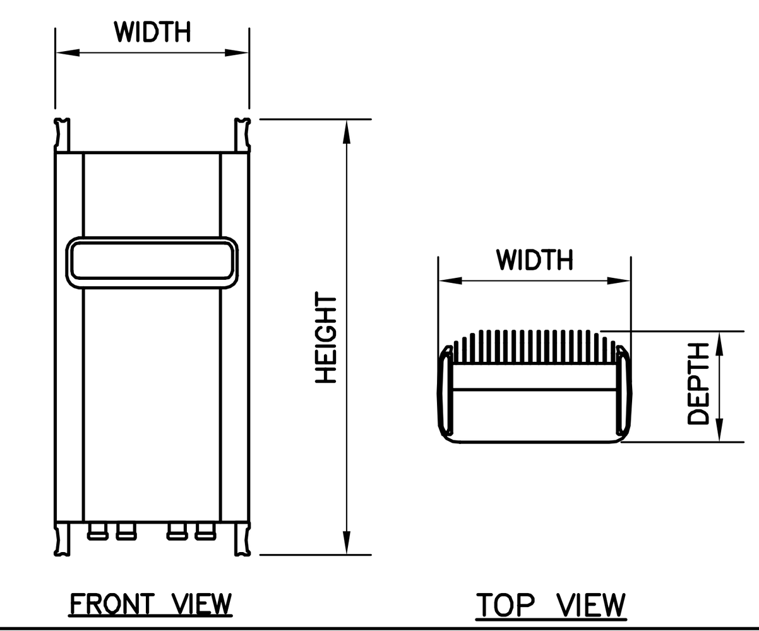
2 (C-3) POLYPHASER TSXDC-4310FM DETAIL
SCALE: NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: B5/B12 4449	41.9"H x 13.2"W x 10.4"D	74 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.

3 (C-3) ERICSSON B5/B12 4449 DETAIL
SCALE: 1" = 1'-0"



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 32	26.7"H x 12.1"W x 6.7"D	60 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.

4 (C-3) ERICSSON RRUS 32 DETAIL
SCALE: 1" = 1'-0"

QUADRUPLEXER			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: KAELUS MODEL: QBC0007F1V51-1	9.73"H x 8.78"D x 3.39"W	16.7 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

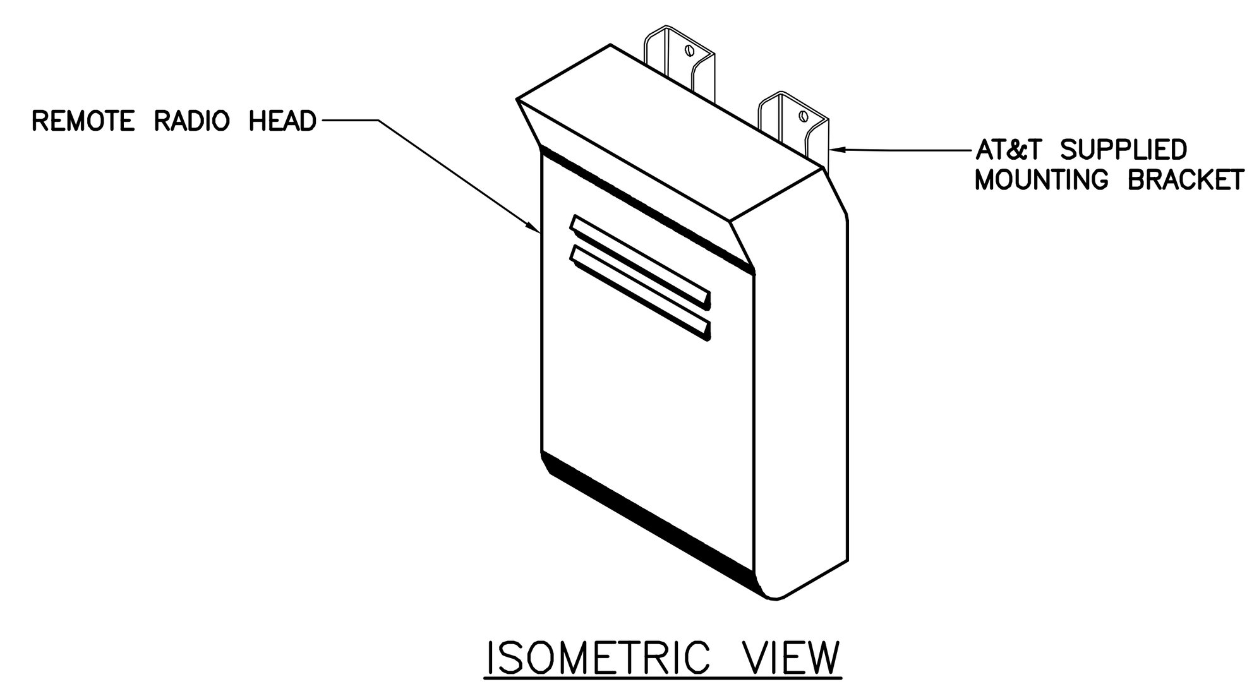
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 (C-3) DQUADRUPLEXER DETAIL
NOT TO SCALE

TOWER MOUNTED AMPLIFIER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KAELUS MODEL: TMA2117F00V1-1	11.81"H x 9.84"D x 4.65"W	26 LBS.

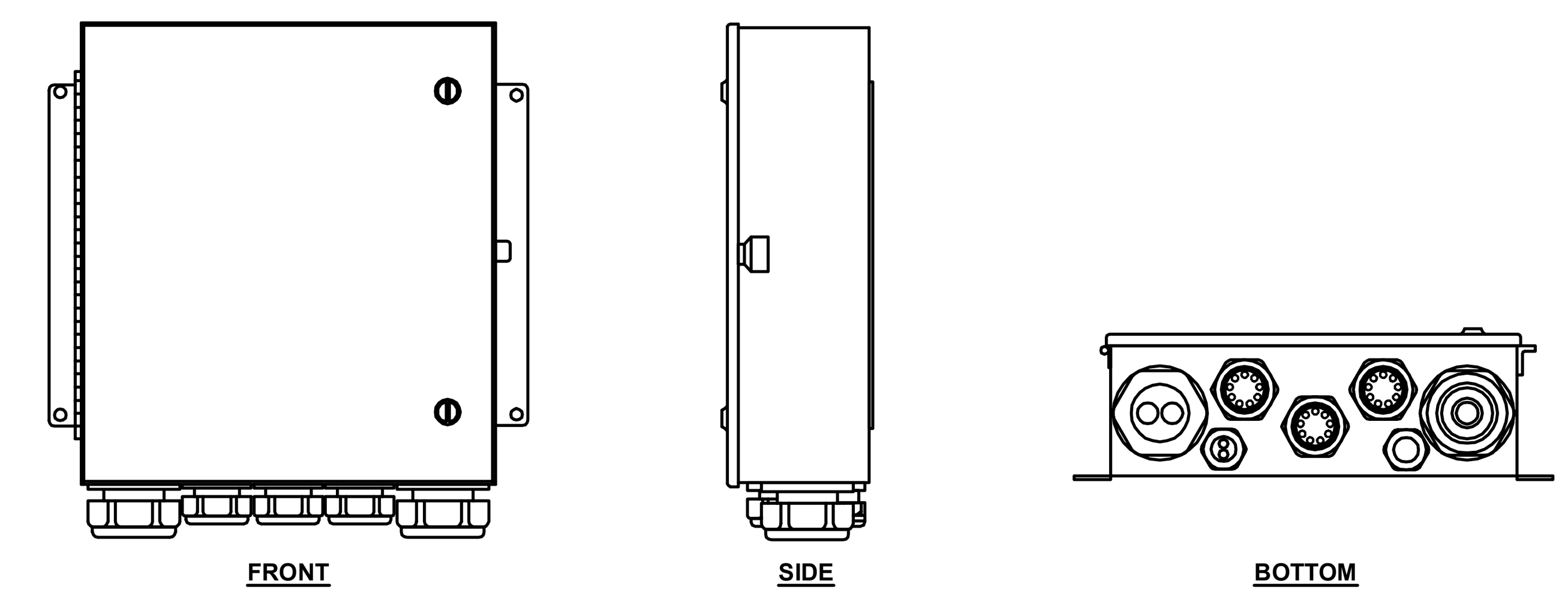
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 (C-3) KAELUS TMA DETAIL
NOT TO SCALE



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

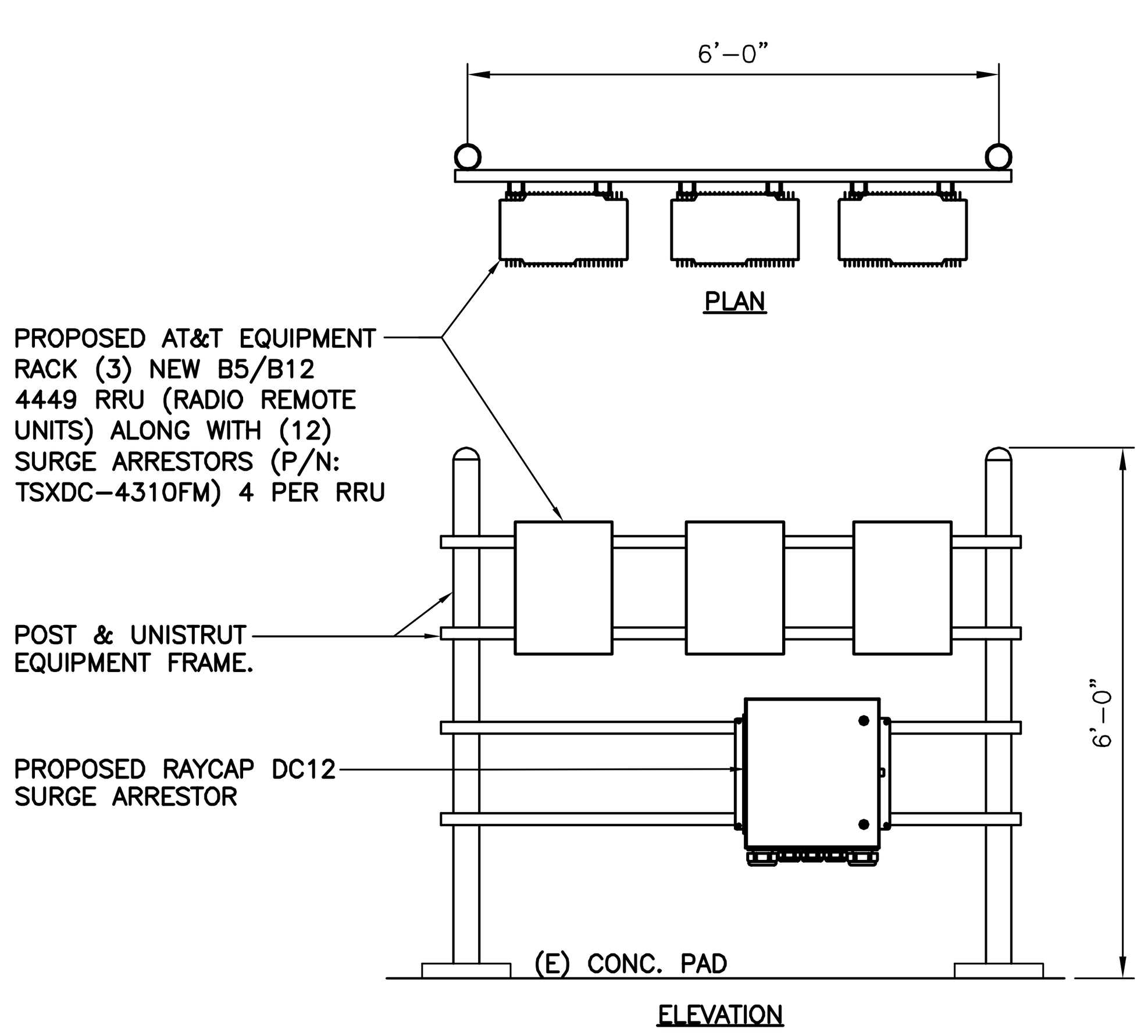
7 (C-3) TYPICAL RRU MOUNTING DETAIL
SCALE: NTS



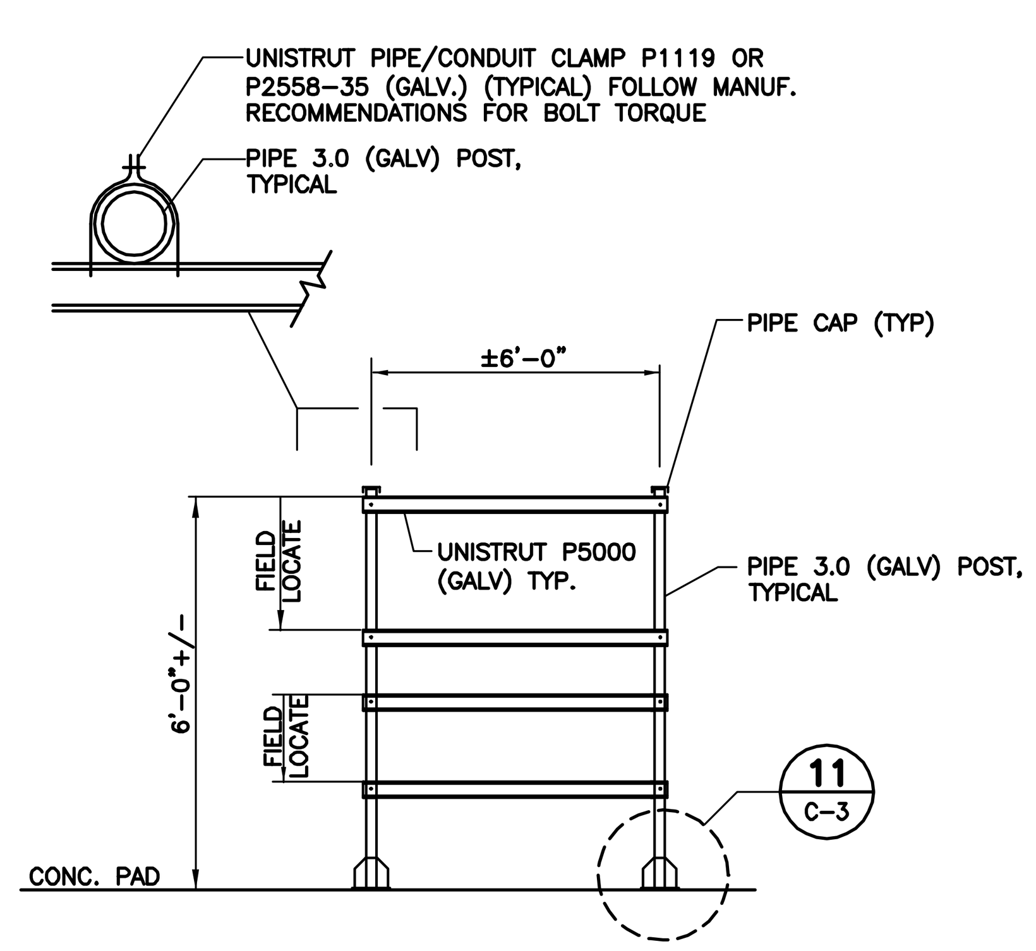
SURGE ARRESTOR			
ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
MAKE: RAYCAP MODEL: DC12-48-60-0-25E	ONE (1)	BACKBOARD AT EQUIPMENT LOCATION	40 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

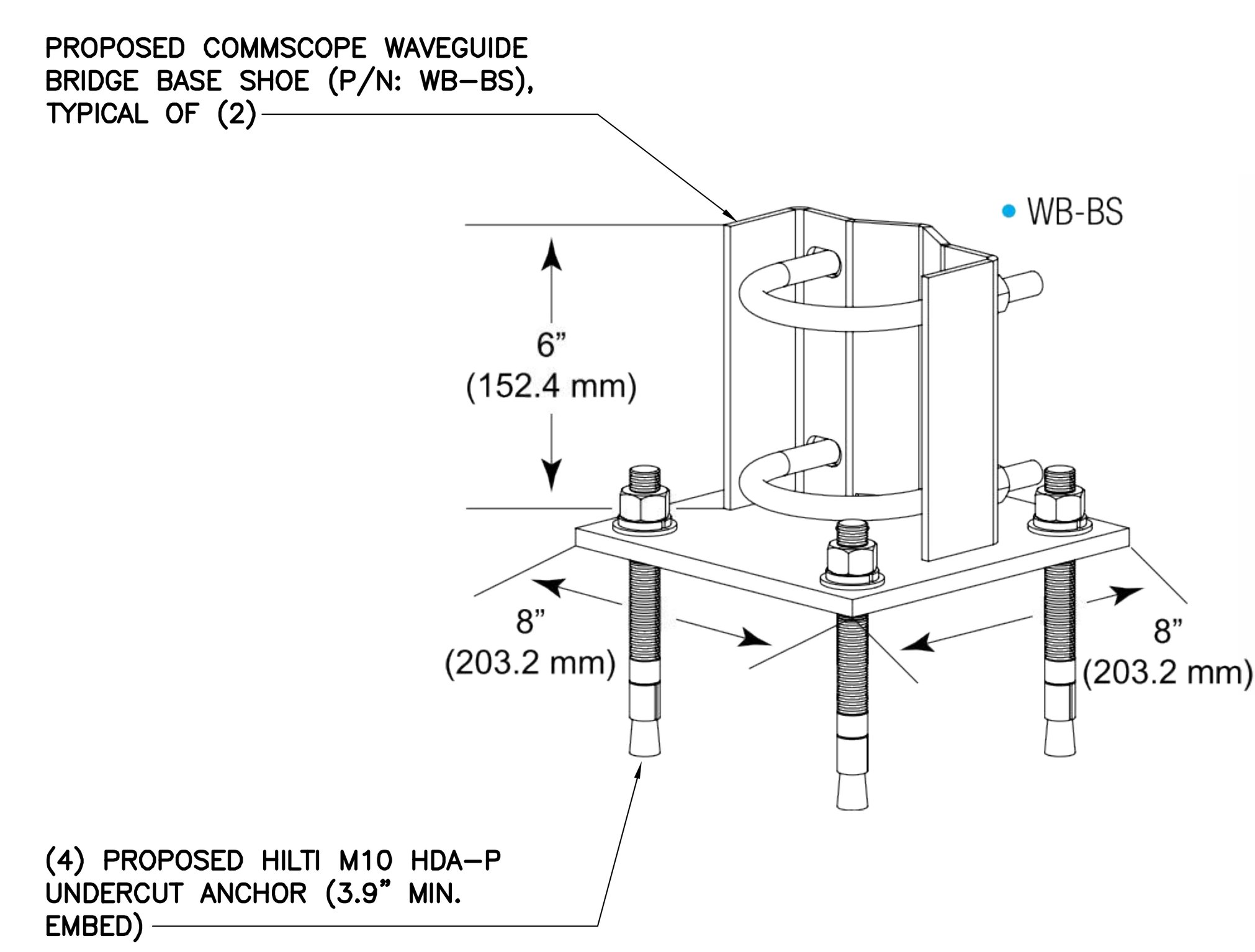
8 (C-3) SURGE ARRESTOR DETAIL
NOT TO SCALE



9 (C-3) PROPOSED EQUIPMENT RACK
SCALE: 1/2" = 1'-0"



10 (C-3) PROPOSED EQUIPMENT MOUNTING FRAME DETAIL
SCALE: NOT TO SCALE



11 (C-3) EQUIPMENT FRAME POST ATTACHMENT DETAIL
SCALE: NOT TO SCALE

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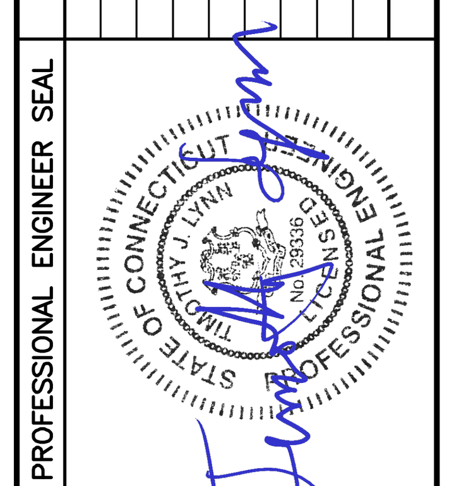

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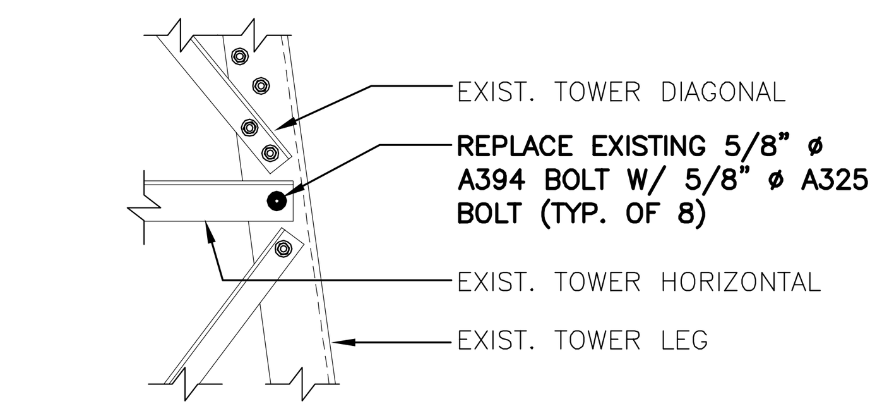
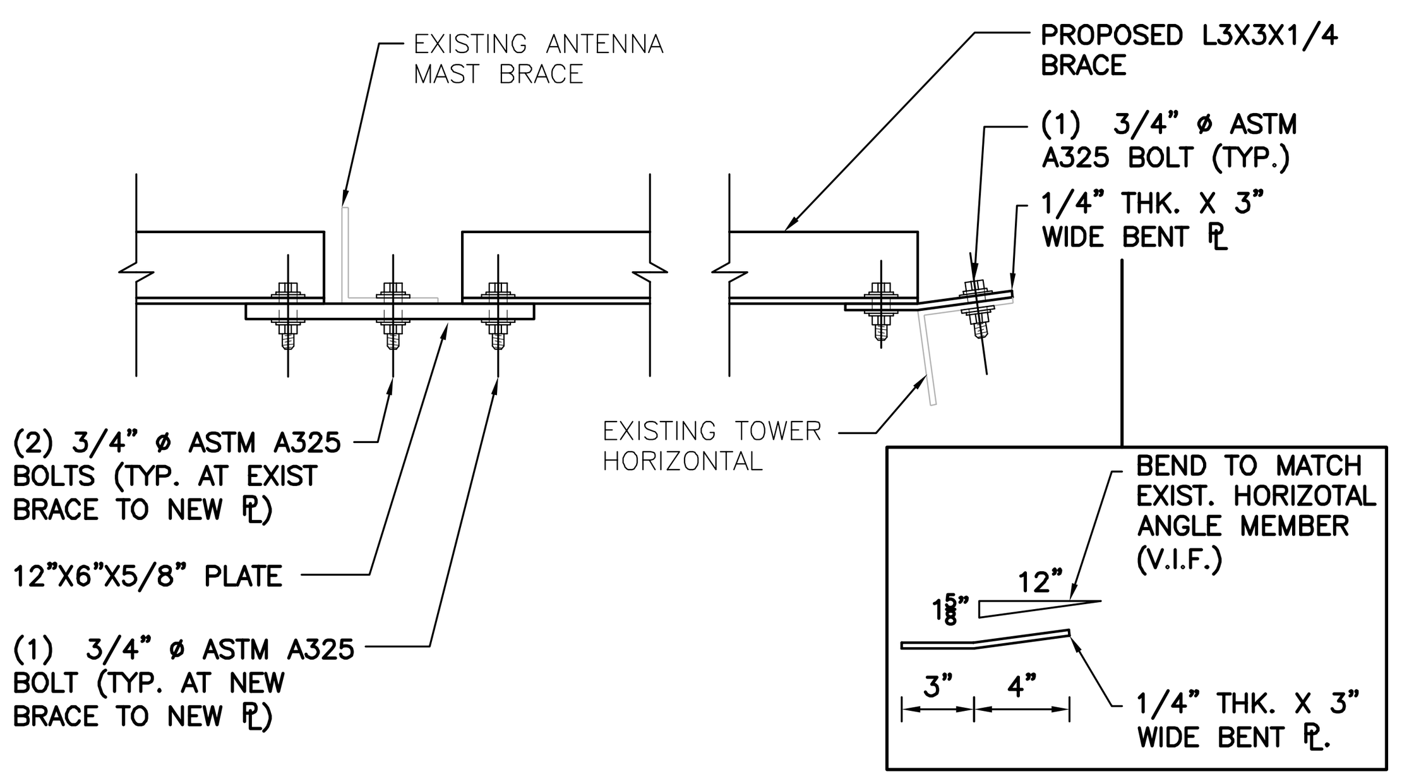
DETAILS

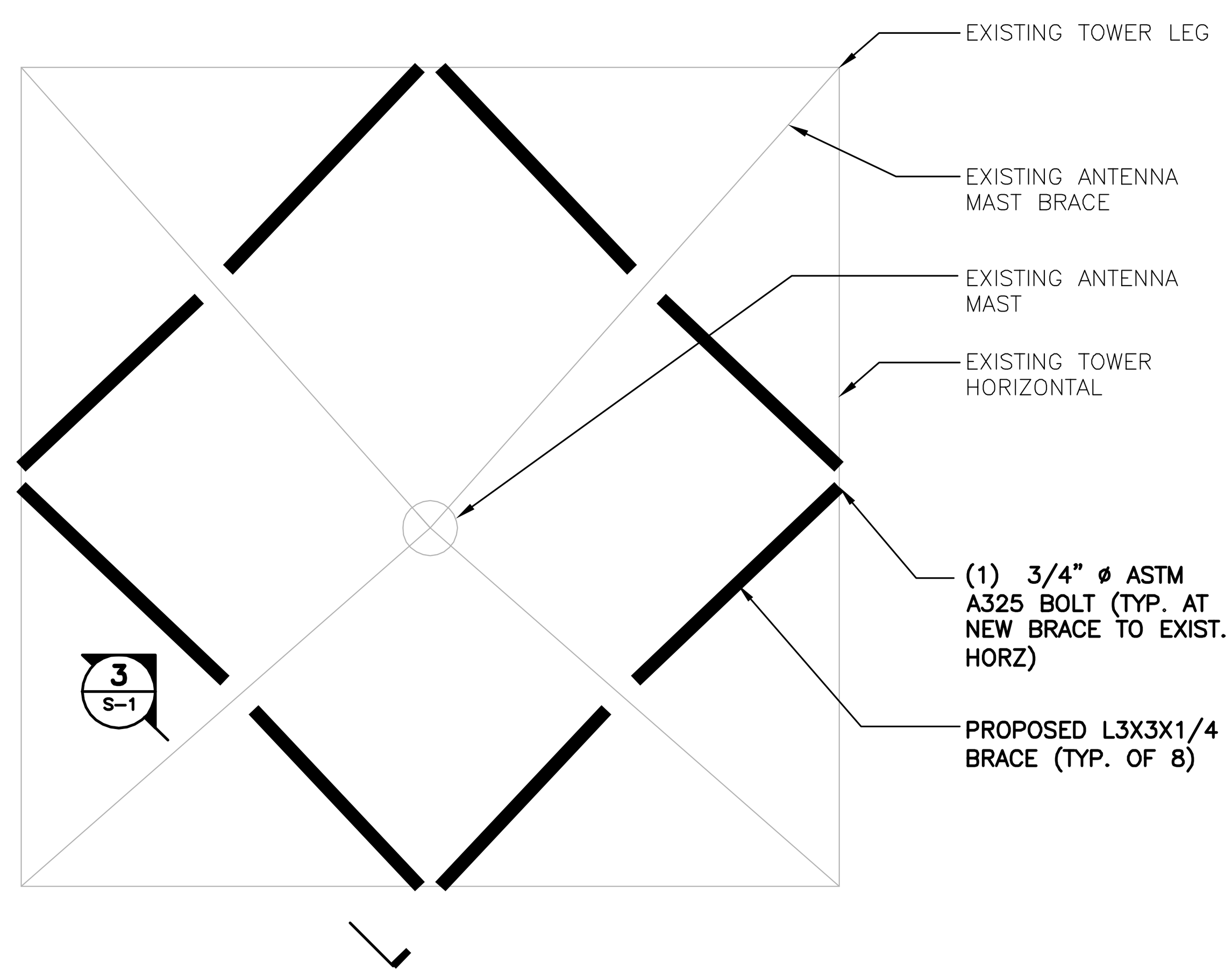
C-3



1 S-1 CONNECTION DETAIL (32' AGL)
SCALE: 1" = 1'-0"



3 S-1 CONNECTION DETAIL (10' AGL)
SCALE: 1-1/2" = 1'-0"



2 S-1 REINFORCEMENT PLAN (10' AGL)
SCALE: 1/4" = 1'-0"

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REINFORCEMENT DETAILS

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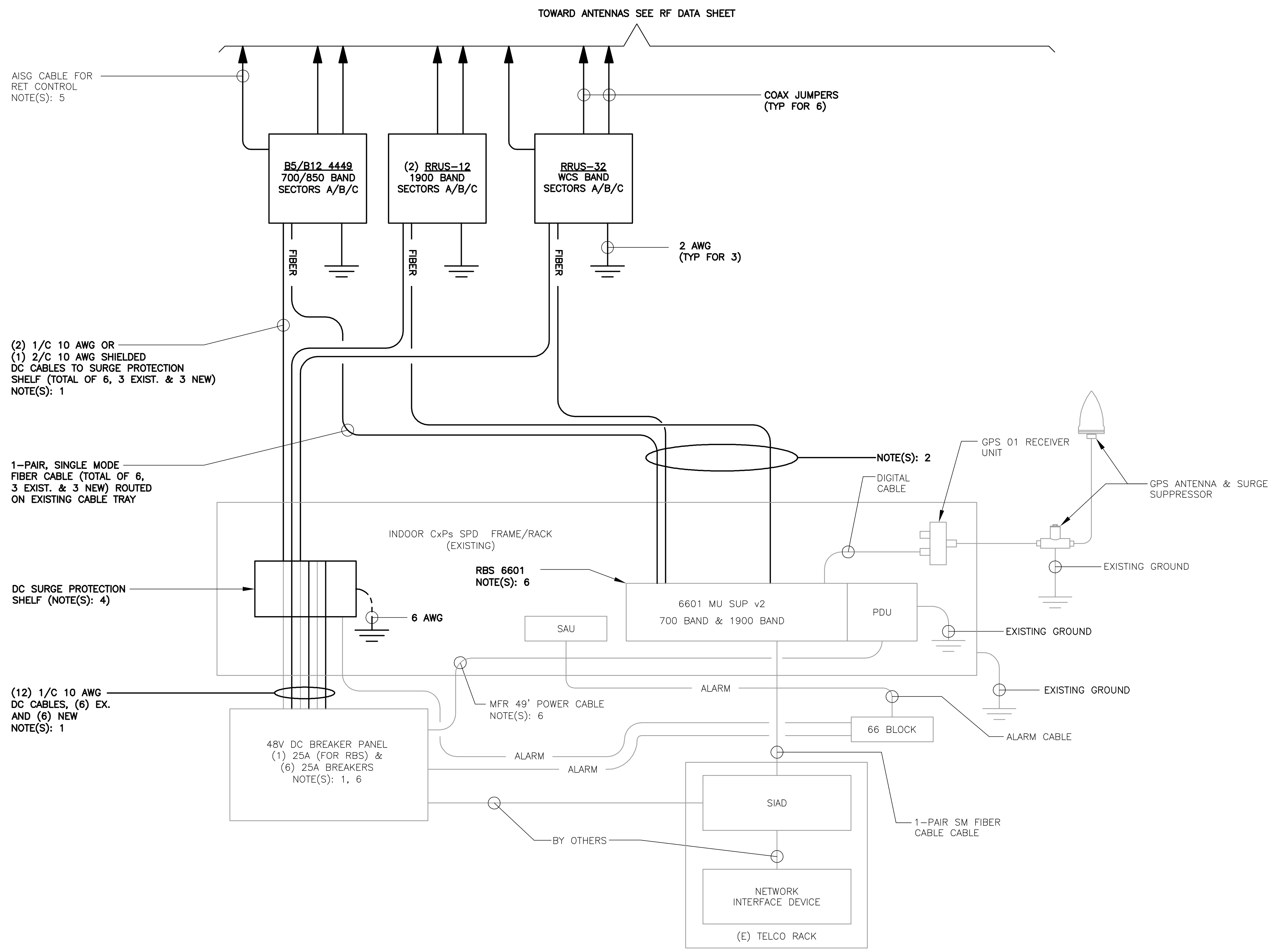

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

1 / E-1 **LTE SCHEMATIC DIAGRAM**
NOT TO SCALE

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

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

   TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

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

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

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

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

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	08/5/19	TJL	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/31/19	DMD	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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STATE OF CONNECTICUT TIMOTHY J. LYNN No. 29336 LICENSED PROFESSIONAL ENGINEER

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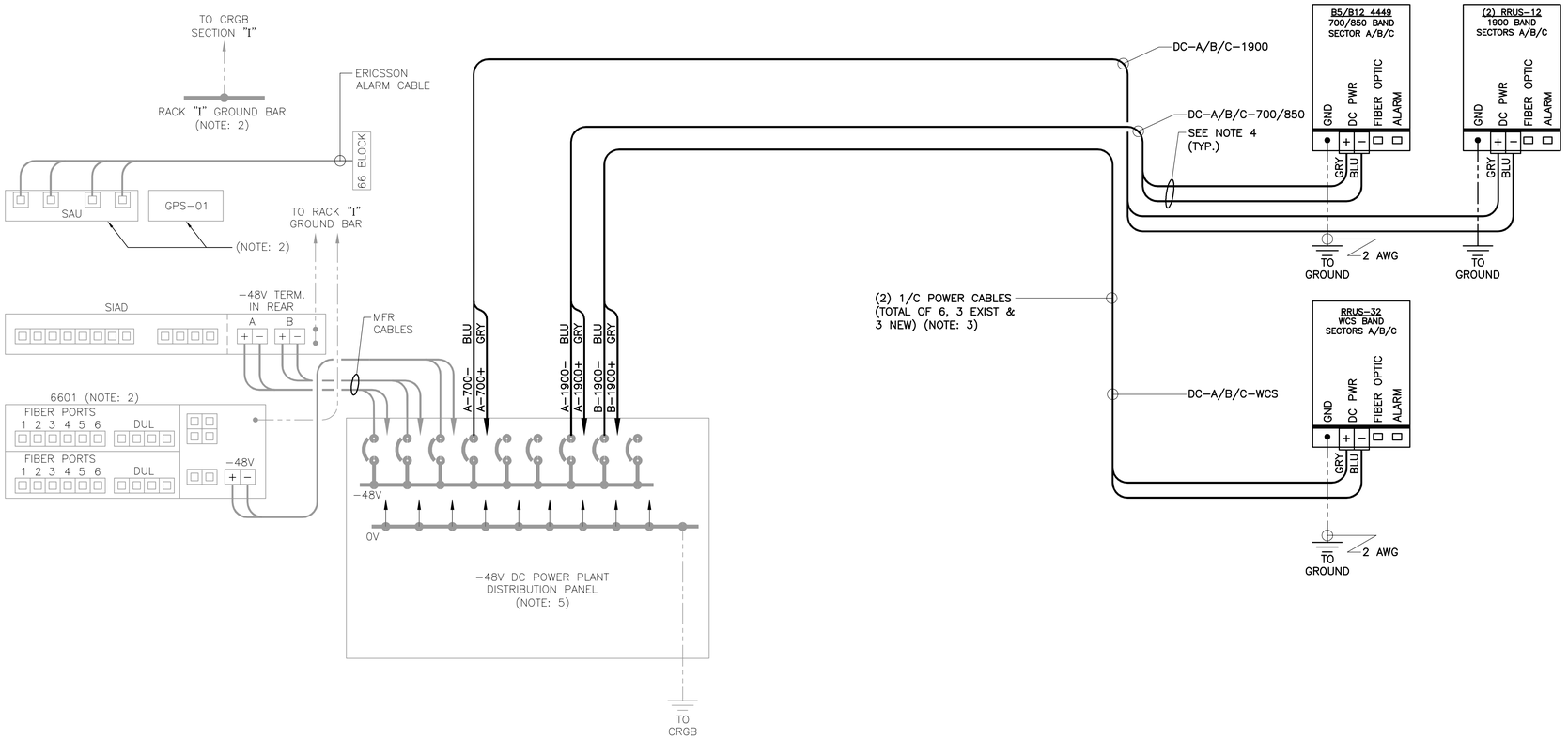
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
TRUMBULL SOUTHEAST
CT5090 - LTE 3C WCS/4C 850/700 BC
2891 NICHOLS AVENUE
TRUMBULL, CT 06611

DATE: 03/21/19
SCALE: AS NOTED
JOB NO. 19047.00

SCHEMATIC DIAGRAM AND NOTES

E-1



LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

1 / E-2 **LTE WIRING DIAGRAM**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	08/5/19	TJL	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/31/19	DMD	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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TRUMBULL, CT 06611

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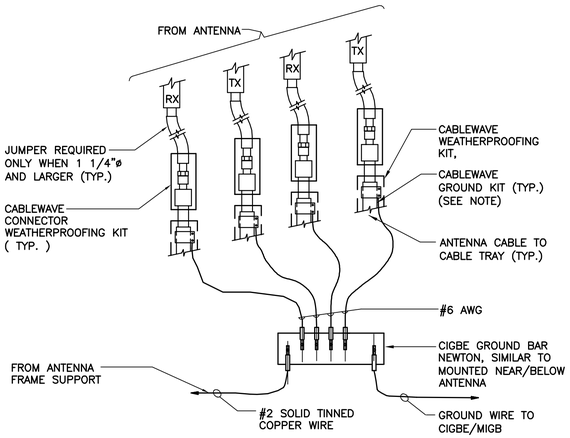
SCALE: AS NOTED
JOB NO. 19047.00

WIRING DIAGRAM

E-2

Sheet No. 8 of 9



NOTE:

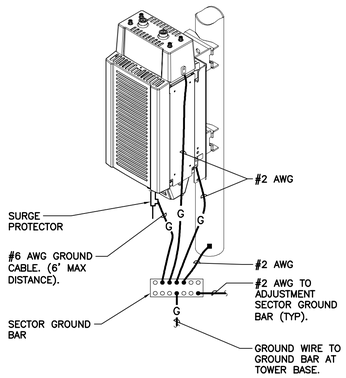
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

1 E-3 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE

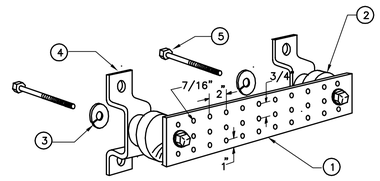
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

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



2 E-3 RRU POLE MOUNT GROUNDING

NOT TO SCALE

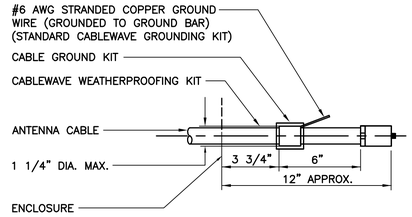


LEGEND

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

3 E-3 GROUND BAR DETAIL

NOT TO SCALE

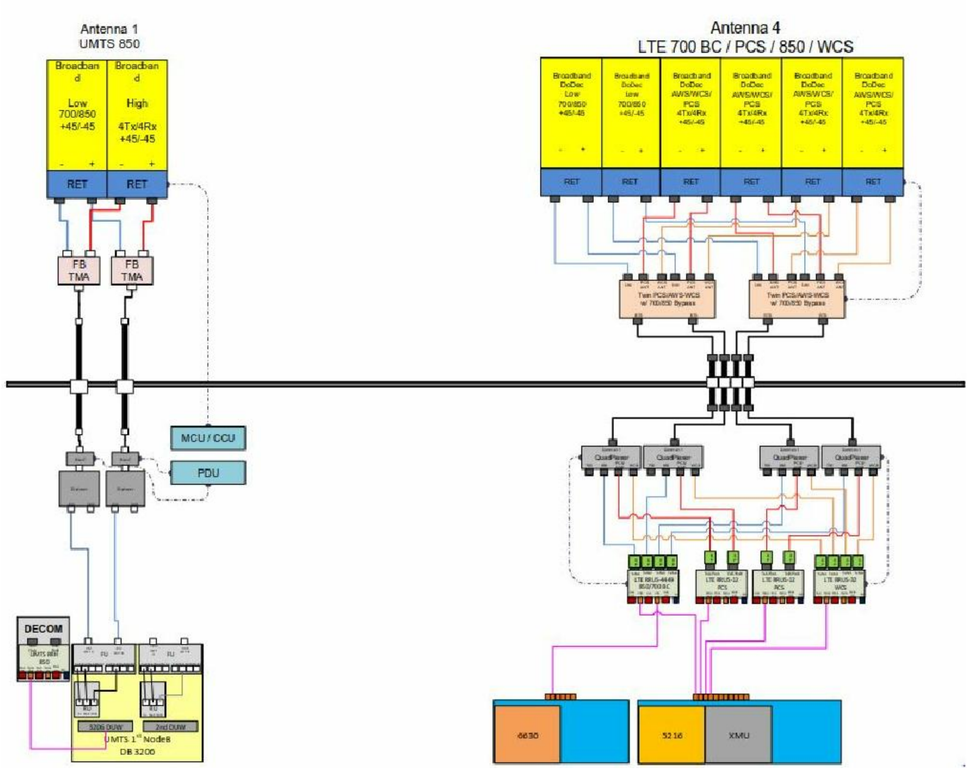


NOTE:

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

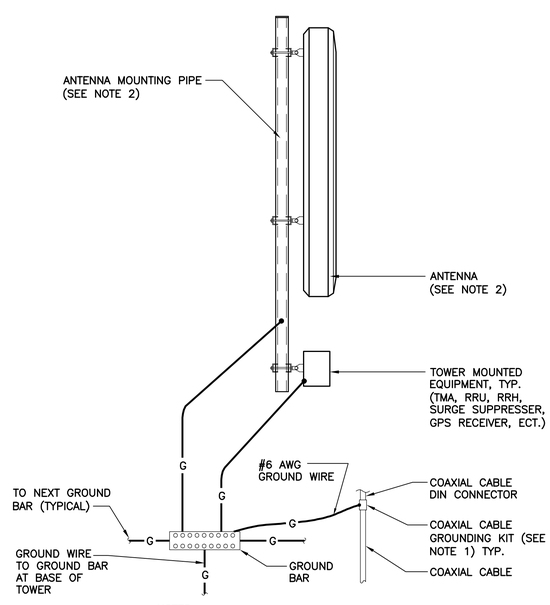
4 E-3 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE



6 E-3 RF PLUMBING DIAGRAM (ALPHA/BETA/GAMMA SECTOR)

NOT TO SCALE



NOTES:

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

5 E-3 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

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0	05/31/19	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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DATE:	03/21/19
SCALE:	AS NOTED
JOB NO.	19047.00

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 9 of 9

CENTEK engineering

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Structural Analysis of Antenna Mast and Tower

AT&T Site Ref: CT5090

Eversource Structure No. 833

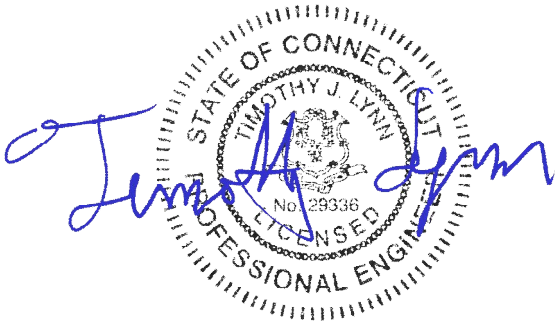
91' Electric Transmission Lattice Tower

2891 Nichols Ave
Trumbull, CT

CENTEK Project No. 19047.00

~~Date: April 17, 2019~~

Rev 2: June 11, 2019



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

Table of Contents

Introduction

The purpose of this report is to analyze the existing antenna mast and 91' utility tower located at 2891 Nichols Ave in Trumbull, 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):
  Antennas: Three (3) Powerwave 7770 panel antennas and six (6) Powerwave LGP17201 TMAs mounted on a low profile platform with a RAD center elevation of 101-ft above grade.
  Coax Cables: Twelve (12) 7/8" ∅ coax cables running inside the antenna mast. Six (6) 7/8" ∅ coax cables running exterior of the antenna mast.
- AT&T (Existing to Remove):
  Antennas: Three (3) CCI HPA-65R-BUU-H6 panel antennas and six (6) CCI DTMABP7819VG12A TMA's mounted on a low profile platform with a RAD center elevation of 101-ft above grade.
- **AT&T (Proposed):**
  Antennas: Three (3) KMW EPBQ-654L8H6L2 panel antennas and six (6) Kaelus TMA2117F00V1-1 TMAs mounted on a low profile platform with a RAD center elevation of 101-ft above grade. (Handrail to be installed on existing platform. Refer to section 4 for details)

Primary assumptions used in the analysis

- Design steel stresses are defined by AISC-LRFD 14th edition for design of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable 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 as indicated in Section 4 of this report.
- 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.

Analysis

Structural analysis of the existing antenna mast was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc. The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing antenna mast consisting of a 12" Sch. 40 pipe conforming to ASTM A500 Grade C (Fy = 50ksi) connected at five points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA loading are listed in report Section 6.

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 NESC 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 91-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 7 of this report details these gravity and lateral wind loads.

Design Basis

Our analysis was performed in accordance with TIA-222-G, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2012 and Eversource 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 C2-2012 ~ 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
  Radial Ice Thickness…….. 0.0"
  Vertical Overload Capacity Factor……. 1.00
  Wind Overload Capacity Factor……. 1.00
  Wire Tension Overload Capacity Factor…… 1.00

- MAST ASSEMBLY ANALYSIS

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

  Load cases considered:

  Load Case 1:
  Wind Speed…….... 97 mph (2018 CSBC Appendix-N)
  Radial Ice Thickness……. 0”

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

R e s u l t s

- ANTENNA MAST

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

Component	Design Limit	Stress Ratio (percentage of capacity)	Result
12” Sch. 40 Pipe	Bending	59.6%	**PASS**
L2x2x3/16 Brace	Bending	70.2%	**PASS**
Connection	Shear	79.8%	**PASS**

- 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 **97.39%** occurs in the utility tower under the **NESC Extreme** loading condition.

  TOWER SECTION:

  The utility structure **with the reinforcement detailed in section 4 of this report** was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g38x	97.39%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of four (4) 1-ft-8-in square tapering to 2-ft-4-in square x 5-ft-3-in long reinforced concrete piers and four (4) 5-ft square x 2-ft thick reinforced concrete pads. The foundation was reinforced with four (4) 12-ft square x 3-ft thick reinforced concrete mats per Tabas Associates drawing S-1 dated 2/8/10. The base of the tower is connected to the foundation by one (1) anchor stub angle per leg. Foundation information was obtained from Northeast Utilities drawing 01064-60003.

BASE REACTIONS:

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

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	7.51 kips	25.96 kips	36.26 kips
NESC Extreme Wind	14.27 kips	57.04 kips	63.43 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	Allowable Limit	Proposed Loading (2)	Result
Reinf. Conc. Pad & Pier	Uplift	1.0 FS (1)	1.31 FS (1)	**PASS**
	Overturning	1.0 FS (1)	1.13 FS (1)	**PASS**
	Bearing	9 ksf	7.78 ksf	**PASS**

Note 1: FS denotes Factor of Safety
Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

Conclusion

This analysis shows that the subject utility tower **with the reinforcement listed below and detailed in section 4 of this report is adequate** to support the proposed AT&T equipment upgrade.

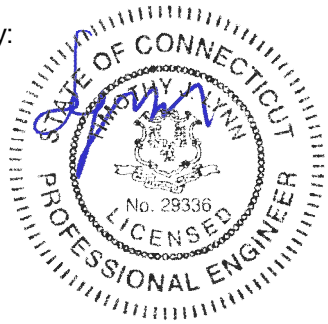
- Replacement of the existing 5/8" ∅ A394 bolts with 5/8" ∅ A325 bolts at the horizontal to leg connection on the tower at 10-ft AGL will be required prior to the AT&T equipment upgrade.
- Install secondary inner bracing at 10-ft AGL.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer



STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

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

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

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

Modeling Features:

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

Results Features:

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-TOWER

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

Modeling Features:

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

Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as drag coefficients according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
  - ASCE Standard 10-90

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

Results Features:

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

Tool for interactive angle member sizing and bolt quantity determination.

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

Introduction

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

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

ANSI Standard C2-2007 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in "unifying" both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

Note 1: Prepared from documentation provide from Northeast Utilities.

P C S M a s t

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

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

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

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

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

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

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

Attachment A
Eversource Design Criteria

		Attachment A NU Design Criteria	Basic Wind Speed	Pressure	Height factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	____	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	____	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
NESC Extreme Ice with Wind Condition *		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 X Gust Response Factor Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
		* Only for structures installed after 2007						

mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition

With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

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

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

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

c) Electric Transmission Structure

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

   ii) Shape Factor Multiplier:

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

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

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

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

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

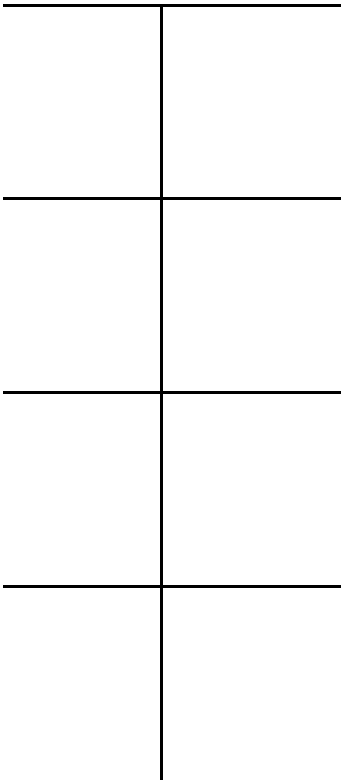
e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

Project: Lines 1710 & 1730, Structure 833
Date: 01/08/2019
Engineer: JS
Purpose Recalculate wire loads for AT&T site.

All Conductors: 795 "Drake" ACSS, @ 7000 lb at 250B final in PLS-CADD
1710 Shield Wire: AFL DNO-7757 OPGW @ 5500 lb at 250B final in PLS-CADD
1730 Shield Wire: AFL DNO-11426 OPGW @ 5500 lb at 250B final in PLS-CADD

NESC 250B, Heavy

1730 Line				**1710 Line**	
DNO-11426	**V**	63	25	**V**	**DNO-7757**
OPGW	**T**	-710	-946	**T**	**OPGW**
	L	0	25	**L**	
Top Phase:	**V**	866	865	**V**	
	T	-1190	-1157	**T**	
	L	384	382	**L**	
Mid Phase:	**V**	866	865	**V**	
	T	-1174	-1174	**T**	
	L	377	389	**L**	
Bot Phase:	**V**	897	895	**V**	
	T	-1291	-1055	**T**	
	L	381	384	**L**	



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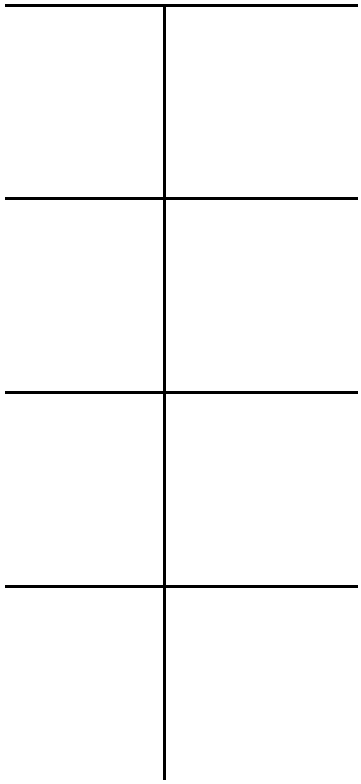
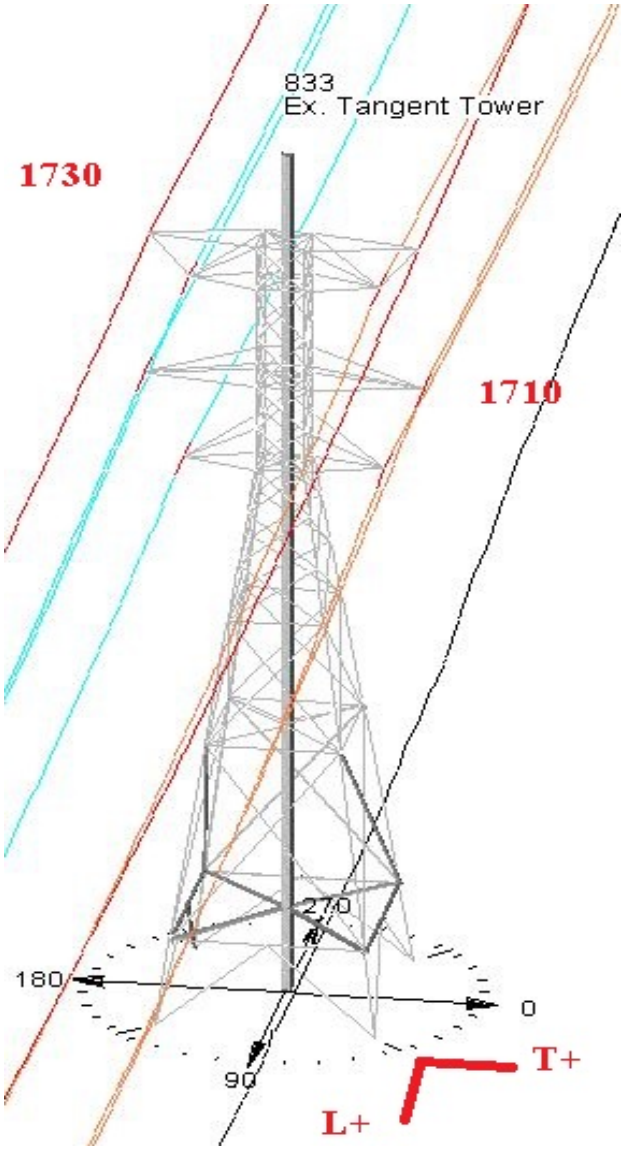
1730 Shield Wire: AFL DNO-11426 OPGW @ 5500 lb at 250B final in PLS-CADD

NESC 250C

1730 Line				**1710 Line**	
DNO-11426	**V**	-425	-474 **V**		**DNO-7757**
OPGW	**T**	-843	-971 **T**		**OPGW**
	L	25	-50 **L**		
Top Phase:	**V**	-97	-98 **V**		
	T	-1948	-1928 **T**		
	L	-426	-426 **L**		
Mid Phase:	**V**	-97	-98 **V**		
	T	-1903	-1912 **T**		
	L	-436	-417 **L**		
Bot Phase:	**V**	-74	-75 **V**		
	T	-1944	-1811 **T**		
	L	-433	-425 **L**		





This is the same view as the tree on page 1.

TOWER REINFORCEMENT DESIGN

STRUCT. NO. 833
2891 NICHOLS AVE
TRUMBULL, CT 06611

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	2891 NICHOLS AVE TRUMBULL, CT 06611
PROJECT COORDINATES:	LAT: 41°–13'–58.37"N LON: 73°–09'–33.44"W ELEV:±166' AMSL
STRUCT NO:	833
EVERSOURCE CONTACT:	JOEL SZARKOWICZ 860.728.4503
AT&T SITE REF.:	CT5090
AT&T CONTACT:	DAVID FORD 508.821.6509
ANTENNA CL HEIGHT:	101'–0"
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

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1	6/3/19	TJL	CAG	ISSUED FOR CONSTRUCTION
0	4/17/19	TJL	CAG	ISSUED FOR EVERSOURCE REVIEW

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions
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Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
TOWER REINFORCEMENT DESIGN

CT5090
EVERSOURCE STRUCTURE 833

2891 NICHOLS AVE
TRUMBULL, CT 06611

DATE:	4/17/19
SCALE:	AS SHOWN
JOB NO.	19047.00

TITLE SHEET

SHEET NO.
T–1
Sheet No. 1 of 8

DESIGN BASIS

1. GOVERNING CODE: 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CT STATE BUILDING CODE.

2. TIA–222–G, ASCE MANUAL NO. 48–11 – "DESIGN OF STEEL TRANSMISSION POLE STRUCTURES", NESC C2–2012 AND EVERSOURCE DESIGN CRITERIA.

3. DESIGN CRITERIA:

ANTENNA MAST

- WIND LOAD: PER ANSI/TIA 222 G – 97 MPH

TRANSMISSION TOWER

- WIND LOAD: PER NESC C2–2012 SECTION 25 RULE 250B – 4PSF
- WIND LOAD: PER NESC C2–2012 SECTION 25 RULE 250C – 110MPH
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS PREPARED BY CENTEK ENGINEERING, INC., FOR AT&T, DATED 4/17/19.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM THE ORIGINAL TOWER DESIGN DOCUMENTS PREPARED BY AMERICAN BRIDGE CO. ORDER NO. J6125, CIRCA 1949.

3. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE & SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, UNDERPINNING, TEMPORARY ANCHORS, GUYING, BARRICADES, ETC. AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY. MAINTAIN EXISTING SITE OPERATIONS AND COORDINATE WORK WITH TOWER OWNER.

4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE.

5. 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 SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

6. 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. THIS INCLUDES VERIFYING ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

7. MAST INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF TRANSMISSION STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

8. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH MAST INSTALLATION.

9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

10. 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.

11. NO DRILLING WELDING OR TAPING IS PERMITTED ON CL&P OWNED EQUIPMENT.

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DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 6

STRUCTURAL STEEL

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

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (TOWER REINF. SOLID ROUND BAR)--- ASTM A572_GR50 (50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM E80XX FOR A572_GR65 STEEL.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. 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.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. 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.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. 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.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. 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.

16. ALL BOLTS SHALL BE INSTALLED PER THE REQUIREMENTS OF AISC 14TH EDITION & RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS".

17. ALL BOLTS SHALL BE INSTALLED AS SNUG-TIGHT CONNECTIONS UNLESS OTHERWISE INDICATED. CONNECTIONS SPECIFIED AS PRETENSIONED OR SLIP-CRITICAL SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT GIVEN IN TABLE J3.1 OF AISC 14TH EDITION.

18. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

19. LOAD INDICATOR WASHERS SHALL BE UTILIZED ON ALL PRETENSIONED OR SLIP-CRITICAL CONNECTIONS.

20. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

21. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

22. FABRICATE BEAMS WITH MILL CAMBER UP.

23. 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.

24. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

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AT&T MOBILITY
TOWER REINFORCEMENT DESIGN

CT5090
EVERSOURCE STRUCTURE 833

2981 NICHOLS AVE
TRUMBULL, CT 06611

DATE:	4/17/19
SCALE:	AS SHOWN
JOB NO.	19047.00

STRUCTURAL STEEL NOTES

SHEET NO.
N-2
Sheet No. 3 of 6

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST–INSTALLED ANCHOR ROD PULL–OUT TEST
–	EOR APPROVED POST–INSTALLED ANCHOR MPII	–	REBAR & FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	–	CONCRETE TESTING		
–	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	–	POST INSTALLED ANCHOR ROD VERIFICATION		
		–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON–SITE COLD GALVANIZING VERIFICATION		
		X	CONTRACTOR AS–BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.

3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.

4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.

5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON–SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS–BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE–CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST–CONSTRUCTION: FINAL CONDITION OF THE SITE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	6/11/19	TJL	CAG	CONSTRUCTION – MODIFIED REINFORCEMENT CONN.
1	6/3/19	TJL	CAG	ISSUED FOR CONSTRUCTION
0	4/17/19	TJL	CAG	ISSUED FOR EVERSOURCE REVIEW

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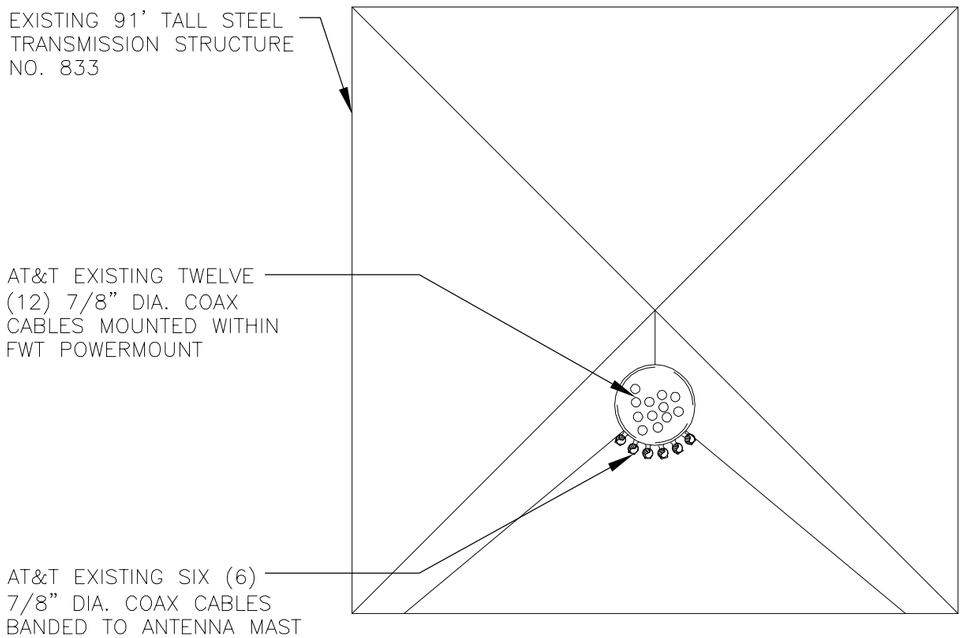
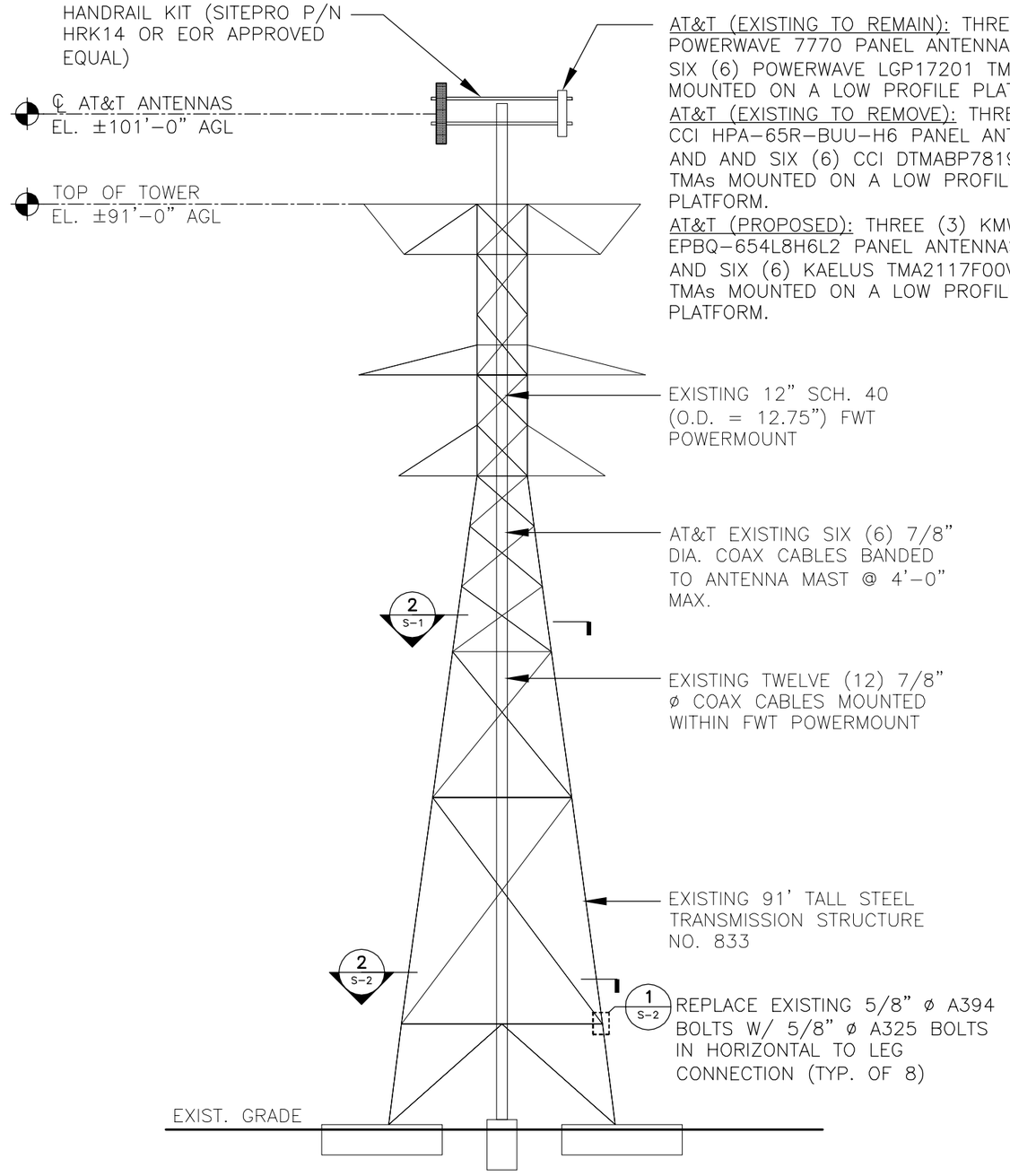
MODIFICATION INSPECTION REQUIREMENTS

SHEET NO.
MI-1
Sheet No. 4 of 8



2 / S-1 FEEDLINE PLAN

SCALE: 1/2" = 1'-0"



1 / S-1 TOWER & MAST ELEVATION

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	6/11/19	TJL	CAG	CONSTRUCTION - MODIFIED REINFORCEMENT CONN.
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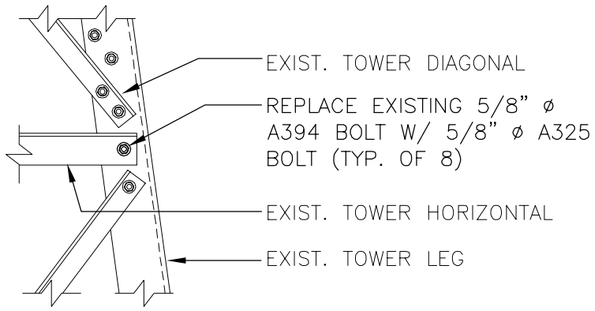
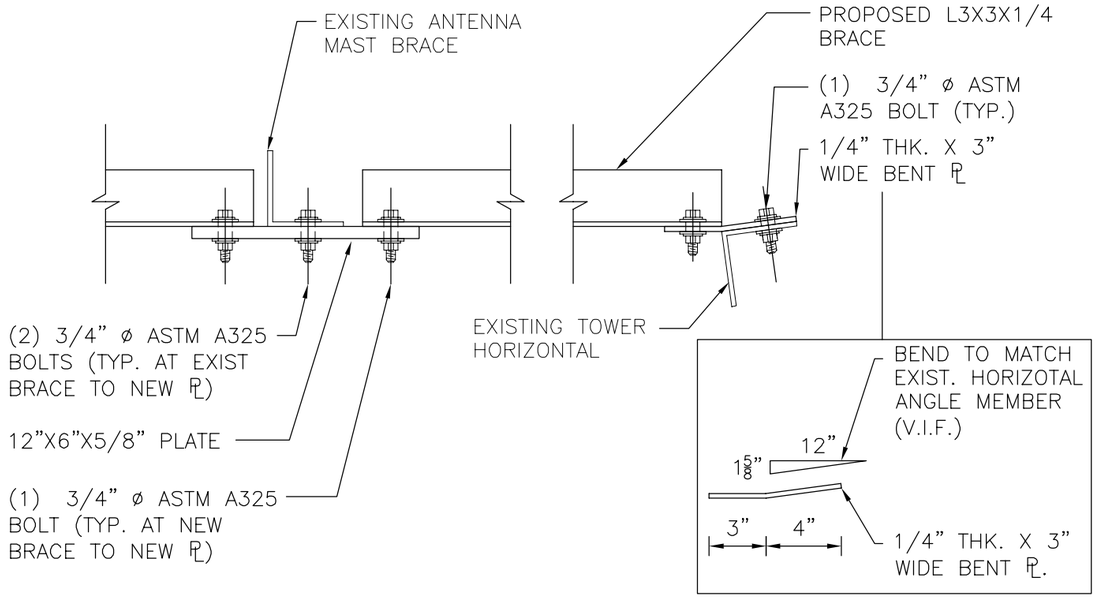
TOWER ELEVATION AND FEEDLINE PLAN

SHEET NO.
S-1
Sheet No. 5 of 6



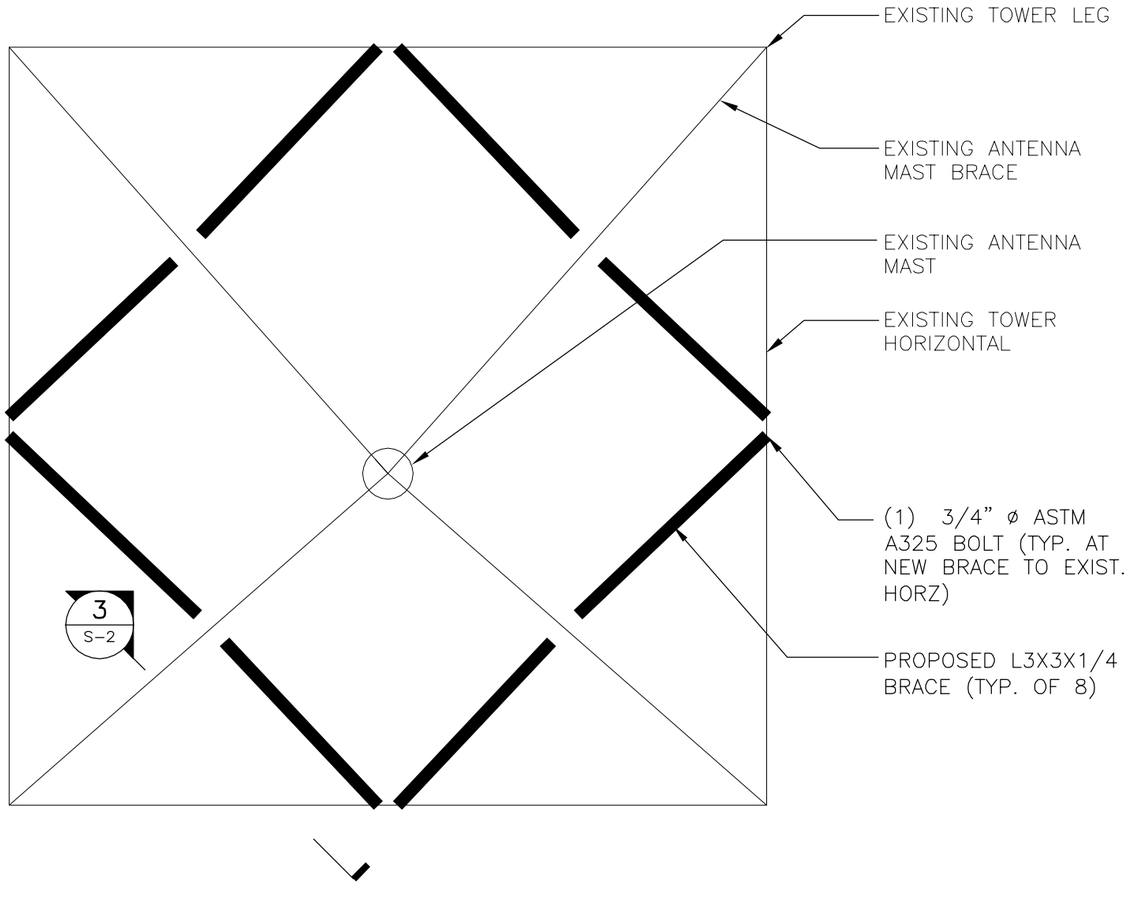
1 / S-2 CONNECTION DETAIL (32' AGL)

SCALE: 1" = 1'-0"



3 / S-2 CONNECTION DETAIL (10' AGL)

SCALE: 1-1/2" = 1'-0"



2 / S-2 REINFORCEMENT PLAN (10' AGL)

SCALE: 1/4" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	6/11/19	TJL	CAG	CONSTRUCTION - MODIFIED REINFORCEMENT CONN.
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0	4/17/19	TJL	CAG	ISSUED FOR EVERSOURCE REVIEW

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REINFORCEMENT DETAILS

SHEET NO.
S-2
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Subject:	Loads on Equipment Structure 833
Location:	Trumbull, CT
Rev. 1: 6/3/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19047.00

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

Wind Speeds

Basic Wind Speed	$V := 97$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-G Section 2.8.3)

Input

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 101$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 91$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input)
Length of Pole =	$L_{pole} := 102$		(User Input)
Increment Length =	$Ic := 20$		(User Input)
Number of Increments =	$N := \frac{\text{Round}(L_{pole}, Ic)}{Ic}$		

Mast Based on Max 20-ft Section per 2.6.9.1.3

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

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

Importance Factor (Service) = $I_{Ser} := 1$ (Per Section 2.8.3 of TIA-222-G)

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.107$$

$$t_{izant} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.075$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.241$$

Velocity Pressure w/o Ice Antennas =

$$qz_{ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V^2 \cdot I_{Wind} = 29.213$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.75$$

Velocity Pressure Service =

$$qz_{ant.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{ant} \cdot V_{Ser}^2 \cdot I_{Ser} = 9.719$$

Distance Above Ground Level =

$i := 0.. (N - 1)$

$$z_{mast_i} := \left| \begin{array}{l} x \leftarrow (Ic \cdot i) \\ b \leftarrow \left(Round\left(L_{pole}, Ic\right) - \frac{Ic}{2}\right) \\ z_{mast} \leftarrow b - x \end{array} \right.$$

$$z_{mast_i} = \begin{pmatrix} 90 \\ 70 \\ 50 \\ 30 \\ 10 \end{pmatrix}$$

$$K_{izMast_i} := \left| \begin{array}{l} \left(\frac{z_{mast_i}}{33}\right)^{0.1} \\ 1.4 \quad if \quad \left(\frac{z_{mast_i}}{33}\right)^{0.1} > 1.4 \end{array} \right.$$

$$K_{izMast_i} = \begin{pmatrix} 1.11 \\ 1.08 \\ 1.04 \\ 0.99 \\ 0.89 \end{pmatrix}$$

$$t_{izMast_i} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast_i} \cdot K_{zt}^{0.35}$$

$$t_{izMast_i} = \begin{pmatrix} 2.07 \\ 2.02 \\ 1.95 \\ 1.86 \\ 1.66 \end{pmatrix}$$

$$K_{zMast_i} := \begin{cases} Kz_{min} \text{ if } Kz_{min} > 2.01\left(\frac{z_{mast_i}}{zg}\right)^{\frac{2}{\alpha}} \\ 2.01\left(\frac{z_{mast_i}}{zg}\right)^{\frac{2}{\alpha}} \text{ if } Kz_{min} \le 2.01\left(\frac{z_{mast_i}}{zg}\right)^{\frac{2}{\alpha}} \le 2.01 \\ 2.01 \text{ if } \left(\frac{z_{mast_i}}{zg}\right)^{\frac{2}{\alpha}} > 2.01 \end{cases} \qquad K_{zMast_i} = \begin{pmatrix} 1.24 \\ 1.17 \\ 1.09 \\ 0.98 \\ 0.85 \end{pmatrix}$$

$$qz_{Mast_i} := 0.00256 \cdot K_d \cdot K_{zMast_i} \cdot V^2 \cdot I_{Wind} \qquad qz_{Mast_i} = \begin{pmatrix} 29.15 \\ 27.64 \\ 25.75 \\ 23.13 \\ 20.01 \end{pmatrix}$$

$$qz_{ice.Mast_i} := 0.00256 \cdot K_d \cdot K_{zMast_i} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} \qquad qz_{ice.Mast_i} = \begin{pmatrix} 6.73 \\ 6.39 \\ 5.95 \\ 5.34 \\ 4.62 \end{pmatrix}$$

$$qz_{Mast.Ser_i} := 0.00256 \cdot K_{dSer} \cdot K_{zMast_i} \cdot V_{Ser}^2 \cdot I_{Ser} \qquad qz_{Mast.Ser_i} = \begin{pmatrix} 9.7 \\ 9.2 \\ 8.57 \\ 7.69 \\ 6.66 \end{pmatrix}$$

Development of Wind & Ice Load on Mast

Mast Data: (12 Std. Pipe) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 12.75$ in (User Input)

Mast Length = $L_{mast} := 102$ ft (User Input)

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

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 96.0$

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

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.063$ sf/ft

Total Mast Wind Force =

$F_{Mast} := qz_{Mast} \cdot G_H \cdot Ca_{mast} \cdot A_{mast}$

$$F_{Mast} = \begin{pmatrix} 50 \\ 48 \\ 44 \\ 40 \\ 34 \end{pmatrix}$$ plf **BLC 5,7**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice =

$$AICE_{mast_i} := \frac{\left(D_{mast} + 2 \cdot t_{izMast_i}\right)}{12}$$

$$AICE_{mast_i} = \begin{pmatrix} 1.41 \\ 1.4 \\ 1.39 \\ 1.37 \\ 1.34 \end{pmatrix}$$ sf/ft

Total Mast Wind Force w/ Ice =

$F_{ice.Mast_i} := qz_{ice.Mast_i} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast_i}$

$$F_{ice.Mast_i} = \begin{pmatrix} 15 \\ 14 \\ 13 \\ 12 \\ 10 \end{pmatrix}$$ plf **BLC 4,6**

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Subject: Loads on Equipment Structure 833

Location: Trumbull, CT

Rev. 1: 6/3/19

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 19047.00

Wind Load (Service)

Total Mast Wind Force Service Loads =

$$qz_{Mast.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = \begin{pmatrix} 17 \\ 16 \\ 15 \\ 13 \\ 11 \end{pmatrix}$$ plf **BLC 8**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot =

$$Ai_{mast_i} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast_i} \cdot 2\right)^2 - D_{mast}^{\,2}\right]$$

$$Ai_{mast_i} = \begin{pmatrix} 96.53 \\ 93.81 \\ 90.29 \\ 85.23 \\ 75.35 \end{pmatrix}$$ sq in

Weight of Ice on Mast =

$$W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144}$$

$$W_{ICEmast} = \begin{pmatrix} 38 \\ 36 \\ 35 \\ 33 \\ 29 \end{pmatrix}$$ plf **BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Powerwave 7770			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55$	in	(User Input)	
Antenna Width =	$W_{ant} := 11$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 39$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 5.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.31$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf		
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf		
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 652$	lbs	**BLC 5,7**	

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 6.2$	sf		
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 18.7$	sf		
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 223$	lbs	**BLC 4,6**	

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 217$	lbs	**BLC 8**	

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 117$	lbs	**BLC 2**	

Gravity Loads (ice only)

cu in

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in		
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 5175$			
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 168$	lbs		
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 503$	lbs	**BLC 3**	

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	EPBQ-654L8H6L2			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 73$	in	(User Input)	
Antenna Width =	$W_{ant} := 21$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 6.3$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 73$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.5$			
Antenna Force Coefficient =	$Ca_{ant} = 1.24$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 10.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 31.9$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1566$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 13.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 40.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 458$	lbs	**BLC 4,6**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 521$	lbs	**BLC 8**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 219$	lbs	**BLC 2**

Gravity Loads (ice only)

			cu in
Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 9658$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 1 \times 10^4$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 344$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 1032$	lbs	**BLC 3**

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Subject: Loads on Equipment Structure 833

Location: Trumbull, CT

Rev. 1: 6/3/19

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 19047.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Powerwave LGP17201			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 13.9$	in	(User Input)	
Antenna Width =	$W_{ant} := 14.4$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 3.7$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 31$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.2$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.4$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 8.3$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 395$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 2.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 153$	lbs	**BLC 4,6**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 131$	lbs	**BLC 8**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 186$	lbs	**BLC 2**

Gravity Loads (ice only)

			cu in
Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 741$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 1888$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 61$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 367$	lbs	**BLC 3**

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 =	$WT_{ant} := 20$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.7$			
Antenna Force Coefficient =	$Ca_{ant} = 1.2$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.7$	sf		
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.2$	sf		
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 197$	lbs	**BLC 5,7**	

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 1.4$	sf		
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 8.4$	sf		
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 92$	lbs	**BLC 4,6**	

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 66$	lbs	**BLC 8**	

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 120$	lbs	**BLC 2**	

Gravity Loads (ice only)

cu in

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 421$	cu in		
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 1262$			
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 41$	lbs		
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 245$	lbs	**BLC 3**	

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Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Platform w/ Handrail		
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 14$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICE.plt} := 18$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 3300$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICE.plt} := 3800$	lbs	(User Input)

Wind Load (without ice)

Total Platform Wind Force =	$F_{plt} := qz_{ant} \cdot G_H \cdot A_{plt} = 552$	lbs	**BLC 5,7**

Wind Load (with ice)

Total Platform Wind Force w/ Ice =	$Fi_{plt} := qz_{ice.ant} \cdot G_H \cdot A_{ICE.plt} = 164$	lbs	**BLC 4,6**

Wind Load (Service)

Total Platform Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot A_{plt} = 184$	lbs	**BLC 8**

Gravity Load (without ice)

Weight of Platform =	$WT_{plt} = 3300$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform =	$WT_{ICE.plt} - WT_{plt} = 500$	lbs	**BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type = HELIAX 7/8"

Coax Outside Diameter = $D_{coax} := 1.11$ in (User Input)

Coax Cable Length = $L_{coax} := 102$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 0.54$ plf (User Input)

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

No. of Coax Projecting Outside Face of Mast = $NP_{coax} := 2$ (User Input)

No. of Coax on Exterior of Mast = $NE_{coax} := 6$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 1.1 \times 10^3$

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

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.2$ sf/ft

Total Coax Wind Force = $F_{Coax} := qz_{Mast} \cdot G_H \cdot Ca_{coax} \cdot A_{coax}$

$$F_{Coax} = \begin{pmatrix} 9 \\ 8 \\ 8 \\ 7 \\ 6 \end{pmatrix}$$ plf **BLC 5,7**

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax_i} := \frac{\left[NP_{coax} \cdot D_{coax} + \left(2 \cdot t_{izMast_i}\right)\right]}{12}$

$$AICE_{coax_i} = \begin{pmatrix} 0.53 \\ 0.52 \\ 0.51 \\ 0.49 \\ 0.46 \end{pmatrix}$$ sf/ft

Total Coax Wind Force w/ Ice = $F_{ice.Coax_i} := qz_{ice.Mast_i} \cdot G_H \cdot Ca_{coax} \cdot AICE_{coax_i}$

$$F_{ice.Coax_i} = \begin{pmatrix} 6 \\ 5 \\ 5 \\ 4 \\ 3 \end{pmatrix}$$ plf **BLC 4,6**

Wind Load (Service)

Total Coax Wind Force Service Loads =

$$qz_{Mast.Ser} \cdot G_H \cdot Ca_{coax} \cdot A_{coax} = \begin{pmatrix} 3 \\ 3 \\ 3 \\ 2 \\ 2 \end{pmatrix}$$ plf **BLC 8**

Gravity Loads (without ice)

Weight of all cables w/o ice

$$WT_{coax} := Wt_{coax} \cdot N_{coax} = 10$$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot =

$$Ai_{coax_i} := \frac{\pi}{4}\left[\left(D_{coax} + t_{izMast_i} \cdot 2\right)^2 - D_{coax}^2\right] \cdot NE_{coax}$$

$$Ai_{coax_i} = \begin{pmatrix} 124.36 \\ 119.32 \\ 112.91 \\ 103.88 \\ 87.01 \end{pmatrix}$$ sq in

Weight of Ice on Coax =

$$W_{ICEcoax} := Id \cdot \frac{Ai_{coax}}{144}$$

$$W_{ICEcoax} = \begin{pmatrix} 48 \\ 46 \\ 44 \\ 40 \\ 34 \end{pmatrix}$$ plf **BLC 3**

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast	PIPE_12.0	Column	Pipe	A500 Gr. C 50	Typical	13.7	262	262	523
2	L4x4x1/4	L4X4X4	Beam	Single Angle	A36 Gr.36	Typical	1.93	3	3	.044
3	L5x5x3/8	L5X5X6	Beam	Single Angle	A36 Gr.36	Typical	3.65	8.76	8.76	.183
4	L2x2x3/16	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
5	L3x3x3/16	L3X3X3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014
6	L2.5x2.5x3/16	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
7	L2.5x2.5x1/4	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
8	6x3/4 PL	6"X3/4" PL	Beam	Single Angle	A36 Gr.36	Typical	4.5	.211	13.5	.777

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Antenna Mast	101.5			Lbyy						Lateral
2	M6	L5x5x3/8	15.052			Lbyy						Lateral
3	M7	L5x5x3/8	15.052			Lbyy						Lateral
4	M8	L4x4x1/4	13.288			Lbyy						Lateral
5	M9	L4x4x1/4	13.288			Lbyy						Lateral
6	M10	L3x3x3/16	8.918			Lbyy						Lateral
7	M11	L3x3x3/16	8.918			Lbyy						Lateral
8	M12	L2x2x3/16	1.25			Lbyy						Lateral
9	M13	L2x2x3/16	2.795			Lbyy						Lateral
10	M14	L2x2x3/16	2.795			Lbyy						Lateral
11	M15	L2x2x3/16	1.25			Lbyy						Lateral
12	M16	L2x2x3/16	2.795			Lbyy						Lateral
13	M17	L2x2x3/16	2.795			Lbyy						Lateral
14	M18	L2x2x3/16	1.25			Lbyy						Lateral
15	M19	L2x2x3/16	2.795			Lbyy						Lateral
16	M20	L2x2x3/16	2.795			Lbyy						Lateral
17	M21	L2x2x3/16	1.25			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N7			Antenna Mast	Column	Pipe	A500 Gr....	Typical
2	M6	N8	N2			L5x5x3/8	Beam	Single Angle	A36 Gr.36	Typical
3	M7	N9	N2			L5x5x3/8	Beam	Single Angle	A36 Gr.36	Typical
4	M8	N10	N2			L4x4x1/4	Beam	Single Angle	A36 Gr.36	Typical
5	M9	N11	N2			L4x4x1/4	Beam	Single Angle	A36 Gr.36	Typical
6	M10	N12	N3			L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
7	M11	N13	N3			L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
8	M12	N14	N3			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
9	M13	N15	N4			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
10	M14	N16	N4			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
11	M15	N17	N4			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
12	M16	N18	N5			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
13	M17	N19	N5			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
14	M18	N20	N5			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
15	M19	N21	N6			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
16	M20	N22	N6			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical
17	M21	N23	N6			L2x2x3/16	Beam	Single Angle	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	-1.25	0	
2	N2	0	10	-1.25	0	
3	N3	0	32	-1.25	0	
4	N4	0	64	-1.25	0	
5	N5	0	74	-1.25	0	
6	N6	0	91	-1.25	0	
7	N7	0	101.5	-1.25	0	
8	N8	10	10	10	0	
9	N9	-10	10	10	0	
10	N10	10	10	-10	0	
11	N11	-10	10	-10	0	
12	N12	6.9	32	-6.9	0	
13	N13	-6.9	32	-6.9	0	
14	N14	0	32	0	0	
15	N15	2.5	64	-2.5	0	
16	N16	-2.5	64	-2.5	0	
17	N17	0	64	0	0	
18	N18	2.5	74	-2.5	0	
19	N19	-2.5	74	-2.5	0	
20	N20	0	74	0	0	
21	N21	2.5	91	-2.5	0	
22	N22	-2.5	91	-2.5	0	
23	N23	0	91	0	0	
24	N24	0	20	-1.25	0	
25	N25	0	40	-1.25	0	
26	N26	0	60	-1.25	0	
27	N27	0	80	-1.25	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2						
3	N3						
4	N4						
5	N5						
6	N6						
7	N7						
8	N21	Reaction		Reaction			
9	N22	Reaction		Reaction			
10	N23	Reaction		Reaction			
11	N18	Reaction		Reaction			
12	N20	Reaction		Reaction			
13	N19	Reaction		Reaction			
14	N16	Reaction		Reaction			
15	N17	Reaction		Reaction			
16	N15	Reaction		Reaction			
17	N13	Reaction		Reaction			
18	N14	Reaction		Reaction			
19	N12	Reaction		Reaction			

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
20	N9	Reaction		Reaction			
21	N11	Reaction		Reaction			
22	N10	Reaction		Reaction			
23	N8	Reaction		Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.117	101
2	M1	Y	-.219	101
3	M1	Y	-.186	101
4	M1	Y	-.12	101
5	M1	Y	-3.3	101

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.503	101
2	M1	Y	-1.032	101
3	M1	Y	-.367	101
4	M1	Y	-.245	101
5	M1	Y	-.5	101

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.223	101
2	M1	X	.458	101
3	M1	X	.153	101
4	M1	X	.092	101
5	M1	X	.164	101

Member Point Loads (BLC 5 : (x) TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.652	101
2	M1	X	1.566	101
3	M1	X	.395	101
4	M1	X	.197	101
5	M1	X	.552	101

Member Point Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.223	101
2	M1	Z	.458	101
3	M1	Z	.153	101
4	M1	Z	.092	101
5	M1	Z	.164	101

Member Point Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.652	101

Member Point Loads (BLC 7 : (z) TIA Wind) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
2	M1	Z	1.566	101
3	M1	Z	.395	101
4	M1	Z	.197	101
5	M1	Z	.552	101

Member Point Loads (BLC 8 : Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.217	101
2	M1	X	.521	101
3	M1	X	.131	101
4	M1	X	.066	101
5	M1	X	.184	101

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.038	-.038	80	101.5
2	M1	Y	-.036	-.036	60	80
3	M1	Y	-.035	-.035	40	60
4	M1	Y	-.033	-.033	20	40
5	M1	Y	-.029	-.029	0	20
6	M1	Y	-.048	-.048	80	101.5
7	M1	Y	-.046	-.046	60	80
8	M1	Y	-.044	-.044	40	60
9	M1	Y	-.04	-.04	20	40
10	M1	Y	-.034	-.034	0	20
11	M6	Y	-.008	-.008	0	20
12	M7	Y	-.008	-.008	0	20
13	M8	Y	-.008	-.008	0	20
14	M9	Y	-.008	-.008	0	20
15	M10	Y	-.008	-.008	0	20
16	M11	Y	-.008	-.008	0	20
17	M12	Y	-.008	-.008	0	20
18	M13	Y	-.008	-.008	0	20
19	M14	Y	-.008	-.008	0	20
20	M15	Y	-.008	-.008	0	20
21	M16	Y	-.008	-.008	0	20
22	M17	Y	-.008	-.008	0	20
23	M18	Y	-.008	-.008	0	20
24	M19	Y	-.008	-.008	0	20
25	M20	Y	-.008	-.008	0	20
26	M21	Y	-.008	-.008	0	20

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.015	.015	80	101.5

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
2	M1	X	.014	.014	60	80
3	M1	X	.013	.013	40	60
4	M1	X	.012	.012	20	40
5	M1	X	.01	.01	0	20
6	M1	X	.006	.006	80	101.5
7	M1	X	.005	.005	60	80
8	M1	X	.005	.005	40	60
9	M1	X	.004	.004	20	40
10	M1	X	.003	.003	0	20
11	M6	X	.006	.006	0	0
12	M7	X	.006	.006	0	0
13	M8	X	.006	.006	0	0
14	M9	X	.006	.006	0	0
15	M10	X	.006	.006	0	0
16	M11	X	.006	.006	0	0
17	M12	X	.006	.006	0	0
18	M13	X	.006	.006	0	0
19	M14	X	.006	.006	0	0
20	M15	X	.006	.006	0	0
21	M16	X	.006	.006	0	0
22	M17	X	.006	.006	0	0
23	M18	X	.006	.006	0	0
24	M19	X	.006	.006	0	0
25	M20	X	.006	.006	0	0
26	M21	X	.006	.006	0	0

Member Distributed Loads (BLC 5 : (x) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.05	.05	80	101.5
2	M1	X	.048	.048	60	80
3	M1	X	.044	.044	40	60
4	M1	X	.04	.04	20	40
5	M1	X	.034	.034	0	20
6	M1	X	.009	.009	80	101.5
7	M1	X	.008	.008	60	80
8	M1	X	.008	.008	40	60
9	M1	X	.007	.007	20	40
10	M1	X	.006	.006	0	20
11	M6	X	.02	.02	0	0
12	M7	X	.02	.02	0	0
13	M8	X	.02	.02	0	0
14	M9	X	.02	.02	0	0
15	M10	X	.02	.02	0	0
16	M11	X	.02	.02	0	0
17	M12	X	.02	.02	0	0
18	M13	X	.02	.02	0	0
19	M14	X	.02	.02	0	0
20	M15	X	.02	.02	0	0
21	M16	X	.02	.02	0	0
22	M17	X	.02	.02	0	0
23	M18	X	.02	.02	0	0

Member Distributed Loads (BLC 5 : (x) TIA Wind) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
24	M19	X	.02	.02	0	0
25	M20	X	.02	.02	0	0
26	M21	X	.02	.02	0	0

Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.015	.015	80	101.5
2	M1	Z	.014	.014	60	80
3	M1	Z	.013	.013	40	60
4	M1	Z	.012	.012	20	40
5	M1	Z	.01	.01	0	20
6	M1	Z	.006	.006	80	101.5
7	M1	Z	.005	.005	60	80
8	M1	Z	.005	.005	40	60
9	M1	Z	.004	.004	20	40
10	M1	Z	.003	.003	0	20
11	M6	Z	.006	.006	0	0
12	M7	Z	.006	.006	0	0
13	M8	Z	.006	.006	0	0
14	M9	Z	.006	.006	0	0
15	M10	Z	.006	.006	0	0
16	M11	Z	.006	.006	0	0
17	M13	Z	.006	.006	0	0
18	M14	Z	.006	.006	0	0
19	M16	Z	.006	.006	0	0
20	M17	Z	.006	.006	0	0
21	M19	Z	.006	.006	0	0
22	M20	Z	.006	.006	0	0

Member Distributed Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.05	.05	80	101.5
2	M1	Z	.048	.048	60	80
3	M1	Z	.044	.044	40	60
4	M1	Z	.04	.04	20	40
5	M1	Z	.034	.034	0	20
6	M1	Z	.009	.009	80	101.5
7	M1	Z	.008	.008	60	80
8	M1	Z	.008	.008	40	60
9	M1	Z	.007	.007	20	40
10	M1	Z	.006	.006	0	20
11	M6	Z	.02	.02	0	0
12	M7	Z	.02	.02	0	0
13	M8	Z	.02	.02	0	0
14	M9	Z	.02	.02	0	0
15	M10	Z	.02	.02	0	0
16	M11	Z	.02	.02	0	0
17	M13	Z	.02	.02	0	0
18	M14	Z	.02	.02	0	0
19	M16	Z	.02	.02	0	0
20	M17	Z	.02	.02	0	0

Member Distributed Loads (BLC 7 : (z) TIA Wind) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
21	M19	Z	.02	.02	0	0
22	M20	Z	.02	.02	0	0

Member Distributed Loads (BLC 8 : Service)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.017	.017	80	101.5
2	M1	X	.016	.016	60	80
3	M1	X	.015	.015	40	60
4	M1	X	.013	.013	20	40
5	M1	X	.011	.011	0	20
6	M1	X	.003	.003	80	101.5
7	M1	X	.003	.003	60	80
8	M1	X	.003	.003	40	60
9	M1	X	.002	.002	20	40
10	M1	X	.002	.002	0	20
11	M6	X	.005	.005	0	0
12	M7	X	.005	.005	0	0
13	M8	X	.005	.005	0	0
14	M9	X	.005	.005	0	0
15	M10	X	.005	.005	0	0
16	M11	X	.005	.005	0	0
17	M12	X	.005	.005	0	0
18	M13	X	.005	.005	0	0
19	M14	X	.005	.005	0	0
20	M15	X	.005	.005	0	0
21	M16	X	.005	.005	0	0
22	M17	X	.005	.005	0	0
23	M18	X	.005	.005	0	0
24	M19	X	.005	.005	0	0
25	M20	X	.005	.005	0	0
26	M21	X	.005	.005	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					5	1		
3	Weight of Ice Only	None					5	26		
4	(x) TIA Wind with Ice	None					5	26		
5	(x) TIA Wind	None					5	26		
6	(z) TIA Wind with Ice	None					5	22		
7	(z) TIA Wind	None					5	22		
8	Service	None					5	26		

Load Combinations

	Description	Solve	PDel...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	4	1												

Load Combinations (Continued)

	Description	Solve	PDel..	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
4	1.2D + 1.6W (Z-direc...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-direc...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
7	1.0D + 1.0W Service	Yes	Y		1	1	2	1	8	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	-.001	5	23.634	6	.231	3	.727	3	-1.488	5	.444	2
2		min	-.232	2	9.321	2	-.118	5	-.07	5	-3.352	6	.007	5
3	N21	max	1.774	4	0	7	2.884	1	0	7	0	7	0	7
4		min	-5.888	1	0	1	-.924	4	0	1	0	1	0	1
5	N22	max	-.35	6	0	7	-.184	6	0	7	0	7	0	7
6		min	-5.87	1	0	1	-2.899	1	0	1	0	1	0	1
7	N23	max	.026	5	0	7	.025	1	0	7	0	7	0	7
8		min	-.083	1	0	1	-9.962	4	0	1	0	1	0	1
9	N18	max	2.722	1	0	7	.387	4	0	7	0	7	0	7
10		min	-.835	5	0	1	-1.376	1	0	1	0	1	0	1
11	N20	max	-.001	2	0	7	4.747	4	0	7	0	7	0	7
12		min	-.038	6	0	1	-.021	1	0	1	0	1	0	1
13	N19	max	2.713	1	0	7	1.375	1	0	7	0	7	0	7
14		min	.188	6	0	1	.087	6	0	1	0	1	0	1
15	N16	max	-.118	6	0	7	-.067	6	0	7	0	7	0	7
16		min	-2.23	2	0	1	-1.099	1	0	1	0	1	0	1
17	N17	max	-.018	5	0	7	.027	3	0	7	0	7	0	7
18		min	-.049	1	0	1	-3.757	4	0	1	0	1	0	1
19	N15	max	.688	4	0	7	1.102	1	0	7	0	7	0	7
20		min	-2.236	1	0	1	-.375	4	0	1	0	1	0	1
21	N13	max	-.031	6	0	7	-.018	6	0	7	0	7	0	7
22		min	-1.371	2	0	1	-1.028	2	0	1	0	1	0	1
23	N14	max	-.019	5	0	7	-.015	2	0	7	0	7	0	7
24		min	-.062	1	0	1	-2.18	4	0	1	0	1	0	1
25	N12	max	.256	4	0	7	1.023	2	0	7	0	7	0	7
26		min	-1.37	2	0	1	-.325	4	0	1	0	1	0	1
27	N9	max	.694	4	0	7	.651	2	0	7	0	7	0	7
28		min	-.718	2	0	1	-.891	4	0	1	0	1	0	1
29	N11	max	-.147	7	0	7	-.084	7	0	7	0	7	0	7
30		min	-.669	1	0	1	-.511	4	0	1	0	1	0	1
31	N10	max	.387	4	0	7	.377	2	0	7	0	7	0	7
32		min	-.617	2	0	1	-.525	4	0	1	0	1	0	1
33	N8	max	-.149	6	0	7	-.194	7	0	7	0	7	0	7
34		min	-.789	1	0	1	-.981	4	0	1	0	1	0	1
35	Totals:	max	0	6	23.634	6	0	7						
36		min	-16.73	1	9.321	2	-16.57	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	0	7	0	7	0	7	0	7	0	7	0	7
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.003	1	-.003	5	.003	4	1.506e-04	4	8.275e-04	6	-2.701e-07	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
4		min	0	5	-.009	3	0	2	5.723e-05	2	3.672e-04	5	-8.388e-05	1
5	N3	max	.009	2	-.01	5	.002	4	2.568e-04	5	9.177e-04	6	1.289e-06	6
6		min	0	6	-.025	3	0	2	-8.183e-05	3	1.982e-04	2	-3.14e-04	1
7	N4	max	.005	1	-.018	5	.003	4	2.963e-05	4	7.897e-04	6	2.372e-05	2
8		min	0	6	-.044	3	0	3	3.597e-06	2	1.952e-04	2	-4.134e-07	6
9	N5	max	0	5	-.019	5	0	1	9.027e-07	2	7.641e-04	6	1.198e-03	1
10		min	-.007	1	-.049	3	-.004	4	-1.187e-03	4	2.085e-04	2	-4.133e-08	5
11	N6	max	.015	1	-.022	5	.009	4	6.529e-03	4	7.432e-04	6	-8.242e-08	6
12		min	0	6	-.055	3	0	1	-1.319e-05	1	2.323e-04	2	-6.597e-03	1
13	N7	max	1.447	1	-.024	5	1.433	4	1.337e-02	4	7.432e-04	6	-8.289e-08	6
14		min	0	6	-.058	3	-.002	1	-1.324e-05	1	2.323e-04	2	-1.344e-02	1
15	N8	max	0	7	-.706	5	0	7	7.363e-03	3	2.118e-03	4	-2.542e-03	5
16		min	0	1	-1.386	6	0	1	2.99e-03	5	-1.556e-03	2	-6.472e-03	3
17	N9	max	0	7	-.627	2	0	7	7.351e-03	6	3.262e-04	6	6.43e-03	6
18		min	0	1	-1.384	6	0	1	3.915e-03	7	-1.557e-03	2	3.408e-03	7
19	N10	max	0	7	-.563	5	0	7	-1.261e-03	5	4.387e-03	4	-1.59e-03	5
20		min	0	1	-1.632	3	0	1	-8.076e-03	3	9.677e-04	7	-9.363e-03	3
21	N11	max	0	7	-.554	2	0	7	-1.486e-03	2	3.898e-03	1	9.655e-03	6
22		min	0	1	-1.585	6	0	1	-8.332e-03	6	-3.485e-03	5	1.681e-03	2
23	N12	max	0	7	-.213	5	0	7	7.276e-05	5	3.966e-03	4	-2.243e-04	5
24		min	0	1	-.913	3	0	1	-6.424e-03	3	6.633e-04	7	-7.817e-03	3
25	N13	max	0	7	-.161	2	0	7	-7.348e-05	2	3.429e-03	1	7.873e-03	6
26		min	0	1	-.858	6	0	1	-6.462e-03	6	-3.694e-03	5	-2.624e-04	2
27	N14	max	0	7	-.015	7	0	7	8.693e-04	3	-1.734e-04	5	1.289e-06	6
28		min	0	1	-.034	6	0	1	3.973e-04	7	-1.057e-03	1	-3.14e-04	1
29	N15	max	0	7	-.025	2	0	7	-2.303e-05	5	4.454e-04	5	-1.012e-04	5
30		min	0	1	-.082	3	0	1	-6.746e-04	3	-2.029e-04	3	-1.36e-03	3
31	N16	max	0	7	-.024	2	0	7	-3.978e-05	2	2.678e-04	2	1.441e-03	6
32		min	0	1	-.083	6	0	1	-7.109e-04	6	-7.991e-04	4	1.105e-04	2
33	N17	max	0	7	-.021	5	0	7	8.168e-04	3	-1.669e-04	5	2.372e-05	2
34		min	0	1	-.052	3	0	1	3.437e-04	7	-7.267e-04	1	-4.134e-07	6
35	N18	max	0	7	.002	2	0	7	-1.902e-04	7	1.414e-04	5	7.702e-04	2
36		min	0	1	-.092	6	0	1	-1.432e-03	4	-2.393e-04	3	-1.361e-03	6
37	N19	max	0	7	-.041	7	0	7	-2.078e-04	7	1.191e-05	2	2.047e-03	1
38		min	0	1	-.096	3	0	1	-1.586e-03	4	-4.938e-04	4	6.602e-04	7
39	N20	max	0	7	-.006	5	0	7	6.306e-04	3	5.32e-04	2	1.198e-03	1
40		min	0	1	-.055	3	0	1	-7.768e-04	5	-3.52e-04	6	-4.133e-08	5
41	N21	max	0	7	.058	5	0	7	6.321e-03	5	6.594e-04	5	-3.937e-04	5
42		min	0	1	-.37	1	0	1	-2.747e-03	1	-1.414e-04	3	-1.207e-02	1
43	N22	max	0	7	.116	2	0	7	5.9e-03	5	4.24e-04	2	1.424e-03	6
44		min	0	1	-.074	6	0	1	-1.163e-03	1	-1.024e-03	4	-4.382e-03	2
45	N23	max	0	7	-.029	7	0	7	8.35e-03	4	-1.978e-04	5	-8.242e-08	6
46		min	0	1	-.146	4	0	1	4.26e-04	7	-1.637e-03	1	-6.597e-03	1
47	N24	max	.012	1	-.006	5	.013	4	2.262e-06	3	8.685e-04	6	3.341e-05	1
48		min	0	6	-.016	3	.003	2	-6.472e-05	4	2.946e-04	2	6.458e-07	5
49	N25	max	.063	1	-.012	5	.053	5	5.466e-04	5	8.857e-04	6	-6.285e-08	5
50		min	0	6	-.03	3	-.005	3	-1.917e-05	3	1.974e-04	2	-5.6e-04	1
51	N26	max	.021	2	-.017	5	.017	5	2.217e-05	3	8.057e-04	6	5.22e-04	1
52		min	0	6	-.042	3	0	3	-4.745e-04	5	1.956e-04	2	-8.325e-07	6
53	N27	max	0	5	-.021	5	0	2	3.911e-06	1	7.567e-04	6	1.866e-03	1
54		min	-.141	1	-.051	3	-.139	4	-1.899e-03	4	2.169e-04	2	-1.792e-07	4

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M1	PIPE_12.0	.596	0	3	.034	91....		1	39.898	616.5	201....	201....	...	H1-...
2	M6	L5X5X6	.353	15....	6	.010	15....	y	6	24.572	118.26	7.418	13.97	...	H2-1
3	M7	L5X5X6	.338	15....	6	.010	15....	y	6	24.572	118.26	7.418	14.203	...	H2-1
4	M8	L4X4X4	.453	13....	3	.011	13....	y	3	10.514	62.532	3.138	5.552	...	H2-1
5	M9	L4X4X4	.442	13....	3	.011	13....	z	4	10.514	62.532	3.138	5.56	...	H2-1
6	M10	L3X3X3	.428	8.9...	1	.012	8.9...	z	5	7.383	35.316	1.32	1.991	...	H2-1
7	M11	L3X3X3	.366	8.9...	3	.013	8.9...	z	4	7.383	35.316	1.32	2.418	...	H2-1
8	M12	L2x2x3	.160	1.25	4	.008	0	z	1	21.632	23.393	.558	1.239	...	H2-1
9	M13	L2x2x3	.188	2.7...	1	.007	2.7...	z	4	15.816	23.393	.558	1.185	...	H2-1
10	M14	L2x2x3	.140	2.7...	1	.006	2.7...	z	5	15.816	23.393	.558	1.203	...	H2-1
11	M15	L2x2x3	.228	1.25	4	.007	0	z	1	21.632	23.393	.558	1.239	...	H2-1
12	M16	L2x2x3	.178	2.7...	1	.007	2.7...	z	4	15.816	23.393	.558	1.187	...	H2-1
13	M17	L2x2x3	.256	2.7...	1	.007	2.7...	z	5	15.816	23.393	.558	1.185	...	H2-1
14	M18	L2x2x3	.255	1.25	4	.005	1.25	z	2	21.632	23.393	.558	1.239	...	H2-1
15	M19	L2x2x3	.702	2.7...	1	.010	2.7...	y	1	15.816	23.393	.558	1.239	...	H2-1
16	M20	L2x2x3	.412	2.7...	1	.006	2.7...	z	5	15.816	23.393	.558	1.237	...	H2-1
17	M21	L2x2x3	.623	1.25	4	.011	0	z	1	21.632	23.393	.558	1.239	...	H2-1

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-.229	12.428	.174	.549	-1.999	.436
2	1	N21	-5.888	0	2.884	0	0	0
3	1	N22	-5.87	0	-2.899	0	0	0
4	1	N23	-.083	0	.025	0	0	0
5	1	N18	2.722	0	-1.376	0	0	0
6	1	N20	-.006	0	-.021	0	0	0
7	1	N19	2.713	0	1.375	0	0	0
8	1	N16	-2.229	0	-1.099	0	0	0
9	1	N17	-.049	0	.018	0	0	0
10	1	N15	-2.236	0	1.102	0	0	0
11	1	N13	-1.368	0	-1.025	0	0	0
12	1	N14	-.062	0	-.019	0	0	0
13	1	N12	-1.368	0	1.017	0	0	0
14	1	N9	-.701	0	.649	0	0	0
15	1	N11	-.669	0	-.42	0	0	0
16	1	N10	-.616	0	.369	0	0	0
17	1	N8	-.789	0	-.755	0	0	0
18	1	Totals:	-16.73	12.428	0			
19	1	COG (ft):	X: 0	Y: 67.717	Z: -1.14			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-.232	9.321	.131	.411	-1.519	.444
2	2	N21	-5.886	0	2.884	0	0	0
3	2	N22	-5.869	0	-2.897	0	0	0
4	2	N23	-.078	0	.024	0	0	0
5	2	N18	2.713	0	-1.372	0	0	0
6	2	N20	-.001	0	-.019	0	0	0
7	2	N19	2.705	0	1.371	0	0	0
8	2	N16	-2.23	0	-1.098	0	0	0
9	2	N17	-.044	0	.014	0	0	0
10	2	N15	-2.235	0	1.101	0	0	0
11	2	N13	-1.371	0	-1.028	0	0	0
12	2	N14	-.056	0	-.015	0	0	0
13	2	N12	-1.37	0	1.023	0	0	0
14	2	N9	-.718	0	.651	0	0	0
15	2	N11	-.656	0	-.415	0	0	0
16	2	N10	-.617	0	.377	0	0	0
17	2	N8	-.783	0	-.73	0	0	0
18	2	Totals:	-16.73	9.321	0			
19	2	COG (ft):	X: 0	Y: 67.717	Z: -1.14			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	-.047	23.634	.231	.727	-3.35	.092
2	3	N21	-1.197	0	.594	0	0	0
3	3	N22	-1.195	0	-.594	0	0	0
4	3	N23	-.048	0	.005	0	0	0
5	3	N18	.574	0	-.288	0	0	0
6	3	N20	-.033	0	-.017	0	0	0
7	3	N19	.567	0	.286	0	0	0
8	3	N16	-.445	0	-.221	0	0	0
9	3	N17	-.044	0	.027	0	0	0
10	3	N15	-.455	0	.225	0	0	0
11	3	N13	-.268	0	-.176	0	0	0
12	3	N14	-.052	0	-.023	0	0	0
13	3	N12	-.265	0	.17	0	0	0
14	3	N9	-.044	0	.111	0	0	0
15	3	N11	-.196	0	-.089	0	0	0
16	3	N10	-.118	0	.018	0	0	0
17	3	N8	-.175	0	-.261	0	0	0
18	3	Totals:	-3.439	23.634	0			
19	3	COG (ft):	X: 0	Y: 65.536	Z: -1.194			

Joint Reactions (By Combination)

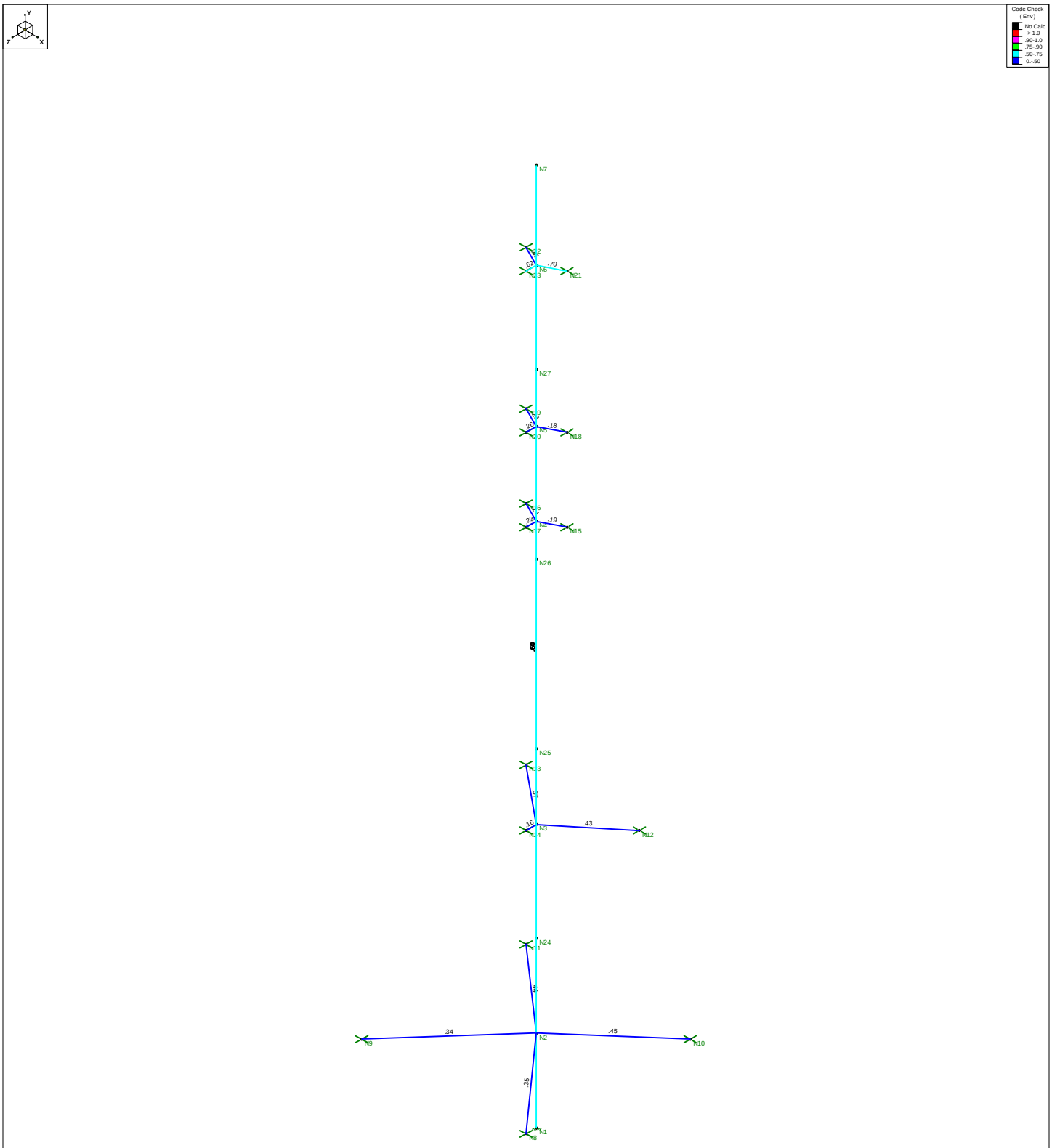
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N1	-.001	12.428	-.07	.078	-1.972	.008
2	4	N21	1.774	0	-.924	0	0	0
3	4	N22	-1.796	0	-.936	0	0	0
4	4	N23	.022	0	-9.962	0	0	0
5	4	N18	-.834	0	.387	0	0	0
6	4	N20	-.021	0	4.747	0	0	0
7	4	N19	.854	0	.392	0	0	0
8	4	N16	-.665	0	-.371	0	0	0
9	4	N17	-.022	0	-3.757	0	0	0
10	4	N15	.688	0	-.375	0	0	0
11	4	N13	-.232	0	-.288	0	0	0
12	4	N14	-.025	0	-2.18	0	0	0
13	4	N12	.256	0	-.325	0	0	0
14	4	N9	.694	0	-.891	0	0	0
15	4	N11	-.432	0	-.511	0	0	0
16	4	N10	.387	0	-.525	0	0	0
17	4	N8	-.648	0	-.981	0	0	0
18	4	Totals:	0	12.428	-16.57			
19	4	COG (ft):	X: 0	Y: 67.717	Z: -1.14			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N1	-.001	9.321	-.118	-.07	-1.488	.007
2	5	N21	1.771	0	-.923	0	0	0
3	5	N22	-1.797	0	-.935	0	0	0
4	5	N23	.026	0	-9.956	0	0	0
5	5	N18	-.835	0	.387	0	0	0
6	5	N20	-.016	0	4.74	0	0	0
7	5	N19	.851	0	.391	0	0	0
8	5	N16	-.667	0	-.371	0	0	0
9	5	N17	-.018	0	-3.757	0	0	0
10	5	N15	.685	0	-.374	0	0	0
11	5	N13	-.234	0	-.292	0	0	0
12	5	N14	-.019	0	-2.174	0	0	0
13	5	N12	.252	0	-.32	0	0	0
14	5	N9	.676	0	-.888	0	0	0
15	5	N11	-.419	0	-.506	0	0	0
16	5	N10	.386	0	-.517	0	0	0
17	5	N8	-.641	0	-.955	0	0	0
18	5	Totals:	0	9.321	-16.57			
19	5	COG (ft):	X: 0	Y: 67.717	Z: -1.14			

