EMPIRE telecom

July 15, 2016

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

Regarding:	Notice of Exempt Modification – Swap of 3 Antennas and addition of radios and associated lines
Property Address:	190 Olcott Street, Manchester, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 155 foot Utility tower ("tower") at the above-referenced address, latitude 41.7723811, longitude -72.5564461. AT&T's facility consists of nine (9) wireless telecommunications antennas at 168 feet. The tower is controlled and owned by Eversource Energy. Assessor's information is attached hereto.

AT&T desires to modify its existing telecommunications facility by swapping three (3) antennas and adding (6) remote radios, (6) TMAs and associated lines. The centerline height of said antennas is and will remain at 168 feet.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Town Manager of the Town of Manchester, Chief building inspector of the Town of Manchester and the Director of Planning and Economic Development of the Town of Manchester. A copy of this letter is also being sent to Eversource, Energy, the owner of the structure that AT&T is located.

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

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas and associated lines will be installed at 168 foot level of the 155 foot Utility tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.

16 Esquire Road, Billerica, MA 01862 Phone 978-284-3906 Email: ncaplan@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Centek Engineering dated March 28, 2016).

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

Sincerely,

Nicole Caplan
Site Acquisition Specialist
Empire Telecom

CC: Scott Shanley, Town Manager, Town of Manchester
Greg Smith, Chief Building Inspector, Town of Manchester
Mark Pellegrini, Director of Planning and Economic Development, Town of Manchester
Eversource Energy, c/o Robert Gray

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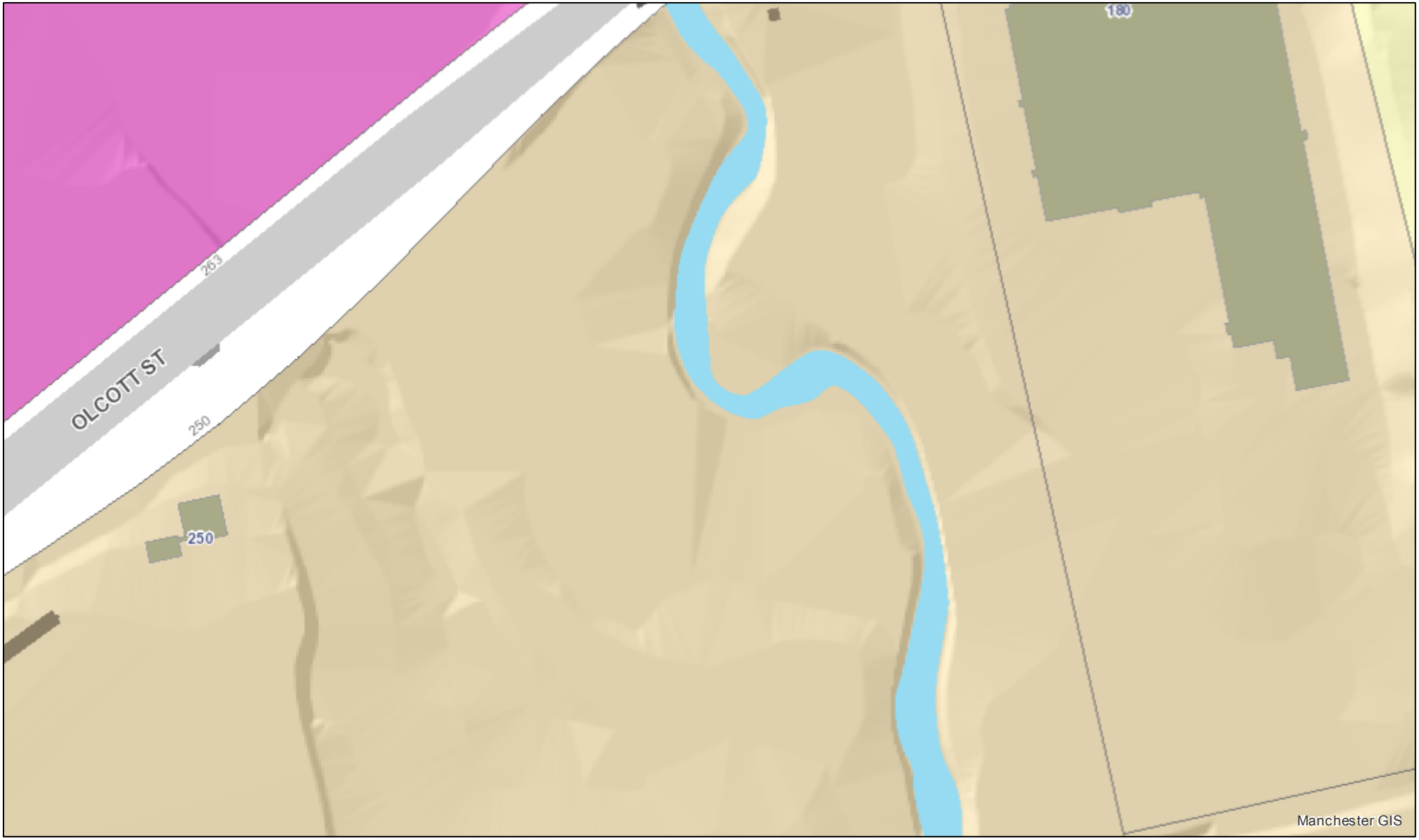
Town of Manchester, CT



Town of Manchester, CT
DISCLAIMER: This map is compiled from other maps, deeds, dimensions and other sources of information.
Not to be construed as accurate surveys and subject to final changes as a more accurate survey may disclose.
NOTES:Original planimetric and topographic data were compiled by stereophotogrammetric methods from photography dated April 1999 in accordance with ASPR accuracy standards for 1inch = 40ft large scale Class I mapping. The updating of the GIS data is performed by the GIS/Maps & Records Unit on a continual basis utilizing the best and most appropriated sources available.

1 inch = 100 feet

Author:

N
W E
S

Date: 7/14/2016

PROJECT INFORMATION

SCOPE OF WORK:
- REMOVE (1) ANTENNA PER SECTOR (TOTAL OF 3 ANTENNAS)
- INSTALL (1) ANTENNA PER SECTOR (TOTAL OF 3 NEW ANTENNAS)
- ADD (1) RRH PER SECTOR (TOTAL OF 3 NEW RRHs)
- ADD (1) A-2 MODULE PER SECTOR (TOTAL OF 3 NEW A-2 MODULES)
- REMOVE (1) TMA PER SECTOR (TOTAL OF 3 TMAs)
- INSTALL (2) TWIN TMA PER SECTOR (TOTAL OF 6 NEW TWIN TMAs)
- ADD (2) COAX PER SECTOR (TOTAL OF 6 NEW COAX)

SITE ADDRESS:	190 OLCOTT STREET MANCHESTER, CT 06040
LATITUDE:	41.7723811 41° 46' 20.57196"N
LONGITUDE:	-72.5564461 72° 33' 23.20596"W
USID:	59439
TOWER OWNER:	CL&P STRUCTURE NO. 20003
TYPE OF SITE:	UTILITY / INDOOR EQUIPMENT
TOWER HEIGHT:	155-0"±
RAD CENTER:	168'-0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

at&t MOBILITY

FA CODE: 10035390
SITE NUMBER: CT1209
SITE NAME: MANCHESTER CT
EVERSOURCE STRUCTURE: 20003

PROJECT TEAM

CLIENT REPRESENTATIVE
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

ZONING:
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

ENGINEERING:
COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46, SUITE E39, MOUNTAIN LAKES, NJ 07046
CONTACT: NICHOLAS D. BARILE, P.E.
PHONE: 862-209-4300
EMAIL: nbarile@comexconsultants.com

RF ENGINEER:
COMPANY: AT&T MOBILITY - NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD, SUITE 550 13 & 14, FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508-596-7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484-683-1750
EMAIL: gdorman@empiretelecomm.com

DRAWING INDEX

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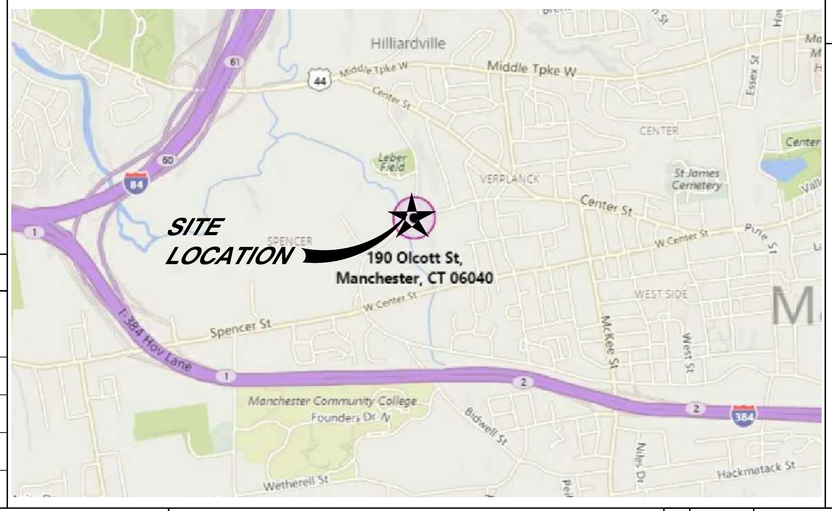
VICINITY MAP

FROM ROCKY HILL, HEAD SOUTHWEST ON CONCRIB LN. TURN LEFT ONTO SOLO DR. TURN RIGHT ONTO GILBERT AVE. TURN RIGHT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 N. TAKE EXIT 29 FOR CT-15 N. MERGE ONTO I-84 E. TAKE EXIT 66 FOR S FRONTAGE RD. TURN LEFT ONTO S FRONTAGE RD. TURN RIGHT ONTO BOLTON RD. TURN LEFT ONTO CLARK RD. TURN RIGHT ONTO INDUSTRIAL PARK RD. SITE WILL BE ON RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP - CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

COM-EX Consultants
115 ROUTE 46
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PHONE: 862.209.4300
FAX: 862.209.4301

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16 ESQUIRE ROAD
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SITE NUMBER: CT1209
SITE NAME: MANCHESTER CT., OLCOTT ST
190 OLCOTT STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	06/23/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, 25643, REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER
CT LICENSE NO. 25643

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15118-EMP	T-1	0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – EMPIRE TELECOM
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
    - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
    - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
    - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
    - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
    - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
    - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
    - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
    - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
    - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
    - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
    - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

22. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY CENTEK ENGINEERING FOR A RECENT UPGRADE DATED 05/30/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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PHONE: 862.209.4300
FAX: 862.209.4301

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16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1209
SITE NAME: MANCHESTER CT.,
OLCOTT ST
190 OLCOTT STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	06/23/16	ISSUED AS FINAL	KCD	NDB	NDB

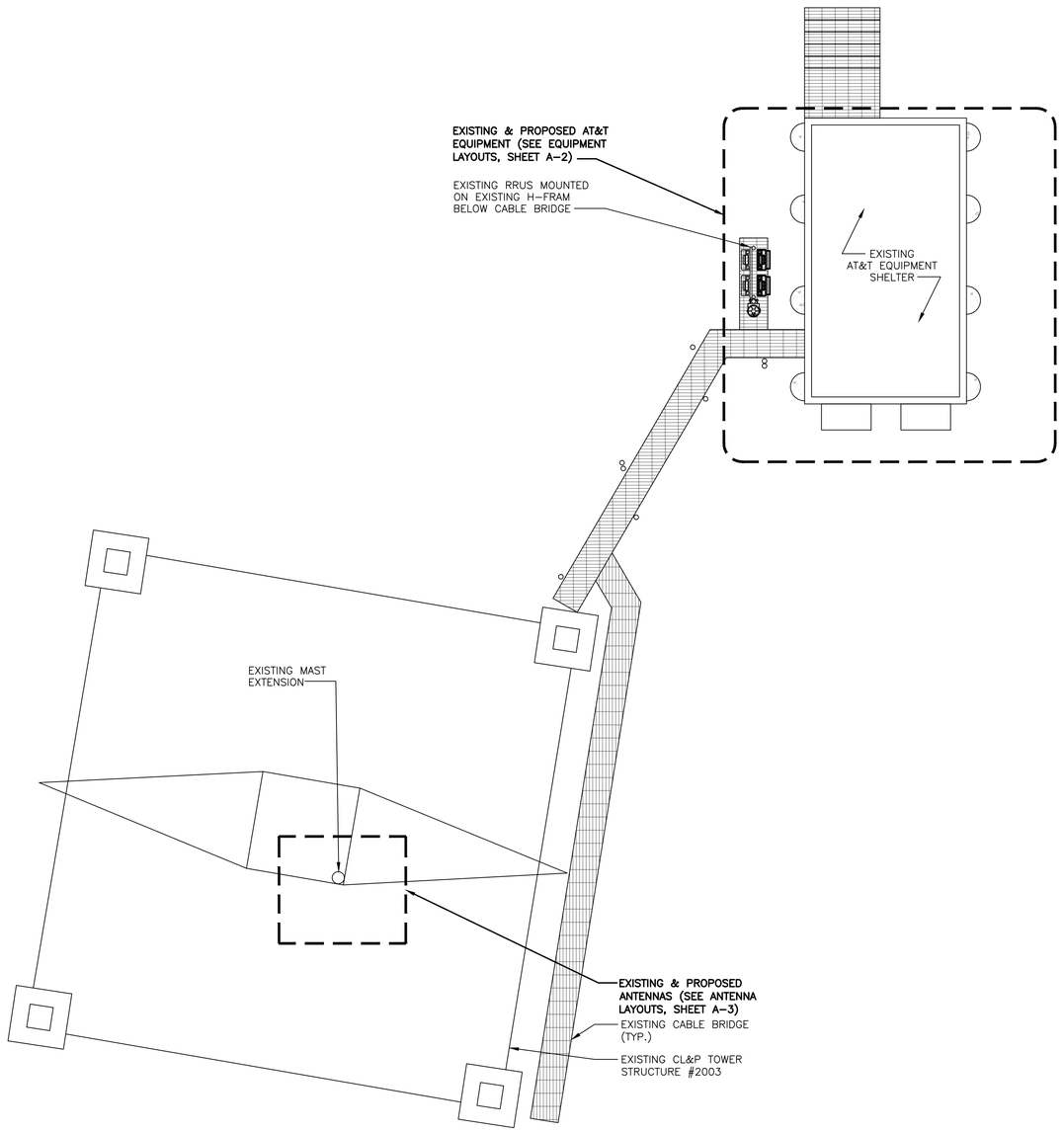
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT
DOUGLAS G. BAILEY
0023643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT 0023643

AT&T

DRAWING TITLE:
GROUNDING NOTES & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15118-EMP	GN-1	0



NORTH

COMPOUND LAYOUT

SCALE: 3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"

GRAPHIC SCALE: 3/16"=1'-0"

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PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

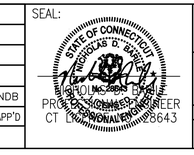
SITE NUMBER: CT1209
SITE NAME: MANCHESTER CT., OLCOTT ST
190 OLCOTT STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	06/23/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:

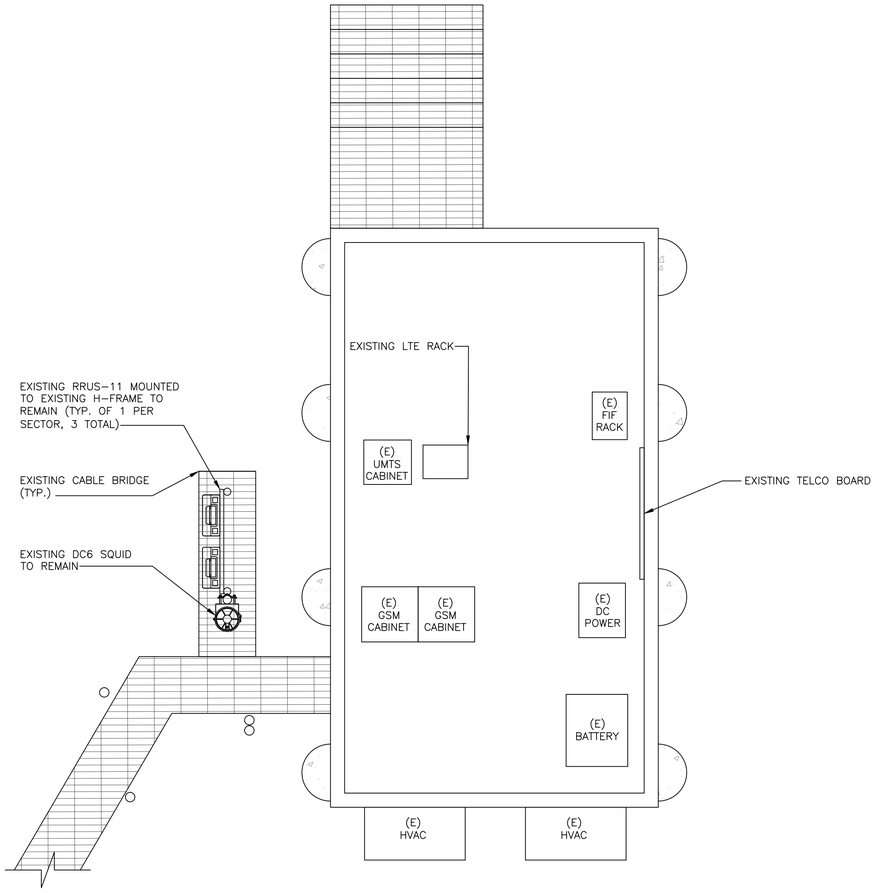


DOUGLAS D. BAKER
PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

AT&T

DRAWING TITLE: COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15118-EMP	A-1	0



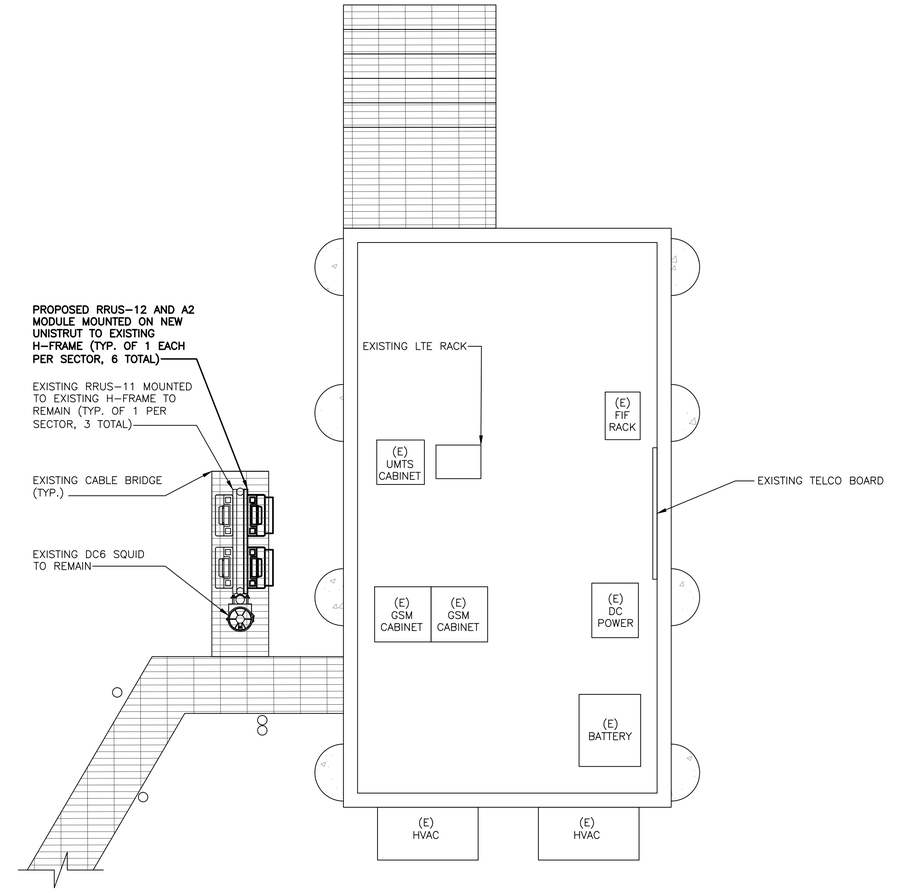
NORTH

EXISTING EQUIPMENT LAYOUT

SCALE: 3/8" = 1'-0"

0 1'-4" 2'-8" 5'-4"

GRAPHIC SCALE: 3/8"=1'-0"



NORTH

PROPOSED EQUIPMENT LAYOUT

SCALE: 3/8" = 1'-0"

0 1'-4" 2'-8" 5'-4"

GRAPHIC SCALE: 3/8"=1'-0"

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BILLERICA, MA 01821

SITE NUMBER: CT1209
SITE NAME: MANCHESTER CT., OLCOTT ST
190 OLCOTT STREET
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	06/23/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

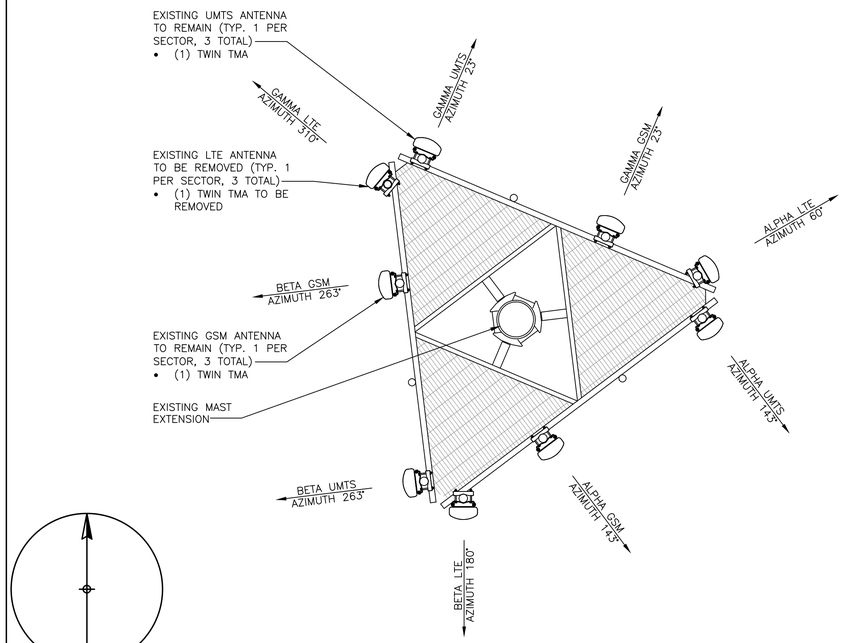
SEAL:

STATE OF CONNECTICUT
NICHOLAS G. BUSH
LICENSED PROFESSIONAL ENGINEER
PRINCIPAL ENGINEER
CT LICENSE NO. 28643

AT&T

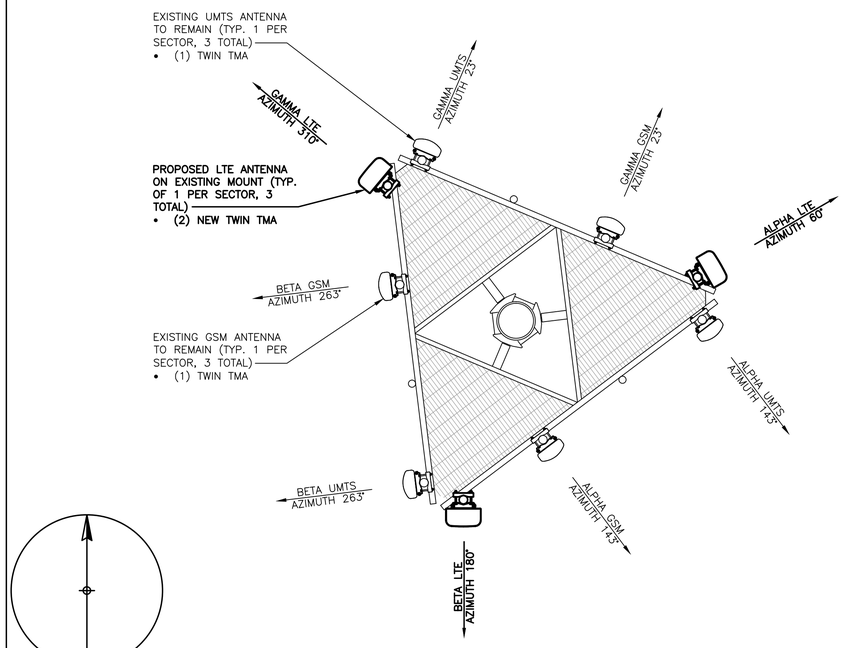
DRAWING TITLE: EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
15118-EMP	A-2	0



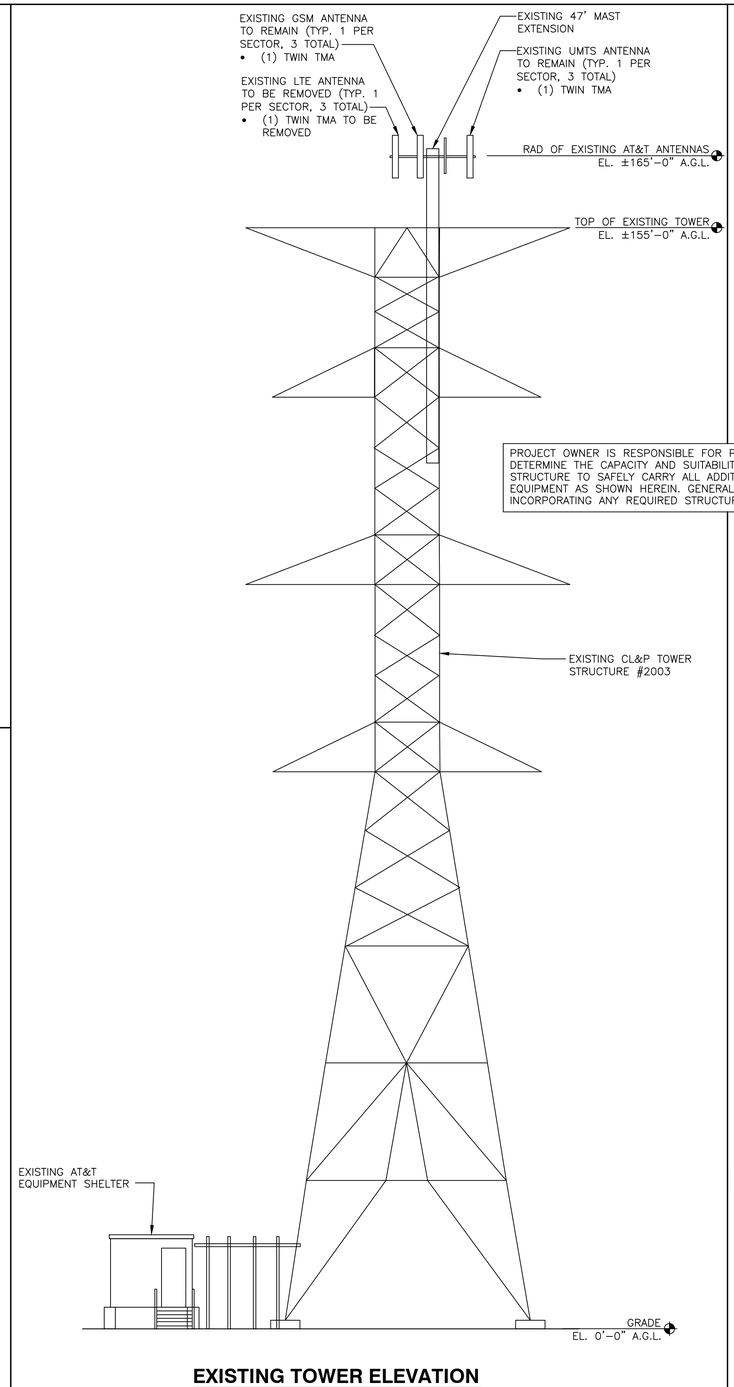
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



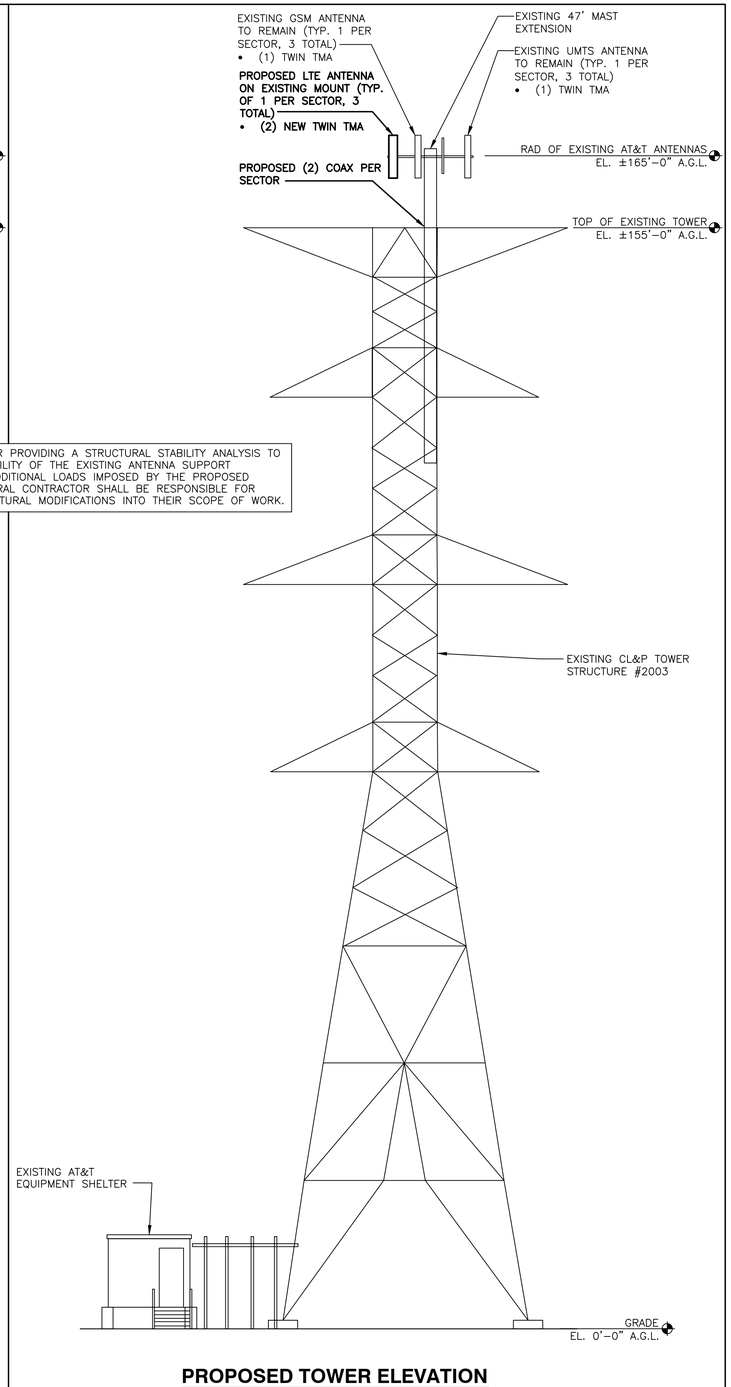
EXISTING TOWER ELEVATION

SCALE: 3/32" = 1'-0"

0 5'-4" 10'-8" 21'-4"

GRAPHIC SCALE: 3/32"=1'-0"

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.



PROPOSED TOWER ELEVATION

SCALE: 3/32" = 1'-0"

0 5'-4" 10'-8" 21'-4"

GRAPHIC SCALE: 3/32"=1'-0"

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SEAL: STATE OF CONNECTICUT — DOUGLAS G. BURNS — LICENSED PROFESSIONAL ENGINEER — PRINCIPAL ENGINEER — CT LICENSE NO. 28643

AT&T

DRAWING TITLE: ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
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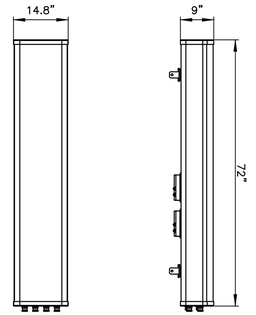
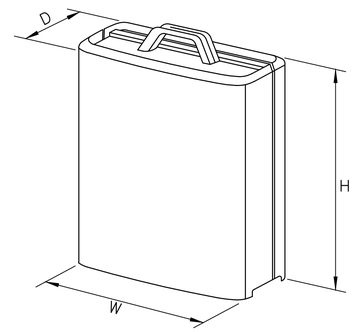


MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H6
WEIGHT	57 LBS

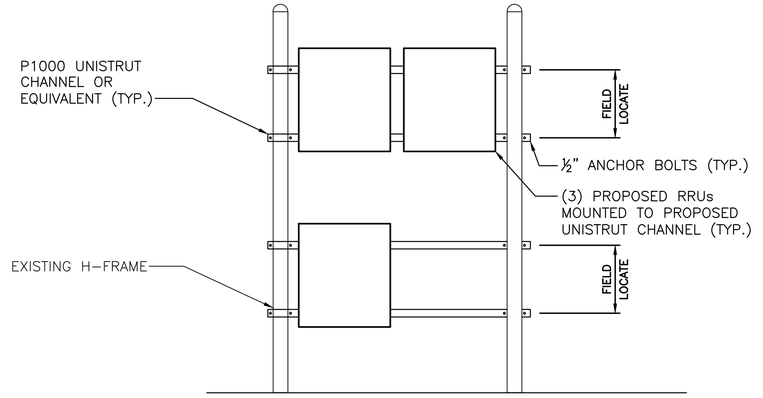
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.7" x 16.9" x 7.2"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

* DENOTES EXISTING

RRUS DETAIL
SCALE: N.T.S.



NOTES:

1. SUBCONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS.
2. SUBCONTRACTOR SHALL SUPPLY (BUT NOT INSTALL) 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER RRU. SUBCONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.
3. SPACING MAY VARY BASED ON SELECTED EQUIPMENT. ADJUSTMENTS TO SPACING WILL BE MADE BY RRU INSTALLER.

PROPOSED RRU MOUNTING DETAIL (FRONT VIEW)
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
BETA	B1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	G1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x9"**
BETA	B1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x9"**
GAMMA	G1	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x9"**

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**
BETA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**
GAMMA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**

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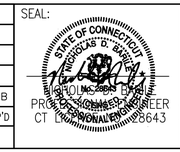
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:


AT&T

DRAWING TITLE: DETAILS

JOB NUMBER	DRAWING NUMBER	REV
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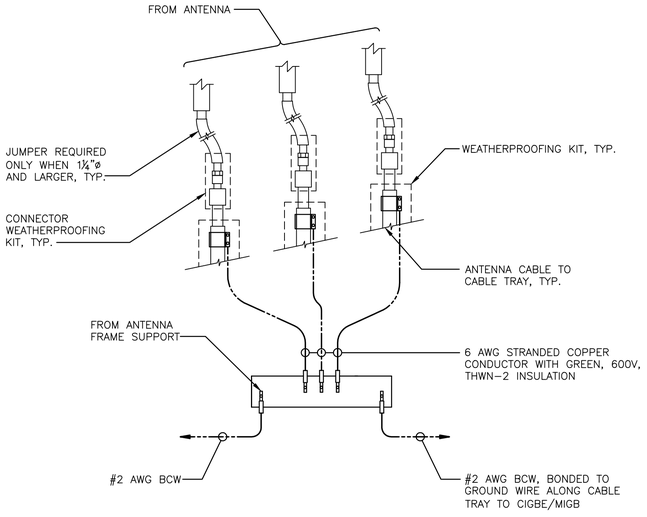
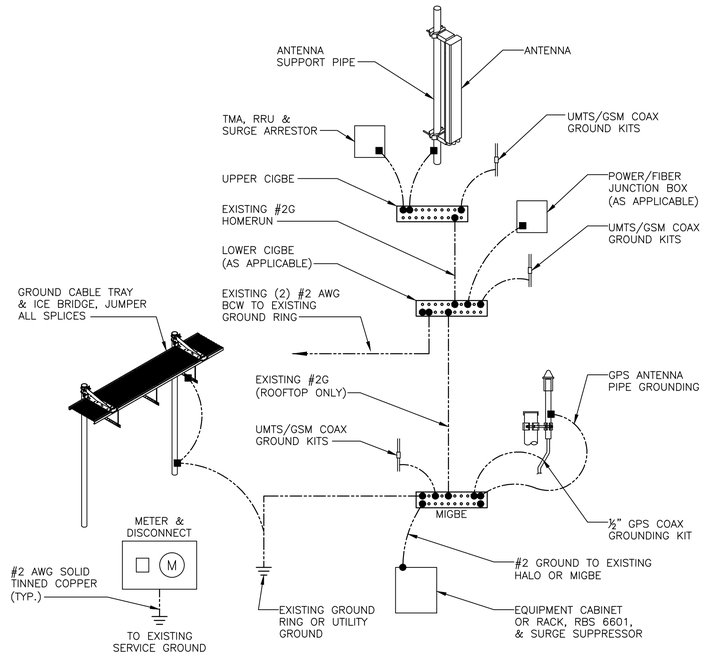


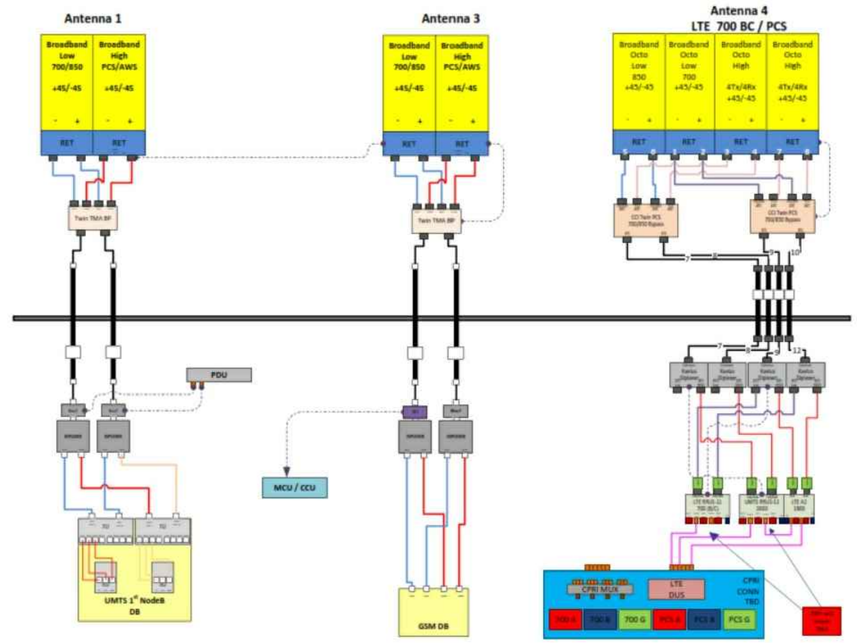
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



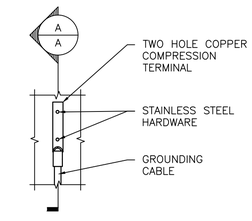
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

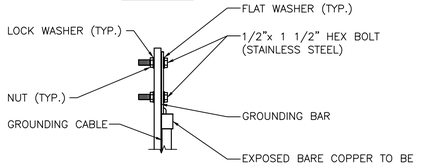


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



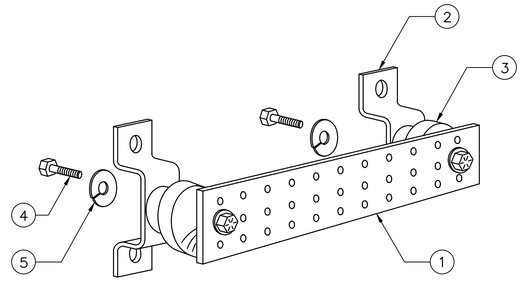
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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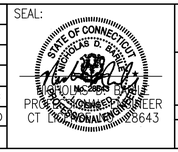


AT&T

DRAWING TITLE: GROUNDING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15118–EMP	G–1	0

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Tower

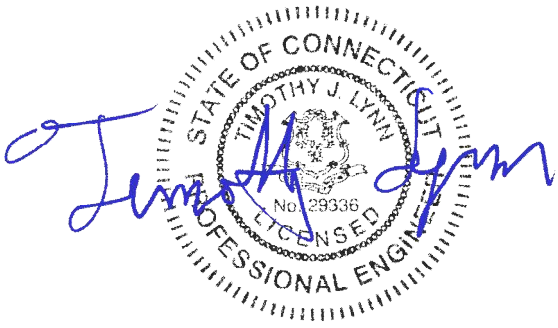
AT&T Site Ref: CT1209

Eversource Structure No. 20003
155' Electric Transmission Lattice Tower

190 Olcott Street
Manchester, CT

CENTEK Project No. 16002.002

Date: March 28, 2016



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

Table of Contents

Introduction

The purpose of this report is to analyze the existing antenna mast and 155' utility tower located at 190 Olcott Street in Manchester, 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: Six (6) KMW AM-X-CD-16-65-00T-RET panel antennas and six (6) CCI DTMABP7819VG12A TMA's mounted on a 12-ft low profile platform with a RAD center elevation of 165-ft above grade.
  Coax Cables: Eighteen (18) 1-5/8" ∅ coax cables running the legs of the existing tower.
- AT&T (Existing to Remove):
  Antennas: Three (3) KMW AM-X-CD-16-65-00T-RET panel antennas and three (3) CCI DTMABP7819VG12A TMA's mounted on a 12-ft low profile platform with a RAD center elevation of 165-ft above grade.
- **AT&T (Proposed):**
  Antennas: Three (3) CCI OPA-65R-LCUU-H6 panel antennas and six (6) CCI TMABPDB7823VG12A TMA's mounted on a 12-ft low profile platform with a RAD center elevation of 165-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running the legs of the existing tower.

Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9th 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 within the antenna mast unless specified otherwise.
- Antenna mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Antenna mast and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

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 A53 Grade B (Fy = 35ksi) connected at two points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA/EIA standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA 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 155-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 EIA-222-F-1996, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

- UTILITY TOWER ANALYSIS

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

  Load cases considered:

  Load Case 1: NESC Heavy
  Wind Pressure…….. 4.0 psf
  Radial Ice Thickness……. 0.5"
  Vertical Overload Capacity Factor……. 1.50
  Wind Overload Capacity Factor……. 2.50
  Wire Tension Overload Capacity Factor…… 1.65

  Load Case 2: NESC Extreme
  Wind Speed……. 110 mph (1)
  Radial Ice Thickness……. 0"

  Note 1: NESC C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- ANTENNA MAST ANALYSIS

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

  Load cases considered:

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

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

  Note 2: Per NU Mast Design Criteria Exception 1.