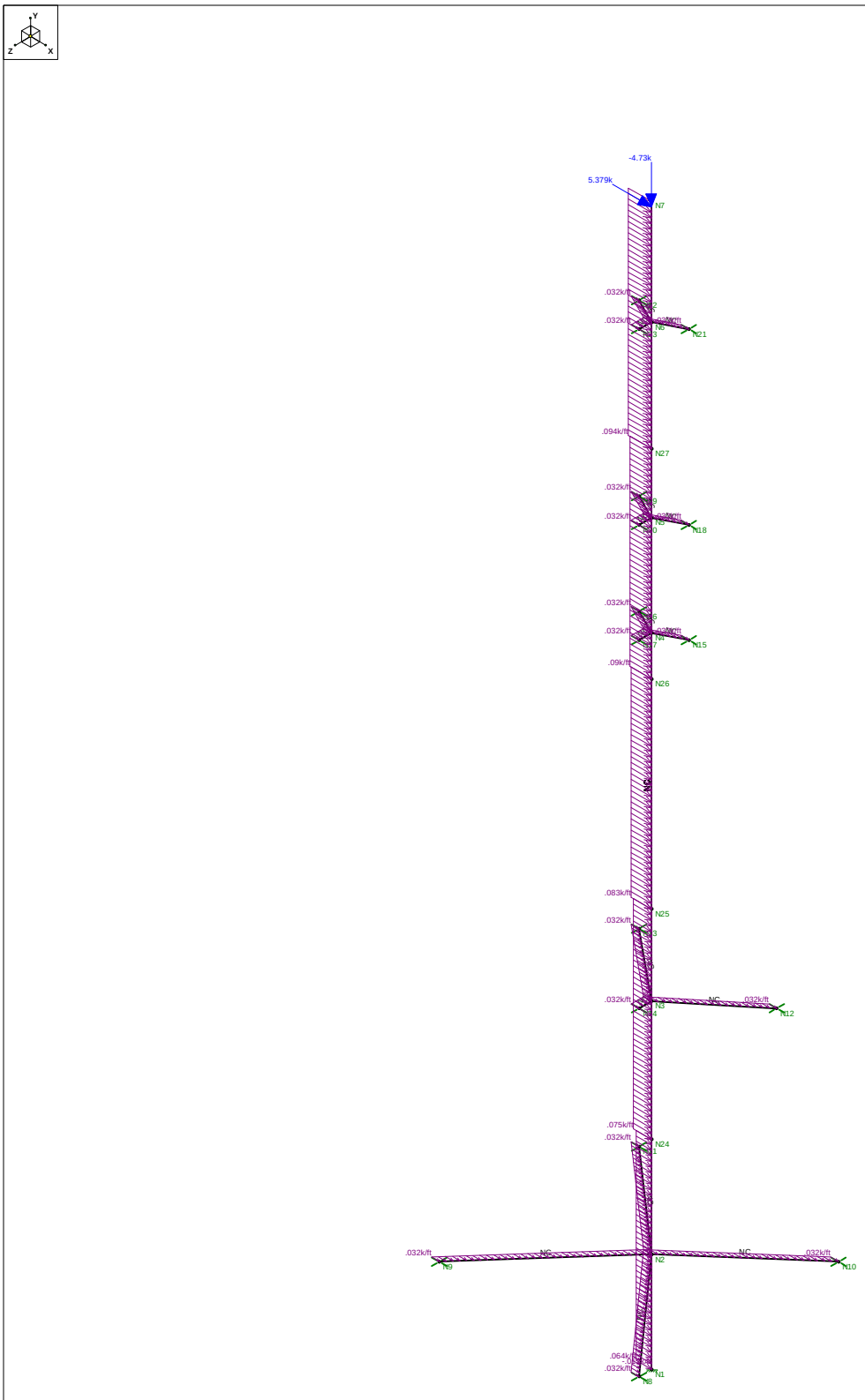
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N1	-.001	23.634	.183	.636	-3.352	.009
2	6	N21	.385	0	-.198	0	0	0
3	6	N22	-.35	0	-.184	0	0	0
4	6	N23	-.034	0	-2.051	0	0	0
5	6	N18	-.151	0	.071	0	0	0
6	6	N20	-.038	0	.954	0	0	0
7	6	N19	.188	0	.087	0	0	0
8	6	N16	-.118	0	-.067	0	0	0
9	6	N17	-.039	0	-.764	0	0	0
10	6	N15	.157	0	-.083	0	0	0
11	6	N13	-.031	0	-.018	0	0	0
12	6	N14	-.045	0	-.48	0	0	0
13	6	N12	.075	0	-.109	0	0	0
14	6	N9	.227	0	-.186	0	0	0
15	6	N11	-.151	0	-.106	0	0	0
16	6	N10	.076	0	-.154	0	0	0
17	6	N8	-.149	0	-.304	0	0	0
18	6	Totals:	0	23.634	-3.409			
19	6	COG (ft):	X: 0	Y: 65.536	Z: -1.194			



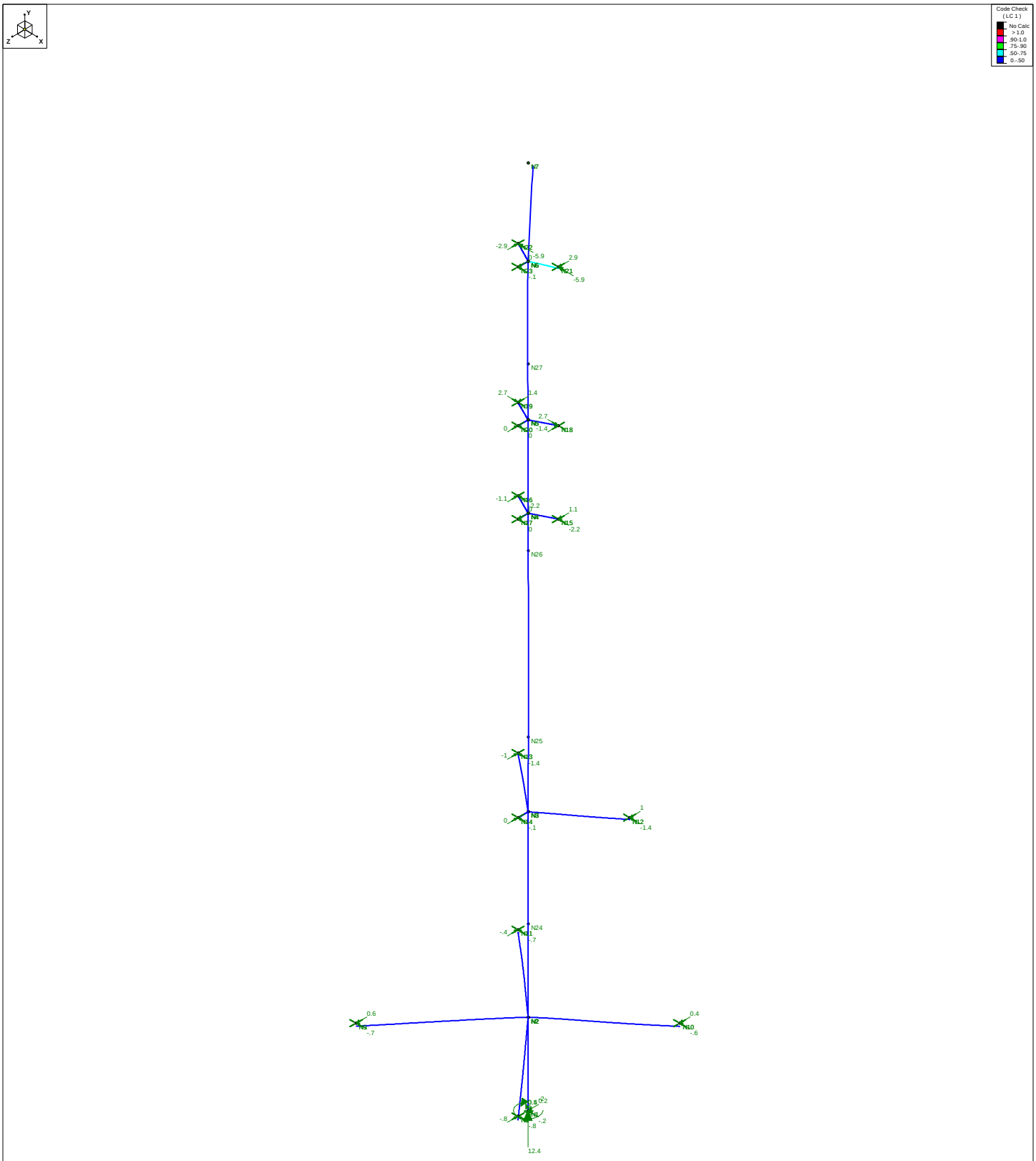
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:11 AM
19047.00 - CT5090	Unity Check	TIA - Antenna Mast.r3d



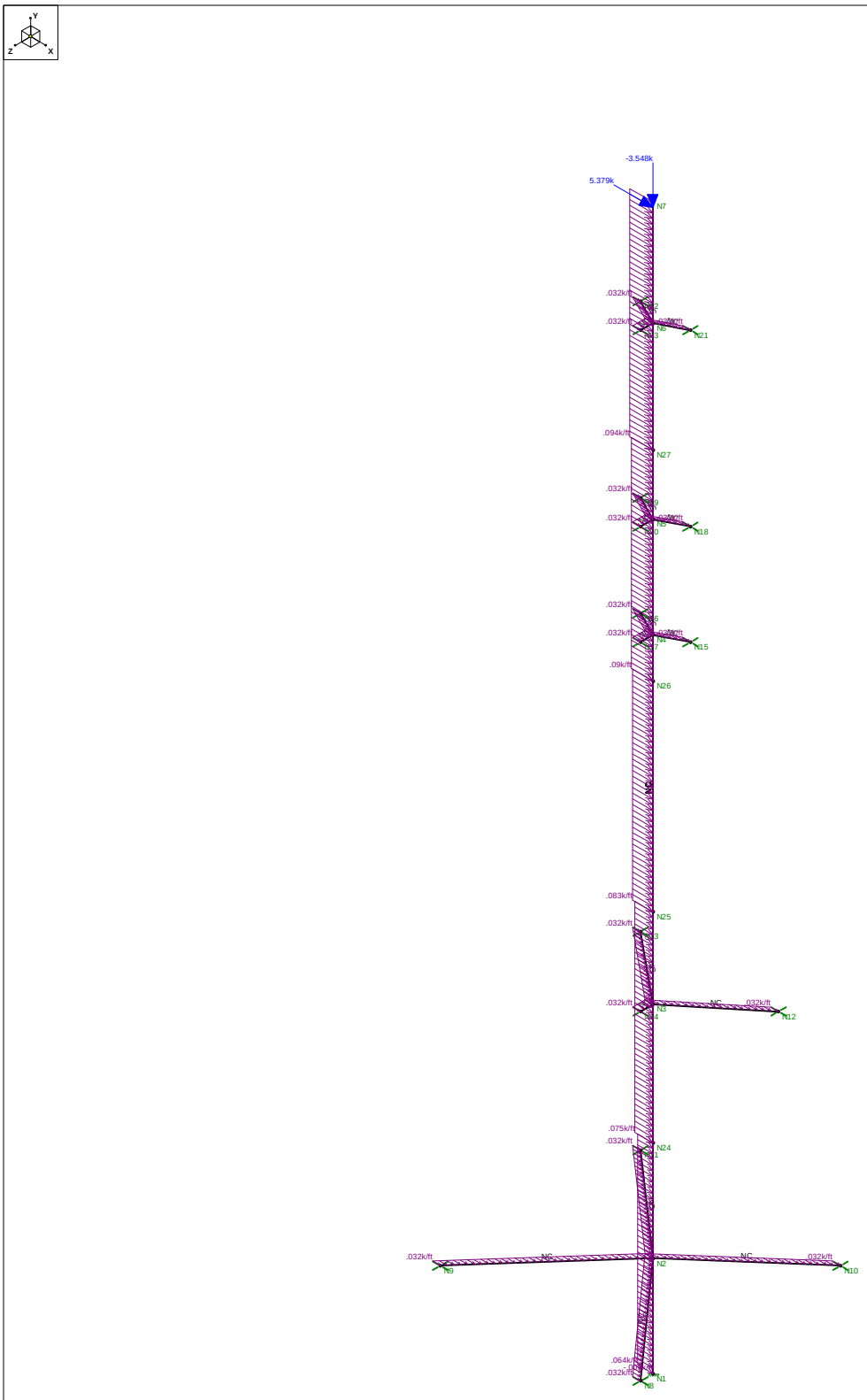
Member Code Checks Displayed
Loads: LC 1, 1.2D + 1.6W (X-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:12 AM
19047.00 - CT5090	LC #1 Loads	TIA - Antenna Mast.r3d



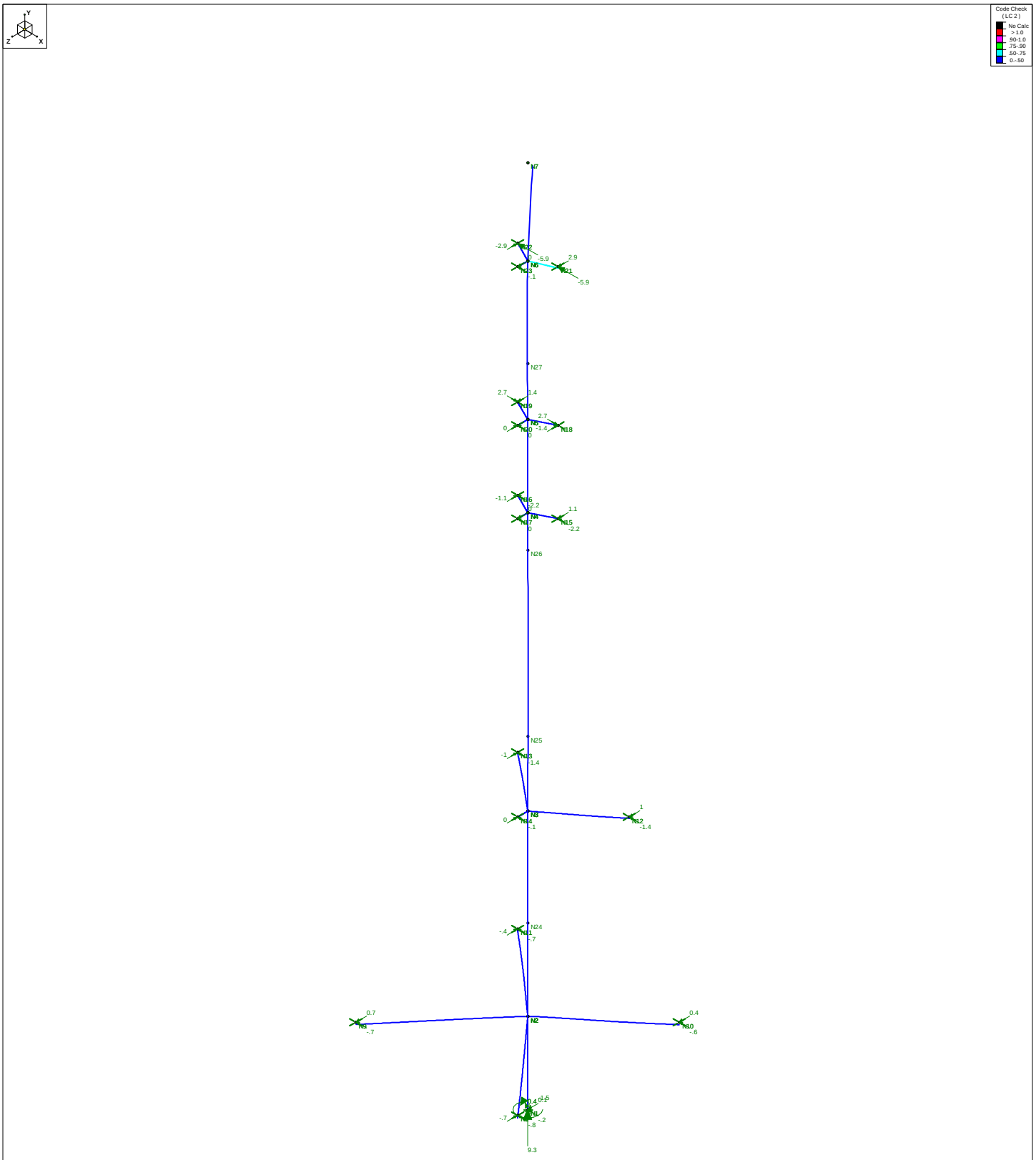
Member Code Checks Displayed
Results for LC 1, 1.2D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:14 AM
19047.00 - CT5090	LC #1 Reactions and Deflected Shape	TIA - Antenna Mast.r3d



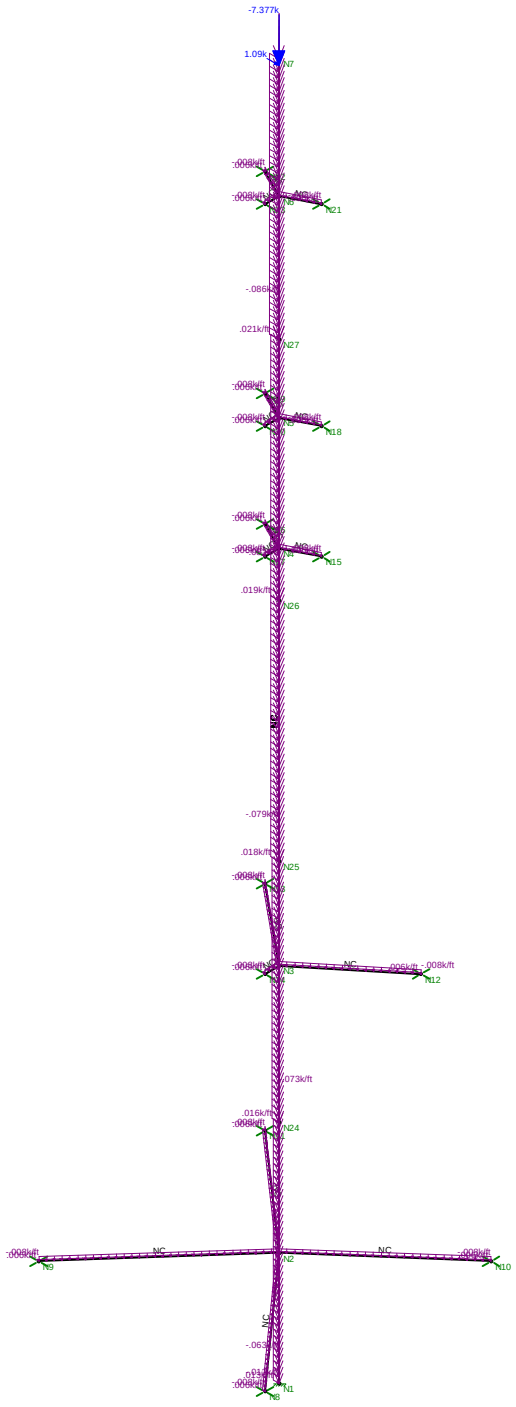
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:12 AM
19047.00 - CT5090	LC #2 Loads	TIA - Antenna Mast.r3d



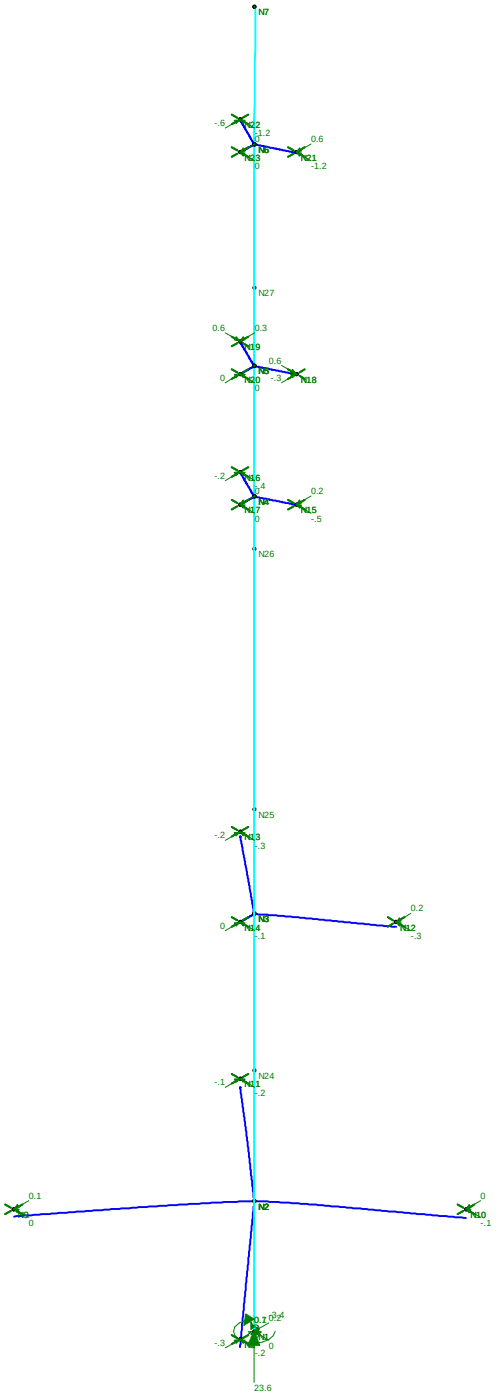
Member Code Checks Displayed
Results for LC 2, 0.9D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:14 AM
19047.00 - CT5090	LC #2 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

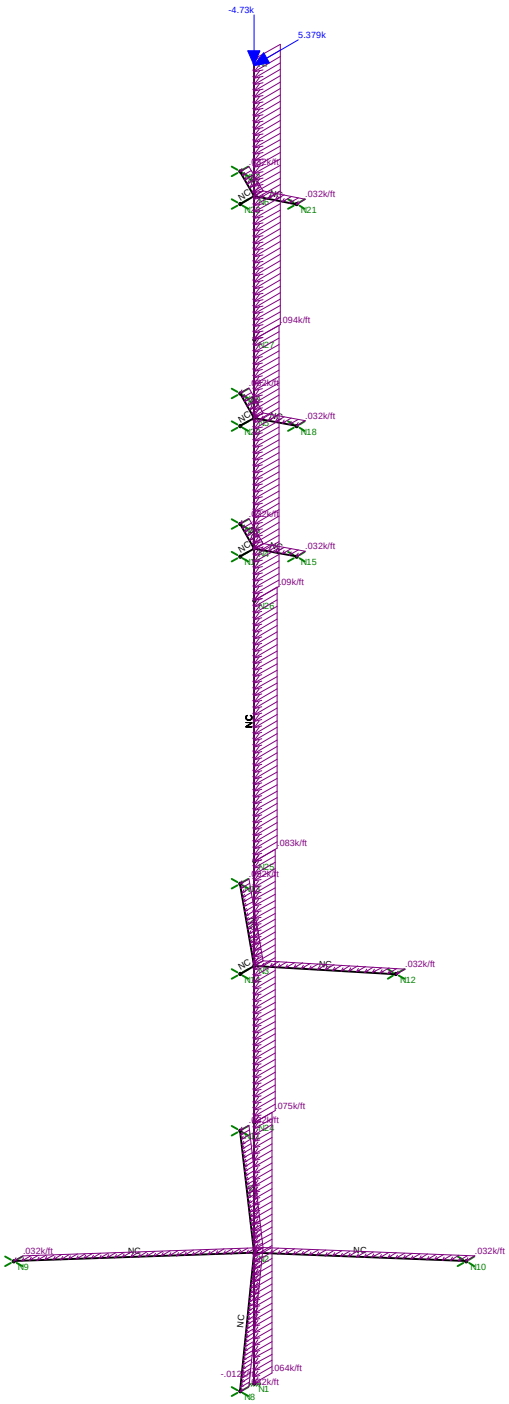


Member Code Checks Displayed
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:12 AM
19047.00 - CT5090	LC #3 Loads	TIA - Antenna Mast.r3d

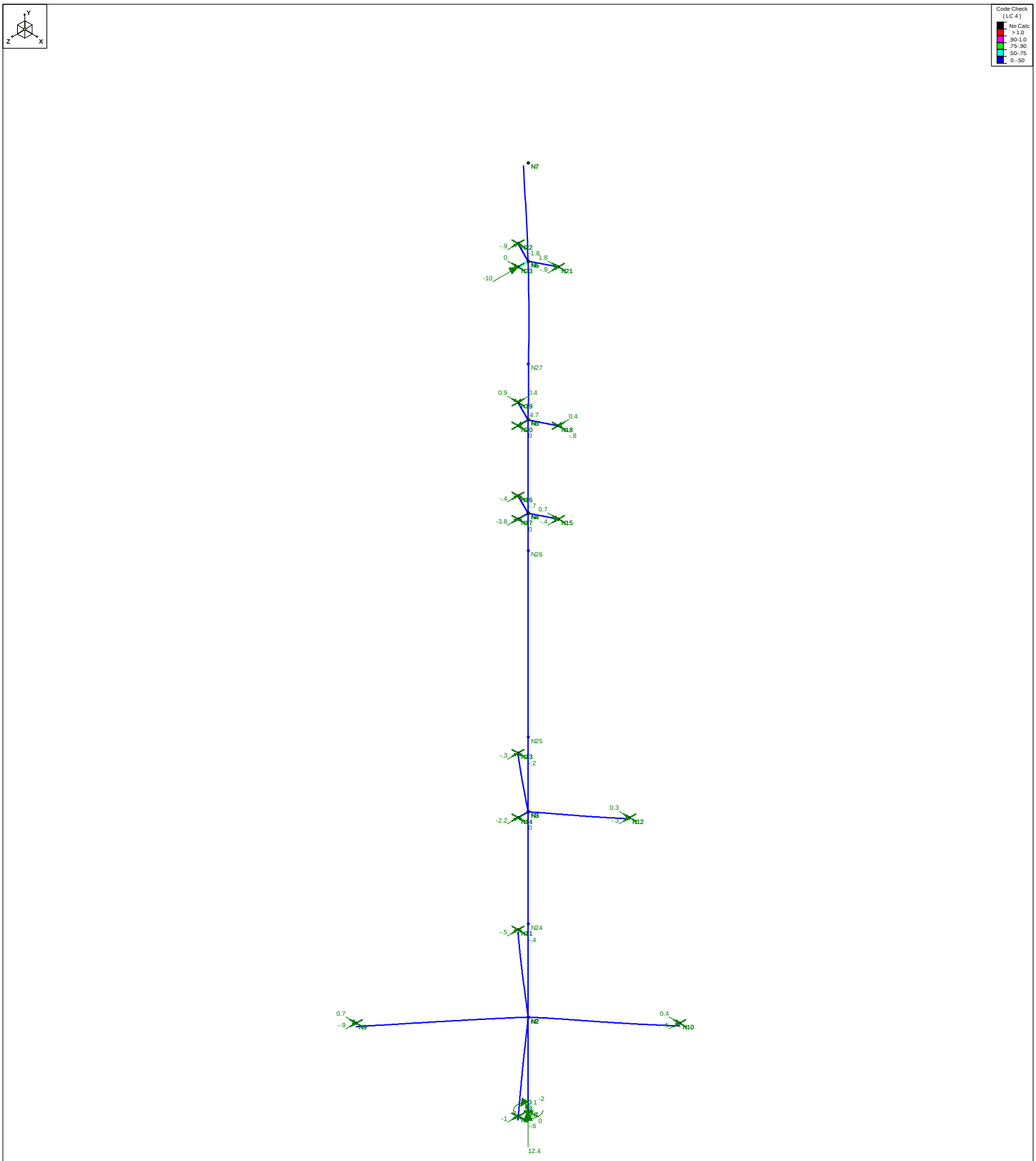


CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:15 AM
19047.00 - CT5090	LC #3 Reactions and Deflected Shape	TIA - Antenna Mast.r3d



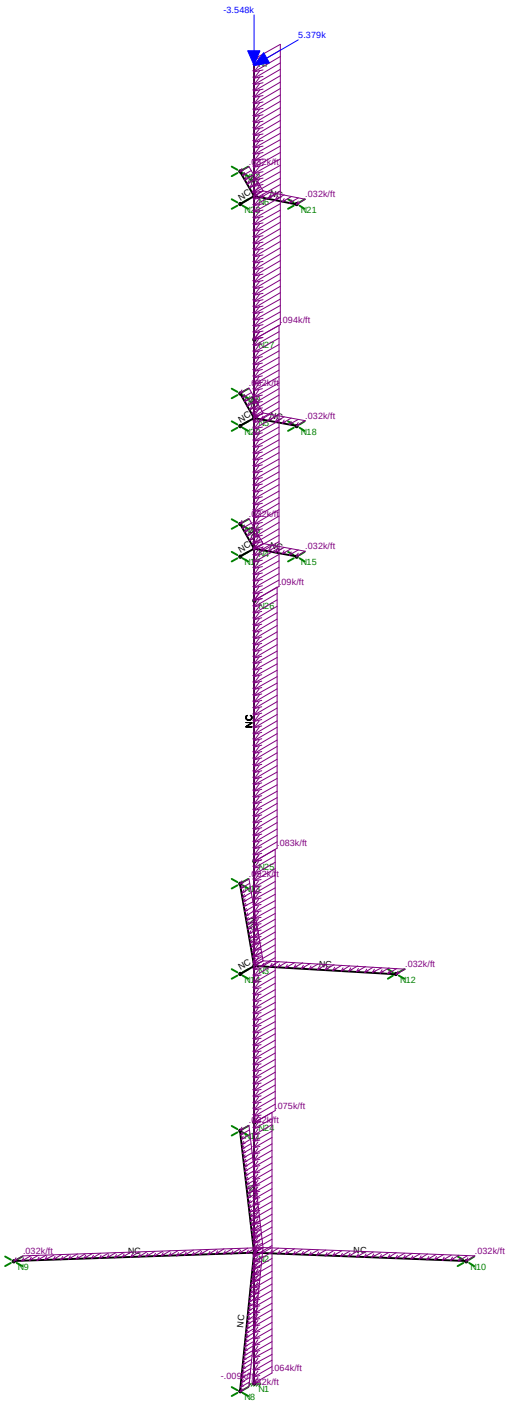
Member Code Checks Displayed
Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:12 AM
19047.00 - CT5090	LC #4 Loads	TIA - Antenna Mast.r3d



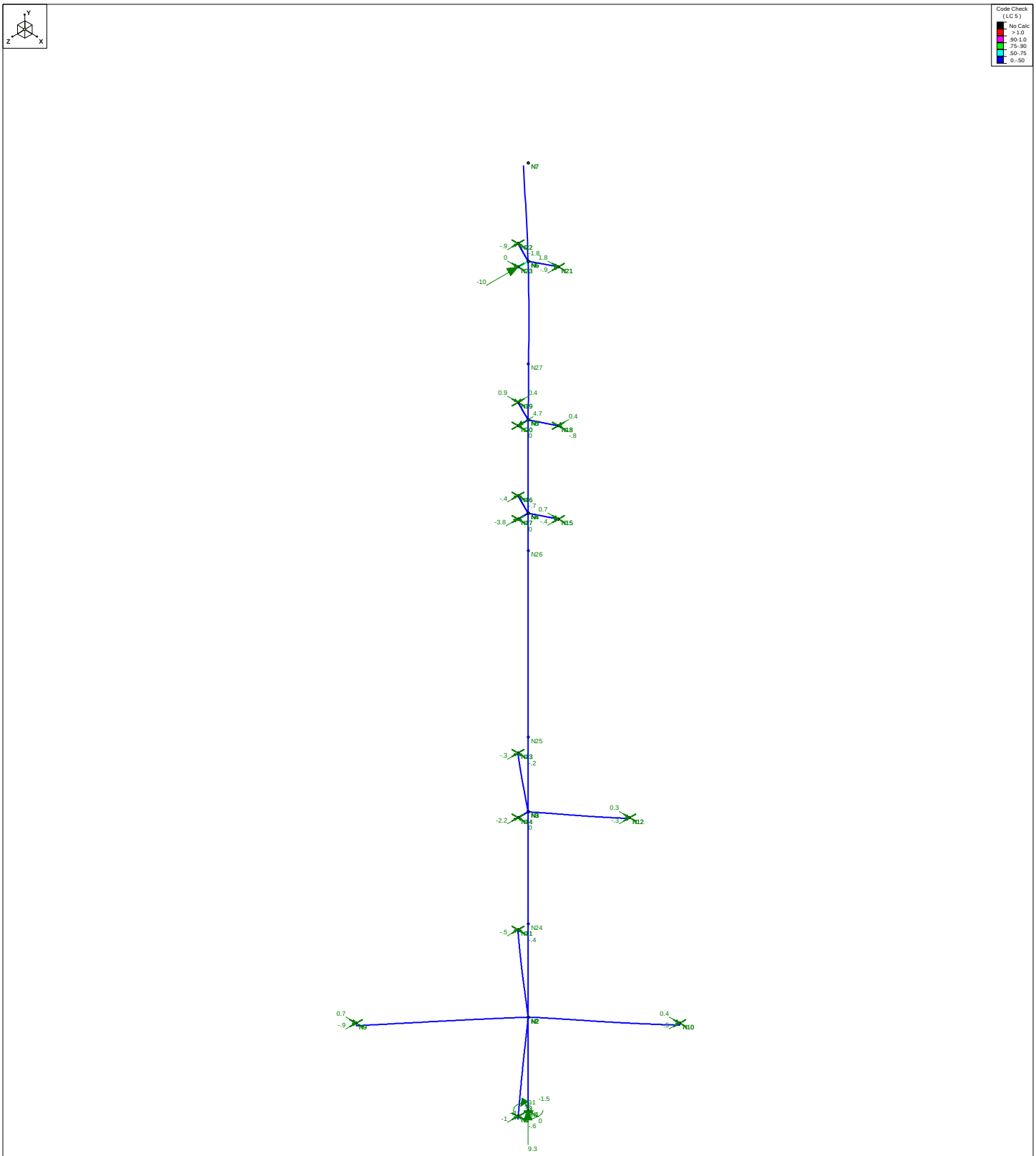
Member Code Checks Displayed
Results for LC 4, 1.2D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:15 AM
19047.00 - CT5090	LC #4 Reactions and Deflected Shape	TIA - Antenna Mast.r3d



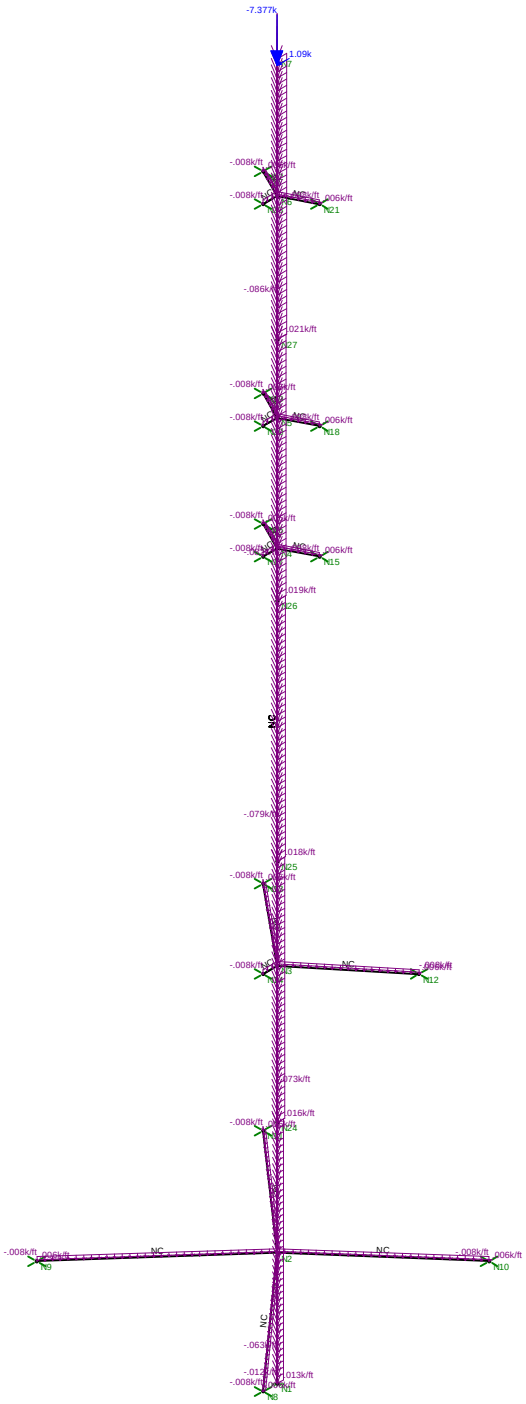
Member Code Checks Displayed
Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:12 AM
19047.00 - CT5090	LC #5 Loads	TIA - Antenna Mast.r3d



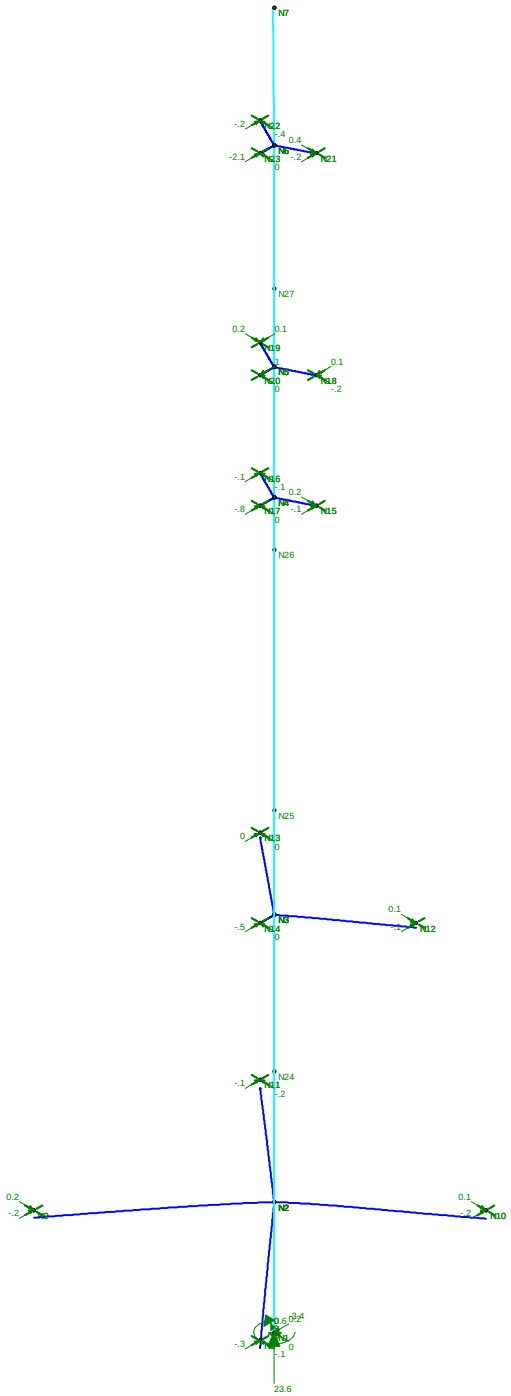
Member Code Checks Displayed
Results for LC 5, 0.9D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:16 AM
19047.00 - CT5090	LC #5 Reactions and Deflected Shape	TIA - Antenna Mast.r3d



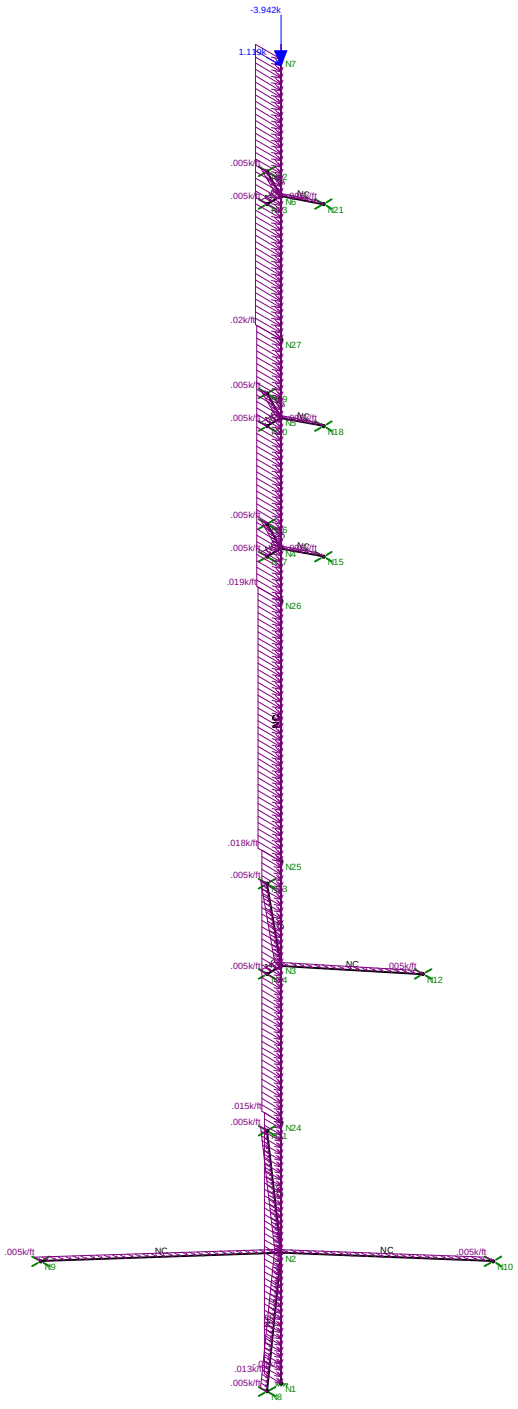
Member Code Checks Displayed
Loads: LC 6, 1.2D + 1.0Di + 1.0Wi (Z-direction)

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:13 AM
19047.00 - CT5090	LC #6 Loads	TIA - Antenna Mast.r3d



Member Code Checks Displayed
Results for LC 6, 1.2D + 1.0Di + 1.0Wi (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:16 AM
19047.00 - CT5090	LC #6 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

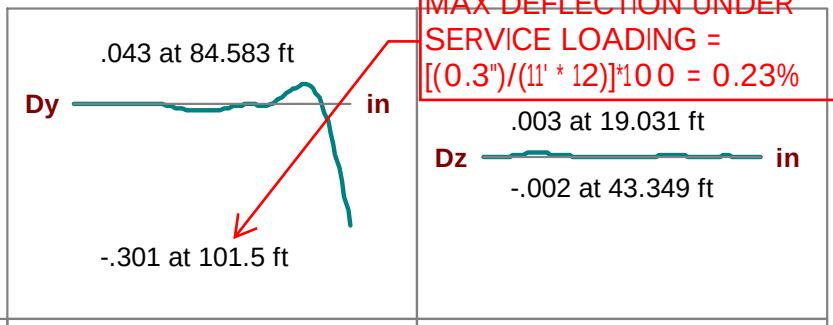


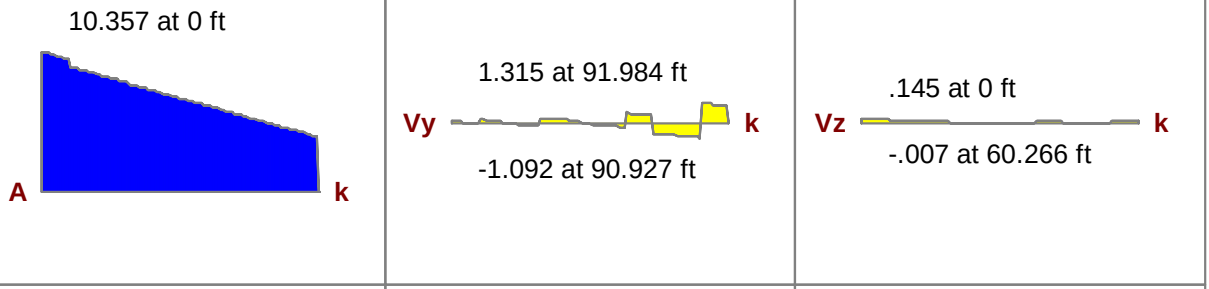
Member Code Checks Displayed
Loads: LC 7, 1.0D + 1.0WService

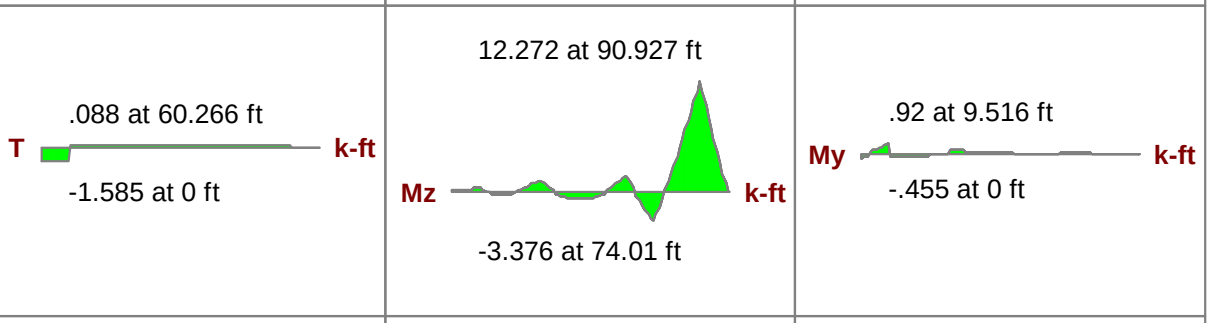
CENTEK Engineering, INC.		
TJL	Tower # 833 - Antenna Mast	Apr 17, 2019 at 10:13 AM
19047.00 - CT5090	LC #7 Loads	TIA - Antenna Mast.r3d

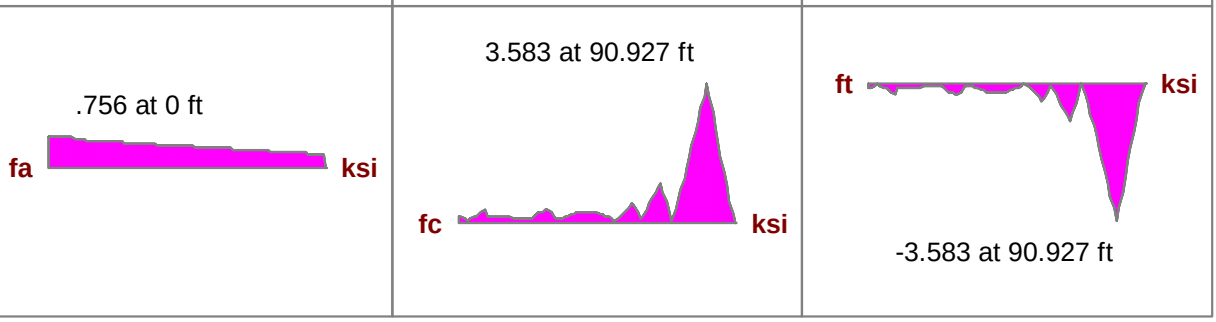
Column: ***M1***

Shape: **PIPE_12.0**
Material: **A500 Gr. C 50**
Length: **101.5 ft**
I Joint: **N1**
J Joint: **N7**
LC 7: 1.0D + 1.0WService
Code Check: **0.262 (bending)**
Report Based On 97 Sections









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

Direct Analysis Method

Max Bending Check	**0.262**	Max Shear Check	**0.009 (s)**
Location	**0 ft**	Location	**9.516 ft**
Equation	**H1-1a**	Max Defl Ratio	**L/4050**

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

			y-y	z-z
Fy	**50 ksi**	Lb	**101.5 ft**	**101.5 ft**
phi*Pnc	**39.898 k**	KL/r	**278.52**	**278.52**
phi*Pnt	**616.5 k**			
phi*Mny	**201.375 k-ft**	L Comp Flange	**101.5 ft**	
phi*Mnz	**201.375 k-ft**	L-torque	**101.5 ft**	
phi*Vny	**184.95 k**	Tau_b	**1**	
phi*Vnz	**184.95 k**			
phi*Tn	**189.689 k-ft**			
Cb	**3.91**			

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

Subject:	Connection of Antenna Mast to Tower # 833
Location:	Trumbull, CT
Rev. 0: 4/17/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19047.00

Antenna Mast Connection to Tower:

Reactions:

Horz = $Horz := 11.8 \cdot kips$ (User Input)

Pipe Collar:

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = $D := 0.625 \cdot in$ (User Input)

Number of Bolts = $N_b := 4$ (User Input)

Design Tensile Strength = $F_t := 20.7 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 12.4 \cdot kips$ (User Input)

Check Pipe Collar Bolts:

Tension Force = $f_t := \frac{Horz}{N_b} = 3 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 14.25 \cdot \%$

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

$Bolt\_Tension = "OK"$

Reactions:

Force = $Fab := 9.9 \cdot kips$ (User Input)

Angle Plate:

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = $D := 0.625 \cdot in$ (User Input)

Number of Bolts = $N_b := 1$ (User Input)

Design Tensile Strength = $F_t := 20.7 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 12.4 \cdot kips$ (User Input)

Check Angle Brace Bolts:

Shear Force = $f_v := \frac{Fab}{N_b} = 9.9 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 79.84 \cdot \%$

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

$Bolt\_Shear = "OK"$

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Subject:	Load Analysis of Antenna Mast on Tower # 833
Location:	Trumbull, CT
Rev. 0: 4/16/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 19047.00

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2012 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 := 102	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 2012 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2012 Section 250.C.2)
Velocity Pressure Coefficient =	$Kz := 2.01\cdot\left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.271$		(NESC 2012 Table 250-2)
Exposure Factor =	$Es := 0.346\left[\frac{33}{(0.67\cdot TME)}\right]^{\frac{1}{7}} = 0.312$		(NESC 2012 Table 250-3)
Response Term =	$Bs := \frac{1}{\left(1 + 0.375\cdot\frac{TME}{220}\right)} = 0.852$		(NESC 2012 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(2.7\cdot Es\cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.869$		(NESC 2012 Table 250-3)
Wind Pressure =	$qz := 0.00256\cdot Kz\cdot V^2\cdot Grf\cdot I = 34.2$	psf	(NESC 2012 Section 250.C.2)

Shape Factors

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

Overload Factors

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

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

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Location:	Trumbull, CT
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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Powerwave 7770		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55$	in	(User Input)
Antenna Width =	$W_{ant} := 11$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 39$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 862$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 90$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant1} := (WT_{ant} \cdot N_{ant}) = 117$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 98$	lbs	**BLC 3**

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Location:	Trumbull, CT
Rev. 0: 4/16/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 19047.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	KMW EPBQ-654L8H6L2		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 73$	in	(User Input)
Antenna Width =	$W_{ant} := 21$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 73$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 10.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 31.9$	sf	
Total Antenna Wind Force =	$F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2185$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 11.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 33.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 217$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant2} := (WT_{ant} \cdot N_{ant}) = 219$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 9658$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 2227$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 72$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 216$	lbs	**BLC 3**

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Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Powerwave LGP17201		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 13.9$	in	(User Input)
TMA Width =	$W_{TMA} := 14.4$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.7$	in	(User Input)
TMA Weight =	$WT_{TMA} := 31$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)

Wind Load (NESC Extreme Wind)

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

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 1.4$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 8.3$ sf

Total TMA Wind Force = $F_{TMA1} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 571$ lbs **BLC 5**

Wind Load (NESC Heavy Wind)

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

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 2 \cdot Ir) \cdot (W_{TMA} + 2 \cdot Ir)}{144} = 1.6$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 9.6$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA1} := p \cdot Cd_F \cdot A_{ICETMA} = 61$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All TMA's = $Wt_{TMA1} := (WT_{TMA} \cdot N_{TMA}) = 186$ lbs **BLC 2**

Gravity Load (ice)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 741$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 2 \cdot Ir)(W_{TMA} + 2 \cdot Ir)(T_{TMA} + 2 \cdot Ir) - V_{TMA} = 338$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 11$ lbs

Weight of Ice on All TMA's = $Wt_{ice.TMA1} := W_{ICETMA} \cdot N_{TMA} = 66$ lbs **BLC 3**

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Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Kaelus TMA2117F00V1-1		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 8.46$	in	(User Input)
TMA Width =	$W_{TMA} := 11.81$	in	(User Input)
TMA Thickness =	$T_{TMA} := 4.21$	in	(User Input)
TMA Weight =	$WT_{TMA} := 20$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)

Wind Load (NESC Extreme Wind)

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

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

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 4.2$ sf

Total TMA Wind Force = $F_{TMA2} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 285$ lbs **BLC 5**

Wind Load (NESC Heavy Wind)

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

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

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 5$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA2} := p \cdot Cd_F \cdot A_{ICETMA} = 32$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All TMA's = $Wt_{TMA2} := (WT_{TMA} \cdot N_{TMA}) = 120$ lbs **BLC 2**

Gravity Load (ice)

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

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

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

Weight of Ice on All TMA's = $Wt_{ice.TMA2} := W_{ICETMA} \cdot N_{TMA} = 41$ lbs **BLC 3**

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Subject:	Load Analysis of Antenna Mast on Tower # 833
Location:	Trumbull, CT
Rev. 0: 4/16/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 19047.00

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	Platform w/ Handrail		(User Input)
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 14$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICEplt} := 18$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 3300$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICEplt} := 3800$	lbs	(User Input)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt1} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 958$ lbs **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt1} := p \cdot Cd_F \cdot A_{ICEplt} = 115$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt1} := WT_{plt} = 3300$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt1} := WT_{ICEplt} - WT_{plt} = 500$ lbs **BLC 3**

Total Equipment Loads:

AT&T @ 101-ftAGL

NESC Heavy Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{ant2} + Wt_{ice.ant2} + Wt_{TMA1} + Wt_{ice.TMA1} + Wt_{TMA2} + Wt_{ice.TMA2} + Wt_{mnt1} + Wt_{ice.mnt1}\right)\cdot 1.5 = 7295$$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{ant2} + Fi_{TMA1} + Fi_{TMA2} + Fi_{mnt1}\right)\cdot 2.5 = 1288$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{ant2} + Wt_{TMA1} + Wt_{TMA2} + Wt_{mnt1}\right) = 3942$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{ant2} + F_{TMA1} + F_{TMA2} + F_{mnt1}\right) = 4861$

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Subject: Coax Cable on Antenna Mast Tower # 833

Location: Trumbull, CT

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19047.00

Rev. 1: 6/3/19

Coax Cable on Antenna Mast

Basic Components

Heavy Wind Pressure =	$p := 4.00 \cdot psf$		(User Input NESC 2012 Figure 250-1 & Table 250-1)
Basic Windspeed =	$V := 110$	mph	(User Input NESC 2012 Figure 250-2(e))
Radial Ice Thickness =	$Ir := 0.50in$		(User Input)
Radial Ice Density =	$Id := 57.0 \cdot pcf$		(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Cables Above Grade =	$TME := 102$	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 2012 Table 250-3 equation)
Importance Factor =	$I := 1.0$		(User Input from NESC 2012 Section 250.C.2)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TME}{900}\right)^{\frac{2}{9.5}} = 1.168$		(NESC 2012 Table 250-2)
Exposure Factor =	$Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.312$		(NESC 2012 Table 250-3)
Response Term =	$Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.852$		(NESC 2012 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.869$		(NESC 2012 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 31.4$	psf	(NESC 2012 Section 250.C.

Shape Factors

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

Overload Factors

Overload Factor for NESC Heavy Wind Transverse Load =	$OF_{HWT} := 2.5$	*(User Input)*
Overload Factor for NESC Heavy Wind Vertical Load =	$OF_{HWV} := 1.5$	*(User Input)*
Overload Factor for NESC Extreme Wind Transverse Load =	$OF_{EWT} := 1.0$	*(User Input)*
Overload Factor for NESC Extreme Wind Vertical Load =	$OF_{EWV} := 1.0$	*(User Input)*

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Subject: Coax Cable on Antenna Mast Tower # 833

Location: Trumbull, CT

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19047.00

Rev. 1: 6/3/19

Distance Between Coax Cable Attach Points =

$Coax_{Span} := \begin{pmatrix} 8.5 \\ 13.5 \\ 21 \\ 27.25 \\ 21.25 \end{pmatrix} \cdot ft$ *(User Input)*

Diameter of Coax Cable = $D_{coax} := 1.11 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.54 \cdot plf$ *(User Input)*

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

Number of Projected Coax Cables = $NP_{coax} := 2$ *(User Input)*

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

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 2.22 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 3.22 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^2\right] = 0.018\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot NX_{coax} = 6.006 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$Heavy\_WInd_{Vert} = \begin{pmatrix} 201 \\ 318 \\ 495 \\ 643 \\ 501 \end{pmatrix} lb$ $Heavy\_Wind_{Trans} = \begin{pmatrix} 36 \\ 58 \\ 90 \\ 117 \\ 91 \end{pmatrix} lb$

Extreme Wind Vertical Load =

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

Extreme Wind Transverse Load =

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

$Extreme\_Wind_{Vert} = \begin{pmatrix} 83 \\ 131 \\ 204 \\ 265 \\ 207 \end{pmatrix} lb$ $Extreme\_Wind_{Trans} = \begin{pmatrix} 79 \\ 126 \\ 195 \\ 254 \\ 198 \end{pmatrix} lb$

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Subject: Coax Cable on Antenna Mast Tower # 833

Location: Trumbull, CT

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19047.00

Rev. 1: 6/3/19

Distance Between Coax Cable Attach Points =
Above Top of Tower $Coax_{Span} := 9.5 \cdot ft$ *(User Input)*

Diameter of Coax Cable = $D_{coax} := 1.11 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.54 \cdot plf$ *(User Input)*

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

Number of Projected Coax Cables = $NP_{coax} := 2$ *(User Input)*

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

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 2.22 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 3.22 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^{\,2}\right] = 0.018\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot NX_{coax} = 6.006 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$Heavy\_WInd_{Vert} = 224\,lb$ $Heavy\_Wind_{Trans} = 41\,lb$

Extreme Wind Vertical Load =

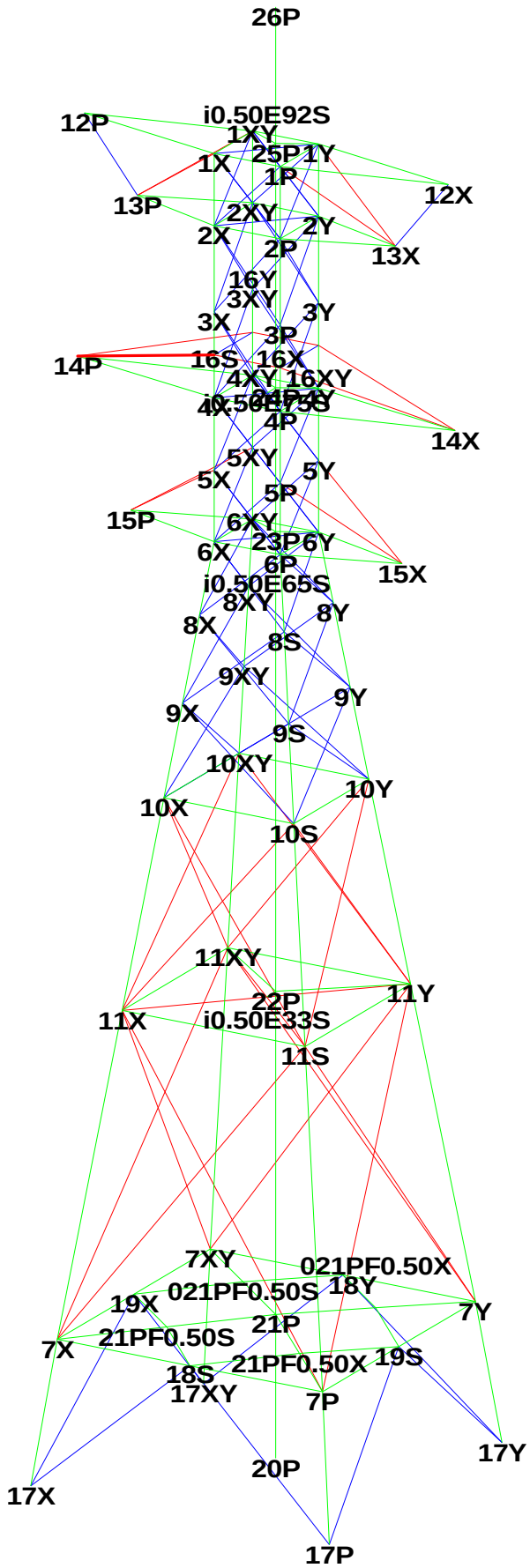
$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

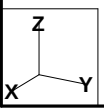
Extreme Wind Transverse Load =

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

$Extreme\_Wind_{Vert} = 92\,lb$ $Extreme\_Wind_{Trans} = 111\,lb$

Centek Engineering Inc, Project: "cl&p # 833 reinforced"
Tower Version 12.50, 10:54:30 AM Monday, June 03, 2019
Undeformed geometry displayed





Project Name : 19047.00 - Trumbull, CT
Project Notes: Structure # 833/ AT&T CT5090
Project File : J:\Jobs\1904700.WI\04_Structural\Backup Documentation\Rev (1)\Calcs\PLS Tower\cl&p # 833 reinforced.tow
Date run : 10:53:35 AM Monday, June 03, 2019
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 1 warning. ??