R e s u l t s

- 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	97.9%[1]	**PASS**
C12x20.7	Bending	94.0%[1]	**PASS**
Connection	Shear	28.4%[2]	**PASS**

Note 1 – 1/3 increase in allowable stress used per OTRM 059.
Note 2 – 1/3 increase in allowable stress not used per OTRM 059.

- 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 **95.05%** occurs in the utility tower under the **NESC Extreme** loading condition.

  TOWER SECTION:

  The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g52Y	95.05%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of four (4) 4-ft square tapering to 6-ft square x 9.5-ft long reinforced concrete piers and four (4) 12-ft square x 1.75-ft thick reinforced concrete pads. The base of the tower is connected to the foundation by four (4) 1-1/2" ∅ ASTM A36 and four (4) 1" ∅ ASTM A193 Gr. B7 anchor bolts per leg Foundation information was obtained from NUSCO drawing # 01165-60003.

BASE REACTIONS:

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

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	34.66 kips	113.28 kips	159.15 kips
NESC Extreme Wind	47.55 kips	175.56 kips	196.26 kips

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

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	93.5%	**PASS**

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)	1.63 FS (1)	**PASS**
	Overturning	1.0 FS (1)	1.35 FS (1)	**PASS**
	Bearing	4 ksf	3.59 ksf	**PASS**

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

C o n c l u s i o n

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

The analysis is based, in part on the information provided to this office by Eversource and AT&T. If the existing conditions are different than the information in this report, 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

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

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

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

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

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

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

Modeling Features:

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

Results Features:

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-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

NU Design Criteria

			Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	------	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	-----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
High Wind Condtion	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
		* Only for Structures Installed after 2007						

Shape Factor Criteria shall be per TIA Shape Factors.

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

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

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

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

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

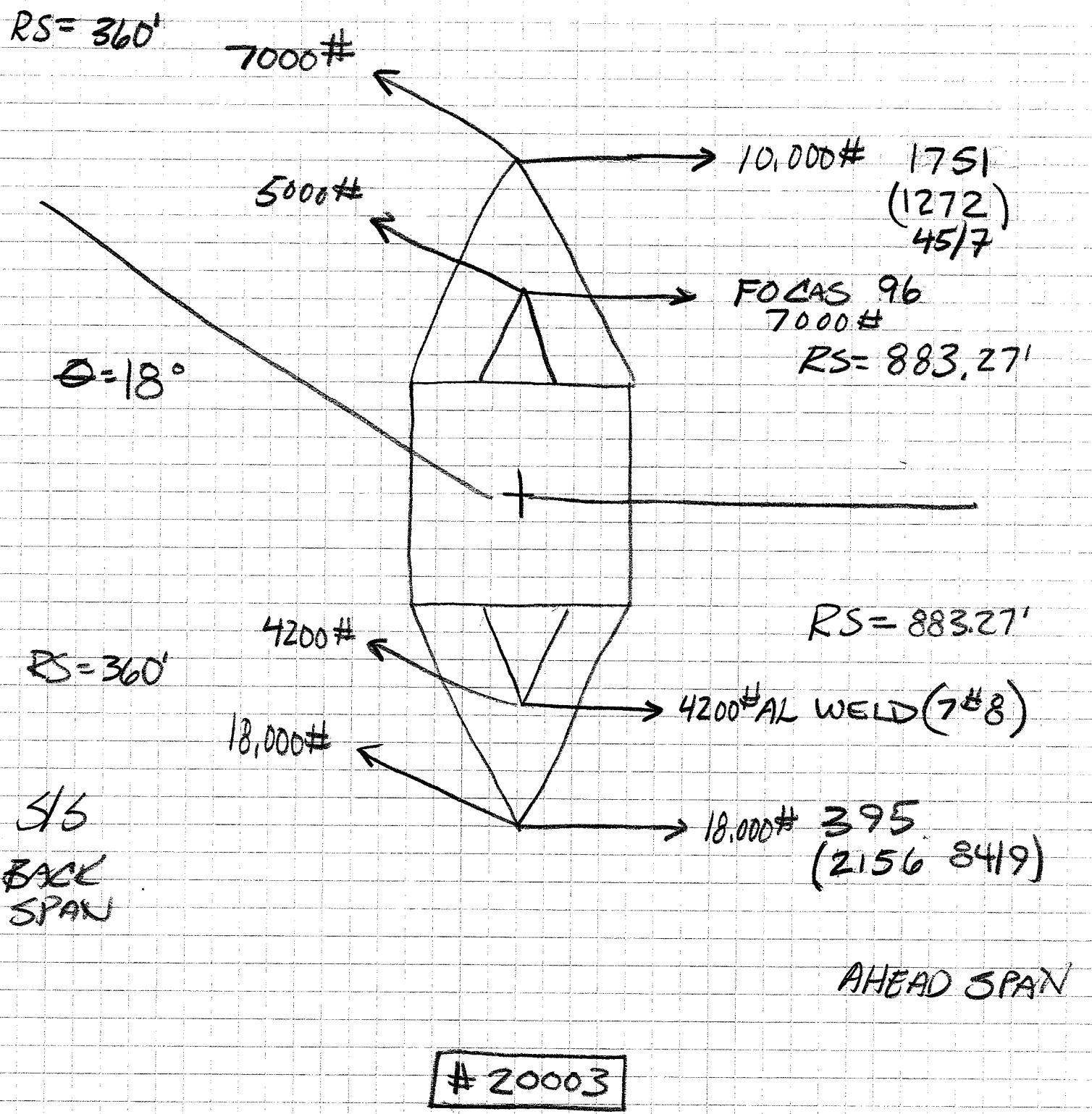
iii) When Coaxial Cables are mounted along side the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.3

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

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

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


RS = 360'
7000#
10,000#
1751
(1272)
45/7
5000#
FOCAS 96
7000#
RS = 883.27'
Θ = 18°
RS = 883.27'
4200#
RS = 360'
4200# AL WELD (7#8)
18,000#
18,000#
395
(2156 8419)
S/S
BACK
SPAN
AHEAD SPAN

#20003

Northeast Utilities System

Job :		Spec. Number	Page of
Description:		Computed by	Sheet of
		Checked by	Date 12/19/11
			Date

INPUT DATA

TOWER ID: 20003

Structure Height (ft) : 75

Wind Zone : Central CT (green)

Wind Speed : 110 mph

Tower Type : ○ Suspension ◉ Strain

Extreme Wind Model : PCS Addition

Shield Wire Properties:

	BACK	AHEAD
NAME =	*3/8 AW*	*3/8 AW*
DESCRIPTION =	3/8	3/8
STRANDING =	7 #8 Al Weld	7 #8 Al Weld
DIAMETER =	0.385 in	0.385 in
WEIGHT =	0.262 lb/ft	0.262 lb/ft

Conductor Properties:

	BACK	AHEAD	
NAME =	*BLUEBIRD*	*BLUEBIRD*	
Number of Conductors per phase: 1	2156.000 84/19 ACSR	2156.000 84/19 ACSR	1 Number of Conductors per phase
DIAMETER =	1.762 in	1.762 in	
WEIGHT =	2.507 lb/ft	2.507 lb/ft	

Insulator Weight = 200 lbs

Broken Wire Side = AHEAD SPAN

Horizontal Line Tensions:

	BACK		AHEAD	
	Shield	Conductor	Shield	Conductor
NESC HEAVY =	4,200 ✓	18,000 ✓	4,200 ✓	18,000 ✓
EXTREME WIND =	3,368 ✓	13,978 ✓	3,453 ✓	18,464 ✓
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	2,438 ✓	8,834 ✓	1,114 ✓	9,957 ✓

Line Geometry:

					SUM
LINE ANGLE (deg) =	BACK:	9	AHEAD:	9	**18**
WIND SPAN (ft) =	BACK:	180	AHEAD:	442	**622**
WEIGHT SPAN (ft) =	BACK:	(51)	AHEAD:	694	**642**

Northeast Utilities System

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		Date	

WIRE LOADING AT ATTACHMENTS

TOWER ID: 20003

Wind Span =	622 ft	Broken Wire Span =	AHEAD SPAN
Weight Span =	642 ft	Type of Insulator Attachment =	STRAIN
Total Angle =	18 degrees		

1. NESC RULE 250B Heavy Loading:

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
Shield Wire =	2,886 lb	0 lb	783 lb	1,292 lb	6,845 lb	-62 lb
Conductor =	10,723 lb	0 lb	4,371 lb	5,060 lb	29,334 lb	0 lb

2. NESC RULE 250C Transverse Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	1,659 lb	84 lb	168 lb
Conductor =	7,786 lb	4,431 lb	2,011 lb

3. NESC RULE 250C Longitudinal Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	168 lb
Conductor =	#VALUE!	#VALUE!	2,011 lb

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

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	1,275 lb
Conductor =	#VALUE!	#VALUE!	4,217 lb

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

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	522 lb
Conductor =	#VALUE!	#VALUE!	2,914 lb

6. 60 Deg. F, No Wind

	Horizontal	Longitudinal	Vertical
Shield Wire =	556 lb	1,308 lb	168 lb
Conductor =	2,940 lb	1,109 lb	2,011 lb

7. Construction

	Horizontal	Longitudinal	Vertical
Shield Wire =	556 lb	1,308 lb	168 lb
Conductor =	2,940 lb	1,109 lb	2,011 lb

Northeast Utilities System

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

LC 1		HORIZONTAL	LONGITUDINAL	VERTICAL
NESC Heavy	shield - back	1291.840843	6844.6802	-62.15986663
	shield - ahead	1593.770843	-6844.6802	844.7553892
	SHIELD - SUM	**2885.611685**	**0**	**782.5955225**
	conductor - back	5060.403612	29334.34372	0.444834946
	conductor - ahead	5662.519612	-29334.34372	4370.968194
	CONDUCTOR - SUM	**10722.92322**	**0**	**4371.413029**
LC 2		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Extreme Wind	shield - back	698.3888656	3326.534331	-13.359654
	shield - ahead	960.958022	-3410.48784	181.5583
	SHIELD - SUM	**1659.346888**	**-83.95350895**	**168.198646**
	conductor - back	2971.612352	13805.90762	72.06779
	conductor - ahead	4814.202463	-18236.67752	1938.6045
	CONDUCTOR - SUM	**7785.814815**	**-4430.769896**	**2010.67229**
LC 3		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Long. Wind	shield - back	#VALUE!	#VALUE!	-13.359654
	shield - ahead	#VALUE!	#VALUE!	181.5583
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**168.198646**
	conductor - back	#VALUE!	#VALUE!	72.06779
	conductor - ahead	#VALUE!	#VALUE!	1938.6045
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**2010.67229**
LC 4		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
RULE 250D	shield - back	#VALUE!	#VALUE!	-101.2492722
	shield - ahead	#VALUE!	#VALUE!	1375.982173
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**1274.732901**
	conductor - back	#VALUE!	#VALUE!	-103.2037808
	conductor - ahead	#VALUE!	#VALUE!	4320.553047
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**4217.349266**
LC 5		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
NESC w/o OLF's	shield - back	#VALUE!	#VALUE!	-41.43991109
	shield - ahead	#VALUE!	#VALUE!	563.1702594
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**521.7303484**
	conductor - back	#VALUE!	#VALUE!	0.296556631
	conductor - ahead	#VALUE!	#VALUE!	2913.978796
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**2914.275353**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Raking	shield - back	381.3872258	2407.984174	-13.359654
	shield - ahead	174.2679941	-1100.284811	181.5583
	SHIELD - SUM	**555.6552198**	**1307.699363**	**168.198646**
	conductor - back	1381.942064	8725.238801	72.06779
	conductor - ahead	1557.617968	-9834.412807	1938.6045
	CONDUCTOR - SUM	**2939.560033**	**-1109.174006**	**2010.67229**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
60 DEG F NO WIND	shield - back	381.3872258	2407.984174	-13.359654
	shield - ahead	174.2679941	-1100.284811	181.5583
	SHIELD - SUM	**555.6552198**	**1307.699363**	**168.198646**
	conductor - back	1381.942064	8725.238801	72.06779
	conductor - ahead	1557.617968	-9834.412807	1938.6045
	CONDUCTOR - SUM	**2939.560033**	**-1109.174006**	**2010.67229**

Northeast Utilities System

Job :		Page	of
Description:	Spec. Number	Sheet	of
	Computed by	Date	12/19/11
	Checked by	Date	

INPUT DATA

TOWER ID: 20003

Structure Height (ft) : 75

Wind Zone : Central CT (green)

Wind Speed : 110 mph

Tower Type : ○ Suspension ◉ Strain

Extreme Wind Model : PCS Addition

Shield Wire Properties:

	BACK	AHEAD
NAME =	*OPGW-120*	*OPGW-120*
DESCRIPTION =	6-Groove	6-Groove
STRANDING =	10/9 FOCAS	10/9 FOCAS
DIAMETER =	0.738 in	0.738 in
WEIGHT =	0.518 lb/ft	0.518 lb/ft

Conductor Properties:

	BACK	AHEAD		
NAME =	*BITTERN*	*BITTERN*		
Number of Conductors per phase: 1	1272.000 45/7 ACSR	1272.000 45/7 ACSR	1	Number of Conductors per phase
DIAMETER =	1.345 in	1.345 in		
WEIGHT =	1.432 lb/ft	1.432 lb/ft		

Insulator Weight = 200 lbs

Broken Wire Side = AHEAD SPAN

Horizontal Line Tensions:

	BACK		AHEAD	
	Shield	Conductor	Shield	Conductor
NESC HEAVY =	5,000	7,000	7,000	10,000
EXTREME WIND =	4,405	6,779	7,046	11,130
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	1,826	2,947	2,487	4,661

Line Geometry:

					SUM
LINE ANGLE (deg) =	BACK:	9	AHEAD:	9	**18**
WIND SPAN (ft) =	BACK:	180	AHEAD:	442	**622**
WEIGHT SPAN (ft) =	BACK:	(51)	AHEAD:	694	**642**

Northeast Utilities System

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Description:	Spec. Number	Sheet	of
	Computed by	Date	12/19/11
	Checked by	Date	

WIRE LOADING AT ATTACHMENTS

TOWER ID: 20003

Wind Span =	622	ft	
Weight Span =	642	ft	
Total Angle =	18	degrees	

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

1. NESC RULE 250B Heavy Loading:

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
Shield Wire =	3,998 lb	3,259 lb	1,241 lb	1,551 lb	8,148 lb	-99 lb
Conductor =	5,603 lb	4,889 lb	3,086 lb	2,159 lb	11,408 lb	103 lb

2. NESC RULE 250C Transverse Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	2,927 lb	2,608 lb	333 lb
Conductor =	4,871 lb	4,297 lb	1,320 lb

3. NESC RULE 250C Longitudinal Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	333 lb
Conductor =	#VALUE!	#VALUE!	1,320 lb

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

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	1,721 lb
Conductor =	#VALUE!	#VALUE!	3,194 lb

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

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	827 lb
Conductor =	#VALUE!	#VALUE!	2,057 lb

6. 60 Deg. F, No Wind

	Horizontal	Longitudinal	Vertical
Shield Wire =	675 lb	653 lb	333 lb
Conductor =	1,190 lb	1,693 lb	1,320 lb

7. Construction

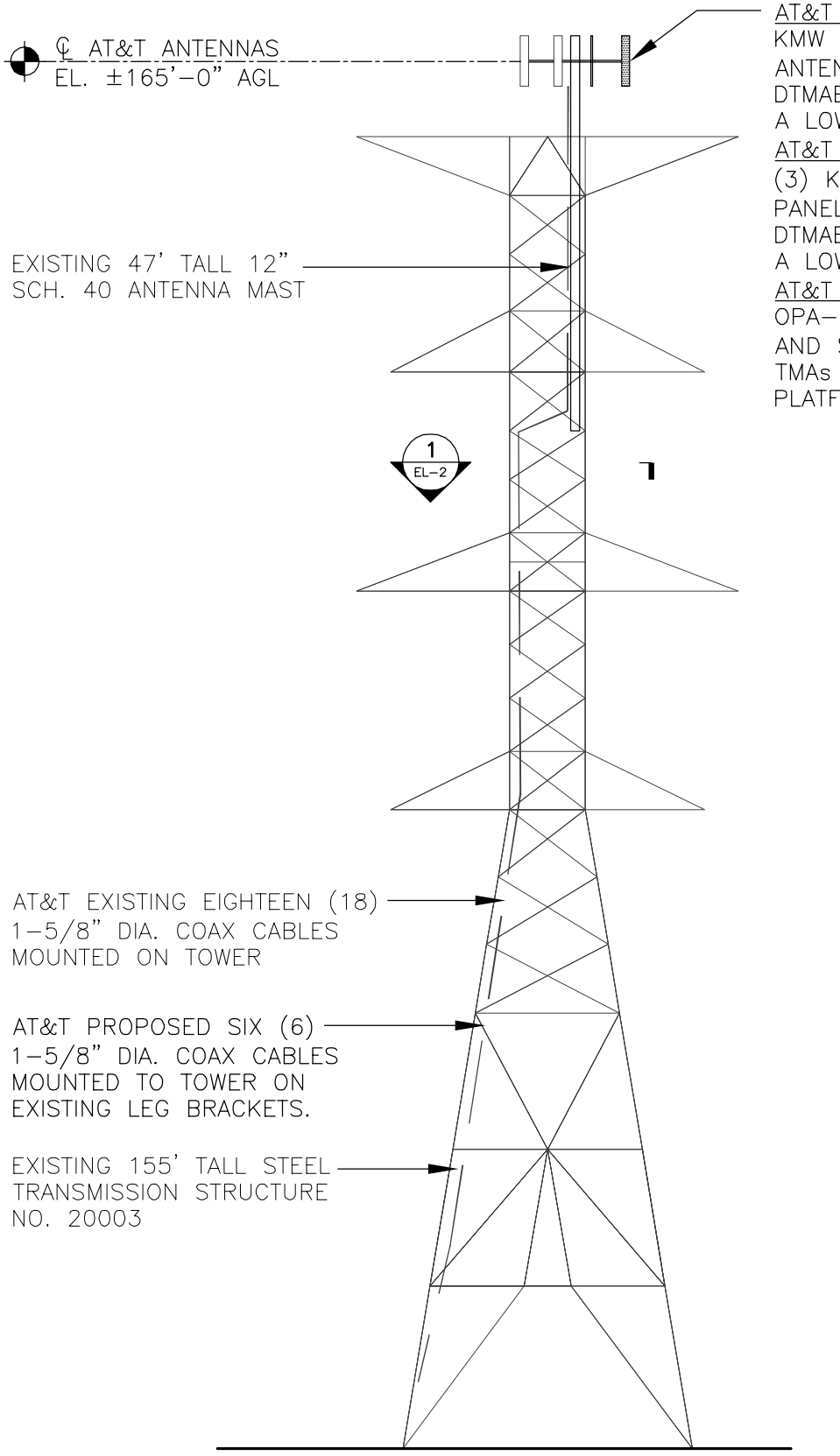
	Horizontal	Longitudinal	Vertical
Shield Wire =	675 lb	653 lb	333 lb
Conductor =	1,190 lb	1,693 lb	1,320 lb

Northeast
Utilities System

Job :	Spec. Number	Page	of
Description:	Computed by	Sheet	of
	Checked by	Date	12/19/11
		Date	

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

LC 1		HORIZONTAL	LONGITUDINAL	VERTICAL
NESC Heavy	shield - back	1551.284337	8148.42881	-98.57125623
	shield - ahead	2446.402071	-11407.80033	1339.587815
	SHIELD - SUM	**3997.686408**	**-3259.371524**	**1241.016559**
	conductor - back	2158.568071	11407.80033	102.5772645
	conductor - ahead	3444.128673	-16296.85762	2982.983873
	CONDUCTOR - SUM	**5602.696744**	**-4889.057286**	**3085.561138**
LC 2		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Extreme Wind	shield - back	1017.872986	4350.76714	-26.43354
	shield - ahead	1908.842131	-6959.252048	359.233
	SHIELD - SUM	**2926.715117**	**-2608.484908**	**332.79946**
	conductor - back	1659.667043	6695.539261	126.92504
	conductor - ahead	3211.147544	-10992.97123	1193.092
	CONDUCTOR - SUM	**4870.814588**	**-4297.43197**	**1320.01704**
LC 3		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Long. Wind	shield - back	#VALUE!	#VALUE!	-26.43354
	shield - ahead	#VALUE!	#VALUE!	359.233
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**332.79946**
	conductor - back	#VALUE!	#VALUE!	126.92504
	conductor - ahead	#VALUE!	#VALUE!	1193.092
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**1320.01704**
LC 4		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
RULE 250D	shield - back	#VALUE!	#VALUE!	-136.7239057
	shield - ahead	#VALUE!	#VALUE!	1858.084041
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**1721.360135**
	conductor - back	#VALUE!	#VALUE!	-21.88445801
	conductor - ahead	#VALUE!	#VALUE!	3215.419785
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**3193.535327**
LC 5		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
NESC w/o OLF's	shield - back	#VALUE!	#VALUE!	-65.71417082
	shield - ahead	#VALUE!	#VALUE!	893.0585433
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**827.3443724**
	conductor - back	#VALUE!	#VALUE!	68.38484302
	conductor - ahead	#VALUE!	#VALUE!	1988.655915
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**2057.040758**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Raking	shield - back	285.6493332	1803.51891	-26.43354
	shield - ahead	389.0525146	-2456.380903	359.233
	SHIELD - SUM	**674.7018477**	**-652.8619931**	**332.79946**
	conductor - back	461.0123685	2910.71754	126.92504
	conductor - ahead	729.1410416	-4603.615356	1193.092
	CONDUCTOR - SUM	**1190.15341**	**-1692.897816**	**1320.01704**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
60 DEG F NO WIND	shield - back	285.6493332	1803.51891	-26.43354
	shield - ahead	389.0525146	-2456.380903	359.233
	SHIELD - SUM	**674.7018477**	**-652.8619931**	**332.79946**
	conductor - back	461.0123685	2910.71754	126.92504
	conductor - ahead	729.1410416	-4603.615356	1193.092
	CONDUCTOR - SUM	**1190.15341**	**-1692.897816**	**1320.01704**



1 / EL-1 **TOWER & MAST ELEVATION**

SCALE: NOT TO SCALE

REVISIONS		
00	3/28/16	CONSTRUCTION

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CT1209
EVERSOURCE 20003

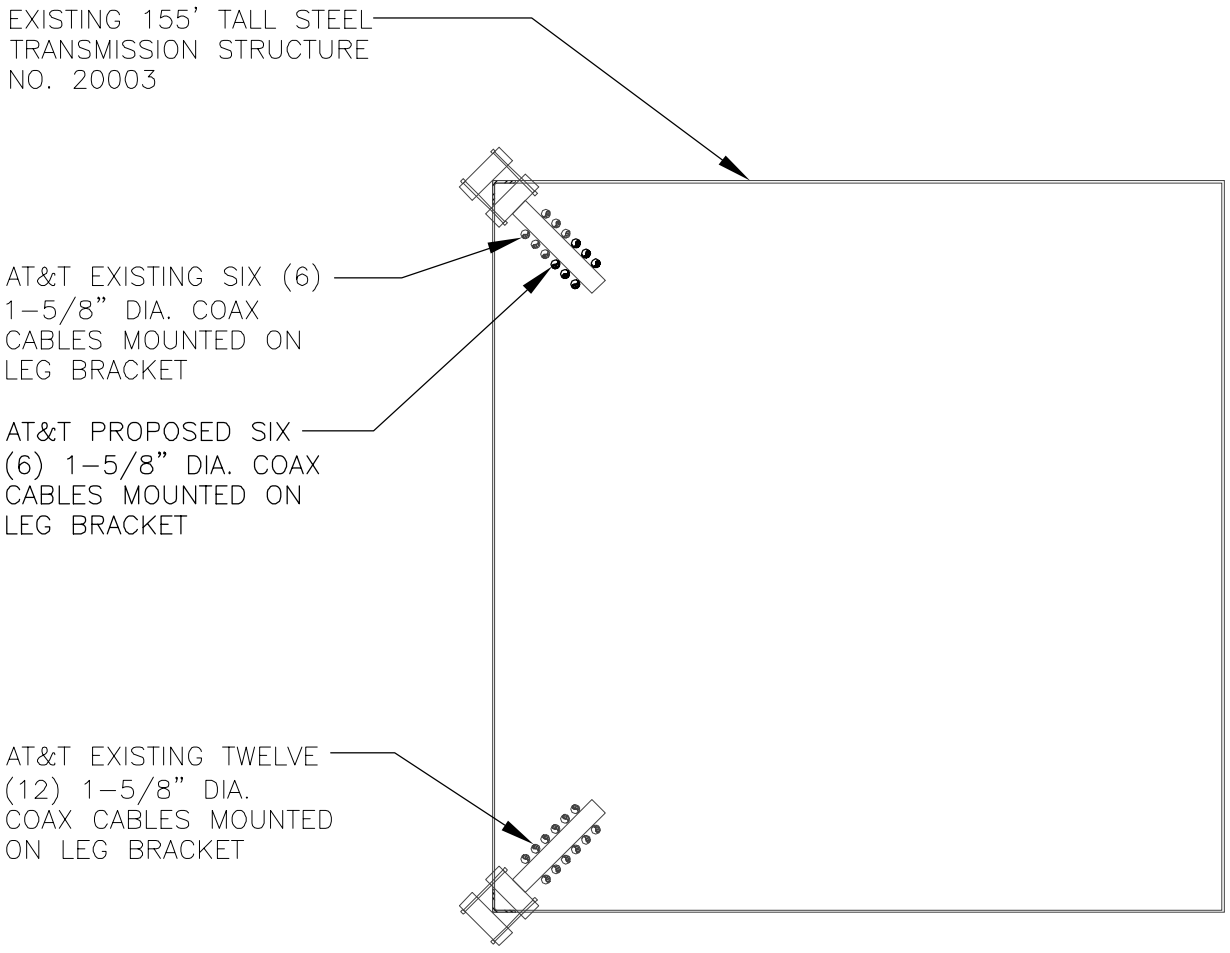
190 OLCOTT STREET
MANCHESTER, CT 06040

PROJECT NO:	16002.002
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	3/28/16

TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 2



1 / EL–2 **COAX CABLE PLAN**

SCALE: NOT TO SCALE

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00	3/28/16	CONSTRUCTION

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190 OLCOTT STREET
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PROJECT NO:	16002.002
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FEEDLINE PLAN

EL-2

DWG. 2 OF 2

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

Wind Speeds

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

Heights above ground level, z

Mast Section 1	$z_{mast1} := 158.5$	ft	(User Input)
Mast Section 2	$z_{mast2} := 135$	ft	(User Input)
Antenna	$z_{ant} := 165$	ft	(User Input)
Platform	$z_{plt} := 165$	ft	(User Input)
Coax	$z_{coax} := 143$	ft	(User Input)
Brace Member 1	$z_{mem1} := 148$	ft	(User Input)
Brace Member 2	$z_{mem2} := 121$	ft	(User Input)

Exposure Coefficients, kz

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

Mast Section 1: $Kz_{mast1} := \left(\frac{z_{mast1}}{33}\right)^{\frac{2}{7}} = 1.566$

Mast Section 2: $Kz_{mast2} := \left(\frac{z_{mast2}}{33}\right)^{\frac{2}{7}} = 1.496$

Antenna: $Kz_{ant} := \left(\frac{z_{ant}}{33}\right)^{\frac{2}{7}} = 1.584$

Platform: $Kz_{plt} := \left(\frac{z_{plt}}{33}\right)^{\frac{2}{7}} = 1.584$

Coax: $Kz_{coax} := \left(\frac{z_{coax}}{33}\right)^{\frac{2}{7}} = 1.52$

Brace Member 1: $Kz_{mem1} := \left(\frac{z_{mem1}}{33}\right)^{\frac{2}{7}} = 1.535$

Brace Member 2: $Kz_{mem2} := \left(\frac{z_{mem2}}{33}\right)^{\frac{2}{7}} = 1.45$

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

Mast Section 1 $qz_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V^2 = 28.96$

Mast Section 2 $qz_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V^2 = 27.662$

Antenna $qz_{ant} := 0.00256 \cdot Kz_{ant} \cdot V^2 = 29.294$

Platform $qz_{plt} := 0.00256 \cdot Kz_{plt} \cdot V^2 = 29.294$

Coax $qz_{coax} := 0.00256 \cdot Kz_{coax} \cdot V^2 = 28.121$

Brace Member 1 $qz_{mem1} := 0.00256 \cdot Kz_{mem1} \cdot V^2 = 28.398$

Brace Member 2 $qz_{mem2} := 0.00256 \cdot Kz_{mem2} \cdot V^2 = 26.81$

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

Mast Section 1 $qzICE_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V_i^2 = 21.949$

Mast Section 2 $qzICE_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V_i^2 = 20.966$

Antenna $qzICE_{ant} := 0.00256 \cdot Kz_{ant} \cdot V_i^2 = 22.203$

Platform $qzICE_{plt} := 0.00256 \cdot Kz_{plt} \cdot V_i^2 = 22.203$

Coax $qzICE_{coax} := 0.00256 \cdot Kz_{coax} \cdot V_i^2 = 21.313$

Brace Member 1 $qzICE_{mem1} := 0.00256 \cdot Kz_{mem1} \cdot V_i^2 = 21.524$

Brace Member 2 $qzICE_{mem2} := 0.00256 \cdot Kz_{mem2} \cdot V_i^2 = 20.32$

TIA/EIA Common Factors:

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

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Mast Data: (12" Sch. 40)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 12.8$	in	(User Input)
Total Mast Length =	$L_{mast} := 47$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$	in	(User Input)
Velocity Coefficient =	$C := \sqrt{Kz_{mast2}} \cdot V \cdot \frac{D_{mast}}{12} = 111$		
Powermount Force Coefficient =	$CF_{mast} = 0.59$		(per TIA/EIA-222-F Table 1)

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

Mast Projected Surface Area =	$A_{mast} := \frac{D_{mast}}{12} = 1.067$	sf/ft		
Total Mast Section 1 Wind Force =	$qz_{mast1} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 31$	plf	**BLC 5,7**	
Total Mast Section 2 Wind Force =	$qz_{mast2} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 29$	plf	**BLC 5,7**	

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

Mast Projected Surface Area w/ Ice =	$AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.15$	sf/ft		
Total Mast Section 1 Wind Force w/ Ice =	$qzICE_{mast1} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 25$	plf	**BLC 4,6**	
Total Mast Section 2 Wind Force w/ Ice =	$qzICE_{mast2} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 24$	plf	**BLC 4,6**	

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 20.9$	sq in		
Weight of Ice on Mast =	$W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 8$	plf	**BLC 3**	

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Subject: Load Analysis of AT&T Equipment on Tower # 20003

Location: Manchester, CT

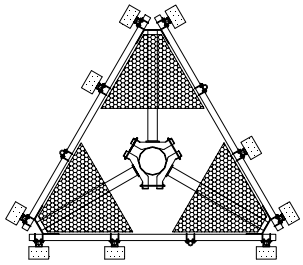
Rev. 0: 3/28/16

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 16002.002

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

Antenna Data:

Antenna Model =	KMW AM-X-CD-16-65-00T-RET			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 5.9$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 49$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.1$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	



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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 35.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 2454$	lbs	**BLC 5,7**

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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 38.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 2045$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 294$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5013$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1435$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 46$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 279$	lbs	**BLC 3**

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Subject: Load Analysis of AT&T Equipment on Tower # 20003

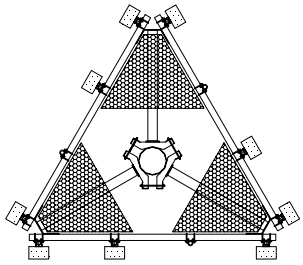
Location: Manchester, CT

Rev. 0: 3/28/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Antenna Data:

Antenna Model =	CCI OPA-65R-LCUU-H6			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 14.8$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7.4$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 73$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	



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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.4$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 22.2$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1539$	lbs	**BLC 5,7**

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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 8$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 24$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1262$	lbs	**BLC 4,6**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 7885$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1803$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 58$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 175$	lbs	**BLC 3**

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Subject: Load Analysis of AT&T Equipment on Tower # 20003

Location: Manchester, CT

Rev. 0: 3/28/16

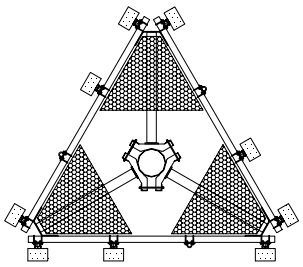
Prepared by: T.J.L. Checked by: C.F.C.
Job No. 16002.002

Development of Wind & Ice Load on Antennas

(per TIA/EIA-222-F-1996 Criteria)

Antenna Data:

Antenna Model =	CCI DTMABP7819VG12A TMA			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 14.25$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.46$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 4.17$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 20$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.2$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	



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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 6.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 472$	lbs	**BLC 5,7**

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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 1.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 7.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 416$	lbs	**BLC 4,6**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 681$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 301$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 10$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 59$	lbs	**BLC 3**

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

Subject: Load Analysis of AT&T Equipment on Tower # 20003

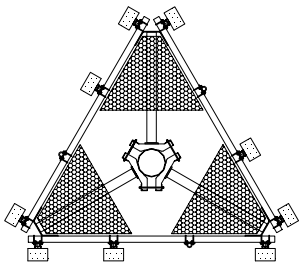
Location: Manchester, CT

Rev. 0: 3/28/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Antenna Data:

Antenna Model =	CCI TMABPDB7823VG12A			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 14.25$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.03$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 4.11$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 25$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.3$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	



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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 6.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 454$	lbs	**BLC 5,7**

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

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 1.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 7.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 402$	lbs	**BLC 4,6**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 646$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 291$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 9$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 57$	lbs	**BLC 3**

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Location:	Manchester, CT
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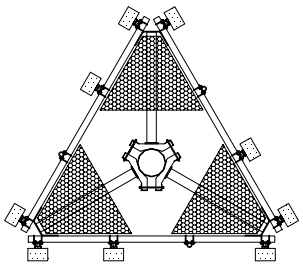
Development of Wind & Ice Load on Platform (per TIA/EIA-222-F-1996 Criteria)

Platform Data:

Platform Model =	Site Pro 12'-6" Low Profile Platform (RMSP-496)		
Platform Shape =	Flat		(User Input)
Platform Area =	$CaA_{plt} := 17.3$	sq ft	(User Input)
Platform Area w/ Ice =	$CaA_{ICE.plt} := 23.4$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 1520$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICE.plt} := 2000$	lbs	(User Input)



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

Total Platform Wind Force =	$F_{plt} := qz_{plt} \cdot G_H \cdot CaA_{plt} = 856$	lbs	**BLC 5,7**

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

Total Platform Wind Force w/ Ice =	$Fi_{plt} := qzICE_{plt} \cdot G_H \cdot CaA_{ICE.plt} = 878$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of Platform =	$WT_{plt} = 1520$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform =	$WT_{ICE.plt} - WT_{plt} = 480$	lbs	**BLC 3**

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

Development of Wind & Ice Load on Coax Cables per TIA/EIA-222-F-96 Criteria

Coax Cable Data: (Below top of CL&P Tower)

Coax Type = HELIAX 1-5/8"

Shape = Round (User Input)

Coax Outside Diameter = $D_{coax} := 1.98$ in (User Input)

Coax Cable Length = $L_{coax} := 30$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 1.04$ plf (User Input)

Total Number of Coax = $N_{coax} := 12$ (User Input)

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 6$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 181.8$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} \cdot D_{coax})}{12} = 1$ sfft

Total Coax Wind Force = $F_{coax} := qz_{coax} \cdot G_H \cdot Ca_{coax} \cdot A_{coax} = 56$ plf **BLC 5,7**

Wind Load (with ice) per TIA/EIA-222-F-96 Section 2.3.2

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

Total Coax Wind Force w/ Ice = $Fi_{coax} := qzICE_{coax} \cdot G_H \cdot Ca_{coax} \cdot AICE_{coax} = 46$ plf **BLC 4,6**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Loads (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \left(N_{coax} \cdot \frac{Ai_{coax}}{144}\right) = 18$ plf **BLC 3**

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

Development of Wind & Ice Load on Coax Cables per TIA/EIA-222-F-96 Criteria

Coax Cable Data: (Above top of CL&P Tower)

Coax Type = HELIAX 1-5/8"

Shape = Round (User Input)

Coax Outside Diameter = $D_{coax} := 1.98$ in (User Input)

Coax Cable Length = $L_{coax} := 10$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 1.04$ plf (User Input)

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

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 9$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 60.6$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} \cdot D_{coax})}{12} = 1.5$ sfft

Total Coax Wind Force = $F_{coax} := qz_{coax} \cdot G_H \cdot Ca_{coax} \cdot A_{coax} = 85$ plf **BLC 5,7**

Wind Load (with ice) per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 1.6$ sfft

Total Coax Wind Force w/ Ice = $Fi_{coax} := qzICE_{coax} \cdot G_H \cdot Ca_{coax} \cdot AICE_{coax} = 68$ plf **BLC 4,6**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 25$ plf **BLC 2**

Gravity Loads (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \left(N_{coax} \cdot \frac{Ai_{coax}}{144}\right) = 36$ plf **BLC 3**

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Member Data: L3x3x1/4

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 3$ in (User Input)

Thickness = $t_{mem} := 0.25$ in (User Input)

Length = $L_{mem} := 36$ in (User Input)

Cross Sectional Area of Member = $Ac_{mem} := 1.44$ sq in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{H_{mem}}{L_{mem}} = 0.1$

Member Force Coefficient = $Ca_{mem} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Member Projected Surface Area = $A_{mem} := \frac{H_{mem}}{12} = 0.3$ sf/ft

Total Member Wind Force = $F_{mem} := qz_{mem1} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 17$ plf **BLC 5,7**

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

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{mem1} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 17$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := (H_{mem} + 2 \cdot Ir) \cdot (t_{mem} + 2 \cdot Ir) + (H_{mem} - t_{mem}) \cdot (t_{mem} + 2 \cdot Ir) - Ac_{mem} = 7 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 3$ plf **BLC 3**

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Member Data: L3x3x1/4

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 3$ in (User Input)

Thickness = $t_{mem} := 0.25$ in (User Input)

Length = $L_{mem} := 36$ in (User Input)

Cross Sectional Area of Member = $Ac_{mem} := 1.44$ sq in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{H_{mem}}{L_{mem}} = 0.1$

Member Force Coefficient = $Ca_{mem} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Member Projected Surface Area = $A_{mem} := \frac{H_{mem}}{12} = 0.3$ sf/ft

Total Member Wind Force = $F_{mem} := qz_{mem2} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 16$ plf **BLC 5,7**

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

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{mem2} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 16$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := (H_{mem} + 2 \cdot Ir) \cdot (t_{mem} + 2 \cdot Ir) + (H_{mem} - t_{mem}) \cdot (t_{mem} + 2 \cdot Ir) - Ac_{mem} = 7 \quad \text{sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 3$ plf **BLC 3**

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Subject:	Load Analysis of AT&T Equipment on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Member Data: C12x20.7

Antenna Shape =	Flat		(User Input)
Height =	$H_{mem} := 12$	in	(User Input)
Flange Width =	$b_f := 2.94$	in	(User Input)
Flange Thickness =	$t_f := 0.501$	in	(User Input)
Web Thickness =	$t_w := 0.282$	in	(User Input)
Length =	$L_{mem} := 105$	in	(User Input)
Cross Sectional Area of Member =	$Ac_{mem} := 6.08$	sq in	(User Input)
Member Aspect Ratio =	$Ar_{mem} := \frac{H_{mem}}{L_{mem}} = 0.1$		
Member Force Coefficient =	$Ca_{mem} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

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

Member Projected Surface Area =	$A_{mem} := \frac{H_{mem}}{12} = 1$	sf/ft	
Total Member Wind Force =	$F_{mem} := qz_{mem2} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 63$	plf	**BLC 5,7**

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

Member Projected Surface Area w/ Ice =	$A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 1.1$	sf/ft	
Total Member Wind Force w/ Ice =	$Fi_{mem} := qzICE_{mem2} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 52$	plf	**BLC 4,6**

Gravity Load (without ice)

Weight of Member =	Self Weight	lbs	**BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := (b_f + 2 \cdot Ir) \cdot (t_f + 2 \cdot Ir) \cdot 2 + (H_{mem} - t_f - 2 \cdot Ir) \cdot (t_w + 2 \cdot Ir) - Ac_{mem} = 19 \quad \text{sq in}$$

Weight of Ice on Member =	$W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 7$	plf	**BLC 3**

CENTEK engineering, INC.	Subject:	**Analysis of TIA/EIA Wind and Ice Loads for Design of Antenna Mast Only**			
Consulting Engineers		**Tabulated Load Cases**			
63-2 North Branford Road					
Branford, CT 06405	Location:	**Manchester, CT**			
Ph. 203-488-0580 / Fax. 203-488-8587	Date: 3/28/16	Prepared by: T.J.L.	Checked by: C.F.C.	Job No. 16002.02	

Load Case	Description
1	Self Weight
2	Weight of Appurtenances
3	Weight of Ice Only
4	TIA/EIA Wind with Ice
5	TIA/EIA Wind

Footnotes:

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

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

Location: **Manchester, CT**

Date: 3/28/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Footnotes:
(1) BLC = Basic Load Case

Global

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

Hot Rolled Steel Code	AISC 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building

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

Global, Continued

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

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Design Parameters

	Label	Shape	Leng...	Lbyy[ft]	Lbzz[ft]	Lcomp ...	Lcomp ...	Kyy	Kzz	Cm...	Cm...	Cb	y s...	z s...	Functi...
1	M1	Mast	47	Segment	Segment										Lateral
2	M2	Brace 2	9	Segment	Segment										Lateral
3	M3	Brace 2	9	Segment	Segment										Lateral
4	M4	Brace 1	9												Lateral
5	M5	Brace 1	9												Lateral
6	M6	Brace 1	6.906												Lateral
7	M7	Brace 1	5.293												Lateral
8	M8	Brace 1	5.276												Lateral
9	M9	Brace 1	6.893												Lateral
10	M10	Brace 1	9	Segment	Segment										Lateral
11	M11	Brace 1	8.421												Lateral
12	M12	Brace 1	9.646												Lateral
13	M13	Brace 1	5.863												Lateral
14	M14	Brace 1	3.497												Lateral
15	M15	Brace 2	9			3.75									Lateral
16	M16	Brace 2	9			3.75									Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE 12.0	Beam	Pipe	A53 Gr. B	Typical	13.7	262	262	523
2	Brace 1	L3x3x4	Beam	Pipe	A36 Gr.36	Typical	1.44	1.23	1.23	.031
3	Brace 2	C12x20.7	Beam	Pipe	A36 Gr.36	Typical	6.08	3.86	129	.369

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N3			Mast	Beam	Pipe	A53 Gr. B	Typical
2	M2	N10	N11			Brace 2	Beam	Pipe	A36 Gr.36	Typical
3	M3	N8	N9			Brace 2	Beam	Pipe	A36 Gr.36	Typical
4	M4	N8	N10			Brace 1	Beam	Pipe	A36 Gr.36	Typical
5	M5	N9	N11			Brace 1	Beam	Pipe	A36 Gr.36	Typical
6	M6	N12	N14			Brace 1	Beam	Pipe	A36 Gr.36	Typical
7	M7	N16	N13			Brace 1	Beam	Pipe	A36 Gr.36	Typical
8	M8	N13	N17			Brace 1	Beam	Pipe	A36 Gr.36	Typical
9	M9	N15	N12			Brace 1	Beam	Pipe	A36 Gr.36	Typical
10	M10	N12	N13			Brace 1	Beam	Pipe	A36 Gr.36	Typical
11	M11	N2	N5			Brace 1	Beam	Pipe	A36 Gr.36	Typical
12	M12	N2	N4			Brace 1	Beam	Pipe	A36 Gr.36	Typical
13	M13	N2	N6			Brace 1	Beam	Pipe	A36 Gr.36	Typical
14	M14	N2	N7			Brace 1	Beam	Pipe	A36 Gr.36	Typical
15	M15	N17	N16			Brace 2	Beam	Pipe	A36 Gr.36	Typical
16	M16	N14	N15			Brace 2	Beam	Pipe	A36 Gr.36	Typical
17	M17	N18	N19			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From D...
1	N1	0	0	0	0	
2	N2	0	28	0	0	
3	N3	0	47	0	0	
4	N4	-7.76	28	5.73	0	
5	N5	-7.76	28	-3.27	0	
6	N6	1.24	28	5.73	0	
7	N7	1.24	28	-3.27	0	
8	N8	-7.76	0	5.73	0	
9	N9	-7.76	0	-3.27	0	
10	N10	1.24	0	5.73	0	
11	N11	1.24	0	-3.27	0	
12	N12	-3.25	0	5.73	0	
13	N13	-3.25	0	-3.27	0	
14	N14	-7.76	0	.5	0	
15	N15	1.24	0	.5	0	
16	N16	-7.76	0	-.5	0	
17	N17	1.24	0	-.5	0	
18	N18	0	0	.5	0	
19	N19	0	0	-.5	0	
20	N20	-3.25	0	.5	0	
21	N21	-3.25	0	-.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N4	Reaction	Reaction	Reaction				
2	N5	Reaction	Reaction	Reaction				
3	N6	Reaction	Reaction	Reaction				
4	N7	Reaction	Reaction	Reaction				
5	N8	Reaction	Reaction	Reaction				
6	N9	Reaction	Reaction	Reaction				
7	N10	Reaction	Reaction	Reaction				
8	N11	Reaction	Reaction	Reaction				

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.294	44
2	M1	Y	-.219	44
3	M1	Y	-.12	44
4	M1	Y	-.15	44
5	M1	Y	-1.52	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.279	44
2	M1	Y	-.175	44
3	M1	Y	-.059	44
4	M1	Y	-.057	44
5	M1	Y	-.48	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	2.045	44
2	M1	X	1.262	44
3	M1	X	.416	44
4	M1	X	.402	44
5	M1	X	.878	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	2.454	44
2	M1	X	1.539	44
3	M1	X	.472	44
4	M1	X	.454	44
5	M1	X	.856	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	2.045	44
2	M1	Z	1.262	44
3	M1	Z	.416	44
4	M1	Z	.402	44
5	M1	Z	.878	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	2.454	44
2	M1	Z	1.539	44
3	M1	Z	.472	44
4	M1	Z	.454	44
5	M1	Z	.856	44

Joint Loads and Enforced Displacements

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

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.012	-.012	0	30
2	M1	Y	-.025	-.025	30	41

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M1	Y	-.018	-.018	0	30
3	M1	Y	-.036	-.036	30	41
4	M12	Y	-.003	-.003	0	0
5	M11	Y	-.003	-.003	0	0
6	M14	Y	-.003	-.003	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
7	M13	Y	-.003	-.003	0	0
8	M9	Y	-.003	-.003	0	0
9	M4	Y	-.003	-.003	0	0
10	M10	Y	-.003	-.003	0	0
11	M6	Y	-.003	-.003	0	0
12	M7	Y	-.003	-.003	0	0
13	M5	Y	-.003	-.003	0	0
14	M8	Y	-.003	-.003	0	0
15	M3	Y	-.007	-.007	0	0
16	M16	Y	-.007	-.007	0	0
17	M15	Y	-.007	-.007	0	0
18	M2	Y	-.007	-.007	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.024	.024	0	30
2	M1	X	.025	.025	30	41
3	M1	X	.046	.046	0	30
4	M1	X	.068	.068	30	41
5	M11	X	.017	.017	0	0
6	M12	X	.017	.017	0	0
7	M13	X	.017	.017	0	0
8	M14	X	.017	.017	0	0
9	M3	X	.052	.052	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.029	.029	0	30
2	M1	X	.031	.031	30	41
3	M1	X	.056	.056	0	30
4	M1	X	.085	.085	30	41
5	M11	X	.017	.017	0	0
6	M12	X	.017	.017	0	0
7	M13	X	.017	.017	0	0
8	M14	X	.017	.017	0	0
9	M3	X	.063	.063	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.024	.024	0	30
2	M1	Z	.025	.025	30	41
3	M1	Z	.046	.046	0	30
4	M1	Z	.068	.068	30	41
5	M11	Z	.017	.017	0	0
6	M12	Z	.017	.017	0	0
7	M13	Z	.017	.017	0	0
8	M14	Z	.017	.017	0	0
9	M5	Z	.016	.016	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.029	.029	0	30
2	M1	Z	.031	.031	30	41
3	M1	Z	.056	.056	0	30
4	M1	Z	.085	.085	30	41
5	M11	Z	.017	.017	0	0
6	M12	Z	.017	.017	0	0
7	M13	Z	.017	.017	0	0
8	M14	Z	.017	.017	0	0
9	M5	Z	.016	.016	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					5	2		
3	Weight of Ice Only	None					5	18		
4	(x) TIA/EIA Wind with Ice	None					5	9		
5	(x) TIA/EIA Wind	None					5	9		
6	(z) TIA/EIA Wind with Ice	None					5	9		
7	(z) TIA/EIA Wind	None					5	9		

Load Combinations

	Description	Sol...	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
1	(x) TIA/EIA Wind + Ice	Yes			1	1	2	1	3	1	4	1								
2	(x) TIA/EIA Wind	Yes			1	1	2	1	5	1										
3	(z) TIA/EIA Wind + Ice	Yes			1	1	2	1	3	1	6	1								
4	(z) TIA/EIA Wind	Yes			1	1	2	1	7	1										

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
1	M1	1	max	7.599	3	.031	4	3.246	4	0	1	-.241	2	.881	4
2			min	5.196	2	-3.612	2	.009	2	0	1	-22.078	4	-32.303	2
3		2	max	6.605	3	.031	4	4.245	4	0	1	21.935	4	16.001	2
4			min	4.507	2	-4.61	2	.009	2	0	1	-.438	1	.501	3
5		3	max	5.611	3	.031	4	5.244	4	0	1	77.683	4	76.04	2
6			min	3.819	2	-5.609	2	.009	2	0	1	-.121	1	.139	3
7		4	max	4.346	1	6.442	2	0	1	0	1	52.449	4	52.449	2
8			min	2.995	2	0	3	-6.442	4	0	1	0	1	0	3
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	-.131	2	1.415	1	.048	4	.002	2	-.015	1	0	3
12			min	-1.255	4	-.525	4	.011	1	-.014	3	-.028	4	0	2
13		2	max	-.131	2	1.353	1	.048	4	.002	2	.079	4	1.234	4
14			min	-1.255	4	-.572	4	.011	1	-.014	3	.009	1	-3.114	1
15		3	max	-.131	2	1.29	1	.048	4	.002	2	.186	4	2.573	4
16			min	-1.255	4	-.618	4	.011	1	-.014	3	.034	1	-6.088	1
17		4	max	2.188	4	-.778	2	.127	4	.032	3	.04	2	-1.804	2
18			min	.006	2	-6.611	3	-.021	2	-.004	2	-.29	4	-14.944	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
19		5	max	2.188	4	-.825	2	.127	4	.032	3	-.005	4	0	3
20			min	.006	2	-6.673	3	-.021	2	-.004	2	-.008	3	0	2
21	M3	1	max	.091	2	1.747	1	.017	4	.013	1	.021	2	0	4
22			min	.069	3	.375	4	-.129	2	.003	4	-.005	4	0	1
23		2	max	.091	2	1.689	2	.017	4	.013	1	.034	4	-.792	4
24			min	.069	3	.329	4	.011	1	.003	4	-.11	2	-3.861	1
25		3	max	.091	2	1.642	2	.154	2	.013	1	.077	2	-1.48	4
26			min	.069	3	.282	4	.015	3	.003	4	.064	3	-7.598	2
27		4	max	.041	1	-.604	4	.068	4	-.01	2	.026	2	-1.411	4
28			min	-.12	4	-2.929	2	-.085	2	-.036	3	-.111	4	-6.643	2
29		5	max	.041	1	-.65	4	.068	4	-.01	2	.042	4	0	2
30			min	-.12	4	-2.976	2	.046	1	-.036	3	-.006	2	0	3
31	M4	1	max	.617	2	.072	1	-.002	4	0	1	.001	4	.01	3
32			min	.255	3	.014	4	-.027	1	0	4	-.021	1	-.01	2
33		2	max	.617	2	.054	1	-.002	4	0	1	.036	1	-.011	4
34			min	.255	3	.003	4	-.027	1	0	4	.011	4	-.145	1
35		3	max	.617	2	.036	1	-.002	4	0	1	.065	1	-.011	4
36			min	.255	3	-.008	4	-.027	1	0	4	.003	4	-.26	1
37		4	max	-.256	3	-.003	4	.027	1	0	3	.039	1	-.022	4
38			min	-.62	2	-.053	1	-.005	4	0	2	-.002	4	-.147	1
39		5	max	-.256	3	-.014	4	.027	1	0	3	-.012	2	-.006	1
40			min	-.62	2	-.071	1	-.005	4	0	2	-.026	3	-.016	4
41	M5	1	max	.978	2	.088	3	-.019	2	0	2	.005	4	.054	4
42			min	-.24	4	.045	2	-.076	3	0	3	-.015	1	.003	2
43		2	max	.978	2	.07	3	-.019	2	0	2	.036	3	-.09	2
44			min	-.24	4	.034	2	-.04	3	0	3	.021	2	-.164	3
45		3	max	.978	2	.054	4	0	4	0	2	.099	3	-.166	2
46			min	-.24	4	.023	2	-.024	1	0	3	.037	2	-.296	3
47		4	max	.241	4	-.031	2	.033	3	0	2	.037	1	-.091	2
48			min	-.982	2	-.069	3	.022	2	0	3	.021	4	-.177	3
49		5	max	.241	4	-.042	2	.069	3	0	2	.007	2	.029	3
50			min	-.982	2	-.087	3	.022	2	0	3	-.017	3	.001	2
51	M6	1	max	-.222	3	.027	3	0	4	0	4	0	1	0	1
52			min	-.864	2	.017	4	0	1	0	1	0	1	0	1
53		2	max	-.222	3	.014	3	0	4	0	4	.025	3	-.015	4
54			min	-.864	2	.008	4	0	1	0	1	.015	4	-.025	1
55		3	max	-.222	3	0	1	0	1	0	4	.033	3	-.021	4
56			min	-.864	2	0	1	0	1	0	1	.021	4	-.033	1
57		4	max	-.222	3	-.008	2	0	4	0	4	.025	3	-.015	4
58			min	-.864	2	-.014	1	0	1	0	1	.015	4	-.025	1
59		5	max	-.222	3	-.017	2	0	4	0	4	0	1	0	1
60			min	-.864	2	-.027	1	0	1	0	1	0	1	0	1
61	M7	1	max	.023	4	.021	3	0	2	0	2	0	1	0	1
62			min	-1.127	2	.013	2	0	1	0	3	0	1	0	1
63		2	max	.023	4	.01	3	0	2	0	2	.015	3	-.009	2
64			min	-1.127	2	.006	2	0	1	0	3	.009	4	-.015	1
65		3	max	.023	4	0	1	0	1	0	2	.02	3	-.012	2
66			min	-1.127	2	0	1	0	1	0	3	.012	4	-.02	1
67		4	max	.023	4	-.006	4	0	2	0	2	.015	3	-.009	2
68			min	-1.127	2	-.01	1	0	1	0	3	.009	4	-.015	1
69		5	max	.023	4	-.013	4	0	2	0	2	0	1	0	1
70			min	-1.127	2	-.021	1	0	1	0	3	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
71	M8	1	max	1.178	2	.021	1	0	1	0	4	0	1	0	1
72			min	-.498	4	.013	2	0	3	0	2	0	1	0	1
73		2	max	1.178	2	.01	1	0	1	0	4	.015	1	-.009	2
74			min	-.498	4	.006	2	0	2	0	2	.009	2	-.015	3
75		3	max	1.178	2	0	1	0	1	0	4	.019	1	-.012	2
76			min	-.498	4	0	1	0	1	0	2	.012	2	-.019	3
77		4	max	1.178	2	-.006	4	0	1	0	4	.015	1	-.009	2
78			min	-.498	4	-.01	1	0	2	0	2	.009	2	-.015	3
79		5	max	1.178	2	-.013	4	0	1	0	4	0	1	0	1
80			min	-.498	4	-.021	1	0	2	0	2	0	1	0	1
81	M9	1	max	1.037	2	.027	3	0	1	0	2	0	1	0	1
82			min	.514	3	.017	4	0	3	0	3	0	1	0	1
83		2	max	1.037	2	.014	3	0	1	0	2	.025	1	-.015	4
84			min	.514	3	.008	4	0	3	0	3	.015	2	-.025	3
85		3	max	1.037	2	0	1	0	1	0	2	.033	1	-.021	4
86			min	.514	3	0	1	0	1	0	3	.021	2	-.033	3
87		4	max	1.037	2	-.008	2	0	1	0	2	.025	1	-.015	4
88			min	.514	3	-.014	1	0	3	0	3	.015	2	-.025	3
89		5	max	1.037	2	-.017	2	0	1	0	2	0	1	0	1
90			min	.514	3	-.027	1	0	3	0	3	0	1	0	1
91	M10	1	max	-.089	1	.017	1	.033	4	0	2	0	1	0	1
92			min	-.23	4	-.05	4	-.002	2	0	3	0	1	0	1
93		2	max	-.089	1	.004	2	.033	4	0	2	.013	1	.141	4
94			min	-.23	4	-.061	4	-.002	2	0	3	-.035	4	-.018	2
95		3	max	-.089	1	-.007	2	.033	4	0	2	.005	2	.299	4
96			min	-.23	4	-.075	3	-.002	2	0	3	-.088	4	-.018	2
97		4	max	.256	4	.011	1	.037	4	0	3	.061	4	.011	1
98			min	-.069	2	-.07	4	-.005	1	0	2	.004	1	-.18	4
99		5	max	.256	4	-.007	1	.037	4	0	3	0	1	0	1
100			min	-.069	2	-.081	4	-.005	1	0	2	0	1	0	1
101	M11	1	max	-1.979	3	.033	3	.066	4	0	1	0	1	0	1
102			min	-7.656	2	.021	4	-.028	2	0	1	0	1	0	1
103		2	max	-1.993	3	.017	3	.033	4	0	1	.111	3	.051	4
104			min	-7.689	2	.01	4	-.014	2	0	1	-.008	2	-.068	1
105		3	max	-2.007	3	0	1	0	1	0	1	.148	3	.067	4
106			min	-7.722	2	0	1	0	1	0	1	-.011	2	-.091	1
107		4	max	-2.021	3	-.01	2	.014	1	0	1	.111	3	.051	4
108			min	-7.755	2	-.017	3	-.033	3	0	1	-.008	2	-.068	1
109		5	max	-2.035	3	-.021	2	.028	1	0	1	0	1	0	1
110			min	-7.788	2	-.033	1	-.066	3	0	1	0	1	0	1
111	M12	1	max	.998	4	.038	1	.066	3	0	1	0	1	0	1
112			min	-4.9	2	.024	4	.049	2	0	1	0	1	0	1
113		2	max	1.022	4	.019	1	.033	3	0	1	.133	3	.054	4
114			min	-4.933	2	.012	4	.024	2	0	1	.093	2	.014	1
115		3	max	1.047	4	0	1	0	1	0	1	.177	3	.072	4
116			min	-4.966	2	0	1	0	1	0	1	.123	2	.018	1
117		4	max	1.071	4	-.012	2	-.024	1	0	1	.133	3	.054	4
118			min	-4.999	2	-.019	3	-.033	4	0	1	.093	2	.014	1
119		5	max	1.095	4	-.024	2	-.049	1	0	1	0	1	0	1
120			min	-5.032	2	-.038	3	-.066	4	0	1	0	1	0	1
121	M13	1	max	5.159	4	.023	3	.049	1	0	1	0	1	0	1
122			min	3.41	1	.014	4	-.011	3	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
123		2	max	5.183	4	.012	3	.024	1	0	1	.056	1	.027	2
124			min	3.415	1	.007	4	-.005	3	0	1	.003	4	-.026	3
125		3	max	5.208	4	0	1	0	1	0	1	.074	1	.036	2
126			min	3.42	1	0	1	0	1	0	1	.004	4	-.035	3
127		4	max	5.232	4	-.007	2	.005	4	0	1	.056	1	.027	2
128			min	3.426	1	-.012	1	-.024	2	0	1	.003	4	-.026	3
129		5	max	5.256	4	-.014	2	.011	4	0	1	0	1	0	1
130			min	3.431	1	-.023	1	-.049	2	0	1	0	1	0	1
131	M14	1	max	4.198	2	.014	1	-.011	3	0	1	0	1	0	1
132			min	-6.88	4	.009	4	-.028	1	0	1	0	1	0	1
133		2	max	4.203	2	.007	1	-.005	3	0	1	.002	3	-.009	4
134			min	-6.894	4	.004	4	-.014	1	0	1	-.009	2	-.019	1
135		3	max	4.208	2	0	1	0	1	0	1	.002	3	-.012	4
136			min	-6.908	4	0	1	0	1	0	1	-.012	2	-.026	1
137		4	max	4.214	2	-.004	2	.014	2	0	1	.002	3	-.009	4
138			min	-6.922	4	-.007	3	.005	4	0	1	-.009	2	-.019	1
139		5	max	4.219	2	-.009	2	.028	2	0	1	0	1	0	1
140			min	-6.936	4	-.014	3	.011	4	0	1	0	1	0	1
141	M15	1	max	-.339	3	23.349	4	.044	2	-.003	2	.804	4	.044	4
142			min	-1.008	2	.735	2	-1.423	4	-.157	4	-.036	2	-.003	1
143		2	max	.899	2	-1.028	4	.25	4	.019	4	-.02	1	-4.631	4
144			min	-1.291	4	-2.146	2	.016	1	0	1	-.253	4	-14.859	2
145		3	max	.961	2	-.458	4	.016	2	.032	4	.04	4	-2.273	4
146			min	-.444	4	-2.169	2	.003	3	.004	2	-.022	2	-9.979	2
147		4	max	.961	2	-.505	4	.016	2	.032	4	.047	4	-1.189	4
148			min	-.444	4	-2.216	2	.003	3	.004	2	.013	1	-5.046	2
149		5	max	.961	2	-.551	4	.016	2	.032	4	.054	4	-.002	4
150			min	-.444	4	-2.262	2	.003	3	.004	2	.046	1	-.013	1
151	M16	1	max	.945	2	2.232	2	.008	3	.028	4	.028	2	-.009	2
152			min	.479	3	.259	4	-.008	2	0	1	-.071	4	-.038	3
153		2	max	.945	2	2.186	2	.008	3	.028	4	.01	2	-.566	4
154			min	.479	3	.212	4	-.008	2	0	1	-.053	4	-4.98	2
155		3	max	.945	2	2.139	2	.008	3	.028	4	-.003	1	-.99	4
156			min	.479	3	.165	4	-.008	2	0	1	-.035	4	-9.845	2
157		4	max	1.393	4	2.058	2	.247	4	.023	4	.252	4	.099	4
158			min	.865	1	-.511	4	.024	1	0	2	.02	1	-14.528	2
159		5	max	.531	4	18.577	4	-.012	2	.002	1	-.016	2	.002	2
160			min	-.702	2	-1.145	1	-1.326	4	-.146	4	-.722	4	-.077	3
161	M17	1	max	-.036	2	3.056	1	1.704	2	22.351	4	.047	2	.17	4
162			min	-1.573	4	-19.134	4	.756	3	14.713	1	-.421	4	0	1
163		2	max	-.036	2	3.056	1	1.704	2	22.351	4	.473	2	4.953	4
164			min	-1.573	4	-19.134	4	.756	3	14.713	1	-.206	4	-.765	1
165		3	max	1.673	4	-2.834	2	.893	4	23.233	4	.899	2	-1.422	2
166			min	-.042	1	-24.33	4	-1.907	2	14.713	1	.009	3	-12.342	4
167		4	max	1.673	4	-2.834	2	.893	4	23.233	4	.422	2	-.713	2
168			min	-.028	2	-24.33	4	-1.907	2	-16.124	2	.205	3	-6.259	4
169		5	max	1.673	4	-2.834	2	.893	4	23.233	4	.456	4	-.005	2
170			min	-.028	2	-24.33	4	-1.907	2	-16.124	2	-.055	2	-.176	4

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	.555	3	.005	4	.474	4	9.469	2	.258	4	-.071	2	6.472	4
2			min	.379	2	-.527	2	.001	2	-.258	4	-9.469	2	-6.472	4	.071	2
3		2	max	.482	3	.005	4	.62	4	-.147	3	4.69	2	6.43	4	.128	1
4			min	.329	2	-.673	2	.001	2	-4.69	2	.147	3	-.128	1	-6.43	4
5		3	max	.41	3	.005	4	.766	4	-.041	3	22.289	2	22.771	4	.036	1
6			min	.279	2	-.819	2	.001	2	-22.289	2	.041	3	-.036	1	-22.771	4
7		4	max	.317	1	.94	2	0	1	0	3	15.374	2	15.374	4	0	1
8			min	.219	2	0	3	-.94	4	-15.374	2	0	3	0	1	-15.374	4
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	-.022	2	.418	1	.016	4	0	2	0	3	-.106	1	.061	4
12			min	-.206	4	-.155	4	.004	1	0	3	0	2	-.197	4	.033	1
13		2	max	-.022	2	.4	1	.016	4	1.738	1	.689	4	.55	4	-.02	1
14			min	-.206	4	-.169	4	.004	1	-.689	4	-1.738	1	.064	1	-.171	4
15		3	max	-.022	2	.381	1	.016	4	3.398	1	1.436	4	1.297	4	-.073	1
16			min	-.206	4	-.183	4	.004	1	-1.436	4	-3.398	1	.234	1	-.404	4
17		4	max	.36	4	-.23	2	.043	4	8.341	3	-1.007	2	.282	2	.629	4
18			min	0	2	-1.954	3	-.007	2	1.007	2	-8.341	3	-2.021	4	-.088	2
19		5	max	.36	4	-.244	2	.043	4	0	2	0	3	-.036	4	.018	3
20			min	0	2	-1.972	3	-.007	2	0	3	0	2	-.058	3	.011	4
21	M3	1	max	.015	2	.516	1	.006	4	0	1	0	4	.148	2	.011	4
22			min	.011	3	.111	4	-.044	2	0	4	0	1	-.036	4	-.046	2
23		2	max	.015	2	.499	2	.006	4	2.155	1	-.442	4	.234	4	.24	2
24			min	.011	3	.097	4	.004	1	.442	4	-2.155	1	-.77	2	-.073	4
25		3	max	.015	2	.485	2	.052	2	4.241	2	-.826	4	.535	2	-.139	3
26			min	.011	3	.083	4	.005	3	.826	4	-4.241	2	.445	3	-.167	2
27		4	max	.007	1	-.178	4	.023	4	3.708	2	-.788	4	.184	2	.24	4
28			min	-.02	4	-.866	2	-.029	2	.788	4	-3.708	2	-.771	4	-.057	2
29		5	max	.007	1	-.192	4	.023	4	0	3	0	2	.295	4	.013	2
30			min	-.02	4	-.879	2	.016	1	0	2	0	3	-.04	2	-.092	4
31	M4	1	max	.429	2	.115	1	-.004	4	.126	2	.126	3	.033	4	.614	1
32			min	.177	3	.022	4	-.043	1	-.126	3	-.126	2	-.534	1	-.038	4
33		2	max	.429	2	.086	1	-.004	4	1.804	1	-.138	4	.899	1	-.314	4
34			min	.177	3	.005	4	-.043	1	.138	4	-1.804	1	.273	4	-1.034	1
35		3	max	.429	2	.058	1	-.004	4	3.222	1	-.132	4	1.624	1	-.085	4
36			min	.177	3	-.013	4	-.043	1	.132	4	-3.222	1	.074	4	-1.869	1
37		4	max	-.178	3	-.005	4	.044	1	1.826	1	-.275	4	.967	1	.045	4
38			min	-.431	2	-.084	1	-.008	4	.275	4	-1.826	1	-.039	4	-1.113	1
39		5	max	-.178	3	-.023	4	.044	1	.203	4	-.069	1	-.288	2	.762	3
40			min	-.431	2	-.113	1	-.008	4	.069	1	-.203	4	-.662	3	.332	2
41	M5	1	max	.679	2	.14	3	-.031	2	-.039	2	.675	4	.135	4	.419	1
42			min	-.167	4	.072	2	-.121	3	-.675	4	.039	2	-.364	1	-.155	4
43		2	max	.679	2	.112	3	-.031	2	2.033	3	-1.12	2	.903	3	-.618	2
44			min	-.167	4	.055	2	-.064	3	1.12	2	-2.033	3	.537	2	-1.039	3
45		3	max	.679	2	.087	4	-.002	4	3.668	3	-2.061	2	2.469	3	-1.056	2
46			min	-.167	4	.037	2	-.039	1	2.061	2	-3.668	3	.918	2	-2.841	3
47		4	max	.167	4	-.05	2	.053	3	2.194	3	-1.134	2	.919	1	-.605	4
48			min	-.682	2	-.111	3	.035	2	1.134	2	-2.194	3	.526	4	-1.058	1
49		5	max	.167	4	-.067	2	.11	3	-.017	2	.354	3	.174	2	.481	3
50			min	-.682	2	-.14	3	.035	2	-.354	3	.017	2	-.418	3	-.2	2
51	M6	1	max	-.154	3	.044	3	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
52			min	-.6	2	.027	4	0	1	0	1	0	1	0	1	0	1
53		2	max	-.154	3	.022	3	0	1	.31	1	-.192	4	.625	3	-.446	4
54			min	-.6	2	.014	4	0	1	.192	4	-.31	1	.388	4	-.719	3
55		3	max	-.154	3	0	1	0	1	.413	1	-.256	4	.833	3	-.595	4
56			min	-.6	2	0	1	0	1	.256	4	-.413	1	.517	4	-.959	3
57		4	max	-.154	3	-.014	2	0	1	.31	1	-.192	4	.625	3	-.446	4
58			min	-.6	2	-.022	1	0	1	.192	4	-.31	1	.388	4	-.719	3
59		5	max	-.154	3	-.027	2	0	1	0	1	0	1	0	1	0	1
60			min	-.6	2	-.044	1	0	1	0	1	0	1	0	1	0	1
61	M7	1	max	.016	4	.033	3	0	1	0	1	0	1	0	1	0	1
62			min	-.783	2	.021	2	0	1	0	1	0	1	0	1	0	1
63		2	max	.016	4	.017	3	0	1	.182	1	-.113	2	.367	3	-.262	4
64			min	-.783	2	.01	2	0	1	.113	2	-.182	1	.228	4	-.422	3
65		3	max	.016	4	0	1	0	1	.243	1	-.15	2	.489	3	-.349	4
66			min	-.783	2	0	1	0	1	.15	2	-.243	1	.304	4	-.563	3
67		4	max	.016	4	-.01	4	0	1	.182	1	-.113	2	.367	3	-.262	4
68			min	-.783	2	-.017	1	0	1	.113	2	-.182	1	.228	4	-.422	3
69		5	max	.016	4	-.021	4	0	1	0	1	0	1	0	1	0	1
70			min	-.783	2	-.033	1	0	1	0	1	0	1	0	1	0	1
71	M8	1	max	.818	2	.033	1	0	1	0	1	0	1	0	1	0	1
72			min	-.346	4	.021	2	0	1	0	1	0	1	0	1	0	1
73		2	max	.818	2	.017	1	0	1	.181	3	-.112	2	.365	1	-.26	2
74			min	-.346	4	.01	2	0	1	.112	2	-.181	3	.226	2	-.42	1
75		3	max	.818	2	0	1	0	1	.241	3	-.149	2	.486	1	-.347	2
76			min	-.346	4	0	1	0	1	.149	2	-.241	3	.302	2	-.56	1
77		4	max	.818	2	-.01	4	0	1	.181	3	-.112	2	.365	1	-.26	2
78			min	-.346	4	-.017	1	0	1	.112	2	-.181	3	.226	2	-.42	1
79		5	max	.818	2	-.021	4	0	1	0	1	0	1	0	1	0	1
80			min	-.346	4	-.033	1	0	1	0	1	0	1	0	1	0	1
81	M9	1	max	.72	2	.044	3	0	1	0	1	0	1	0	1	0	1
82			min	.357	3	.027	4	0	1	0	1	0	1	0	1	0	1
83		2	max	.72	2	.022	3	0	1	.309	3	-.191	4	.623	1	-.444	2
84			min	.357	3	.014	4	0	1	.191	4	-.309	3	.386	2	-.716	1
85		3	max	.72	2	0	1	0	1	.411	3	-.255	4	.83	1	-.592	2
86			min	.357	3	0	1	0	1	.255	4	-.411	3	.515	2	-.955	1
87		4	max	.72	2	-.014	2	0	1	.309	3	-.191	4	.623	1	-.444	2
88			min	.357	3	-.022	1	0	1	.191	4	-.309	3	.386	2	-.716	1
89		5	max	.72	2	-.027	2	0	1	0	1	0	1	0	1	0	1
90			min	.357	3	-.044	1	0	1	0	1	0	1	0	1	0	1
91	M10	1	max	-.062	1	.027	1	.053	4	0	1	0	1	0	1	0	1
92			min	-.159	4	-.08	4	-.003	2	0	1	0	1	0	1	0	1
93		2	max	-.062	1	.006	2	.053	4	.221	2	1.748	4	.317	1	1.008	4
94			min	-.159	4	-.097	4	-.003	2	-1.748	4	-.221	2	-.876	4	-.364	1
95		3	max	-.062	1	-.012	2	.053	4	.225	2	3.714	4	.126	2	2.52	4
96			min	-.159	4	-.12	3	-.003	2	-3.714	4	-.225	2	-2.19	4	-.145	2
97		4	max	.178	4	.018	1	.06	4	2.231	4	.142	1	1.528	4	-.125	1
98			min	-.048	2	-.112	4	-.008	1	-.142	1	-2.231	4	.109	1	-1.758	4
99		5	max	.178	4	-.011	1	.06	4	0	1	0	1	0	1	0	1
100			min	-.048	2	-.13	4	-.008	1	0	1	0	1	0	1	0	1
101	M11	1	max	-1.374	3	.053	3	.106	4	0	1	0	1	0	1	0	1
102			min	-5.317	2	.033	4	-.044	2	0	1	0	1	0	1	0	1
103		2	max	-1.384	3	.027	3	.053	4	.845	1	.628	4	2.771	3	.23	2

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
104			min	-5.34	2	.017	4	-.022	2	-.628	4	-.845	1	-.2	2	-3.189	3
105		3	max	-1.394	3	0	1	0	1	1.127	1	.837	4	3.695	3	.307	2
106			min	-5.362	2	0	1	0	1	-.837	4	-1.127	1	-.267	2	-4.252	3
107		4	max	-1.403	3	-.017	2	.022	1	.845	1	.628	4	2.771	3	.23	2
108			min	-5.385	2	-.027	3	-.053	3	-.628	4	-.845	1	-.2	2	-3.189	3
109		5	max	-1.413	3	-.033	2	.044	1	0	1	0	1	0	1	0	1
110			min	-5.408	2	-.053	1	-.106	3	0	1	0	1	0	1	0	1
111	M12	1	max	.693	4	.061	1	.106	3	0	1	0	1	0	1	0	1
112			min	-3.403	2	.038	4	.078	2	0	1	0	1	0	1	0	1
113		2	max	.71	4	.03	1	.053	3	-.168	1	.671	4	3.33	3	-2.663	2
114			min	-3.426	2	.019	4	.039	2	-.671	4	.168	1	2.315	2	-3.832	3
115		3	max	.727	4	0	1	0	1	-.224	1	.895	4	4.44	3	-3.551	2
116			min	-3.448	2	0	1	0	1	-.895	4	.224	1	3.086	2	-5.109	3
117		4	max	.744	4	-.019	2	-.039	1	-.168	1	.671	4	3.33	3	-2.663	2
118			min	-3.471	2	-.03	3	-.053	4	-.671	4	.168	1	2.315	2	-3.832	3
119		5	max	.761	4	-.038	2	-.078	1	0	1	0	1	0	1	0	1
120			min	-3.494	2	-.061	3	-.106	4	0	1	0	1	0	1	0	1
121	M13	1	max	3.583	4	.037	3	.078	1	0	1	0	1	0	1	0	1
122			min	2.368	1	.023	4	-.017	3	0	1	0	1	0	1	0	1
123		2	max	3.6	4	.019	3	.039	1	.325	3	.331	2	1.397	1	-.086	4
124			min	2.372	1	.011	4	-.008	3	-.331	2	-.325	3	.074	4	-1.608	1
125		3	max	3.617	4	0	1	0	1	.433	3	.441	2	1.863	1	-.114	4
126			min	2.375	1	0	1	0	1	-.441	2	-.433	3	.099	4	-2.144	1
127		4	max	3.633	4	-.011	2	.008	4	.325	3	.331	2	1.397	1	-.086	4
128			min	2.379	1	-.019	1	-.039	2	-.331	2	-.325	3	.074	4	-1.608	1
129		5	max	3.65	4	-.023	2	.017	4	0	1	0	1	0	1	0	1
130			min	2.383	1	-.037	1	-.078	2	0	1	0	1	0	1	0	1
131	M14	1	max	2.915	2	.022	1	-.017	3	0	1	0	1	0	1	0	1
132			min	-4.778	4	.014	4	-.044	1	0	1	0	1	0	1	0	1
133		2	max	2.919	2	.011	1	-.008	3	.239	1	-.11	4	.038	3	.257	2
134			min	-4.788	4	.007	4	-.022	1	.11	4	-.239	1	-.223	2	-.044	3
135		3	max	2.923	2	0	1	0	1	.319	1	-.146	4	.051	3	.342	2
136			min	-4.797	4	0	1	0	1	.146	4	-.319	1	-.297	2	-.058	3
137		4	max	2.926	2	-.007	2	.022	2	.239	1	-.11	4	.038	3	.257	2
138			min	-4.807	4	-.011	3	.008	4	.11	4	-.239	1	-.223	2	-.044	3
139		5	max	2.93	2	-.014	2	.044	2	0	1	0	1	0	1	0	1
140			min	-4.817	4	-.022	3	.017	4	0	1	0	1	0	1	0	1
141	M15	1	max	-.056	3	6.9	4	.015	2	.002	1	.025	4	5.601	4	.078	2
142			min	-.166	2	.217	2	-.483	4	-.025	4	-.002	1	-.252	2	-1.744	4
143		2	max	.148	2	-.304	4	.085	4	8.293	2	-2.585	4	-.137	1	.548	4
144			min	-.212	4	-.634	2	.005	1	2.585	4	-8.293	2	-1.761	4	.043	1
145		3	max	.158	2	-.135	4	.005	2	5.57	2	-1.268	4	.28	4	.047	2
146			min	-.073	4	-.641	2	.001	3	1.268	4	-5.57	2	-.151	2	-.087	4
147		4	max	.158	2	-.149	4	.005	2	2.816	2	-.664	4	.329	4	-.028	1
148			min	-.073	4	-.655	2	.001	3	.664	4	-2.816	2	.091	1	-.102	4
149		5	max	.158	2	-.163	4	.005	2	.007	1	0	4	.378	4	-.1	1
150			min	-.073	4	-.669	2	.001	3	0	4	-.007	1	.32	1	-.118	4
151	M16	1	max	.155	2	.66	2	.003	3	.021	3	-.005	2	.199	2	.155	4
152			min	.079	3	.076	4	-.003	2	.005	2	-.021	3	-.498	4	-.062	2
153		2	max	.155	2	.646	2	.003	3	2.779	2	-.316	4	.072	2	.116	4
154			min	.079	3	.063	4	-.003	2	.316	4	-2.779	2	-.371	4	-.022	2
155		3	max	.155	2	.632	2	.003	3	5.495	2	-.553	4	-.02	1	.076	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
156			min	.079	3	.049	4	-.003	2	.553	4	-5.495	2	-.244	4	.006	1
157		4	max	.229	4	.608	2	.084	4	8.109	2	.055	4	1.76	4	-.044	1
158			min	.142	1	-.151	4	.008	1	-.055	4	-8.109	2	.142	1	-.548	4
159		5	max	.087	4	5.49	4	-.004	2	.043	3	0	2	-.114	2	1.567	4
160			min	-.115	2	-.338	1	-.45	4	0	2	-.043	3	-5.032	4	.036	2
161	M17	1	max	0	2	0	1	0	1	0	1	0	1	0	1	0	1
162			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
163		2	max	0	2	0	1	0	1	0	1	0	1	0	1	0	1
164			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
165		3	max	0	4	0	1	0	1	0	1	0	1	0	1	0	1
166			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
167		4	max	0	4	0	1	0	1	0	1	0	1	0	1	0	1
168			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
169		5	max	0	4	0	1	0	1	0	1	0	1	0	1	0	1
170			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N4	max	.842	4	.038	1	2.95	2	0	1	0	1	0	1
2		min	-4.077	2	.024	4	-.704	4	0	1	0	1	0	1
3	N5	max	-1.849	3	.033	1	-.851	3	0	1	0	1	0	1
4		min	-7.187	2	.021	4	-2.999	2	0	1	0	1	0	1
5	N6	max	-.773	1	.023	1	-3.343	1	0	1	0	1	0	1
6		min	-1.101	4	.014	4	-5.14	4	0	1	0	1	0	1
7	N7	max	2.449	4	.014	1	3.935	2	0	1	0	1	0	1
8		min	-1.522	2	.009	4	-6.489	4	0	1	0	1	0	1
9	N8	max	.488	2	1.819	1	-.084	3	0	1	0	1	0	1
10		min	.27	3	.389	4	-.106	2	0	1	0	1	0	1
11	N9	max	.921	2	3.032	1	.017	1	0	1	0	1	0	1
12		min	-.308	4	.727	4	-.193	4	0	1	0	1	0	1
13	N10	max	.632	2	1.486	1	1.26	4	0	1	0	1	0	1
14		min	.298	3	-.511	4	.104	1	0	1	0	1	0	1
15	N11	max	1.003	2	6.76	3	2.123	4	0	1	0	1	0	1
16		min	-.368	4	.867	2	-.016	2	0	1	0	1	0	1
17	Totals:	max	0	3	9.11	1	0	1						
18		min	-10.634	2	6.26	4	-10.211	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
1	N1	max	0	3	-.018	4	0	2	1.422e-4	1	-3.26e-5	1	1.719e-3	2
2		min	-.004	2	-.049	1	-.01	4	-3.546e-3	4	-2.703e-4	4	1.451e-4	3
3	N2	max	.019	2	-.022	4	.008	4	1.475e-2	4	-3.26e-5	1	-8.394e-5	3
4		min	.002	3	-.054	1	.002	1	-5.787e-5	1	-2.703e-4	4	-1.386e-2	2
5	N3	max	5.646	2	-.023	4	5.837	4	2.956e-2	4	-3.26e-5	1	-8.394e-5	3
6		min	.021	3	-.056	1	-.011	1	-5.787e-5	1	-2.703e-4	4	-2.868e-2	2
7	N4	max	0	2	0	4	0	4	7.64e-3	4	-3.19e-3	2	-7.218e-3	1
8		min	0	4	0	1	0	2	3.45e-3	1	-4.402e-3	3	-9.715e-3	4
9	N5	max	0	2	0	4	0	2	1.345e-2	4	6.24e-4	2	3.e-3	4
10		min	0	3	0	1	0	3	-4.769e-3	2	-3.257e-3	3	-2.891e-3	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
11	N6	max	0	4	0	4	0	4	1.937e-4	4	2.432e-5	4	3.063e-3	4
12		min	0	1	0	1	0	1	-4.157e-3	2	-1.352e-3	1	-1.297e-2	2
13	N7	max	0	2	0	4	0	4	5.384e-3	2	5.957e-4	2	-3.916e-3	3
14		min	0	4	0	1	0	2	2.387e-3	4	1.255e-4	3	-1.182e-2	2
15	N8	max	0	3	0	4	0	2	-1.534e-4	4	1.094e-4	4	-2.701e-4	4
16		min	0	2	0	1	0	3	-7.572e-4	2	-1.498e-4	2	-2.149e-3	1
17	N9	max	0	4	0	4	0	4	9.002e-4	2	5.44e-5	4	-1.346e-3	2
18		min	0	2	0	1	0	1	1.84e-4	4	-6.118e-5	2	-2.486e-3	3
19	N10	max	0	3	0	4	0	1	-6.599e-5	4	2.174e-4	4	2.216e-3	1
20		min	0	2	0	1	0	4	-6.19e-4	1	6.782e-5	1	6.337e-5	4
21	N11	max	0	4	0	2	0	2	1.141e-3	3	2.469e-4	4	2.355e-3	3
22		min	0	2	0	3	0	4	2.379e-4	2	-1.288e-4	2	1.547e-3	2
23	N12	max	0	3	-.007	4	0	2	-6.849e-5	4	1.835e-5	2	5.256e-5	4
24		min	0	2	-.081	1	0	4	-8.275e-4	1	-8.116e-5	4	-1.889e-5	2
25	N13	max	0	4	-.051	2	0	2	9.72e-4	1	4.679e-5	2	4.001e-5	3
26		min	-.001	2	-.093	3	0	4	4.25e-4	4	-7.319e-5	4	-4.46e-5	2
27	N14	max	-.001	3	-.006	4	0	2	1.378e-4	1	5.192e-5	2	2.629e-5	4
28		min	-.004	2	-.032	2	0	3	2.522e-5	4	-1.584e-4	4	-9.538e-4	1
29	N15	max	-.002	3	-.008	2	0	2	1.006e-4	1	-1.959e-5	2	1.729e-3	2
30		min	-.004	2	-.027	3	0	4	-3.614e-4	4	-4.304e-4	4	-3.994e-4	4
31	N16	max	0	4	-.006	4	0	4	4.636e-4	2	-6.569e-5	1	-5.555e-4	4
32		min	-.003	2	-.028	2	0	1	9.071e-5	4	-1.301e-4	4	-9.851e-4	1
33	N17	max	.001	4	-.007	2	0	2	3.725e-4	1	-4.56e-5	1	1.74e-3	2
34		min	-.004	2	-.034	3	0	4	-1.275e-4	4	-3.961e-4	4	8.001e-4	3
35	N18	max	-.002	3	.003	4	0	2	1.422e-4	1	-3.26e-5	1	1.719e-3	2
36		min	-.004	2	-.05	1	-.01	4	-3.546e-3	4	-2.703e-4	4	1.451e-4	3
37	N19	max	.001	4	-.034	2	0	2	1.422e-4	1	-3.26e-5	1	1.719e-3	2
38		min	-.004	2	-.053	3	-.01	4	-3.546e-3	4	-2.703e-4	4	1.451e-4	3
39	N20	max	-.002	3	-.004	4	0	2	2.126e-4	1	1.503e-4	4	1.217e-4	4
40		min	-.004	2	-.072	1	0	4	-2.223e-3	4	-8.711e-6	1	-1.066e-4	1
41	N21	max	0	4	-.033	4	0	2	1.594e-4	2	1.437e-4	4	2.666e-5	2
42		min	-.003	2	-.07	1	0	4	-2.447e-3	4	9.476e-6	1	-4.577e-4	3