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\1904700.wi\04_structural\backup documentation\rev (1)\calcs\pls tower\cl&p # 833.lca

*** Analysis Results:

Maximum element usage is 97.39% for Angle "g38X" in load case "NESC Extreme"
Maximum insulator usage is 16.02% for Clamp "9" 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	17P	-4.84	-5.74	-36.26	7.51	0.01	-0.01	0.02	-0.01	0.00
NESC Heavy	20P	0.05	0.03	-18.13	0.06	0.00	0.00	0.00	0.00	0.00
NESC Heavy	17X	2.04	-3.25	17.76	3.84	-0.04	-0.03	0.05	0.02	0.00
NESC Heavy	17XY	-3.24	-4.58	25.96	5.61	-0.03	0.03	0.04	-0.01	0.00
NESC Heavy	17Y	3.67	-5.07	-28.77	6.26	0.02	0.00	0.02	0.01	0.00
NESC Extreme	17P	-6.96	-9.87	-54.16	12.08	0.04	-0.04	0.05	0.01	0.00
NESC Extreme	20P	-0.03	-0.04	-8.28	0.05	0.00	0.00	0.00	0.00	0.00
NESC Extreme	17X	7.17	-9.90	57.04	12.23	-0.07	-0.08	0.11	0.01	0.00
NESC Extreme	17XY	-5.91	-9.39	49.06	11.10	-0.06	0.09	0.10	-0.01	0.00
NESC Extreme	17Y	8.32	-11.59	-63.43	14.27	0.06	0.02	0.06	-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. (kips)	Residual Shear Perpendicular To Leg (kips)	Residual Shear Horizontal To Leg - Res. (kips)	Residual Shear Horizontal To Leg - Long. (kips)	Residual Shear Horizontal To Leg - Tran. (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)
NESC Heavy	17P	7P	g12X	37.013	1.191	1.205	0.270	1.174	-4.84	-5.74	-36.26
NESC Heavy	17X	7X	g12P	-18.142	1.030	1.035	0.199	1.016	2.04	-3.25	17.76
NESC Heavy	17XY	7XY	g12Y	-26.529	1.301	1.311	-0.029	1.311	-3.24	-4.58	25.96
NESC Heavy	17Y	7Y	g12XY	29.405	1.437	1.449	-0.046	1.448	3.67	-5.07	-28.77
NESC Extreme	17P	7P	g12X	55.409	3.019	3.045	0.138	3.042	-6.96	-9.87	-54.16
NESC Extreme	17X	7X	g12P	-58.277	2.692	2.713	0.015	2.713	7.17	-9.90	57.04
NESC Extreme	17XY	7XY	g12Y	-50.200	3.201	3.221	-0.267	3.210	-5.91	-9.39	49.06
NESC Extreme	17Y	7Y	g12XY	64.914	3.581	3.614	-0.328	3.599	8.32	-11.59	-63.43

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	101.000	47.000	55	180	0.00	9.82	288.394	0.00	9.82	561.769
2	47.000	0.000	29	74	9.82	22.52	764.206	9.82	22.52	764.206

*** 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 Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Cont-rol	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R KL/R	Length (ft)	Curve Comp.	No. Of Bolts	No. Member
LEG1	L4X4X1/4	SAE	4X4X0.25	33.0	84.52	Tens	75.89	g6XY	-40.609	NESC Ext	53.509	109.200	168.750	1.000	1.000	1.000	75.47	75.47	5.000	1	12
LEG2	L4X4X5/16	SAE	4X4X0.3125	33.0	92.16	Comp	92.16	g9XY	-51.758	NESC Ext	56.161	91.000	175.781	1.000	1.000	1.000	100.46	100.46	6.622	1	10
LEG3	L4X4X3/8	SAE	4X4X0.375	33.0	91.27	Comp	91.27	g10XY	-54.731	NESC Ext	59.963	91.000	210.937	0.500	0.500	0.500	112.48	112.48	14.772	1	10
XBR1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	44.33	Comp	44.33	g13Y	-5.125	NESC Ext	11.559	18.200	21.094	0.750	0.500	0.500	123.69	122.85	7.071	5	2
XBR2	L3X2X3/16	SAU	3X2X0.1875	33.0	44.86	Comp	44.86	g17Y	-7.749	NESC Ext	17.275	27.300	31.641	0.500	0.750	0.500	120.57	120.47	7.810	5	3
XBR3	L2X2X3/16	SAE	2X2X0.1875	33.0	24.81	Tens	24.29	g24P	-2.624	NESC Ext	10.802	18.200	21.094	0.779	1.000	0.559	147.90	137.16	7.604	6	2
XBR4	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	22.01	Cross	22.01	g26X	-1.945	NESC Ext	8.840	18.200	21.094	0.563	1.000	0.563	188.20	161.94	9.410	6	2
XBR5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	73.42	Comp	73.42	g30Y	-3.537	NESC Hea	4.817	33.600	20.391	0.792	0.584	0.584	266.28	231.51	18.808	5	2
HORZ1	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	55.02	Comp	55.02	g36X	-5.007	NESC Ext	10.506	9.100	10.547	1.000	0.500	0.500	148.55	148.55	9.817	4	1
HORZ2	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	97.39	Comp	97.39	g38X	-13.695	NESC Ext	15.230	16.800	14.062	0.500	0.500	0.500	156.90	156.90	13.807	4	1
ARM1	**L3X2.5X1/4**	**SAU**	**3X2.5X0.25**	**33.0**	**10.43**	**Comp**	**10.43**	**g48P**	**-1.899**	**NESC Hea**	**27.682**	**18.200**	**28.125**	**1.000**	**0.500**	**0.500**	**103.41**	**111.70**	**8.143**	**3**	**2**
ARM2	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	13.07	Comp	13.07	g46P	-3.292	NESC Hea	25.189	27.300	42.187	1.000	0.500	0.500	132.50	127.69	12.013	6	3
M1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	45.08	Comp	45.08	g53P	-2.614	NESC Ext	5.799	9.100	10.547	1.000	1.000	1.000	174.93	174.93	5.000	4	1
M2	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	34.07	Tens	24.95	g54X	-2.270	NESC Ext	11.437	9.100	10.547	1.500	1.000	1.000	123.69	123.69	3.536	4	1
M3	L2.5X2.5X3/16	SAE	2.5X2.5X0.1875	33.0	4.52	Tens	2.12	g58P	-0.193	NESC Hea	10.714	9.100	10.547	1.000	1.000	1.000	155.23				

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g44P g44X g44XY g44Y ??

155.23 6.403   4   1
     M4   BAR 1.75X1/4   Bar   1-3/4x1/4   33.0 59.67 Comp 59.67   g61XY -0.355NESC Ext   0.595   9.100   14.062 1.000 1.000 1.000 458.68
458.68 9.556   4   1
   XBR6   L4x4x5/16   SAE   4X4X0.3125   36.0 75.83 Tens 68.89   g32Y -16.797NESC Ext   24.380   33.600   33.984 0.667 0.333 0.333 182.75
167.86 28.312   5   2
   LEG4   L4x4x5/16   SAE   4X4X0.3125   33.0 93.10 Tens 92.02   g12XY -60.412NESC Ext   65.648   91.000 175.781 0.500 0.500 0.500 77.05
77.05 10.158   1   10
   XBR7   L3.5x2.5x1/4   SAU   3.5X2.5X0.25   33.0 53.63 Comp 53.63   g33XY -4.880NESC Ext   14.836   9.100   14.062 1.000 0.500 0.500 166.68
166.68 15.112   4   1
  HORZ3   L4x3x1/4   SAU   4X3X0.25   33.0 64.37 Comp 64.37   g40X -8.857NESC Ext   13.759   16.800   14.062 2.000 1.000 1.000 187.50
187.50 10.000   4   1
  Pwmnt   12" Std Pipe Pwmnt   Pipe 12" Std.   50.0 2.77 Comp 2.77   g65P -12.524NESC Hea 452.775   0.000   0.000 1.000 1.000 1.000 87.47
87.47 32.000   1   0
 Brace2   L5x5x3/8   SAE   5X5X0.375   36.0 0.53 Tens 0.43 Fg7083X -0.321NESC Ext   75.176   0.000   0.000 1.000 2.000 1.000 115.78
115.78 7.526   1   0
 Brace1   L4x4x1/4   SAE   4X4X0.25   36.0 1.54 Comp 1.54 Fg6984X -0.525NESC Ext   34.124   0.000   0.000 1.000 2.000 1.000 127.56
127.56 6.644   4   0
 Brace3   L3x3x3/16   SAE   3X3X0.1875   36.0 6.47 Tens 3.15   g71X -0.304NESC Hea   9.665   16.800   10.195 1.000 1.000 1.000 179.66
179.66 8.923   4   1
 Brace4   L2x2x3/16   SAE   2X2X0.1875   36.0 46.78 Comp 46.78   g81X -4.770NESC Ext   17.105   16.800   10.195 1.000 1.000 1.000 85.13
102.56 2.795   3   1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g81P ??
   InBr   L2.5X2X3/16   SAU   2.5X2X0.1875   33.0 20.38 Comp 20.38   g41X -0.628NESC Ext   3.080   9.100   10.547 1.000 1.000 1.000 274.38
274.38 9.763   4   1
     M5   L2x2x1/4   SAE   2X2X0.25   36.0 0.00   0.00   0.000   0.000   0.000   0.000 0.000 0.000 0.000   0.00
0.00 0.000   0   0
    M2a L1.75X1.75X3/16   SAE 1.75X1.75X0.1875   33.0 7.72 Comp 7.72   g83P -0.448NESC Hea   5.799   9.100   10.547 1.000 1.000 1.000 174.93
174.93 5.000   4   1
 New Br   L3x3x1/4   SAE   3X3X0.25   36.0 6.61 Comp 6.61   g93P -0.899NESC Ext   22.725   16.800   13.594 1.000 1.000 1.000 134.67
134.67 6.644   4   1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Tens. Use %	Tension Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Tension Member Length (ft)	No. Of Bolts	Hole Diameter (in)
LEG1	L4X4X1/4	SAE	4X4X0.25	33.0	84.52	Tens	84.52	g6P	41.506	NESC Ext	49.108	109.200	168.750	187.078	5.000	12	2.410	0.75
LEG2	L4X4X5/16	SAE	4X4X0.3125	33.0	92.16	Comp	88.77	g8P	51.218	NESC Ext	57.698	0.000	0.000	0.000	6.113	0	2.780	0.75
LEG3	L4X4X3/8	SAE	4X4X0.375	33.0	91.27	Comp	75.07	g10P	47.507	NESC Ext	63.288	91.000	210.937	260.367	14.772	10	3.350	0.75
XBR1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	44.33	Comp	34.84	g13XY	4.960	NESC Ext	14.237	18.200	21.094	16.066	7.071	2	1.000	0.75
XBR2	L3X2X3/16	SAU	3X2X0.1875	33.0	44.86	Comp	34.23	g17XY	7.720	NESC Ext	22.553	27.300	31.641	22.904	7.810	3	1.000	0.75
XBR3	L2X2X3/16	SAE	2X2X0.1875	33.0	24.81	Tens	24.81	g24XY	2.844	NESC Ext	16.910	18.200	21.094	11.461	7.604	2	1.000	0.75
XBR4	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	22.01	Cross	12.16	g26Y	1.862	NESC Ext	19.880	18.200	21.094	15.311	9.410	2	1.000	0.75

XBR5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	73.42	Comp	53.50	g30XY	6.165NESC Ext	25.048	33.600	20.391	11.524	18.808	2	1.000	0.6875
HORZ1	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	55.02	Comp	41.44	g36P	2.680NESC Hea	17.096	9.100	10.547	6.469	9.817	1	1.000	0.75
HORZ2	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	97.39	Comp	94.44	g38P	11.805NESC Ext	30.090	16.800	14.062	12.500	13.807	1	1.000	0.6875
ARM1	**L3X2.5X1/4**	**SAU**	**3X2.5X0.25**	**33.0**	**10.43**	**Comp**	**7.92**	**g48X**	**1.442NESC Ext**	**27.769**	**18.200**	**28.125**	**37.500**	**8.143**	**2**	**2.000**	**0.75 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g44P g44X g44XY g44Y ??**
ARM2	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	13.07	Comp	7.58	g46X	2.069NESC Ext	31.630	27.300	42.187	43.969	12.013	3	2.000	0.75
M1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	45.08	Comp	42.04	g53X	2.719NESC Ext	14.237	9.100	10.547	6.469	5.000	1	1.000	0.75
M2	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	34.07	Tens	34.07	g54P	2.204NESC Ext	14.237	9.100	10.547	6.469	3.536	1	1.000	0.75
M3	L2.5X2.5X3/16	SAE	2.5X2.5X0.1875	33.0	4.52	Tens	4.52	g58P	0.371NESC Ext	22.613	9.100	10.547	8.203	6.403	1	1.000	0.75
M4	BAR 1.75X1/4	Bar	1-3/4x1/4	33.0	59.67	Comp	29.70	g60Y	2.205NESC Hea	7.425	9.100	14.062	10.937	12.382	1	1.000	0.75
XBR6	L4x4x5/16	SAE	4X4X0.3125	36.0	75.83	Tens	75.83	g32XY	15.614NESC Ext	70.799	33.600	33.984	20.590	28.312	2	1.000	0.6875
LEG4	L4x4x5/16	SAE	4X4X0.3125	33.0	93.10	Tens	93.10	g12P	56.020NESC Ext	60.173	91.000	175.781	172.334	10.158	10	2.460	0.75
XBR7	L3.5x2.5x1/4	SAU	3.5X2.5X0.25	33.0	53.63	Comp	45.96	g33Y	4.182NESC Ext	29.774	9.100	14.062	14.706	15.112	1	1.000	0.75
HORZ3	L4x3x1/4	SAU	4X3X0.25	33.0	64.37	Comp	63.83	g40P	8.976NESC Ext	37.663	16.800	14.062	17.883	10.000	1	1.000	0.6875
Pwmnt	12" Std Pipe Pwmnt	Pipe	12" Std.	50.0	2.77	Comp	0.00	g68P	0.000	679.999	0.000	0.000	0.000	9.500	0	0.000	0
Brace2	L5x5x3/8	SAE	5X5X0.375	36.0	0.53	Tens	0.53	Fg7083P	0.688NESC Ext	129.960	0.000	0.000	0.000	7.526	0	0.000	0
Brace1	L4x4x1/4	SAE	4X4X0.25	36.0	1.54	Comp	1.18	Fg6984P	0.827NESC Ext	69.840	0.000	0.000	0.000	6.644	0	0.000	0
Brace3	L3x3x3/16	SAE	3X3X0.1875	36.0	6.47	Tens	6.47	g71P	0.659NESC Hea	31.139	16.800	10.195	13.594	8.923	1	1.000	0.6875
Brace4	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**46.78**	**Comp**	**45.89**	**g81P**	**4.678NESC Ext**	**18.827**	**16.800**	**10.195**	**13.594**	**2.795**	**1**	**1.000**	**0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g81P ??**
InBr	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	20.38	Comp	6.78	g41P	0.605NESC Hea	19.880	9.100	10.547	8.930	9.763	1	1.000	0.75
M5	L2x2x1/4	SAE	2X2X0.25	36.0	0.00		0.00		0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0
M2a	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	7.72	Comp	2.66	g55P	0.172NESC Ext	14.237	9.100	10.547	6.469	7.071	1	1.000	0.75
New Br	L3x3x1/4	SAE	3X3X0.25	36.0	6.61	Comp	6.01	g92P	0.817NESC Ext	41.087	16.800	13.594	15.104	6.644	1	1.000	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	73.42	g30Y	Angle
NESC Extreme	97.39	g38X	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	2.41	NESC Extreme	0.0
2	Clamp	2.13	NESC Extreme	0.0
3	Clamp	4.33	NESC Extreme	0.0
4	Clamp	4.29	NESC Extreme	0.0
5	Clamp	4.25	NESC Extreme	0.0
6	Clamp	4.26	NESC Extreme	0.0
7	Clamp	4.33	NESC Extreme	0.0
8	Clamp	4.06	NESC Extreme	0.0
9	Clamp	16.02	NESC Heavy	0.0
10	Clamp	2.59	NESC Heavy	0.0
11	Clamp	2.86	NESC Heavy	0.0
12	Clamp	4.55	NESC Heavy	0.0
13	Clamp	6.03	NESC Heavy	0.0
14	Clamp	4.17	NESC Heavy	0.0

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 16277.4
Total: 16277.4

*** End of Report

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*                                                                           *
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*                                                                           *
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Project Name : 19047.00 - Trumbull, CT
Project Notes: Structure # 833/ AT&T CT5090
Project File : J:\Jobs\1904700.WI\04_Structural\Backup Documentation\Rev (1)\Calcs\PLS Tower\cl&p # 833 reinforced.tow
Date run     : 10:53:35 AM Monday, June 03, 2019
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

Unusual number of fixed joints found: 5.  Towers normally have from between 1 and 4 fixed joints. ??
The model has 1 warning.  ??
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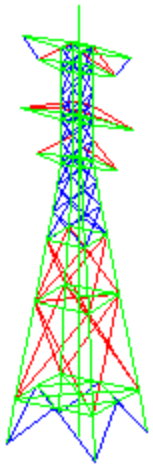

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Nonlinear convergence parameters: Use Standard Parameters
Tension only member maximum compression load as a percent of compression capacity: 100%
Member check option: ASCE 10
Connection rupture check: ASCE 10
Crossing diagonal check: ASCE 10  [Alternate 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	XY-Symmetry	2.5	2.5	91.5	Free	Free	Free	Free	Free	Free
2P	XY-Symmetry	2.5	2.5	86.5	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	2.5	2.5	80.5	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	2.5	2.5	74.5	Free	Free	Free	Free	Free	Free

5P	XY-Symmetry	2.5	2.5	69.5	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	2.5	2.5	64.5	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	10	10	10	Free	Free	Free	Free	Free	Free
12P	X-Symmetry	0	-13.75	91.5	Free	Free	Free	Free	Free	Free
13P	X-Symmetry	0	-9.75	86.5	Free	Free	Free	Free	Free	Free
14P	X-Symmetry	0	-14.25	74.5	Free	Free	Free	Free	Free	Free
15P	X-Symmetry	0	-10.25	64.5	Free	Free	Free	Free	Free	Free
17P	XY-Symmetry	11.26	11.26	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
20P	None	-1.25	0	0	Fixed	Fixed	Fixed	Free	Free	Free
21P	None	-1.25	0	10	Free	Free	Free	Free	Free	Free
22P	None	-1.25	0	32.5	Free	Free	Free	Free	Free	Free
23P	None	-1.25	0	64.5	Free	Free	Free	Free	Free	Free
24P	None	-1.25	0	74.5	Free	Free	Free	Free	Free	Free
25P	None	-1.25	0	91.5	Free	Free	Free	Free	Free	Free
26P	None	-1.25	0	101	Free	Free	Free	Free	Free	Free
1X	X-GenXY	2.5	-2.5	91.5	Free	Free	Free	Free	Free	Free
1XY	XY-GenXY	-2.5	-2.5	91.5	Free	Free	Free	Free	Free	Free
1Y	Y-GenXY	-2.5	2.5	91.5	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2.5	-2.5	86.5	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2.5	-2.5	86.5	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-2.5	2.5	86.5	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2.5	-2.5	80.5	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2.5	-2.5	80.5	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2.5	2.5	80.5	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2.5	-2.5	74.5	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2.5	-2.5	74.5	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2.5	2.5	74.5	Free	Free	Free	Free	Free	Free
5X	X-GenXY	2.5	-2.5	69.5	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-2.5	-2.5	69.5	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-2.5	2.5	69.5	Free	Free	Free	Free	Free	Free
6X	X-GenXY	2.5	-2.5	64.5	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-2.5	-2.5	64.5	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-2.5	2.5	64.5	Free	Free	Free	Free	Free	Free
7X	X-GenXY	10	-10	10	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-10	-10	10	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-10	10	10	Free	Free	Free	Free	Free	Free
12X	X-Gen	0	13.75	91.5	Free	Free	Free	Free	Free	Free
13X	X-Gen	0	9.75	86.5	Free	Free	Free	Free	Free	Free
14X	X-Gen	0	14.25	74.5	Free	Free	Free	Free	Free	Free
15X	X-Gen	0	10.25	64.5	Free	Free	Free	Free	Free	Free
17X	X-GenXY	11.26	-11.26	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
17XY	XY-GenXY	-11.26	-11.26	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
17Y	Y-GenXY	-11.26	11.26	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Secondary Joints:

Joint Label	Symmetry Code	Origin Joint	End Joint	Fraction	Elevation (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
8S	XY-Symmetry	6P	7P	0	59.5	Free	Free	Free	Free	Free	Free
9S	XY-Symmetry	6P	7P	0	53.5	Free	Free	Free	Free	Free	Free
10S	XY-Symmetry	6P	7P	0	47	Free	Free	Free	Free	Free	Free
11S	XY-Symmetry	6P	7P	0	32.5	Free	Free	Free	Free	Free	Free
16S	XY-Symmetry	3X	4X	0.5	0	Free	Free	Free	Free	Free	Free
18S	Y-Symmetry	7P	7X	0.5	0	Free	Free	Free	Free	Free	Free
19S	X-Symmetry	7P	7Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E33S	None	11X	11Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E65S	None	6X	6Y	0.5	0	Free	Free	Free	Free	Free	Free

i0.50E75S	None	4X	4Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E92S	None	1X	1Y	0.5	0	Free	Free	Free	Free	Free	Free
21PF0.50S	X-Symmetry	21P	7X	0.5	0	Free	Free	Free	Free	Free	Free
021PF0.50S	X-Symmetry	21P	7XY	0.5	0	Free	Free	Free	Free	Free	Free
8X	X-GenXY	6P	7P	0	59.5	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	6P	7P	0	59.5	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	6P	7P	0	59.5	Free	Free	Free	Free	Free	Free
9X	X-GenXY	6P	7P	0	53.5	Free	Free	Free	Free	Free	Free
9XY	XY-GenXY	6P	7P	0	53.5	Free	Free	Free	Free	Free	Free
9Y	Y-GenXY	6P	7P	0	53.5	Free	Free	Free	Free	Free	Free
10X	X-GenXY	6P	7P	0	47	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	6P	7P	0	47	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	6P	7P	0	47	Free	Free	Free	Free	Free	Free
11X	X-GenXY	6P	7P	0	32.5	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	6P	7P	0	32.5	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	6P	7P	0	32.5	Free	Free	Free	Free	Free	Free
16X	X-GenXY	3X	4X	0.5	0	Free	Free	Free	Free	Free	Free
16XY	XY-GenXY	3X	4X	0.5	0	Free	Free	Free	Free	Free	Free
16Y	Y-GenXY	3X	4X	0.5	0	Free	Free	Free	Free	Free	Free
18Y	Y-Gen	7P	7X	0.5	0	Free	Free	Free	Free	Free	Free
19X	X-Gen	7P	7Y	0.5	0	Free	Free	Free	Free	Free	Free
21PF0.50X	X-Gen	21P	7X	0.5	0	Free	Free	Free	Free	Free	Free
021PF0.50X	X-Gen	21P	7XY	0.5	0	Free	Free	Free	Free	Free	Free

The model contains 47 primary and 32 secondary joints for a total of 79 joints.

Steel Material Properties:

Steel Material Label	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Member Stress All. Hyp. 1 (ksi)	Member Stress All. Hyp. 2 (ksi)	Member Rupture Hyp. 1 (ksi)	Member Rupture Hyp. 2 (ksi)	Member Bearing Hyp. 1 (ksi)	Member Bearing Hyp. 2 (ksi)
A 36	2.9e+004	36	58	0	0	0	0	0	0
A7	2.9e+004	33	60	0	0	0	0	0	0
A500-50	2.9e+004	50	62	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	0.75	9.1	1.125	1.5	0	0
5/8 A325	0.625	0.6875	16.8	1.25	1.5	0	0

Number Bolts Used By Type:

Bolt Type	Number Bolts
5/8 A394	464
5/8 A325	64

Angle Properties:

Angle Type	Angle Size	Long Leg	Short Leg	Thick.	Unit Weight	Gross Area	w/t Ratio	Radius of Gyration	Radius of Gyration	Radius of Gyration	Number of	Wind Width	Short Edge	Long Edge	Optimize Cost	Section Modulus

		(in)	(in)	(in)	(lbs/ft)	(in^2)		Rx (in)	Ry (in)	Rz (in)	Angles	(in)	Dist. (in)	Dist. (in)	Factor	(in^3)
SAE	5X5X0.375	5	5	0.375	12.3	3.61	11	1.56	1.56	0.99	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	3X3X0.25	3	3	0.25	4.9	1.44	9.75	0.93	0.93	0.592	1	3	1.5	0	1.0000	0
SAE	3X3X0.1875	3	3	0.1875	3.71	1.09	13.33	0.939	0.939	0.596	1	3	1.5	0	1.0000	0
SAE	2.5X2.5X0.1875	2.5	2.5	0.1875	3.07	0.902	10.67	0.778	0.778	0.495	1	2.5	1.25	0	1.0000	0
SAE	2X2X0.25	2	2	0.25	3.19	0.94	5	0.609	0.609	0.391	1	2	1	0	1.0000	0
SAE	2X2X0.1875	2	2	0.1875	2.44	0.71	8	0.617	0.617	0.394	1	2	1	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	4X3X0.25	4	3	0.25	5.8	1.69	13.25	1.28	0.896	0.651	1	4	1.5	0	1.0000	0
SAU	3.5X2.5X0.25	3.5	2.5	0.25	4.9	1.44	11.25	1.12	0.735	0.544	1	3.5	1.25	0	1.0000	0
SAU	3X2.5X0.25	3	2.5	0.25	4.5	1.31	9.5	0.945	0.753	0.528	1	3	1.25	0	1.0000	0
SAU	3X2X0.1875	3	2	0.1875	3.07	0.9	13.33	0.966	0.583	0.439	1	3	1	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
Pwmnt	Pipe 12" Std.	12.75	12	0	49.6	13.6	1	4.39	4.39	4.39	1	12.75	0	0	0.0000	0
Bar	1-3/4x1/4	1.75	0	0.25	2	0.4375	7	0.875	0.875	0.25	1	2	0	0	0.0000	0

Angle Groups:

Group Label	Group Description	Angle Type	Angle Size	Material Type	Element Type	Group Type	Optimize Group	Allow. Add. Angle Width For Optimize (in)
LEG1	L4X4X1/4	SAE	4X4X0.25	A7	Beam	Leg	None	0.000
LEG2	L4X4X5/16	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000
LEG3	L4X4X3/8	SAE	4X4X0.375	A7	Beam	Leg	None	0.000
XBR1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBR2	L3X2X3/16	SAU	3X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBR3	L2X2X3/16	SAE	2X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBR4	L2.5X2X3/16	SAU	2.5X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBR5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A 36	T-Only	Other	None	0.000
HORZ1	L2.5X2X3/16	SAU	2.5X2X0.1875	A7	Beam	Other	None	0.000
HORZ2	L3X2.5X1/4	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
ARM1	L3X2.5X1/4	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
ARM2	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	A7	Beam	Other	None	0.000
M1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	A7	Beam	Other	None	0.000
M2	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000
M3	L2.5X2.5X3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000
M4	BAR 1.75X1/4	Bar	1-3/4x1/4	A7	T-Only	Other	None	0.000
XBR6	L4x4x5/16	SAE	4X4X0.3125	A 36	T-Only	Other	None	0.000
LEG4	L4x4x5/16	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000
XBR7	L3.5x2.5x1/4	SAU	3.5X2.5X0.25	A7	Truss	Other	None	0.000
HORZ3	L4x3x1/4	SAU	4X3X0.25	A7	Beam	Other	None	0.000
Pwmnt	12" Std Pipe	Pwmnt	Pipe 12" Std.	A500-50	Beam	Other	None	0.000
Brace2	L5x5x3/8	SAE	5X5X0.375	A 36	Beam	Other	None	0.000
Brace1	L4x4x1/4	SAE	4X4X0.25	A 36	Beam	Other	None	0.000
Brace3	L3x3x3/16	SAE	3X3X0.1875	A 36	Beam	Other	None	0.000
Brace4	L2x2x3/16	SAE	2X2X0.1875	A 36	Beam	Other	None	0.000
InBr	L2.5X2X3/16	SAU	2.5X2X0.1875	A7	T-Only Beam	Other	None	0.000
M5	L2x2x1/4	SAE	2X2X0.25	A 36	Beam	Other	None	0.000
M2a	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000
New Br	L3x3x1/4	SAE	3X3X0.25	A 36	Beam	Other	None	0.000

Aggregate Angle Information:

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

Angle Type	Angle Size	Material Type	Total Length (ft)	Total Surface Area (ft^2)	Total Weight (lbs)
SAE	4X4X0.25	A7	108.00	144.00	712.80
SAE	4X4X0.3125	A7	111.94	149.26	917.94
SAE	4X4X0.375	A7	150.78	201.04	1477.61
SAE	1.75X1.75X0.1875	A7	163.14	95.16	345.85
SAU	3X2X0.1875	A7	238.10	198.42	730.97
SAE	2X2X0.1875	A7	60.84	40.56	148.44
SAU	2.5X2X0.1875	A7	242.20	181.65	666.04
SAE	2.5X2.5X0.1875	A 36	150.47	125.39	461.93
SAE	4X4X0.3125	A 36	226.50	302.00	1857.27
SAU	3.5X2.5X0.25	A7	178.95	178.95	876.85
SAU	3X2.5X0.25	A7	194.58	178.36	875.59
SAU	4X3X0.25	A7	80.00	93.33	464.00
SAE	2.5X2.5X0.1875	A7	12.81	10.67	39.32
Bar	1-3/4x1/4	A7	134.37	39.19	268.74
Pwmnt	Pipe 12" Std.	A500-50	101.00	416.63	5009.60
SAE	4X4X0.25	A 36	26.58	35.43	175.40
SAE	5X5X0.375	A 36	30.10	50.17	370.28
SAE	3X3X0.1875	A 36	17.85	17.85	66.21
SAE	2X2X0.1875	A 36	21.77	14.51	53.12
SAE	3X3X0.25	A 36	56.68	56.68	277.73

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 Bottom	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 Flat Factor For Face EIA Only	Ar Round Factor For Face EIA Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	10X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
2	17X	1.050	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None

Angle Member Connectivity:

Member Label	Group Label	Section Label	Symmetry Code	Origin Joint	End Joint	Ecc. Code	Rest. Code	Ratio RLX	Ratio RLY	Ratio RLZ	Bolt Type	# Bolts	# Bolt Holes	# Shear Planes	Connect Leg	Short Edge Dist. (in)	Long Edge Dist. (in)	End Dist. (in)	Bolt Spacing (in)	Shear Path Length (in)	Tension Path Length (in)	Rest. Path Coef.
g1P	LEG1		XY-Symmetry	1X	2X	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0
g1X	LEG1		X-GenXY	1P	2P	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0
g1XY	LEG1		XY-GenXY	1Y	2Y	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0

g1Y	LEG1	Y-GenXY	1XY	2XY	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0
0	0	0																	
g2P	LEG1	XY-Symmetry	2X	3X	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g2X	LEG1	X-GenXY	2P	3P	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g2XY	LEG1	XY-GenXY	2Y	3Y	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g2Y	LEG1	Y-GenXY	2XY	3XY	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g3P	LEG1	XY-Symmetry	3X	16S	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g3X	LEG1	X-GenXY	3P	16X	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g3XY	LEG1	XY-GenXY	3Y	16XY	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g3Y	LEG1	Y-GenXY	3XY	16Y	1	4	1	1	1 5/8	A394	0	1	1	Both	0	0	0	0	0
0	0	0																	
g4P	LEG1	XY-Symmetry	16S	4X	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0
0	0	0																	
g4X	LEG1	X-GenXY	16X	4P	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0
0	0	0																	
g4XY	LEG1	XY-GenXY	16XY	4Y	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0
0	0	0																	
g4Y	LEG1	Y-GenXY	16Y	4XY	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0
0	0	0																	
g5P	LEG1	XY-Symmetry	4X	5X	1	4	1	1	1 5/8	A394	0	2.75	1	Both	0	0	0	0	0
0	0	0																	
g5X	LEG1	X-GenXY	4P	5P	1	4	1	1	1 5/8	A394	0	2.75	1	Both	0	0	0	0	0
0	0	0																	
g5XY	LEG1	XY-GenXY	4Y	5Y	1	4	1	1	1 5/8	A394	0	2.75	1	Both	0	0	0	0	0
0	0	0																	
g5Y	LEG1	Y-GenXY	4XY	5XY	1	4	1	1	1 5/8	A394	0	2.75	1	Both	0	0	0	0	0
0	0	0																	
g6P	LEG1	XY-Symmetry	5X	6X	1	4	1	1	1 5/8	A394	12	2.41	1	Both	1.25	2.375	1.5	4	17.063
4.0625	0																		
g6X	LEG1	X-GenXY	5P	6P	1	4	1	1	1 5/8	A394	12	2.41	1	Both	1.25	2.375	1.5	4	17.063
4.0625	0																		
g6XY	LEG1	XY-GenXY	5Y	6Y	1	4	1	1	1 5/8	A394	12	2.41	1	Both	1.25	2.375	1.5	4	17.063
4.0625	0																		
g6Y	LEG1	Y-GenXY	5XY	6XY	1	4	1	1	1 5/8	A394	12	2.41	1	Both	1.25	2.375	1.5	4	17.063
4.0625	0																		
g7P	LEG2	XY-Symmetry	6X	8X	1	4	1	1	1 5/8	A394	0	2.99	1	Both	0	0	0	0	0
0	0	0																	
g7X	LEG2	X-GenXY	6P	8S	1	4	1	1	1 5/8	A394	0	2.99	1	Both	0	0	0	0	0
0	0	0																	
g7XY	LEG2	XY-GenXY	6Y	8Y	1	4	1	1	1 5/8	A394	0	2.99	1	Both	0	0	0	0	0
0	0	0																	
g7Y	LEG2	Y-GenXY	6XY	8XY	1	4	1	1	1 5/8	A394	0	2.99	1	Both	0	0	0	0	0
0	0	0																	
g8P	LEG2	XY-Symmetry	8X	9X	1	4	1	1	1 5/8	A394	0	2.78	1	Both	0	0	0	0	0
0	0	0																	
g8X	LEG2	X-GenXY	8S	9S	1	4	1	1	1 5/8	A394	0	2.78	1	Both	0	0	0	0	0
0	0	0																	
g8XY	LEG2	XY-GenXY	8Y	9Y	1	4	1	1	1 5/8	A394	0	2.78	1	Both	0	0	0	0	0
0	0	0																	
g8Y	LEG2	Y-GenXY	8XY	9XY	1	4	1	1	1 5/8	A394	0	2.78	1	Both	0	0	0	0	0
0	0	0																	
g9P	LEG2	XY-Symmetry	9X	10X	1	4	1	1	1 5/8	A394	10	2.02	1	Both	1.25	2.375	1.5	4	17.063
4.0625	0																		

```
3.5 14.438  4.0625     0
      g9X   LEG2              X-GenXY         9S        10S    1     4     1     1     1 5/8 A394    10   2.02       1       Both   1.25  2.375   1.5
3.5 14.438  4.0625     0
     g9XY   LEG2             XY-GenXY         9Y        10Y    1     4     1     1     1 5/8 A394    10   2.02       1       Both   1.25  2.375   1.5
3.5 14.438  4.0625     0
      g9Y   LEG2              Y-GenXY        9XY       10XY    1     4     1     1     1 5/8 A394    10   2.02       1       Both   1.25  2.375   1.5
3.5 14.438  4.0625     0
     g10P   LEG3          XY-Symmetry        10X        11X    1     4   0.5   0.5   0.5 5/8 A394    10   3.35       1       Both 1.3125  2.375   1.5
3.5 15.563  4.0625     0
     g10X   LEG3              X-GenXY        10S        11S    1     4   0.5   0.5   0.5 5/8 A394    10   3.35       1       Both 1.3125  2.375   1.5
3.5 15.563  4.0625     0
    g10XY   LEG3             XY-GenXY        10Y        11Y    1     4   0.5   0.5   0.5 5/8 A394    10   3.35       1       Both 1.3125  2.375   1.5
3.5 15.563  4.0625     0
     g10Y   LEG3              Y-GenXY       10XY       11XY    1     4   0.5   0.5   0.5 5/8 A394    10   3.35       1       Both 1.3125  2.375   1.5
3.5 15.563  4.0625     0
     g11P   LEG3          XY-Symmetry        11X         7X    1     4  0.33  0.33  0.33 5/8 A394    10   3.03       1       Both  0.875 1.9375   1.5
3.75 16.063  3.1875     0
     g11X   LEG3              X-GenXY        11S         7P    1     4  0.33  0.33  0.33 5/8 A394    10   3.03       1       Both  0.875 1.9375   1.5
3.75 16.063  3.1875     0
    g11XY   LEG3             XY-GenXY        11Y         7Y    1     4  0.33  0.33  0.33 5/8 A394    10   3.03       1       Both  0.875 1.9375   1.5
3.75 16.063  3.1875     0
     g11Y   LEG3              Y-GenXY       11XY        7XY    1     4  0.33  0.33  0.33 5/8 A394    10   3.03       1       Both  0.875 1.9375   1.5
3.75 16.063  3.1875     0
     g12P   LEG4          XY-Symmetry         7X        17X    1     4   0.5   0.5   0.5 5/8 A394    10   2.46       1       Both 0.9375  1.625   1.5
4 16.188  4.0625     0
     g12X   LEG4              X-GenXY         7P        17P    1     4   0.5   0.5   0.5 5/8 A394    10   2.46       1       Both 0.9375  1.625   1.5
4 16.188  4.0625     0
    g12XY   LEG4             XY-GenXY         7Y        17Y    1     4   0.5   0.5   0.5 5/8 A394    10   2.46       1       Both 0.9375  1.625   1.5
4 16.188  4.0625     0
     g12Y   LEG4              Y-GenXY        7XY       17XY    1     4   0.5   0.5   0.5 5/8 A394    10   2.46       1       Both 0.9375  1.625   1.5
4 16.188  4.0625     0
     g13P   XBR1          XY-Symmetry         1X         2P    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g13X   XBR1              X-GenXY         1P         2X    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
    g13XY   XBR1             XY-GenXY         1Y        2XY    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g13Y   XBR1              Y-GenXY        1XY         2Y    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g14P   XBR1          XY-Symmetry         1P         2Y    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g14X   XBR1              X-GenXY         1X        2XY    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
    g14XY   XBR1             XY-GenXY        1XY         2X    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g14Y   XBR1              Y-GenXY         1Y         2P    2     5  0.75   0.5   0.5 5/8 A394     2      1       1  Long only 1.0625      0 0.875
2       0       0     0
     g15P   XBR2          XY-Symmetry         2X         3P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g15X   XBR2              X-GenXY         2P         3X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
    g15XY   XBR2             XY-GenXY         2Y        3XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g15Y   XBR2              Y-GenXY        2XY         3Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g16P   XBR2          XY-Symmetry         2P         3Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g16X   XBR2              X-GenXY         2X        3XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
```

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    g16XY   XBR2            XY-GenXY        2XY         3X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g16Y   XBR2             Y-GenXY         2Y         3P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g17P   XBR2           XY-Symmetry       3X         4P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g17X   XBR2             X-GenXY         3P         4X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
    g17XY   XBR2            XY-GenXY         3Y        4XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g17Y   XBR2             Y-GenXY        3XY         4Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g18P   XBR2           XY-Symmetry       3P         4Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g18X   XBR2             X-GenXY         3X        4XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
    g18XY   XBR2            XY-GenXY        3XY         4X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g18Y   XBR2             Y-GenXY         3Y         4P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
2.0625 2.9063 0.53125     0
     g19P   XBR2           XY-Symmetry       4X         5P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g19X   XBR2             X-GenXY         4P         5X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
    g19XY   XBR2            XY-GenXY         4Y        5XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g19Y   XBR2             Y-GenXY        4XY         5Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g20P   XBR2           XY-Symmetry       4P         5Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g20X   XBR2             X-GenXY         4X        5XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
    g20XY   XBR2            XY-GenXY        4XY         5X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g20Y   XBR2             Y-GenXY         4Y         5P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g21P   XBR2           XY-Symmetry       5X         6P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g21X   XBR2             X-GenXY         5P         6X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
    g21XY   XBR2            XY-GenXY         5Y        6XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g21Y   XBR2             Y-GenXY        5XY         6Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g22P   XBR2           XY-Symmetry       5P         6Y    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g22X   XBR2             X-GenXY         5X        6XY    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
    g22XY   XBR2            XY-GenXY        5XY         6X    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g22Y   XBR2             Y-GenXY         5Y         6P    2     5   0.5  0.75   0.5 5/8 A394     3      1       1  Long only  0.875      2 0.875
1.875 2.5313 0.53125      0
     g23P   XBR3           XY-Symmetry       6X         8S    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375       0       0     0
     g23X   XBR3             X-GenXY         6P         8X    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375       0       0     0
    g23XY   XBR3            XY-GenXY         6Y        8XY    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375       0       0     0
     g23Y   XBR3             Y-GenXY        6XY         8Y    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
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1.375      0       0     0
     g24P   XBR3          XY-Symmetry         6P         8Y    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375      0       0     0
     g24X   XBR3              X-GenXY         6X        8XY    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375      0       0     0
    g24XY   XBR3             XY-GenXY        6XY         8X    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375      0       0     0
     g24Y   XBR3              Y-GenXY         6Y         8S    2     5 0.779 0.559 0.559 5/8 A394     2      1       1  Long only      1      0 0.875
1.375      0       0     0
     g25P   XBR4          XY-Symmetry         8X         9S    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g25X   XBR4              X-GenXY         8S         9X    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
    g25XY   XBR4             XY-GenXY         8Y        9XY    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g25Y   XBR4              Y-GenXY        8XY         9Y    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g26P   XBR4          XY-Symmetry         8S         9Y    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g26X   XBR4              X-GenXY         8X        9XY    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
    g26XY   XBR4             XY-GenXY        8XY         9X    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g26Y   XBR4              Y-GenXY         8Y         9S    2     5 0.563 0.781 0.563 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.8125 1.7813 0.53125     0
     g27P   XBR4          XY-Symmetry         9X        10S    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g27X   XBR4              X-GenXY         9S        10X    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
    g27XY   XBR4             XY-GenXY         9Y       10XY    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g27Y   XBR4              Y-GenXY        9XY        10Y    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g28P   XBR4          XY-Symmetry         9S        10Y    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g28X   XBR4              X-GenXY         9X       10XY    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
    g28XY   XBR4             XY-GenXY        9XY        10X    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g28Y   XBR4              Y-GenXY         9Y        10S    2     5  0.55 0.775  0.55 5/8 A394     2      1       1  Long only  0.875 1.5625 0.875
1.625 1.5938 0.53125      0
     g29P   XBR5          XY-Symmetry        10X        11S    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g29X   XBR5              X-GenXY        10S        11X    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
    g29XY   XBR5             XY-GenXY        10Y       11XY    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g29Y   XBR5              Y-GenXY       10XY        11Y    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g30P   XBR5          XY-Symmetry        10S        11Y    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g30X   XBR5              X-GenXY        10X       11XY    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
    g30XY   XBR5             XY-GenXY       10XY        11X    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g30Y   XBR5              Y-GenXY        10Y        11S    2     5 0.792 0.584 0.584 5/8 A325     2      1       1  Long only 0.8125      0 0.875
1.4375     0       0     0
     g31P   XBR6          XY-Symmetry        11X         7P    2     5 0.667 0.333 0.333 5/8 A325     2      1       1  Long only  0.875      0 0.875
1.5      0       0     0
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g31X	XBR6		X-GenXY	11S	7X	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g31XY	XBR6		XY-GenXY	11Y	7XY	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g31Y	XBR6		Y-GenXY	11XY	7Y	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g32P	XBR6		XY-Symmetry	11S	7Y	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g32X	XBR6		X-GenXY	11X	7XY	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g32XY	XBR6		XY-GenXY	11XY	7X	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g32Y	XBR6		Y-GenXY	11Y	7P	2	5	0.667	0.333	0.333	5/8	A325	2	1	1	Long only	0.875	0	0.875	1.5	0	0	0
g33P	XBR7		XY-Symmetry	17X	18S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g33X	XBR7		X-GenXY	17P	18S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g33XY	XBR7		XY-GenXY	17Y	18Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g33Y	XBR7		Y-GenXY	17XY	18Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g34P	XBR7		XY-Symmetry	17P	19S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g34X	XBR7		X-GenXY	17X	19X	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g34XY	XBR7		XY-GenXY	17XY	19X	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g34Y	XBR7		Y-GenXY	17Y	19S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	1	0	1.5	0	0	0	0
g35P	HORZ1		Y-Symmetry	10X	10S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0	0
g35Y	HORZ1		Y-Gen	10XY	10Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0	0
g36P	HORZ1		X-Symmetry	10S	10Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0	0
g36X	HORZ1		X-Gen	10X	10XY	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0	0
g37P	HORZ2		Y-Symmetry	11X	11S	3	4	1	0.5	0.5	5/8	A325	1	1	1	Short only	1.25	0	1	0	0	0	0
g37Y	HORZ2		Y-Gen	11XY	11Y	3	4	1	0.5	0.5	5/8	A325	1	1	1	Short only	1.25	0	1	0	0	0	0
g38P	HORZ2		X-Symmetry	11S	11Y	3	4	0.5	0.5	0.5	5/8	A325	1	1	1	Short only	1.25	0	1	0	0	0	0
g38X	HORZ2		X-Gen	11X	11XY	3	4	0.5	0.5	0.5	5/8	A325	1	1	1	Short only	1.25	0	1	0	0	0	0
g39P	HORZ3		XY-Symmetry	7X	18S	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g39X	HORZ3		X-GenXY	7P	18S	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g39XY	HORZ3		XY-GenXY	7Y	18Y	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g39Y	HORZ3		Y-GenXY	7XY	18Y	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g40P	HORZ3		XY-Symmetry	7P	19S	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g40X	HORZ3		X-GenXY	7X	19X	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	0	0	0	0
g40XY	HORZ3		XY-GenXY	7XY	19X	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5				

0		0	0	0																	
	g40Y	HORZ3		Y-GenXY	7Y	19S	3	4	2	1	1	5/8	A325	1	1	1	Short only	1.25	0	1.5	
0		0	0	0																	
	g41P	InBr		X-Symmetry	11X	i0.50E33S	3	4	1	1	1	5/8	A394	1	1	1	Long only	0	0	0	
0		0	0	0																	
	g41X	InBr		X-Gen	11S	i0.50E33S	3	4	1	1	1	5/8	A394	1	1	1	Long only	0	0	0	
0		0	0	0																	
	g42P	ARM1		XY-Symmetry	12P	1X	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.25	0	1.5	
4		0	0	0																	
	g42X	ARM1		X-GenXY	12X	1P	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.25	0	1.5	
4		0	0	0																	
	g42XY	ARM1		XY-GenXY	12X	1Y	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.25	0	1.5	
4		0	0	0																	
	g42Y	ARM1		Y-GenXY	12P	1XY	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.25	0	1.5	
4		0	0	0																	
	g43P	ARM1		Y-Symmetry	1X	1P	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g43Y	ARM1		Y-Gen	1XY	1Y	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g44P	ARM1		XY-Symmetry	13P	2X	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.25	0	1.5	
2.75		0	0	0																	
	g44X	ARM1		X-GenXY	13X	2P	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.25	0	1.5	
2.75		0	0	0																	
	g44XY	ARM1		XY-GenXY	13X	2Y	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.25	0	1.5	
2.75		0	0	0																	
	g44Y	ARM1		Y-GenXY	13P	2XY	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.25	0	1.5	
2.75		0	0	0																	
	g45P	ARM1		Y-Symmetry	2X	2P	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g45Y	ARM1		Y-Gen	2XY	2Y	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g46P	ARM2		XY-Symmetry	14P	4X	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.75	0	1.5	
2		0	0	0																	
	g46X	ARM2		X-GenXY	14X	4P	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.75	0	1.5	
2		0	0	0																	
	g46XY	ARM2		XY-GenXY	14X	4Y	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.75	0	1.5	
2		0	0	0																	
	g46Y	ARM2		Y-GenXY	14P	4XY	3	6	1	0.5	0.5	5/8	A394	3	2	1	Long only	1.75	0	1.5	
2		0	0	0																	
	g47P	ARM2		Y-Symmetry	4X	4P	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g47Y	ARM2		Y-Gen	4XY	4Y	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g48P	ARM1		XY-Symmetry	15P	6X	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.5	0	1.5	
4		0	0	0																	
	g48X	ARM1		X-GenXY	15X	6P	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.5	0	1.5	
4		0	0	0																	
	g48XY	ARM1		XY-GenXY	15X	6Y	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.5	0	1.5	
4		0	0	0																	
	g48Y	ARM1		Y-GenXY	15P	6XY	3	6	1	0.5	0.5	5/8	A394	2	2	1	Long only	1.5	0	1.5	
4		0	0	0																	
	g49P	ARM1		Y-Symmetry	6X	6P	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g49Y	ARM1		Y-Gen	6XY	6Y	3	6	1	1	1	5/8	A394	0	2	1	Long only	0	0	0	
0		0	0	0																	
	g50P	M1		X-Symmetry	1P	1Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0		0	0	0																	
	g50X	M1		X-Gen	1X	1XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0		0	0	0																	

g51P	M1		X-Symmetry	2P	2Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g51X	M1		X-Gen	2X	2XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g52P	M1		X-Symmetry	4P	4Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g52X	M1		X-Gen	4X	4XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g53P	M1		X-Symmetry	6P	6Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g53X	M1		X-Gen	6X	6XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g54P	M2		X-Symmetry	1X	i0.50E92S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g54X	M2		X-Gen	1P	i0.50E92S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g55P	M2a		X-Symmetry	2X	2Y	2	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g55X	M2a		X-Gen	2P	2XY	2	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g56P	M2		X-Symmetry	4X	i0.50E75S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g56X	M2		X-Gen	4P	i0.50E75S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g57P	M2		X-Symmetry	6X	i0.50E65S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g57X	M2		X-Gen	6P	i0.50E65S	3	4	1.5	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	0	0
g58P	M3		X-Symmetry	12P	13P	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g58X	M3		X-Gen	12X	13X	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g59P	M4		XY-Symmetry	1X	13P	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g59X	M4		X-GenXY	1P	13X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g59XY	M4		XY-GenXY	1Y	13X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g59Y	M4		Y-GenXY	1XY	13P	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g60P	M4		XY-Symmetry	14P	16S	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g60X	M4		X-GenXY	14X	16X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g60XY	M4		XY-GenXY	14X	16XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g60Y	M4		Y-GenXY	14P	16Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g61P	M4		XY-Symmetry	15P	5X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g61X	M4		X-GenXY	15X	5P	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g61XY	M4		XY-GenXY	15X	5Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g61Y	M4		Y-GenXY	15P	5XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g62P	M4		Y-Symmetry	16S	16X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875	0	0
g62Y	M4		Y-Gen	16Y	16XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	1.25	0	0.875		

0	0	0	0																						
	g63P	Pwmnt		None		20P		21P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g64P	Pwmnt		None		21P		22P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g65P	Pwmnt		None		22P		23P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g66P	Pwmnt		None		23P		24P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g67P	Pwmnt		None		24P		25P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g68P	Pwmnt		None		25P		26P	1	4	1	1	1		0	0	1				0	0	0		
0	0	0	0																						
	g69P	Brace1		X-Symmetry		21P	021PF0.50S		1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	g69X	Brace1		X-Gen		21P	021PF0.50X		1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	Fg6984P	Brace1		X-Symmetry	021PF0.50S			7XY	1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	Fg6984X	Brace1		X-Gen	021PF0.50X			7Y	1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	g70P	Brace2		X-Symmetry		21P	21PF0.50S		1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	g70X	Brace2		X-Gen		21P	21PF0.50X		1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	Fg7083P	Brace2		X-Symmetry	21PF0.50S			7X	1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	Fg7083X	Brace2		X-Gen	21PF0.50X			7P	1	4	1	2	1		0	0	1				0	0	0		
0	0	0	0																						
	g71P	Brace3		X-Symmetry		22P		11XY	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	g71X	Brace3		X-Gen		22P		11Y	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	ig41P71P	InBr		X-Symmetry	i0.50E33S			11Y	3	4	1	1	1	5/8	A394	1	1	1	Long	only	0	0	0		
0	0	0	0																						
	ig41P71X	InBr		X-Gen	i0.50E33S			11XY	3	4	1	1	1	5/8	A394	1	1	1	Long	only	0	0	0		
0	0	0	0																						
	ig57P72P	M2		X-Symmetry	i0.50E65S			6Y	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	ig57P72X	M2		X-Gen	i0.50E65S			6XY	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	ig56P73P	M2		X-Symmetry	i0.50E75S			4Y	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	ig56P73X	M2		X-Gen	i0.50E75S			4XY	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	ig54P74P	M2		X-Symmetry	i0.50E92S			1Y	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	ig54P74X	M2		X-Gen	i0.50E92S			1XY	3	4	1.5	1	1	5/8	A394	1	1	1	Long	only	0.875	0	0.875		
0	0	0	0																						
	g76P	Brace4		None	i0.50E33S			22P	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	g77P	Brace4		X-Symmetry		23P		6XY	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	g77X	Brace4		X-Gen		23P		6Y	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	g78P	Brace4		None	i0.50E65S			23P	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						
	g79P	Brace4		X-Symmetry		24P		4XY	3	4	1	1	1	5/8	A325	1	1	1	Short	only	1.5	0	1.5		
0	0	0	0																						

g79X	Brace4		X-Gen	24P	4Y	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.5	0	0	0
g80P	Brace4		None	i0.50E75S	24P	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.5	0	0	0
g81P	Brace4		X-Symmetry	25P	1XY	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.5	0	0	0
g81X	Brace4		X-Gen	25P	1Y	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.5	0	0	0
g82P	Brace4		None	i0.50E92S	25P	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.5	0	0	0
g83P	M2a		X-Symmetry	16S	16Y	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.875	0	1	0	0	0
g83X	M2a		X-Gen	16X	16XY	3	4	1	1	1 5/8	A394	1	1	1	Short only	0.875	0	1	0	0	0
g86P	New Br		None	19X	21PF0.50S	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g87P	New Br		None	19X	021PF0.50S	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g88P	New Br		None	18S	21PF0.50S	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g89P	New Br		None	18S	21PF0.50X	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g90P	New Br		None	21PF0.50X	19S	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g91P	New Br		None	19S	021PF0.50X	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g92P	New Br		None	021PF0.50X	18Y	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0
g93P	New Br		None	18Y	021PF0.50S	3	4	1	1	1 5/8	A325	1	1	1	Short only	1.5	0	1.25	0	0	0

Member Capacities and Overrides:

Member Label	Group Label	Design Comp. Capacity	Comp. Control Criterion	Design Tension Capacity	Tension Control Criterion	L/r Length	L/r Comp. Capacity	Connection Shear Capacity	Connection Bearing Capacity	Net Section Tension Capacity	Rupture Tension Capacity	RTE End Dist. Tension Capacity	RTE Edge Dist. Tension Capacity	Override Comp. Capacity	Override Comp. Control Criterion	Override Design Comp. Capacity	Override Comp. Control Criterion	Override Tension Face	Warnings or Errors	Override Member Unsup. (kips)	Override Criterion	Override Criterion (kips)	Override Criterion (kips)	Override Member ship (kips)
g1P	LEG1	53.509	L/r	51.645	Net Sect	75	5.00	53.509	0.000	0.000	51.645	0.000	0.000	0.000	0.000	0.000	Automatic							
g1X	LEG1	53.509	L/r	51.645	Net Sect	75	5.00	53.509	0.000	0.000	51.645	0.000	0.000	0.000	0.000	0.000	Automatic							
g1XY	LEG1	53.509	L/r	51.645	Net Sect	75	5.00	53.509	0.000	0.000	51.645	0.000	0.000	0.000	0.000	0.000	Automatic							
g1Y	LEG1	53.509	L/r	51.645	Net Sect	75	5.00	53.509	0.000	0.000	51.645	0.000	0.000	0.000	0.000	0.000	Automatic							
g2P	LEG1	48.884	L/r	57.832	Net Sect	91	6.00	48.884	0.000	0.000	57.832	0.000	0.000	0.000	0.000	0.000	Automatic							
g2X	LEG1	48.884	L/r	57.832	Net Sect	91	6.00	48.884	0.000	0.000	57.832	0.000	0.000	0.000	0.000	0.000	Automatic							
g2XY	LEG1	48.884	L/r	57.832	Net Sect	91	6.00	48.884	0.000	0.000	57.832	0.000	0.000	0.000	0.000	0.000	Automatic							

g2Y	LEG1	48.884	L/r	57.832	Net Sect	91	6.00	48.884	0.000	0.000	57.832	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3P	LEG1	60.236	L/r	57.832	Net Sect	45	3.00	60.236	0.000	0.000	57.832	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3X	LEG1	60.236	L/r	57.832	Net Sect	45	3.00	60.236	0.000	0.000	57.832	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3XY	LEG1	60.236	L/r	57.832	Net Sect	45	3.00	60.236	0.000	0.000	57.832	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3Y	LEG1	60.236	L/r	57.832	Net Sect	45	3.00	60.236	0.000	0.000	57.832	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4P	LEG1	60.236	L/r	51.645	Net Sect	45	3.00	60.236	0.000	0.000	51.645	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4X	LEG1	60.236	L/r	51.645	Net Sect	45	3.00	60.236	0.000	0.000	51.645	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4XY	LEG1	60.236	L/r	51.645	Net Sect	45	3.00	60.236	0.000	0.000	51.645	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4Y	LEG1	60.236	L/r	51.645	Net Sect	45	3.00	60.236	0.000	0.000	51.645	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5P	LEG1	53.509	L/r	47.004	Net Sect	75	5.00	53.509	0.000	0.000	47.004	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5X	LEG1	53.509	L/r	47.004	Net Sect	75	5.00	53.509	0.000	0.000	47.004	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5XY	LEG1	53.509	L/r	47.004	Net Sect	75	5.00	53.509	0.000	0.000	47.004	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5Y	LEG1	53.509	L/r	47.004	Net Sect	75	5.00	53.509	0.000	0.000	47.004	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g6P	LEG1	53.509	L/r	49.108	Net Sect	75	5.00	53.509	109.200	168.750	49.108	187.078	0.000	0.000	0.000
0.000		0.000		Automatic											
g6X	LEG1	53.509	L/r	49.108	Net Sect	75	5.00	53.509	109.200	168.750	49.108	187.078	0.000	0.000	0.000
0.000		0.000		Automatic											
g6XY	LEG1	53.509	L/r	49.108	Net Sect	75	5.00	53.509	109.200	168.750	49.108	187.078	0.000	0.000	0.000
0.000		0.000		Automatic											
g6Y	LEG1	53.509	L/r	49.108	Net Sect	75	5.00	53.509	109.200	168.750	49.108	187.078	0.000	0.000	0.000
0.000		0.000		Automatic											
g7P	LEG2	65.567	L/r	56.074	Net Sect	77	5.09	65.567	0.000	0.000	56.074	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g7X	LEG2	65.567	L/r	56.074	Net Sect	77	5.09	65.567	0.000	0.000	56.074	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g7XY	LEG2	65.567	L/r	56.074	Net Sect	77	5.09	65.567	0.000	0.000	56.074	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g7Y	LEG2	65.567	L/r	56.074	Net Sect	77	5.09	65.567	0.000	0.000	56.074	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8P	LEG2	59.569	L/r	57.698	Net Sect	93	6.11	59.569	0.000	0.000	57.698	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8X	LEG2	59.569	L/r	57.698	Net Sect	93	6.11	59.569	0.000	0.000	57.698	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8XY	LEG2	59.569	L/r	57.698	Net Sect	93	6.11	59.569	0.000	0.000	57.698	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8Y	LEG2	59.569	L/r	57.698	Net Sect	93	6.11	59.569	0.000	0.000	57.698	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g9P	LEG2	56.161	L/r	63.576	Net Sect	100	6.62	56.161	91.000	175.781	63.576	204.316	0.000	0.000	0.000
0.000		0.000		Automatic											
g9X	LEG2	56.161	L/r	63.576	Net Sect	100	6.62	56.161	91.000	175.781	63.576	204.316	0.000	0.000	0.000
0.000		0.000		Automatic											
g9XY	LEG2	56.161	L/r	63.576	Net Sect	100	6.62	56.161	91.000	175.781	63.576	204.316	0.000	0.000	0.000
0.000		0.000		Automatic											
g9Y	LEG2	56.161	L/r	63.576	Net Sect	100	6.62	56.161	91.000	175.781	63.576	204.316	0.000	0.000	0.000
0.000		0.000		Automatic											
g10P	LEG3	59.963	L/r	63.288	Net Sect	112	14.77	59.963	91.000	210.937	63.288	260.367	0.000	0.000	0.000

0.000		0.000		Automatic											
g10X	LEG3	59.963	L/r	63.288	Net Sect	112	14.77	59.963	91.000	210.937	63.288	260.367	0.000	0.000	0.000
0.000		0.000		Automatic											
g10XY	LEG3	59.963	L/r	63.288	Net Sect	112	14.77	59.963	91.000	210.937	63.288	260.367	0.000	0.000	0.000
0.000		0.000		Automatic											
g10Y	LEG3	59.963	L/r	63.288	Net Sect	112	14.77	59.963	91.000	210.937	63.288	260.367	0.000	0.000	0.000
0.000		0.000		Automatic											
g11P	LEG3	58.282	L/r	66.258	Net Sect	115	22.92	58.282	91.000	210.937	66.258	193.014	0.000	0.000	0.000
0.000		0.000		Automatic											
g11X	LEG3	58.282	L/r	66.258	Net Sect	115	22.92	58.282	91.000	210.937	66.258	193.014	0.000	0.000	0.000
0.000		0.000		Automatic											
g11XY	LEG3	58.282	L/r	66.258	Net Sect	115	22.92	58.282	91.000	210.937	66.258	193.014	0.000	0.000	0.000
0.000		0.000		Automatic											
g11Y	LEG3	58.282	L/r	66.258	Net Sect	115	22.92	58.282	91.000	210.937	66.258	193.014	0.000	0.000	0.000
0.000		0.000		Automatic											
g12P	LEG4	65.648	L/r	60.173	Net Sect	77	10.16	65.648	91.000	175.781	60.173	172.334	0.000	0.000	0.000
0.000		0.000		Automatic											
g12X	LEG4	65.648	L/r	60.173	Net Sect	77	10.16	65.648	91.000	175.781	60.173	172.334	0.000	0.000	0.000
0.000		0.000		Automatic											
g12XY	LEG4	65.648	L/r	60.173	Net Sect	77	10.16	65.648	91.000	175.781	60.173	172.334	0.000	0.000	0.000
0.000		0.000		Automatic											
g12Y	LEG4	65.648	L/r	60.173	Net Sect	77	10.16	65.648	91.000	175.781	60.173	172.334	0.000	0.000	0.000
0.000		0.000		Automatic											
g13P	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g13X	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g13XY	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g13Y	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g14P	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g14X	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g14XY	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g14Y	XBR1	11.559	L/r	14.237	Net Sect	124	7.07	11.559	18.200	21.094	14.237	16.066	0.000	0.000	0.000
0.000		0.000		Automatic											
g15P	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g15X	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g15XY	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g15Y	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g16P	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g16X	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g16XY	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g16Y	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g17P	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g17X	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											

g17XY	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g17Y	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g18P	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g18X	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g18XY	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g18Y	XBR2	17.275	L/r	22.553	Net Sect	121	7.81	17.275	27.300	31.641	22.553	22.904	0.000	0.000	0.000
0.000		0.000		Automatic											
g19P	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g19X	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g19XY	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g19Y	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g20P	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g20X	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g20XY	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g20Y	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g21P	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g21X	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g21XY	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g21Y	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g22P	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g22X	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g22XY	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g22Y	XBR2	18.986	L/r	20.373	Rupture	109	7.07	18.986	27.300	31.641	22.553	20.373	0.000	0.000	0.000
0.000		0.000		Automatic											
g23P	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g23X	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g23XY	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g23Y	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g24P	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g24X	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g24XY	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000
0.000		0.000		Automatic											
g24Y	XBR3	12.493	L/r	11.461	Rupture	129	7.60	12.493	18.200	21.094	16.910	11.461	0.000	0.000	0.000

0.000		0.000	Automatic												
g25P	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g25X	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g25XY	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g25Y	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g26P	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g26X	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g26XY	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g26Y	XBR4	11.489	L/r 15.311	Rupture	149	9.41	11.489	18.200	21.094	19.880	15.311	0.000	0.000	0.000	
0.000		0.000	Automatic												
g27P	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g27X	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g27XY	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g27Y	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g28P	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g28X	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g28XY	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g28Y	XBR4	9.124	L/r 14.045	Rupture	172	11.07	9.124	18.200	21.094	19.880	14.045	0.000	0.000	0.000	
0.000		0.000	Automatic												
g29P	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g29X	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g29XY	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g29Y	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g30P	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g30X	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g30XY	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g30Y	XBR5	4.817	L/r 11.524	Rupture	266	18.81	4.817	33.600	20.391	25.048	11.524	0.000	0.000	0.000	
0.000		0.000	Automatic												
g31P	XBR6	24.380	L/r 20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000	
0.000		0.000	Automatic												
g31X	XBR6	24.380	L/r 20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000	
0.000		0.000	Automatic												
g31XY	XBR6	24.380	L/r 20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000	
0.000		0.000	Automatic												
g31Y	XBR6	24.380	L/r 20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000	
0.000		0.000	Automatic												
g32P	XBR6	24.380	L/r 20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000	
0.000		0.000	Automatic												

g32X	XBR6	24.380	L/r	20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000
0.000		0.000		Automatic											
g32XY	XBR6	24.380	L/r	20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000
0.000		0.000		Automatic											
g32Y	XBR6	24.380	L/r	20.590	Rupture	183	28.31	24.380	33.600	33.984	70.799	20.590	0.000	0.000	0.000
0.000		0.000		Automatic											
g33P	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g33X	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g33XY	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g33Y	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g34P	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g34X	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g34XY	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g34Y	XBR7	9.100	Shear	9.100	Shear	167	15.11	14.836	9.100	14.062	29.774	14.706	0.000	0.000	0.000
0.000		0.000		Automatic											
g35P	HORZ1	9.100	Shear	6.469	Rupture	149	9.82	10.506	9.100	10.547	17.096	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g35Y	HORZ1	9.100	Shear	6.469	Rupture	149	9.82	10.506	9.100	10.547	17.096	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g36P	HORZ1	9.100	Shear	6.469	Rupture	149	9.82	10.506	9.100	10.547	17.096	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g36X	HORZ1	9.100	Shear	6.469	Rupture	149	9.82	10.506	9.100	10.547	17.096	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g37P	HORZ2	12.197	L/r	12.500	Rupture	175	13.81	12.197	16.800	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g37Y	HORZ2	12.197	L/r	12.500	Rupture	175	13.81	12.197	16.800	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g38P	HORZ2	14.062	Bearing	12.500	Rupture	157	13.81	15.230	16.800	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g38X	HORZ2	14.062	Bearing	12.500	Rupture	157	13.81	15.230	16.800	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g39P	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g39X	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g39XY	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g39Y	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g40P	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g40X	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g40XY	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g40Y	HORZ3	13.759	L/r	14.062	Bearing	188	10.00	13.759	16.800	14.062	37.663	17.883	0.000	0.000	0.000
0.000		0.000		Automatic											
g41P	InBr	3.080	L/r	8.930	Rupture	274	9.76	3.080	9.100	10.547	19.880	8.930	0.000	0.000	0.000
0.000		0.000		Automatic											
g41X	InBr	3.080	L/r	8.930	Rupture	274	9.76	3.080	9.100	10.547	19.880	8.930	0.000	0.000	0.000
0.000		0.000		Automatic											
g42P	ARM1	18.200	Shear	18.200	Shear	146	11.52	20.212	18.200	28.125	27.769	36.765	0.000	0.000	0.000

0.000		0.000		Automatic											
g42X	ARM1	18.200	Shear	18.200	Shear	146	11.52	20.212	18.200	28.125	27.769	36.765	0.000	0.000	0.000
0.000		0.000		Automatic											
g42XY	ARM1	18.200	Shear	18.200	Shear	146	11.52	20.212	18.200	28.125	27.769	36.765	0.000	0.000	0.000
0.000		0.000		Automatic											
g42Y	ARM1	18.200	Shear	18.200	Shear	146	11.52	20.212	18.200	28.125	27.769	36.765	0.000	0.000	0.000
0.000		0.000		Automatic											
g43P	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g43Y	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g44P	ARM1	27.300	Shear	27.300	Shear	97	7.67	28.509	27.300	42.187	27.769	53.344	0.000	0.000	0.000
0.000		0.000		Automatic											
g44X	ARM1	27.300	Shear	27.300	Shear	97	7.67	28.509	27.300	42.187	27.769	53.344	0.000	0.000	0.000
0.000		0.000		Automatic											
g44XY	ARM1	27.300	Shear	27.300	Shear	97	7.67	28.509	27.300	42.187	27.769	53.344	0.000	0.000	0.000
0.000		0.000		Automatic											
g44Y	ARM1	27.300	Shear	27.300	Shear	97	7.67	28.509	27.300	42.187	27.769	53.344	0.000	0.000	0.000
0.000		0.000		Automatic											
g45P	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g45Y	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g46P	ARM2	25.189	L/r	27.300	Shear	132	12.01	25.189	27.300	42.187	31.630	43.969	0.000	0.000	0.000
0.000		0.000		Automatic											
g46X	ARM2	25.189	L/r	27.300	Shear	132	12.01	25.189	27.300	42.187	31.630	43.969	0.000	0.000	0.000
0.000		0.000		Automatic											
g46XY	ARM2	25.189	L/r	27.300	Shear	132	12.01	25.189	27.300	42.187	31.630	43.969	0.000	0.000	0.000
0.000		0.000		Automatic											
g46Y	ARM2	25.189	L/r	27.300	Shear	132	12.01	25.189	27.300	42.187	31.630	43.969	0.000	0.000	0.000
0.000		0.000		Automatic											
g47P	ARM2	29.359	L/r	31.630	Net Sect	110	5.00	29.359	0.000	0.000	31.630	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g47Y	ARM2	29.359	L/r	31.630	Net Sect	110	5.00	29.359	0.000	0.000	31.630	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g48P	ARM1	18.200	Shear	18.200	Shear	103	8.14	27.682	18.200	28.125	27.769	37.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g48X	ARM1	18.200	Shear	18.200	Shear	103	8.14	27.682	18.200	28.125	27.769	37.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g48XY	ARM1	18.200	Shear	18.200	Shear	103	8.14	27.682	18.200	28.125	27.769	37.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g48Y	ARM1	18.200	Shear	18.200	Shear	103	8.14	27.682	18.200	28.125	27.769	37.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g49P	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g49Y	ARM1	26.226	L/r	27.769	Net Sect	114	5.00	26.226	0.000	0.000	27.769	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g50P	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g50X	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g51P	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g51X	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g52P	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g52X	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											

g53P	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g53X	M1	5.799	L/r	6.469	Rupture	175	5.00	5.799	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g54P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g54X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g55P	M2a	9.100	Shear	6.469	Rupture	124	7.07	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g55X	M2a	9.100	Shear	6.469	Rupture	124	7.07	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g56P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g56X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g57P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g57X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g58P	M3	9.100	Shear	8.203	Rupture	155	6.40	10.714	9.100	10.547	22.613	8.203	0.000	0.000	0.000
0.000		0.000		Automatic											
g58X	M3	9.100	Shear	8.203	Rupture	155	6.40	10.714	9.100	10.547	22.613	8.203	0.000	0.000	0.000
0.000		0.000		Automatic											
g59P	M4	0.648	L/r	7.425	Net Sect	439	9.15	0.648	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g59X	M4	0.648	L/r	7.425	Net Sect	439	9.15	0.648	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g59XY	M4	0.648	L/r	7.425	Net Sect	439	9.15	0.648	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g59Y	M4	0.648	L/r	7.425	Net Sect	439	9.15	0.648	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g60P	M4	0.354	L/r	7.425	Net Sect	594	12.38	0.354	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g60X	M4	0.354	L/r	7.425	Net Sect	594	12.38	0.354	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g60XY	M4	0.354	L/r	7.425	Net Sect	594	12.38	0.354	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g60Y	M4	0.354	L/r	7.425	Net Sect	594	12.38	0.354	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g61P	M4	0.595	L/r	7.425	Net Sect	459	9.56	0.595	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g61X	M4	0.595	L/r	7.425	Net Sect	459	9.56	0.595	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g61XY	M4	0.595	L/r	7.425	Net Sect	459	9.56	0.595	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g61Y	M4	0.595	L/r	7.425	Net Sect	459	9.56	0.595	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g62P	M4	2.174	L/r	7.425	Net Sect	240	5.00	2.174	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g62Y	M4	2.174	L/r	7.425	Net Sect	240	5.00	2.174	9.100	14.062	7.425	10.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g63P	Pwmnt	657.809	L/r	679.999	Net Sect	27	10.00	657.809	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g64P	Pwmnt	567.663	L/r	679.999	Net Sect	62	22.50	567.663	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g65P	Pwmnt	452.775	L/r	679.999	Net Sect	87	32.00	452.775	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g66P	Pwmnt	657.809	L/r	679.999	Net Sect	27	10.00	657.809	0.000	0.000	679.999	0.000	0.000	0.000	0.000

0.000		0.000		Automatic											
g67P	Pwmnt	615.870	L/r	679.999	Net Sect	46	17.00	615.870	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g68P	Pwmnt	659.973	L/r	679.999	Net Sect	26	9.50	659.973	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g69P	Brace1	34.124	L/r	69.840	Net Sect	128	6.64	34.124	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g69X	Brace1	34.124	L/r	69.840	Net Sect	128	6.64	34.124	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
Fg6984P	Brace1	34.124	L/r	69.840	Net Sect	128	6.64	34.124	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
Fg6984X	Brace1	34.124	L/r	69.840	Net Sect	128	6.64	34.124	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g70P	Brace2	75.176	L/r	129.960	Net Sect	116	7.53	75.176	0.000	0.000	129.960	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g70X	Brace2	75.176	L/r	129.960	Net Sect	116	7.53	75.176	0.000	0.000	129.960	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
Fg7083P	Brace2	75.176	L/r	129.960	Net Sect	116	7.53	75.176	0.000	0.000	129.960	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
Fg7083X	Brace2	75.176	L/r	129.960	Net Sect	116	7.53	75.176	0.000	0.000	129.960	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g71P	Brace3	9.665	L/r	10.195	Bearing	180	8.92	9.665	16.800	10.195	31.139	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g71X	Brace3	9.665	L/r	10.195	Bearing	180	8.92	9.665	16.800	10.195	31.139	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
ig41P71P	InBr	3.080	L/r	8.930	Rupture	274	9.76	3.080	9.100	10.547	19.880	8.930	0.000	0.000	0.000
0.000		0.000		Automatic											
ig41P71X	InBr	3.080	L/r	8.930	Rupture	274	9.76	3.080	9.100	10.547	19.880	8.930	0.000	0.000	0.000
0.000		0.000		Automatic											
ig57P72P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
ig57P72X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
ig56P73P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
ig56P73X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
ig54P74P	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
ig54P74X	M2	9.100	Shear	6.469	Rupture	124	3.54	11.437	9.100	10.547	14.237	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g76P	Brace4	10.195	Bearing	10.195	Bearing	38	1.25	20.539	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g77P	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g77X	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g78P	Brace4	10.195	Bearing	10.195	Bearing	38	1.25	20.539	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g79P	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g79X	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g80P	Brace4	10.195	Bearing	10.195	Bearing	38	1.25	20.539	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g81P	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g81X	Brace4	10.195	Bearing	10.195	Bearing	85	2.80	17.105	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											

g82P	Brace4	10.195	Bearing	10.195	Bearing	38	1.25	20.539	16.800	10.195	18.827	13.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g83P	M2a	5.799	L/r	7.312	Rupture	175	5.00	5.799	9.100	10.547	14.237	7.312	0.000	0.000	0.000
0.000		0.000		Automatic											
g83X	M2a	5.799	L/r	7.312	Rupture	175	5.00	5.799	9.100	10.547	14.237	7.312	0.000	0.000	0.000
0.000		0.000		Automatic											
g86P	New Br	13.594	Bearing	13.594	Bearing	135	6.64	22.725	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g87P	New Br	13.594	Bearing	13.594	Bearing	153	7.53	17.710	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g88P	New Br	13.594	Bearing	13.594	Bearing	153	7.53	17.710	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g89P	New Br	13.594	Bearing	13.594	Bearing	153	7.53	17.710	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g90P	New Br	13.594	Bearing	13.594	Bearing	135	6.64	22.725	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g91P	New Br	13.594	Bearing	13.594	Bearing	153	7.53	17.710	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g92P	New Br	13.594	Bearing	13.594	Bearing	135	6.64	22.725	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											
g93P	New Br	13.594	Bearing	13.594	Bearing	135	6.64	22.725	16.800	13.594	41.087	15.104	0.000	0.000	0.000
0.000		0.000		Automatic											

The model contains 254 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	0.0869	4.661	3.039
2P	0.117	6.336	5.481
3P	0.0777	4.953	4.953
4P	0.123	7.193	5.480
5P	0.086	5.453	5.150
6P	0.116	6.011	5.094
7P	0.49	16.649	16.779
12P	0.0617	3.479	1.146
13P	0.0626	3.947	2.078
14P	0.0836	5.448	1.380
15P	0.0558	3.475	1.557
17P	0.116	5.346	5.346
20P	0.248	5.313	5.313
21P	0.942	21.016	21.068
22P	1.39	30.679	30.471
23P	1.05	22.729	22.625
24P	0.678	14.760	14.656
25P	0.666	14.495	14.391
26P	0.236	5.047	5.047
1X	0.0869	4.661	3.039
1XY	0.0903	4.869	3.143
1Y	0.0903	4.869	3.143
2X	0.117	6.336	5.481
2XY	0.117	6.336	5.481
2Y	0.117	6.336	5.481
3X	0.0777	4.953	4.953
3XY	0.0777	4.953	4.953
3Y	0.0777	4.953	4.953

4X	0.123	7.193	5.480
4XY	0.126	7.402	5.584
4Y	0.126	7.402	5.584
5X	0.086	5.453	5.150
5XY	0.086	5.453	5.150
5Y	0.086	5.453	5.150
6X	0.116	6.011	5.094
6XY	0.12	6.219	5.199
6Y	0.12	6.219	5.199
7X	0.49	16.649	16.779
7XY	0.466	16.441	16.337
7Y	0.466	16.441	16.337
12X	0.0617	3.479	1.146
13X	0.0626	3.947	2.078
14X	0.0836	5.448	1.380
15X	0.0558	3.475	1.557
17X	0.116	5.346	5.346
17XY	0.116	5.346	5.346
17Y	0.116	5.346	5.346
8S	0.0904	4.510	4.510
9S	0.109	5.544	5.544
10S	0.215	9.862	9.862
11S	0.55	20.618	20.618
16S	0.0425	2.427	1.690
18S	0.169	8.976	4.346
19S	0.167	4.190	8.976
i0.50E33S	0.0552	2.877	2.981
i0.50E65S	0.0165	0.729	0.833
i0.50E75S	0.0165	0.729	0.833
i0.50E92S	0.0165	0.729	0.833
21PF0.50S	0.127	3.333	3.594
021PF0.50S	0.0786	2.917	2.708
8X	0.0904	4.510	4.510
8XY	0.0904	4.510	4.510
8Y	0.0904	4.510	4.510
9X	0.109	5.544	5.544
9XY	0.109	5.544	5.544
9Y	0.109	5.544	5.544
10X	0.215	9.862	9.862
10XY	0.215	9.862	9.862
10Y	0.215	9.862	9.862
11X	0.55	20.618	20.618
11XY	0.567	21.481	21.325
11Y	0.567	21.481	21.325
16X	0.0425	2.427	1.690
16XY	0.0425	2.427	1.690
16Y	0.0425	2.427	1.690
18Y	0.165	8.976	4.033
19X	0.167	4.190	8.976
21PF0.50X	0.127	3.333	3.594
021PF0.50X	0.0786	2.917	2.708
Total	15.8	591.442	545.643

Unadjusted Dead Load and Drag Areas by Section:

Section Label	Unfactored Dead Load (kips)	X-Drag Area All (ft^2)	Y-Drag Area All (ft^2)	X-Drag Area Face (ft^2)	Y-Drag Area Face (ft^2)

1	6.162	280.315	234.725	137.317	110.584
2	9.634	311.127	310.918	145.607	145.607
Total	15.796	591.442	545.643	282.924	256.191

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	6.162	6.162	1096.746	1096.746
2	9.634	10.116	1353.003	1420.654
Total	15.796	16.277	2449.749	2517.399

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	1X	91.500
1	2X	86.500
1	1P	91.500
1	2P	86.500
1	1Y	91.500
1	2Y	86.500
1	1XY	91.500
1	2XY	86.500
1	3X	80.500
1	3P	80.500
1	3Y	80.500
1	3XY	80.500
1	16S	77.500
1	16X	77.500
1	16XY	77.500
1	16Y	77.500
1	4X	74.500
1	4P	74.500
1	4Y	74.500
1	4XY	74.500
1	5X	69.500
1	5P	69.500
1	5Y	69.500
1	5XY	69.500
1	6X	64.500
1	6P	64.500
1	6Y	64.500
1	6XY	64.500
1	8X	59.500
1	8S	59.500
1	8Y	59.500
1	8XY	59.500
1	9X	53.500
1	9S	53.500
1	9Y	53.500
1	9XY	53.500
1	10X	47.000
1	10S	47.000
1	10Y	47.000

1	10XY	47.000
1	12P	91.500
1	12X	91.500
1	13P	86.500
1	13X	86.500
1	14P	74.500
1	14X	74.500
1	15P	64.500
1	15X	64.500
1	i0.50E92S	91.500
1	i0.50E75S	74.500
1	i0.50E65S	64.500
1	23P	64.500
1	24P	74.500
1	25P	91.500
1	26P	101.000
2	10X	47.000
2	11X	32.500
2	10S	47.000
2	11S	32.500
2	10Y	47.000
2	11Y	32.500
2	10XY	47.000
2	11XY	32.500
2	7X	10.000
2	7P	10.000
2	7Y	10.000
2	7XY	10.000
2	17X	0.000
2	17P	0.000
2	17Y	0.000
2	17XY	0.000
2	18S	10.000
2	18Y	10.000
2	19S	10.000
2	19X	10.000
2	i0.50E33S	32.500
2	20P	0.000
2	21P	10.000
2	22P	32.500
2	23P	64.500
2	021PF0.50S	10.000
2	021PF0.50X	10.000
2	21PF0.50S	10.000
2	21PF0.50X	10.000

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	101.000	47.000	55	180	0.00	9.82	288.394	0.00	9.82	561.769
2	47.000	0.000	29	74	9.82	22.52	764.206	9.82	22.52	764.206

*** 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. Required Vertical Load (uplift) (lbs)
1	12P	C-EX1	No Limit
2	12X	C-EX1	No Limit
3	13P	C-EX1	No Limit
4	13X	C-EX1	No Limit
5	14P	C-EX1	No Limit
6	14X	C-EX1	No Limit
7	15P	C-EX1	No Limit
8	15X	C-EX1	No Limit
9	26P	C-EX1	No Limit
10	25P	C-EX1	No Limit
11	24P	C-EX1	No Limit
12	23P	C-EX1	No Limit
13	22P	C-EX1	No Limit
14	21P	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1904700.wi\04_structural\backup documentation\rev (1)\calcs\pls tower\cl&p # 833.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)	101.00 (ft)	
Structure height	101.00 (ft)	
Structure height above ground	101.00 (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 Tubular Arms and Towers	SF for Guys 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)	Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	15 loads	Wind on Face	4	0	0.000	56.000	0.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	15 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
12P	63	710	0	Shield Wire (11/32 CW)
12X	25	946	25	Shield Wire (OPGW-120)
13P	866	1190	384	Conductor (Parakeet)
13X	865	1157	382	Conductor (Parakeet)
14P	866	1174	377	Conductor (Parakeet)
14X	865	1174	389	Conductor (Parakeet)
15P	897	1291	381	Conductor (Parakeet)
15X	895	1055	384	Conductor (Parakeet)
26P	7295	1288	0	Antennas
26P	224	41	0	Coax Cables
25P	201	36	0	Coax Cables
24P	318	58	0	Coax Cables
23P	495	90	0	Coax Cables
22P	643	117	0	Coax Cables
21P	501	91	0	Coax Cables

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

Section Label	Z of	Z of	Ave. Elev.	Res. Adj.	Tran Adj.	Tran Drag	Tran Wind	Long Adj.	Long Drag	Long Wind	Ice Weight	Total Weight

	Top (ft)	Bottom (ft)	Above Ground (ft)	Wind Pres. (psf)	Wind Pres. (psf)	Coef	Load (lbs)	Wind Pres. (psf)	Coef	Load (lbs)	(lbs)	(lbs)
1	101.00	47.00	74.00	10.00	10.00	3.200	3538.7	0.00	3.200	0.0	0	9242
2	47.00	0.00	23.50	10.00	10.00	3.200	4659.4	0.00	3.200	0.0	0	15174

Point Loads for Load Case "NESC Extreme":

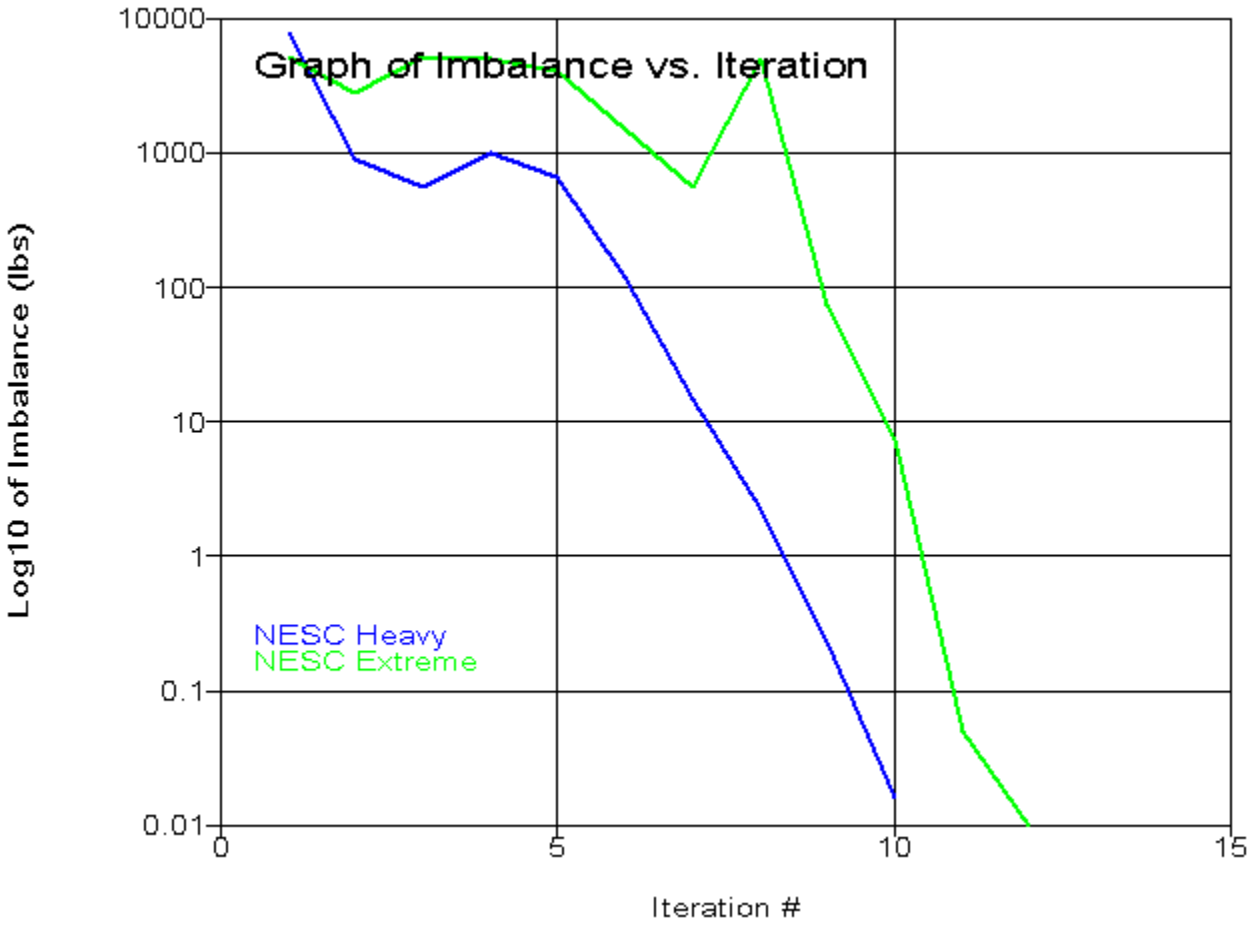
Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
12X	-425	843	25	Shield Wire (11/32 CW)
12P	-474	971	-50	Shield Wire (OPGW-120)
13P	-97	1948	-426	Conductor (Parakeet)
13X	-98	1928	-426	Conductor (Parakeet)
14P	-97	1903	-436	Conductor (Parakeet)
14X	-98	1912	-417	Conductor (Parakeet)
15P	-74	1944	-433	Conductor (Parakeet)
15X	-75	1811	-425	Conductor (Parakeet)
26P	3942	4861	0	Antennas
26P	92	111	0	Coax Cables
25P	83	79	0	Coax Cables
24P	131	126	0	Coax Cables
23P	204	195	0	Coax Cables
22P	265	254	0	Coax Cables
21P	207	198	0	Coax Cables

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

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran Adj. Wind Pres. (psf)	Tran Angle Face Area (ft^2)	Tran Round Face Area (ft^2)	Tran Gross Area (ft^2)	Tran Soli- dity Ratio	Tran Angle Drag Coef	Tran Round Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Round Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli- dity Ratio	Long Angle Drag Coef	Long Round Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	101.00	47.00	74.00	31.41	31.41	71.80	38.78	288.39	0.383	3.200	2.000	9651.8	0.00	98.54	38.78	561.77	0.244	3.200	2.000	0.0	0	6162
2	47.00	0.00	23.50	31.41	31.41	77.08	68.53	764.21	0.191	3.200	2.000	12050.3	0.00	77.08	68.53	764.21	0.191	3.200	2.000	0.0	0	10116

*** Analysis Results:

Maximum element usage is 97.39% for Angle "g38X" in load case "NESC Extreme"
Maximum insulator usage is 16.02% for Clamp "9" 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	4.72	2.439	0.000	0.556	2.439
LEG1	g1X	4.89	0.000	-2.615	-1.537	-2.615
LEG1	g1XY	5.74	0.000	-3.071	-1.706	-3.071
LEG1	g1Y	6.04	3.120	0.000	0.451	3.120

LEG1	g2P	19.76	11.430	0.000	3.549	11.430
LEG1	g2X	22.51	0.000	-11.004	-5.926	-11.004
LEG1	g2XY	25.72	0.000	-12.575	-5.602	-12.575
LEG1	g2Y	20.30	11.737	0.000	4.355	11.737
LEG1	g3P	35.05	20.270	0.000	6.877	20.270
LEG1	g3X	31.73	0.000	-19.110	-9.981	-19.110
LEG1	g3XY	35.67	0.000	-21.488	-8.950	-21.488
LEG1	g3Y	34.04	19.686	0.000	8.558	19.686
LEG1	g4P	39.02	20.150	0.000	6.372	20.150
LEG1	g4X	31.91	0.000	-19.221	-10.490	-19.221
LEG1	g4XY	35.86	0.000	-21.598	-9.541	-21.598
LEG1	g4Y	37.93	19.587	0.000	7.959	19.587
LEG1	g5P	69.51	32.674	0.000	10.624	32.674
LEG1	g5X	57.32	0.000	-30.669	-17.128	-30.669
LEG1	g5XY	62.49	0.000	-33.440	-14.858	-33.440
LEG1	g5Y	63.82	29.999	0.000	13.391	29.999
LEG1	g6P	84.52	41.506	0.000	13.415	41.506
LEG1	g6X	71.76	0.000	-38.399	-22.045	-38.399
LEG1	g6XY	75.89	0.000	-40.609	-18.300	-40.609
LEG1	g6Y	72.62	35.664	0.000	17.131	35.664
LEG2	g7P	85.45	47.914	0.000	15.888	47.914
LEG2	g7X	65.84	0.000	-43.169	-25.859	-43.169
LEG2	g7XY	71.26	0.000	-46.723	-20.547	-46.723
LEG2	g7Y	71.77	40.245	0.000	20.952	40.245
LEG2	g8P	88.77	51.218	0.000	17.077	51.218
LEG2	g8X	77.20	0.000	-45.990	-28.776	-45.990
LEG2	g8XY	87.24	0.000	-51.966	-22.478	-51.966
LEG2	g8Y	75.59	43.614	0.000	23.167	43.614
LEG2	g9P	79.07	50.268	0.000	16.910	50.268
LEG2	g9X	79.15	0.000	-44.451	-28.967	-44.451
LEG2	g9XY	92.16	0.000	-51.758	-22.376	-51.758
LEG2	g9Y	67.86	43.143	0.000	23.345	43.143
LEG3	g10P	75.07	47.507	0.000	16.085	47.507
LEG3	g10X	77.92	0.000	-46.722	-27.711	-46.722
LEG3	g10XY	91.27	0.000	-54.731	-21.250	-54.731
LEG3	g10Y	65.21	41.269	0.000	22.468	41.269
LEG3	g11P	63.13	41.831	0.000	14.260	41.831
LEG3	g11X	63.75	0.000	-37.155	-24.689	-37.155
LEG3	g11XY	75.88	0.000	-44.224	-18.999	-44.224
LEG3	g11Y	54.67	36.224	0.000	20.035	36.224
LEG4	g12P	93.10	56.020	0.000	17.542	56.020
LEG4	g12X	78.85	0.000	-51.766	-35.135	-51.766
LEG4	g12XY	92.02	0.000	-60.412	-27.468	-60.412
LEG4	g12Y	79.21	47.663	0.000	25.403	47.663
XBR1	g13P	27.00	0.000	-3.121	-1.555	-3.121
XBR1	g13X	22.48	3.201	0.000	1.265	3.201
XBR1	g13XY	34.84	4.960	0.000	1.773	4.960
XBR1	g13Y	44.33	0.000	-5.125	-1.868	-5.125
XBR1	g14P	2.42	0.344	-0.072	-0.072	0.344
XBR1	g14X	3.21	0.049	-0.370	0.049	-0.370
XBR1	g14XY	7.01	0.998	0.000	0.118	0.998
XBR1	g14Y	8.29	0.000	-0.959	-0.387	-0.959
XBR2	g15P	31.83	0.000	-5.498	-2.430	-5.498
XBR2	g15X	24.92	5.621	0.000	2.678	5.621
XBR2	g15XY	33.34	7.519	0.000	3.214	7.519
XBR2	g15Y	41.43	0.000	-7.158	-3.172	-7.158
XBR2	g16P	6.69	1.508	0.000	0.995	1.508
XBR2	g16X	18.01	0.000	-2.204	-0.404	-2.204
XBR2	g16XY	3.58	0.288	-0.438	-0.438	0.288

XBR2	g16Y	1.68	0.379	-0.183	-0.183	0.379
XBR2	g17P	33.53	0.000	-5.792	-2.861	-5.792
XBR2	g17X	26.97	6.082	0.000	2.478	6.082
XBR2	g17XY	34.23	7.720	0.000	3.242	7.720
XBR2	g17Y	44.86	0.000	-7.749	-3.321	-7.749
XBR2	g18P	6.50	0.036	-0.795	0.036	-0.795
XBR2	g18X	2.73	0.617	0.000	0.617	0.047
XBR2	g18XY	11.39	2.568	0.000	0.508	2.568
XBR2	g18Y	15.65	0.000	-1.916	-1.213	-1.916
XBR2	g19P	32.39	0.000	-6.150	-2.741	-6.150
XBR2	g19X	31.35	6.386	0.000	3.430	6.386
XBR2	g19XY	31.10	6.337	0.000	3.897	6.337
XBR2	g19Y	34.61	0.000	-6.571	-2.847	-6.571
XBR2	g20P	6.00	1.222	0.000	1.222	1.179
XBR2	g20X	15.89	0.000	-2.223	-0.259	-2.223
XBR2	g20XY	6.41	0.251	-0.897	-0.897	0.251
XBR2	g20Y	4.51	0.919	-0.279	-0.279	0.919
XBR2	g21P	33.58	0.000	-6.376	-2.958	-6.376
XBR2	g21X	32.93	6.709	0.000	3.407	6.709
XBR2	g21XY	30.82	6.279	0.000	4.047	6.279
XBR2	g21Y	35.63	0.000	-6.765	-2.778	-6.765
XBR2	g22P	10.22	0.000	-1.430	-0.177	-1.430
XBR2	g22X	4.23	0.863	0.000	0.863	0.201
XBR2	g22XY	13.72	2.795	0.000	0.053	2.795
XBR2	g22Y	13.03	0.000	-1.822	-1.822	-1.435
XBR3	g23P	7.76	0.160	-0.838	-0.838	0.160
XBR3	g23X	1.10	0.126	0.000	0.126	0.063
XBR3	g23XY	12.74	1.460	0.000	0.973	1.460
XBR3	g23Y	14.29	0.000	-1.785	-1.149	-1.785
XBR3	g24P	24.29	0.000	-2.624	-0.469	-2.624
XBR3	g24X	12.90	1.478	0.000	0.985	1.478
XBR3	g24XY	24.81	2.844	0.000	0.945	2.844
XBR3	g24Y	23.22	0.000	-2.508	-1.642	-2.508
XBR4	g25P	3.04	0.000	-0.282	-0.282	-0.268
XBR4	g25X	3.55	0.544	-0.055	0.544	-0.055
XBR4	g25XY	9.43	1.443	0.000	0.822	1.443
XBR4	g25Y	12.17	0.000	-1.398	-0.918	-1.398
XBR4	g26P	11.46	1.755	0.000	1.145	1.755
XBR4	g26X	22.01	0.000	-1.945	-0.642	-1.945
XBR4	g26XY	10.13	0.000	-0.896	-0.669	-0.896
XBR4	g26Y	12.16	1.862	0.000	0.245	1.862
XBR4	g27P	6.52	0.000	-0.595	-0.595	-0.247
XBR4	g27X	2.42	0.340	0.000	0.189	0.340
XBR4	g27XY	8.50	1.194	0.000	0.669	1.194
XBR4	g27Y	15.03	0.000	-1.372	-0.818	-1.372
XBR4	g28P	19.68	0.000	-1.371	-0.183	-1.371
XBR4	g28X	4.15	0.583	0.000	0.453	0.583
XBR4	g28XY	9.93	1.395	0.000	0.428	1.395
XBR4	g28Y	19.53	0.000	-1.361	-0.867	-1.361
XBR5	g29P	28.54	0.000	-1.375	-1.375	-1.133
XBR5	g29X	9.20	1.060	-0.279	-0.279	1.060
XBR5	g29XY	9.50	1.095	0.000	0.907	1.095
XBR5	g29Y	63.03	0.000	-3.036	-0.895	-3.036
XBR5	g30P	59.54	0.000	-2.868	-2.868	-0.003
XBR5	g30X	46.51	5.360	0.000	2.464	5.360
XBR5	g30XY	53.50	6.165	0.000	2.433	6.165
XBR5	g30Y	73.42	0.000	-3.537	-3.537	0.000
XBR6	g31P	13.19	0.000	-3.216	-3.216	-0.943
XBR6	g31X	13.40	2.758	-1.295	-1.295	2.758

XBR6	g31XY	6.11	1.258	0.000	1.258	0.432
XBR6	g31Y	14.66	0.000	-3.573	-1.332	-3.573
XBR6	g32P	66.24	0.000	-16.151	-8.302	-16.151
XBR6	g32X	70.41	14.497	0.000	6.462	14.497
XBR6	g32XY	75.83	15.614	0.000	6.479	15.614
XBR6	g32Y	68.89	0.000	-16.797	-8.816	-16.797
XBR7	g33P	37.72	3.433	0.000	1.331	3.433
XBR7	g33X	44.35	0.000	-4.036	-1.810	-4.036
XBR7	g33XY	53.63	0.000	-4.880	-2.223	-4.880
XBR7	g33Y	45.96	4.182	0.000	1.771	4.182
XBR7	g34P	4.87	0.000	-0.443	-0.443	-0.270
XBR7	g34X	3.49	0.000	-0.317	-0.317	-0.053
XBR7	g34XY	4.74	0.000	-0.431	-0.061	-0.431
XBR7	g34Y	6.21	0.000	-0.565	-0.107	-0.565
HORZ1	g35P	8.81	0.570	-0.131	0.570	-0.131
HORZ1	g35Y	10.12	0.655	-0.133	-0.133	0.655
HORZ1	g36P	41.44	2.680	0.000	2.680	0.921
HORZ1	g36X	55.02	0.000	-5.007	-2.159	-5.007
HORZ2	g37P	11.11	1.389	-0.620	1.389	-0.620
HORZ2	g37Y	12.46	1.557	-0.632	-0.632	1.557
HORZ2	g38P	94.44	11.805	0.000	7.488	11.805
HORZ2	g38X	97.39	0.000	-13.695	-6.381	-13.695
HORZ3	g39P	21.91	0.000	-3.014	-0.435	-3.014
HORZ3	g39X	13.35	1.877	0.000	1.877	1.561
HORZ3	g39XY	22.12	3.111	0.000	0.830	3.111
HORZ3	g39Y	14.05	0.000	-1.933	-1.821	-1.933
HORZ3	g40P	63.83	8.976	0.000	4.670	8.976
HORZ3	g40X	64.37	0.000	-8.857	-3.844	-8.857
HORZ3	g40XY	59.88	0.000	-8.238	-3.906	-8.238
HORZ3	g40Y	63.05	8.867	0.000	4.271	8.867
InBr	g41P	6.78	0.605	0.000	0.605	0.267
InBr	g41X	20.38	0.142	-0.628	0.142	-0.628
ARM1	g42P	3.23	0.000	-0.588	-0.322	-0.588
ARM1	g42X	2.60	0.474	0.000	0.474	0.367
ARM1	g42XY	3.22	0.586	0.000	0.586	0.469
ARM1	g42Y	4.50	0.000	-0.819	-0.321	-0.819
ARM1	g43P	2.74	0.762	-0.311	0.762	-0.311
ARM1	g43Y	3.15	0.874	-0.258	0.874	-0.258
ARM1	g44P	7.03	0.000	-1.920	-1.920	-0.343
ARM1	g44X	6.87	1.876	-0.859	-0.859	1.876
ARM1	g44XY	2.06	0.563	0.000	0.373	0.563
ARM1	g44Y	6.07	0.000	-1.656	-1.226	-1.656
ARM1	g45P	5.06	0.767	-1.327	-1.327	0.767
ARM1	g45Y	1.77	0.000	-0.464	-0.429	-0.464
ARM2	g46P	13.07	0.000	-3.292	-3.292	-0.051
ARM2	g46X	8.36	2.069	-2.107	-2.107	2.069
ARM2	g46XY	2.24	0.065	-0.564	-0.564	0.065
ARM2	g46Y	8.21	0.000	-2.068	-1.859	-2.068
ARM2	g47P	8.86	0.858	-2.600	-2.600	0.858
ARM2	g47Y	4.15	0.000	-1.219	-1.219	-0.887
ARM1	g48P	10.43	0.000	-1.899	-1.899	-0.589
ARM1	g48X	7.92	1.442	-0.667	-0.667	1.442
ARM1	g48XY	3.58	0.652	0.000	0.220	0.652
ARM1	g48Y	9.40	0.000	-1.710	-1.111	-1.710
ARM1	g49P	6.19	0.340	-1.623	-1.623	0.340
ARM1	g49Y	2.57	0.000	-0.673	-0.673	-0.524
M1	g50P	19.81	1.282	0.000	0.068	1.282
M1	g50X	18.75	0.000	-1.087	-0.679	-1.087
M1	g51P	11.94	0.051	-0.692	0.051	-0.692

M1	g51X	10.67	0.690	0.000	0.690	0.566
M1	g52P	9.28	0.367	-0.538	0.367	-0.538
M1	g52X	12.13	0.785	0.000	0.785	0.509
M1	g53P	45.08	0.000	-2.614	-1.014	-2.614
M1	g53X	42.04	2.719	0.000	1.552	2.719
M2	g54P	34.07	2.204	0.000	0.752	2.204
M2	g54X	24.95	0.000	-2.270	-0.574	-2.270
M2a	g55P	2.66	0.172	0.000	0.085	0.172
M2a	g55X	1.80	0.000	-0.163	-0.129	-0.163
M2	g56P	11.64	0.000	-1.059	-0.435	-1.059
M2	g56X	13.56	0.877	0.000	0.073	0.877
M2	g57P	10.18	0.658	0.000	0.248	0.658
M2	g57X	7.46	0.000	-0.679	-0.679	-0.580
M3	g58P	4.52	0.371	-0.193	-0.193	0.371
M3	g58X	3.90	0.320	-0.141	-0.141	0.320
M4	g59P	9.65	0.716	0.000	0.716	0.000
M4	g59X	13.55	1.006	0.000	1.006	0.000
M4	g59XY	12.53	0.931	0.000	0.931	0.000
M4	g59Y	17.44	1.295	0.000	1.295	0.000
M4	g60P	24.46	1.816	0.000	1.816	0.043
M4	g60X	24.65	1.830	0.000	1.830	0.000
M4	g60XY	29.17	2.166	0.000	2.166	0.000
M4	g60Y	29.70	2.205	-0.048	2.205	-0.048
M4	g61P	9.04	0.671	0.000	0.671	0.214
M4	g61X	9.47	0.703	0.000	0.703	0.346
M4	g61XY	59.67	1.127	-0.355	1.127	-0.355
M4	g61Y	21.57	1.204	-0.128	1.204	-0.128
M4	g62P	22.06	1.638	-0.052	1.638	-0.052
M4	g62Y	26.28	1.951	-0.075	1.951	-0.075
Pwmnt	g63P	2.70	0.000	-17.738	-17.738	-7.931
Pwmnt	g64P	2.72	0.000	-15.430	-15.430	-6.681
Pwmnt	g65P	2.77	0.000	-12.524	-12.524	-5.729
Pwmnt	g66P	1.58	0.000	-10.394	-10.394	-4.900
Pwmnt	g67P	1.47	0.000	-9.062	-9.062	-4.494
Pwmnt	g68P	1.19	0.000	-7.861	-7.861	-4.047
Brace1	g69P	0.92	0.645	0.000	0.578	0.645
Brace1	g69X	0.99	0.000	-0.337	-0.022	-0.337
Brace1	Fg6984P	1.18	0.827	0.000	0.534	0.827
Brace1	Fg6984X	1.54	0.006	-0.525	0.006	-0.525
Brace2	g70P	0.39	0.502	0.000	0.502	0.379
Brace2	g70X	0.14	0.000	-0.102	-0.102	-0.019
Brace2	Fg7083P	0.53	0.688	0.000	0.503	0.688
Brace2	Fg7083X	0.43	0.000	-0.321	-0.084	-0.321
Brace3	g71P	6.47	0.659	0.000	0.659	0.104
Brace3	g71X	3.15	0.000	-0.304	-0.304	-0.086
InBr	ig41P71P	4.88	0.435	0.000	0.435	0.101
InBr	ig41P71X	10.56	0.000	-0.325	-0.030	-0.325
M2	ig57P72P	6.50	0.421	0.000	0.387	0.421
M2	ig57P72X	5.54	0.000	-0.504	-0.504	-0.481
M2	ig56P73P	11.01	0.000	-1.002	-0.312	-1.002
M2	ig56P73X	17.65	1.142	0.000	0.183	1.142
M2	ig54P74P	30.95	2.002	0.000	0.626	2.002
M2	ig54P74X	22.09	0.000	-2.011	-0.638	-2.011
Brace4	g76P	2.38	0.242	-0.096	0.242	-0.096
Brace4	g77P	17.01	1.734	0.000	0.855	1.734
Brace4	g77X	20.08	0.000	-2.047	-1.165	-2.047
Brace4	g78P	2.18	0.098	-0.222	-0.222	0.098
Brace4	g79P	27.97	0.000	-2.851	-0.920	-2.851
Brace4	g79X	26.78	2.730	0.000	0.388	2.730

Brace4	g80P	2.24	0.000	-0.228	-0.165	-0.228
Brace4	g81P	45.89	4.678	0.000	1.751	4.678
Brace4	g81X	46.78	0.000	-4.770	-1.436	-4.770
Brace4	g82P	1.31	0.134	-0.042	0.134	-0.042
M2a	g83P	7.72	0.000	-0.448	-0.448	-0.156
M2a	g83X	5.40	0.176	-0.313	-0.313	0.176
New Br	g86P	1.00	0.000	-0.137	-0.122	-0.137
New Br	g87P	4.24	0.000	-0.577	-0.279	-0.577
New Br	g88P	3.42	0.000	-0.465	-0.057	-0.465
New Br	g89P	2.92	0.396	-0.015	-0.015	0.396
New Br	g90P	0.80	0.062	-0.109	-0.109	0.062
New Br	g91P	3.68	0.500	0.000	0.110	0.500
New Br	g92P	6.01	0.817	0.000	0.170	0.817
New Br	g93P	6.61	0.000	-0.899	-0.261	-0.899

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 10

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	0.02864	0.2062	-0.01772	-0.2973	0.0378	-0.0204	2.529	2.706	91.48
2P	0.02557	0.1802	-0.01751	-0.2948	0.0275	-0.0187	2.526	2.68	86.48
3P	0.02264	0.15	-0.0168	-0.2809	0.0450	-0.0159	2.523	2.65	80.48
4P	0.01799	0.1205	-0.01564	-0.2690	0.0213	-0.0129	2.518	2.621	74.48
5P	0.01645	0.09913	-0.01407	-0.2392	0.0390	-0.0102	2.516	2.599	69.49
6P	0.01196	0.07908	-0.01207	-0.2002	0.0293	-0.0074	2.512	2.579	64.49
7P	0.001033	0.001144	-0.004934	-0.0059	0.0012	0.0114	10	10	9.995
12P	0.02265	0.2074	0.06516	-0.2830	0.0345	-0.0246	0.02265	-13.54	91.57
13P	0.02191	0.1817	0.04477	-0.2754	0.0361	-0.0165	0.02191	-9.568	86.54
14P	0.01569	0.1222	0.05122	-0.1871	0.0338	-0.0026	0.01569	-14.13	74.55
15P	0.01038	0.08021	0.03353	-0.2134	0.0262	-0.0075	0.01038	-10.17	64.53
17P	0	0	0	0.0000	0.0000	0.0000	11.26	11.26	0
20P	0	0	0	-0.0082	0.0005	-0.0042	-1.25	0	0
21P	0.0002479	0.00205	-0.00045	-0.0191	0.0032	-0.0042	-1.25	0.00205	10
22P	0.002465	0.01781	-0.001336	-0.0558	0.0087	-0.0056	-1.248	0.01781	32.5
23P	0.01177	0.08002	-0.002414	-0.2080	0.0285	-0.0099	-1.238	0.08002	64.5
24P	0.01736	0.1213	-0.002764	-0.2497	0.0341	-0.0107	-1.233	0.1213	74.5
25P	0.02781	0.208	-0.003379	-0.3809	0.0361	-0.0120	-1.222	0.208	91.5
26P	0.03384	0.2796	-0.00384	-0.4568	0.0363	-0.0120	-1.216	0.2796	101
1X	0.02694	0.2062	0.00748	-0.2921	0.0292	-0.0195	2.527	-2.294	91.51
1XY	0.02713	0.2081	0.01054	-0.2939	0.0371	-0.0172	-2.473	-2.292	91.51
1Y	0.02863	0.2082	-0.01475	-0.2937	0.0361	-0.0194	-2.471	2.708	91.49
2X	0.02408	0.1804	0.007498	-0.2940	0.0415	-0.0175	2.524	-2.32	86.51
2XY	0.02389	0.182	0.01057	-0.2953	0.0306	-0.0169	-2.476	-2.318	86.51
2Y	0.02555	0.1819	-0.01453	-0.3000	0.0437	-0.0197	-2.474	2.682	86.49
3X	0.01953	0.1494	0.007201	-0.2897	0.0251	-0.0147	2.52	-2.351	80.51
3XY	0.02113	0.1509	0.01019	-0.2976	0.0371	-0.0147	-2.479	-2.349	80.51
3Y	0.0208	0.1511	-0.01385	-0.2836	0.0236	-0.0169	-2.479	2.651	80.49
4X	0.01693	0.1209	0.006563	-0.2578	0.0455	-0.0120	2.517	-2.379	74.51
4XY	0.01671	0.1218	0.009378	-0.2559	0.0261	-0.0125	-2.483	-2.378	74.51
4Y	0.01789	0.1216	-0.01279	-0.2700	0.0535	-0.0144	-2.482	2.622	74.49
5X	0.0126	0.09802	0.005673	-0.2449	0.0277	-0.0121	2.513	-2.402	69.51
5XY	0.0154	0.09919	0.008239	-0.2456	0.0334	-0.0093	-2.485	-2.401	69.51
5Y	0.01335	0.09983	-0.01142	-0.2397	0.0274	-0.0119	-2.487	2.6	69.49
6X	0.01165	0.07932	0.004516	-0.1917	0.0246	-0.0122	2.512	-2.421	64.5
6XY	0.01122	0.08018	0.006754	-0.1923	0.0282	-0.0061	-2.489	-2.42	64.51
6Y	0.01224	0.08007	-0.009754	-0.1999	0.0305	-0.0094	-2.488	2.58	64.49
7X	-0.0007225	0.0008519	0.002402	-0.0205	-0.0234	-0.0178	9.999	-9.999	10
7XY	0.0008602	0.001342	0.003488	-0.0225	0.0226	0.0140	-9.999	-9.999	10
7Y	-0.000789	0.001139	-0.003829	-0.0065	-0.0028	-0.0098	-10	10	9.996
12X	0.03313	0.2072	-0.07666	-0.3138	0.0372	-0.0246	0.03313	13.96	91.42
13X	0.0284	0.1809	-0.05544	-0.3163	0.0327	-0.0239	0.0284	9.931	86.44
14X	0.0215	0.1205	-0.08216	-0.3593	0.0354	-0.0192	0.0215	14.37	74.42
15X	0.01393	0.0795	-0.04413	-0.2670	0.0280	-0.0159	0.01393	10.33	64.46
17X	0	0	0	0.0000	0.0000	0.0000	11.26	-11.26	0
17XY	0	0	0	0.0000	0.0000	0.0000	-11.26	-11.26	0
17Y	0	0	0	0.0000	0.0000	0.0000	-11.26	11.26	0
8S	0.01111	0.06415	-0.01229	-0.1492	0.0084	-0.0057	3.199	3.252	59.49
9S	0.008422	0.04903	-0.01215	-0.1273	0.0256	-0.0034	4.022	4.063	53.49
10S	0.006097	0.03613	-0.01142	-0.0949	0.0120	-0.0041	4.914	4.944	46.99