Envelope AISC ASD Steel Code Checks

	Me...	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Fa ...	Ft [...	Fb y-y [ksi]	Fb	...	AS...
1	M1	PIPE_1...	.979	27.906	4	.056	28.396		2	20...	27....	30.723	30.....		H1-2
2	M2	C12x20.7	.426	6.188	3	.318	5.25	y	4	27...	28....	35.91	28.....		H1-2
3	M3	C12x20.7	.207	5.156	2	.052	6.281	y	1	20...	28....	35.91	28.....		H1-2
4	M4	L3x3x4	.074	0	2	.006	9	y	1	5.8..	28....	- Code check b...			H1-1
5	M5	L3x3x4	.117	0	2	.009	9	y	3	5.8..	28....	- Code check b...			H1-1
6	M6	L3x3x4	.021	0	2	.002	6.906	y	1	9.8..	28....	- Code check b...			H2-1
7	M7	L3x3x4	.027	0	2	.002	5.293	y	1	15...	28....	- Code check b...			H2-1
8	M8	L3x3x4	.052	0	2	.003	0	y	1	15...	28....	- Code check b...			H1-1
9	M9	L3x3x4	.072	0	2	.003	6.893	y	1	9.9..	28....	- Code check b...			H1-1
10	M10	L3x3x4	.008	6.281	4	.073	5.25	z	4	23...	28....	- Code check b...			H1-1
11	M11	L3x3x4	.188	8.421	2	.006	0	z	4	6.6..	28....	- Code check b...			H2-1
12	M12	L3x3x4	.150	9.646	4	.006	9.646	z	4	5.0..	28....	- Code check b...			H1-1
13	M13	L3x3x4	.268	5.863	4	.004	0	z	1	13...	28....	- Code check b...			H1-1
14	M14	L3x3x4	.168	3.497	4	.002	3.497	z	2	21...	28....	- Code check b...			H2-1
15	M15	C12x20.7	.809	1.219	4	.414	1.219	y	4	10...	28....	35.91	28...	1	H2-1

Envelope AISC ASD Steel Code Checks (Continued)

	Me...	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Fa ...	Ft [...	Fb y-y [ksi]	Fb	...	AS...
16	M16	C12x20.7	.940	7.781	4	.338	7.781	y	4	10...	28...	35.91	18...	1	H1-2

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N4	-3.502	.038	2.525	0	0	0
2	1	N5	-6.169	.033	-2.569	0	0	0
3	1	N6	-.773	.023	-3.343	0	0	0
4	1	N7	-1.304	.014	3.36	0	0	0
5	1	N8	.44	1.819	-.1	0	0	0
6	1	N9	.81	3.032	.017	0	0	0
7	1	N10	.559	1.486	.104	0	0	0
8	1	N11	.878	2.666	.006	0	0	0
9	1	Totals:	-9.06	9.11	0			
10	1	COG (ft):	X: -.558	Y: 27.578	Z: .138			

Joint Reactions

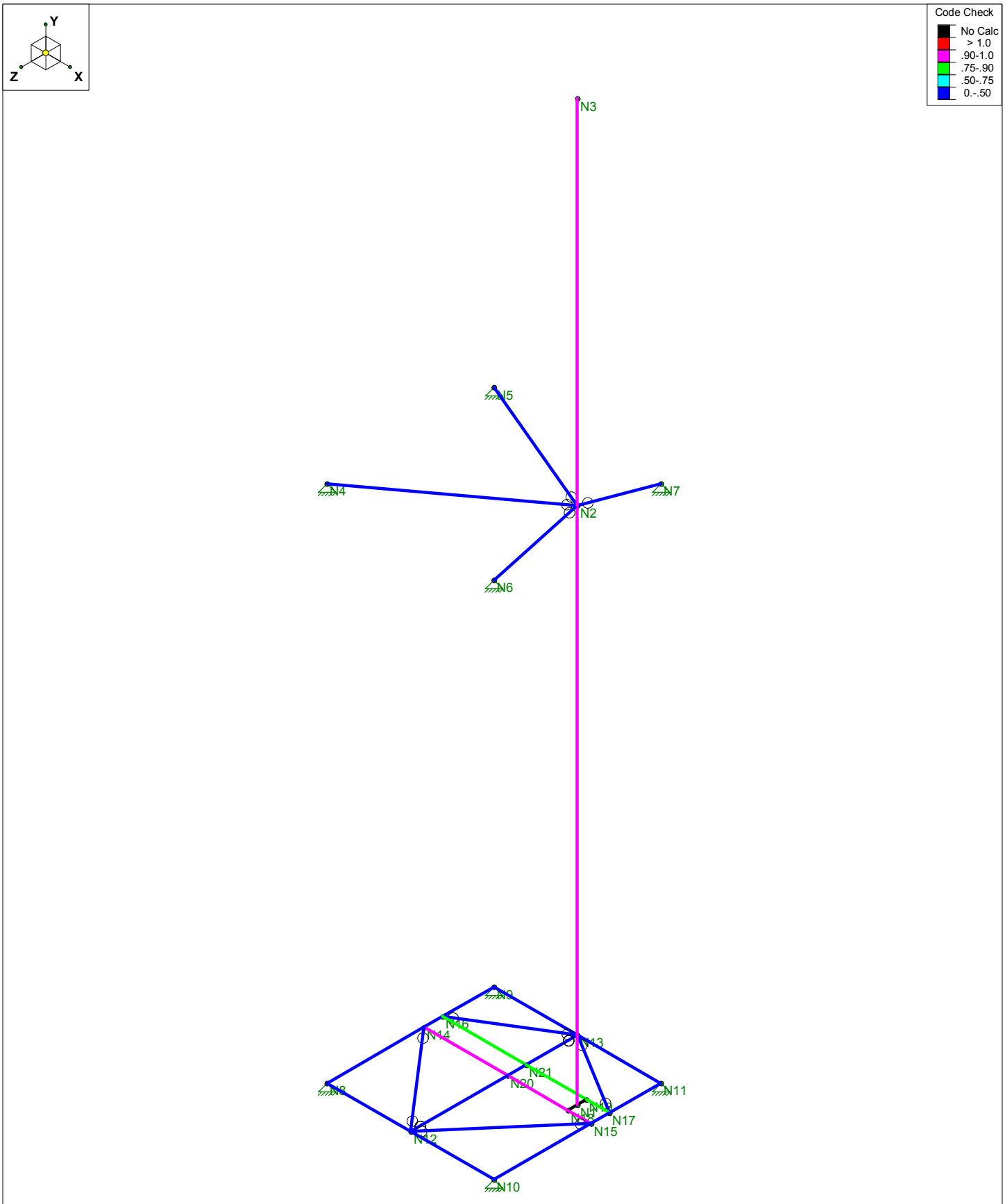
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N4	-4.077	.024	2.95	0	0	0
2	2	N5	-7.187	.021	-2.999	0	0	0
3	2	N6	-.893	.014	-3.895	0	0	0
4	2	N7	-1.522	.009	3.935	0	0	0
5	2	N8	.488	1.782	-.106	0	0	0
6	2	N9	.921	3.021	.016	0	0	0
7	2	N10	.632	.522	.115	0	0	0
8	2	N11	1.003	.867	-.016	0	0	0
9	2	Totals:	-10.634	6.26	0			
10	2	COG (ft):	X: -.569	Y: 27.436	Z: .137			

Joint Reactions

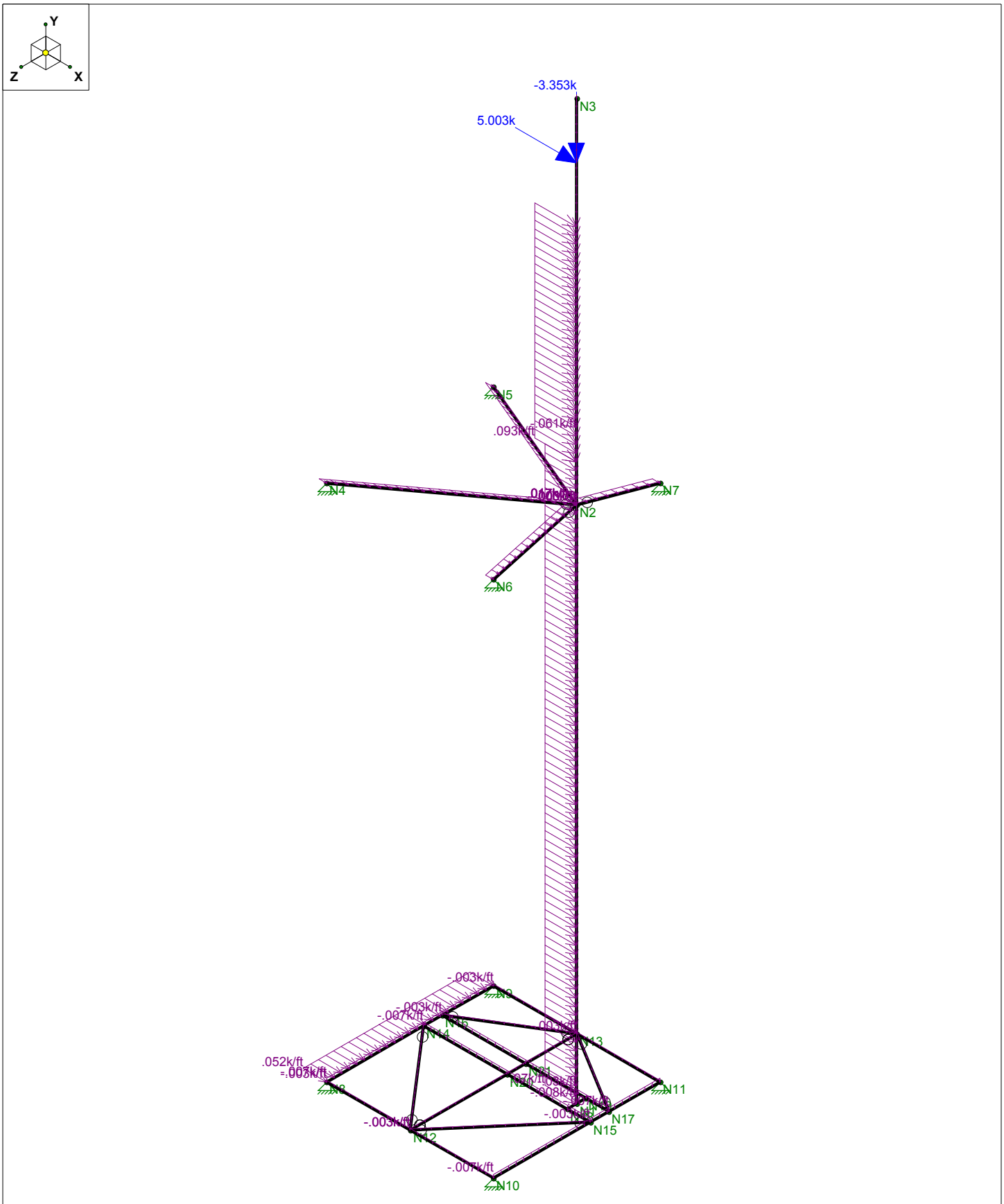
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N4	.723	.038	-.616	0	0	0
2	3	N5	-1.849	.033	-.851	0	0	0
3	3	N6	-.945	.023	-4.415	0	0	0
4	3	N7	2.102	.014	-5.572	0	0	0
5	3	N8	.27	.61	-.084	0	0	0
6	3	N9	-.275	1.042	-.173	0	0	0
7	3	N10	.298	.589	1.104	0	0	0
8	3	N11	-.324	6.76	1.871	0	0	0
9	3	Totals:	0	9.11	-8.736			
10	3	COG (ft):	X: -.558	Y: 27.578	Z: .138			

Joint Reactions

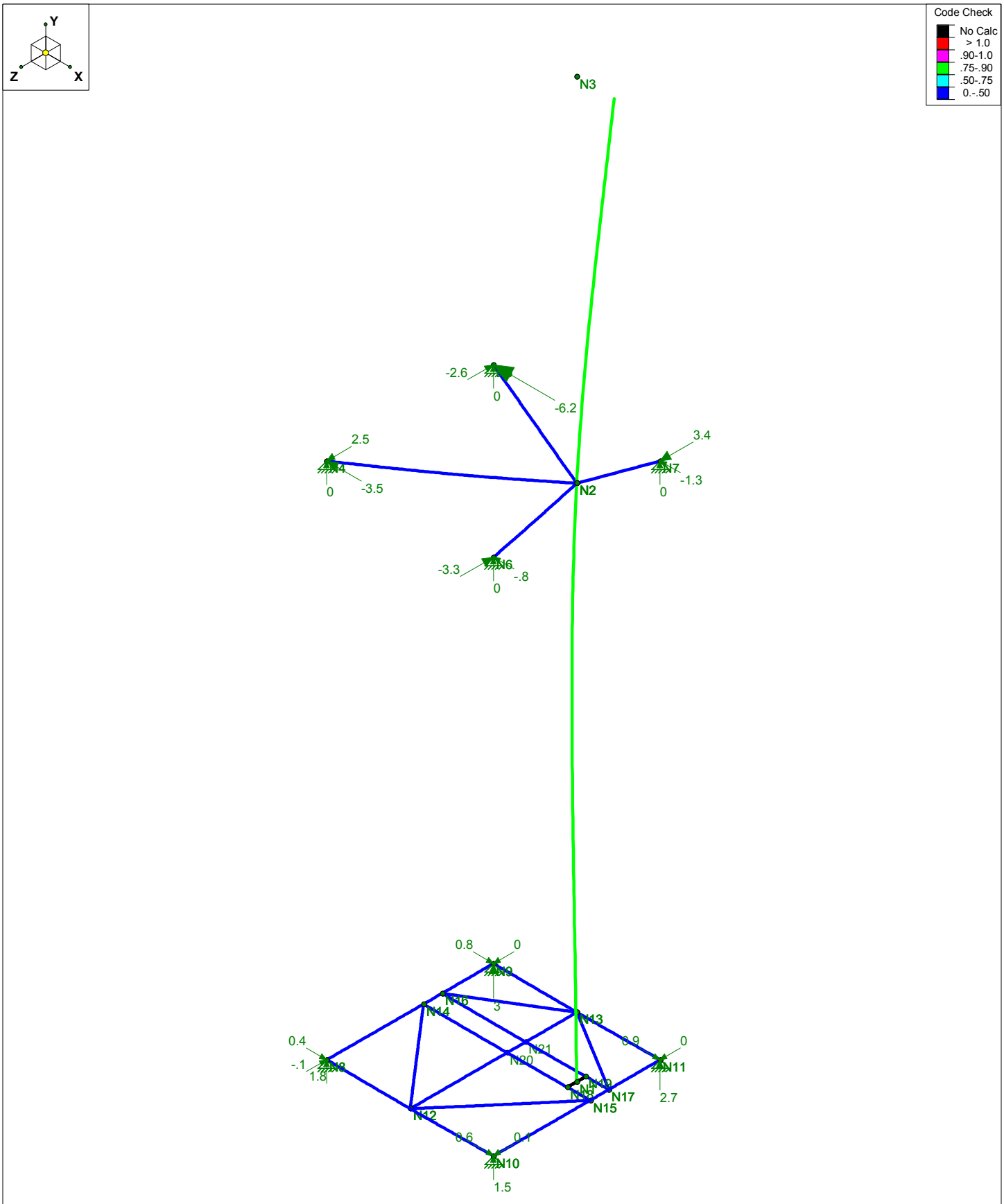
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N4	.842	.024	-.704	0	0	0
2	4	N5	-2.158	.021	-.981	0	0	0
3	4	N6	-1.101	.014	-5.14	0	0	0
4	4	N7	2.449	.009	-6.489	0	0	0
5	4	N8	.306	.389	-.087	0	0	0
6	4	N9	-.308	.727	-.193	0	0	0
7	4	N10	.338	-.511	1.26	0	0	0
8	4	N11	-.368	5.587	2.123	0	0	0
9	4	Totals:	0	6.26	-10.211			
10	4	COG (ft):	X: -.569	Y: 27.436	Z: .137			



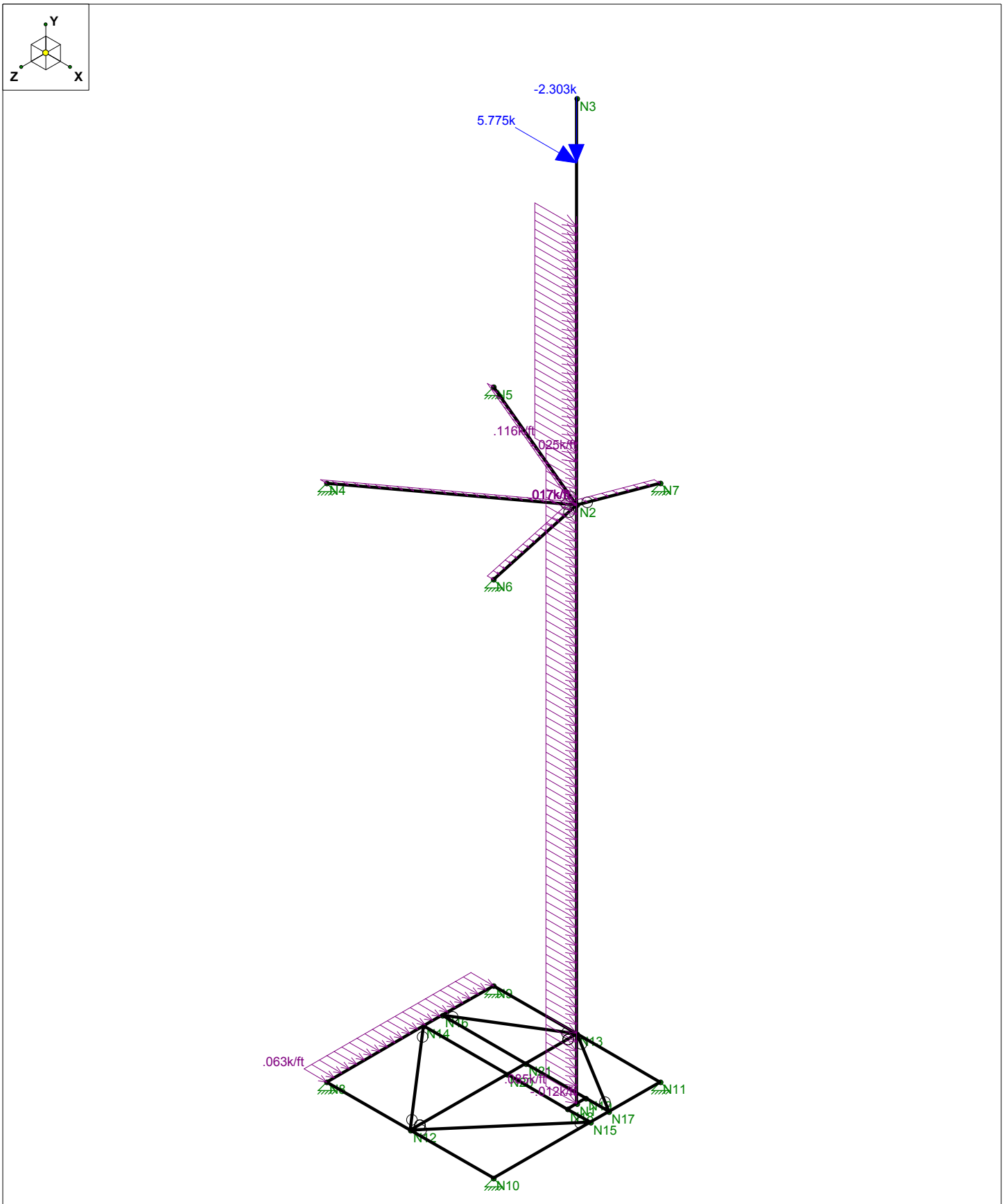
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:08 PM
16002.002 - CT1209	Unity Check	EIA-TIA Mast Analysis.r3d



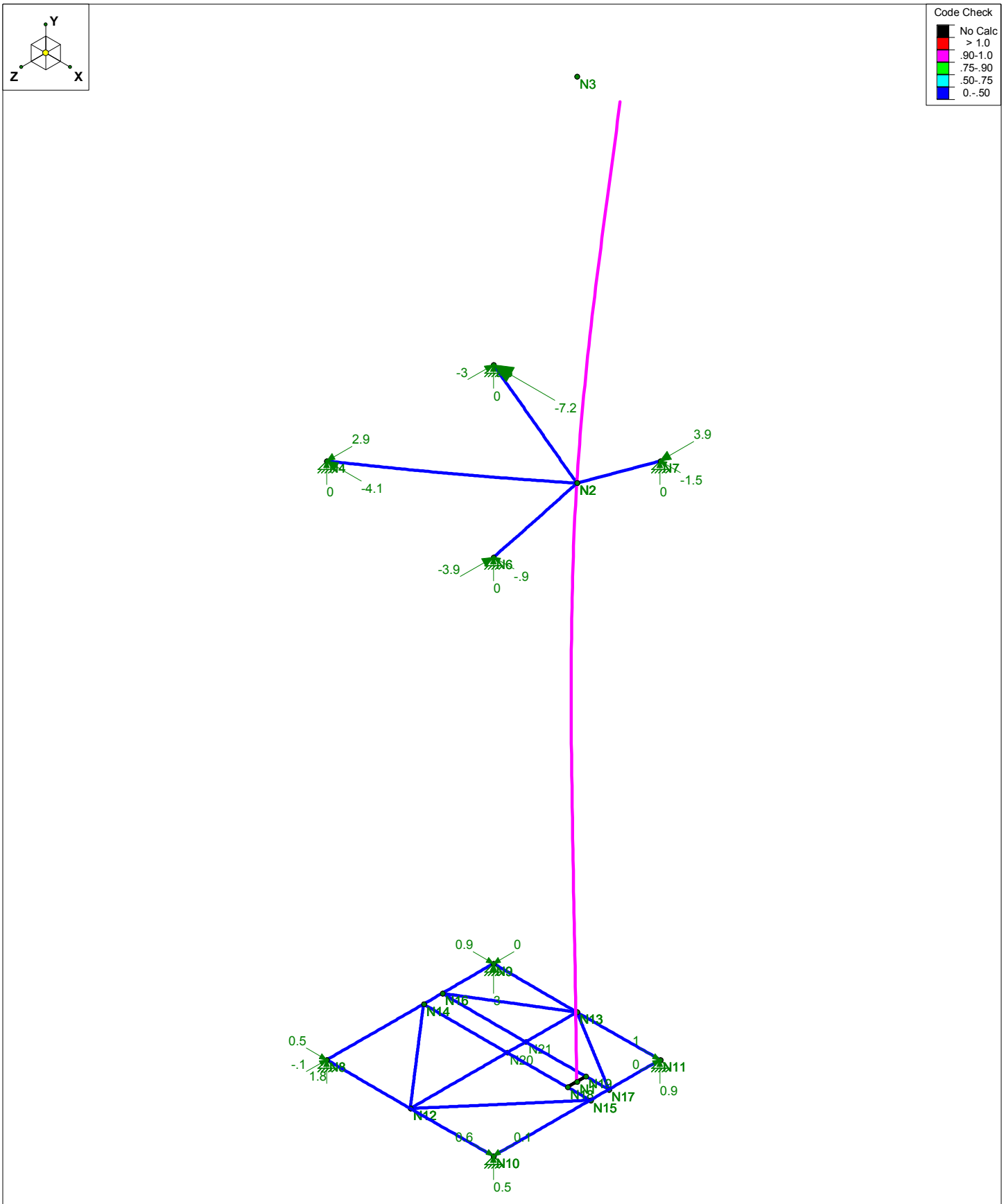
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:06 PM
16002.002 - CT1209	LC #1 Loads	EIA-TIA Mast Analysis.r3d



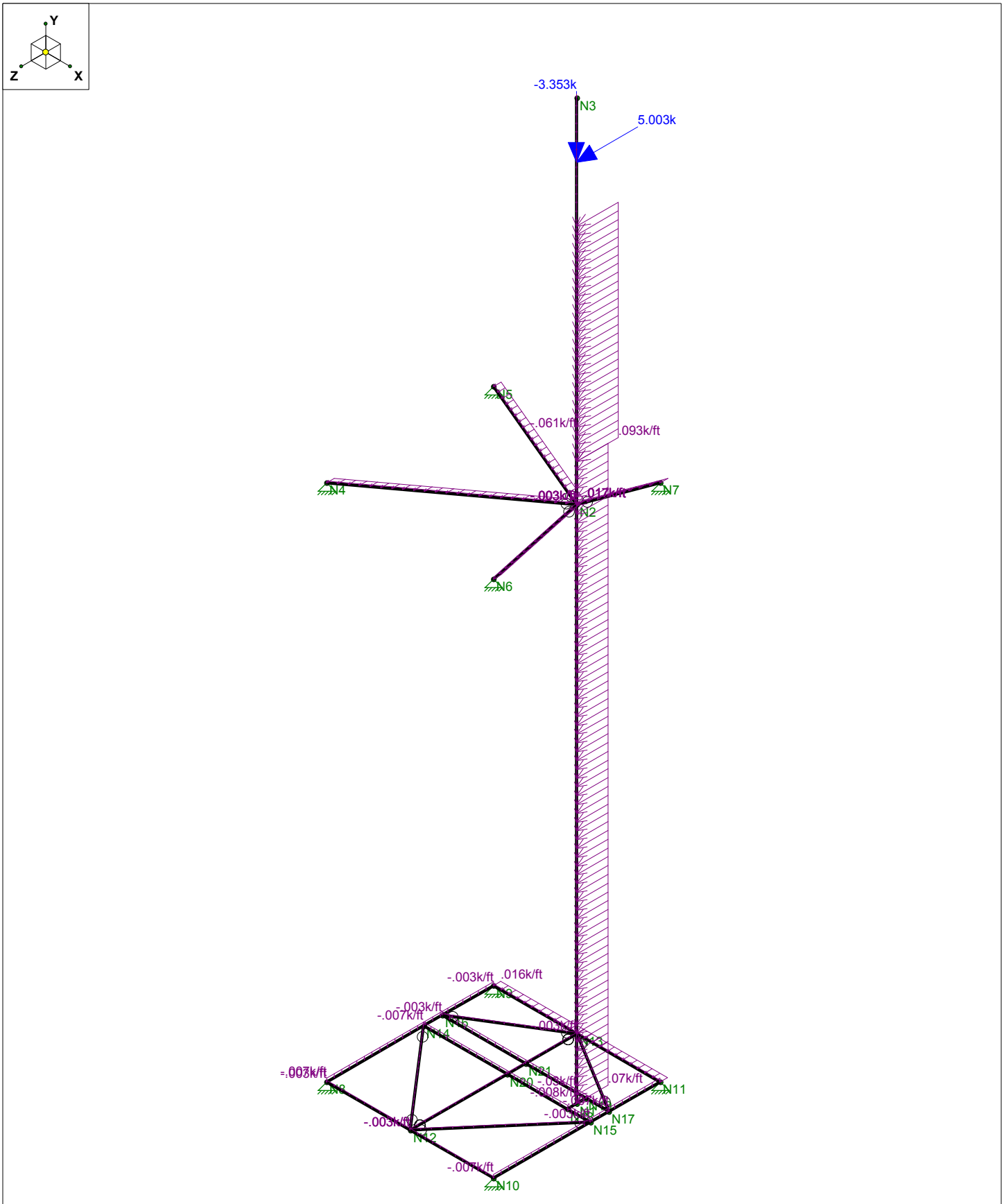
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:13 PM
16002.002 - CT1209	LC #1 Reactions and Deflected Shape	EIA-TIA Mast Analysis.r3d



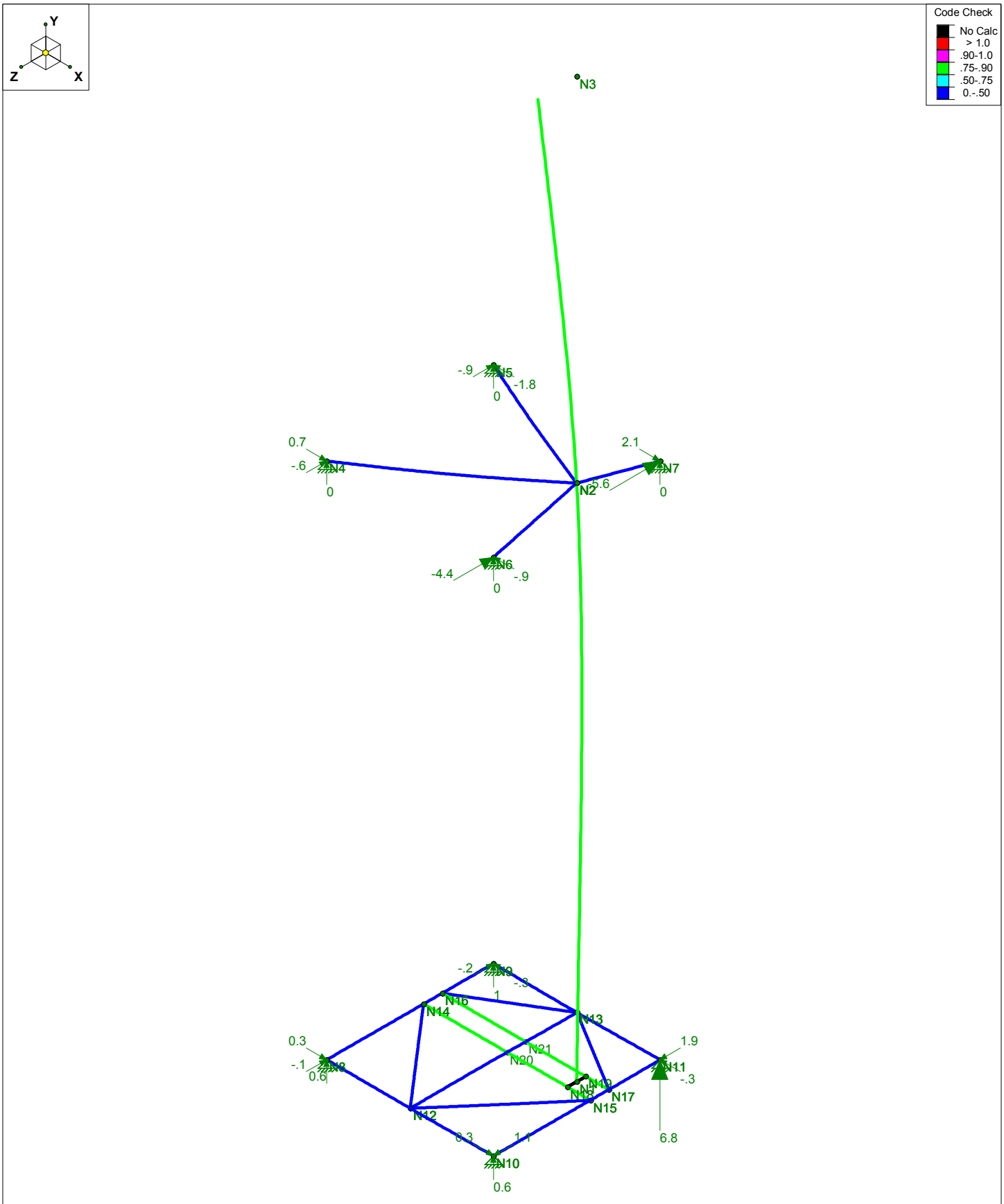
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:06 PM
16002.002 - CT1209	LC #2 Loads	EIA-TIA Mast Analysis.r3d



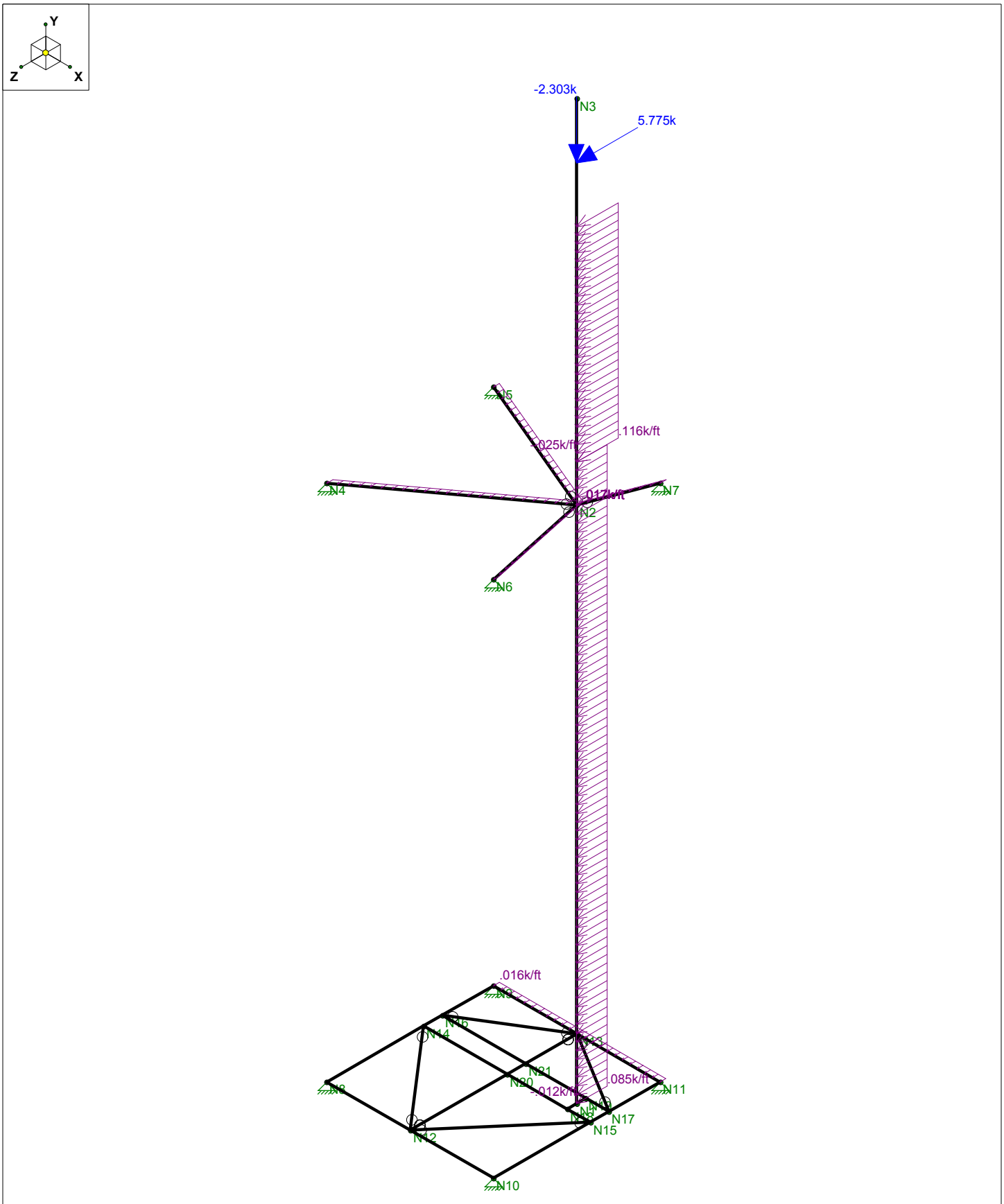
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:13 PM
16002.002 - CT1209	LC #2 Reactions and Deflected Shape	EIA-TIA Mast Analysis.r3d



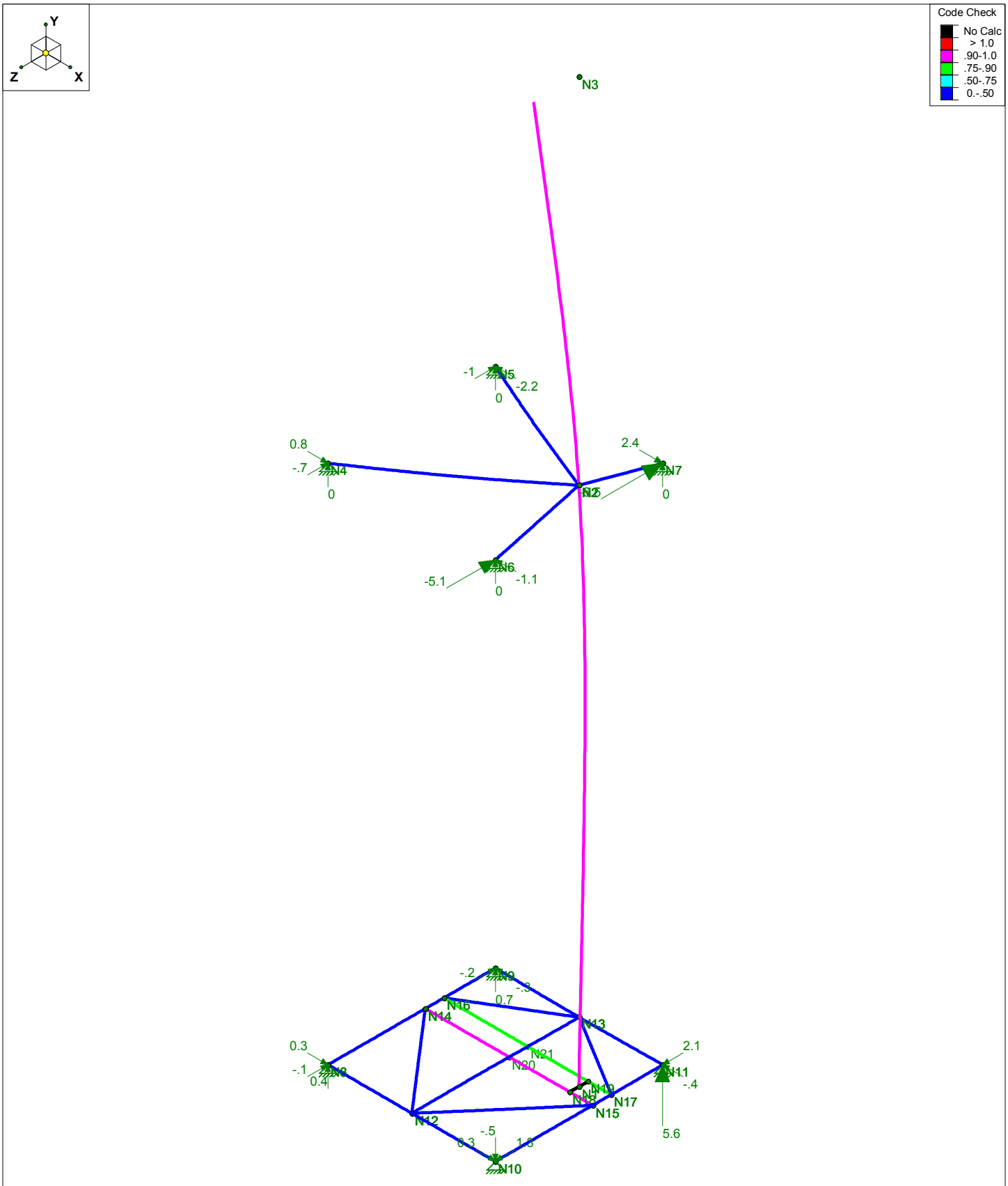
CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:06 PM
16002.002 - CT1209	LC #3 Loads	EIA-TIA Mast Analysis.r3d



CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:14 PM
16002.002 - CT1209	LC #3 Reactions and Deflected Shape	EIA-TIA Mast Analysis.r3d



CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:07 PM
16002.002 - CT1209	LC #4 Loads	EIA-TIA Mast Analysis.r3d



CENTEK Engineering, INC.		
tjl, cfc	Tower # 20003 - Mast	Mar 28, 2016 at 12:15 PM
16002.002 - CT1209	LC #4 Reactions and Deflected Shape	EIA-TIA Mast Analysis.r3d

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

Subject: Connection of Mast to Tower # 20003

Location: Manchester, CT

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 16002.002

Rev. 0: 3/28/16

Mast Connection to Tower:

Check Pipe Collar Bolts:

Reactions:

Shear = $Shear := 13.5 \cdot kips$ (Input From Risa-3D LC #2)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

Bolt Diameter = $D := 0.75 \cdot in$ (User Input)

Number of Bolts = $N_b := 4$ (User Input) (6 Botls Total Only 4 Used)

Allowable Tensile Strength = $F_t := 19.9 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 11.9 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Shear}{N_b} = 3.4 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 28.36 \cdot \%$

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

$Bolt\_Shear = "OK"$

Check Pipe Collar:

Reactions:

Maximum Bolt Force = $P := \frac{Shear}{N_b} = 3.4 \cdot kips$

Plate Data:

Plate Yield Strength = $Fy_{bp} := 36 \cdot ksi$ (User Input)

Plate Thickness = $t_p := 0.875 \cdot in$ (User Input)

Plate Width = $t_w := 5 \cdot in$ (User Input)

Distance Between Brace Plates = $d_p := 4 \cdot in$ (User Input)

Maximum Moment in Plate = $M := P \cdot \frac{d_p}{8} = 1.688 \cdot k \cdot in$

Maximum Bending Stress in Plate = $f_{bp} := \frac{6 \cdot M}{\left(t_w \cdot t_p^2\right)} = 2.6 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.75 \cdot Fy_{bp} = 27 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 9.8 \cdot \%$

Plate Bending = $Plate\_Bending := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

$Plate\_Bending = "Ok"$

Check Angle Brace Bolts:

Reactions:

Vertical =	Vertical := .02·kips	(Input From Risa-3D LC #2)
Horizontal x-dir =	$Horizontal_x := 7.2 \cdot kips$	(Input From Risa-3D LC #2)
Horizontal z-dir =	$Horizontal_z := 3.0 \cdot kips$	(Input From Risa-3D LC #2)

Bolt Data:

Bolt Type =	ASTM A325	(User Input)
Bolt Diameter =	D := 0.625·in	(User Input)
Number of Bolts =	$N_b := 2$	(User Input)
Allowable Tensile Strength =	$F_t := 13.8 \cdot kips$	(User Input)
Allowable Shear Strength =	$F_v := 8.3 \cdot kips$	(User Input)

Shear Force = $f_v := \frac{\sqrt{Horizontal_z^2 + Vertical^2}}{N_b} = 1.5 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 18.07 \cdot \%$

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

Bolt_Shear = "OK"

Tension Force = $f_t := \frac{Horizontal_x}{N_b} = 3.6 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 26.09 \cdot \%$

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

Bolt_Tension = "OK"

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Subject:	Load Analysis of AT&T Equipment on Tower #20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 16002.002

Basic Components

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

Factors for Extreme Wind Calculation

Elevation of Top of PCS Mast Above Grade =	TME := 165	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.406$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.291$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.78$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.829$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 36.1$ psf (NESC 2007 Section 250.C.2)

Shape Factors

NUS Design Criteria Issued April 12, 2007

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

Overload Factors

NU Design Criteria Table

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

Development of Wind & Ice Load on Mast

Mast Data: (12" Sch. 40)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 12.8$	in	(User Input)
Mast Length =	$L_{mast} := 47$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.067$ sf/ft

Total Mast Wind Force (Above Top of Tower) = $qz \cdot Cd_R \cdot A_{mast} \cdot m = 63$ plf **BLC 5**

Total Mast Wind Force (Below Top of Tower) = $qz \cdot Cd_R \cdot A_{mast} = 50$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.15$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{mast} = 6$ plf **BLC 4**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

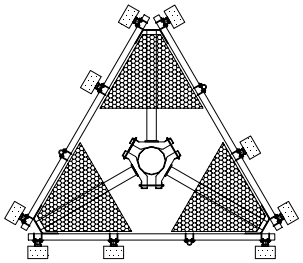
Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 20.9$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 8$ plf **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	KMW AMX-CD-16-65-00T-RET		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5.9$	in	(User Input)
Antenna Weight =	$WT_{ant} := 49$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 35.4$	sf	
Total Antenna Wind Force =	$F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2556$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 38.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 249$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant1} := WT_{ant} \cdot N_{ant} = 294$	lbs	**BLC 2**

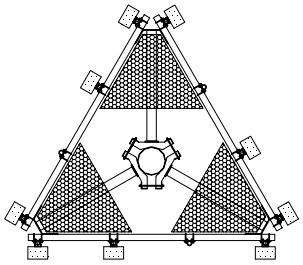
Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5013$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1435$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 46$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 279$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI OPA-65R-LCUU-H6		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 14.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.4$	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 = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.4$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 22.2$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1603$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 8$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 24$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 154$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 219$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 7885$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1803$ cu in

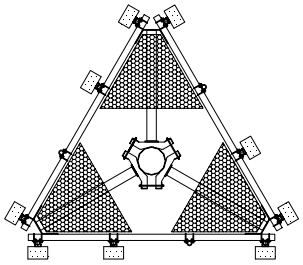
Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 58$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 175$ lbs **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI DTMABP7819VG12A TMA		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 14.25$	in	(User Input)
Antenna Width =	$W_{ant} := 11.46$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.17$	in	(User Input)
Antenna Weight =	$WT_{ant} := 20$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 6.8$	sf	
Total Antenna Wind Force =	$F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 491$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 1.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 7.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 51$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant2} := WT_{ant} \cdot N_{ant} = 120$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 681$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 301$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 10$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 59$	lbs	**BLC 3**

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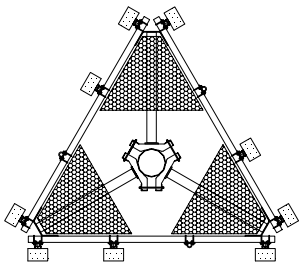
Subject:	Load Analysis of AT&T Equipment on Tower #20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 16002.002

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI TMABPDB7823VG12A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 14.25$	in	(User Input)
Antenna Width =	$W_{ant} := 11.03$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.11$	in	(User Input)
Antenna Weight =	$WT_{ant} := 25$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 6.5$	sf	
Total Antenna Wind Force =	$F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 473$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 1.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 7.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 49$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant2} := WT_{ant} \cdot N_{ant} = 150$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 646$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 291$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot ld = 9$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 57$	lbs	**BLC 3**

Development of Wind & Ice Load on Platform

Platform Data:

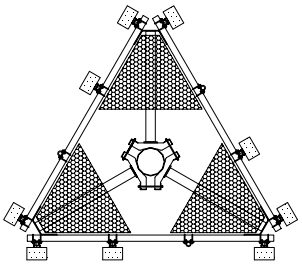
Platform Model = Site Pro 12'-6" Low Profile Platform (RMSP-496)

Platform Area = $A_{plt} := 14$ sq ft (User Input)

Platform Area w/ Ice = $A_{ICEplt} := 19.5$ sq ft (User Input)

Platform Weight = $WT_{plt} := 1520$ lbs (User Input)

Platform Weight w/ Ice = $WT_{ICEplt} := 2000$ lbs (User Input)



Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{plt} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 1011$ lbs **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{plt} := p \cdot Cd_F \cdot A_{ICEplt} = 125$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 1520$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Platform = $WT_{ICEplt} - WT_{plt} = 480$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 30$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 12$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 6$		(User Input)

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 1$ sf/ft

Total Coax Wind Force (Below NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 52$ plf **BLC 5**

Wind Load (NESC Heavy)

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

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 6$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^2\right] = 3.9$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \left(N_{coax} \cdot \frac{Ai_{coax}}{144}\right) = 18$ plf **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 24$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 9$		(User Input)

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 1.5$ sf/ft

Total Coax Wind Force (Above NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 97$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 1.6$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 9$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 25$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^2\right] = 3.9$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \left(N_{coax} \cdot \frac{Ai_{coax}}{144}\right) = 36$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member

Member Data: L3x3x1/4

Antenna Shape =	Flat		(User Input)	
Height =	$H_{mem} := 3$	in	(User Input)	
Thickness =	$t_{mem} := 0.25$	in	(User Input)	
Length =	$L_{mem} := 36$	in	(User Input)	
Cross Sectional Area of Member =	$Ac_{mem} := 1.44$	sq in	(User Input)	

Wind Load (NESC Extreme)

Member projected surface area = $A_{mem} := \frac{H_{mem}}{12} = 0.3$ sf/ft

Total Member Wind Force = $F_{mem} := qz \cdot Cd_F \cdot A_{mem} = 14$ plf **BLC 5**

Wind Load (NESC Heavy)

Member projected surface area w/ Ice = $AICE_{mem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := p \cdot Cd_F \cdot AICE_{mem} = 2$ plf **BLC 4**

Gravity Loads (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Load (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := (H_{mem} + 2 \cdot Ir) \cdot (t_{mem} + 2 \cdot Ir) + (H_{mem} - t_{mem}) \cdot (t_{mem} + 2 \cdot Ir) - Ac_{mem} = 7 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 3$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member

Member Data:	C12x20.7			
Antenna Shape =	Flat		(User Input)	
Height =	$H_{mem} := 12$	in	(User Input)	
Flange Width =	$b_f := 2.94$	in	(User Input)	
Flange Thickness =	$t_f := 0.501$	in	(User Input)	
Web Thickness =	$t_w := 0.282$	in	(User Input)	
Length =	$L_{mem} := 105$	in	(User Input)	
Cross Sectional Area of Member =	$Ac_{mem} := 6.08$	sq in	(User Input)	

Wind Load (NESC Extreme)

Member projected surface area = $A_{mem} := \frac{H_{mem}}{12} = 1$ sf/ft

Total Member Wind Force = $F_{mem} := qz \cdot Cd_F \cdot A_{mem} = 58$ plf **BLC 5**

Wind Load (NESC Heavy)

Member projected surface area w/ Ice = $AICE_{mem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 1.1$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := p \cdot Cd_F \cdot AICE_{mem} = 7$ plf **BLC 4**

Gravity Loads (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Load (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := (b_f + 2 \cdot Ir) \cdot (t_f + 2 \cdot Ir) \cdot 2 + (H_{mem} - t_f - 2 \cdot Ir) \cdot (t_w + 2 \cdot Ir) - Ac_{mem} = 19 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 7$ plf **BLC 3**

CENTEK engineering, INC.	Subject:	**Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining Antenna Structure Reactions Applied to Tower Tabulated Load Cases**			
Consulting Engineers					
63-2 North Branford Road					
Branford, CT 06405	Location:	**Manchester, CT**			
Ph. 203-488-0580 / Fax. 203-488-8587	Date:3/28/16	Prepared by: T.J.L.	Checked by: C.F.C.	Job No. 16002.002	

Load Case	Description
1	Self Weight
2	Weight of Appurtenances
3	Weight of Ice Only
4	NESC Heavy Wind
5	NESC Extreme Wind

Footnotes:

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

Subject: **Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining Antenna Mast Reactions Applied to Tower Load Combinations Table**

Location: **Manchester CT**

Date: 3/28/16 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

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

Footnotes:
(1) BLC = Basic Load Case

Global

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

Hot Rolled Steel Code	AISC 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building

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

Global, Continued

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

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Design Parameters

	Label	Shape	Leng...	Lbyy[ft]	Lbzz[ft]	Lcomp ...	Lcomp ...	Kyy	Kzz	Cm...	Cm...	Cb	y s...	z s...	Functi...
1	M1	Mast	47	Segment	Segment										Lateral
2	M3	Brace 2	9	Segment	Segment										Lateral
3	M4	Brace 2	9	Segment	Segment										Lateral
4	M5	Brace 1	9												Lateral
5	M6	Brace 1	9												Lateral
6	M7	Brace 1	6.906												Lateral
7	M8	Brace 1	5.293												Lateral
8	M9	Brace 1	5.276												Lateral
9	M10	Brace 1	6.893												Lateral
10	M11	Brace 1	9	Segment	Segment										Lateral
11	M12	Brace 1	8.421												Lateral
12	M13	Brace 1	9.646												Lateral
13	M14	Brace 1	5.863												Lateral
14	M15	Brace 1	3.497												Lateral
15	M16	Brace 2	9	Segment	Segment										Lateral
16	M16A	Brace 2	9	Segment	Segment										Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE 12.0	Beam	Pipe	A53 Gr. B	Typical	13.7	262	262	523
2	Brace 1	L3x3x4	Beam	Pipe	A36 Gr.36	Typical	1.44	1.23	1.23	.031
3	Brace 2	C12x20.7	Beam	Pipe	A36 Gr.36	Typical	6.08	3.86	129	.369

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N3			Mast	Beam	Pipe	A53 Gr. B	Typical
2	M3	N10	N11			Brace 2	Beam	Pipe	A36 Gr.36	Typical
3	M4	N8	N9			Brace 2	Beam	Pipe	A36 Gr.36	Typical
4	M5	N8	N10			Brace 1	Beam	Pipe	A36 Gr.36	Typical
5	M6	N9	N11			Brace 1	Beam	Pipe	A36 Gr.36	Typical
6	M7	N12	N14			Brace 1	Beam	Pipe	A36 Gr.36	Typical
7	M8	N16	N13			Brace 1	Beam	Pipe	A36 Gr.36	Typical
8	M9	N13	N17			Brace 1	Beam	Pipe	A36 Gr.36	Typical
9	M10	N15	N12			Brace 1	Beam	Pipe	A36 Gr.36	Typical
10	M11	N12	N13			Brace 1	Beam	Pipe	A36 Gr.36	Typical
11	M12	N2	N5			Brace 1	Beam	Pipe	A36 Gr.36	Typical
12	M13	N2	N4			Brace 1	Beam	Pipe	A36 Gr.36	Typical
13	M14	N2	N6			Brace 1	Beam	Pipe	A36 Gr.36	Typical
14	M15	N2	N7			Brace 1	Beam	Pipe	A36 Gr.36	Typical
15	M16	N17	N16			Brace 2	Beam	Pipe	A36 Gr.36	Typical
16	M16A	N14	N15			Brace 2	Beam	Pipe	A36 Gr.36	Typical
17	M17	N18	N19			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From D...
1	N1	0	0	0	0	
2	N2	0	28	0	0	
3	N3	0	47	0	0	
4	N4	-7.76	28	5.73	0	
5	N5	-7.76	28	-3.27	0	
6	N6	1.24	28	5.73	0	
7	N7	1.24	28	-3.27	0	
8	N8	-7.76	0	5.73	0	
9	N9	-7.76	0	-3.27	0	
10	N10	1.24	0	5.73	0	
11	N11	1.24	0	-3.27	0	
12	N12	-3.25	0	5.73	0	
13	N13	-3.25	0	-3.27	0	
14	N14	-7.76	0	.5	0	
15	N15	1.24	0	.5	0	
16	N16	-7.76	0	-.5	0	
17	N17	1.24	0	-.5	0	
18	N18	0	0	.5	0	
19	N19	0	0	-.5	0	
20	N20	-3.25	0	.5	0	
21	N21	-3.25	0	-.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N4	Reaction	Reaction	Reaction				
2	N6	Reaction	Reaction	Reaction				
3	N5	Reaction	Reaction	Reaction				
4	N7	Reaction	Reaction	Reaction				
5	N8	Reaction	Reaction	Reaction				
6	N10	Reaction	Reaction	Reaction				
7	N9	Reaction	Reaction	Reaction				
8	N11	Reaction	Reaction	Reaction				

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.294	44
2	M1	Y	-.219	44
3	M1	Y	-.12	44
4	M1	Y	-.15	44
5	M1	Y	-1.52	44

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.279	44
2	M1	Y	-.175	44
3	M1	Y	-.059	44
4	M1	Y	-.057	44
5	M1	Y	-.48	44

Member Point Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.249	44
2	M1	X	.154	44
3	M1	X	.051	44
4	M1	X	.049	44
5	M1	X	.125	44

Member Point Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	2.556	44
2	M1	X	1.603	44
3	M1	X	.491	44
4	M1	X	.473	44
5	M1	X	1.011	44

Joint Loads and Enforced Displacements

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

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.012	-.012	0	30
2	M1	Y	-.025	-.025	30	41

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M1	Y	-.018	-.018	0	30
3	M1	Y	-.036	-.036	30	41
4	M12	Y	-.003	-.003	0	0
5	M13	Y	-.003	-.003	0	0
6	M14	Y	-.003	-.003	0	0
7	M15	Y	-.003	-.003	0	0
8	M6	Y	-.003	-.003	0	0
9	M8	Y	-.003	-.003	0	0
10	M9	Y	-.003	-.003	0	0
11	M11	Y	-.003	-.003	0	0
12	M7	Y	-.003	-.003	0	0
13	M10	Y	-.003	-.003	0	0
14	M5	Y	-.003	-.003	0	0
15	M4	Y	-.007	-.007	0	0
16	M16A	Y	-.007	-.007	0	0
17	M16	Y	-.007	-.007	0	0
18	M3	Y	-.007	-.007	0	0

Member Distributed Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.006	.006	0	41

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
2	M1	X	.006	.006	0	30
3	M1	X	.009	.009	30	41
4	M12	X	.002	.002	0	0
5	M13	X	.002	.002	0	0
6	M14	X	.002	.002	0	0
7	M15	X	.002	.002	0	0
8	M4	X	.007	.007	0	0

Member Distributed Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.05	.05	0	35
2	M1	X	.063	.063	35	41
3	M1	X	.052	.052	0	30
4	M1	X	.097	.097	30	41
5	M13	X	.014	.014	0	0
6	M12	X	.014	.014	0	0
7	M14	X	.014	.014	0	0
8	M15	X	.014	.014	0	0
9	M4	X	.058	.058	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					5	2		
3	Weight of Ice Only	None					5	18		
4	NESC Heavy Wind	None					5	8		
5	NESC Extreme Wind	None					5	9		

Load Combinations

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

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N4	max	-1.158	1	.057	1	3.26	2	0	1	0	1	0	1
2		min	-4.482	2	.024	2	.837	1	0	1	0	1	0	1
3	N6	max	-.26	1	.035	1	-1.134	1	0	1	0	1	0	1
4		min	-.972	2	.014	2	-4.303	2	0	1	0	1	0	1
5	N5	max	-2.059	1	.05	1	-.859	1	0	1	0	1	0	1
6		min	-7.922	2	.021	2	-3.313	2	0	1	0	1	0	1
7	N7	max	-.422	1	.021	1	4.35	2	0	1	0	1	0	1
8		min	-1.674	2	.009	2	1.09	1	0	1	0	1	0	1
9	N8	max	.539	2	1.87	2	-.043	1	0	1	0	1	0	1
10		min	.119	1	1.37	1	-.114	2	0	1	0	1	0	1
11	N10	max	.673	2	3.507	1	.122	2	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

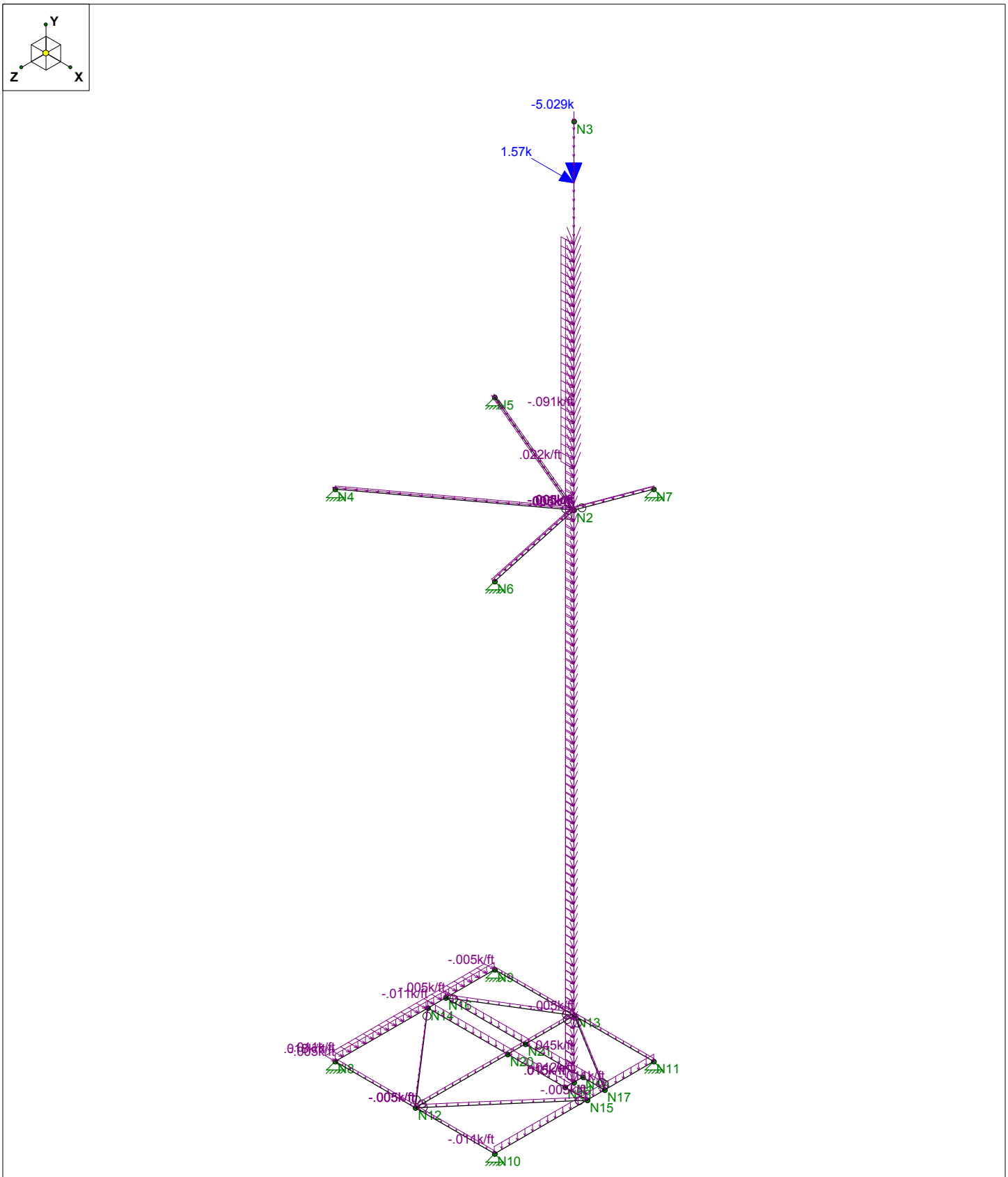
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
12		min	.159	1	.44	2	.038	1	0	1	0	1	0	1
13	N9	max	.984	2	3.176	2	.015	2	0	1	0	1	0	1
14		min	.211	1	2.154	1	.014	1	0	1	0	1	0	1
15	N11	max	1.06	2	6.471	1	.057	1	0	1	0	1	0	1
16		min	.233	1	.707	2	-.016	2	0	1	0	1	0	1
17	Totals:	max	-3.177	1	13.665	1	0	2						
18		min	-11.795	2	6.26	2	0	1						

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N4	-1.158	.057	.837	0	0	0
2	1	N6	-.26	.035	-1.134	0	0	0
3	1	N5	-2.059	.05	-.859	0	0	0
4	1	N7	-.422	.021	1.09	0	0	0
5	1	N8	.119	1.37	-.043	0	0	0
6	1	N10	.159	3.507	.038	0	0	0
7	1	N9	.211	2.154	.014	0	0	0
8	1	N11	.233	6.471	.057	0	0	0
9	1	Totals:	-3.177	13.665	0			
10	1	COG (ft):	X: -.558	Y: 27.578	Z: .138			

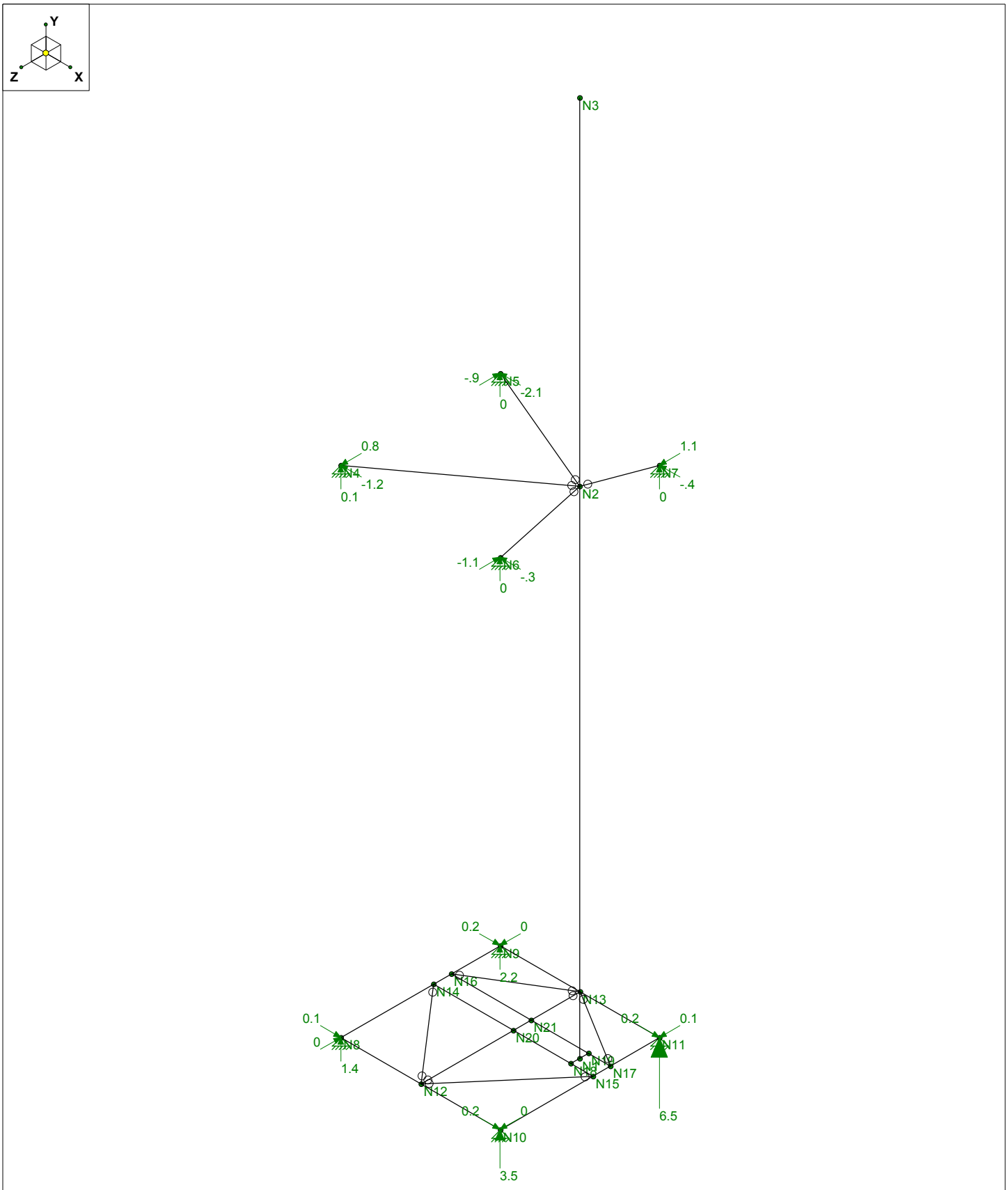
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N4	-4.482	.024	3.26	0	0	0
2	2	N6	-.972	.014	-4.303	0	0	0
3	2	N5	-7.922	.021	-3.313	0	0	0
4	2	N7	-1.674	.009	4.35	0	0	0
5	2	N8	.539	1.87	-.114	0	0	0
6	2	N10	.673	.44	.122	0	0	0
7	2	N9	.984	3.176	.015	0	0	0
8	2	N11	1.06	.707	-.016	0	0	0
9	2	Totals:	-11.795	6.26	0			
10	2	COG (ft):	X: -.569	Y: 27.436	Z: .137			

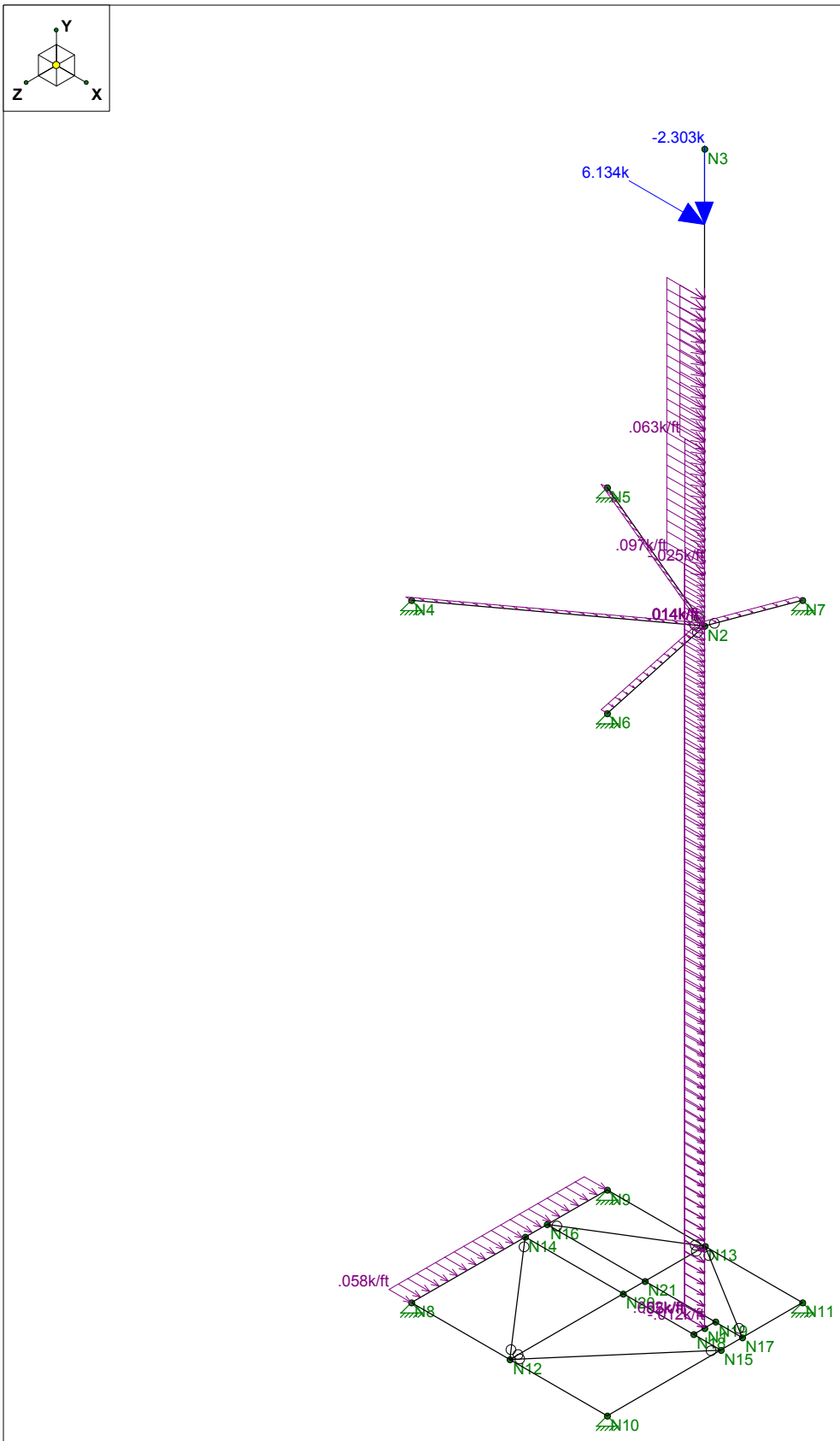


Loads: LC 1, NESC Heavy Wind

CENTEK Engineering, Inc.		
tjl, cfc	Tower # 20003	Mar 28, 2016 at 1:28 PM
16002.002 - CT1209	LC #1 Loads	NESC Mast Analysis.r3d

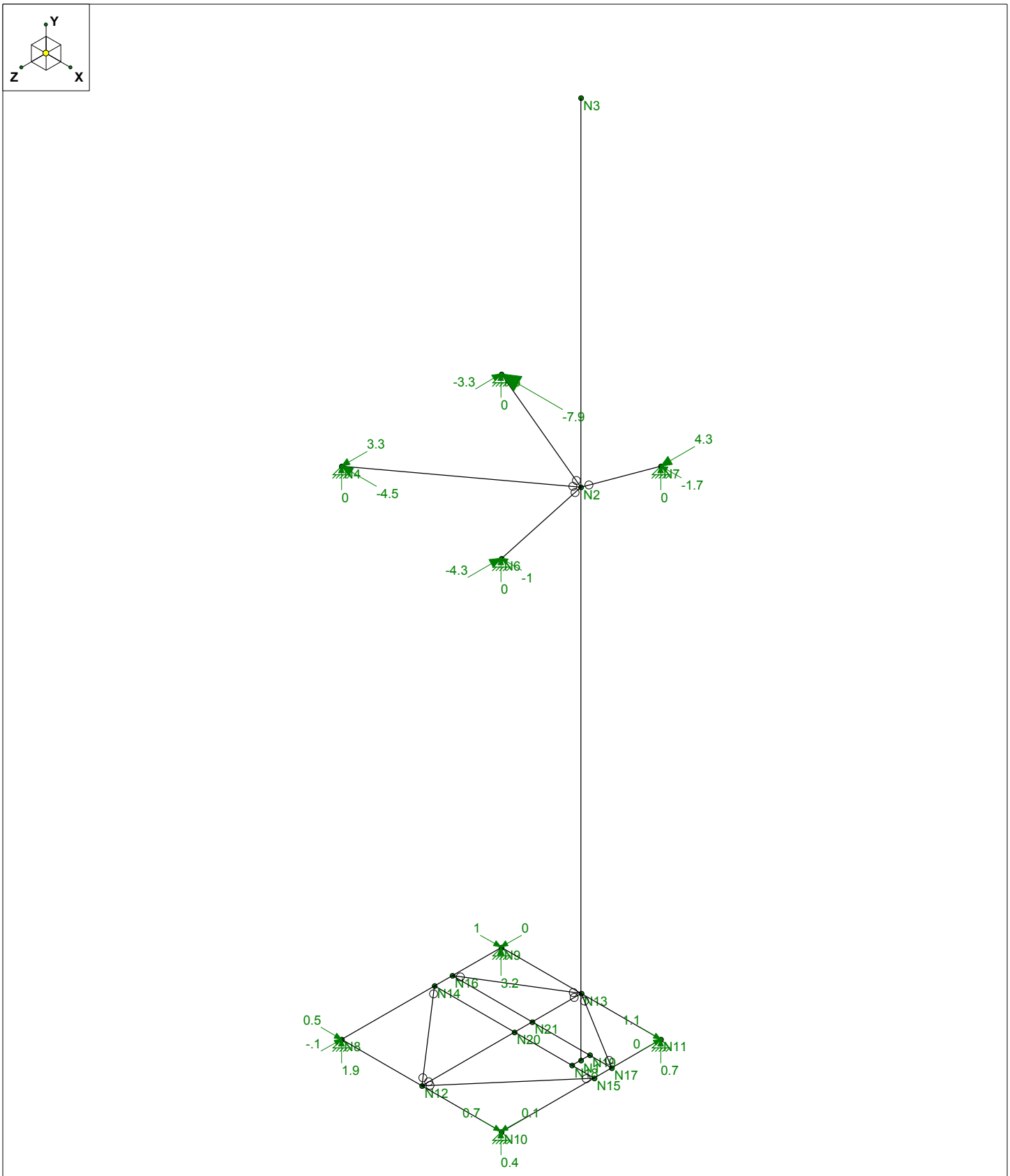


CENTEK Engineering, Inc.		
tjl, cfc	Tower # 20003	Mar 28, 2016 at 1:29 PM
16002.002 - CT1209	LC #1 Reactions	NESC Mast Analysis.r3d



Loads: LC 2, NESC Extreme Wind

CENTEK Engineering, Inc.		
tjl, cfc	Tower # 20003	Mar 28, 2016 at 1:28 PM
16002.002 - CT1209	LC #2 Loads	NESC Mast Analysis.r3d



CENTEK Engineering, Inc.		
tjl, cfc	Tower # 20003	Mar 28, 2016 at 1:30 PM
16002.002 - CT1209	LC #2 Reactions	NESC Mast Analysis.r3d

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

Subject:	AT&T Coax Cable on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 16002.002

Coax Cable on Tower

Distance Between Coax Cable Attach Points =

Coaxial Cable Span $Coax_{Span} := \begin{pmatrix} 6 \\ 13 \\ 13 \\ 13 \\ 16 \\ 16 \\ 16 \\ 27 \end{pmatrix} \cdot ft$ *(User Input)*

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

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

Number of Coax Cables = $N_{coax} := 12$ *(User Input)*

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

Extreme Wind Pressure = $qz := 36.1 \cdot psf$ *(User Input)*

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

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

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

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

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

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

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

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

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 18.179 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 276 \\ 598 \\ 598 \\ 598 \\ 736 \\ 736 \\ 736 \\ 1242 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 65 \\ 140 \\ 140 \\ 140 \\ 172 \\ 172 \\ 172 \\ 291 \end{pmatrix} lb$$

Extreme Wind Vertical Load =

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

Extreme Wind Transverse Load =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix} 75 \\ 162 \\ 162 \\ 162 \\ 200 \\ 200 \\ 200 \\ 337 \end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix} 207 \\ 449 \\ 449 \\ 449 \\ 553 \\ 553 \\ 553 \\ 933 \end{pmatrix} lb$$

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:	AT&T Coax Cable on Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L Checked by: C.F.C. Job No. 16002.002

Coax Cable on Tower

Distance Between Coax Cable Attach Points =

Coaxial Cable Span $Coax_{Span} := \begin{pmatrix} 10 \\ 14 \\ 13 \\ 13 \\ 13 \\ 13 \\ 16 \\ 16 \\ 16 \\ 27 \end{pmatrix} \cdot ft$ *(User Input)*

Diameter of Coax Cable =	$D_{coax} := 1.98 \cdot in$	*(User Input)*
Weight of Coax Cable =	$W_{coax} := 1.04 \cdot plf$	*(User Input)*
Number of Coax Cables =	$N_{coax} := 12$	*(User Input)*
Number of Projected Coax Cables =	$NP_{coax} := 6$	*(User Input)*
Extreme Wind Pressure =	$qz := 36.1 \cdot psf$	*(User Input)*
Heavy Wind Pressure =	$p := 4 \cdot psf$	*(User Input)*
Radial Ice Thickness =	$Ir := 0.5 \cdot in$	*(User Input)*
Radial Ice Density =	$Id := 56 \cdot pcf$	*(User Input)*
Shape Factor =	$Cd_{coax} := 1.45$	*(User Input)*
Overload Factor for NESC Heavy Wind Transverse Load =	$OF_{HWT} := 2.5$	*(User Input)*
Overload Factor for NESC Heavy Wind Vertical Load =	$OF_{HWV} := 1.5$	*(User Input)*
Overload Factor for NESC Extreme Wind Transverse Load =	$OF_{EWT} := 1.0$	*(User Input)*
Overload Factor for NESC Extreme Wind Vertical Load =	$OF_{EWV} := 1.0$	*(User Input)*
Wind Area without Ice =	$A := \left(NP_{coax} \cdot D_{coax}\right) = 11.88 \cdot in$	
Wind Area with Ice =	$A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 12.88 \cdot in$	
Ice Area per Liner Ft =	$Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^2\right] = 0.027\,ft^2$	
Weight of Ice on All Coax Cables =	$W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 18.179 \cdot plf$	

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 460 \\ 644 \\ 598 \\ 598 \\ 598 \\ 598 \\ 736 \\ 736 \\ 736 \\ 1242 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 156 \\ 218 \\ 202 \\ 202 \\ 202 \\ 202 \\ 249 \\ 249 \\ 249 \\ 420 \end{pmatrix} lb$$

Extreme Wind Vertical Load =

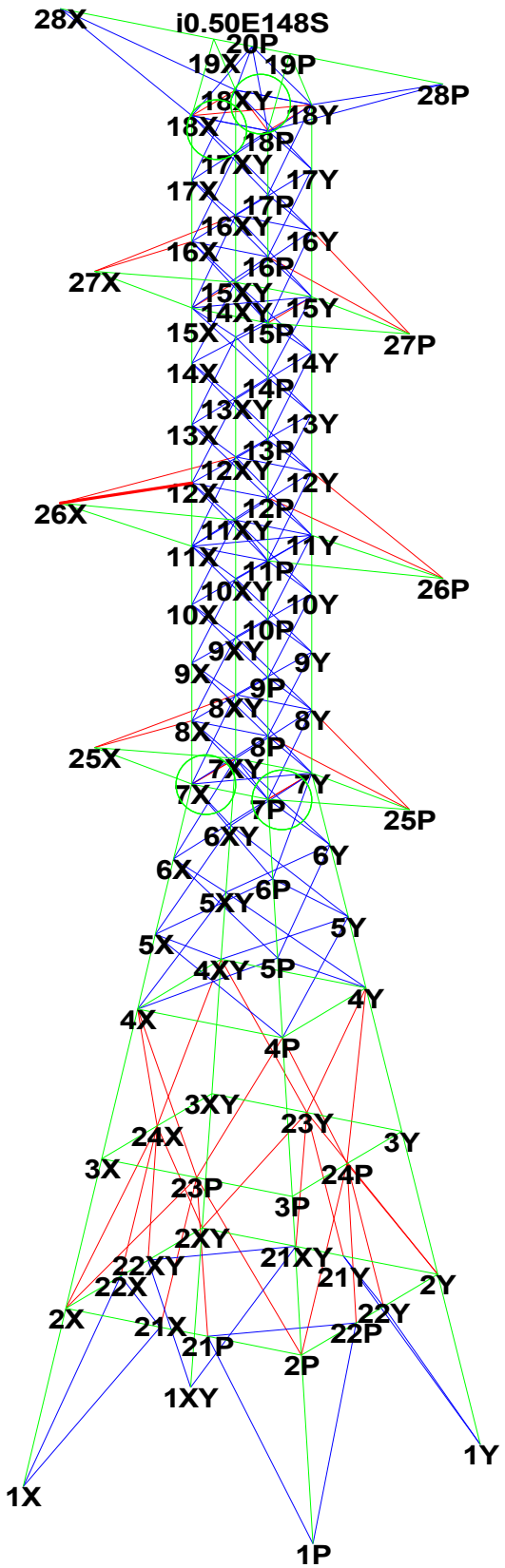
$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

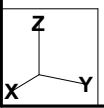
Extreme Wind Transverse Load =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix} 125 \\ 175 \\ 162 \\ 162 \\ 162 \\ 162 \\ 200 \\ 200 \\ 200 \\ 337 \end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix} 518 \\ 726 \\ 674 \\ 674 \\ 674 \\ 674 \\ 829 \\ 829 \\ 829 \\ 1399 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "cl&p tower #20003"
Tower Version 12.50, 2:20:24 PM Monday, March 28, 2016
Undeformed geometry displayed





Project Name : 16002.002 - Manchester, CT
Project Notes: Structure # 20003/ AT&T CT1209
Project File : J:\Jobs\1600200.WI\02_Manchester CT - CTV1209\04_Structural\Backup Documentation\Calcs\PLS Tower\cl&p tower #20003.tow
Date run : 2:19:44 PM Monday, March 28, 2016
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 167.55 exceeds maximum of 150.00 for member "g1P" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1X" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1XY" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1Y" ??
Member "g8P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g8X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g8XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g8Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g12P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g12X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g12XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g12Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g15P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g15X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g15XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g15Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g16P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g16X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g16XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g16Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g17P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g17X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g17XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g17Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g18Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19P" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19X" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19XY" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19Y" ??
Member "g20P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g23P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g23X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g23XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g23Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g24P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g24X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g24XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g24Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g25P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g25X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g25XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g25Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g26XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g33Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g41P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54P" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54X" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54XY" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54Y" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55X" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55XY" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55Y" ??
Member "g56P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g56Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61P" ??
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66P" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66XY" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66Y" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67P" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67XY" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67Y" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76P" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76X" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76XY" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76Y" ??
Member "g77P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g78P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g78Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g80P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g80Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g81P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g82P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g82Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g89P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g89Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
The following members have the same origin joint label '18X' and end joint label '18P'
Member label 'g56P', member number 149 ??
Member label 'g89P', member number 193 ??
The following members have the same origin joint label '18XY' and end joint label '18Y'
Member label 'g56Y', member number 150 ??
Member label 'g89Y', member number 194 ??
The following members have the same origin joint label '7P' and end joint label '7Y'
Member label 'g63P', member number 163 ??
Member label 'g90X', member number 196 ??
The following members have the same origin joint label '7X' and end joint label '7XY'
Member label 'g63X', member number 164 ??
Member label 'g90P', member number 195 ??
The model has 168 warnings. ??