11S	0.003775	0.01649	-0.009401	-0.0586	0.0050	-0.0048	6.907	6.92	32.49
16S	0.01865	0.1347	0.006871	-0.2716	0.0196	-0.0133	2.519	-2.365	77.51
18S	0.001822	0.0007626	9.835e-005	-0.0246	-0.0340	-0.0066	10	0.0007626	10
19S	8.169e-005	-0.0008464	-0.000257	0.0407	0.0055	0.0017	8.169e-005	9.999	10
i0.50E33S	0.002479	0.01771	-0.002021	-0.0591	0.0300	-0.0032	0.002479	0.01771	32.5
i0.50E65S	0.01176	0.07948	-0.003335	-0.2080	0.0489	-0.0314	0.01176	0.07948	64.5
i0.50E75S	0.01735	0.1212	-0.00381	-0.2497	0.0546	-0.0035	0.01735	0.1212	74.5
i0.50E92S	0.02782	0.2072	-0.004458	-0.3809	0.0562	-0.0478	0.02782	0.2072	91.5
21PF0.50S	0.0004939	0.002273	-0.001637	-0.0070	-0.0026	-0.0046	4.375	-4.998	9.998
021PF0.50S	-0.0001769	0.002331	-0.001158	-0.0083	0.0120	0.0067	-5.625	-4.998	9.999
8X	0.008147	0.06356	0.005043	-0.1592	0.0353	-0.0127	3.196	-3.125	59.51
8XY	0.01036	0.06473	0.007461	-0.1587	0.0074	-0.0024	-3.178	-3.123	59.51
8Y	0.008475	0.06469	-0.009794	-0.1570	0.0409	-0.0069	-3.18	3.253	59.49
9X	0.006384	0.04868	0.005339	-0.1225	0.0116	-0.0084	4.02	-3.965	53.51
9XY	0.007763	0.04969	0.007834	-0.1259	0.0237	-0.0028	-4.006	-3.964	53.51
9Y	0.006602	0.04958	-0.009586	-0.1276	0.0140	-0.0061	-4.007	4.063	53.49
10X	0.004732	0.03591	0.005243	-0.0967	0.0162	-0.0099	4.913	-4.872	47.01
10XY	0.005634	0.03675	0.007658	-0.0978	0.0112	0.0020	-4.903	-4.872	47.01
10Y	0.004977	0.03668	-0.008956	-0.0972	0.0186	-0.0004	-4.903	4.945	46.99
11X	0.001118	0.01599	0.004581	-0.0575	0.0131	-0.0134	6.905	-6.888	32.5
11XY	0.003437	0.01677	0.006646	-0.0568	0.0045	0.0104	-6.9	-6.887	32.51
11Y	0.001054	0.01654	-0.007318	-0.0609	0.0130	0.0093	-6.903	6.92	32.49
16X	0.01989	0.1353	-0.01623	-0.2839	0.0496	-0.0145	2.52	2.635	77.48
16XY	0.01998	0.1364	-0.01333	-0.2833	0.0223	-0.0156	-2.48	2.636	77.49
16Y	0.01877	0.1356	0.00977	-0.2779	0.0472	-0.0137	-2.481	-2.364	77.51
18Y	-0.001669	0.0009701	8.663e-005	-0.0240	0.0316	0.0068	-10	0.0009701	10
19X	6.238e-005	0.002676	-0.0004409	-0.0178	0.0041	-0.0017	6.238e-005	-9.997	10
21PF0.50X	0.001604	0.0005112	-0.004656	-0.0146	0.0129	-0.0053	4.377	5.001	9.995
021PF0.50X	-0.001305	0.000686	-0.004096	-0.0143	-0.0067	0.0043	-5.626	5.001	9.996

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %(kips)	Y Force	Y Usage %	H-Shear Usage %	Z Comp. 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 %
17P	-4.84	0.0	-5.74	0.0	0.0	-36.26	0.0	0.0	37.03	0.0	0.01	0.0	-0.0	0.0	0.0	-0.01	0.0	0.0
20P	0.05	0.0	0.03	0.0	0.0	-18.13	0.0	0.0	18.13	0.0	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.0
17X	2.04	0.0	-3.25	0.0	0.0	17.76	0.0	0.0	18.17	0.0	-0.04	0.0	-0.0	0.0	0.0	0.02	0.0	0.0
17XY	-3.24	0.0	-4.58	0.0	0.0	25.96	0.0	0.0	26.56	0.0	-0.03	0.0	0.0	0.0	0.0	-0.01	0.0	0.0
17Y	3.67	0.0	-5.07	0.0	0.0	-28.77	0.0	0.0	29.44	0.0	0.02	0.0	0.0	0.0	0.0	0.01	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	0.0000	-0.1303	0.0000	0.0000	0.1303	0.0286	0.2062	-0.0177
2P	0.0000	0.0000	-0.1749	0.0000	0.0000	0.1749	0.0256	0.1802	-0.0175
3P	0.0000	0.0000	-0.1165	0.0000	0.0000	0.1165	0.0226	0.1500	-0.0168
4P	0.0000	0.0000	-0.1842	-0.0000	0.0000	0.1842	0.0180	0.1205	-0.0156
5P	0.0000	0.0000	-0.1290	0.0000	0.0000	0.1290	0.0165	0.0991	-0.0141
6P	0.0000	0.0000	-0.1744	0.0000	0.0000	0.1744	0.0120	0.0791	-0.0121
7P	0.0000	0.0000	-0.7724	0.0000	0.0000	0.7724	0.0010	0.0011	-0.0049
12P	0.0000	0.7467	-0.1555	0.0000	-0.7467	0.1555	0.0227	0.2074	0.0652
13P	0.3840	1.2565	-0.9600	-0.3840	-1.2565	0.9600	0.0219	0.1817	0.0448
14P	0.3770	1.2182	-0.9914	-0.3770	-1.2182	0.9914	0.0157	0.1222	0.0512

15P	0.3810	1.3408	-0.9806	-0.3810	-1.3408	0.9806	0.0104	0.0802	0.0335
17P	0.0000	0.0000	-0.1822	4.8391	5.7430	-36.0806	0.0000	0.0000	0.0000
20P	0.0000	0.1700	-0.3906	-0.0504	-0.2047	-17.7376	0.0000	0.0000	0.0000
21P	0.0000	0.6435	-1.9853	0.0000	-0.6435	1.9853	0.0002	0.0021	-0.0004
22P	0.0000	1.0435	-2.8263	0.0000	-1.0435	2.8263	0.0025	0.0178	-0.0013
23P	0.0000	0.8040	-2.1294	-0.0000	-0.8040	2.1294	0.0118	0.0800	-0.0024
24P	0.0000	0.5170	-1.3349	0.0000	-0.5170	1.3349	0.0174	0.1213	-0.0028
25P	0.0000	0.4865	-1.1993	-0.0000	-0.4865	1.1993	0.0278	0.2080	-0.0034
26P	0.0000	1.4905	-7.8724	0.0000	-1.4905	7.8724	0.0338	0.2796	-0.0038
1X	0.0000	0.0681	-0.1303	0.0000	-0.0681	0.1303	0.0269	0.2062	0.0075
1XY	0.0000	0.0681	-0.1354	0.0000	-0.0681	0.1354	0.0271	0.2081	0.0105
1Y	0.0000	0.0000	-0.1354	0.0000	0.0000	0.1354	0.0286	0.2082	-0.0147
2X	0.0000	0.1164	-0.1749	0.0000	-0.1164	0.1749	0.0241	0.1804	0.0075
2XY	0.0000	0.1164	-0.1749	0.0000	-0.1164	0.1749	0.0239	0.1820	0.0106
2Y	0.0000	0.0000	-0.1749	0.0000	0.0000	0.1749	0.0256	0.1819	-0.0145
3X	0.0000	0.1105	-0.1165	0.0000	-0.1105	0.1165	0.0195	0.1494	0.0072
3XY	0.0000	0.1105	-0.1165	0.0000	-0.1105	0.1165	0.0211	0.1509	0.0102
3Y	0.0000	0.0000	-0.1165	0.0000	0.0000	0.1165	0.0208	0.1511	-0.0138
4X	0.0000	0.1139	-0.1842	0.0000	-0.1139	0.1842	0.0169	0.1209	0.0066
4XY	0.0000	0.1139	-0.1893	-0.0000	-0.1139	0.1893	0.0167	0.1218	0.0094
4Y	0.0000	0.0000	-0.1893	-0.0000	0.0000	0.1893	0.0179	0.1216	-0.0128
5X	0.0000	0.1248	-0.1290	0.0000	-0.1248	0.1290	0.0126	0.0980	0.0057
5XY	0.0000	0.1248	-0.1290	0.0000	-0.1248	0.1290	0.0154	0.0992	0.0082
5Y	0.0000	0.0000	-0.1290	0.0000	0.0000	0.1290	0.0133	0.0998	-0.0114
6X	0.0000	0.1121	-0.1744	0.0000	-0.1121	0.1744	0.0117	0.0793	0.0045
6XY	0.0000	0.1121	-0.1795	0.0000	-0.1121	0.1795	0.0112	0.0802	0.0068
6Y	0.0000	0.0000	-0.1795	-0.0000	0.0000	0.1795	0.0122	0.0801	-0.0098
7X	0.0000	0.3783	-0.7724	-0.0000	-0.3783	0.7724	-0.0007	0.0009	0.0024
7XY	0.0000	0.3783	-0.7340	0.0000	-0.3783	0.7340	0.0009	0.0013	0.0035
7Y	0.0000	0.0000	-0.7340	-0.0000	0.0000	0.7340	-0.0008	0.0011	-0.0038
12X	0.0250	0.9460	-0.1175	-0.0250	-0.9460	0.1175	0.0331	0.2072	-0.0767
13X	0.3820	1.1570	-0.9590	-0.3820	-1.1570	0.9590	0.0284	0.1809	-0.0554
14X	0.3890	1.1740	-0.9904	-0.3890	-1.1740	0.9904	0.0215	0.1205	-0.0822
15X	0.3840	1.0550	-0.9786	-0.3840	-1.0550	0.9786	0.0139	0.0795	-0.0441
17X	0.0000	0.1240	-0.1822	-2.0388	3.1295	17.9431	0.0000	0.0000	0.0000
17XY	0.0000	0.1240	-0.1822	3.2425	4.4578	26.1435	0.0000	0.0000	0.0000
17Y	0.0000	0.0000	-0.1822	-3.6705	5.0724	-28.5840	0.0000	0.0000	0.0000
8S	0.0000	0.0000	-0.1356	0.0000	0.0000	0.1356	0.0111	0.0642	-0.0123
9S	0.0000	0.0000	-0.1628	0.0000	0.0000	0.1628	0.0084	0.0490	-0.0121
10S	0.0000	0.0000	-0.3318	0.0000	0.0000	0.3318	0.0061	0.0361	-0.0114
11S	0.0000	0.0000	-0.8665	0.0000	0.0000	0.8665	0.0038	0.0165	-0.0094
16S	0.0000	0.0541	-0.0637	0.0000	-0.0541	0.0637	0.0186	0.1347	0.0069
18S	0.0000	0.0000	-0.2661	0.0000	0.0000	0.2661	0.0018	0.0008	0.0001
19S	0.0000	0.0000	-0.2627	-0.0000	0.0000	0.2627	0.0001	-0.0008	-0.0003
i0.50E33S	0.0000	0.0000	-0.0870	0.0000	0.0000	0.0870	0.0025	0.0177	-0.0020
i0.50E65S	0.0000	0.0000	-0.0248	0.0000	-0.0000	0.0248	0.0118	0.0795	-0.0033
i0.50E75S	0.0000	0.0000	-0.0248	0.0000	-0.0000	0.0248	0.0174	0.1212	-0.0038
i0.50E92S	0.0000	0.0000	-0.0248	0.0000	-0.0000	0.0248	0.0278	0.2072	-0.0045
21PF0.50S	0.0000	0.0000	-0.2005	-0.0000	0.0000	0.2005	0.0005	0.0023	-0.0016
021PF0.50S	0.0000	0.0000	-0.1237	0.0000	0.0000	0.1237	-0.0002	0.0023	-0.0012
8X	0.0000	0.1107	-0.1356	0.0000	-0.1107	0.1356	0.0081	0.0636	0.0050
8XY	0.0000	0.1107	-0.1356	0.0000	-0.1107	0.1356	0.0104	0.0647	0.0075
8Y	0.0000	0.0000	-0.1356	0.0000	0.0000	0.1356	0.0085	0.0647	-0.0098
9X	0.0000	0.1353	-0.1628	0.0000	-0.1353	0.1628	0.0064	0.0487	0.0053
9XY	0.0000	0.1353	-0.1628	0.0000	-0.1353	0.1628	0.0078	0.0497	0.0078
9Y	0.0000	0.0000	-0.1628	0.0000	0.0000	0.1628	0.0066	0.0496	-0.0096
10X	0.0000	0.2449	-0.3318	0.0000	-0.2449	0.3318	0.0047	0.0359	0.0052
10XY	0.0000	0.2449	-0.3318	0.0000	-0.2449	0.3318	0.0056	0.0367	0.0077
10Y	0.0000	0.0000	-0.3318	-0.0000	0.0000	0.3318	0.0050	0.0367	-0.0090

11X	0.0000	0.4669	-0.8665	0.0000	-0.4669	0.8665	0.0011	0.0160	0.0046
11XY	0.0000	0.4669	-0.8926	0.0000	-0.4669	0.8926	0.0034	0.0168	0.0066
11Y	0.0000	0.0000	-0.8926	-0.0000	0.0000	0.8926	0.0011	0.0165	-0.0073
16X	0.0000	0.0000	-0.0637	0.0000	0.0000	0.0637	0.0199	0.1353	-0.0162
16XY	0.0000	0.0000	-0.0637	0.0000	0.0000	0.0637	0.0200	0.1364	-0.0133
16Y	0.0000	0.0541	-0.0637	0.0000	-0.0541	0.0637	0.0188	0.1356	0.0098
18Y	0.0000	0.0000	-0.2593	-0.0000	0.0000	0.2593	-0.0017	0.0010	0.0001
19X	0.0000	0.2472	-0.2627	0.0000	-0.2472	0.2627	0.0001	0.0027	-0.0004
21PF0.50X	0.0000	0.0000	-0.2005	0.0000	0.0000	0.2005	0.0016	0.0005	-0.0047
021PF0.50X	0.0000	0.0000	-0.1237	-0.0000	0.0000	0.1237	-0.0013	0.0007	-0.0041

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 Supported L/R Cap. (kips)	Original Supported RLX	Original Supported RLY	Original Supported RLZ	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported L/R Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g14P	g14Y	Long only	-0.07	-0.39	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g14Y	g14P	Long only	-0.39	-0.07	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g16X	g16XY	Long only	-0.40	-0.44	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g16XY	g16X	Long only	-0.44	-0.40	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g18Y	g18P	Long only	-1.21	0.04	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g20X	g20XY	Long only	-0.26	-0.90	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g20XY	g20X	Long only	-0.90	-0.26	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g22P	g22Y	Long only	-0.18	-1.82	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g22Y	g22P	Long only	-1.82	-0.18	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g23P	g23X	Long only	-0.84	0.13	12.49	0.779	0.559	0.559	129.47	127.26	5	10.80	1.000	147.90	137.16	6
g24P	g24Y	Long only	-0.47	-1.64	12.49	0.779	0.559	0.559	129.47	127.26	5	10.80	1.000	147.90	137.16	6
g24Y	g24P	Long only	-1.64	-0.47	12.49	0.779	0.559	0.559	129.47	127.26	5	10.80	1.000	147.90	137.16	6
g26X	g26XY	Long only	-0.64	-0.67	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g26XY	g26X	Long only	-0.67	-0.64	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g28P	g28Y	Long only	-0.18	-0.87	9.12	0.550	0.775	0.550	171.66	159.41	5	6.97	1.000	221.50	182.42	6
g28Y	g28P	Long only	-0.87	-0.18	9.12	0.550	0.775	0.550	171.66	159.41	5	6.97	1.000	221.50	182.42	6

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	0.763	50.00	50.00	1.53
2	0.954	50.00	50.00	1.91
3	1.627	50.00	50.00	3.25
4	1.551	50.00	50.00	3.10
5	1.615	50.00	50.00	3.23
6	1.584	50.00	50.00	3.17
7	1.704	50.00	50.00	3.41
8	1.489	50.00	50.00	2.98
9	8.012	50.00	50.00	16.02
10	1.294	50.00	50.00	2.59
11	1.432	50.00	50.00	2.86
12	2.276	50.00	50.00	4.55
13	3.013	50.00	50.00	6.03
14	2.087	50.00	50.00	4.17

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 12

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	-0.02812	0.4356	-0.02849	-0.6182	-0.0323	-0.0744	2.472	2.936	91.47
2P	-0.02472	0.3795	-0.02794	-0.5907	-0.0488	-0.0654	2.475	2.88	86.47
3P	-0.01811	0.3133	-0.0264	-0.6190	-0.0242	-0.0568	2.482	2.813	80.47
4P	-0.01602	0.251	-0.02403	-0.5664	-0.0703	-0.0473	2.484	2.751	74.48
5P	-0.009183	0.2038	-0.02108	-0.5128	-0.0306	-0.0443	2.491	2.704	69.48
6P	-0.009605	0.163	-0.0175	-0.4095	-0.0311	-0.0412	2.49	2.663	64.48
7P	0.001757	0.002129	-0.007184	-0.0049	0.0002	-0.0086	10	10	9.993
12P	-0.05121	0.4422	0.2583	-1.4525	-0.0510	-0.0903	-0.05121	-13.31	91.76
13P	-0.03959	0.3854	0.2132	-1.8646	-0.0320	-0.0732	-0.03959	-9.365	86.71
14P	-0.03116	0.2541	0.1436	-0.6032	-0.0441	-0.0514	-0.03116	-14	74.64
15P	-0.01903	0.1657	0.08041	-0.5091	-0.0339	-0.0486	-0.01903	-10.08	64.58
17P	0	0	0	0.0000	0.0000	0.0000	11.26	11.26	0
20P	0	0	0	-0.0186	-0.0009	-0.0103	-1.25	0	0
21P	-0.0002358	0.004414	-0.0002021	-0.0390	-0.0023	-0.0103	-1.25	0.004414	10
22P	-0.00274	0.03572	-0.0006051	-0.1117	-0.0061	-0.0161	-1.253	0.03572	32.5
23P	-0.01096	0.1661	-0.001336	-0.4447	-0.0344	-0.0324	-1.261	0.1661	64.5
24P	-0.01808	0.2534	-0.001845	-0.5151	-0.0446	-0.0358	-1.268	0.2534	74.5
25P	-0.03137	0.4423	-0.003094	-0.9254	-0.0455	-0.0414	-1.281	0.4423	91.5
26P	-0.0388	0.6244	-0.004939	-1.1813	-0.0457	-0.0416	-1.289	0.6244	101
1X	-0.03461	0.4359	0.02611	-0.6665	-0.0560	-0.0713	2.465	-2.064	91.53
1XY	-0.0343	0.4432	0.02241	-0.6588	-0.0536	-0.0730	-2.534	-2.057	91.52
1Y	-0.02847	0.4429	-0.03264	-0.6274	-0.0468	-0.0698	-2.528	2.943	91.47
2X	-0.03035	0.3797	0.02621	-0.7027	-0.0131	-0.0623	2.47	-2.12	86.53
2XY	-0.0305	0.3857	0.02246	-0.7194	-0.0771	-0.0726	-2.531	-2.114	86.52
2Y	-0.02452	0.3853	-0.03203	-0.6018	-0.0419	-0.0652	-2.525	2.885	86.47
3X	-0.02742	0.3137	0.02536	-0.5983	-0.0722	-0.0555	2.473	-2.186	80.53
3XY	-0.02339	0.3182	0.02159	-0.6041	-0.0272	-0.0645	-2.523	-2.182	80.52
3Y	-0.0222	0.3183	-0.03031	-0.6287	-0.0596	-0.0581	-2.522	2.818	80.47
4X	-0.02032	0.2512	0.02353	-0.5676	-0.0189	-0.0497	2.48	-2.249	74.52
4XY	-0.02046	0.2551	0.01983	-0.5713	-0.0766	-0.0555	-2.52	-2.245	74.52
4Y	-0.01586	0.2548	-0.02768	-0.5704	-0.0139	-0.0516	-2.516	2.755	74.47
5X	-0.01961	0.2041	0.02085	-0.5121	-0.0547	-0.0458	2.48	-2.296	69.52
5XY	-0.01314	0.2077	0.0174	-0.5116	-0.0359	-0.0482	-2.513	-2.292	69.52
5Y	-0.01583	0.2079	-0.02448	-0.5106	-0.0467	-0.0462	-2.516	2.708	69.48
6X	-0.01233	0.1631	0.01733	-0.4091	-0.0397	-0.0419	2.488	-2.337	64.52
6XY	-0.01308	0.1669	0.01439	-0.4129	-0.0378	-0.0407	-2.513	-2.333	64.51
6Y	-0.008876	0.1667	-0.0207	-0.4166	-0.0434	-0.0408	-2.509	2.667	64.48
7X	-0.001902	0.002432	0.007758	-0.0501	-0.0487	-0.0073	9.998	-9.998	10.01
7XY	0.001592	0.002597	0.006538	-0.0522	0.0476	0.0055	-9.998	-9.997	10.01
7Y	-0.001877	0.002832	-0.008362	-0.0071	-0.0064	0.0045	-10	10	9.992
12X	-0.01176	0.4392	-0.07943	-0.0692	-0.0458	-0.0900	-0.01176	14.19	91.42
13X	-0.01664	0.3827	-0.03379	0.2307	-0.0499	-0.0624	-0.01664	10.13	86.47
14X	-0.008446	0.2527	-0.1384	-0.5355	-0.0432	-0.0299	-0.008446	14.5	74.36
15X	-0.003763	0.1649	-0.08391	-0.5116	-0.0396	-0.0401	-0.003763	10.41	64.42
17X	0	0	0	0.0000	0.0000	0.0000	11.26	-11.26	0
17XY	0	0	0	0.0000	0.0000	0.0000	-11.26	-11.26	0
17Y	0	0	0	0.0000	0.0000	0.0000	-11.26	11.26	0
8S	-0.003283	0.1311	-0.0177	-0.3162	-0.0702	-0.0384	3.185	3.319	59.48
9S	0.0004785	0.1002	-0.01725	-0.2544	-0.0205	-0.0295	4.014	4.114	53.48
10S	0.002204	0.07386	-0.01627	-0.1952	-0.0067	-0.0262	4.91	4.982	46.98

11S	-0.0002801	0.03311	-0.01368	-0.1185	-0.0018	-0.0199	6.903	6.937	32.49
16S	-0.02292	0.2822	0.02444	-0.6031	-0.0798	-0.0523	2.477	-2.218	77.52
18S	-8.24e-005	0.001814	-0.0001754	-0.0498	-0.0457	-0.0136	10	0.001814	10
19S	-7.158e-005	0.00219	4.741e-005	0.0846	-0.0071	-0.0008	-7.158e-005	10	10
i0.50E33S	-0.002747	0.03595	-0.002448	-0.1211	0.0770	0.0143	-0.002747	0.03595	32.5
i0.50E65S	-0.01095	0.1646	-0.001912	-0.4446	0.0563	-0.0838	-0.01095	0.1646	64.5
i0.50E75S	-0.01809	0.253	-0.002213	-0.5150	0.0466	-0.0118	-0.01809	0.253	74.5
i0.50E92S	-0.03137	0.4396	-0.003374	-0.9252	0.0439	-0.1655	-0.03137	0.4396	91.5
21PF0.50S	-0.00124	0.003243	-0.00114	-0.0202	-0.0115	-0.0085	4.374	-4.997	9.999
021PF0.50S	0.000948	0.003279	-0.004205	-0.0127	0.0170	0.0124	-5.624	-4.997	9.996
8X	-0.01277	0.1315	0.01815	-0.3122	0.0023	-0.0383	3.175	-3.057	59.52
8XY	-0.007662	0.1345	0.01522	-0.3352	-0.0620	-0.0323	-3.196	-3.054	59.52
8Y	-0.008026	0.1348	-0.02163	-0.3293	0.0028	-0.0334	-3.196	3.323	59.48
9X	-0.009487	0.1005	0.01836	-0.2558	-0.0362	-0.0293	4.004	-3.913	53.52
9XY	-0.006251	0.103	0.01553	-0.2673	-0.0117	-0.0302	-4.02	-3.911	53.52
9Y	-0.003925	0.1032	-0.02181	-0.2699	-0.0500	-0.0325	-4.018	4.117	53.48
10X	-0.006927	0.07397	0.01754	-0.1954	-0.0116	-0.0291	4.901	-4.834	47.02
10XY	-0.004834	0.07589	0.01494	-0.2097	-0.0241	-0.0162	-4.913	-4.832	47.01
10Y	0.001821	0.07609	-0.02125	-0.2051	-0.0136	-0.0191	-4.906	4.984	46.98
11X	-0.005203	0.03336	0.01481	-0.1175	0.0001	-0.0207	6.898	-6.87	32.51
11XY	-0.0002248	0.03364	0.01269	-0.1174	-0.0211	0.0179	-6.904	-6.87	32.51
11Y	-0.00457	0.03417	-0.01615	-0.1290	0.0186	0.0147	-6.908	6.938	32.48
16X	-0.01803	0.2819	-0.02522	-0.5955	-0.0082	-0.0525	2.482	2.782	77.47
16XY	-0.01807	0.2862	-0.02899	-0.6095	-0.0734	-0.0544	-2.518	2.786	77.47
16Y	-0.02287	0.2865	0.02071	-0.6089	-0.0180	-0.0604	-2.523	-2.213	77.52
18Y	-6.479e-005	0.002201	-0.0001827	-0.0487	0.0803	0.0138	-10	0.002201	10
19X	-9.177e-005	0.002267	-0.0004183	-0.0374	-0.0107	0.0010	-9.177e-005	-9.998	10
21PF0.50X	0.0009478	0.003075	-0.007283	-0.0240	0.0198	-0.0104	4.376	5.003	9.993
021PF0.50X	-0.001286	0.003432	-0.01013	-0.0326	-0.0212	0.0114	-5.626	5.003	9.99

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
17P	-6.96	0.0	-9.87	0.0	0.0	-54.16	0.0	0.0	55.49	0.0	0.04	0.0	-0.0	0.0	0.0	0.01	0.0	0.0
20P	-0.03	0.0	-0.04	0.0	0.0	-8.28	0.0	0.0	8.28	0.0	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.0
17X	7.17	0.0	-9.90	0.0	0.0	57.04	0.0	0.0	58.34	0.0	-0.07	0.0	-0.1	0.0	0.0	0.01	0.0	0.0
17XY	-5.91	0.0	-9.39	0.0	0.0	49.06	0.0	0.0	50.30	0.0	-0.06	0.0	0.1	0.0	0.0	-0.01	0.0	0.0
17Y	8.32	0.0	-11.59	0.0	0.0	-63.43	0.0	0.0	65.01	0.0	0.06	0.0	0.0	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	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0281	0.4356	-0.0285
2P	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0247	0.3795	-0.0279
3P	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0181	0.3133	-0.0264
4P	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0160	0.2510	-0.0240
5P	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0092	0.2038	-0.0211
6P	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0096	0.1630	-0.0175
7P	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	0.0018	0.0021	-0.0072
12P	-0.0500	1.1465	0.3620	0.0500	-1.1465	-0.3620	-0.0512	0.4422	0.2583
13P	-0.4260	2.1235	-0.0150	0.4260	-2.1235	0.0150	-0.0396	0.3854	0.2132
14P	-0.4360	2.0785	-0.0150	0.4360	-2.0785	0.0150	-0.0312	0.2541	0.1436

15P	-0.4330	2.1195	-0.0380	0.4330	-2.1195	0.0380	-0.0190	0.1657	0.0804
17P	0.0000	0.4155	-0.3488	6.9627	9.4504	-53.8124	0.0000	0.0000	0.0000
20P	0.0000	0.4155	-0.3488	0.0267	-0.3785	-7.9311	0.0000	0.0000	0.0000
21P	0.0000	0.6135	-0.5558	0.0000	-0.6135	0.5558	-0.0002	0.0044	-0.0002
22P	0.0000	0.6695	-0.6138	0.0000	-0.6695	0.6138	-0.0027	0.0357	-0.0006
23P	0.0000	0.7860	-0.6649	0.0000	-0.7860	0.6649	-0.0110	0.1661	-0.0013
24P	0.0000	0.3015	-0.2430	0.0000	-0.3015	0.2430	-0.0181	0.2534	-0.0018
25P	0.0000	0.2545	-0.1950	-0.0000	-0.2545	0.1950	-0.0314	0.4423	-0.0031
26P	0.0000	5.1475	-4.1460	0.0000	-5.1475	4.1460	-0.0388	0.6244	-0.0049
1X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0346	0.4359	0.0261
1XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0343	0.4432	0.0224
1Y	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0285	0.4429	-0.0326
2X	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0303	0.3797	0.0262
2XY	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0305	0.3857	0.0225
2Y	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0245	0.3853	-0.0320
3X	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0274	0.3137	0.0254
3XY	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0234	0.3182	0.0216
3Y	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0222	0.3183	-0.0303
4X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0203	0.2512	0.0235
4XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0205	0.2551	0.0198
4Y	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0159	0.2548	-0.0277
5X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0196	0.2041	0.0208
5XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0131	0.2077	0.0174
5Y	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0158	0.2079	-0.0245
6X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0123	0.1631	0.0173
6XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0131	0.1669	0.0144
6Y	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0089	0.1667	-0.0207
7X	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	-0.0019	0.0024	0.0078
7XY	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	0.0016	0.0026	0.0065
7Y	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0019	0.0028	-0.0084
12X	0.0250	1.0185	0.3130	-0.0250	-1.0185	-0.3130	-0.0118	0.4392	-0.0794
13X	-0.4260	2.1035	-0.0140	0.4260	-2.1035	0.0140	-0.0166	0.3827	-0.0338
14X	-0.4170	2.0875	-0.0140	0.4170	-2.0875	0.0140	-0.0084	0.2527	-0.1384
15X	-0.4250	1.9865	-0.0370	0.4250	-1.9865	0.0370	-0.0038	0.1649	-0.0839
17X	0.0000	0.4155	-0.3488	-7.1727	9.4845	57.3923	0.0000	0.0000	0.0000
17XY	0.0000	0.4155	-0.3488	5.9147	8.9767	49.4110	0.0000	0.0000	0.0000
17Y	0.0000	0.4155	-0.3488	-8.3194	11.1754	-63.0791	0.0000	0.0000	0.0000
8S	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0033	0.1311	-0.0177
9S	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	0.0005	0.1002	-0.0172
10S	0.0000	0.5910	-0.4609	-0.0000	-0.5910	0.4609	0.0022	0.0739	-0.0163
11S	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0003	0.0331	-0.0137
16S	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0229	0.2822	0.0244
18S	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	-0.0001	0.0018	-0.0002
19S	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	-0.0001	0.0022	0.0000
i0.50E33S	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	-0.0027	0.0360	-0.0024
i0.50E65S	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0110	0.1646	-0.0019
i0.50E75S	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0181	0.2530	-0.0022
i0.50E92S	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0314	0.4396	-0.0034
21PF0.50S	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0012	0.0032	-0.0011
021PF0.50S	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	0.0009	0.0033	-0.0042
8X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0128	0.1315	0.0182
8XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0077	0.1345	0.0152
8Y	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0080	0.1348	-0.0216
9X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0095	0.1005	0.0184
9XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0063	0.1030	0.0155
9Y	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0039	0.1032	-0.0218
10X	0.0000	0.5910	-0.4609	0.0000	-0.5910	0.4609	-0.0069	0.0740	0.0175
10XY	0.0000	0.5910	-0.4609	-0.0000	-0.5910	0.4609	-0.0048	0.0759	0.0149
10Y	0.0000	0.5910	-0.4609	-0.0000	-0.5910	0.4609	0.0018	0.0761	-0.0213

11X	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	-0.0052	0.0334	0.0148
11XY	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0002	0.0336	0.0127
11Y	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0046	0.0342	-0.0162
16X	0.0000	0.1755	-0.1120	0.0000	-0.1755	0.1120	-0.0180	0.2819	-0.0252
16XY	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0181	0.2862	-0.0290
16Y	0.0000	0.1755	-0.1120	-0.0000	-0.1755	0.1120	-0.0229	0.2865	0.0207
18Y	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0001	0.0022	-0.0002
19X	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0001	0.0023	-0.0004
21PF0.50X	0.0000	0.4155	-0.3488	0.0000	-0.4155	0.3488	0.0009	0.0031	-0.0073
021PF0.50X	0.0000	0.4155	-0.3488	-0.0000	-0.4155	0.3488	-0.0013	0.0034	-0.0101

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 Supported L/R Cap. (kips)	Original Supported RLX	Original Supported RLY	Original Supported RLZ	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported L/R Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g16X	g16XY	Long only	-2.20	0.29	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g18P	g18Y	Long only	-0.80	-1.92	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g18Y	g18P	Long only	-1.92	-0.80	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g20X	g20XY	Long only	-2.22	0.25	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g22P	g22Y	Long only	-1.43	-1.44	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g22Y	g22P	Long only	-1.44	-1.43	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g24P	g24Y	Long only	-2.62	-2.51	12.49	0.779	0.559	0.559	129.47	127.26	5	10.80	1.000	147.90	137.16	6
g24Y	g24P	Long only	-2.51	-2.62	12.49	0.779	0.559	0.559	129.47	127.26	5	10.80	1.000	147.90	137.16	6
g25P	g25X	Long only	-0.27	-0.05	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g25X	g25P	Long only	-0.05	-0.27	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g26X	g26XY	Long only	-1.95	-0.90	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g26XY	g26X	Long only	-0.90	-1.95	11.49	0.563	0.781	0.563	148.89	142.05	5	8.84	1.000	188.20	161.94	6
g28P	g28Y	Long only	-1.37	-1.36	9.12	0.550	0.775	0.550	171.66	159.41	5	6.97	1.000	221.50	182.42	6
g28Y	g28P	Long only	-1.36	-1.37	9.12	0.550	0.775	0.550	171.66	159.41	5	6.97	1.000	221.50	182.42	6

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	1.203	50.00	50.00	2.41
2	1.066	50.00	50.00	2.13
3	2.166	50.00	50.00	4.33
4	2.146	50.00	50.00	4.29
5	2.124	50.00	50.00	4.25
6	2.129	50.00	50.00	4.26
7	2.164	50.00	50.00	4.33
8	2.032	50.00	50.00	4.06
9	6.610	50.00	50.00	13.22
10	0.321	50.00	50.00	0.64
11	0.387	50.00	50.00	0.77
12	1.029	50.00	50.00	2.06
13	0.908	50.00	50.00	1.82
14	0.828	50.00	50.00	1.66

*** 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 Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Cont-rol	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R Comp.	KL/R Comp.	Length No. Of Member Bolts	Curve No. (ft)
LEG1	L4X4X1/4	SAE	4X4X0.25	33.0	84.52	Tens	75.89	g6XY	-40.609	NESC Ext	53.509	109.200	168.750	1.000	1.000	1.000	75.47	75.47	5.000	1 12
LEG2	L4X4X5/16	SAE	4X4X0.3125	33.0	92.16	Comp	92.16	g9XY	-51.758	NESC Ext	56.161	91.000	175.781	1.000	1.000	1.000	100.46	100.46	6.622	1 10
LEG3	L4X4X3/8	SAE	4X4X0.375	33.0	91.27	Comp	91.27	g10XY	-54.731	NESC Ext	59.963	91.000	210.937	0.500	0.500	0.500	112.48	112.48	14.772	1 10
XBR1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	44.33	Comp	44.33	g13Y	-5.125	NESC Ext	11.559	18.200	21.094	0.750	0.500	0.500	123.69	122.85	7.071	5 2
XBR2	L3X2X3/16	SAU	3X2X0.1875	33.0	44.86	Comp	44.86	g17Y	-7.749	NESC Ext	17.275	27.300	31.641	0.500	0.750	0.500	120.57	120.47	7.810	5 3
XBR3	L2X2X3/16	SAE	2X2X0.1875	33.0	24.81	Tens	24.29	g24P	-2.624	NESC Ext	10.802	18.200	21.094	0.779	1.000	0.559	147.90	137.16	7.604	6 2
XBR4	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	22.01	Cross	22.01	g26X	-1.945	NESC Ext	8.840	18.200	21.094	0.563	1.000	0.563	188.20	161.94	9.410	6 2
XBR5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	73.42	Comp	73.42	g30Y	-3.537	NESC Hea	4.817	33.600	20.391	0.792	0.584	0.584	266.28	231.51	18.808	5 2
HORZ1	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	55.02	Comp	55.02	g36X	-5.007	NESC Ext	10.506	9.100	10.547	1.000	0.500	0.500	148.55	148.55	9.817	4 1
HORZ2	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	97.39	Comp	97.39	g38X	-13.695	NESC Ext	15.230	16.800	14.062	0.500	0.500	0.500	156.90	156.90	13.807	4 1
ARM1	**L3X2.5X1/4**	**SAU**	**3X2.5X0.25**	**33.0**	**10.43**	**Comp**	**10.43**	**g48P**	**-1.899**	**NESC Hea**	**27.682**	**18.200**	**28.125**	**1.000**	**0.500**	**0.500**	**103.41**	**111.70**	**8.143**	**3 2**
A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g44P g44X g44XY g44Y ??																				
ARM2	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	13.07	Comp	13.07	g46P	-3.292	NESC Hea	25.189	27.300	42.187	1.000	0.500	0.500	132.50	127.69	12.013	6 3
M1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	45.08	Comp	45.08	g53P	-2.614	NESC Ext	5.799	9.100	10.547	1.000	1.000	1.000	174.93	174.93	5.000	4 1
M2	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	34.07	Tens	24.95	g54X	-2.270	NESC Ext	11.437	9.100	10.547	1.500	1.000	1.000	123.69	123.69	3.536	4 1
M3	L2.5X2.5X3/16	SAE	2.5X2.5X0.1875	33.0	4.52	Tens	2.12	g58P	-0.193	NESC Hea	10.714	9.100	10.547	1.000	1.000	1.000	155.23	155.23	6.403	4 1
M4	BAR 1.75X1/4	Bar	1-3/4x1/4	33.0	59.67	Comp	59.67	g61XY	-0.355	NESC Ext	0.595	9.100	14.062	1.000	1.000	1.000	458.68	458.68	9.556	4 1
XBR6	L4x4x5/16	SAE	4X4X0.3125	36.0	75.83	Tens	68.89	g32Y	-16.797	NESC Ext	24.380	33.600	33.984	0.667	0.333	0.333	182.75	167.86	28.312	5 2
LEG4	L4x4x5/16	SAE	4X4X0.3125	33.0	93.10	Tens	92.02	g12XY	-60.412	NESC Ext	65.648	91.000	175.781	0.500	0.500	0.500	77.05	77.05	10.158	1 10

XBR7	L3.5x2.5x1/4	SAU	3.5X2.5X0.25	33.0	53.63	Comp	53.63	g33XY	-4.880	NESC Ext	14.836	9.100	14.062	1.000	0.500	0.500	166.68	166.68	15.112	4	1
HORZ3	L4x3x1/4	SAU	4X3X0.25	33.0	64.37	Comp	64.37	g40X	-8.857	NESC Ext	13.759	16.800	14.062	2.000	1.000	1.000	187.50	187.50	10.000	4	1
Pwmnt	12" Std Pipe	Pwmnt	Pipe 12" Std.	50.0	2.77	Comp	2.77	g65P	-12.524	NESC Hea	452.775	0.000	0.000	1.000	1.000	1.000	87.47	87.47	32.000	1	0
Brace2	L5x5x3/8	SAE	5X5X0.375	36.0	0.53	Tens	0.43	Fg7083X	-0.321	NESC Ext	75.176	0.000	0.000	1.000	2.000	1.000	115.78	115.78	7.526	1	0
Brace1	L4x4x1/4	SAE	4X4X0.25	36.0	1.54	Comp	1.54	Fg6984X	-0.525	NESC Ext	34.124	0.000	0.000	1.000	2.000	1.000	127.56	127.56	6.644	4	0
Brace3	L3x3x3/16	SAE	3X3X0.1875	36.0	6.47	Tens	3.15	g71X	-0.304	NESC Hea	9.665	16.800	10.195	1.000	1.000	1.000	179.66	179.66	8.923	4	1
Brace4	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**46.78**	**Comp**	**46.78**	**g81X**	**-4.770**	**NESC Ext**	**17.105**	**16.800**	**10.195**	**1.000**	**1.000**	**1.000**	**85.13**	**102.56**	**2.795**	**3**	**1**
A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g81P ??																					
InBr	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	20.38	Comp	20.38	g41X	-0.628	NESC Ext	3.080	9.100	10.547	1.000	1.000	1.000	274.38	274.38	9.763	4	1
M5	L2x2x1/4	SAE	2X2X0.25	36.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0
M2a	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	7.72	Comp	7.72	g83P	-0.448	NESC Hea	5.799	9.100	10.547	1.000	1.000	1.000	174.93	174.93	5.000	4	1
New Br	L3x3x1/4	SAE	3X3X0.25	36.0	6.61	Comp	6.61	g93P	-0.899	NESC Ext	22.725	16.800	13.594	1.000	1.000	1.000	134.67	134.67	6.644	4	1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Steel Size	Max Usage Strength (ksi)	Usage Cont-rol %	Max Tension Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts	Hole Of Diameter (in)
LEG1	L4X4X1/4	SAE	4X4X0.25	33.0	84.52	Tens	84.52	g6P	41.506	NESC Ext	49.108	109.200	168.750	187.078	5.000	12	2.410	0.75
LEG2	L4X4X5/16	SAE	4X4X0.3125	33.0	92.16	Comp	88.77	g8P	51.218	NESC Ext	57.698	0.000	0.000	0.000	6.113	0	2.780	0.75
LEG3	L4X4X3/8	SAE	4X4X0.375	33.0	91.27	Comp	75.07	g10P	47.507	NESC Ext	63.288	91.000	210.937	260.367	14.772	10	3.350	0.75
XBR1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	44.33	Comp	34.84	g13XY	4.960	NESC Ext	14.237	18.200	21.094	16.066	7.071	2	1.000	0.75
XBR2	L3X2X3/16	SAU	3X2X0.1875	33.0	44.86	Comp	34.23	g17XY	7.720	NESC Ext	22.553	27.300	31.641	22.904	7.810	3	1.000	0.75
XBR3	L2X2X3/16	SAE	2X2X0.1875	33.0	24.81	Tens	24.81	g24XY	2.844	NESC Ext	16.910	18.200	21.094	11.461	7.604	2	1.000	0.75
XBR4	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	22.01	Cross	12.16	g26Y	1.862	NESC Ext	19.880	18.200	21.094	15.311	9.410	2	1.000	0.75
XBR5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	73.42	Comp	53.50	g30XY	6.165	NESC Ext	25.048	33.600	20.391	11.524	18.808	2	1.000	0.6875
HORZ1	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	55.02	Comp	41.44	g36P	2.680	NESC Hea	17.096	9.100	10.547	6.469	9.817	1	1.000	0.75
HORZ2	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	97.39	Comp	94.44	g38P	11.805	NESC Ext	30.090	16.800	14.062	12.500	13.807	1	1.000	0.6875
ARM1	**L3X2.5X1/4**	**SAU**	**3X2.5X0.25**	**33.0**	**10.43**	**Comp**	**7.92**	**g48X**	**1.442**	**NESC Ext**	**27.769**	**18.200**	**28.125**	**37.500**	**8.143**	**2**	

2.000 0.75 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g44P g44X g44XY g44Y ??

ARM2	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	13.07	Comp	7.58	g46X	2.069NESC Ext	31.630	27.300	42.187	43.969	12.013	3
2.000	0.75														
M1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	45.08	Comp	42.04	g53X	2.719NESC Ext	14.237	9.100	10.547	6.469	5.000	1
1.000	0.75														
M2	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	34.07	Tens	34.07	g54P	2.204NESC Ext	14.237	9.100	10.547	6.469	3.536	1
1.000	0.75														
M3	L2.5X2.5X3/16	SAE	2.5X2.5X0.1875	33.0	4.52	Tens	4.52	g58P	0.371NESC Ext	22.613	9.100	10.547	8.203	6.403	1
1.000	0.75														
M4	BAR 1.75X1/4	Bar	1-3/4x1/4	33.0	59.67	Comp	29.70	g60Y	2.205NESC Hea	7.425	9.100	14.062	10.937	12.382	1
1.000	0.75														
XBR6	L4x4x5/16	SAE	4X4X0.3125	36.0	75.83	Tens	75.83	g32XY	15.614NESC Ext	70.799	33.600	33.984	20.590	28.312	2
1.000	0.6875														
LEG4	L4x4x5/16	SAE	4X4X0.3125	33.0	93.10	Tens	93.10	g12P	56.020NESC Ext	60.173	91.000	175.781	172.334	10.158	10
2.460	0.75														
XBR7	L3.5x2.5x1/4	SAU	3.5X2.5X0.25	33.0	53.63	Comp	45.96	g33Y	4.182NESC Ext	29.774	9.100	14.062	14.706	15.112	1
1.000	0.75														
HORZ3	L4x3x1/4	SAU	4X3X0.25	33.0	64.37	Comp	63.83	g40P	8.976NESC Ext	37.663	16.800	14.062	17.883	10.000	1
1.000	0.6875														
Pwmnt	12" Std Pipe Pwmnt		Pipe 12" Std.	50.0	2.77	Comp	0.00	g68P	0.000		679.999	0.000	0.000	0.000	9.500	0
0.000	0														
Brace2	L5x5x3/8	SAE	5X5X0.375	36.0	0.53	Tens	0.53	Fg7083P	0.688NESC Ext	129.960	0.000	0.000	0.000	7.526	0
0.000	0														
Brace1	L4x4x1/4	SAE	4X4X0.25	36.0	1.54	Comp	1.18	Fg6984P	0.827NESC Ext	69.840	0.000	0.000	0.000	6.644	0
0.000	0														
Brace3	L3x3x3/16	SAE	3X3X0.1875	36.0	6.47	Tens	6.47	g71P	0.659NESC Hea	31.139	16.800	10.195	13.594	8.923	1
1.000	0.6875														
Brace4	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**46.78**	**Comp**	**45.89**	**g81P**	**4.678NESC Ext**	**18.827**	**16.800**	**10.195**	**13.594**	**2.795**	**1**
1.000	**0.6875**														

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g81P ??

InBr	L2.5X2X3/16	SAU	2.5X2X0.1875	33.0	20.38	Comp	6.78	g41P	0.605NESC Hea	19.880	9.100	10.547	8.930	9.763	1
1.000	0.75														
M5	L2x2x1/4	SAE	2X2X0.25	36.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0
0.000	0														
M2a	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	7.72	Comp	2.66	g55P	0.172NESC Ext	14.237	9.100	10.547	6.469	7.071	1
1.000	0.75														
New Br	L3x3x1/4	SAE	3X3X0.25	36.0	6.61	Comp	6.01	g92P	0.817NESC Ext	41.087	16.800	13.594	15.104	6.644	1
1.000	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	73.42	g30Y	Angle
NESC Extreme	97.39	g38X	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)

1	Clamp	2.41	NESC Extreme	0.0
2	Clamp	2.13	NESC Extreme	0.0
3	Clamp	4.33	NESC Extreme	0.0
4	Clamp	4.29	NESC Extreme	0.0
5	Clamp	4.25	NESC Extreme	0.0
6	Clamp	4.26	NESC Extreme	0.0
7	Clamp	4.33	NESC Extreme	0.0
8	Clamp	4.06	NESC Extreme	0.0
9	Clamp	16.02	NESC Heavy	0.0
10	Clamp	2.59	NESC Heavy	0.0
11	Clamp	2.86	NESC Heavy	0.0
12	Clamp	4.55	NESC Heavy	0.0
13	Clamp	6.03	NESC Heavy	0.0
14	Clamp	4.17	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	12P	0.000	0.747	0.156	0.763
NESC Heavy	2	Clamp	12X	0.025	0.946	0.118	0.954
NESC Heavy	3	Clamp	13P	0.384	1.256	0.960	1.627
NESC Heavy	4	Clamp	13X	0.382	1.157	0.959	1.551
NESC Heavy	5	Clamp	14P	0.377	1.218	0.991	1.615
NESC Heavy	6	Clamp	14X	0.389	1.174	0.990	1.584
NESC Heavy	7	Clamp	15P	0.381	1.341	0.981	1.704
NESC Heavy	8	Clamp	15X	0.384	1.055	0.979	1.489
NESC Heavy	9	Clamp	26P	0.000	1.490	7.872	8.012
NESC Heavy	10	Clamp	25P	0.000	0.486	1.199	1.294
NESC Heavy	11	Clamp	24P	0.000	0.517	1.335	1.432
NESC Heavy	12	Clamp	23P	0.000	0.804	2.129	2.276
NESC Heavy	13	Clamp	22P	0.000	1.043	2.826	3.013
NESC Heavy	14	Clamp	21P	0.000	0.643	1.985	2.087
NESC Extreme	1	Clamp	12P	-0.050	1.146	-0.362	1.203
NESC Extreme	2	Clamp	12X	0.025	1.018	-0.313	1.066
NESC Extreme	3	Clamp	13P	-0.426	2.123	0.015	2.166
NESC Extreme	4	Clamp	13X	-0.426	2.103	0.014	2.146
NESC Extreme	5	Clamp	14P	-0.436	2.078	0.015	2.124
NESC Extreme	6	Clamp	14X	-0.417	2.087	0.014	2.129
NESC Extreme	7	Clamp	15P	-0.433	2.119	0.038	2.164
NESC Extreme	8	Clamp	15X	-0.425	1.986	0.037	2.032
NESC Extreme	9	Clamp	26P	0.000	5.147	4.146	6.610
NESC Extreme	10	Clamp	25P	0.000	0.254	0.195	0.321
NESC Extreme	11	Clamp	24P	0.000	0.301	0.243	0.387
NESC Extreme	12	Clamp	23P	0.000	0.786	0.665	1.029
NESC Extreme	13	Clamp	22P	0.000	0.670	0.614	0.908
NESC Extreme	14	Clamp	21P	0.000	0.614	0.556	0.828

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	Total Long. Load	Total Vert. Load	Transverse Overturning Moment	Longitudinal Overturning Moment	Torsional Moment

	(kips)	(kips)	(kips)	(ft-k)	(ft-k)	(ft-k)
NESC Heavy	10.418	2.322	15.019	832.577	162.860	-2.677
NESC Extreme	19.084	-2.588	3.486	1569.909	-201.030	-8.664

*** Weight of structure (lbs):
    Weight of Angles*Section DLF: 16277.4
    Total: 16277.4

*** End of Report

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Subject:	Foundation Analysis Tower # 833
Location:	Trumbull, CT
Rev. 1: 6/1/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19047.00

Foundation Analysis

Input Data:

Max. Reactions at Tower Leg:

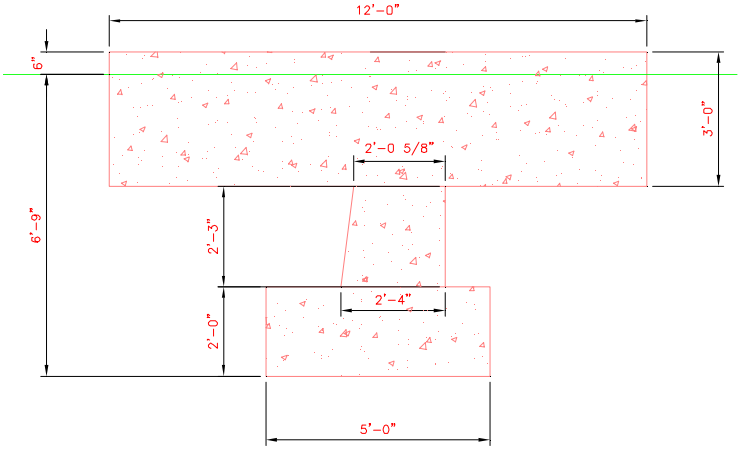
Shear =	Shear := 12.08·1.1·kips = 13.3·kips	(User Input)
Compression =	Comp := 63.43·1.1·kips = 69.8·kips	(User Input)
Uplift =	Uplift := 57.04·1.1·kips = 62.7·kips	(User Input)

Foundation Properties:

Pier Height =	$P_H := 2.25 \cdot ft$	(User Input)
Pier Width Top =	$P_{w1} := 2.05 \cdot ft$	(User Input)
Pier Width Botttom =	$P_{w2} := 2.33 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 0.5 \cdot ft$	(User Input)
Pad Width =	$Pd_w := 5 \cdot ft$	(User Input)
Pad Thickness =	$Pd_t := 2.0 \cdot ft$	(User Input)
Mat Width =	$Mat_w := 12 \cdot ft$	(User Input)
Mat Thickness =	$Mat_t := 3 \cdot ft$	(User Input)
Depth Below Grade =	$H := 6.75 \cdot ft$	(User Input)

Subgrade Properties:

Concrete Unit Weight =	$\gamma c := 150 \cdot pcf$	(User Input)
Water Unit Weight =	$\gamma w := 62.4 \cdot pcf$	(User Input)
Soil Unit Weight =	$\gamma s := 100 \cdot pcf$	(User Input)
Uplift Angle =	$\psi := 30.0 \cdot deg$	(User Input)
Soil Bearing Capacity =	$BC_{soil} := 9000 \cdot psf$	(User Input)
Coefficient of Friction =	$\mu := 0.45$	(User Input)



Calculated Data:

Volume of the Concrete Pad = $V_{pad} := Pd_w^2 \cdot Pd_t = 50 \cdot ft^3$

Volume of the Concrete Mat = $V_{mat} := Mat_w^2 \cdot Mat_t = 432 \cdot ft^3$

Volume of the Concrete Pier = $V_{pier} := \frac{P_H}{3} \cdot \left(P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2} \right) = 10.806 \cdot ft^3$

Total Vdume of Concrete = $V_{Conc} := V_{pad} + V_{mat} + V_{pier} = 493 \cdot ft^3$

Resisting Pyramid Base 1 = $B_1 := Pd_w^2 = 25\,ft^2$

Resisting Pyramid Base 2 = $B_2 := \left[2 \cdot \tan(\psi) \cdot \left(H + P_P - Pd_t - Mat_t \right) + Pd_w \right]^2 = 57.731\,ft^2$

Volume of Soil = $V_{Soil} := \left[\frac{(P_H)}{3} \cdot \left(B_1 + B_2 + \sqrt{B_1 \cdot B_2} \right) \right] - V_{pier} = 79.735 \cdot ft^3$

Mass of Concrete = $Mass_{Conc} := V_{Conc} \cdot \gamma c = 73.9 \cdot kips$

Mass of Soil = $Mass_{Soil} := V_{Soil} \cdot \gamma s = 8 \cdot kips$

Total Mass = $Total_{mass} := Mass_{Conc} + Mass_{Soil} = 81.894 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Total_{mass}}{Uplift} = 1.31$

$Uplift\_Check := if\left(\frac{Total_{mass}}{Uplift} \geq F_S, "OK", "Overstressed" \right)$

Uplift_Check = "OK"

Check Sliding:

Sliding Resistance = $S_R := \mu \cdot \left(Mass_{Conc} \right) = 33.264 \cdot kips$

$Sliding\_Check := if\left(Shear \leq S_R, "OK", "No Good" \right)$

Sliding_Check = "OK"

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Subject:	Foundation Analysis Tower # 833
Location:	Trumbull, CT
Rev. 1: 6/1/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19047.00

Check Bearing:

Cross Sectional Area of Pad = $A_{pad} := Pd_w^{\,2} = 25\,ft^2$

Section Modulus of Pad = $S_{pad} := \frac{(Pd_w)^3}{6} = 21 \cdot ft^3$

Mass of Pad and Pier = $Mass_{pad.pier} := (V_{pad} + V_{pier}) \cdot \gamma c = 9.1 \cdot kips$

$$Bearing := \frac{Comp + Mass_{pad.pier}}{A_{pad}} + \frac{Shear \cdot (H + P_P)}{S_{pad}} = 7.78 \cdot ksf$$

$Bearing\_Check := if(Bearing \le BC_{soil}, "OK", "No Good")$

Bearing_Check = "OK"

Check Overturning:

Overturning Moment = $OM := Uplift \cdot \frac{Mat_w}{2} + Shear \cdot (P_H + Pd_t) = 432.9 \cdot k \cdot ft$

Resisting Moment = $RM := Total_{mass} \cdot \frac{Mat_w}{2} = 491.4 \cdot k \cdot ft$

$$ActualFS := \frac{RM}{OM} = 1.13$$

$Overturning\_Check := if\left(\frac{RM}{OM} \ge F_S, "OK", "No Good"\right)$

Overturning_Check = "OK"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT5090	**DATE:**	06/29/2018	**RF DESIGN ENG:**	Parminder Singh
ISSUE:	Bronze Standard	**Approved? (Y/N):**	Yes	**RF DESIGN PHONE:**	8607214315
REVISION:	Final	**RF MANAGER:**	John Benedetto	**RF DESIGN EMAIL:**	sp656b@att.com
INITIATIVE /PROJECT:	LTE 3C WCS, LTE 4C 850, 700 B/C 4T4R Retrofit (Software 4T4R).				

RF PERF ENG:		**RFDS PROGRAM TYPE:**	2019 LTE Next Carrier		
RF PERF PHONE:		**RFDS TECHNOLOGY:**	LTE		
RF PERF EMAIL:		**STATE/STATUS:**	As Built/In Progress		
RFDS VERSION:	1.00	**RFDS ID:**	2454466		
GSM FREQUENCY:		**Created By:**	sp656b	**Updated By:**	mr673a
UMTS FREQUENCY:	850	**Date Created:**	6/29/2018 5:52:48 PM	**Date Updated:**	10/17/2018 3:22:27 PM
LTE FREQUENCY:	700, 850, 1900, WCS				
5G FREQUENCY:	850				
I-PLAN JOB # 1:	NER-RCTB-18-05684	**IPLAN PRD GRP || SUB GRP #1:**	LTE Next Carrier || LTE 3C		
I-PLAN JOB # 2:	NER-RCTB-18-05838	**IPLAN PRD GRP || SUB GRP #2:**	LTE Next Carrier || LTE 4C		
I-PLAN JOB # 3:	NER-RCTB-18-06218	**IPLAN PRD GRP || SUB GRP #3:**	Antenna Modifications || 4TX4RX Software Retrofit		
I-PLAN JOB # 4:		**IPLAN PRD GRP || SUB GRP #4:**			
I-PLAN JOB # 5:		**IPLAN PRD GRP || SUB GRP #5:**			
I-PLAN JOB # 6:		**IPLAN PRD GRP || SUB GRP #6:**			
I-PLAN JOB # 7:		**IPLAN PRD GRP || SUB GRP #7:**			
I-PLAN JOB # 8:		**IPLAN PRD GRP || SUB GRP #8:**			

Section 2 - LOCATION INFORMATION

USID:	25871	**FA LOCATION CODE:**	10092214	**LOCATION NAME:**	TRUMBULL SOUTH EAST
REGION:	NORTHEAST	**MARKET CLUSTER:**	NEW ENGLAND	**MARKET:**	CONNECTICUT
ADDRESS:	2891 NICHOLS AVENUE	**CITY:**	TRUMBULL	**STATE:**	CT
ZIP CODE:	06611	**COUNTY:**	FAIRFIELD	**LONG (DEC. DEG.):**	-73.1592881
LATITUDE (D-M-S):	41d 13m58.37196s	**LONGITUDE (D-M-S):**	-73d -9m-33.43716s	**LAT (DEC. DEG.):**	41.2328811
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	TRUMBULL / NICHOLS (LATTICE POWER POLE)5090MERRITT PARKWAY NORTH. GET OFF EXIT 51 NICHOLS ROAD (RT108) MAKE LEFT AT END OF RAMP. FOLLOW TO 2ND LIGHT JUST BEFORE LIGHT YOU WILL SEE A YELLOW FIRE HYDRANT ON YOUR RIGHT, TAKE RIGHT INTO DIRT ROAD TO POWER POLE OUR SITE IS AT THE BASE OF THE LATTICE TOWER. SITE IS LOCATED AT THE INTERSECTION OF RT 8 AND NICHOLS ROAD. DEMARC IS OUTSIDE THE GATE IN A GRAY BOX. ADDRESS: NICHOLS AVE, TRUMBULL, CONNECTICUT 06606ACCESS: 24/7 (8899) (6664)CONTACT: UNITED ILLUMINATINGSECURITY: NONE IF GATE COMBOS DONT WORK CALL PETER 2036736710 HE WILL COME OUT AND LET YOU INPOWER COMPANY: UNITED ILLUMINATING (800) 722-5584METER#: 014000494 ACCOUNT# 0100001269465 8APPLETON PLUG: VR20312-S39POLICE/FIRE: (203-261-3665)CIRCUITS: GSM HCGS 738264 ET-108HCGS 738580 ET-103UMTS #1 HCGS730411 AID=168-16#2 HCGS730413 AID=168-15				

ORACLE PTN # 1:	2051A0JD9Q	**PACE JOB # 1:**	MRCTB033554		
ORACLE PTN # 2:	2051A0JD83	**PACE JOB # 2:**	MRCTB033718		
ORACLE PTN # 3:	2051A0JD46	**PACE JOB # 3:**	MRCTB033889		
ORACLE PTN # 4:		**PACE JOB # 4:**			
ORACLE PTN # 5:		**PACE JOB # 5:**			
ORACLE PTN # 6:		**PACE JOB # 6:**			
ORACLE PTN # 7:		**PACE JOB # 7:**			
ORACLE PTN # 8:		**PACE JOB # 8:**			
BORDER CELL WITH CONTOUR COORD:		**SEARCH RING NAME:**			
AM STUDY REQ'D (Y/N):	No	**SEARCH_RING_ID:**			
FREQ COORD:		**BTA:**		**MSA / RSA:**	
OPS DISTRICT:	CT-South	**LAC(GSM):**			
OPS ZONE:	NE_CT_S_FRFD_CTL_CS	**LAC(UMTS):**	05991		
RF DISTRICT:	NPO Triage	**BSC(GSM):**			
RF ZONE:	Hotseat	**RNC(UMTS):**	BRPTCT04CR0R05		
PARENT NAME(GSM):		**MME POOL ID(LTE):**	FF01		
PARENT NAME(UMTS):	BRIDGEPORT RNC05				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

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

CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	**GROUND ELEVATION (ft):**	0	**STRUCTURE TYPE:**	UTILITY
ADDITIONAL REGULATORY?:	No	**HEIGHT OVERALL (ft):**	104	**FCC ASR NUMBER:**	0
SUB-LEASE RIGHTS?:	No	**STRUCTURE HEIGHT (ft):**	101.68		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:			
MARKET LOCATION 850 MHz Band:	On-Air		
MARKET LOCATION 1900 MHz Band:			
MARKET LOCATION AWS Band:			
MARKET LOCATION WCS Band:			
MARKET LOCATION Future Band:			

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911				INTRADO_MIAMI		0				
SECTOR B				INTRADO_MIAMI		0				
SECTOR C				INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911				INTRADO_MIAMI		0				
SECTOR B				INTRADO_MIAMI		0				
SECTOR C				INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS							
RBS ID:	172634	222830	401758	360132								
CTS COMMON ID:	CTU5090	CTV5090	CTU4090	CTL05090								
CELL ID / BCF:	CTU5090	CTU5090	CTU4090	CTL05090								
BTA/TID:	321V	321U	321W	321L								
4-9 DIGIT SITE ID:	9090	5090	04090	5090								
COW OR TOY?:	No	No	No	No								
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED								
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL								
BTS LOCATION ID:	GROUND	GROUND	GROUND	INTERNAL								
BASE STATION TYPE:	BASE	OVERLAY	OVERLAY	BASE								
EQUIPMENT NAME:	TRUMBELL SOUTH EAST	TRUMBULL SOUTH EAST	TRUMBELL SOUTH EAST	TRUMBULL SOUTH EAST								
DISASTER PRIORITY:	1	1	0	3								

Section 6 - RBS GENERAL INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS							
RBS ID:	222830			360132	RFDS_37692032							
CTS COMMON ID:	CTV5090			CTL05090	CTN0005090							
CELL ID / BCF:	CTU5090			CTL05090	CTN0005090							
BTA/TID:	321U			321L	321L							
4-9 DIGIT SITE ID:	5090			5090	05090							
COW OR TOY?:	No			No	No							
CELL SITE TYPE:	SECTORIZED			SECTORIZED	SECTORIZED							
SITE TYPE:	MACRO-CONVENTIONAL			MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND			INTERNAL	INTERNAL							
BASE STATION TYPE:	OVERLAY			BASE	BASE							
EQUIPMENT NAME:	TRUMBULL SOUTH EAST			TRUMBULL SOUTH EAST	TRUMBULL SOUTH EAST							
DISASTER PRIORITY:	1			3	3							

Section 7 - RBS SPECIFIC INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON								
EQUIPMENT TYPE:	3106 OUTDOOR	3106 OUTDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU								
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:				CT								
AGPS:	Yes	Yes	Yes	Yes								
NODE B NUMBER:	0	0	0	5090								

Section 7 - RBS SPECIFIC INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	ERICSSON			ERICSSON	ERICSSON							
EQUIPMENT TYPE:	3106 OUTDOOR			6601 INDOOR MU	BASEBAND 6630 5G							
BASEBAND CONFIGURATION:				1x6601 / 1x5216 / 1xXMU03	xxxxx / 1x6630 / xxxxx							
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:				CT	CT							
AGPS:	Yes			Yes	Yes							
NODE B NUMBER:	0			5090	5090							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
CTS Common ID	CTU5090	CTV5090	CTU4090	CTL05090															
Soft Sector IDs	CTU50907	CTV50901	CTV4090A	CTL05090_7A_1															
	CTU50908	CTV50902	CTV4090B	CTL05090_7B_1															
	CTU50909	CTV50903	CTV4090C	CTL05090_7C_1															
				CTL05090_9A_1															
				CTL05090_9A_2															
				CTL05090_9B_1															
				CTL05090_9B_2															
				CTL05090_9C_1															
				CTL05090_9C_2															

Section 8 - RBS/SECTOR ASSOCIATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
CTS Common ID	CTV5090			CTL05090	CTN0005090														
Soft Sector IDs	CTV50901			CTL05090_3A_1	CTN0005090_F1N5A_1														
	CTV50902			CTL05090_3B_1	CTN0005090_F1N5B_1														
	CTV50903			CTL05090_3C_1	CTN0005090_F1N5C_1														
				CTL05090_7A_1															
				CTL05090_7B_1															
				CTL05090_7C_1															
				CTL05090_8A_1															
				CTL05090_8B_1															
				CTL05090_8C_1															
				CTL05090_9A_1															
				CTL05090_9A_2															
				CTL05090_9B_1															
				CTL05090_9B_2															
				CTL05090_9C_1															
				CTL05090_9C_2															

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																	
USEID (excluding Hard Sector)	25871.850.3G.1	25871.1900.3G.1	25871.850.3G.2																							
SECTOR A **SOFT SECTOR ID**	CTV50901	CTU50907	CTV4090A	CTL05090_7A_1		CTL05090_9A_1		CTL05090_9A_2																		
SECTOR B	CTV50902	CTU50908	CTV4090B	CTL05090_7B_1		CTL05090_9B_1		CTL05090_9B_2																		
SECTOR C	CTV50903	CTU50909	CTV4090C	CTL05090_7C_1		CTL05090_9C_1		CTL05090_9C_2																		
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																	
USEID (excluding Hard Sector)	25871.850.3G.1																									
SECTOR A **SOFT SECTOR ID**	CTV50901			CTL05090_7A_1	CTL05090_8A_1	CTL05090_9A_1	CTL05090_3A_1	CTL05090_9A_2	CTN0005090_F1N5A_1																	
SECTOR B	CTV50902			CTL05090_7B_1	CTL05090_8B_1	CTL05090_9B_1	CTL05090_3B_1	CTL05090_9B_2	CTN0005090_F1N5B_1																	
SECTOR C	CTV50903			CTL05090_7C_1	CTL05090_8C_1	CTL05090_9C_1	CTL05090_3C_1	CTL05090_9C_2	CTN0005090_F1N5C_1																	
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - Cell Number - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																	
USEID (excluding Hard Sector)	25871.850.3G.1	25871.1900.3G.1	25871.850.3G.2																							
SECTOR A **CELL NUMBER**				15		8		178																		
SECTOR B				16		9		179																		
SECTOR C				17		10		180																		
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - Cell Number - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																	
USEID (excluding Hard Sector)	25871.850.3G.1																									
SECTOR A **CELL NUMBER**				15	1	8	149	178	1																	
SECTOR B				16	2	9	150	179	2																	
SECTOR C				17	3	10	151	180	3																	
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 10 - CID/SAC - existing

		UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																		
SECTOR A	CID/SAC	50901	50907	40901																								
SECTOR B		50902	50908	40902																								
SECTOR C		50903	50909	40903																								
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 10 - CID/SAC - final

		UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850																		
SECTOR A	CID/SAC	50901																										
SECTOR B		50902																										
SECTOR C		50903																										
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 11 - CURRENT RADIO COUNTS existing

		GSM 1ST 850	UMTS 1ST 850	UMTS 2ND 1900	UMTS 3RD 850	LTE 1ST 700																						
SECTOR A	RADIO COUNTS	1	1	1	1	1																						
SECTOR B		2	1	1	1	1																						
SECTOR C		2	1	1	1	1																						
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 13 - NEW/PROPOSED RADIO COUNTS

	GSM 1ST 850	UMTS 1ST 850	UMTS 2ND 1900	UMTS 3RD 850	LTE 1ST 700																						
SECTOR A RADIO COUNTS	1	1	1	1	1																						
SECTOR B	2	1	1	1	1																						
SECTOR C	2	1	1	1	1																						
SECTOR D																											
SECTOR E																											
SECTOR F																											
OMNI																											

Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						HPA-65R-BUU-H6							
ANTENNA VENDOR	Powerwave						CCI Products							
ANTENNA SIZE (H x W x D)	55X11X5						72X14.8X9							
ANTENNA WEIGHT	35						50.7							
AZIMUTH	30						30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	101						101							
ANTENNA TIP HEIGHT	103						104							
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						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)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							6	Andrew APTDC-BDFDM-DBW						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					2	Kaelus DBC2055F1V1-2						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Powerwave 7070						LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					2	DTMABP7819VG12A (Twin 700/850 Bypass)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860						AiSG Diplexer						
PDU FOR TMAS (QTY/MODEL)	1	LGP 18104 (Full Dual Band TMA)												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11 (REUSE ONLY)						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							2	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		25871.A.850.3G.1	CTV50901	CTV50901		UMTS 850	7770.00.850.01	13.5	30	1	None	Andrew 7/8 (850)	135		0				272.9		1	
	PORT 2		25871.A.850.3G.2	CTV5090A	CTV50901	Decom	UMTS 850	7770.00.850.01	13.5	30	1	Bottom	Andrew 7/8 (850)	135		0				272.9		2	
	PORT 3		25871.A.1900.3G.1	CTU50907	CTU50907	Decom	UMTS 1900	7770.00.1900.00	15.5	30	0	None	Andrew 7/8 (850)	135		0				286.42		1	
	PORT 5		25871.A.850.25G.1	321G50901	321G50901	Decom	GSM 850	7770.00.850.01	13.5	30	1	None	Andrew 7/8 (850)	135	RxAIT 850	1	LLC 850			272.9		1	

ANTENNA POSITION 4	**PORT 1**		25871.A.700.4G.1	CTL05090_7A_1	CTL05090_7A_1		LTE 700	HPA-65R-BUU-H6_719MHz_06DT	14.08	30	2	BOTTOM	ANDREW 7/8"	135		0				827.9421		7	
	PORT 3		25871.A.1900.4G.1	CTL05090_9A_1	CTL05090_9A_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_04DT	17.15	30	4	BOTTOM	ANDREW 7/8"	135		0				3258.367		7	
	PORT 4			CTL05090_9A_2	CTL05090_9A_2		LTE 1900	HPA-65R-BUU-H6_1930MHz_04DT	17.15	30	4	BOTTOM	ANDREW 7/8"	135		0				3258.367		7	

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770			HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave			CCI Products			
ANTENNA SIZE (H x W x D)	55X11X5			72X14.8X9			
ANTENNA WEIGHT	35			50.7			
AZIMUTH	150			150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	101			101			
ANTENNA TIP HEIGHT	103			104			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			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)	2 Powerwave 7020			Internal			
SURGE ARRESTOR (QTY/MODEL)			6 Andrew APTDC-BDFDM-DBW				
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901			2 Kaelus DBC2055F1V1-2			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 17201 (Full Dual Band)			2 DTMABP7819VG12A (Twin 700/850 Bypass)			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860			AiSG Diplexer			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11 (REUSE ONLY)			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				2 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		25871.B.850.3G.1	CTV50902	CTV50902		UMTS 850	7770.00.850.00	13.5	150	0	None	Andrew 7/8 (850)	135		0				272.9		9	
	PORT 2		25871.B.850.3G.2	CTV5090B	CTV50902	Decom	UMTS 850	7770.00.850.00	13.5	150	0	Bottom	Andrew 7/8 (850)	135		0				272.9		10	
	PORT 3		25871.B.1900.3G.1	CTU50908	CTU50908	Decom	UMTS 1900	7770.00.1900.00	15.5	150	0	None	Andrew 7/8 (850)	135		0				286.42		9	
	PORT 5		25871.B.850.25G.1	321G50902	321G50902	Decom	GSM 850	7770.00.850.00	13.5	150	0	None	Andrew 7/8 (850)	135	RxAIT 850	2	LLC 850			272.9		9	

ANTENNA POSITION 4	**PORT 1**		25871.B.700.4G.1	CTL05090_7B_1	CTL05090_7B_1		LTE 700	HPA-65R-BUU-H6_719MHz_02DT	14.28	150	2	BOTTOM	ANDREW 7/8	135		0				827.9421		15	
	PORT 3		25871.B.1900.4G.1	CTL05090_9B_1	CTL05090_9B_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_03DT	17	150	3	BOTTOM	ANDREW 7/8	135		0				3258.367		15	
	PORT 4			CTL05090_9B_2	CTL05090_9B_2		LTE 1900	HPA-65R-BUU-H6_1930MHz_03DT	17	150	3	BOTTOM	ANDREW 7/8	135		0				3258.367		15	

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						HPA-65R-BUU-H6							
ANTENNA VENDOR	Powerwave						CCI Products							
ANTENNA SIZE (H x W x D)	55X11X5						72X14.8X9							
ANTENNA WEIGHT	35						50.7							
AZIMUTH	260						270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	101						101							
ANTENNA TIP HEIGHT	103						104							
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						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)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							6	Andrew APTDC-BDFDM-DBW						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					2	Kaelus DBC2055F1V1-2						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)								LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					2	DTMABP7819VG12A (Twin 700/850 Bypass)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860						AiSG Diplexer						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11 (REUSE ONLY)						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							2	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		25871.C.850.3G.1	CTV50903	CTV50903		UMTS 850	7770.00.850.01	13.5	260	1	None	Andrew 7/8 (850)	135		0				272.9		17	
	PORT 2		25871.C.850.3G.2	CTV5090C	CTV50903	Decom	UMTS 850	7770.00.850.01	13.5	260	1	Bottom	Andrew 7/8 (850)	135		0				272.9		18	
	PORT 3		25871.C.1900.3G.1	CTU50909	CTU50909	Decom	UMTS 1900	7770.00.1900.00	15.5	260	0	None	Andrew 7/8 (850)	135		0				286.42		17	
	PORT 5		25871.C.850.25G.1	321G50903	321G50903	Decom	GSM 850	7770.00.850.01	13.5	260	1	None	Andrew 7/8 (850)	135	RxAIT 850	2	LLC 850			272.9		17	

ANTENNA POSITION 4	**PORT 1**		25871.C.700.4G.1	CTL05090_7C_1	CTL05090_7C_1		LTE 700	HPA-65R-BUU-H6_719MHz_02DT	14.28	270	2	BOTTOM	ANDREW 7/8	135		0				827.9421		23	
	PORT 3		25871.C.1900.4G.1	CTL05090_9C_1	CTL05090_9C_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_04DT	17.15	270	4	BOTTOM	ANDREW 7/8	135		0				3258.367		23	
	PORT 4			CTL05090_9C_2	CTL05090_9C_2		LTE 1900	HPA-65R-BUU-H6_1930MHz_04DT	17.15	270	4	BOTTOM	ANDREW 7/8	135		0				3258.367		23	

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	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				EPBQ-654L8H6-L2			
ANTENNA VENDOR				KMW			
ANTENNA SIZE (H x W x D)				73X21X6.3			
ANTENNA WEIGHT				72.8			
AZIMUTH				30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				101			
ANTENNA TIP HEIGHT				104			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)			8	TSXDC-4310FM			
DIPLEXER (QTY/MODEL)			4	QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)			2	TMA2117F00V1-1			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AiSG			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1	B5/B12 4449			
RRH - 850 band (QTY/MODEL)				RRH is shared with another band			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)			1	RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx						

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 4	PORT 2		25871.A.850.4G.1	CTL05090_8A_1	CTL05090_8A_1		LTE 850	EPBQ-654L8H6-L2_851MHz_06DT	15.49	30	6	BOTTOM	ANDREW 7/8	135						1000		7	
	PORT 5		25871.A.850.5G.1	CTN0005090_8A_1	CTN0005090_8A_1		5G 850	EPBQ-654L8H6-L2_851MHz_06DT	15.49	30	6	BOTTOM	ANDREW 7/8	135						1000		7	

	PORT 7		25871.A.WCS.4G.1	CTL05090_3A_1	CTL05090_3A_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	30	3	BOTTOM	ANDREW 7/8	135						1285.2866		8	

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	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				EPBQ-654L8H6-L2			
ANTENNA VENDOR				KMW			
ANTENNA SIZE (H x W x D)				73X21X6.3			
ANTENNA WEIGHT				72.8			
AZIMUTH				150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				101			
ANTENNA TIP HEIGHT				104			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)				8 TSXDC-4310FM			
DIPLEXER (QTY/MODEL)				4 QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 TMA2117F00V1-1			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AiSG			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 B5/B12 4449			
RRH - 850 band (QTY/MODEL)				RRH is shared with another band			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx						

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 4	PORT 2		25871.B.850.4G.1	CTL05090_8B_1	CTL05090_8B_1		LTE 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	150	2	BOTTOM	ANDREW 7/8	135						1000		15	
	PORT 5		25871.B.850.5G.1	CTN0005090_8B_1	CTN0005090_8B_1		5G 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	150	2	BOTTOM	ANDREW 7/8	135						1000		15	

	PORT 7		25871.B.WCS.4G.1	CTL05090_3B_1	CTL05090_3B_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	150	3	BOTTOM	ANDREW 7/8	135							1285.2866		16	

Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	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				EPBQ-654L8H6-L2			
ANTENNA VENDOR				KMW			
ANTENNA SIZE (H x W x D)				73X21X6.3			
ANTENNA WEIGHT				72.8			
AZIMUTH				270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				101			
ANTENNA TIP HEIGHT				104			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)				8 TSXDC-4310FM			
DIPLEXER (QTY/MODEL)				4 QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 TMA2117F00V1-1			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AiSG			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 B5/B12 4449			
RRH - 850 band (QTY/MODEL)				RRH is shared with another band			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx						

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 4	PORT 2		25871.C.850.4G.1	CTL05090_8C_1	CTL05090_8C_1		LTE 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	270	2	BOTTOM	ANDREW 7/8	135						1000		23	
	PORT 5		25871.C.850.5G.1	CTN0005090_8C_1	CTN0005090_8C_1		5G 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	270	2	BOTTOM	ANDREW 7/8	135						1000		23	

	PORT 7		25871.C.WCS.4G.1	CTL05090_3C_1	CTL05090_3C_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	270	3	BOTTOM	ANDREW 7/8	135						1285.2866		24	

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						EPBQ-654L8H6-L2							
ANTENNA VENDOR	Powerwave						KMW							
ANTENNA SIZE (H x W x D)	55X11X5						73X21X6.3							
ANTENNA WEIGHT	35						72.8							
AZIMUTH	30						30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	101						101							
ANTENNA TIP HEIGHT	103						104							
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						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)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							12	Andrew APTDC-BDFDM-DBW (4) + TSXDC-4310FM (8)						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					4	QBC0007F1V51-1						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Powerwave 7070						LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					2	TMA2117F00V1-1						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860						AiSG						
PDU FOR TMAS (QTY/MODEL)	1	LGP 18104 (Full Dual Band TMA)												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	B5/B12 4449						
RRH - 850 band (QTY/MODEL)								RRH is shared with another band						
RRH - 1900 band (QTY/MODEL)							2	RRUS-12						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx													

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	25871.A.850.3G.1	25871.A.850.3G.1	CTV50901	CTV50901		UMTS 850	7770.00.850.01	13.5	30	1	None	Andrew 7/8 (850)	135						272.9		1	

ANTENNA POSITION 4	**PORT 1**	25871.A.700.4G.1	25871.A.700.4G.1	CTL05090_7A_1	CTL05090_7A_1		LTE 700	EPBQ-654L8H6-L2_722MHz_06DT	14.71	30	6	BOTTOM	ANDREW 7/8	135						1475.7065		7	
	PORT 2	25871.A.850.4G.1	25871.A.850.4G.1	CTL05090_8A_1	CTL05090_8A_1		LTE 850	EPBQ-654L8H6-L2_851MHz_06DT	15.49	30	6	BOTTOM	ANDREW 7/8	135						1000		7	
	PORT 3	25871.A.1900.4G.1	25871.A.1900.4G.1	CTL05090_9A_1	CTL05090_9A_1		LTE 1900	EPBQ-654L8H6-L2_1930MHz_04DT	16.23	30	4	BOTTOM	ANDREW 7/8	135						7328.7514		8	
	PORT 4	25871.A.1900.4G.2	25871.A.1900.4G.4	CTL05090_9A_2	CTL05090_9A_2		LTE 1900	EPBQ-654L8H6-L2_1930MHz_04DT	16.23	30	4	BOTTOM	ANDREW 7/8	135						7328.7514		8	
	PORT 5	25871.A.850.5G.tmp1	25871.A.850.5G.1	CTN0005090_F1N5A_1	CTN0005090_F1N5A_1		5G 850	EPBQ-654L8H6-L2_851MHz_06DT	15.49	30	6	BOTTOM	ANDREW 7/8	135						1000		7	
	PORT 7	25871.A.WCS.4G.1	25871.A.WCS.4G.1	CTL05090_3A_1	CTL05090_3A_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	30	3	BOTTOM	ANDREW 7/8	135						1285.2866		8	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770			EPBQ-654L8H6-L2			
ANTENNA VENDOR	Powerwave			KMW			
ANTENNA SIZE (H x W x D)	55X11X5			73X21X6.3			
ANTENNA WEIGHT	35			72.8			
AZIMUTH	150			150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	101			101			
ANTENNA TIP HEIGHT	103			104			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			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)	2 Powerwave 7020			Internal			
SURGE ARRESTOR (QTY/MODEL)				12 Andrew APTDC-BDFDM-DBW (4) + TSXDC-4310FM (8)			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901			4 QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 17201 (Full Dual Band)			2 TMA2117F00V1-1			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860			AiSG			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 B5/B12 4449			
RRH - 850 band (QTY/MODEL)				RRH is shared with another band			
RRH - 1900 band (QTY/MODEL)				2 RRUS-12			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx						

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	25871.B.850.3G.1	25871.B.850.3G.1	CTV50902	CTV50902		UMTS 850	7770.00.850.00	13.5	150	0	None	Andrew 7/8 (850)	135						272.9		9	
ANTENNA POSITION 4	PORT 1	25871.B.700.4G.1	25871.B.700.4G.1	CTL05090_7B_1	CTL05090_7B_1		LTE 700	EPBQ-654L8H6-	14.48	150	2	BOTTOM	ANDREW 7/8	135						1475.7065		15	

								L2_722MHz_02DT															
	PORT 2	25871.B.850.4G.1	25871.B.850.4G.1	CTL05090_8B_1	CTL05090_8B_1		LTE 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	150	2	BOTTOM	ANDREW 7/8	135						1000		15	
	PORT 3	25871.B.1900.4G.1	25871.B.1900.4G.1	CTL05090_9B_1	CTL05090_9B_1		LTE 1900	EPBQ-654L8H6-L2_1930MHz_03DT	16.14	150	3	BOTTOM	ANDREW 7/8	135						7328.7514		16	
	PORT 4	25871.B.1900.4G.2	25871.B.1900.4G.4	CTL05090_9B_2	CTL05090_9B_2		LTE 1900	EPBQ-654L8H6-L2_1930MHz_03DT	16.14	150	3	BOTTOM	ANDREW 7/8	135						7328.7514		16	
	PORT 5	25871.B.850.5G.tmp1	25871.B.850.5G.1	CTN0005090_F1N5B_1	CTN0005090_F1N5B_1		5G 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	150	2	BOTTOM	ANDREW 7/8	135						1000		15	
	PORT 7	25871.B.WCS.4G.1	25871.B.WCS.4G.1	CTL05090_3B_1	CTL05090_3B_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	150	3	BOTTOM	ANDREW 7/8	135						1285.2866		16	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770			EPBQ-654L8H6-L2			
ANTENNA VENDOR	Powerwave			KMW			
ANTENNA SIZE (H x W x D)	55X11X5			73X21X6.3			
ANTENNA WEIGHT	35			72.8			
AZIMUTH	260			270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	101			101			
ANTENNA TIP HEIGHT	103			104			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			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)	2 Powerwave 7020			Internal			
SURGE ARRESTOR (QTY/MODEL)				12 Andrew APTDC-BDFDM-DBW (4) + TSXDC-4310FM (8)			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901			4 QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 17201 (Full Dual Band)			2 TMA2117F00V1-1			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860			AiSG			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 B5/B12 4449			
RRH - 850 band (QTY/MODEL)				RRH is shared with another band			
RRH - 1900 band (QTY/MODEL)				2 RRUS-12			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	// Antennae & Radio positions according to PD - Replace exisitng LTE Antenna with 12 port - Replace TMA/Diplexer with Twin TMA/Quadplexer - Add & replace LTE Radios - Swap BB with 5216 - Add RBS 6630 - Baseband configuration as per PD / Section-7						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 & xxxxx / 1x6630 / xxxxx						

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	25871.C.850.3G.1	25871.C.850.3G.1	CTV50903	CTV50903		UMTS 850	7770.00.850.01	13.5	260	1	None	Andrew 7/8 (850)	135						272.9		17	
ANTENNA POSITION 4	PORT 1	25871.C.700.4G.1	25871.C.700.4G.1	CTL05090_7C_1	CTL05090_7C_1		LTE 700	EPBQ-654L8H6-	14.48	270	2	BOTTOM	ANDREW 7/8	135						1475.7065		23	

								L2_722MHz_02DT															
	PORT 2	25871.C.850.4G.1	25871.C.850.4G.1	CTL05090_8C_1	CTL05090_8C_1		LTE 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	270	2	BOTTOM	ANDREW 7/8	135						1000		23	
	PORT 3	25871.C.1900.4G.1	25871.C.1900.4G.1	CTL05090_9C_1	CTL05090_9C_1		LTE 1900	EPBQ-654L8H6-L2_1930MHz_04DT	16.23	270	4	BOTTOM	ANDREW 7/8	135						7328.7514		24	
	PORT 4	25871.C.1900.4G.2	25871.C.1900.4G.4	CTL05090_9C_2	CTL05090_9C_2		LTE 1900	EPBQ-654L8H6-L2_1930MHz_04DT	16.23	270	4	BOTTOM	ANDREW 7/8	135						7328.7514		24	
	PORT 5	25871.C.850.5G.tmp1	25871.C.850.5G.1	CTN0005090_F1N5C_1	CTN0005090_F1N5C_1		5G 850	EPBQ-654L8H6-L2_851MHz_02DT	15.28	270	2	BOTTOM	ANDREW 7/8	135						1000		23	
	PORT 7	25871.C.WCS.4G.1	25871.C.WCS.4G.1	CTL05090_3C_1	CTL05090_3C_1		LTE WCS	EPBQ-654L8H6-L2_2355MHz_03DT	16.06	270	3	BOTTOM	ANDREW 7/8	135						1285.2866		24	

Diagram - Sector	A	Diagram File Name - CT5090_A_B_C_WCS_850_d1.vsd					
Atoll Site Name -	CT5090	Location Name -	TRUMBULL SOUTH EAST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson

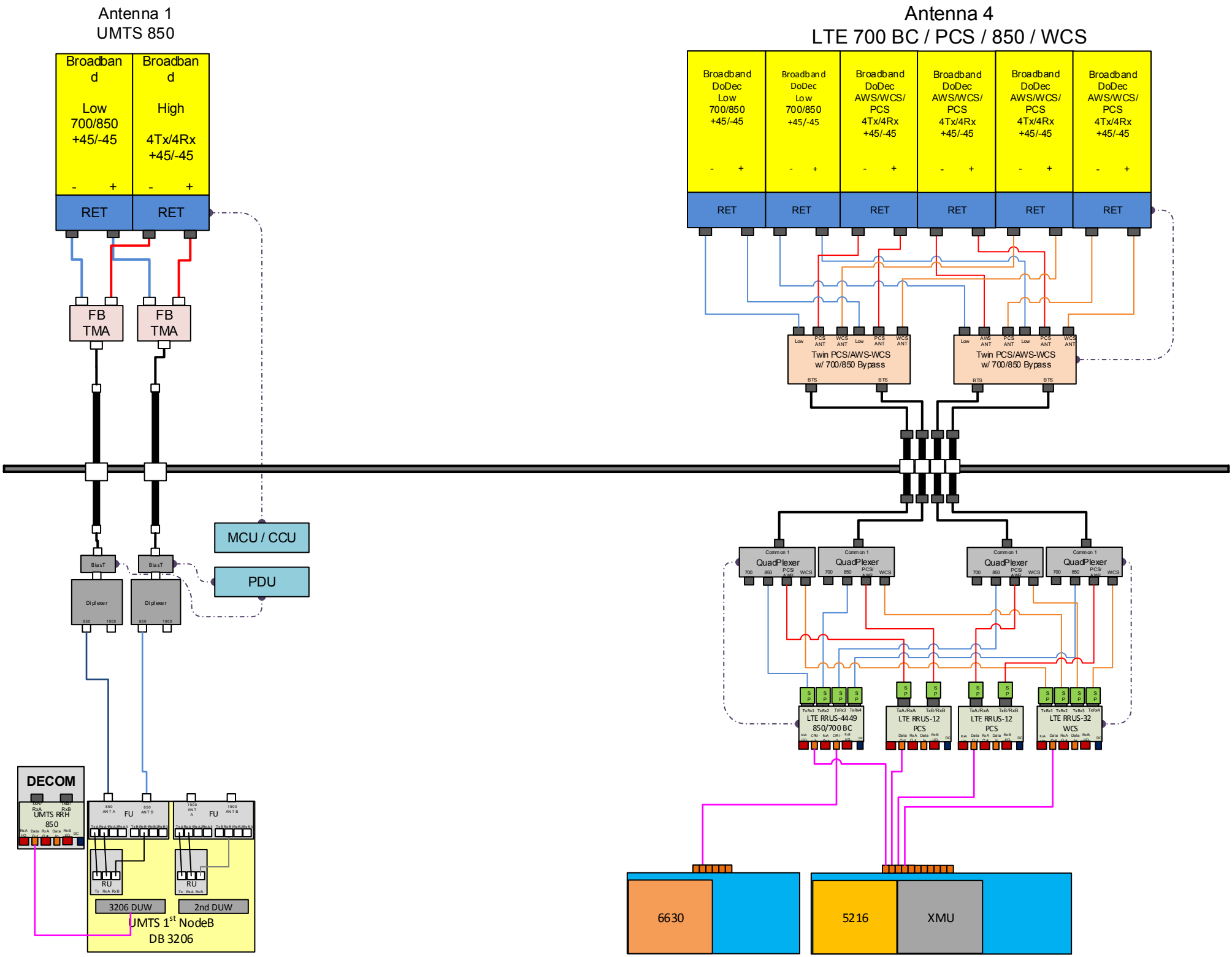


Diagram - Sector	B	Diagram File Name - CT5090_A_B_C_WCS_850_d1.vsd					
Atoll Site Name -	CT5090	Location Name -	TRUMBULL SOUTH EAST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson

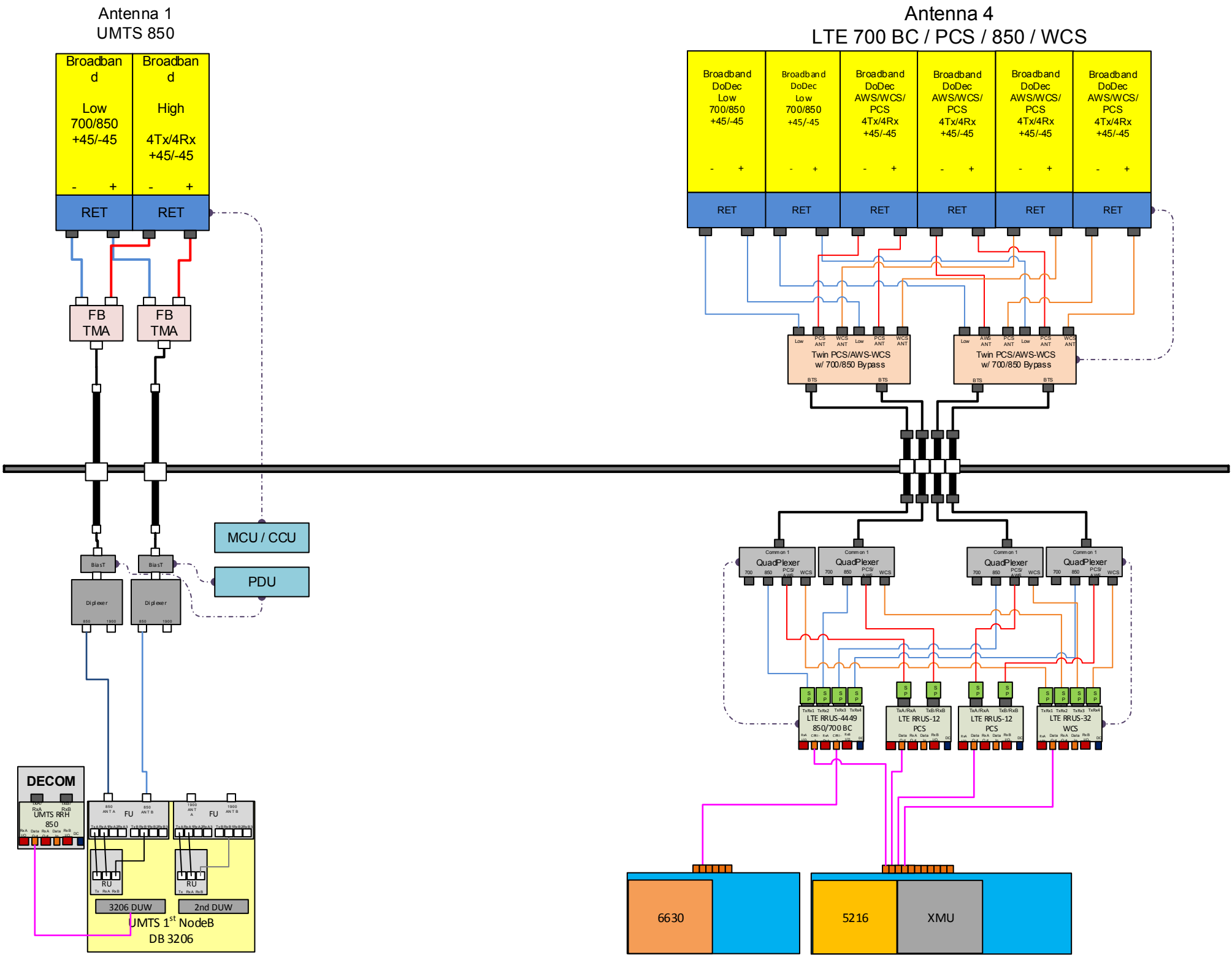
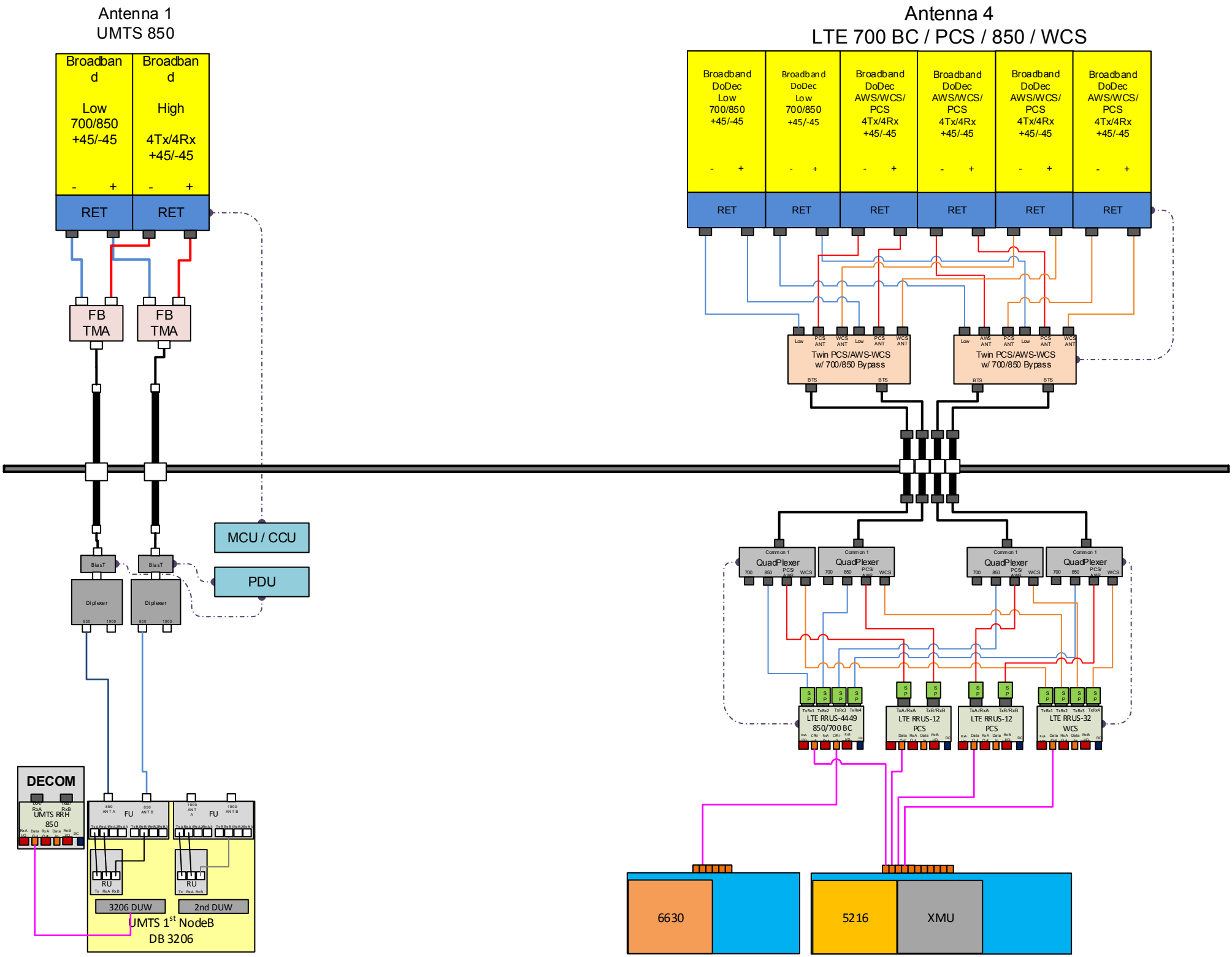


Diagram - Sector	C	Diagram File Name - CT5090_A_B_C_WCS_850_d1.vsd					
Atoll Site Name -	CT5090	Location Name -	TRUMBULL SOUTH EAST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson



NOTES			
Date Time (Eastern)	Version	ATTUID	Note
10/17/2018 2:52:08 PM	1.00	mr673a	Final/RF Approval

WORKFLOW SUMMARY							
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
07/13/2018	Preliminary In Progress	sp656b	Preliminary In Progress	MR673A	Reassign	Successfully Reassigned	
08/20/2018	Preliminary In Progress	MR673A	Preliminary Submitted for Approval	RC475S	Promote	LTE Preliminary RFDS	NER-RCTB-18-05684 MRCTB033554 SUCCESS 08/20/2018 2:29:36 PM NER-RCTB-18-05838 MRCTB033718 SUCCESS 08/20/2018 2:29:36 PM NER-RCTB-18-06218 MRCTB033889 SUCCESS 08/20/2018 2:29:36 PM
08/27/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	DC5778	Promote		
10/12/2018	Preliminary Approved	DC5778	Final RF Approval	OM636A	Promote	Please Promote the RFDS.Need to fix Market Node 3, only 1 XMU	
10/16/2018	Final RF Approval	OM636A	Final RF Approval	MR673A	Reassign	Successfully Reassigned	
10/17/2018	Final RF Approval	MR673A	Final Approved	DC5778	Promote	Final/RF Approval	NER-RCTB-18-05684 MRCTB033554 SUCCESS 10/17/2018 3:23:44 PM NER-RCTB-18-05838 MRCTB033718 SUCCESS 10/17/2018 3:23:44 PM NER-RCTB-18-06218 MRCTB033889 SUCCESS 10/17/2018 3:23:44 PM
10/17/2018	Final Approved	DC5778	As Built In Progress	JI625B	Promote	Please Promote RFDS.Thank you	NER-RCTB-18-05684 MRCTB033554 SUCCESS 10/17/2018 3:33:33 PM NER-RCTB-18-05838 MRCTB033718 SUCCESS 10/17/2018 3:33:33 PM NER-RCTB-18-06218 MRCTB033889 SUCCESS 10/17/2018 3:33:33 PM

TMA2117F00V1-1

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

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

PRODUCT FEATURES

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

TECHNICAL SPECIFICATIONS

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

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

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

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

ENVIRONMENTAL

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

MECHANICAL

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

ELECTRICAL BLOCK DIAGRAM

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

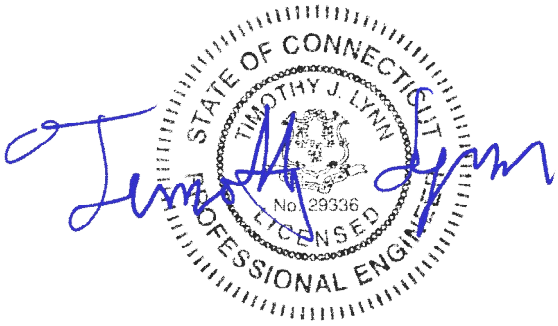
AT&T Site #: CT5090

2891 Nichols Ave
Trumbull, CT

Centek Project No. 19047.00

Date: August 6, 2019

Max Stress Ratio = 53.2%



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

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CENTEK engineering

Centered on Solutions℠

August 6, 2019

Mr. David Ford
Centerline Communications
95 Ryan Drive, Suite #1
Raynham, MA 02767

Re: Structural Letter ~ Antenna Mount
AT&T– Site Ref: CT5090
2891 Nichols Ave
Trumbull, CT 06611

Centek Project No. 19047.00

Dear Mr. Ford,

Centek Engineering, Inc. has reviewed the AT&T antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting one (1)13-ft platform to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- AT&T:
  Platform: Three (3) Powerwave 7770 panel antennas, three (3) KMW EPBQ-654L8H6L2 panel antennas, six (6) Powerwave LGP17201 TMAs and six (6) Kaelus TMA2117F00V1-1 TMAs mounted on the platform with a RAD center elevation of 101-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Trumbull as required in Appendix N of the 2018 Connecticut State Building Code.

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

- Installation of one (1) SitePro handrail kit (P/N HRK14) 2'-0" above existing platform

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

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT · TIMOTHY J. LYNN · No. 29336 · LICENSED PROFESSIONAL ENGINEER

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

Section 2 - Calculations

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

Subject: TIA-222-G Loads

Location: Trumbull, CT

Rev. 0: 8/6/19

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 19047.00

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

Wind Speeds

Basic Wind Speed: $V := 97$ mph (User Input - 2018 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = Structure_Type := Pole (User Input)

Structure Category = SC := III (User Input)

Exposure Category = Exp := C (User Input)

Structure Height = $h := 91$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 101$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = Id := 56.00 pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.118$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.097$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.268$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 33.375$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 8.868$$

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

Subject:	TIA-222-G Loads
Location:	Trumbull, CT
Rev. 0: 8/6/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19047.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Powerwave 7770		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55$	in	(User Input)
Antenna Width =	$W_{ant} := 11$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 39$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 5.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 202$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 92$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 80$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 48$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 39$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5244$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 170$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 170$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	KMW EPBQ-654L8H6L2		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 73$	in	(User Input)
Antenna Width =	$W_{ant} := 21$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 73$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.5$		
Antenna Force Coefficient =	$Ca_{ant} = 1.24$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 10.6$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 486$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 146$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 13.5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 164$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 68$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 73$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 9658$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 348$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 348$	lbs

Development of Wind & Ice Load on TMAs

TMA Data:

TMA Model =	Powerwave LGP17201		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 13.9$	in	(User Input)
TMA Width =	$W_{TMA} := 14.4$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.7$	in	(User Input)
TMA Weight =	$WT_{TMA} := 31$	lbs	(User Input)
Number of TMAs =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.0$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 1.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 61$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 16$	lbs

Wind Load (with ice)

Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 2.3$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 27$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 1$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 12$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 31$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 741$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz})(W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 1915$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 62$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 62$	lbs

Development of Wind & Ice Load on TMAs

TMA Data:

TMA Model =	Kaelus TMA2117F00/v1-1		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 8.46$	in	(User Input)
TMA Width =	$W_{TMA} := 11.81$	in	(User Input)
TMA Thickness =	$T_{TMA} := 4.21$	in	(User Input)
TMA Weight =	$WT_{TMA} := 20$	lbs	(User Input)
Number of TMAs =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 0.7$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA=	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.7$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 31$	lbs
Surface Area for One TMA=	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 11$	lbs

Wind Load (with ice)

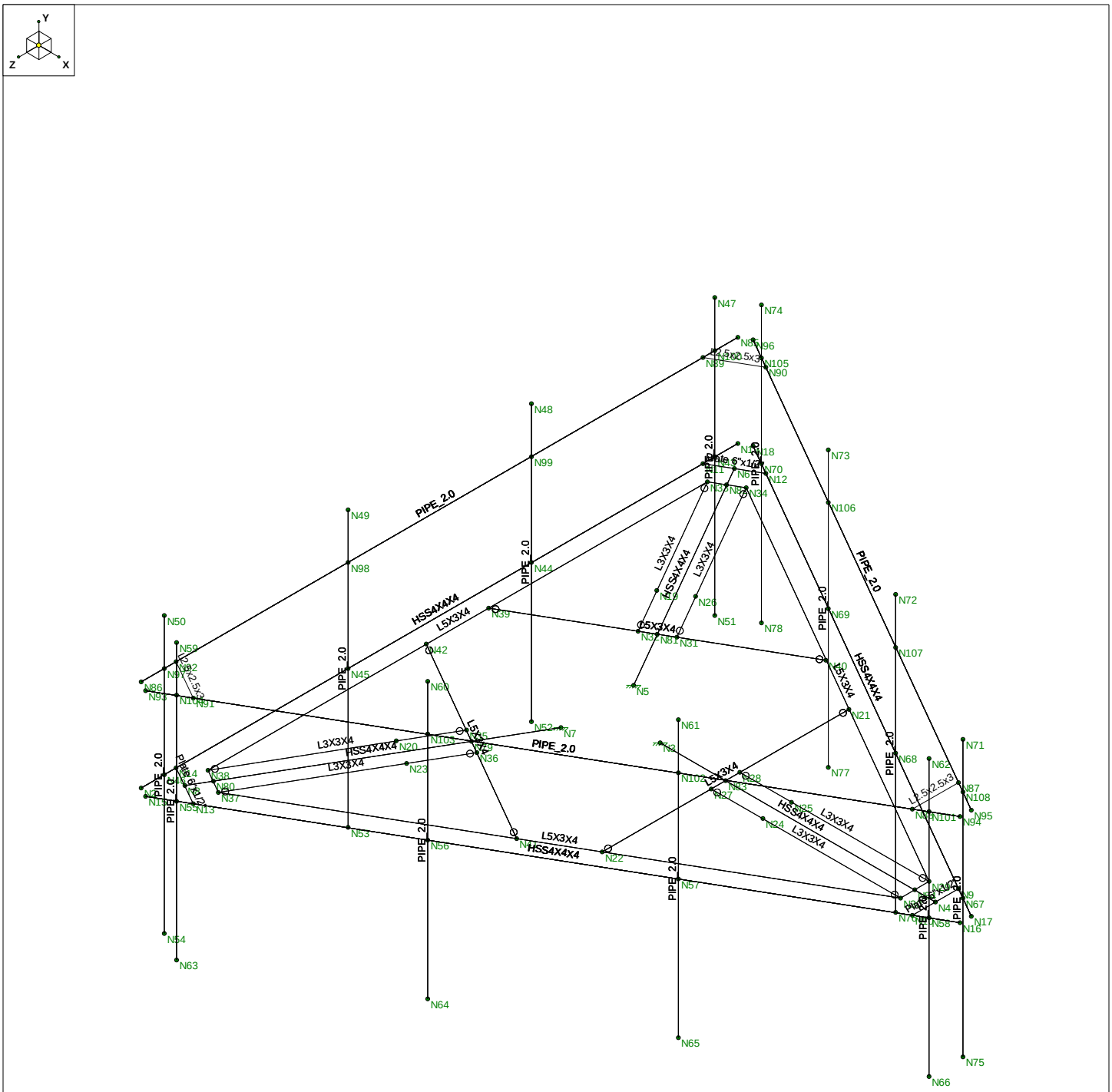
Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 1.4$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 16$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.7$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.Ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 9$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 20$	lbs

Gravity Loads (ice only)

Volume of Each TMA=	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 421$	cu in
Volume of Ice on Each TMA=	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz})(W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 1281$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 42$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 42$	lbs



Envelope Only Solution

Centek		
TJL	CT5090 - Mount	Aug 6, 2019 at 9:34 AM
19047.00	Member Framing	Mount.R3D

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	.145
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#6
Footing Top Bar Cover (in)	1.5
Footing Bottom Bar	#6
Footing Bottom Bar Cover (in)	3
Pedestal Bar	#6
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#4

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Horz	HSS4X4X4	Beam	None	A500 Gr.B ...	Typical	3.37	7.8	7.8	12.8
2	Outrigger	HSS4X4X4	Beam	None	A500 Gr.B ...	Typical	3.37	7.8	7.8	12.8
3	Plate	Plate 6"x1/2"	Beam	None	A36 Gr.36	Typical	3	.063	9	.237
4	Antenna Mast	PIPE_2.0	Column	Wide Flange	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	Handrail	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail Corner	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical	.901	.535	.535	.011
7	Grating Support 1	L5X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.94	1.41	5.09	.044
8	Grating Support 2	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Horz	13			Lbyy						Lateral
2	M2	Horz	13			Lbyy						Lateral
3	M3	Horz	13			Lbyy						Lateral
4	M4	Plate	1			Lbyy						Lateral
5	M5	Plate	1			Lbyy						Lateral
6	M6	Plate	1			Lbyy						Lateral
7	M7	Outrigger	6			Lbyy						Lateral
8	M8	Outrigger	6			Lbyy						Lateral
9	M9	Outrigger	6			Lbyy						Lateral
10	M10	Grating Sup...	10.882			Lbyy						Lateral
11	M11	Grating Sup...	10.882			Lbyy						Lateral
12	M12	Grating Sup...	10.882			Lbyy						Lateral
13	M13	Grating Sup...	5.381			Lbyy						Lateral
14	M14	Grating Sup...	5.381			Lbyy						Lateral
15	M15	Grating Sup...	5.381			Lbyy						Lateral
16	M16	Grating Sup...	4.124			Lbyy						Lateral
17	M17	Grating Sup...	4.124			Lbyy						Lateral
18	M18	Grating Sup...	4.124			Lbyy						Lateral
19	M19	Grating Sup...	4.124			Lbyy						Lateral
20	M20	Grating Sup...	4.124			Lbyy						Lateral
21	M21	Grating Sup...	4.124			Lbyy						Lateral
22	M25	Antenna Mast	6									Lateral
23	M26	Antenna Mast	6									Lateral
24	M27	Antenna Mast	6									Lateral
25	M28	Antenna Mast	6									Lateral
26	M29	Antenna Mast	6									Lateral
27	M30	Antenna Mast	6									Lateral
28	M31	Antenna Mast	6									Lateral
29	M32	Antenna Mast	6									Lateral
30	M33	Antenna Mast	6									Lateral
31	M34	Antenna Mast	6									Lateral
32	M35	Antenna Mast	6									Lateral
33	M36	Antenna Mast	6									Lateral
34	M37	Handrail	13			Lbyy						Lateral
35	M38	Handrail	13			Lbyy						Lateral
36	M39	Handrail	13			Lbyy						Lateral
37	M40	Handrail Co...	1			Lbyy						Lateral
38	M41	Handrail Co...	1			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
39	M42	Handrail Co...	1			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N15	N16			Horz	Beam	None	A500 Gr....	Typical
2	M2	N2	N1			Horz	Beam	None	A500 Gr....	Typical
3	M3	N18	N17			Horz	Beam	None	A500 Gr....	Typical
4	M4	N13	N14			Plate	Beam	None	A36 Gr.36	Typical
5	M5	N11	N12			Plate	Beam	None	A36 Gr.36	Typical
6	M6	N10	N9			Plate	Beam	None	A36 Gr.36	Typical
7	M7	N8	N7			Outrigger	Beam	None	A500 Gr....	Typical
8	M8	N6	N5			Outrigger	Beam	None	A500 Gr....	Typical
9	M9	N4	N3			Outrigger	Beam	None	A500 Gr....	Typical
10	M10	N38	N33			Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
11	M11	N34	N29			Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
12	M12	N30	N37			Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
13	M13	N42	N41		90	Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
14	M14	N40	N39		90	Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
15	M15	N22	N21		90	Grating Support 1	Beam	Single Angle	A36 Gr.36	Typical
16	M16	N38	N35		270	Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
17	M17	N37	N36			Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
18	M18	N27	N30			Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
19	M19	N28	N29		270	Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
20	M20	N31	N34			Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N32	N33		270	Grating Support 2	Beam	Single Angle	A36 Gr.36	Typical
22	M22	N30	N29			RIGID	None	None	RIGID	Typical
23	M23	N37	N38			RIGID	None	None	RIGID	Typical
24	M24	N34	N33			RIGID	None	None	RIGID	Typical
25	M25	N54	N50			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
26	M26	N53	N49			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
27	M27	N52	N48			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
28	M28	N51	N47			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
29	M29	N66	N62			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
30	M30	N65	N61			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
31	M31	N64	N60			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
32	M32	N63	N59			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
33	M33	N78	N74			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
34	M34	N77	N73			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
35	M35	N76	N72			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
36	M36	N75	N71			Antenna Mast	Column	Wide Flange	A53 Gr.B	Typical
37	M37	N93	N94			Handrail	Beam	None	A53 Gr.B	Typical
38	M38	N86	N85			Handrail	Beam	None	A53 Gr.B	Typical
39	M39	N96	N95			Handrail	Beam	None	A53 Gr.B	Typical
40	M40	N91	N92			Handrail Corner	Beam	None	A36 Gr.36	Typical
41	M41	N89	N90			Handrail Corner	Beam	None	A36 Gr.36	Typical
42	M42	N88	N87			Handrail Corner	Beam	None	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	-3.891346	0	-6.5	0	
2	N2	-3.891346	0	6.5	0	
3	N3	0.916667	0	0	0	
4	N4	6.916667	0	0	0	
5	N5	-0.458333	0	-0.793857	0	
6	N6	-3.458333	0	-5.990009	0	
7	N7	-0.458333	0	0.793857	0	
8	N8	-3.458333	0	5.990009	0	
9	N9	6.916667	0	-0.5	0	
10	N10	6.916667	0	0.5	0	
11	N11	-3.891346	0	-5.740009	0	
12	N12	-3.02532	0	-6.240009	0	
13	N13	-3.02532	0	6.240009	0	
14	N14	-3.891346	0	5.740009	0	
15	N15	-3.683492	0	6.620005	0	
16	N16	7.574838	0	0.120005	0	
17	N17	7.574838	0	-0.120005	0	
18	N18	-3.683492	0	-6.620005	0	
19	N19	-1.999101	0	-2.842895	0	
20	N20	-1.999101	0	2.842895	0	
21	N21	2.337844	0	-2.690659	0	
22	N22	2.337844	0	2.690659	0	
23	N23	-1.462469	0	3.152719	0	
24	N24	3.461569	0	0.309825	0	
25	N25	3.461569	0	-0.309825	0	
26	N26	-1.462469	0	-3.152719	0	
27	N27	2.337844	0	0.309825	0	
28	N28	2.337844	0	-0.309825	0	
29	N29	6.461569	0	-0.309825	0	
30	N30	6.461569	0	0.309825	0	
31	N31	-0.900606	0	-2.179545	0	
32	N32	-1.437238	0	-1.86972	0	
33	N33	-3.499101	0	-5.440971	0	
34	N34	-2.962469	0	-5.750796	0	
35	N35	-1.437238	0	1.86972	0	
36	N36	-0.900606	0	2.179545	0	
37	N37	-2.962469	0	5.750796	0	
38	N38	-3.499101	0	5.440971	0	
39	N39	-3.499101	0	-0.679303	0	
40	N40	1.161256	0	-3.369962	0	
41	N41	1.161256	0	3.369962	0	
42	N42	-3.499101	0	0.679303	0	
43	N43	-3.891346	0	-6	0	
44	N44	-3.891346	0	-2	0	
45	N45	-3.891346	0	2	0	
46	N46	-3.891346	0	6	0	
47	N47	-3.891346	3	-6	0	
48	N48	-3.891346	3	-2	0	
49	N49	-3.891346	3	2	0	
50	N50	-3.891346	3	6	0	
51	N51	-3.891346	-3	-6	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
52	N52	-3.891346	-3	-2	0	
53	N53	-3.891346	-3	2	0	
54	N54	-3.891346	-3	6	0	
55	N55	-3.250479	0	6.370004	0	
56	N56	0.213622	0	4.370004	0	
57	N57	3.677724	0	2.370004	0	
58	N58	7.141825	0	0.370004	0	
59	N59	-3.250479	3	6.370004	0	
60	N60	0.213622	3	4.370004	0	
61	N61	3.677724	3	2.370004	0	
62	N62	7.141825	3	0.370004	0	
63	N63	-3.250479	-3	6.370004	0	
64	N64	0.213622	-3	4.370004	0	
65	N65	3.677724	-3	2.370004	0	
66	N66	7.141825	-3	0.370004	0	
67	N67	7.141825	0	-0.370004	0	
68	N68	3.677724	0	-2.370004	0	
69	N69	0.213622	0	-4.370004	0	
70	N70	-3.250479	0	-6.370004	0	
71	N71	7.141825	3	-0.370004	0	
72	N72	3.677724	3	-2.370004	0	
73	N73	0.213622	3	-4.370004	0	
74	N74	-3.250479	3	-6.370004	0	
75	N75	7.141825	-3	-0.370004	0	
76	N76	3.677724	-3	-2.370004	0	
77	N77	0.213622	-3	-4.370004	0	
78	N78	-3.250479	-3	-6.370004	0	
79	N79	-1.168922	0	2.024633	0	
80	N80	-3.230785	0	5.595884	0	
81	N81	-1.168922	0	-2.024633	0	
82	N82	-3.230785	0	-5.595884	0	
83	N83	2.337844	0	0	0	
84	N84	6.461569	0	0	0	
85	N85	-3.891346	2	-6.5	0	
86	N86	-3.891346	2	6.5	0	
87	N87	6.916667	2	-0.5	0	
88	N88	6.916667	2	0.5	0	
89	N89	-3.891346	2	-5.740009	0	
90	N90	-3.02532	2	-6.240009	0	
91	N91	-3.02532	2	6.240009	0	
92	N92	-3.891346	2	5.740009	0	
93	N93	-3.683492	2	6.620005	0	
94	N94	7.574838	2	0.120005	0	
95	N95	7.574838	2	-0.120005	0	
96	N96	-3.683492	2	-6.620005	0	
97	N97	-3.891346	2	6	0	
98	N98	-3.891346	2	2	0	
99	N99	-3.891346	2	-2	0	
100	N100	-3.891346	2	-6	0	
101	N101	7.141825	2	0.370004	0	
102	N102	3.677724	2	2.370004	0	
103	N103	0.213622	2	4.370004	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
104	N104	-3.250479	2	6.370004	0	
105	N105	-3.250479	2	-6.370004	0	
106	N106	0.213622	2	-4.370004	0	
107	N107	3.677724	2	-2.370004	0	
108	N108	7.141825	2	-0.370004	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N7	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Y	-.02	.5
2	M29	Y	-.02	.5
3	M33	Y	-.02	.5
4	M25	Y	-.02	5.5
5	M29	Y	-.02	5.5
6	M33	Y	-.02	5.5
7	M28	Y	-.037	.5
8	M32	Y	-.037	.5
9	M36	Y	-.037	.5
10	M28	Y	-.037	5.5
11	M32	Y	-.037	5.5
12	M36	Y	-.037	5.5
13	M25	Y	-.031	4.5
14	M29	Y	-.031	4.5
15	M33	Y	-.031	4.5
16	M28	Y	-.04	4.5
17	M32	Y	-.04	4.5
18	M36	Y	-.04	4.5