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

Loads from file: j:\jobs\1600200.wi\02_manchester ct - ctv1209\04_structural\backup documentation\calcs\pls tower\cl&p # 20003.lca

*** Analysis Results:

Maximum element usage is 95.05% for Angle "g52Y" in load case "NESC Extreme"
Maximum insulator usage is 23.58% for Clamp "6" 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	1P	-27.35	-21.30	-159.15	34.66	-3.30	-4.93	5.93	-0.98	0.00
NESC Heavy	1X	15.24	-9.12	54.80	17.76	-3.03	1.31	3.30	0.95	0.00
NESC Heavy	1XY	-19.22	-24.99	113.28	31.53	2.23	0.97	2.43	-0.52	0.00
NESC Heavy	1Y	13.42	-17.75	-103.65	22.26	1.99	-5.96	6.28	-0.04	0.00
NESC Extreme	1P	-33.70	-32.95	-196.26	47.13	-1.29	-2.75	3.04	0.66	0.00
NESC Extreme	1X	19.61	-14.82	82.55	24.58	-0.77	0.59	0.97	0.81	0.00
NESC Extreme	1XY	-34.17	-33.07	175.56	47.55	0.24	0.45	0.51	-0.55	0.00

NESC Extreme	1Y	19.37	-20.04	-111.45	27.87	0.06	-2.80	2.80	-1.17	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	1P	2P	g18X	162.785	5.593	5.659	0.400	-5.645	-27.35	-21.30	-159.15
NESC Heavy	1X	2X	g18P	-57.308	5.886	5.963	-5.961	-0.154	15.24	-9.12	54.80
NESC Heavy	1XY	2XY	g18Y	-117.450	5.724	5.805	0.043	5.805	-19.22	-24.99	113.28
NESC Heavy	1Y	2Y	g18XY	105.933	4.080	4.131	4.126	0.204	13.42	-17.75	-103.65
NESC Extreme	1P	2P	g18X	201.834	0.544	0.545	0.466	-0.282	-33.70	-32.95	-196.26
NESC Extreme	1X	2X	g18P	-85.950	5.599	5.699	-5.637	0.843	19.61	-14.82	82.55
NESC Extreme	1XY	2XY	g18Y	-181.802	5.410	5.560	4.441	3.346	-34.17	-33.07	175.56
NESC Extreme	1Y	2Y	g18XY	114.871	1.240	1.271	-0.503	1.167	19.37	-20.04	-111.45

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Resultant Moment (ft-k)
NESC Heavy	7397.022	1956.747	7651.457
NESC Extreme	9713.239	3052.592	10181.617

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	155.000	75.000	60	208	0.00	9.00	688.500	45.34	37.34	1173.817
2	75.000	35.000	24	60	9.00	22.50	631.192	9.00	22.50	631.192
3	35.000	19.000	20	36	22.50	27.90	403.200	22.50	27.90	403.200
4	19.000	0.000	16	12	27.90	34.33	591.223	27.90	34.33	591.223

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

```
     Leg1       L3x3x3/16   SAE       3X3X0.1875     36.0  1.80  Comp  1.80     g1Y   -0.200NESC Ext   11.113   44.600   40.781 1.000 1.000 1.000
167.55 167.55  8.322     4     4
     Leg2        L4x4x1/4   SAE         4X4X0.25     36.0 65.99  Comp 65.99     g4X  -28.494NESC Ext   43.178   44.600   54.375 1.000 1.000 1.000
109.89 109.89  7.280     1     4
     Leg3       L5x5x5/16   SAE       5X5X0.3125     50.0 79.53  Comp 79.53     g7X  -81.757NESC Ext  102.806    0.000    0.000 1.000 1.000 1.000
76.66  76.66  6.350     1     0
     Leg4       L6x6x9/16   SAE       6X6X0.5625     50.0 80.11  Comp 80.11    g12X -201.997NESC Ext  252.165  312.200  856.405 1.000 1.000 1.000
70.27  70.27  6.910     1    28
     Leg5        L8x8x1/2   SAE          8X8X0.5     50.0 85.87  Comp 85.87    g18X -201.238NESC Ext  234.356  312.200  761.249 0.600 0.600 0.600
88.47  88.47 19.537     1    28
    Diag1    L2.5x2.5x1/4   SAE     2.5X2.5X0.25     36.0 87.54  Comp 87.54    g19P   -7.110NESC Ext    8.122   33.600   27.187 1.000 1.000 1.000
231.21 204.78  9.460     5     2
    Diag2       L2x2x5/16   SAE       2X2X0.3125     36.0 87.12  Comp 87.12   g20XY  -10.891NESC Ext   12.501   33.600   33.984 0.750 0.500 0.500
175.41 162.26 11.402     5     2
    Diag3      L3X2.5X1/4   SAU       3X2.5X0.25     36.0 66.56  Comp 66.56   g28XY  -15.728NESC Hea   23.631   33.450   40.781 0.750 0.500 0.500
127.77 125.96 11.244     5     3
    Diag4       L4X3X1/4   SAU         4X3X0.25     36.0 71.20  Tens 63.65   g36XY  -25.009NESC Hea   39.288   55.750   67.969 0.750 0.500 0.500
101.52 106.14 11.015     2     5
    Diag5       L3X3X1/4   SAE         3X3X0.25     36.0 90.26 Cross 90.26    g47Y  -10.629NESC Hea   11.776   22.300   27.187 1.000 0.542 0.542
229.08 187.08 17.754     6     2
    Diag6      L2.5x2x1/4   SAU       2.5X2X0.25     36.0 90.95  Tens  0.00    g49Y    0.000             5.156   33.450   40.781 1.000 0.500 0.500
280.79 242.56 18.345     5     3
    Diag7     L2.5x2x3/16   SAU     2.5X2X0.1875     36.0 86.76  Tens 55.87    g50X   -1.029NESC Hea    1.843   22.300   20.391 0.500 1.000 0.500
427.97 354.71 21.398     5     2
    Diag8 L1.75x1.75x3/16   SAE 1.75X1.75X0.1875     36.0 95.05  Comp 95.05    g52Y   -1.246NESC Ext    1.310   22.300   20.391 1.000 0.500 0.500
368.00 368.00 16.468     4     2
    Diag9      L3x2.5x1/4   SAU       3X2.5X0.25     36.0 41.78  Tens 38.19    g54Y   -2.100NESC Ext    5.499   33.450   40.781 1.000 0.500 0.500
305.13 261.11 24.029     5     3
    Horz1       L3X3X3/16   SAE       3X3X0.1875     36.0 23.32  Tens 15.51    g56P   -1.947NESC Hea   12.554   22.300   20.391 1.000 1.000 1.000
181.21 157.64  9.000     6     2
    Horz2       L2X2X3/16   SAE       2X2X0.1875     36.0 38.40  Tens  0.00    g57P    0.000             2.705   33.450   30.586 1.000 1.000 1.000
274.11 274.11  9.000     4     3
    Horz3     L2.5X2X3/16   SAU     2.5X2X0.1875     36.0 46.11  Tens  9.77    g59P   -0.556NESC Ext    5.696   22.300   20.391 1.000 1.000 1.000
252.93 201.75  9.000     6     2
    Horz4    L3.5X2.5X1/4   SAU     3.5X2.5X0.25     36.0 63.57  Comp 63.57    g65X   -9.938NESC Ext   15.634   22.300   27.187 1.000 0.500 0.500
188.89 162.37 17.126     6     2
    Horz5    L3.5X3.5X1/4   SAE     3.5X3.5X0.25     36.0 39.45  Comp 39.45    g68X   -7.039NESC Hea   17.846   22.300   27.187 1.000 1.000 1.000
192.58 164.64 11.138     6     2 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g69P g69Y g71P  ??
    Horz6     L2.5X2X5/16   SAU     2.5X2X0.3125     36.0 12.26  Tens  0.00    g61X    0.000             9.046   22.300   33.984 1.000 1.000 1.000
255.92 203.59  9.000     6     2
   Inner1        L3x3x1/4   SAE       2X2X0.1875     36.0 72.98  Comp 72.98    g72X   -2.420NESC Ext    3.316   11.150   10.195 2.000 1.000 1.000
247.54 247.54  6.364     4     1
   Inner2     L2.5X2X3/16   SAU     2.5X2X0.1875     36.0 74.75  Comp 74.75    g75P   -6.375NESC Hea    8.528   22.300   20.391 0.750 0.500 0.500
178.85 164.88 12.728     5     2
   Inner3   L2.5x2.5x3/16   SAE   2.5X2.5X0.1875     36.0 22.58  Comp 22.58    g74P   -2.729NESC Hea   12.085   22.300   20.391 0.750 0.500 0.500
154.28 146.16 12.728     5     2
 TopCrArm        L4X4X1/4   SAE         4X4X0.25     36.0 29.60  Comp 29.60    g77Y  -11.883NESC Hea   40.145   55.750   67.969 0.500 0.500 0.500
112.21 116.10 14.867     3     5
 TopArmBr      2.5x2x3/16   SAU     2.5X2X0.1875     36.0 47.31  Tens 11.64    g83P   -0.958NESC Ext    8.230   33.450   30.586 0.670 0.330 0.330
167.84 167.84 16.554     4     3
 MdCrArm1        L4X4X1/4   SAE         4X4X0.25     50.0 29.71  Comp 29.71    g79Y  -14.240NESC Hea   47.928   66.900   81.562 0.330 0.330 0.330
93.24 106.62 18.719     3     6
 MidArmBr       2.5x2x1/4   SAU       2.5X2X0.25     36.0 49.65  Tens 12.01    g84P   -0.871NESC Ext    7.246   33.450   40.781 0.670 0.330 0.330
204.63 204.63 19.954     4     3
 BotCrArm        L4X4X1/4   SAE         4X4X0.25     36.0 34.03  Comp 34.03    g81Y  -13.662NESC Hea   40.145   55.750   67.969 0.500 0.500 0.500
112.21 116.10 14.867     3     5
 BotArmBr      2.5x2x3/16   SAU     2.5X2X0.1875     36.0 61.46  Tens  7.25    g85P   -0.608NESC Ext    8.391   33.450   30.586 0.670 0.330 0.330
166.22 166.22 16.395     4     3
```

ShArmBr	L4x3x1/4	SAU	4X3X0.25	36.0	66.99	Comp	66.99	g86P	-9.231	NESC Hea	13.780	22.300	27.187	1.000	0.500	0.500	187.36	187.36	19.985	4	2
ShieldAr	4ST10	ST	ST4x10	36.0	17.78	Tens	3.76	g87P	-1.011	NESC Ext	26.876	44.600	107.880	1.000	1.000	1.000	194.68	176.95	18.170	5	4
Mast	12" Sch. 40	Pwmnt	Pipe 12" Std.	35.0	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
M1	L3x3x1/4	SAE	3X3X0.25	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
M2	C12x20.7	CHA	12X20.7	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
Diag10	L3X3X3/8	SAE	3X3X0.375	36.0	93.19	Comp	93.19	g42P	-20.781	NESC Hea	28.743	22.300	40.781	0.784	0.567	0.567	152.69	144.95	13.173	5	2
MdCrArm2	L4X4X1/4	SAE	4X4X0.25	36.0	18.88	Comp	18.88	g80P	-6.227	NESC Hea	32.984	66.900	81.562	1.000	1.000	1.000	135.85	129.75	9.000	6	6
Inner4	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	25.08	Comp	25.08	g76Y	-1.023	NESC Ext	4.081	11.150	10.195	1.000	0.500	0.500	238.35	238.35	15.751	4	1
Horz7	**L3X3X3/16**	**SAE**	**3X3X0.1875**	**36.0**	**43.08**	**Comp**	**43.08**	**g66Y**	**-2.190**	**NESC Ext**	**5.085**	**22.300**	**20.391**	**2.000**	**1.000**	**1.000**	**287.54**	**247.71**	**11.250**	**5**	**2 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g67P g67X g67XY g67Y ??**
M3	L3x3x1/4	SAE	3X3X0.25	36.0	17.54	Comp	17.54	g89P	-2.573	NESC Hea	14.670	33.600	27.187	1.000	1.000	1.000	182.43	167.61	9.000	5	2
M4	L2.5x2x3/16	SAU	2.5X2X0.1875	36.0	46.11	Tens	0.00	g90P	0.000		4.733	33.600	20.391	1.000	1.000	1.000	252.93	221.33	9.000	5	2

Group Summary (Tension Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Cont-rol	Max 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 Tens.	No. Of Holes	Hole Diameter (in)
Leg1	L3x3x3/16	SAE	3X3X0.1875	36.0	1.80	Comp	0.00	g1Y	0.000		27.900	44.600	40.781	31.719	8.322	4	2.240	0.75
Leg2	L4x4x1/4	SAE	4X4X0.25	36.0	65.99	Comp	63.19	g4Y	28.184	NESC Ext	56.340	44.600	54.375	60.417	7.280	4	2.000	0.75
Leg3	L5x5x5/16	SAE	5X5X0.3125	50.0	79.53	Comp	78.93	g8Y	87.847	NESC Ext	111.305	133.800	203.906	213.235	6.910	12	3.430	0.75
Leg4	L6x6x9/16	SAE	6X6X0.5625	50.0	80.11	Comp	79.42	g12Y	188.320	NESC Ext	237.125	312.200	856.405	895.587	6.910	28	4.000	0.75
Leg5	L8x8x1/2	SAE	8X8X0.5	50.0	85.87	Comp	60.45	g15Y	188.719	NESC Ext	312.500	312.200	761.249	845.832	8.219	28	4.000	0.75
Diag1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	36.0	87.54	Comp	25.74	g19X	6.997	NESC Ext	32.987	33.600	27.187	27.187	9.460	2	1.000	0.6875
Diag2	L2x2x5/16	SAE	2X2X0.3125	36.0	87.12	Comp	43.32	g24Y	11.450	NESC Ext	30.299	33.600	33.984	26.432	11.576	2	1.000	0.6875
Diag3	L3X2.5X1/4	SAU	3X2.5X0.25	36.0	66.56	Comp	53.94	g32Y	17.110	NESC Ext	32.319	33.450	40.781	31.719	11.347	3	1.000	0.75
Diag4	L4X3X1/4	SAU	4X3X0.25	36.0	71.20	Tens	71.20	g38Y	25.259	NESC Hea	35.478	55.750	67.969	48.866	11.015	5	1.840	0.75
Diag5	L3X3X1/4	SAE	3X3X0.25	36.0	90.26	Cross	71.49	g45P	15.117	NESC Hea	40.581	22.300	27.187	21.146	15.414	2	1.000	0.75
Diag6	L2.5x2x1/4	SAU	2.5X2X0.25	36.0	90.95	Tens	90.95	g48X	22.028	NESC Hea	24.219	33.450	40.781	27.375	18.345	3		

1.000	0.75																		
	Diag7	L2.5x2x3/16	SAU	2.5X2X0.1875	36.0	86.76	Tens	86.76	g50P	13.615NESC	Hea	21.688	22.300	20.391	15.694	21.398	2		
1.000	0.75																		
	Diag8	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	36.0	95.05	Comp	75.94	g53X	10.305NESC	Hea	15.532	22.300	20.391	13.570	16.468	2		
1.000	0.75																		
	Diag9	L3x2.5x1/4	SAU	3X2.5X0.25	36.0	41.78	Tens	41.78	g55X	12.378NESC	Hea	32.319	33.450	40.781	29.625	24.029	3		
1.000	0.75																		
	Horz1	L3X3X3/16	SAE	3X3X0.1875	36.0	23.32	Tens	23.32	g60P	5.547NESC	Hea	30.760	33.450	30.586	23.789	9.000	3		
1.000	0.75																		
	Horz2	L2X2X3/16	SAE	2X2X0.1875	36.0	38.40	Tens	38.40	g57P	7.084NESC	Ext	18.448	33.450	30.586	23.789	9.000	3		
1.000	0.75																		
	Horz3	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	46.11	Tens	46.11	g63X	9.402NESC	Ext	21.688	22.300	20.391	26.654	9.000	2		
1.000	0.75																		
	Horz4	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	36.0	63.57	Comp	15.01	g65P	3.175NESC	Ext	32.481	22.300	27.187	21.146	17.126	2		
1.000	0.75																		
****	**Horz5**	**L3.5X3.5X1/4**	**SAE**	**3.5X3.5X0.25**	**36.0**	**39.45**	**Comp**	**3.79**	**g71X**	**1.614NESC**	**Ext**	**42.606**	**0.000**	**0.000**	**0.000**	**5.625**	**0**		
2.000	**0.75**	**A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g69P g69Y g71P ??**																	
	Horz6	L2.5X2X5/16	SAU	2.5X2X0.3125	36.0	12.26	Tens	12.26	g61X	2.735NESC	Hea	34.850	22.300	33.984	44.424	9.000	2		
1.000	0.75																		
	Inner1	L3x3x1/4	SAE	2X2X0.1875	36.0	72.98	Comp	2.12	ig72P90P	0.159NESC	Ext	18.448	11.150	10.195	7.481	6.364	1		
1.000	0.75																		
	Inner2	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	74.75	Comp	23.45	g73X	2.998NESC	Hea	18.650	22.300	20.391	12.783	12.728	2		
1.000	0.75																		
	Inner3	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	22.58	Comp	13.71	g74X	1.984NESC	Hea	24.669	22.300	20.391	14.470	12.728	2		
1.000	0.75																		
	TopCrArm	L4X4X1/4	SAE	4X4X0.25	36.0	29.60	Comp	15.58	g77XY	7.823NESC	Ext	50.220	55.750	67.969	52.865	14.867	5		
2.080	0.75																		
	TopArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	36.0	47.31	Tens	47.31	g83Y	6.668NESC	Hea	14.094	33.450	30.586	22.950	16.554	3		
2.000	0.75																		
	MdCrArm1	L4X4X1/4	SAE	4X4X0.25	50.0	29.71	Comp	11.94	g79XY	7.572NESC	Hea	70.425	66.900	81.562	63.437	18.719	6		
2.000	0.75																		
	MidArmBr	2.5x2x1/4	SAU	2.5X2X0.25	36.0	49.65	Tens	49.65	g84Y	9.009NESC	Hea	18.144	33.450	40.781	30.600	19.954	3		
2.000	0.75																		
	BotCrArm	L4X4X1/4	SAE	4X4X0.25	36.0	34.03	Comp	15.64	g81XY	7.929NESC	Hea	50.706	55.750	67.969	52.865	14.867	5		
2.000	0.75																		
	BotArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	36.0	61.46	Tens	61.46	g85Y	8.663NESC	Hea	14.094	33.450	30.586	22.950	16.395	3		
2.000	0.75																		
	ShArmBr	L4x3x1/4	SAU	4X3X0.25	36.0	66.99	Comp	23.85	g86Y	5.044NESC	Ext	40.581	22.300	27.187	21.146	19.985	2		
1.000	0.75																		
	ShieldAr	4ST10	ST	ST4x10	36.0	17.78	Tens	17.78	g87X	7.929NESC	Hea	83.203	44.600	107.880	83.907	18.170	4		
2.000	0.75																		
	Mast	12" Sch. 40 Pwmnt		Pipe 12" Std.	35.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0		
0.000	0																		
	M1	L3x3x1/4	SAE	3X3X0.25	36.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0		
0.000	0																		
	M2	C12x20.7	CHA	12X20.7	36.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0		
0.000	0																		
	Diag10	L3X3X3/8	SAE	3X3X0.375	36.0	93.19	Comp	60.45	g43XY	19.174NESC	Hea	60.011	33.600	40.781	31.719	13.173	2		
1.000	0.6875																		
	MdCrArm2	L4X4X1/4	SAE	4X4X0.25	36.0	18.88	Comp	1.73	g80Y	0.712NESC	Ext	41.223	66.900	81.562	63.437	9.000	6		
3.561	0.75																		
	Inner4	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	25.08	Comp	9.97	g76XY	0.746NESC	Ext	18.650	11.150	10.195	7.481	15.751	1		
1.000	0.75																		
	Horz7	**L3X3X3/16**	**SAE**	**3X3X0.1875**	**36.0**	**43.08**	**Comp**	**4.46**	**g66XY**	**0.707NESC**	**Ext**	**30.760**	**22.300**	**20.391**	**15.859**	**11.250**	**2**		
1.000	**0.75**	**A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g67P g67X g67XY g67Y ??**																	
	M3	L3x3x1/4	SAE	3X3X0.25	36.0	17.54	Comp	3.43	g89Y	0.726NESC	Hea	36.131	33.600	27.187	21.146	9.000	2		
1.890	0.6875																		

M4 L2.5x2x3/16 SAU 2.5X2X0.1875 36.0 46.11 Tens 46.11 g90P 9.402NESC Ext 22.067 33.600 20.391 20.391 9.000 2 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	93.19	g42P	Angle
NESC Extreme	95.05	g52Y	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	10.77	NESC Heavy	0.0
2	Clamp	6.34	NESC Heavy	0.0
3	Clamp	16.27	NESC Heavy	0.0
4	Clamp	23.52	NESC Heavy	0.0
5	Clamp	16.34	NESC Heavy	0.0
6	Clamp	23.58	NESC Heavy	0.0
7	Clamp	16.27	NESC Heavy	0.0
8	Clamp	23.51	NESC Heavy	0.0
10	Clamp	4.33	NESC Extreme	0.0
11	Clamp	1.99	NESC Heavy	0.0
12	Clamp	2.12	NESC Heavy	0.0
13	Clamp	2.28	NESC Heavy	0.0
14	Clamp	2.90	NESC Heavy	0.0
15	Clamp	3.57	NESC Heavy	0.0
16	Clamp	3.40	NESC Heavy	0.0
17	Clamp	5.07	NESC Heavy	0.0
18	Clamp	0.69	NESC Extreme	0.0
19	Clamp	7.52	NESC Heavy	0.0
20	Clamp	0.69	NESC Extreme	0.0
21	Clamp	0.80	NESC Heavy	0.0
22	Clamp	0.94	NESC Heavy	0.0
23	Clamp	1.28	NESC Heavy	0.0
24	Clamp	1.86	NESC Heavy	0.0
25	Clamp	1.73	NESC Heavy	0.0
26	Clamp	2.33	NESC Heavy	0.0
27	Clamp	0.69	NESC Extreme	0.0
28	Clamp	0.69	NESC Extreme	0.0
29	Clamp	0.69	NESC Extreme	0.0
30	Clamp	0.69	NESC Extreme	0.0
31	Clamp	8.97	NESC Extreme	0.0
32	Clamp	11.53	NESC Extreme	0.0
33	Clamp	18.64	NESC Extreme	0.0
34	Clamp	9.54	NESC Extreme	0.0
35	Clamp	7.11	NESC Extreme	0.0
36	Clamp	13.45	NESC Heavy	0.0
38	Clamp	2.13	NESC Extreme	0.0

40	Clamp	2.03	NESC Heavy	0.0
41	Clamp	2.17	NESC Heavy	0.0
42	Clamp	2.32	NESC Heavy	0.0
43	Clamp	2.95	NESC Heavy	0.0
44	Clamp	3.63	NESC Heavy	0.0
45	Clamp	3.45	NESC Heavy	0.0
46	Clamp	5.16	NESC Heavy	0.0

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 29457.3
Total: 29457.3

*** End of Report

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*                                                                           *
* TOWER - Analysis and Design -  Copyright Power Line Systems, Inc. 1986-2011 *
*                                                                           *
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Project Name : 16002.002 - Manchester, CT
Project Notes: Structure # 20003/ AT&T CT1209
Project File : J:\Jobs\1600200.WI\02_Manchester CT - CTV1209\04_Structural\Backup Documentation\Calcs\PLS Tower\cl&p tower #20003.tow
Date run     : 2:19:43 PM Monday, March 28, 2016
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 167.55 exceeds maximum of 150.00 for member "g1P" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1X" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1XY" ??
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1Y" ??
Member "g8P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g8X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g8XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g8Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g12P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g12X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g12XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g12Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g15P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g15X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g15XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g15Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g16P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g16X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g16XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g16Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g17P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g17X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g17XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g17Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
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and spacing distances will be checked. ??
Member "g18P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g18Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19P" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19X" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19XY" ??
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19Y" ??
Member "g20P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g20Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g21Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g22XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g23P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g24P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g24XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g25XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g25Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g26Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g27Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g28Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g29Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g30Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g31Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g32Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g33P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g33Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g34X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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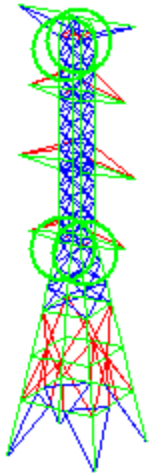
Member "g35P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g35Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g36Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g37Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g38Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g39Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g40X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g40Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g41Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54P" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54X" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54XY" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54Y" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55X" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55XY" ??
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55Y" ??
Member "g56P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g56Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61P" ??
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66P" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66XY" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66Y" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67P" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67X" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67XY" ??
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67Y" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76P" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76X" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76XY" ??
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76Y" ??
Member "g77P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g77Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g78P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g78Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g79XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "g79Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g80P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g80Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g81Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g82P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g82Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g89P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g89Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
The following members have the same origin joint label '18X' and end joint label '18P'
Member label 'g56P', member number 149 ??
Member label 'g89P', member number 193 ??
The following members have the same origin joint label '18XY' and end joint label '18Y'
Member label 'g56Y', member number 150 ??
Member label 'g89Y', member number 194 ??
The following members have the same origin joint label '7P' and end joint label '7Y'
Member label 'g63P', member number 163 ??
Member label 'g90X', member number 196 ??
The following members have the same origin joint label '7X' and end joint label '7XY'
Member label 'g63X', member number 164 ??
Member label 'g90P', member number 195 ??
The model has 168 warnings. ??



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	17.17	17.17	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
2P	XY-Symmetry	13.95	13.95	19	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	11.25	11.25	35	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	8.563	8.563	51	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	7.23	7.23	59	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	5.875	5.875	67	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	4.5	4.5	75	Free	Free	Free	Free	Free	Free
8P	XY-Symmetry	4.5	4.5	81.91	Free	Free	Free	Free	Free	Free
9P	XY-Symmetry	4.5	4.5	88.26	Free	Free	Free	Free	Free	Free
10P	XY-Symmetry	4.5	4.5	94.61	Free	Free	Free	Free	Free	Free
11P	XY-Symmetry	4.5	4.5	101	Free	Free	Free	Free	Free	Free
12P	XY-Symmetry	4.5	4.5	107.9	Free	Free	Free	Free	Free	Free
13P	XY-Symmetry	4.5	4.5	114.3	Free	Free	Free	Free	Free	Free
14P	XY-Symmetry	4.5	4.5	121	Free	Free	Free	Free	Free	Free
15P	XY-Symmetry	4.5	4.5	127	Free	Free	Free	Free	Free	Free
16P	XY-Symmetry	4.5	4.5	134.3	Free	Free	Free	Free	Free	Free
17P	XY-Symmetry	4.5	4.5	141	Free	Free	Free	Free	Free	Free
18P	XY-Symmetry	4.5	4.5	148	Free	Free	Free	Free	Free	Free
19P	X-Symmetry	0	4.5	155	Free	Free	Free	Free	Free	Free
20P	None	0	0	155	Free	Free	Free	Free	Free	Free
21P	XY-Symmetry	13.95	2.813	19	Free	Free	Free	Free	Free	Free
22P	XY-Symmetry	2.813	13.95	19	Free	Free	Free	Free	Free	Free

23P	Y-Symmetry	11.25	0	35	Free	Free	Free	Free	Free	Free
24P	X-Symmetry	0	11.25	35	Free	Free	Free	Free	Free	Free
25P	X-Symmetry	0	18.67	75	Free	Free	Free	Free	Free	Free
26P	X-Symmetry	0	22.67	101	Free	Free	Free	Free	Free	Free
27P	X-Symmetry	0	18.67	127	Free	Free	Free	Free	Free	Free
28P	X-Symmetry	0	22.67	155	Free	Free	Free	Free	Free	Free
1X	X-GenXY	17.17	-17.17	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
1XY	XY-GenXY	-17.17	-17.17	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
1Y	Y-GenXY	-17.17	17.17	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
2X	X-GenXY	13.95	-13.95	19	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-13.95	-13.95	19	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-13.95	13.95	19	Free	Free	Free	Free	Free	Free
3X	X-GenXY	11.25	-11.25	35	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-11.25	-11.25	35	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-11.25	11.25	35	Free	Free	Free	Free	Free	Free
4X	X-GenXY	8.563	-8.563	51	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-8.563	-8.563	51	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-8.563	8.563	51	Free	Free	Free	Free	Free	Free
5X	X-GenXY	7.23	-7.23	59	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-7.23	-7.23	59	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-7.23	7.23	59	Free	Free	Free	Free	Free	Free
6X	X-GenXY	5.875	-5.875	67	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-5.875	-5.875	67	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-5.875	5.875	67	Free	Free	Free	Free	Free	Free
7X	X-GenXY	4.5	-4.5	75	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-4.5	-4.5	75	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-4.5	4.5	75	Free	Free	Free	Free	Free	Free
8X	X-GenXY	4.5	-4.5	81.91	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-4.5	-4.5	81.91	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-4.5	4.5	81.91	Free	Free	Free	Free	Free	Free
9X	X-GenXY	4.5	-4.5	88.26	Free	Free	Free	Free	Free	Free
9XY	XY-GenXY	-4.5	-4.5	88.26	Free	Free	Free	Free	Free	Free
9Y	Y-GenXY	-4.5	4.5	88.26	Free	Free	Free	Free	Free	Free
10X	X-GenXY	4.5	-4.5	94.61	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	-4.5	-4.5	94.61	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	-4.5	4.5	94.61	Free	Free	Free	Free	Free	Free
11X	X-GenXY	4.5	-4.5	101	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	-4.5	-4.5	101	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	-4.5	4.5	101	Free	Free	Free	Free	Free	Free
12X	X-GenXY	4.5	-4.5	107.9	Free	Free	Free	Free	Free	Free
12XY	XY-GenXY	-4.5	-4.5	107.9	Free	Free	Free	Free	Free	Free
12Y	Y-GenXY	-4.5	4.5	107.9	Free	Free	Free	Free	Free	Free
13X	X-GenXY	4.5	-4.5	114.3	Free	Free	Free	Free	Free	Free
13XY	XY-GenXY	-4.5	-4.5	114.3	Free	Free	Free	Free	Free	Free
13Y	Y-GenXY	-4.5	4.5	114.3	Free	Free	Free	Free	Free	Free
14X	X-GenXY	4.5	-4.5	121	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	-4.5	-4.5	121	Free	Free	Free	Free	Free	Free
14Y	Y-GenXY	-4.5	4.5	121	Free	Free	Free	Free	Free	Free
15X	X-GenXY	4.5	-4.5	127	Free	Free	Free	Free	Free	Free
15XY	XY-GenXY	-4.5	-4.5	127	Free	Free	Free	Free	Free	Free
15Y	Y-GenXY	-4.5	4.5	127	Free	Free	Free	Free	Free	Free
16X	X-GenXY	4.5	-4.5	134.3	Free	Free	Free	Free	Free	Free
16XY	XY-GenXY	-4.5	-4.5	134.3	Free	Free	Free	Free	Free	Free
16Y	Y-GenXY	-4.5	4.5	134.3	Free	Free	Free	Free	Free	Free
17X	X-GenXY	4.5	-4.5	141	Free	Free	Free	Free	Free	Free
17XY	XY-GenXY	-4.5	-4.5	141	Free	Free	Free	Free	Free	Free
17Y	Y-GenXY	-4.5	4.5	141	Free	Free	Free	Free	Free	Free
18X	X-GenXY	4.5	-4.5	148	Free	Free	Free	Free	Free	Free
18XY	XY-GenXY	-4.5	-4.5	148	Free	Free	Free	Free	Free	Free

18Y	Y-GenXY	-4.5	4.5	148	Free	Free	Free	Free	Free	Free
19X	X-Gen	0	-4.5	155	Free	Free	Free	Free	Free	Free
21X	X-GenXY	13.95	-2.813	19	Free	Free	Free	Free	Free	Free
21XY	XY-GenXY	-13.95	-2.813	19	Free	Free	Free	Free	Free	Free
21Y	Y-GenXY	-13.95	2.813	19	Free	Free	Free	Free	Free	Free
22X	X-GenXY	2.813	-13.95	19	Free	Free	Free	Free	Free	Free
22XY	XY-GenXY	-2.813	-13.95	19	Free	Free	Free	Free	Free	Free
22Y	Y-GenXY	-2.813	13.95	19	Free	Free	Free	Free	Free	Free
23Y	Y-Gen	-11.25	0	35	Free	Free	Free	Free	Free	Free
24X	X-Gen	0	-11.25	35	Free	Free	Free	Free	Free	Free
25X	X-Gen	0	-18.67	75	Free	Free	Free	Free	Free	Free
26X	X-Gen	0	-22.67	101	Free	Free	Free	Free	Free	Free
27X	X-Gen	0	-18.67	127	Free	Free	Free	Free	Free	Free
28X	X-Gen	0	-22.67	155	Free	Free	Free	Free	Free	Free

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.
i0.50E148S	None	18P	18XY	0.5	0	Free	Free	Free	Free	Free	Free

The model contains 95 primary and 1 secondary joints for a total of 96 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
A53-GrB	2.9e+004	35	60	0	0	0	0	0	0
A36 Mod 50	2.9e+004	50	58	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 TYPE0 N	0.625	0.75	11.15	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 TYPE0 N	1270
5/8 A325	72

Angle Properties:

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

		(in)	(in)	(in)	(lbs/ft)	(in^2)		(in)	(in)	(in)		(in)	(in)	(in)		(in^3)
SAE	8X8X0.5	8	8	0.5	26.4	7.75	13.75	2.5	2.5	1.59	1	8	4	0	1.0000	0
SAE	6X6X0.5625	6	6	0.5625	21.9	6.43	8.78	1.85	1.85	1.18	1	6	3	0	1.0000	0
SAE	5X5X0.3125	5	5	0.3125	10.3	3.03	13.4	1.57	1.57	0.994	1	5	2.5	0	1.0000	0
SAE	4X4X0.25	4	4	0.25	6.6	1.94	13.5	1.25	1.25	0.795	1	4	2	0	1.0000	0
SAE	3.5X3.5X0.25	3.5	3.5	0.25	5.8	1.69	11.5	1.09	1.09	0.694	1	3.5	1.75	0	1.0000	0
SAE	3X3X0.375	3	3	0.375	7.2	2.11	6.17	0.913	0.913	0.587	1	3	1.5	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	2.5X2.5X0.25	2.5	2.5	0.25	4.1	1.19	7.75	0.769	0.769	0.491	1	2.5	1.25	0	1.0000	0
SAE	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	2X2X0.3125	2	2	0.3125	3.92	1.15	3.8	0.601	0.601	0.39	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	2.5X2X0.3125	2.5	2	0.3125	4.5	1.31	6	0.776	0.584	0.422	1	2.5	1	0	1.0000	0
SAU	2.5X2X0.25	2.5	2	0.25	3.62	1.06	7.75	0.784	0.592	0.424	1	2.5	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
ST	ST4x10	5.268	4.07	0.248	10	2.94	16.4	1.12	1.2	1.12	2	4	0	0	0.0000	0
CHA	12X20.7	12	2.94	0.282	20.7	6.08	24	4.61	0.797	0.797	1	12	0	0	1.0000	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	L3x3x3/16	SAE	3X3X0.1875	A 36	Beam	Leg	None	0.000
Leg2	L4x4x1/4	SAE	4X4X0.25	A 36	Beam	Leg	None	0.000
Leg3	L5x5x5/16	SAE	5X5X0.3125	A36 Mod 50	Beam	Leg	None	0.000
Leg4	L6x6x9/16	SAE	6X6X0.5625	A36 Mod 50	Beam	Leg	None	0.000
Leg5	L8x8x1/2	SAE	8X8X0.5	A36 Mod 50	Beam	Leg	None	0.000
Diag1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A 36	Truss	Other	None	0.000
Diag2	L2x2x5/16	SAE	2X2X0.3125	A 36	Truss Crossing Diagonal		None	0.000
Diag3	L3X2.5X1/4	SAU	3X2.5X0.25	A 36	Truss Crossing Diagonal		None	0.000
Diag4	L4X3X1/4	SAU	4X3X0.25	A 36	Truss Crossing Diagonal		None	0.000
Diag5	L3X3X1/4	SAE	3X3X0.25	A 36	Truss Crossing Diagonal		None	0.000
Diag6	L2.5x2x1/4	SAU	2.5X2X0.25	A 36	T-Only	Other	None	0.000
Diag7	L2.5x2x3/16	SAU	2.5X2X0.1875	A 36	T-Only	Other	None	0.000
Diag8	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A 36	T-Only	Other	None	0.000
Diag9	L3x2.5x1/4	SAU	3X2.5X0.25	A 36	Truss	Other	None	0.000
Horz1	L3X3X3/16	SAE	3X3X0.1875	A 36	Truss	Other	None	0.000
Horz2	L2X2X3/16	SAE	2X2X0.1875	A 36	T-Only	Other	None	0.000
Horz3	L2.5X2X3/16	SAU	2.5X2X0.1875	A 36	T-Only	Other	None	0.000
Horz4	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	A 36	Beam	Other	None	0.000
Horz5	L3.5X3.5X1/4	SAE	3.5X3.5X0.25	A 36	Beam	Other	None	0.000
Horz6	L2.5X2X5/16	SAU	2.5X2X0.3125	A 36	Truss	Other	None	0.000
Inner1	L3x3x1/4	SAE	2X2X0.1875	A 36	T-Only Beam	Other	None	0.000
Inner2	L2.5X2X3/16	SAU	2.5X2X0.1875	A 36	Truss Crossing Diagonal		None	0.000
Inner3	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A 36	Truss Crossing Diagonal		None	0.000
TopCrArm	L4X4X1/4	SAE	4X4X0.25	A 36	Beam	Other	None	0.000
TopArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	A 36	T-Only	Other	None	0.000
MdCrArm1	L4X4X1/4	SAE	4X4X0.25	A36 Mod 50	Beam	Other	None	0.000
MidArmBr	2.5x2x1/4	SAU	2.5X2X0.25	A 36	T-Only	Other	None	0.000

BotCrArm	L4X4X1/4	SAE	4X4X0.25	A 36	Beam	Other	None	0.000
BotArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	A 36	T-Only	Other	None	0.000
ShArmBr	L4x3x1/4	SAU	4X3X0.25	A 36	Truss	Other	None	0.000
ShieldAr	4ST10	ST	ST4x10	A 36	Beam	Other	None	0.000
Mast	12" Sch. 40 Pwmnt		Pipe 12" Std.	A53-GrB	Beam	Other	None	0.000
M1	L3x3x1/4	SAE	3X3X0.25	A 36	Truss	Other	None	0.000
M2	C12x20.7	CHA	12X20.7	A 36	Truss	Other	None	0.000
Diag10	L3X3X3/8	SAE	3X3X0.375	A 36	Truss Crossing Diagonal		None	0.000
MdCrArm2	L4X4X1/4	SAE	4X4X0.25	A 36	Truss	Other	None	0.000
Inner4	L2.5X2X3/16	SAU	2.5X2X0.1875	A 36	Truss	Other	None	0.000
Horz7	L3X3X3/16	SAE	3X3X0.1875	A 36	Beam	Other	None	0.000
M3	L3x3x1/4	SAE	3X3X0.25	A 36	Truss	Other	None	0.000
M4	L2.5x2x3/16	SAU	2.5X2X0.1875	A 36	T-Only	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	3X3X0.1875	A 36	195.29	195.29	724.51
SAE	4X4X0.25	A 36	256.94	342.59	1695.80
SAE	5X5X0.3125	A36 Mod 50	104.00	173.33	1071.20
SAE	6X6X0.5625	A36 Mod 50	104.00	208.00	2277.60
SAE	8X8X0.5	A36 Mod 50	308.44	822.50	8142.80
SAE	2.5X2.5X0.25	A 36	37.84	31.53	155.15
SAE	2X2X0.3125	A 36	273.68	182.45	1072.81
SAU	3X2.5X0.25	A 36	547.61	501.98	2464.24
SAU	4X3X0.25	A 36	435.25	507.79	2524.45
SAE	3X3X0.375	A 36	105.39	105.39	758.77
SAE	3X3X0.25	A 36	283.34	283.34	1388.36
SAU	2.5X2X0.25	A 36	226.58	169.93	820.20
SAU	2.5X2X0.1875	A 36	470.90	353.17	1294.97
SAE	1.75X1.75X0.1875	A 36	131.75	76.85	279.30
SAE	2X2X0.1875	A 36	43.46	28.97	106.03
SAU	2.5X2X0.3125	A 36	18.00	13.50	81.00
SAU	3.5X2.5X0.25	A 36	68.50	68.50	335.67
SAE	3.5X3.5X0.25	A 36	111.60	130.20	647.28
SAE	2.5X2.5X0.1875	A 36	25.46	21.21	78.15
SAE	4X4X0.25	A36 Mod 50	74.88	99.83	494.18
ST	ST4x10	A 36	45.34	70.56	453.40