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Y	-.085	.5
2	M29	Y	-.085	.5
3	M33	Y	-.085	.5
4	M25	Y	-.085	5.5
5	M29	Y	-.085	5.5
6	M33	Y	-.085	5.5
7	M28	Y	-.174	.5
8	M32	Y	-.174	.5
9	M36	Y	-.174	.5
10	M28	Y	-.174	5.5
11	M32	Y	-.174	5.5
12	M36	Y	-.174	5.5
13	M25	Y	-.062	4.5

Member Point Loads (BLC 3 : Ice Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
14	M29	Y	-.062	4.5
15	M33	Y	-.062	4.5
16	M28	Y	-.084	4.5
17	M32	Y	-.084	4.5
18	M36	Y	-.084	4.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	X	.04	.5
2	M25	X	.04	5.5
3	M29	X	.024	.5
4	M33	X	.024	.5
5	M29	X	.024	5.5
6	M33	X	.024	5.5
7	M28	X	.082	.5
8	M28	X	.082	5.5
9	M32	X	.034	.5
10	M36	X	.034	.5
11	M32	X	.034	5.5
12	M36	X	.034	5.5
13	M29	X	.012	4.5
14	M33	X	.012	4.5
15	M32	X	.009	4.5
16	M36	X	.009	4.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	X	.101	.5
2	M25	X	.101	5.5
3	M29	X	.046	0
4	M33	X	.046	0
5	M29	X	.046	5
6	M33	X	.046	5
7	M28	X	.243	.5
8	M28	X	.243	5.5
9	M32	X	.073	.5
10	M36	X	.073	.5
11	M32	X	.073	5.5
12	M36	X	.073	5.5
13	M29	X	.016	4.5
14	M33	X	.016	4.5
15	M32	X	.011	4.5
16	M36	X	.011	4.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Z	.024	.5
2	M25	Z	.024	5.5
3	M29	Z	.04	.5
4	M33	Z	.04	.5

Member Point Loads (BLC 6 : Wind with Ice Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
5	M29	Z	.04	5.5
6	M33	Z	.04	5.5
7	M28	Z	.034	.5
8	M28	Z	.034	5.5
9	M32	Z	.082	.5
10	M36	Z	.082	.5
11	M32	Z	.082	5.5
12	M36	Z	.082	5.5
13	M25	Z	.012	4.5
14	M28	Z	.009	4.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Z	.046	.5
2	M25	Z	.046	5.5
3	M29	Z	.101	.5
4	M33	Z	.101	.5
5	M29	Z	.101	5.5
6	M33	Z	.101	5.5
7	M28	Z	.073	.5
8	M28	Z	.073	5.5
9	M32	Z	.243	.5
10	M36	Z	.243	.5
11	M32	Z	.243	5.5
12	M36	Z	.243	5.5
13	M25	Z	.016	4.5
14	M28	Z	.011	4.5

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M38	X	.002	.002	0	0
2	M26	X	.002	.002	0	0
3	M27	X	.002	.002	0	0
4	M32	X	.002	.002	0	0
5	M31	X	.002	.002	0	0
6	M30	X	.002	.002	0	0
7	M29	X	.002	.002	0	0
8	M36	X	.002	.002	0	0
9	M35	X	.002	.002	0	0
10	M34	X	.002	.002	0	0
11	M33	X	.002	.002	0	0
12	M39	X	.002	.002	0	0
13	M37	X	.002	.002	0	0
14	M2	X	.004	.004	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M38	X	.007	.007	0	0
2	M26	X	.007	.007	0	0

Member Distributed Loads (BLC 5 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
3	M27	X	.007	.007	0	0
4	M32	X	.007	.007	0	0
5	M31	X	.007	.007	0	0
6	M30	X	.007	.007	0	0
7	M29	X	.007	.007	0	0
8	M36	X	.007	.007	0	0
9	M35	X	.007	.007	0	0
10	M34	X	.007	.007	0	0
11	M33	X	.007	.007	0	0
12	M39	X	.007	.007	0	0
13	M37	X	.007	.007	0	0
14	M2	X	.011	.011	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M27	Z	.002	.002	0	0
2	M26	Z	.002	.002	0	0
3	M39	Z	.002	.002	0	0
4	M37	Z	.002	.002	0	0
5	M31	Z	.002	.002	0	0
6	M30	Z	.002	.002	0	0
7	M35	Z	.002	.002	0	0
8	M34	Z	.002	.002	0	0
9	M28	Z	.002	.002	0	0
10	M25	Z	.002	.002	0	0
11	M3	Z	.004	.004	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M27	Z	.007	.007	0	0
2	M26	Z	.007	.007	0	0
3	M39	Z	.007	.007	0	0
4	M37	Z	.007	.007	0	0
5	M31	Z	.007	.007	0	0
6	M30	Z	.007	.007	0	0
7	M35	Z	.007	.007	0	0
8	M34	Z	.007	.007	0	0
9	M28	Z	.007	.007	0	0
10	M25	Z	.007	.007	0	0
11	M3	Z	.011	.011	0	0

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-.002	-.003	0	2.176
2	M10	Y	-.003	-.003	2.176	4.353
3	M10	Y	-.003	-.003	4.353	6.529
4	M10	Y	-.003	-.003	6.529	8.706
5	M10	Y	-.003	-.002	8.706	10.882
6	M13	Y	-.012	-.008	0	1.076
7	M13	Y	-.008	-.005	1.076	2.153

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
8	M14	Y	-.006	-.01	3.229	4.305
9	M14	Y	-.01	-.014	4.305	5.381
10	M16	Y	-.001	-.004	.412	2.268
11	M16	Y	-.004	-.006	2.268	4.124
12	M21	Y	-.006	-.004	0	1.856
13	M21	Y	-.004	-.001	1.856	3.711
14	M12	Y	-.002	-.003	0	2.176
15	M12	Y	-.003	-.003	2.176	4.353
16	M12	Y	-.003	-.003	4.353	6.529
17	M12	Y	-.003	-.003	6.529	8.706
18	M12	Y	-.003	-.002	8.706	10.882
19	M13	Y	-.006	-.01	3.229	4.305
20	M13	Y	-.01	-.014	4.305	5.381
21	M15	Y	-.012	-.008	0	1.076
22	M15	Y	-.008	-.005	1.076	2.153
23	M17	Y	-.001	-.004	.412	2.268
24	M17	Y	-.004	-.006	2.268	4.124
25	M18	Y	-.006	-.004	0	1.856
26	M18	Y	-.004	-.001	1.856	3.711
27	M11	Y	-.002	-.003	0	2.176
28	M11	Y	-.003	-.003	2.176	4.353
29	M11	Y	-.003	-.003	4.353	6.529
30	M11	Y	-.003	-.003	6.529	8.706
31	M11	Y	-.003	-.002	8.706	10.882
32	M14	Y	-.014	-.01	0	1.076
33	M14	Y	-.01	-.006	1.076	2.153
34	M15	Y	-.005	-.008	3.229	4.305
35	M15	Y	-.008	-.012	4.305	5.381
36	M19	Y	-.006	-.004	0	1.856
37	M19	Y	-.004	-.001	1.856	3.711
38	M20	Y	-.006	-.004	0	1.856
39	M20	Y	-.004	-.001	1.856	3.711

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Dead Load	None					18		3	
3	Ice Load	None					18			
4	Wind with Ice X	None					16	14		
5	Wind X	None					16	14		
6	Wind with Ice Z	None					14	11		
7	Wind Z	None					14	11		
8	BLC 2 Transient Area Loads	None						39		

Load Combinations

	Description	Solve	PDe...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												

Load Combinations (Continued)

	Description	Solve	PDe...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N3	max	.437	6	1.656	3	-.048	3	.009	6	.812	5	5.373	3
2		min	-1.971	2	.727	5	-.454	5	-.03	5	.088	3	2.198	5
3	N5	max	-.395	3	1.624	3	-.562	3	4.536	3	.63	4	-.981	2
4		min	-1.453	4	.664	5	-1.801	4	1.627	5	.104	6	-2.63	6
5	N7	max	1.257	5	1.647	6	1.225	1	-1.741	2	.619	4	-.917	2
6		min	-.442	1	.678	2	-1.485	5	-4.617	6	.067	3	-2.656	6
7	Totals:	max	0	6	4.902	3	0	2						
8		min	-3.286	1	2.182	5	-3.683	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	.03	4	-.154	5	-.001	6	7.639e-05	5	1.054e-03	2	4.761e-04	3
2		min	.004	3	-.462	3	-.013	1	-4.145e-04	3	-2.917e-04	4	1.97e-04	5
3	N2	max	-.005	3	-.158	2	-.001	6	3.452e-04	6	-5.392e-05	6	1.986e-04	6
4		min	-.03	4	-.468	6	-.013	2	-3.681e-05	1	-1.692e-03	2	-3.125e-04	2
5	N3	max	0	6	0	6	0	6	0	6	0	6	0	6
6		min	0	1	0	1	0	1	0	1	0	1	0	1
7	N4	max	.001	2	-.184	5	.042	4	1.654e-04	5	-7.133e-05	3	-3.122e-03	5
8		min	0	6	-.47	3	.004	3	-8.e-05	3	-7.979e-04	5	-8.228e-03	3
9	N5	max	0	6	0	6	0	6	0	6	0	6	0	6
10		min	0	1	0	1	0	1	0	1	0	1	0	1
11	N6	max	.027	1	-.154	5	-.002	6	-2.148e-03	5	-7.221e-05	6	4.092e-03	6
12		min	.004	6	-.457	3	-.015	2	-6.893e-03	3	-5.718e-04	2	1.353e-03	2
13	N7	max	0	6	0	6	0	6	0	6	0	6	0	6
14		min	0	1	0	1	0	1	0	1	0	1	0	1
15	N8	max	-.002	3	-.16	2	-.002	3	7.081e-03	6	-3.137e-05	3	4.005e-03	6
16		min	-.026	4	-.465	6	-.013	4	2.524e-03	2	-4.672e-04	4	1.032e-03	2
17	N9	max	.01	2	-.183	5	.042	4	1.02e-05	5	6.138e-04	5	2.382e-04	5
18		min	0	6	-.471	3	.004	3	-1.833e-04	6	-8.669e-04	1	-5.652e-04	3
19	N10	max	.006	1	-.185	5	.042	4	2.546e-04	4	2.839e-04	5	-1.877e-04	4
20		min	-.004	5	-.47	3	.004	3	7.869e-06	3	3.641e-05	3	-4.932e-04	3
21	N11	max	.028	1	-.155	5	-.001	6	1.135e-04	5	1.072e-03	2	4.578e-04	3
22		min	.005	6	-.458	3	-.013	1	-4.153e-04	3	-2.874e-04	4	1.959e-04	5
23	N12	max	.031	4	-.153	5	0	6	2.548e-04	5	9.114e-05	1	2.068e-04	6
24		min	.005	6	-.457	3	-.01	1	-3.524e-04	3	-1.708e-03	5	-1.462e-04	1
25	N13	max	-.002	3	-.163	2	0	6	5.975e-04	3	-9.529e-05	3	7.862e-05	6
26		min	-.031	4	-.466	6	-.01	1	-6.91e-04	5	-1.254e-03	4	-3.295e-04	1
27	N14	max	-.002	3	-.158	2	-.001	6	3.503e-04	6	-5.364e-05	6	2.111e-04	6
28		min	-.027	4	-.465	6	-.013	2	-3.535e-05	1	-1.703e-03	2	-3.579e-04	2
29	N15	max	-.003	3	-.162	2	-.002	6	5.874e-04	3	-9.576e-05	3	9.529e-05	6
30		min	-.037	4	-.468	6	-.015	1	-8.4e-04	5	-1.242e-03	4	-2.91e-04	1
31	N16	max	.005	1	-.186	5	.04	4	2.342e-04	4	2.756e-04	5	-2.139e-04	4
32		min	-.006	5	-.474	3	.004	3	-1.194e-06	3	3.517e-05	3	-4.833e-04	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
33	N17	max	.006	2	-.18	5	.037	4	2.172e-06	2	5.951e-04	5	2.417e-04	5
34		min	0	6	-.475	3	.006	3	-2.002e-04	6	-8.606e-04	1	-5.518e-04	3
35	N18	max	.039	5	-.152	5	-.002	3	2.037e-04	5	8.963e-05	1	2.097e-04	6
36		min	.006	3	-.46	3	-.019	4	-3.486e-04	3	-1.7e-03	5	-1.374e-04	1
37	N19	max	.01	4	-.053	5	-.002	6	-2.037e-03	5	-1.602e-04	6	4.449e-03	6
38		min	.003	6	-.149	3	-.007	1	-6.149e-03	3	-5.498e-04	1	1.606e-03	2
39	N20	max	0	3	-.054	2	0	3	6.27e-03	6	4.101e-05	3	4.464e-03	6
40		min	-.008	5	-.152	6	-.006	5	2.264e-03	2	-3.794e-04	5	1.432e-03	2
41	N21	max	.018	4	-.059	5	.006	5	-1.083e-03	5	3.14e-04	4	-1.617e-03	5
42		min	.003	3	-.147	3	0	3	-3.639e-03	3	7.333e-05	6	-3.769e-03	3
43	N22	max	-.001	3	-.063	5	.006	4	3.731e-03	6	2.772e-04	5	-1.268e-03	5
44		min	-.018	5	-.147	3	0	3	1.529e-03	2	-6.889e-06	3	-3.689e-03	3
45	N23	max	-.002	3	-.055	2	-.001	6	7.035e-03	6	-1.312e-04	3	3.153e-03	6
46		min	-.012	4	-.152	6	-.004	4	2.598e-03	2	-5.29e-04	4	9.105e-04	2
47	N24	max	0	3	-.062	5	.013	5	7.352e-04	3	2.114e-05	3	-3.08e-03	5
48		min	-.002	4	-.153	3	0	3	3.826e-04	2	-5.635e-04	5	-7.74e-03	3
49	N25	max	.002	2	-.061	5	.016	4	-2.598e-04	5	-1.507e-04	3	-3.064e-03	5
50		min	0	6	-.153	3	.003	3	-7.879e-04	3	-7.143e-04	4	-7.749e-03	3
51	N26	max	.01	5	-.052	5	0	6	-2.322e-03	5	1.216e-05	6	3.151e-03	6
52		min	0	6	-.149	3	-.003	2	-6.888e-03	3	-3.986e-04	2	1.081e-03	2
53	N27	max	0	3	-.02	5	.006	5	1.035e-03	3	-3.259e-05	3	-1.832e-03	5
54		min	-.002	4	-.048	3	0	3	4.866e-04	5	-5.49e-04	5	-4.628e-03	3
55	N28	max	.002	5	-.019	5	.006	5	-4.079e-04	5	-9.513e-05	3	-1.872e-03	5
56		min	0	6	-.048	3	0	3	-1.058e-03	3	-5.773e-04	4	-4.637e-03	3
57	N29	max	.003	2	-.166	5	.037	4	1.354e-04	5	-7.281e-05	3	-3.168e-03	5
58		min	0	6	-.424	3	.004	3	-6.597e-05	3	-6.321e-04	4	-8.328e-03	3
59	N30	max	0	3	-.167	5	.037	4	1.354e-04	5	-7.281e-05	3	-3.168e-03	5
60		min	-.002	4	-.424	3	.004	3	-6.597e-05	3	-6.321e-04	4	-8.328e-03	3
61	N31	max	.005	4	-.016	5	0	6	-1.488e-03	5	-6.094e-05	3	1.381e-03	6
62		min	0	6	-.047	3	0	2	-4.409e-03	3	-4.81e-04	5	4.207e-04	2
63	N32	max	.004	4	-.017	5	0	6	-1.114e-03	5	-8.887e-05	6	3.162e-03	6
64		min	0	6	-.047	3	-.003	2	-3.394e-03	3	-4.265e-04	4	1.162e-03	2
65	N33	max	.023	1	-.14	5	-.002	6	-2.188e-03	5	-8.685e-05	3	4.125e-03	6
66		min	.004	6	-.413	3	-.015	2	-6.984e-03	3	-5.082e-04	4	1.378e-03	2
67	N34	max	.025	4	-.139	5	-.002	6	-2.188e-03	5	-8.685e-05	3	4.125e-03	6
68		min	.004	6	-.412	3	-.012	2	-6.984e-03	3	-5.082e-04	4	1.378e-03	2
69	N35	max	0	3	-.017	2	0	3	3.455e-03	6	-3.511e-05	3	3.181e-03	6
70		min	-.004	5	-.048	6	-.003	4	1.258e-03	2	-3.962e-04	5	1.039e-03	2
71	N36	max	0	3	-.018	2	0	6	4.506e-03	6	-6.78e-05	3	1.379e-03	6
72		min	-.005	5	-.048	6	0	1	1.71e-03	2	-5.087e-04	4	3.182e-04	2
73	N37	max	-.002	3	-.146	2	-.001	3	7.163e-03	6	-5.873e-05	3	4.066e-03	6
74		min	-.025	4	-.42	6	-.011	4	2.537e-03	2	-5.133e-04	4	1.089e-03	2
75	N38	max	-.002	3	-.144	2	-.002	3	7.163e-03	6	-5.873e-05	3	4.066e-03	6
76		min	-.023	4	-.42	6	-.014	4	2.537e-03	2	-5.133e-04	4	1.089e-03	2
77	N39	max	0	3	-.055	2	-.002	6	-3.13e-04	5	1.898e-04	4	5.007e-03	6
78		min	-.002	4	-.146	6	-.014	4	-1.355e-03	3	4.566e-05	6	1.663e-03	2
79	N40	max	.013	4	-.052	5	.013	5	-1.551e-03	5	3.316e-04	5	-8.2e-04	5
80		min	.002	3	-.145	3	.002	3	-4.936e-03	3	2.747e-05	3	-1.49e-03	3
81	N41	max	-.001	3	-.066	2	.013	4	5.047e-03	6	3.692e-04	4	-3.362e-04	5
82		min	-.013	4	-.147	6	.001	3	1.999e-03	2	4.176e-05	3	-1.424e-03	3
83	N42	max	.003	2	-.051	2	-.002	3	1.313e-03	6	2.063e-04	2	5.007e-03	6
84		min	0	6	-.146	6	-.014	5	2.443e-04	2	3.501e-06	6	1.662e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
85	N43	max	.028	4	-.155	5	-.001	6	7.658e-05	5	1.054e-03	2	4.761e-04	3
86		min	.005	3	-.459	3	-.013	1	-4.143e-04	3	-2.917e-04	4	1.97e-04	5
87	N44	max	.072	2	-.166	2	-.001	6	6.038e-04	4	5.27e-04	2	3.332e-04	6
88		min	.003	6	-.457	6	-.013	2	5.626e-05	3	-4.12e-04	4	-2.662e-04	2
89	N45	max	.058	2	-.164	2	-.001	6	3.508e-04	5	-8.53e-05	6	2.379e-04	6
90		min	-.009	4	-.461	6	-.013	2	-1.675e-04	1	-1.112e-03	2	-4.527e-04	2
91	N46	max	-.003	3	-.158	2	-.001	6	3.449e-04	6	-5.392e-05	6	1.986e-04	6
92		min	-.028	4	-.466	6	-.013	2	-3.705e-05	1	-1.693e-03	2	-3.125e-04	2
93	N47	max	.104	2	-.155	5	.036	4	1.629e-03	4	9.678e-04	2	-5.302e-05	6
94		min	.003	6	-.46	3	-.013	2	4.773e-05	2	-7.807e-04	4	-3.06e-03	2
95	N48	max	.123	2	-.166	2	.026	5	7.889e-04	5	3.469e-04	2	1.912e-04	4
96		min	-.005	6	-.457	6	-.015	2	-8.149e-05	3	-3.049e-04	5	-1.742e-03	2
97	N49	max	.109	2	-.164	2	.026	5	7.721e-04	5	4.204e-05	6	7.31e-05	5
98		min	-.011	4	-.461	6	-.014	1	-3.195e-05	1	-9.692e-04	2	-1.686e-03	2
99	N50	max	.05	1	-.158	2	.034	5	1.406e-03	5	-1.723e-04	6	4.318e-04	5
100		min	-.035	5	-.466	6	-.015	1	-9.296e-05	3	-1.578e-03	2	-2.287e-03	1
101	N51	max	.356	1	-.155	5	.094	4	-2.018e-04	1	1.054e-03	2	1.247e-02	1
102		min	.021	6	-.46	3	-.005	1	-4.035e-03	4	-2.917e-04	4	1.968e-04	5
103	N52	max	.077	1	-.166	2	-.004	3	1.048e-04	4	5.27e-04	2	3.331e-04	6
104		min	.015	6	-.457	6	-.019	4	5.624e-05	3	-4.12e-04	4	1.94e-04	5
105	N53	max	.056	1	-.164	2	0	3	-6.965e-05	6	-8.53e-05	6	2.378e-04	6
106		min	-.005	5	-.461	6	-.01	5	-1.963e-04	4	-1.112e-03	2	4.628e-05	2
107	N54	max	.102	1	-.158	2	.059	4	3.364e-04	3	-5.392e-05	6	4.695e-03	1
108		min	-.023	5	-.466	6	-.014	3	-2.686e-03	4	-1.693e-03	2	1.46e-04	5
109	N55	max	-.002	3	-.162	2	0	6	5.873e-04	3	-9.576e-05	3	9.507e-05	6
110		min	-.033	4	-.467	6	-.012	1	-8.401e-04	5	-1.242e-03	4	-2.912e-04	1
111	N56	max	0	1	-.183	2	.04	4	2.55e-04	6	-9.698e-05	3	5.078e-05	5
112		min	-.006	5	-.464	6	.002	3	1.27e-04	1	-8.202e-04	4	-7.939e-04	1
113	N57	max	.008	1	-.198	5	.054	5	5.854e-04	4	1.029e-04	5	1.97e-04	4
114		min	0	6	-.464	3	.005	3	1.486e-04	2	-5.878e-05	1	-5.493e-04	2
115	N58	max	.005	1	-.185	5	.041	4	2.343e-04	4	2.756e-04	5	-2.136e-04	4
116		min	-.005	5	-.471	3	.004	3	-1.071e-06	3	3.517e-05	3	-4.831e-04	3
117	N59	max	.04	1	-.163	2	.056	5	2.652e-03	5	-1.767e-04	3	-1.643e-05	5
118		min	-.035	5	-.467	6	-.005	1	-7.195e-05	3	-1.323e-03	4	-1.77e-03	1
119	N60	max	.049	2	-.183	2	.086	5	1.416e-03	5	-9.108e-05	3	-9.093e-05	6
120		min	-.004	5	-.464	6	.009	3	2.399e-04	3	-7.692e-04	5	-1.178e-03	2
121	N61	max	.052	2	-.198	5	.111	5	1.735e-03	5	8.183e-05	3	-1.69e-04	6
122		min	.004	6	-.464	3	.008	3	7.627e-05	3	-2.867e-04	5	-1.091e-03	2
123	N62	max	.053	2	-.186	5	.124	5	2.585e-03	5	4.677e-04	5	1.297e-04	6
124		min	0	6	-.471	3	.003	3	-5.537e-05	3	-1.714e-04	1	-1.311e-03	2
125	N63	max	.083	2	-.162	2	.338	5	5.843e-04	3	-9.576e-05	3	3.824e-03	2
126		min	-.04	4	-.467	6	-.024	3	-1.286e-02	5	-1.242e-03	4	-1.732e-04	4
127	N64	max	-.004	5	-.183	2	.049	4	2.51e-04	3	-9.698e-05	3	5.076e-05	5
128		min	-.014	1	-.464	6	-.007	3	-3.631e-04	4	-8.202e-04	4	-2.949e-04	1
129	N65	max	.01	4	-.198	5	.047	5	2.398e-04	3	1.029e-04	5	1.969e-04	4
130		min	-.003	3	-.464	3	-.004	3	6.881e-05	5	-5.878e-05	1	-1.083e-04	3
131	N66	max	.084	1	-.185	5	.164	5	7.008e-05	1	2.756e-04	5	3.396e-03	1
132		min	-.016	6	-.471	3	.004	3	-4.763e-03	5	3.517e-05	3	-4.285e-04	6
133	N67	max	.009	2	-.182	5	.04	4	2.08e-06	2	5.953e-04	5	2.419e-04	5
134		min	0	6	-.472	3	.005	3	-2.003e-04	6	-8.606e-04	1	-5.516e-04	3
135	N68	max	.027	2	-.185	5	.067	4	4.631e-04	5	3.368e-04	5	1.012e-04	4
136		min	-.011	4	-.465	3	-.005	2	-2.67e-04	3	-5.334e-04	1	-4.852e-04	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
137	N69	max	.033	2	-.17	5	.053	5	6.048e-04	4	1.804e-05	2	-1.862e-04	5
138		min	-.003	4	-.459	3	-.015	1	-1.43e-04	3	-1.046e-03	4	-7.025e-04	1
139	N70	max	.034	5	-.152	5	-.001	6	2.038e-04	5	8.963e-05	1	2.095e-04	6
140		min	.006	3	-.458	3	-.01	1	-3.485e-04	3	-1.7e-03	5	-1.376e-04	1
141	N71	max	.061	2	-.182	5	.133	5	3.345e-03	5	3.379e-04	4	4.614e-04	4
142		min	-.012	4	-.473	3	.003	3	-7.703e-05	1	-5.85e-04	2	-1.688e-03	2
143	N72	max	.071	2	-.185	5	.123	5	1.692e-03	5	7.068e-05	5	5.197e-04	4
144		min	-.018	4	-.465	3	-.006	1	-2.679e-04	1	-6.167e-04	1	-1.059e-03	2
145	N73	max	.081	2	-.17	5	.102	5	1.527e-03	5	3.617e-05	3	2.989e-04	5
146		min	-.005	5	-.459	3	-.024	1	-4.413e-04	2	-1.039e-03	5	-1.18e-03	2
147	N74	max	.085	2	-.152	5	.05	4	2.158e-03	4	5.709e-04	1	8.408e-05	5
148		min	.004	6	-.459	3	-.017	2	6.488e-05	2	-1.558e-03	5	-1.515e-03	1
149	N75	max	.108	1	-.182	5	.361	4	2.078e-06	2	5.953e-04	5	3.871e-03	1
150		min	-.016	6	-.472	3	.01	3	-1.218e-02	4	-8.606e-04	1	-4.702e-04	6
151	N76	max	.024	1	-.185	5	.065	4	-3.584e-05	5	3.368e-04	5	1.012e-04	4
152		min	-.008	5	-.465	3	-.004	2	-2.882e-04	6	-5.334e-04	1	-1.277e-04	3
153	N77	max	.022	2	-.17	5	.045	5	1.058e-04	4	1.804e-05	2	-1.742e-04	2
154		min	-.011	4	-.459	3	-.016	1	-1.435e-04	6	-1.046e-03	4	-2.223e-04	4
155	N78	max	.117	2	-.152	5	.114	4	-1.433e-04	2	8.963e-05	1	3.639e-03	2
156		min	.013	6	-.458	3	-.005	2	-4.801e-03	4	-1.7e-03	5	-3.916e-05	4
157	N79	max	0	3	-.017	2	0	3	4.081e-03	6	-4.619e-05	3	2.342e-03	6
158		min	-.004	5	-.045	6	-.002	4	1.512e-03	2	-4.22e-04	4	7.462e-04	2
159	N80	max	-.002	3	-.145	2	-.002	3	7.163e-03	6	-5.873e-05	3	4.066e-03	6
160		min	-.024	4	-.42	6	-.012	4	2.537e-03	2	-5.133e-04	4	1.089e-03	2
161	N81	max	.004	4	-.016	5	0	6	-1.374e-03	5	-7.165e-05	6	2.329e-03	6
162		min	0	6	-.045	3	-.002	2	-4.002e-03	3	-4.249e-04	4	8.304e-04	2
163	N82	max	.024	1	-.139	5	-.002	6	-2.188e-03	5	-8.685e-05	3	4.125e-03	6
164		min	.004	6	-.413	3	-.013	2	-6.984e-03	3	-5.082e-04	4	1.378e-03	2
165	N83	max	0	2	-.019	5	.006	5	4.306e-05	5	-6.132e-05	3	-1.906e-03	5
166		min	0	6	-.046	3	0	3	-1.31e-05	6	-5.534e-04	5	-4.75e-03	3
167	N84	max	.001	2	-.166	5	.037	4	1.354e-04	5	-7.281e-05	3	-3.168e-03	5
168		min	0	6	-.424	3	.004	3	-6.597e-05	3	-6.321e-04	4	-8.328e-03	3
169	N85	max	.062	2	-.146	5	.017	5	1.465e-03	4	9.655e-04	2	-5.3e-05	6
170		min	.003	6	-.459	3	-.014	2	4.708e-05	2	-7.807e-04	4	-2.579e-03	2
171	N86	max	.013	2	-.157	2	.017	5	1.297e-03	5	-1.723e-04	6	4.318e-04	5
172		min	-.035	5	-.468	6	-.014	1	-9.207e-05	3	-1.576e-03	2	-2.087e-03	1
173	N87	max	.042	2	-.179	5	.095	5	2.009e-03	5	3.46e-04	4	5.426e-04	4
174		min	-.007	4	-.472	3	.003	3	-1.157e-04	1	-5.622e-04	2	-1.232e-03	2
175	N88	max	.037	2	-.189	5	.094	5	1.713e-03	5	4.633e-04	5	1.039e-04	6
176		min	0	6	-.471	3	.003	3	-5.992e-05	3	-2.18e-04	1	-1.078e-03	2
177	N89	max	.071	2	-.159	5	.017	5	1.161e-03	4	1.024e-03	2	-4.68e-05	6
178		min	.002	6	-.46	3	-.014	2	1.111e-04	3	-8.336e-04	4	-1.911e-03	2
179	N90	max	.068	2	-.155	5	.029	5	1.734e-03	4	5.953e-04	1	5.043e-05	6
180		min	.004	6	-.46	3	-.019	2	2.234e-04	3	-1.561e-03	5	-1.013e-03	1
181	N91	max	.021	2	-.167	2	.029	5	1.611e-03	5	-1.98e-04	3	1.113e-05	5
182		min	-.033	5	-.467	6	-.002	2	-6.399e-05	1	-1.402e-03	4	-1.193e-03	1
183	N92	max	.028	2	-.158	2	.017	5	9.163e-04	5	-1.757e-04	6	6.507e-04	5
184		min	-.027	5	-.466	6	-.014	1	-2.111e-04	1	-1.576e-03	2	-1.732e-03	1
185	N93	max	.016	2	-.155	2	.018	5	2.171e-03	5	-1.765e-04	3	-1.588e-05	5
186		min	-.039	5	-.468	6	-.01	1	-7.148e-05	3	-1.321e-03	4	-1.606e-03	1
187	N94	max	.037	2	-.18	5	.091	5	2.384e-03	5	4.657e-04	5	1.289e-04	6
188		min	0	6	-.473	3	.004	3	-5.578e-05	3	-1.726e-04	1	-1.293e-03	2

Envelope Joint Displacements (Continued)

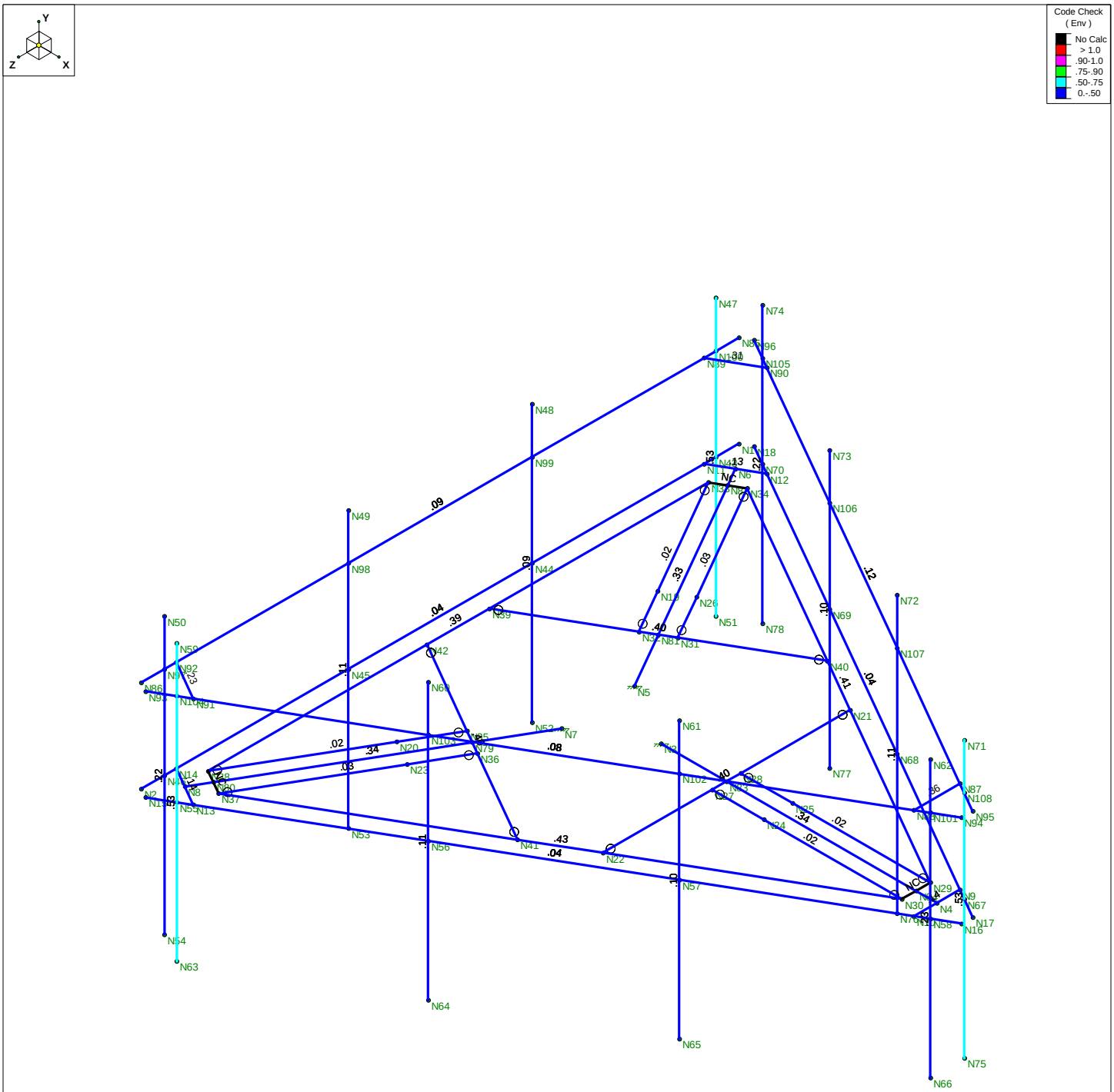
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
189	N95	max	.039	2	-.188	5	.092	5	2.864e-03	5	3.359e-04	4	4.606e-04	4
190		min	-.006	4	-.474	3	.004	3	-7.659e-05	1	-5.839e-04	2	-1.526e-03	2
191	N96	max	.065	2	-.147	5	.017	5	1.958e-03	4	5.698e-04	1	8.463e-05	5
192		min	.005	6	-.456	3	-.015	2	6.455e-05	2	-1.556e-03	5	-1.496e-03	1
193	N97	max	.023	2	-.158	2	.017	5	1.296e-03	5	-1.723e-04	6	4.318e-04	5
194		min	-.029	5	-.466	6	-.014	1	-9.293e-05	3	-1.578e-03	2	-2.087e-03	1
195	N98	max	.088	2	-.164	2	.017	5	7.536e-04	5	4.204e-05	6	7.31e-05	5
196		min	-.01	4	-.461	6	-.014	2	-3.195e-05	1	-9.692e-04	2	-1.667e-03	2
197	N99	max	.102	2	-.166	2	.017	5	7.704e-04	5	3.469e-04	2	1.912e-04	4
198		min	-.003	6	-.457	6	-.014	2	-8.149e-05	3	-3.049e-04	5	-1.723e-03	2
199	N100	max	.068	2	-.155	5	.017	5	1.466e-03	4	9.678e-04	2	-5.3e-05	6
200		min	.003	6	-.46	3	-.014	2	4.773e-05	2	-7.807e-04	4	-2.579e-03	2
201	N101	max	.037	2	-.186	5	.093	5	2.385e-03	5	4.677e-04	5	1.296e-04	6
202		min	0	6	-.471	3	.003	3	-5.535e-05	3	-1.714e-04	1	-1.292e-03	2
203	N102	max	.039	2	-.198	5	.09	5	1.717e-03	5	8.183e-05	3	-1.69e-04	6
204		min	.002	6	-.464	3	.007	3	7.627e-05	3	-2.867e-04	5	-1.072e-03	2
205	N103	max	.034	2	-.183	2	.069	5	1.397e-03	5	-9.108e-05	3	-9.093e-05	6
206		min	-.01	5	-.464	6	.007	3	2.399e-04	3	-7.692e-04	5	-1.16e-03	2
207	N104	max	.019	2	-.163	2	.025	5	2.17e-03	5	-1.767e-04	3	-1.643e-05	5
208		min	-.035	5	-.467	6	-.005	2	-7.191e-05	3	-1.323e-03	4	-1.607e-03	1
209	N105	max	.067	2	-.152	5	.025	5	1.958e-03	4	5.709e-04	1	8.407e-05	5
210		min	.004	6	-.459	3	-.018	2	6.487e-05	2	-1.558e-03	5	-1.496e-03	1
211	N106	max	.067	2	-.17	5	.084	5	1.508e-03	5	3.617e-05	3	2.989e-04	5
212		min	-.001	4	-.459	3	-.019	1	-4.413e-04	2	-1.039e-03	5	-1.161e-03	2
213	N107	max	.058	2	-.185	5	.102	5	1.673e-03	5	7.068e-05	5	5.197e-04	4
214		min	-.012	5	-.465	3	-.004	3	-2.679e-04	1	-6.167e-04	1	-1.04e-03	2
215	N108	max	.041	2	-.182	5	.094	5	2.864e-03	5	3.379e-04	4	4.613e-04	4
216		min	-.007	4	-.472	3	.003	3	-7.702e-05	1	-5.85e-04	2	-1.525e-03	2

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M32	PIPE 2.0	.532	3	4	.043	5		4	20.867	32.13	1.872	1.872	...	H1-...
2	M36	PIPE 2.0	.526	3	5	.048	5		5	20.867	32.13	1.872	1.872	...	H1-...
3	M28	PIPE 2.0	.525	3	2	.043	5		1	20.867	32.13	1.872	1.872	...	H1-...
4	M12	L5X3X4	.426	4.7...	6	.013	6.1...	y	3	10.926	62.856	1.939	4.967	...	H2-1
5	M11	L5X3X4	.412	4.7...	3	.013	4.7...	y	3	10.926	62.856	1.939	4.967	...	H2-1
6	M13	L5X3X4	.403	2.6...	6	.027	2.6...	z	6	34.997	62.856	1.939	6.505	...	H2-1
7	M15	L5X3X4	.402	2.6...	3	.027	2.6...	z	3	34.997	62.856	1.939	6.503	...	H2-1
8	M14	L5X3X4	.401	2.6...	6	.031	2.41	y	4	34.997	62.856	1.939	6.521	...	H2-1
9	M10	L5X3X4	.389	4.8...	3	.013	6.1...	y	6	10.926	62.856	1.939	4.963	...	H2-1
10	M42	L2.5x2.5x3	.355	1	5	.065	0	y	4	27.703	29.192	.873	1.972	...	H2-1
11	M9	HSS4X4X4	.338	6	3	.050	0	z	5	120....	139....	16.181	16.181	...	H1-...
12	M7	HSS4X4X4	.336	6	6	.044	6	y	3	120....	139....	16.181	16.181	...	H1-...
13	M8	HSS4X4X4	.334	6	3	.044	6	y	6	120....	139....	16.181	16.181	...	H1-...
14	M41	L2.5x2.5x3	.313	0	2	.055	1	y	1	27.703	29.192	.873	1.972	...	H2-1
15	M29	PIPE 2.0	.232	3	4	.032	3		5	20.867	32.13	1.872	1.872	...	H1-...
16	M40	L2.5x2.5x3	.227	0	4	.038	0	y	5	27.703	29.192	.873	1.972	...	H2-1
17	M25	PIPE 2.0	.219	3	2	.034	3		4	20.867	32.13	1.872	1.872	...	H1-...
18	M33	PIPE 2.0	.218	3	5	.039	3		2	20.867	32.13	1.872	1.872	...	H1-...
19	M4	Plate 6"x1/2"	.141	.5	5	.392	.5	y	6	67.552	97.2	1.012	12.15	...	H1-...

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
20	M6	Plate 6"x1/2"	.135	1	4	.389	.5	y	3	67.552	97.2	1.012	12.15	...	H1-...
21	M5	Plate 6"x1/2"	.127	.5	4	.383	.5	y	6	67.552	97.2	1.012	12.15	...	H1-...
22	M39	PIPE_2.0	.118	12....	4	.210	12....		5	5.82	32.13	1.872	1.872	...	H1-...
23	M26	PIPE_2.0	.114	3	4	.026	3		4	20.867	32.13	1.872	1.872	...	H1-...
24	M31	PIPE_2.0	.113	3	4	.020	3		4	20.867	32.13	1.872	1.872	...	H1-...
25	M35	PIPE_2.0	.108	3	1	.023	3		4	20.867	32.13	1.872	1.872	...	H1-...
26	M34	PIPE_2.0	.096	3	2	.024	3		2	20.867	32.13	1.872	1.872	...	H1-...
27	M30	PIPE_2.0	.096	3	1	.024	3		5	20.867	32.13	1.872	1.872	...	H1-...
28	M38	PIPE_2.0	.090	.677	4	.202	12....		2	5.82	32.13	1.872	1.872	...	H1-...
29	M27	PIPE_2.0	.086	3	5	.019	3		5	20.867	32.13	1.872	1.872	...	H1-...
30	M37	PIPE_2.0	.083	.812	4	.188	12....		4	5.82	32.13	1.872	1.872	...	H1-...
31	M2	HSS4X4X4	.041	6.3...	1	.061	12....	z	2	68.78	139....	16.181	16.181	...	H1-...
32	M3	HSS4X4X4	.040	8.5...	4	.050	12....	z	5	68.78	139....	16.181	16.181	...	H1-...
33	M1	HSS4X4X4	.037	12....	4	.057	.677	y	4	68.78	139....	16.181	16.181	...	H1-...
34	M20	L3X3X4	.029	1.9...	4	.004	0	y	6	32.012	46.656	1.688	3.461	...	H2-1
35	M17	L3X3X4	.025	2.1...	4	.004	4.1...	y	6	32.012	46.656	1.688	3.461	...	H2-1
36	M19	L3X3X4	.024	1.9...	1	.004	0	z	3	32.012	46.656	1.688	3.461	...	H2-1
37	M16	L3X3X4	.021	2.1...	1	.004	4.1...	z	3	32.012	46.656	1.688	3.461	...	H2-1
38	M18	L3X3X4	.020	1.9...	1	.004	0	y	3	32.012	46.656	1.688	3.461	...	H2-1
39	M21	L3X3X4	.020	1.9...	4	.004	0	z	3	32.012	46.656	1.688	3.461	...	H2-1



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT5090 - Mount	Aug 6, 2019 at 9:34 AM
19047.00	Unity Check	Mount.R3D

Petition No. 527
AT&T Wireless PCS, LLC.
Trumbull, Connecticut
Staff Report
November 7, 2001

On December 28, 2001, Connecticut Siting Council (Council) member Daniel P. Lynch and Fred Cunliffe of the Council staff met with Crown Castle International representative Shane Newhart and Steven Levine of Cingular at 44 Ffyler Road Suffield, Connecticut for inspection of an existing 95-foot monopole telecommunications tower. The site is located at the Town of Suffield Public Works garage. The tower is owned by Crown. This tower was approved by the Town on May 1, 2000. Crown proposes to increase the height from 95 feet to 110 feet for the purposes of installing antennas owned by Cingluar and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

The tower is currently shared by Verizon Wireless at the 92-foot level, Nextel a the 82-foot level , and Sprint PCS a the 72-foot level. The existing 60-foot by 60-foot compound is surrounded by security fence. This fence will not be expanded.

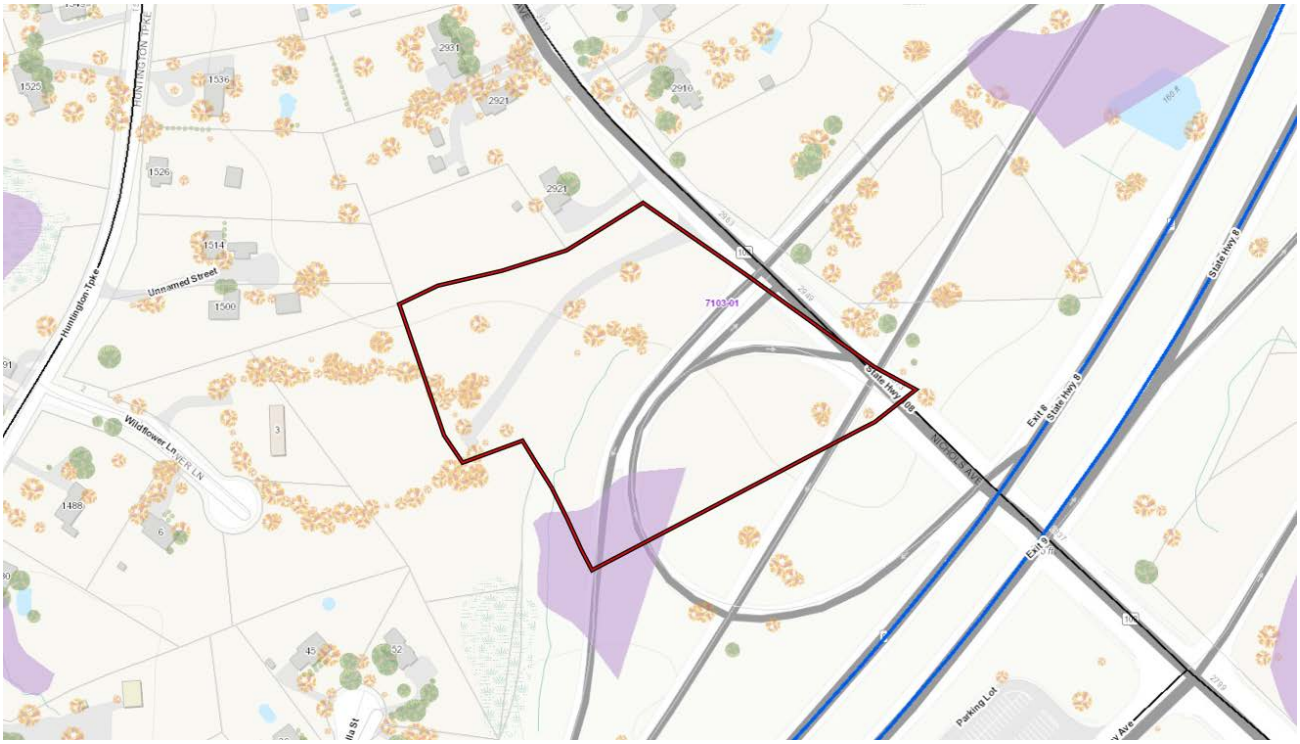
Cingular proposes extending the height of the tower to 110 feet, and installing twelve panel antennas on a triangular antenna platform. The height at the top of the antennas will be about 110 feet above ground level (AGL) with the antenna centerline at 107-feet AGL. A 12-foot by 20-foot equipment shelter will be located near the base of the tower.

Surrounding land uses consist of the Town's public works garage, town offices, office and retail uses, and lumber yard. The zoning designation of this site is industrial.

The worst-case power density for the telecommunications operations at the site has been calculated to be 3.17% of the applicable standard for uncontrolled environments.

AT&T contends that the increase in height of this lattice structure will not result in a substantial environmental effect and the proposed project will be consistent with the existing surrounding landscape. AT&T also states that approval would moot the need for Siting Council action on a tower sharing proposed for use of an existing wooden monopole owned by United Illuminating Company (TS-AT&T-144-001124) which was tabled at a Council meeting on December 14, 2000.

CT5090 – 2891 NICHOLS AVE / PARCEL # J10-40 – TRUMBULL, CT



EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

April 1, 2020

Mr. Tim Burks
Senior Program Manager
SAI Communications
193 Shadow Pond Lane
Suffield, CT 06078

RE: AT&T Site CT-5090, Nichols Avenue, Trumbull CT, Eversource Structure 833

Dear Mr. Burks:

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

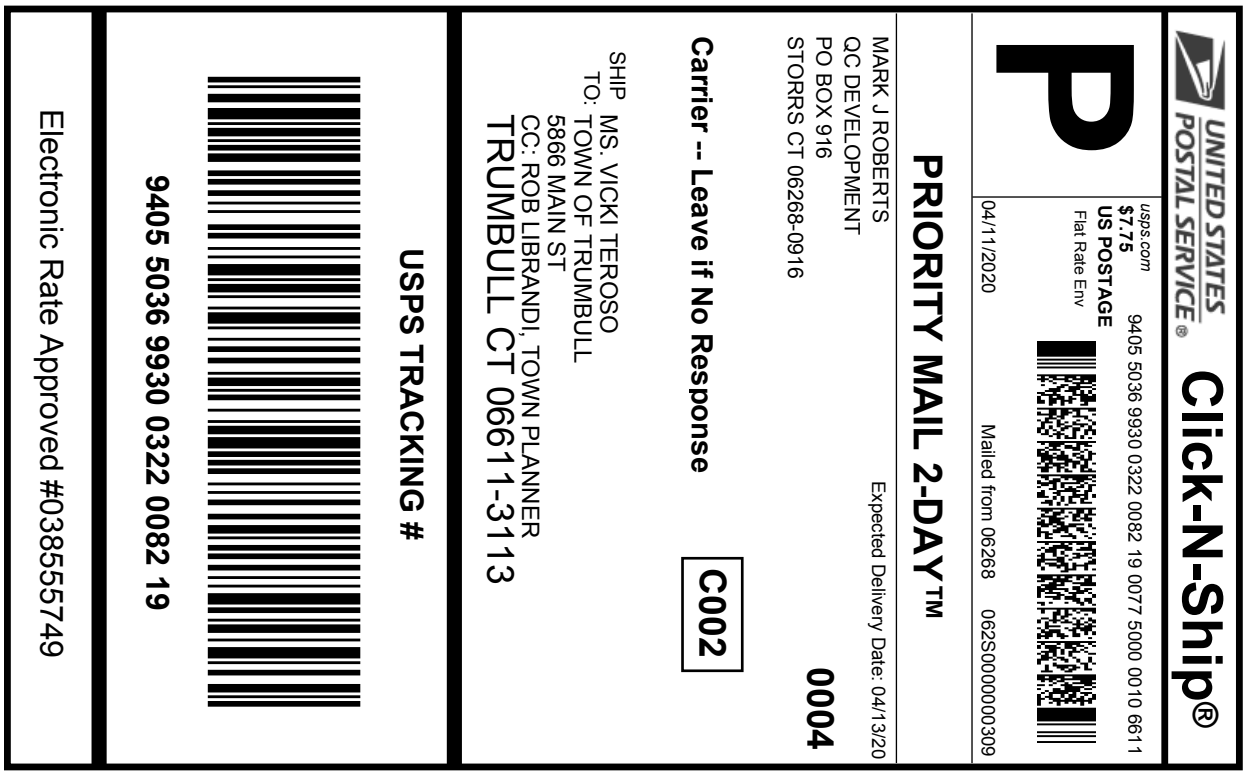
Please work with Christopher Gelinas of Eversource Real Estate to process the site lease amendment if needed. Please do not hesitate to contact us with questions or concerns. Christopher can be contacted at 860-665-2008, and I can be contacted at 860-728-4503.

Sincerely,

Joel Szarkowicz

Joel Szarkowicz
Transmission Line Engineering

Ref: 19047.00 - CT5090 Structural Analysis Rev2 19.06.11
19047.00 CT5090 Trumbull South East - CDs Rev1 08.05.19 (SS)



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0322 0082 19

Trans. #:	489415728
Print Date:	04/10/2020
Ship Date:	04/11/2020
Expected Delivery Date:	04/13/2020

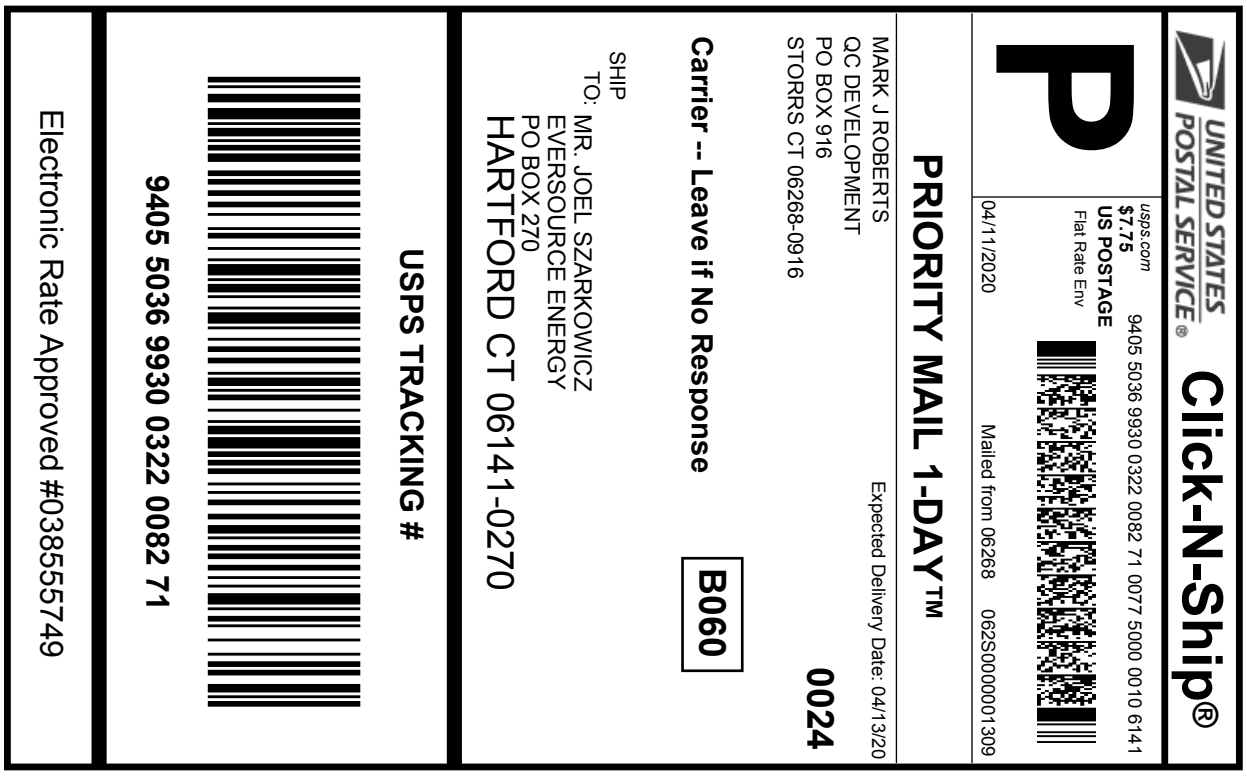
Priority Mail® Postage:	**$7.75**
Total:	**$7.75**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MS. VICKI TEROSO
TOWN OF TRUMBULL
5866 MAIN ST
CC: ROB LIBRANDI, TOWN PLANNER
TRUMBULL CT 06611-3113

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

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



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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0322 0082 71

Trans. #:	489415728
Print Date:	04/10/2020
Ship Date:	04/11/2020
Expected Delivery Date:	04/13/2020

Priority Mail® Postage:	**$7.75**
Total:	**$7.75**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MR. JOEL SZARKOWICZ
EVERSOURCE ENERGY
PO BOX 270
HARTFORD CT 06141-0270

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

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Check the status of your shipment on the USPS Tracking® page at usps.com