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	7P	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
2	3P	1.100	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
3	2P	1.350	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
4	1P	1.230	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 End Edge Dist. (in)	Bolt Spacing (in)	Shear Path Length (in)	Tension Rest. Path Length (in)	Rest. Coef.
g1P	Leg1		XY-Symmetry	19X	18X	1	4	1	1	1 5/8	A394 TYPE0 N	4	2.24	1	Both	1	1.75	0.875	2.5	0	0
g1X	Leg1		X-GenXY	19P	18P	1	4	1	1	1 5/8	A394 TYPE0 N	4	2.24	1	Both	1	1.75	0.875	2.5	0	0
g1XY	Leg1		XY-GenXY	19P	18Y	1	4	1	1	1 5/8	A394 TYPE0 N	4	2.24	1	Both	1	1.75	0.875	2.5	0	0
g1Y	Leg1		Y-GenXY	19X	18XY	1	4	1	1	1 5/8	A394 TYPE0 N	4	2.24	1	Both	1	1.75	0.875	2.5	0	0
g2P	Leg2		XY-Symmetry	18X	17X	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g2X	Leg2		X-GenXY	18P	17P	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g2XY	Leg2		XY-GenXY	18Y	17Y	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g2Y	Leg2		Y-GenXY	18XY	17XY	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g3P	Leg2		XY-Symmetry	17X	16X	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g3X	Leg2		X-GenXY	17P	16P	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g3XY	Leg2		XY-GenXY	17Y	16Y	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g3Y	Leg2		Y-GenXY	17XY	16XY	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g4P	Leg2		XY-Symmetry	16X	15X	1	4	1	1	1 5/8	A394 TYPE0 N	4	2	1	Both	2.25	0	1.25	6	0	0
g4X	Leg2		X-GenXY	16P	15P	1	4	1	1	1 5/8	A394 TYPE0 N	4	2	1	Both	2.25	0	1.25	6	0	0
g4XY	Leg2		XY-GenXY	16Y	15Y	1	4	1	1	1 5/8	A394 TYPE0 N	4	2	1	Both	2.25	0	1.25	6	0	0
g4Y	Leg2		Y-GenXY	16XY	15XY	1	4	1	1	1 5/8	A394 TYPE0 N	4	2	1	Both	2.25	0	1.25	6	0	0
g5P	Leg3		XY-Symmetry	15X	14X	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g5X	Leg3		X-GenXY	15P	14P	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g5XY	Leg3		XY-GenXY	15Y	14Y	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g5Y	Leg3		Y-GenXY	15XY	14XY	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g6P	Leg3		XY-Symmetry	14X	13X	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g6X	Leg3		X-GenXY	14P	13P	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g6XY	Leg3		XY-GenXY	14Y	13Y	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0
g6Y	Leg3		Y-GenXY	14XY	13XY	1	4	1	1	1 5/8	A394 TYPE0 N	0	0	0		0	0	0	0	0	0

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0      0       0      0       0     0
       g7P     Leg3          XY-Symmetry        13X        12X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
       g7X     Leg3            X-GenXY          13P        12P    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g7XY     Leg3             XY-GenXY        13Y        12Y    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
       g7Y     Leg3            Y-GenXY         13XY       12XY    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
       g8P     Leg3          XY-Symmetry        12X        11X    1     4   0.5   0.5   0.5 5/8 A394 TYPE0 N    12   3.43       1       Both     1
3   1.25   3.125      0       0     0
       g8X     Leg3            X-GenXY          12P        11P    1     4   0.5   0.5   0.5 5/8 A394 TYPE0 N    12   3.43       1       Both     1
3   1.25   3.125      0       0     0
      g8XY     Leg3             XY-GenXY        12Y        11Y    1     4   0.5   0.5   0.5 5/8 A394 TYPE0 N    12   3.43       1       Both     1
3   1.25   3.125      0       0     0
       g8Y     Leg3            Y-GenXY         12XY       11XY    1     4   0.5   0.5   0.5 5/8 A394 TYPE0 N    12   3.43       1       Both     1
3   1.25   3.125      0       0     0
       g9P     Leg4          XY-Symmetry        11X        10X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
       g9X     Leg4            X-GenXY          11P        10P    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g9XY     Leg4             XY-GenXY        11Y        10Y    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
       g9Y     Leg4            Y-GenXY         11XY       10XY    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g10P     Leg4          XY-Symmetry        10X         9X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g10X     Leg4            X-GenXY          10P         9P    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
     g10XY     Leg4             XY-GenXY        10Y         9Y    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g10Y     Leg4            Y-GenXY         10XY        9XY    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g11P     Leg4          XY-Symmetry         9X         8X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g11X     Leg4            X-GenXY           9P         8P    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
     g11XY     Leg4             XY-GenXY         9Y         8Y    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g11Y     Leg4            Y-GenXY          9XY        8XY    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g12P     Leg4          XY-Symmetry         8X         7X    1     4     1     1     1 5/8 A394 TYPE0 N    28      4       1       Both     1
4   1.25       2      0       0     0
      g12X     Leg4            X-GenXY           8P         7P    1     4     1     1     1 5/8 A394 TYPE0 N    28      4       1       Both     1
4   1.25       2      0       0     0
     g12XY     Leg4             XY-GenXY         8Y         7Y    1     4     1     1     1 5/8 A394 TYPE0 N    28      4       1       Both     1
4   1.25       2      0       0     0
      g12Y     Leg4            Y-GenXY          8XY        7XY    1     4     1     1     1 5/8 A394 TYPE0 N    28      4       1       Both     1
4   1.25       2      0       0     0
      g13P     Leg5          XY-Symmetry         7X         6X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g13X     Leg5            X-GenXY           7P         6P    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
     g13XY     Leg5             XY-GenXY         7Y         6Y    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g13Y     Leg5            Y-GenXY          7XY        6XY    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
      g14P     Leg5          XY-Symmetry         6X         5X    1     4     1     1     1 5/8 A394 TYPE0 N     0      0       0                0
0      0       0      0       0     0
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     g14X     Leg5              X-GenXY         6P         5P    1     4     1     1     1 5/8 A394 TYPE0 N     0       0       0                 0
0       0        0       0        0      0
    g14XY     Leg5             XY-GenXY         6Y         5Y    1     4     1     1     1 5/8 A394 TYPE0 N     0       0       0                 0
0       0        0       0        0      0
     g14Y     Leg5              Y-GenXY        6XY        5XY    1     4     1     1     1 5/8 A394 TYPE0 N     0       0       0                 0
0       0        0       0        0      0
     g15P     Leg5           XY-Symmetry         5X         4X    1     4     1     1     1 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g15X     Leg5              X-GenXY         5P         4P    1     4     1     1     1 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
    g15XY     Leg5             XY-GenXY         5Y         4Y    1     4     1     1     1 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g15Y     Leg5              Y-GenXY        5XY        4XY    1     4     1     1     1 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g16P     Leg5           XY-Symmetry         4X         3X    1     4  0.59  0.59  0.59 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g16X     Leg5              X-GenXY         4P         3P    1     4  0.59  0.59  0.59 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
    g16XY     Leg5             XY-GenXY         4Y         3Y    1     4  0.59  0.59  0.59 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g16Y     Leg5              Y-GenXY        4XY        3XY    1     4  0.59  0.59  0.59 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g17P     Leg5           XY-Symmetry         3X         2X    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g17X     Leg5              X-GenXY         3P         2P    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
    g17XY     Leg5             XY-GenXY         3Y         2Y    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g17Y     Leg5              Y-GenXY        3XY        2XY    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g18P     Leg5           XY-Symmetry         2X         1X    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g18X     Leg5              X-GenXY         2P         1P    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
    g18XY     Leg5             XY-GenXY         2Y         1Y    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g18Y     Leg5              Y-GenXY        2XY        1XY    1     4   0.6   0.6   0.6 5/8 A394 TYPE0 N    28       4       1        Both 1.4375
4.4375   1.25        2       0        0      0
     g19P    Diag1           XY-Symmetry        20P        18P    2     5     1     1     1         5/8 A325     2       1       1 Short only  1.125
0  1.125  6.1875      0       0      0
     g19X    Diag1              X-GenXY        20P        18X    2     5     1     1     1         5/8 A325     2       1       1 Short only  1.125
0  1.125  6.1875      0       0      0
    g19XY    Diag1             XY-GenXY        20P       18XY    2     5     1     1     1         5/8 A325     2       1       1 Short only  1.125
0  1.125  6.1875      0       0      0
     g19Y    Diag1              Y-GenXY        20P        18Y    2     5     1     1     1         5/8 A325     2       1       1 Short only  1.125
0  1.125  6.1875      0       0      0
     g20P    Diag2           XY-Symmetry        18P        17X    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1  0.875   3.625      0       0      0
     g20X    Diag2              X-GenXY        18X        17P    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1  0.875   3.625      0       0      0
    g20XY    Diag2             XY-GenXY       18XY        17Y    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1  0.875   3.625      0       0      0
     g20Y    Diag2              Y-GenXY        18Y       17XY    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1  0.875   3.625      0       0      0
     g21P    Diag2           XY-Symmetry        18P        17Y    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1.75  0.875   3.625      0       0      0
     g21X    Diag2              X-GenXY        18X       17XY    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
1.75  0.875   3.625      0       0      0
    g21XY    Diag2             XY-GenXY       18XY        17X    2     5  0.75   0.5   0.5         5/8 A325     2       1       1 Short only   0.75
```

1.75	0.875	3.625	0	0	0														
	g21Y	Diag2		Y-GenXY		18Y	17P	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g22P	Diag2		XY-Symmetry		17P	16X	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g22X	Diag2		X-GenXY		17X	16P	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g22XY	Diag2		XY-GenXY		17XY	16Y	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g22Y	Diag2		Y-GenXY		17Y	16XY	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g23P	Diag2		XY-Symmetry		17P	16Y	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g23X	Diag2		X-GenXY		17X	16XY	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g23XY	Diag2		XY-GenXY		17XY	16X	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g23Y	Diag2		Y-GenXY		17Y	16P	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g24P	Diag2		XY-Symmetry		16P	15X	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g24X	Diag2		X-GenXY		16X	15P	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g24XY	Diag2		XY-GenXY		16XY	15Y	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g24Y	Diag2		Y-GenXY		16Y	15XY	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g25P	Diag2		XY-Symmetry		16P	15Y	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g25X	Diag2		X-GenXY		16X	15XY	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g25XY	Diag2		XY-GenXY		16XY	15X	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g25Y	Diag2		Y-GenXY		16Y	15P	2	5	0.75	0.5	0.5		5/8	A325	2	1	1	Short only	0.75
1.75	0.875	3.625	0	0	0														
	g26P	Diag3		XY-Symmetry		15P	14X	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g26X	Diag3		X-GenXY		15X	14P	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g26XY	Diag3		XY-GenXY		15XY	14Y	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g26Y	Diag3		Y-GenXY		15Y	14XY	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g27P	Diag3		XY-Symmetry		15P	14Y	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g27X	Diag3		X-GenXY		15X	14XY	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g27XY	Diag3		XY-GenXY		15XY	14X	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g27Y	Diag3		Y-GenXY		15Y	14P	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g28P	Diag3		XY-Symmetry		14P	13X	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g28X	Diag3		X-GenXY		14X	13P	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g28XY	Diag3		XY-GenXY		14XY	13Y	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														
	g28Y	Diag3		Y-GenXY		14Y	13XY	2	5	0.75	0.5	0.5	5/8	A394	TYPE0 N	3	1	1	Short only	0.75
1.5	0.875	3.0625	0	0	0														

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     g29P    Diag3          XY-Symmetry        14P        13Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g29X    Diag3             X-GenXY         14X       13XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
    g29XY    Diag3            XY-GenXY        14XY        13X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g29Y    Diag3             Y-GenXY         14Y        13P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g30P    Diag3          XY-Symmetry        13P        12X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g30X    Diag3             X-GenXY         13X        12P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
    g30XY    Diag3            XY-GenXY        13XY        12Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g30Y    Diag3             Y-GenXY         13Y       12XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g31P    Diag3          XY-Symmetry        13P        12Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g31X    Diag3             X-GenXY         13X       12XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
    g31XY    Diag3            XY-GenXY        13XY        12X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g31Y    Diag3             Y-GenXY         13Y        12P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g32P    Diag3          XY-Symmetry        12P        11X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g32X    Diag3             X-GenXY         12X        11P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
    g32XY    Diag3            XY-GenXY        12XY        11Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g32Y    Diag3             Y-GenXY         12Y       11XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g33P    Diag3          XY-Symmetry        12P        11Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g33X    Diag3             X-GenXY         12X       11XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
    g33XY    Diag3            XY-GenXY        12XY        11X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g33Y    Diag3             Y-GenXY         12Y        11P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only   0.75
1.5  0.875  3.0625      0       0     0
     g34P    Diag4          XY-Symmetry        11P        10X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g34X    Diag4             X-GenXY         11X        10P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g34XY    Diag4            XY-GenXY        11XY        10Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g34Y    Diag4             Y-GenXY         11Y       10XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g35P    Diag4          XY-Symmetry        11P        10Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g35X    Diag4             X-GenXY         11X       10XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g35XY    Diag4            XY-GenXY        11XY        10X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g35Y    Diag4             Y-GenXY         11Y        10P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g36P    Diag4          XY-Symmetry        10P         9X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g36X    Diag4             X-GenXY         10X         9P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
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2  0.875  1.6875      0       0     0
    g36XY    Diag4             XY-GenXY       10XY         9Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g36Y    Diag4               Y-GenXY        10Y        9XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g37P    Diag4           XY-Symmetry        10P         9Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g37X    Diag4               X-GenXY        10X        9XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g37XY    Diag4             XY-GenXY       10XY         9X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g37Y    Diag4               Y-GenXY        10Y         9P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g38P    Diag4           XY-Symmetry         9P         8X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g38X    Diag4               X-GenXY         9X         8P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g38XY    Diag4             XY-GenXY        9XY         8Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g38Y    Diag4               Y-GenXY         9Y        8XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g39P    Diag4           XY-Symmetry         9P         8Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g39X    Diag4               X-GenXY         9X        8XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g39XY    Diag4             XY-GenXY        9XY         8X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g39Y    Diag4               Y-GenXY         9Y         8P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g40P    Diag4           XY-Symmetry         8P         7X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g40X    Diag4               X-GenXY         8X         7P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g40XY    Diag4             XY-GenXY        8XY         7Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g40Y    Diag4               Y-GenXY         8Y        7XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g41P    Diag4           XY-Symmetry         8P         7Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g41X    Diag4               X-GenXY         8X        7XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
    g41XY    Diag4             XY-GenXY        8XY         7X    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g41Y    Diag4               Y-GenXY         8Y         7P    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     5   1.84       1 Short only 0.6875
2  0.875  1.6875      0       0     0
     g42P   Diag10           XY-Symmetry         7P         6X    2     5 0.784 0.567 0.567 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
     g42X   Diag10               X-GenXY         7X         6P    2     5 0.784 0.567 0.567 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
    g42XY   Diag10             XY-GenXY        7XY         6Y    2     5 0.784 0.567 0.567 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
     g42Y   Diag10               Y-GenXY         7Y        6XY    2     5 0.784 0.567 0.567 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
     g43P   Diag10           XY-Symmetry         7P         6Y    2     5 0.784 0.567 0.567         5/8 A325     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
     g43X   Diag10               X-GenXY         7X        6XY    2     5 0.784 0.567 0.567         5/8 A325     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
    g43XY   Diag10             XY-GenXY        7XY         6X    2     5 0.784 0.567 0.567         5/8 A325     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
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     g43Y   Diag10             Y-GenXY         7Y         6P    2     5 0.784 0.567 0.567         5/8 A325     2      1       1 Short only    1.5
0  0.875  3.4375      0       0     0
     g44P    Diag5           XY-Symmetry       6P         5X    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g44X    Diag5             X-GenXY         6X         5P    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
    g44XY    Diag5            XY-GenXY        6XY         5Y    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g44Y    Diag5             Y-GenXY         6Y        5XY    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g45P    Diag5           XY-Symmetry       6P         5Y    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g45X    Diag5             X-GenXY         6X        5XY    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
    g45XY    Diag5            XY-GenXY        6XY         5X    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g45Y    Diag5             Y-GenXY         6Y         5P    2     5 0.777 0.553 0.553 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875    3.25      0       0     0
     g46P    Diag5           XY-Symmetry       5P         4X    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g46X    Diag5             X-GenXY         5X         4P    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
    g46XY    Diag5            XY-GenXY        5XY         4Y    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g46Y    Diag5             Y-GenXY         5Y        4XY    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g47P    Diag5           XY-Symmetry       5P         4Y    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g47X    Diag5             X-GenXY         5X        4XY    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
    g47XY    Diag5            XY-GenXY        5XY         4X    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g47Y    Diag5             Y-GenXY         5Y         4P    2     5 0.771 0.542 0.542 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875  3.1875      0       0     0
     g48P    Diag6           XY-Symmetry       4P        23P    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g48X    Diag6             X-GenXY         4X        23P    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
    g48XY    Diag6            XY-GenXY        4XY        23Y    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g48Y    Diag6             Y-GenXY         4Y        23Y    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g49P    Diag6           XY-Symmetry       4P        24P    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g49X    Diag6             X-GenXY         4X        24X    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
    g49XY    Diag6            XY-GenXY        4XY        24X    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g49Y    Diag6             Y-GenXY         4Y        24P    3     5     1   0.5   0.5 5/8 A394 TYPE0 N     3      1       1 Short only      1
0  0.875    1.75      0       0     0
     g50P    Diag7           XY-Symmetry       23P        2P    3     5   0.5     1   0.5 5/8 A394 TYPE0 N     2      1       1  Long only   1.25
0  0.875    1.75      0       0     0
     g50X    Diag7             X-GenXY         23P        2X    3     5   0.5     1   0.5 5/8 A394 TYPE0 N     2      1       1  Long only   1.25
0  0.875    1.75      0       0     0
    g50XY    Diag7            XY-GenXY        23Y        2XY    3     5   0.5     1   0.5 5/8 A394 TYPE0 N     2      1       1  Long only   1.25
0  0.875    1.75      0       0     0
     g50Y    Diag7             Y-GenXY         23Y        2Y    3     5   0.5     1   0.5 5/8 A394 TYPE0 N     2      1       1  Long only   1.25
0  0.875    1.75      0       0     0
     g51P    Diag7           XY-Symmetry       24P        2P    3     5   0.5     1   0.5 5/8 A394 TYPE0 N     2      1       1  Long only   1.25
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0	0.875	1.75	0	0	0																
	g51X	Diag7		X-GenXY	24X	2X	3	5	0.5	1	0.5	5/8	A394	TYPE0	N	2	1	1	Long only	1.25	
0	0.875	1.75	0	0	0																
	g51XY	Diag7		XY-GenXY	24X	2XY	3	5	0.5	1	0.5	5/8	A394	TYPE0	N	2	1	1	Long only	1.25	
0	0.875	1.75	0	0	0																
	g51Y	Diag7		Y-GenXY	24P	2Y	3	5	0.5	1	0.5	5/8	A394	TYPE0	N	2	1	1	Long only	1.25	
0	0.875	1.75	0	0	0																
	g52P	Diag8		XY-Symmetry	21P	23P	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g52X	Diag8		X-GenXY	21X	23P	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g52XY	Diag8		XY-GenXY	21XY	23Y	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g52Y	Diag8		Y-GenXY	21Y	23Y	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g53P	Diag8		XY-Symmetry	22P	24P	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g53X	Diag8		X-GenXY	22X	24X	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g53XY	Diag8		XY-GenXY	22XY	24X	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g53Y	Diag8		Y-GenXY	22Y	24P	3	4	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	0.875	
0	0.9375	1.75	0	0	0																
	g54P	Diag9		XY-Symmetry	21P	1P	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g54X	Diag9		X-GenXY	21X	1X	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g54XY	Diag9		XY-GenXY	21XY	1XY	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g54Y	Diag9		Y-GenXY	21Y	1Y	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g55P	Diag9		XY-Symmetry	22P	1P	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g55X	Diag9		X-GenXY	22X	1X	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g55XY	Diag9		XY-GenXY	22XY	1XY	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g55Y	Diag9		Y-GenXY	22Y	1Y	3	5	1	0.5	0.5	5/8	A394	TYPE0	N	3	1	1	Short only	1.25	
0	0.875	1.75	0	0	0																
	g56P	Horz1		Y-Symmetry	18X	18P	3	6	1	1	1	5/8	A394	TYPE0	N	2	1.84	1	Short only	0.75	
2	0.875	1.5	0	0	0																
	g56Y	Horz1		Y-Gen	18XY	18Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	1.84	1	Short only	0.75	
2	0.875	1.5	0	0	0																
	g57P	Horz2		X-Symmetry	18P	18Y	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1	
0	0.875	2.9375	0	0	0																
	g57X	Horz2		X-Gen	18X	18XY	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1	
0	0.875	2.9375	0	0	0																
	g58P	Horz1		Y-Symmetry	16X	16P	3	4	1	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5	
0	0.875	2	0	0	0																
	g58Y	Horz1		Y-Gen	16XY	16Y	3	4	1	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5	
0	0.875	2	0	0	0																
	g59P	Horz3		X-Symmetry	15P	15Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25	
0	3.9375	2	0	0	0																
	g59X	Horz3		X-Gen	15X	15XY	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25	
0	3.9375	2	0	0	0																
	g60P	Horz1		Y-Symmetry	12X	12P	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1.5	
0	0.875	1.75	0	0	0																
	g60Y	Horz1		Y-Gen	12XY	12Y	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1.5	
0	0.875	1.75	0	0	0																

	g61P	Horz6		X-Symmetry	11P	11Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25
0	4.625	2	0	0	0																
	g61X	Horz6		X-Gen	11X	11XY	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25
0	4.625	2	0	0	0																
	g62P	Horz1		Y-Symmetry	8X	8P	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1.5
0	0.875	1.75	0	0	0																
	g62Y	Horz1		Y-Gen	8XY	8Y	3	4	1	1	1	5/8	A394	TYPE0	N	3	1	1	Short only	1.5
0	0.875	1.75	0	0	0																
	g63P	Horz3		X-Symmetry	7P	7Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25
0	4.5	4	0	0	0																
	g63X	Horz3		X-Gen	7X	7XY	3	6	1	1	1	5/8	A394	TYPE0	N	2	1	1	Long only	1.25
0	4.5	4	0	0	0																
	g64P	Horz4		Y-Symmetry	4X	4P	3	6	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	1.25
0	0.875	3	0	0	0																
	g64Y	Horz4		Y-Gen	4XY	4Y	3	6	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	1.25
0	0.875	3	0	0	0																
	g65P	Horz4		X-Symmetry	4P	4Y	3	6	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	1.25
0	0.875	3	0	0	0																
	g65X	Horz4		X-Gen	4X	4XY	3	6	1	0.5	0.5	5/8	A394	TYPE0	N	2	1	1	Short only	1.25
0	0.875	3	0	0	0																
	g66P	Horz7		XY-Symmetry	3X	23P	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g66X	Horz7		X-GenXY	3P	23P	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g66XY	Horz7		XY-GenXY	3Y	23Y	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g66Y	Horz7		Y-GenXY	3XY	23Y	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g67P	Horz7		XY-Symmetry	3P	24P	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g67X	Horz7		X-GenXY	3X	24X	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g67XY	Horz7		XY-GenXY	3XY	24X	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g67Y	Horz7		Y-GenXY	3Y	24P	3	5	2	1	1	5/8	A394	TYPE0	N	2	1	1	Short only	1.5
0	0.875	3	0	0	0																
	g68P	Horz5		XY-Symmetry	2X	21X	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g68X	Horz5		X-GenXY	2P	21P	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g68XY	Horz5		XY-GenXY	2Y	21Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g68Y	Horz5		Y-GenXY	2XY	21XY	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g69P	Horz5		XY-Symmetry	2P	22P	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g69X	Horz5		X-GenXY	2X	22X	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g69XY	Horz5		XY-GenXY	2XY	22XY	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g69Y	Horz5		Y-GenXY	2Y	22Y	3	6	1	1	1	5/8	A394	TYPE0	N	2	2	1	Short only	1.75
0	0.875	3	0	0	0																
	g70P	Horz5		Y-Symmetry	21X	21P	3	6	1	1	1	5/8	A394	TYPE0	N	0	2	1	Short only	0
0	0	0	0	0	0																
	g70Y	Horz5		Y-Gen	21XY	21Y	3	6	1	1	1	5/8	A394	TYPE0	N	0	2	1	Short only	0
0	0	0	0	0	0																
	g71P	Horz5		X-Symmetry	22P	22Y	3	6	1	1	1	5/8	A394	TYPE0	N	0	2	1	Short only	0
0	0	0	0	0	0																
	g71X	Horz5		X-Gen	22X	22XY	3	6	1	1	1	5/8	A394	TYPE0	N	0	2	1	Short only	0

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0      0       0      0       0     0
     g72P   Inner1           X-Symmetry        18P i0.50E148S    2     4     2     1     1 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
     g72X   Inner1               X-Gen        18X i0.50E148S    2     4     2     1     1 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
     g73P   Inner2           X-Symmetry        15P       15XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only      1
0  0.875  1.5625      0       0     0
     g73X   Inner2               X-Gen        15X        15Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only      1
0  0.875  1.5625      0       0     0
     g74P   Inner3           X-Symmetry        11P       11XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only   1.25
0  0.875  1.5625      0       0     0
     g74X   Inner3               X-Gen        11X        11Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only   1.25
0  0.875  1.5625      0       0     0
     g75P   Inner2           X-Symmetry         7P        7XY    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only      1
0  0.875  1.5625      0       0     0
     g75X   Inner2               X-Gen         7X         7Y    2     5  0.75   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only      1
0  0.875  1.5625      0       0     0
     g76P   Inner4          XY-Symmetry        21X        22X    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
     g76X   Inner4             X-GenXY        21P        22P    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
    g76XY   Inner4             XY-GenXY       21Y        22Y    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
     g76Y   Inner4             Y-GenXY       21XY       22XY    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
     g77P TopCrArm           XY-Symmetry        27X        15X    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5   2.08       1 Short only   0.75
2.75  0.875    2.25      0       0     0
     g77X TopCrArm              X-GenXY         27P        15P    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5   2.08       1 Short only   0.75
2.75  0.875    2.25      0       0     0
    g77XY TopCrArm             XY-GenXY        27P        15Y    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5   2.08       1 Short only   0.75
2.75  0.875    2.25      0       0     0
     g77Y TopCrArm              Y-GenXY        27X       15XY    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5   2.08       1 Short only   0.75
2.75  0.875    2.25      0       0     0
     g78P TopCrArm           Y-Symmetry        15X        15P    3     6     1     1     1 5/8 A394 TYPE0 N     5  3.728       1 Short only   0.75
2.75  0.875    2.25      0       0     0
     g78Y TopCrArm               Y-Gen        15XY        15Y    3     6     1     1     1 5/8 A394 TYPE0 N     5  3.728       1 Short only   0.75
2.75  0.875    2.25      0       0     0
     g79P MdCrArm1           XY-Symmetry        26X        11X    3     5  0.33  0.33  0.33 5/8 A394 TYPE0 N     6      2       1 Short only      1
3  0.875     1.5      0       0     0
     g79X MdCrArm1              X-GenXY         26P        11P    3     5  0.33  0.33  0.33 5/8 A394 TYPE0 N     6      2       1 Short only      1
3  0.875     1.5      0       0     0
    g79XY MdCrArm1             XY-GenXY        26P        11Y    3     5  0.33  0.33  0.33 5/8 A394 TYPE0 N     6      2       1 Short only      1
3  0.875     1.5      0       0     0
     g79Y MdCrArm1              Y-GenXY        26X       11XY    3     5  0.33  0.33  0.33 5/8 A394 TYPE0 N     6      2       1 Short only      1
3  0.875     1.5      0       0     0
     g80P MdCrArm2           Y-Symmetry        11X        11P    3     6     1     1     1 5/8 A394 TYPE0 N     6  3.561       1 Short only      1
3  0.875     1.5      0       0     0
     g80Y MdCrArm2               Y-Gen        11XY        11Y    3     6     1     1     1 5/8 A394 TYPE0 N     6  3.561       1 Short only      1
3  0.875     1.5      0       0     0
     g81P BotCrArm           XY-Symmetry        25X         7X    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5      2       1 Short only      1
2.75  0.875       2      0       0     0
     g81X BotCrArm              X-GenXY         25P         7P    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5      2       1 Short only      1
2.75  0.875       2      0       0     0
    g81XY BotCrArm             XY-GenXY        25P         7Y    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5      2       1 Short only      1
2.75  0.875       2      0       0     0
     g81Y BotCrArm              Y-GenXY        25X        7XY    3     5   0.5   0.5   0.5 5/8 A394 TYPE0 N     5      2       1 Short only      1
2.75  0.875       2      0       0     0
     g82P BotCrArm           Y-Symmetry         7X         7P    3     6     1     1     1 5/8 A394 TYPE0 N     5  3.404       1 Short only      1
2.75  0.875       2      0       0     0
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     g82Y BotCrArm               Y-Gen        7XY         7Y    3     6     1     1     1 5/8 A394 TYPE0 N     5  3.404       1 Short only      1
2.75  0.875       2      0       0     0
     g83P TopArmBr          XY-Symmetry        27X        16X    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g83X TopArmBr             X-GenXY        27P        16P    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
    g83XY TopArmBr             XY-GenXY        27P        16Y    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g83Y TopArmBr             Y-GenXY        27X       16XY    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g84P MidArmBr          XY-Symmetry        26X        12X    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g84X MidArmBr             X-GenXY        26P        12P    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
    g84XY MidArmBr             XY-GenXY        26P        12Y    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g84Y MidArmBr             Y-GenXY        26X       12XY    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g85P BotArmBr          XY-Symmetry        25X         8X    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g85X BotArmBr             X-GenXY        25P         8P    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
    g85XY BotArmBr             XY-GenXY        25P         8Y    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g85Y BotArmBr             Y-GenXY        25X        8XY    2     4  0.67  0.33  0.33 5/8 A394 TYPE0 N     3      2       1 Short only  0.875
0  0.875       2      0       0     0
     g86P  ShArmBr          XY-Symmetry        18P        28P    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875       3      0       0     0
     g86X  ShArmBr             X-GenXY        18X        28X    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875       3      0       0     0
    g86XY  ShArmBr             XY-GenXY       18XY        28X    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875       3      0       0     0
     g86Y  ShArmBr             Y-GenXY        18Y        28P    3     4     1   0.5   0.5 5/8 A394 TYPE0 N     2      1       1 Short only    1.5
0  0.875       3      0       0     0
     g87P ShieldAr           X-Symmetry        28X        19X    3     5     1     1     1 5/8 A394 TYPE0 N     4      2       1  Long only   1.25
0  0.875       4      0       0     0
     g87X ShieldAr              X-Gen        28P        19P    3     5     1     1     1 5/8 A394 TYPE0 N     4      2       1  Long only   1.25
0  0.875       4      0       0     0
     g88P ShieldAr           X-Symmetry        19X        20P    3     6     1     1     1 5/8 A394 TYPE0 N     4      2       1  Long only   1.25
0  0.875       4      0       0     0
     g88X ShieldAr              X-Gen        19P        20P    3     6     1     1     1 5/8 A394 TYPE0 N     4      2       1  Long only   1.25
0  0.875       4      0       0     0
     g89P       M3           Y-Symmetry        18X        18P    3     5     1     1     1         5/8 A325     2   1.89       1 Short only      2
0.75  0.875     1.5      0       0     0
     g89Y       M3             Y-Gen       18XY        18Y    3     5     1     1     1         5/8 A325     2   1.89       1 Short only      2
0.75  0.875     1.5      0       0     0
     g90P       M4          X-Symmetry         7X        7XY    3     5     1     1     1         5/8 A325     2      1       1  Long only   1.25
0  1.125       4      0       0     0
     g90X       M4             X-Gen         7P         7Y    3     5     1     1     1         5/8 A325     2      1       1  Long only   1.25
0  1.125       4      0       0     0
 ig72P90P   Inner1          X-Symmetry i0.50E148S       18XY    2     4     1     1     1 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
 ig72P90X   Inner1             X-Gen i0.50E148S        18Y    2     4     1     1     1 5/8 A394 TYPE0 N     1      1       1 Short only      1
0  0.875       0      0       0     0
```

Member Capacities and Overrides:

Member	Group	Design	Comp.	Design	Tension	L/r Length	L/r Connection	Connection	Net	Rupture	RTE End	RTE Edge	Override	Override	Override	Override	Override

Warnings Label	Label	Comp. Capacity	Control Criterion	Tension Capacity	Control Criterion		Comp. Capacity	Shear Capacity	Bearing Capacity	Section Tension Capacity	Tension Capacity	Dist. Tension Capacity	Dist. Tension Capacity	Comp. Capacity
Comp. or Errors	Comp.	Tension Capacity	Tension Control	Face Member										
Unsup. (kips)	Criterion	Criterion (kips)		ship (kips)		(ft)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)
g1P	Leg1	11.113	L/r	27.900	Net Sect	168	8.32	11.113	44.600	40.781	27.900	31.719	0.000	0.000	0.000
0.000		0.000		Automatic											
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1P" ??															
g1X	Leg1	11.113	L/r	27.900	Net Sect	168	8.32	11.113	44.600	40.781	27.900	31.719	0.000	0.000	0.000
0.000		0.000		Automatic											
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1X" ??															
g1XY	Leg1	11.113	L/r	27.900	Net Sect	168	8.32	11.113	44.600	40.781	27.900	31.719	0.000	0.000	0.000
0.000		0.000		Automatic											
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1XY" ??															
g1Y	Leg1	11.113	L/r	27.900	Net Sect	168	8.32	11.113	44.600	40.781	27.900	31.719	0.000	0.000	0.000
0.000		0.000		Automatic											
KL/R value of 167.55 exceeds maximum of 150.00 for member "g1Y" ??															
g2P	Leg2	45.145	L/r	69.840	Net Sect	106	7.00	45.145	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2X	Leg2	45.145	L/r	69.840	Net Sect	106	7.00	45.145	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2XY	Leg2	45.145	L/r	69.840	Net Sect	106	7.00	45.145	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2Y	Leg2	45.145	L/r	69.840	Net Sect	106	7.00	45.145	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3P	Leg2	47.035	L/r	69.840	Net Sect	101	6.72	47.035	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3X	Leg2	47.035	L/r	69.840	Net Sect	101	6.72	47.035	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3XY	Leg2	47.035	L/r	69.840	Net Sect	101	6.72	47.035	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3Y	Leg2	47.035	L/r	69.840	Net Sect	101	6.72	47.035	0.000	0.000	69.840	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4P	Leg2	43.178	L/r	44.600	Shear	110	7.28	43.178	44.600	54.375	56.340	60.417	0.000	0.000	0.000
0.000		0.000		Automatic											
g4X	Leg2	43.178	L/r	44.600	Shear	110	7.28	43.178	44.600	54.375	56.340	60.417	0.000	0.000	0.000
0.000		0.000		Automatic											
g4XY	Leg2	43.178	L/r	44.600	Shear	110	7.28	43.178	44.600	54.375	56.340	60.417	0.000	0.000	0.000
0.000		0.000		Automatic											
g4Y	Leg2	43.178	L/r	44.600	Shear	110	7.28	43.178	44.600	54.375	56.340	60.417	0.000	0.000	0.000
0.000		0.000		Automatic											
g5P	Leg3	105.998	L/r	151.500	Net Sect	72	6.00	105.998	0.000	0.000	151.500	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5X	Leg3	105.998	L/r	151.500	Net Sect	72	6.00	105.998	0.000	0.000	151.500	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5XY	Leg3	105.998	L/r	151.500	Net Sect	72	6.00	105.998	0.000	0.000	151.500	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5Y	Leg3	105.998	L/r	151.500	Net Sect	72	6.00	105.998	0.000	0.000	151.500	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g6P	Leg3	99.035	L/r	151.500	Net Sect	81	6.74	99.035	0.000	0.000	151.500	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											

g6X	Leg3	99.035	L/r	151.500	Net Sect	81	6.74	99.035	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g6XY	Leg3	99.035	L/r	151.500	Net Sect	81	6.74	99.035	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g6Y	Leg3	99.035	L/r	151.500	Net Sect	81	6.74	99.035	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g7P	Leg3	102.806	L/r	151.500	Net Sect	77	6.35	102.806	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g7X	Leg3	102.806	L/r	151.500	Net Sect	77	6.35	102.806	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g7XY	Leg3	102.806	L/r	151.500	Net Sect	77	6.35	102.806	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g7Y	Leg3	102.806	L/r	151.500	Net Sect	77	6.35	102.806	0.000	0.000	151.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g8P	**Leg3**	**123.770**	**L/r**	**111.305**	**Net Sect**	**42**	**6.91**	**123.770**	**133.800**	**203.906**	**111.305**	**213.235**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g8P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g8X	**Leg3**	**123.770**	**L/r**	**111.305**	**Net Sect**	**42**	**6.91**	**123.770**	**133.800**	**203.906**	**111.305**	**213.235**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g8X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g8XY	**Leg3**	**123.770**	**L/r**	**111.305**	**Net Sect**	**42**	**6.91**	**123.770**	**133.800**	**203.906**	**111.305**	**213.235**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g8XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g8Y	**Leg3**	**123.770**	**L/r**	**111.305**	**Net Sect**	**42**	**6.91**	**123.770**	**133.800**	**203.906**	**111.305**	**213.235**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g8Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g9P	Leg4	262.208	L/r	321.500	Net Sect	65	6.39	262.208	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g9X	Leg4	262.208	L/r	321.500	Net Sect	65	6.39	262.208	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g9XY	Leg4	262.208	L/r	321.500	Net Sect	65	6.39	262.208	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g9Y	Leg4	262.208	L/r	321.500	Net Sect	65	6.39	262.208	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g10P	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g10X	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g10XY	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g10Y	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g11P	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g11X	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g11XY	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g11Y	Leg4	262.948	L/r	321.500	Net Sect	65	6.35	262.948	0.000	0.000	321.500	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
g12P	**Leg4**	**252.165**	**L/r**	**237.125**	**Net Sect**	**70**	**6.91**	**252.165**	**312.200**	**856.405**	**237.125**	**895.587**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g12P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g12X	**Leg4**	**252.165**	**L/r**	**237.125**	**Net Sect**	**70**	**6.91**	**252.165**	**312.200**	**856.405**	**237.125**	**895.587**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g12X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
g12XY	**Leg4**	**252.165**	**L/r**	**237.125**	**Net Sect**	**70**	**6.91**	**252.165**	**312.200**	**856.405**	**237.125**	**895.587**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic Member "g12XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**

g12Y	Leg4	252.165	L/r	237.125	Net Sect	70	6.91	252.165	312.200	856.405	237.125	895.587	0.000	0.000	0.000
0.000	0.000	Automatic Member "g12Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g13P	Leg5	283.332	L/r	387.499	Net Sect	62	8.23	283.332	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g13X	Leg5	283.332	L/r	387.499	Net Sect	62	8.23	283.332	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g13XY	Leg5	283.332	L/r	387.499	Net Sect	62	8.23	283.332	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g13Y	Leg5	283.332	L/r	387.499	Net Sect	62	8.23	283.332	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g14P	Leg5	283.409	L/r	387.499	Net Sect	62	8.23	283.409	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g14X	Leg5	283.409	L/r	387.499	Net Sect	62	8.23	283.409	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g14XY	Leg5	283.409	L/r	387.499	Net Sect	62	8.23	283.409	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g14Y	Leg5	283.409	L/r	387.499	Net Sect	62	8.23	283.409	0.000	0.000	387.499	0.000	0.000	0.000	0.000
0.000	0.000	Automatic													
g15P	Leg5	283.492	L/r	312.200	Shear	62	8.22	283.492	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g15P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g15X	Leg5	283.492	L/r	312.200	Shear	62	8.22	283.492	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g15X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g15XY	Leg5	283.492	L/r	312.200	Shear	62	8.22	283.492	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g15XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g15Y	Leg5	283.492	L/r	312.200	Shear	62	8.22	283.492	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g15Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g16P	Leg5	264.792	L/r	312.200	Shear	73	16.45	264.792	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g16P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g16X	Leg5	264.792	L/r	312.200	Shear	73	16.45	264.792	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g16X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g16XY	Leg5	264.792	L/r	312.200	Shear	73	16.45	264.792	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g16XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g16Y	Leg5	264.792	L/r	312.200	Shear	73	16.45	264.792	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g16Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g17P	Leg5	262.493	L/r	312.200	Shear	74	16.45	262.493	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g17P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g17X	Leg5	262.493	L/r	312.200	Shear	74	16.45	262.493	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g17X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g17XY	Leg5	262.493	L/r	312.200	Shear	74	16.45	262.493	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g17XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g17Y	Leg5	262.493	L/r	312.200	Shear	74	16.45	262.493	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g17Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													
g18P	Leg5	234.356	L/r	312.200	Shear	88	19.54	234.356	312.200	761.249	312.500	845.832	0.000	0.000	0.000
0.000	0.000	Automatic Member "g18P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??													

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     g18X     Leg5  234.356       L/r  312.200     Shear   88  19.54  234.356    312.200    761.249  312.500  845.832    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g18X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g18XY     Leg5  234.356       L/r  312.200     Shear   88  19.54  234.356    312.200    761.249  312.500  845.832    0.000    0.000    0.000
0.000             0.000           Automatic Member "g18XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g18Y     Leg5  234.356       L/r  312.200     Shear   88  19.54  234.356    312.200    761.249  312.500  845.832    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g18Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g19P    Diag1    8.122       L/r   27.187   Bearing  231   9.46    8.122     33.600     27.187   32.987   27.187    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19P"  ??
     g19X    Diag1    8.122       L/r   27.187   Bearing  231   9.46    8.122     33.600     27.187   32.987   27.187    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19X"  ??
    g19XY    Diag1    8.122       L/r   27.187   Bearing  231   9.46    8.122     33.600     27.187   32.987   27.187    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19XY"  ??
     g19Y    Diag1    8.122       L/r   27.187   Bearing  231   9.46    8.122     33.600     27.187   32.987   27.187    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 204.78 exceeds maximum of 200.00 for member "g19Y"  ??
     g20P    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g20P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g20X    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g20X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g20XY    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic Member "g20XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g20Y    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g20Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g21P    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g21P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g21X    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g21X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g21XY    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic Member "g21XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g21Y    Diag2   12.501       L/r   26.432   Rupture  175  11.40   12.501     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g21Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g22P    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g22P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g22X    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g22X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g22XY    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic Member "g22XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g22Y    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g22Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g23P    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
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0.000             0.000          Automatic  Member "g23P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g23X    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g23X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g23XY    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic Member "g23XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g23Y    Diag2   12.814       L/r   26.432   Rupture  173  11.23   12.814     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g23Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g24P    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g24P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g24X    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g24X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g24XY    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic Member "g24XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g24Y    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g24Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g25P    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g25P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g25X    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g25X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g25XY    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic Member "g25XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g25Y    Diag2   12.193       L/r   26.432   Rupture  178  11.58   12.193     33.600     33.984   30.299   26.432    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g25Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g26P    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g26P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g26X    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g26X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g26XY    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic Member "g26XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g26Y    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g26Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g27P    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g27P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g27X    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g27X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g27XY    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic Member "g27XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g27Y    Diag3   24.993       L/r   31.719   Rupture  123  10.82   24.993     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000             0.000          Automatic  Member "g27Y" will not be checked for block shear since more than one gage line exists (long edge
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distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g28P Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g28P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g28X Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g28X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g28XY Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g28XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g28Y Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g28Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g29P Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g29P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g29X Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g29X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g29XY Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g29XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g29Y Diag3 23.631 L/r 31.719 Rupture 128 11.24 23.631 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g29Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g30P Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g30P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g30X Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g30X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g30XY Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g30XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g30Y Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g30Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g31P Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g31P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g31X Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g31X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g31XY Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g31XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g31Y Diag3 24.367 L/r 31.719 Rupture 125 11.01 24.367 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g31Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g32P Diag3 23.301 L/r 31.719 Rupture 129 11.35 23.301 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g32P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g32X Diag3 23.301 L/r 31.719 Rupture 129 11.35 23.301 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g32X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g32XY Diag3 23.301 L/r 31.719 Rupture 129 11.35 23.301 33.450 40.781 32.319 31.719 0.000 0.000 0.000
0.000 0.000 Automatic Member "g32XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

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     g32Y    Diag3   23.301       L/r   31.719   Rupture  129  11.35   23.301     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g32Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g33P    Diag3   23.301       L/r   31.719   Rupture  129  11.35   23.301     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g33P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g33X    Diag3   23.301       L/r   31.719   Rupture  129  11.35   23.301     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g33X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g33XY    Diag3   23.301       L/r   31.719   Rupture  129  11.35   23.301     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000              0.000           Automatic Member "g33XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g33Y    Diag3   23.301       L/r   31.719   Rupture  129  11.35   23.301     33.450     40.781   32.319   31.719    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g33Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g34P    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g34P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g34X    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g34X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g34XY    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic Member "g34XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g34Y    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g34Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g35P    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g35P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g35X    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g35X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g35XY    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic Member "g35XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g35Y    Diag4   39.224       L/r   35.478  Net Sect  102  11.04   39.224     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g35Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g36P    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g36P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g36X    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g36X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g36XY    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic Member "g36XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g36Y    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g36Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g37P    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g37P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     g37X    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g37X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g37XY    Diag4   39.288       L/r   35.478  Net Sect  102  11.01   39.288     55.750     67.969   35.478   48.866    0.000    0.000    0.000
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0.000 0.000 Automatic Member "g37XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g37Y Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g37Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g38P Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g38P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g38X Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g38X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g38XY Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g38XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g38Y Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g38Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g39P Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g39P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g39X Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g39X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g39XY Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g39XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g39Y Diag4 39.288 L/r 35.478 Net Sect 102 11.01 39.288 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g39Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g40P Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g40P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g40X Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g40X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g40XY Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g40XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g40Y Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g40Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g41P Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g41P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g41X Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g41X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g41XY Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g41XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g41Y Diag4 38.346 L/r 35.478 Net Sect 105 11.35 38.346 55.750 67.969 35.478 48.866 0.000 0.000 0.000
0.000 0.000 Automatic Member "g41Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g42P Diag10 22.300 Shear 22.300 Shear 153 13.17 28.743 22.300 40.781 59.251 31.719 0.000 0.000 0.000
0.000 0.000 Automatic
g42X Diag10 22.300 Shear 22.300 Shear 153 13.17 28.743 22.300 40.781 59.251 31.719 0.000 0.000 0.000
0.000 0.000 Automatic
g42XY Diag10 22.300 Shear 22.300 Shear 153 13.17 28.743 22.300 40.781 59.251 31.719 0.000 0.000 0.000

0.000		0.000	Automatic												
g42Y	Diag10	22.300	Shear	22.300	Shear	153	13.17	28.743	22.300	40.781	59.251	31.719	0.000	0.000	0.000
0.000		0.000	Automatic												
g43P	Diag10	28.743	L/r	31.719	Rupture	153	13.17	28.743	33.600	40.781	60.011	31.719	0.000	0.000	0.000
0.000		0.000	Automatic												
g43X	Diag10	28.743	L/r	31.719	Rupture	153	13.17	28.743	33.600	40.781	60.011	31.719	0.000	0.000	0.000
0.000		0.000	Automatic												
g43XY	Diag10	28.743	L/r	31.719	Rupture	153	13.17	28.743	33.600	40.781	60.011	31.719	0.000	0.000	0.000
0.000		0.000	Automatic												
g43Y	Diag10	28.743	L/r	31.719	Rupture	153	13.17	28.743	33.600	40.781	60.011	31.719	0.000	0.000	0.000
0.000		0.000	Automatic												
g44P	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g44X	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g44XY	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g44Y	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g45P	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g45X	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g45XY	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g45Y	Diag5	16.048	L/r	21.146	Rupture	173	15.41	16.048	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g46P	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g46X	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g46XY	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g46Y	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g47P	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g47X	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g47XY	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g47Y	Diag5	13.122	L/r	21.146	Rupture	195	17.75	13.122	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
g48P	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g48X	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g48XY	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g48Y	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g49P	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g49X	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g49XY	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												
g49Y	Diag6	5.156	L/r	24.219	Net Sect	281	18.35	5.156	33.450	40.781	24.219	27.375	0.000	0.000	0.000
0.000		0.000	Automatic												

g50P	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g50X	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g50XY	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g50Y	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g51P	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g51X	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g51XY	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g51Y	Diag7	1.843	L/r	15.694	Rupture	428	21.40	1.843	22.300	20.391	21.688	15.694	0.000	0.000	0.000
0.000		0.000		Automatic											
g52P	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g52X	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g52XY	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g52Y	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g53P	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g53X	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g53XY	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g53Y	Diag8	1.310	L/r	13.570	Rupture	368	16.47	1.310	22.300	20.391	15.532	13.570	0.000	0.000	0.000
0.000		0.000		Automatic											
g54P	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54P" ??															
g54X	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54X" ??															
g54XY	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54XY" ??															
g54Y	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g54Y" ??															
g55P	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55P" ??															
g55X	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55X" ??															
g55XY	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55XY" ??															
g55Y	**Diag9**	**5.499**	**L/r**	**29.625**	**Rupture**	**305**	**24.03**	**5.499**	**33.450**	**40.781**	**32.319**	**29.625**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 261.11 exceeds maximum of 200.00 for member "g55Y" ??															
g56P	**Horz1**	**12.554**	**L/r**	**15.859**	**Rupture**	**181**	**9.00**	**12.554**	**22.300**	**20.391**	**26.932**	**15.859**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**	**Member "g56P" will not be checked for block shear since more than one gage line exists (long edge**										

distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g56Y Horz1 12.554 L/r 15.859 Rupture 181 9.00 12.554 22.300 20.391 26.932 15.859 0.000 0.000 0.000
0.000 0.000 Automatic Member "g56Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g57P Horz2 2.705 L/r 18.448 Net Sect 274 9.00 2.705 33.450 30.586 18.448 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g57X Horz2 2.705 L/r 18.448 Net Sect 274 9.00 2.705 33.450 30.586 18.448 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g58P Horz1 9.501 L/r 15.859 Rupture 181 9.00 9.501 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
g58Y Horz1 9.501 L/r 15.859 Rupture 181 9.00 9.501 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
g59P Horz3 5.696 L/r 20.391 Bearing 253 9.00 5.696 22.300 20.391 21.688 26.654 0.000 0.000 0.000
0.000 0.000 Automatic
g59X Horz3 5.696 L/r 20.391 Bearing 253 9.00 5.696 22.300 20.391 21.688 26.654 0.000 0.000 0.000
0.000 0.000 Automatic
g60P Horz1 9.501 L/r 23.789 Rupture 181 9.00 9.501 33.450 30.586 30.760 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g60Y Horz1 9.501 L/r 23.789 Rupture 181 9.00 9.501 33.450 30.586 30.760 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g61P Horz6 9.046 L/r 22.300 Shear 256 9.00 9.046 22.300 33.984 34.850 44.424 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61P" ??
g61X Horz6 9.046 L/r 22.300 Shear 256 9.00 9.046 22.300 33.984 34.850 44.424 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 203.59 exceeds maximum of 200.00 for member "g61X" ??
g62P Horz1 9.501 L/r 23.789 Rupture 181 9.00 9.501 33.450 30.586 30.760 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g62Y Horz1 9.501 L/r 23.789 Rupture 181 9.00 9.501 33.450 30.586 30.760 23.789 0.000 0.000 0.000
0.000 0.000 Automatic
g63P Horz3 5.696 L/r 20.391 Bearing 253 9.00 5.696 22.300 20.391 21.688 26.654 0.000 0.000 0.000
0.000 0.000 Automatic
g63X Horz3 5.696 L/r 20.391 Bearing 253 9.00 5.696 22.300 20.391 21.688 26.654 0.000 0.000 0.000
0.000 0.000 Automatic
g64P Horz4 15.634 L/r 21.146 Rupture 189 17.13 15.634 22.300 27.187 32.481 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g64Y Horz4 15.634 L/r 21.146 Rupture 189 17.13 15.634 22.300 27.187 32.481 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g65P Horz4 15.634 L/r 21.146 Rupture 189 17.13 15.634 22.300 27.187 32.481 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g65X Horz4 15.634 L/r 21.146 Rupture 189 17.13 15.634 22.300 27.187 32.481 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g66P Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66P" ??
g66X Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66X" ??
g66XY Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66XY" ??
g66Y Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g66Y" ??
g67P Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67P" ??
g67X Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000

0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67X" ??
g67XY Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67XY" ??
g67Y Horz7 5.085 L/r 15.859 Rupture 288 11.25 5.085 22.300 20.391 30.760 15.859 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 247.71 exceeds maximum of 200.00 for member "g67Y" ??
g68P Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g68X Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g68XY Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g68Y Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g69P Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g69X Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g69XY Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g69Y Horz5 17.846 L/r 21.146 Rupture 193 11.14 17.846 22.300 27.187 42.606 21.146 0.000 0.000 0.000
0.000 0.000 Automatic
g70P Horz5 38.264 L/r 42.606 Net Sect 97 5.63 38.264 0.000 0.000 42.606 0.000 0.000 0.000 0.000
0.000 0.000 Automatic
g70Y Horz5 38.264 L/r 42.606 Net Sect 97 5.63 38.264 0.000 0.000 42.606 0.000 0.000 0.000 0.000
0.000 0.000 Automatic
g71P Horz5 38.264 L/r 42.606 Net Sect 97 5.63 38.264 0.000 0.000 42.606 0.000 0.000 0.000 0.000
0.000 0.000 Automatic
g71X Horz5 38.264 L/r 42.606 Net Sect 97 5.63 38.264 0.000 0.000 42.606 0.000 0.000 0.000 0.000
0.000 0.000 Automatic
g72P Inner1 3.316 L/r 7.481 Rupture 248 6.36 3.316 11.150 10.195 18.448 7.481 0.000 0.000 0.000
0.000 0.000 Automatic
g72X Inner1 3.316 L/r 7.481 Rupture 248 6.36 3.316 11.150 10.195 18.448 7.481 0.000 0.000 0.000
0.000 0.000 Automatic
g73P Inner2 8.528 L/r 12.783 Rupture 179 12.73 8.528 22.300 20.391 18.650 12.783 0.000 0.000 0.000
0.000 0.000 Automatic
g73X Inner2 8.528 L/r 12.783 Rupture 179 12.73 8.528 22.300 20.391 18.650 12.783 0.000 0.000 0.000
0.000 0.000 Automatic
g74P Inner3 12.085 L/r 14.470 Rupture 154 12.73 12.085 22.300 20.391 24.669 14.470 0.000 0.000 0.000
0.000 0.000 Automatic
g74X Inner3 12.085 L/r 14.470 Rupture 154 12.73 12.085 22.300 20.391 24.669 14.470 0.000 0.000 0.000
0.000 0.000 Automatic
g75P Inner2 8.528 L/r 12.783 Rupture 179 12.73 8.528 22.300 20.391 18.650 12.783 0.000 0.000 0.000
0.000 0.000 Automatic
g75X Inner2 8.528 L/r 12.783 Rupture 179 12.73 8.528 22.300 20.391 18.650 12.783 0.000 0.000 0.000
0.000 0.000 Automatic
g76P Inner4 4.081 L/r 7.481 Rupture 238 15.75 4.081 11.150 10.195 18.650 7.481 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76P" ??
g76X Inner4 4.081 L/r 7.481 Rupture 238 15.75 4.081 11.150 10.195 18.650 7.481 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76X" ??
g76XY Inner4 4.081 L/r 7.481 Rupture 238 15.75 4.081 11.150 10.195 18.650 7.481 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 238.35 exceeds maximum of 200.00 for member "g76XY" ??
g76Y Inner4 4.081 L/r 7.481 Rupture 238 15.75 4.081 11.150 10.195 18.650 7.481 0.000 0.000 0.000
0.000 0.000 Automatic

KL/R value of 238.35 exceeds maximum of 200.00 for member "g76Y" ??
g77P TopCrArm 40.145 L/r 50.220 Net Sect 112 14.87 40.145 55.750 67.969 50.220 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g77P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g77X TopCrArm 40.145 L/r 50.220 Net Sect 112 14.87 40.145 55.750 67.969 50.220 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g77X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g77XY TopCrArm 40.145 L/r 50.220 Net Sect 112 14.87 40.145 55.750 67.969 50.220 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g77XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g77Y TopCrArm 40.145 L/r 50.220 Net Sect 112 14.87 40.145 55.750 67.969 50.220 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g77Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g78P TopCrArm 32.984 L/r 40.208 Net Sect 136 9.00 32.984 55.750 67.969 40.208 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g78P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g78Y TopCrArm 32.984 L/r 40.208 Net Sect 136 9.00 32.984 55.750 67.969 40.208 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g78Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g79P MdCrArm1 47.928 L/r 63.437 Rupture 93 18.72 47.928 66.900 81.562 70.425 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g79P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g79X MdCrArm1 47.928 L/r 63.437 Rupture 93 18.72 47.928 66.900 81.562 70.425 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g79X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g79XY MdCrArm1 47.928 L/r 63.437 Rupture 93 18.72 47.928 66.900 81.562 70.425 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g79XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g79Y MdCrArm1 47.928 L/r 63.437 Rupture 93 18.72 47.928 66.900 81.562 70.425 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g79Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g80P MdCrArm2 32.984 L/r 41.223 Net Sect 136 9.00 32.984 66.900 81.562 41.223 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g80P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g80Y MdCrArm2 32.984 L/r 41.223 Net Sect 136 9.00 32.984 66.900 81.562 41.223 63.437 0.000 0.000 0.000
0.000 0.000 Automatic Member "g80Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g81P BotCrArm 40.145 L/r 50.706 Net Sect 112 14.87 40.145 55.750 67.969 50.706 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g81P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g81X BotCrArm 40.145 L/r 50.706 Net Sect 112 14.87 40.145 55.750 67.969 50.706 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g81X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g81XY BotCrArm 40.145 L/r 50.706 Net Sect 112 14.87 40.145 55.750 67.969 50.706 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g81XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g81Y BotCrArm 40.145 L/r 50.706 Net Sect 112 14.87 40.145 55.750 67.969 50.706 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g81Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g82P BotCrArm 32.984 L/r 42.177 Net Sect 136 9.00 32.984 55.750 67.969 42.177 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g82P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g82Y BotCrArm 32.984 L/r 42.177 Net Sect 136 9.00 32.984 55.750 67.969 42.177 52.865 0.000 0.000 0.000
0.000 0.000 Automatic Member "g82Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g83P TopArmBr 8.230 L/r 14.094 Net Sect 168 16.55 8.230 33.450 30.586 14.094 22.950 0.000 0.000 0.000
0.000 0.000 Automatic
g83X TopArmBr 8.230 L/r 14.094 Net Sect 168 16.55 8.230 33.450 30.586 14.094 22.950 0.000 0.000 0.000

0.000		0.000	Automatic												
	g83XY TopArmBr	8.230	L/r	14.094	Net Sect	168	16.55	8.230	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g83Y TopArmBr	8.230	L/r	14.094	Net Sect	168	16.55	8.230	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g84P MidArmBr	7.246	L/r	18.144	Net Sect	205	19.95	7.246	33.450	40.781	18.144	30.600	0.000	0.000	0.000
0.000		0.000	Automatic												
	g84X MidArmBr	7.246	L/r	18.144	Net Sect	205	19.95	7.246	33.450	40.781	18.144	30.600	0.000	0.000	0.000
0.000		0.000	Automatic												
	g84XY MidArmBr	7.246	L/r	18.144	Net Sect	205	19.95	7.246	33.450	40.781	18.144	30.600	0.000	0.000	0.000
0.000		0.000	Automatic												
	g84Y MidArmBr	7.246	L/r	18.144	Net Sect	205	19.95	7.246	33.450	40.781	18.144	30.600	0.000	0.000	0.000
0.000		0.000	Automatic												
	g85P BotArmBr	8.391	L/r	14.094	Net Sect	166	16.39	8.391	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g85X BotArmBr	8.391	L/r	14.094	Net Sect	166	16.39	8.391	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g85XY BotArmBr	8.391	L/r	14.094	Net Sect	166	16.39	8.391	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g85Y BotArmBr	8.391	L/r	14.094	Net Sect	166	16.39	8.391	33.450	30.586	14.094	22.950	0.000	0.000	0.000
0.000		0.000	Automatic												
	g86P ShArmBr	13.780	L/r	21.146	Rupture	187	19.98	13.780	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
	g86X ShArmBr	13.780	L/r	21.146	Rupture	187	19.98	13.780	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
	g86XY ShArmBr	13.780	L/r	21.146	Rupture	187	19.98	13.780	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
	g86Y ShArmBr	13.780	L/r	21.146	Rupture	187	19.98	13.780	22.300	27.187	40.581	21.146	0.000	0.000	0.000
0.000		0.000	Automatic												
	g87P ShieldAr	26.876	L/r	44.600	Shear	195	18.17	26.876	44.600	107.880	83.203	83.907	0.000	0.000	0.000
0.000		0.000	Automatic												
	g87X ShieldAr	26.876	L/r	44.600	Shear	195	18.17	26.876	44.600	107.880	83.203	83.907	0.000	0.000	0.000
0.000		0.000	Automatic												
	g88P ShieldAr	44.600	Shear	44.600	Shear	48	4.50	72.578	44.600	107.880	83.203	83.907	0.000	0.000	0.000
0.000		0.000	Automatic												
	g88X ShieldAr	44.600	Shear	44.600	Shear	48	4.50	72.578	44.600	107.880	83.203	83.907	0.000	0.000	0.000
0.000		0.000	Automatic												
	g89P	**M3**	**14.670**	**L/r**	**21.146**	**Rupture**	**182**	**9.00**	**14.670**	**33.600**	**27.187**	**36.131**	**21.146**	**0.000**	**0.000**	**0.000**
0.000		**0.000**	**Automatic**	**Member "g89P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**												
	g89Y	**M3**	**14.670**	**L/r**	**21.146**	**Rupture**	**182**	**9.00**	**14.670**	**33.600**	**27.187**	**36.131**	**21.146**	**0.000**	**0.000**	**0.000**
0.000		**0.000**	**Automatic**	**Member "g89Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**												
	g90P	M4	4.733	L/r	20.391	Bearing	253	9.00	4.733	33.600	20.391	22.067	20.391	0.000	0.000	0.000
0.000		0.000	Automatic												
	g90X	M4	4.733	L/r	20.391	Bearing	253	9.00	4.733	33.600	20.391	22.067	20.391	0.000	0.000	0.000
0.000		0.000	Automatic												
	ig72P90P	Inner1	5.409	L/r	7.481	Rupture	194	6.36	5.409	11.150	10.195	18.448	7.481	0.000	0.000	0.000
0.000		0.000	Automatic												
	ig72P90X	Inner1	5.409	L/r	7.481	Rupture	194	6.36	5.409	11.150	10.195	18.448	7.481	0.000	0.000	0.000
0.000		0.000	Automatic												

The model contains 316 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	0.366	11.809	11.809
2P	0.598	17.358	17.358
3P	0.476	12.223	12.223
4P	0.563	17.416	17.416
5P	0.38	11.568	11.568
6P	0.388	10.996	10.996
7P	0.466	14.928	13.691
8P	0.314	12.019	10.111
9P	0.267	8.963	8.963
10P	0.267	8.984	8.984
11P	0.352	13.690	10.849
12P	0.222	10.365	8.074
13P	0.168	7.146	7.146
14P	0.165	7.004	7.004
15P	0.258	10.936	8.762
16P	0.175	8.185	6.292
17P	0.134	5.316	5.316
18P	0.218	10.312	7.119
19P	0.144	5.528	2.080
20P	0.123	4.967	3.467
21P	0.142	7.766	4.752
22P	0.142	4.752	7.766
23P	0.202	13.385	9.127
24P	0.202	9.127	13.385
25P	0.143	8.008	3.218
26P	0.196	10.107	3.218
27P	0.144	8.042	3.283
28P	0.207	9.519	2.774
1X	0.366	11.809	11.809
1XY	0.366	11.809	11.809
1Y	0.366	11.809	11.809
2X	0.598	17.358	17.358
2XY	0.598	17.358	17.358
2Y	0.598	17.358	17.358
3X	0.476	12.223	12.223
3XY	0.476	12.223	12.223
3Y	0.476	12.223	12.223
4X	0.563	17.416	17.416
4XY	0.563	17.416	17.416
4Y	0.563	17.416	17.416
5X	0.38	11.568	11.568
5XY	0.38	11.568	11.568
5Y	0.38	11.568	11.568
6X	0.388	10.996	10.996
6XY	0.388	10.996	10.996
6Y	0.388	10.996	10.996
7X	0.466	14.928	13.691
7XY	0.466	14.928	13.691
7Y	0.466	14.928	13.691
8X	0.314	12.019	10.111
8XY	0.314	12.019	10.111
8Y	0.314	12.019	10.111
9X	0.267	8.963	8.963
9XY	0.267	8.963	8.963
9Y	0.267	8.963	8.963
10X	0.267	8.984	8.984
10XY	0.267	8.984	8.984
10Y	0.267	8.984	8.984

11X	0.352	13.690	10.849
11XY	0.352	13.690	10.849
11Y	0.352	13.690	10.849
12X	0.222	10.365	8.074
12XY	0.222	10.365	8.074
12Y	0.222	10.365	8.074
13X	0.168	7.146	7.146
13XY	0.168	7.146	7.146
13Y	0.168	7.146	7.146
14X	0.165	7.004	7.004
14XY	0.165	7.004	7.004
14Y	0.165	7.004	7.004
15X	0.258	10.936	8.762
15XY	0.258	10.936	8.762
15Y	0.258	10.936	8.762
16X	0.175	8.185	6.292
16XY	0.175	8.185	6.292
16Y	0.175	8.185	6.292
17X	0.134	5.316	5.316
17XY	0.134	5.316	5.316
17Y	0.134	5.316	5.316
18X	0.218	10.312	7.119
18XY	0.218	10.312	7.119
18Y	0.218	10.312	7.119
19X	0.144	5.528	2.080
21X	0.142	7.766	4.752
21XY	0.142	7.766	4.752
21Y	0.142	7.766	4.752
22X	0.142	4.752	7.766
22XY	0.142	4.752	7.766
22Y	0.142	4.752	7.766
23Y	0.202	13.385	9.127
24X	0.202	9.127	13.385
25X	0.143	8.008	3.218
26X	0.196	10.107	3.218
27X	0.144	8.042	3.283
28X	0.207	9.519	2.774
i0.50E148S	0.0311	1.500	1.500
Total	26.9	980.842	863.933

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	13.028	538.833	421.924	232.515	151.376
2	7.602	228.558	228.558	95.348	95.348
3	3.308	118.979	118.979	43.355	43.355
4	2.928	94.471	94.471	37.600	37.600
Total	26.866	980.842	863.933	408.819	327.680

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	13.028	13.028	2366.218	2366.218

2	7.602	8.363	1077.948	1185.743
3	3.308	4.465	558.154	753.508
4	2.928	3.602	384.610	473.070
Total	26.866	29.457	4386.929	4778.538

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	19X	155.000
1	18X	148.000
1	19P	155.000
1	18P	148.000
1	18Y	148.000
1	18XY	148.000
1	17X	141.000
1	17P	141.000
1	17Y	141.000
1	17XY	141.000
1	16X	134.280
1	16P	134.280
1	16Y	134.280
1	16XY	134.280
1	15X	127.000
1	15P	127.000
1	15Y	127.000
1	15XY	127.000
1	14X	121.000
1	14P	121.000
1	14Y	121.000
1	14XY	121.000
1	13X	114.260
1	13P	114.260
1	13Y	114.260
1	13XY	114.260
1	12X	107.910
1	12P	107.910
1	12Y	107.910
1	12XY	107.910
1	11X	101.000
1	11P	101.000
1	11Y	101.000
1	11XY	101.000
1	10X	94.610
1	10P	94.610
1	10Y	94.610
1	10XY	94.610
1	9X	88.260
1	9P	88.260
1	9Y	88.260
1	9XY	88.260
1	8X	81.910
1	8P	81.910
1	8Y	81.910
1	8XY	81.910
1	7X	75.000
1	7P	75.000

1	7Y	75.000
1	7XY	75.000
1	20P	155.000
1	i0.50E148S	148.000
1	27X	127.000
1	27P	127.000
1	26X	101.000
1	26P	101.000
1	25X	75.000
1	25P	75.000
1	28P	155.000
1	28X	155.000
2	7X	75.000
2	6X	67.000
2	7P	75.000
2	6P	67.000
2	7Y	75.000
2	6Y	67.000
2	7XY	75.000
2	6XY	67.000
2	5X	59.000
2	5P	59.000
2	5Y	59.000
2	5XY	59.000
2	4X	51.000
2	4P	51.000
2	4Y	51.000
2	4XY	51.000
2	3X	35.000
2	3P	35.000
2	3Y	35.000
2	3XY	35.000
2	23P	35.000
2	23Y	35.000
2	24P	35.000
2	24X	35.000
3	3X	35.000
3	2X	19.000
3	3P	35.000
3	2P	19.000
3	3Y	35.000
3	2Y	19.000
3	3XY	35.000
3	2XY	19.000
3	23P	35.000
3	23Y	35.000
3	24P	35.000
3	24X	35.000
3	21P	19.000
3	21X	19.000
3	21XY	19.000
3	21Y	19.000
3	22P	19.000
3	22X	19.000
3	22XY	19.000
3	22Y	19.000
4	2X	19.000
4	1X	0.000
4	2P	19.000

4	1P	0.000
4	2Y	19.000
4	1Y	0.000
4	2XY	19.000
4	1XY	0.000
4	21P	19.000
4	21X	19.000
4	21XY	19.000
4	21Y	19.000
4	22P	19.000
4	22X	19.000
4	22XY	19.000
4	22Y	19.000

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	155.000	75.000	60	208	0.00	9.00	688.500	45.34	37.34	1173.817
2	75.000	35.000	24	60	9.00	22.50	631.192	9.00	22.50	631.192
3	35.000	19.000	20	36	22.50	27.90	403.200	22.50	27.90	403.200
4	19.000	0.000	16	12	27.90	34.33	591.223	27.90	34.33	591.223

*** 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	28P	C-EX1	No Limit
2	28X	C-EX1	No Uplift
3	27P	C-EX1	No Uplift
4	27X	C-EX1	No Uplift
5	26P	C-EX1	No Uplift
6	26X	C-EX1	No Uplift
7	25P	C-EX1	No Uplift
8	25X	C-EX1	No Uplift
10	14X	C-EX1	No Limit
11	12X	C-EX1	No Limit
12	10X	C-EX1	No Limit
13	8X	C-EX1	No Limit
14	6X	C-EX1	No Limit
15	4X	C-EX1	No Limit
16	3X	C-EX1	No Limit
17	2X	C-EX1	No Limit
18	16P	C-EX1	No Limit

19	14P	C-EX1	No Limit
20	12P	C-EX1	No Limit
21	10P	C-EX1	No Limit
22	8P	C-EX1	No Limit
23	6P	C-EX1	No Limit
24	4P	C-EX1	No Limit
25	3P	C-EX1	No Limit
26	2P	C-EX1	No Limit
27	17P	C-EX1	No Limit
28	17X	C-EX1	No Limit
29	17XY	C-EX1	No Limit
30	17Y	C-EX1	No Limit
31	18P	C-EX1	No Limit
32	18X	C-EX1	No Limit
33	18XY	C-EX1	No Limit
34	18Y	C-EX1	No Limit
35	14XY	C-EX1	No Limit
36	14Y	C-EX1	No Limit
38	16XY	C-EX1	No Limit
40	12XY	C-EX1	No Limit
41	10XY	C-EX1	No Limit
42	8XY	C-EX1	No Limit
43	6XY	C-EX1	No Limit
44	4XY	C-EX1	No Limit
45	3XY	C-EX1	No Limit
46	2XY	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1600200.wi\02_manchester ct - ctv1209\04_structural\backup documentation\calcs\pls tower\cl&p # 20003.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)	155.00 (ft)	
Structure height	155.00 (ft)	
Structure height above ground	155.00 (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 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	34 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	34 loads	NESC 2007	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
28X	783	2886	0	(3/8 AW) Shield Wire
28P	1241	3998	3259	(OPGW-120) Conductor Wire
27X	4371	10723	0	(Bluebird) Connductor Wire
27P	3086	5603	4889	(Bittern) Conductor Wire
26X	4371	10723	0	(Bluebird) Connductor Wire
26P	3086	5603	4889	(Bittern) Conductor Wire
25X	4371	10723	0	(Bluebird) Connductor Wire
25P	3086	5603	4889	(Bittern) Conductor Wire
14X	276	65	0	AT&T Coax Cables
12X	598	140	0	AT&T Coax Cables
10X	598	140	0	AT&T Coax Cables
8X	598	140	0	AT&T Coax Cables
6X	736	172	0	AT&T Coax Cables
4X	736	172	0	AT&T Coax Cables
3X	736	172	0	AT&T Coax Cables
2X	1242	291	0	AT&T Coax Cables
18X	57	1158	-837	AT&T Mast Connection
18XY	50	2059	859	AT&T Mast Connection
18P	35	260	1134	AT&T Mast Connection
18Y	21	422	-1109	AT&T Mast Connection

14X	1370	-119	43	AT&T Mast Connection
14XY	2154	-211	-14	AT&T Mast Connection
14P	3507	-159	-38	AT&T Mast Connection
14Y	6471	-233	-57	AT&T Mast Connection
18XY	460	156	0	AT&T Coax Cables
16XY	644	218	0	AT&T Coax Cables
14XY	598	202	0	AT&T Coax Cables
12XY	598	202	0	AT&T Coax Cables
10XY	598	202	0	AT&T Coax Cables
8XY	598	202	0	AT&T Coax Cables
6XY	736	249	0	AT&T Coax Cables
4XY	736	249	0	AT&T Coax Cables
3XY	736	249	0	AT&T Coax Cables
2XY	1242	420	0	AT&T Coax Cables

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

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 Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	155.00	75.00	115.00	10.00	10.00	3.200	4844.0	0.00	3.200	0.0	0	19541
2	75.00	35.00	55.00	10.00	10.00	3.200	3051.1	0.00	3.200	0.0	0	12544
3	35.00	19.00	27.00	10.00	10.00	3.200	1387.4	0.00	3.200	0.0	0	6698
4	19.00	0.00	9.50	10.00	10.00	3.200	1203.2	0.00	3.200	0.0	0	5402

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
28X	168	1659	84	(3/8 AW) Shield Wire
28P	333	2927	2608	(OPGW-120) Conductor Wire
27X	2011	7786	4431	(Bluebird) Connductor Wire
27P	1320	4871	4297	(Bittern) Conductor Wire
26X	2011	7786	4431	(Bluebird) Connductor Wire
26P	1320	4871	4297	(Bittern) Conductor Wire
25X	2011	7786	4431	(Bluebird) Connductor Wire
25P	1320	4871	4297	(Bittern) Conductor Wire
14X	75	207	0	AT&T Coax Cables
12X	162	449	0	AT&T Coax Cables
10X	162	449	0	AT&T Coax Cables
8X	162	449	0	AT&T Coax Cables
6X	200	553	0	AT&T Coax Cables
4X	200	553	0	AT&T Coax Cables
3X	200	553	0	AT&T Coax Cables
2X	337	933	0	AT&T Coax Cables
18X	24	4482	-3260	AT&T Mast Connection
18XY	21	7922	3313	AT&T Mast Connection
18P	14	972	4303	AT&T Mast Connection
18Y	9	1674	-4350	AT&T Mast Connection
14X	1870	-539	114	AT&T Mast Connection
14XY	3176	-984	-15	AT&T Mast Connection
14P	440	-673	-122	AT&T Mast Connection
14Y	707	-1060	16	AT&T Mast Connection
18XY	125	518	0	AT&T Coax Cables

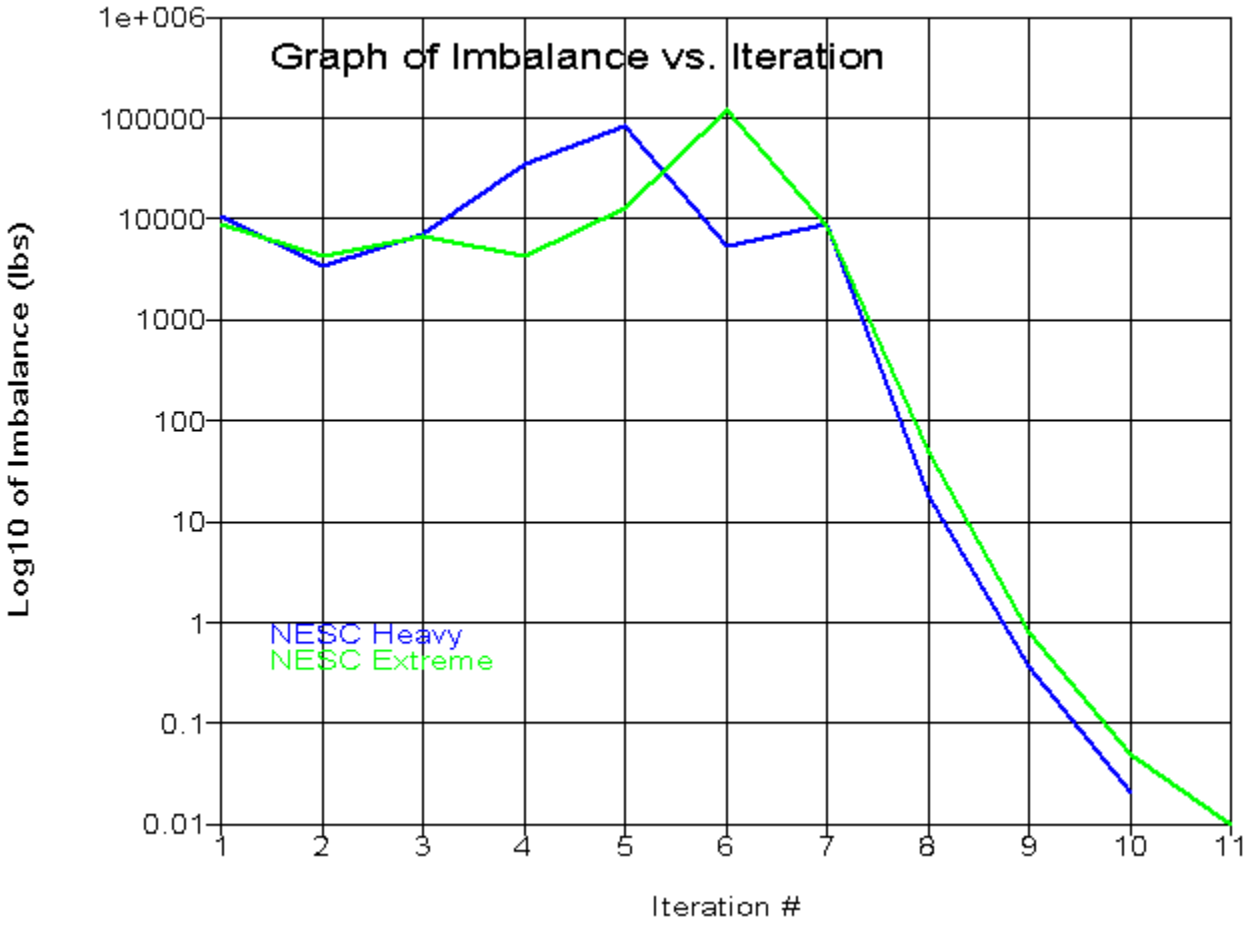
16XY	175	726	0	AT&T Coax Cables
14XY	162	674	0	AT&T Coax Cables
12XY	162	674	0	AT&T Coax Cables
10XY	162	674	0	AT&T Coax Cables
8XY	162	674	0	AT&T Coax Cables
6XY	200	829	0	AT&T Coax Cables
4XY	200	829	0	AT&T Coax Cables
3XY	200	829	0	AT&T Coax Cables
2XY	337	1399	0	AT&T Coax Cables

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 Gross Area (ft^2)	Tran Soli- dity Ratio	Tran Angle Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli- dity Ratio	Long Angle Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	155.00	75.00	115.00	32.95	32.95	151.38	688.50	0.220	3.200	15961.5	0.00	232.51	1173.82	0.198	3.200	0.0	0	13028
2	75.00	35.00	55.00	32.95	32.95	95.35	631.19	0.151	3.200	10053.8	0.00	95.35	631.19	0.151	3.200	0.0	0	8363
3	35.00	19.00	27.00	32.95	32.95	43.36	403.20	0.108	3.200	4571.5	0.00	43.36	403.20	0.108	3.200	0.0	0	4465
4	19.00	0.00	9.50	32.95	32.95	37.60	591.22	0.064	3.200	3964.7	0.00	37.60	591.22	0.064	3.200	0.0	0	3602

*** Analysis Results:

Maximum element usage is 95.05% for Angle "g52Y" in load case "NESC Extreme"
Maximum insulator usage is 23.58% for Clamp "6" 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	1.46	0.000	-0.162	-0.144	-0.162
Leg1	g1X	1.68	0.000	-0.187	-0.187	-0.175
Leg1	g1XY	0.97	0.000	-0.108	-0.108	-0.100
Leg1	g1Y	1.80	0.000	-0.200	-0.173	-0.200

Leg2	g2P	14.80	10.333	0.000	6.779	10.333
Leg2	g2X	26.04	0.000	-11.758	-10.715	-11.758
Leg2	g2XY	7.04	0.000	-3.177	-2.206	-3.177
Leg2	g2Y	11.30	7.894	0.000	5.034	7.894
Leg2	g3P	15.52	10.840	0.000	4.934	10.840
Leg2	g3X	42.77	0.000	-20.114	-15.552	-20.114
Leg2	g3XY	28.97	0.000	-13.627	-7.340	-13.627
Leg2	g3Y	20.57	14.363	0.000	8.715	14.363
Leg2	g4P	52.56	23.441	0.000	9.136	23.441
Leg2	g4X	65.99	0.000	-28.494	-19.724	-28.494
Leg2	g4XY	56.32	0.000	-24.318	-12.952	-24.318
Leg2	g4Y	63.19	28.184	0.000	14.906	28.184
Leg3	g5P	18.74	28.394	0.000	10.186	28.394
Leg3	g5X	41.57	0.000	-44.058	-30.384	-44.058
Leg3	g5XY	32.42	0.000	-34.365	-19.355	-34.365
Leg3	g5Y	27.14	41.114	0.000	22.279	41.114
Leg3	g6P	22.90	34.687	0.000	15.058	34.687
Leg3	g6X	62.64	0.000	-62.039	-46.713	-62.039
Leg3	g6XY	43.90	0.000	-43.478	-32.044	-43.478
Leg3	g6Y	36.66	55.538	0.000	32.357	55.538
Leg3	g7P	30.71	46.521	0.000	23.865	46.521
Leg3	g7X	79.53	0.000	-81.757	-61.549	-81.757
Leg3	g7XY	55.10	0.000	-56.645	-41.980	-56.645
Leg3	g7Y	49.06	74.327	0.000	45.908	74.327
Leg3	g8P	51.10	56.879	0.000	29.985	56.879
Leg3	g8X	78.57	0.000	-97.244	-73.288	-97.244
Leg3	g8XY	53.82	0.000	-66.617	-49.215	-66.617
Leg3	g8Y	78.93	87.847	0.000	53.967	87.847
Leg4	g9P	21.27	68.374	0.000	38.167	68.374
Leg4	g9X	48.15	0.000	-126.256	-95.118	-126.256
Leg4	g9XY	30.35	0.000	-79.580	-60.943	-79.580
Leg4	g9Y	35.34	113.617	0.000	71.946	113.617
Leg4	g10P	24.55	78.930	0.000	46.956	78.930
Leg4	g10X	57.64	0.000	-151.554	-114.565	-151.554
Leg4	g10XY	33.65	0.000	-88.473	-71.464	-88.473
Leg4	g10Y	43.52	139.912	0.000	92.104	139.912
Leg4	g11P	30.02	96.514	0.000	61.347	96.514
Leg4	g11X	70.50	0.000	-185.365	-139.885	-185.365
Leg4	g11XY	41.71	0.000	-109.687	-90.068	-109.687
Leg4	g11Y	52.85	169.916	0.000	115.849	169.916
Leg4	g12P	45.39	107.635	0.000	70.222	107.635
Leg4	g12X	80.11	0.000	-201.997	-154.107	-201.997
Leg4	g12XY	46.23	0.000	-116.582	-97.129	-116.582
Leg4	g12Y	79.42	188.320	0.000	128.261	188.320
Leg5	g13P	28.06	108.750	0.000	73.849	108.750
Leg5	g13X	75.55	0.000	-214.051	-164.618	-214.051
Leg5	g13XY	41.10	0.000	-116.452	-99.852	-116.452
Leg5	g13Y	51.98	201.433	0.000	138.062	201.433
Leg5	g14P	26.65	103.268	0.000	70.996	103.268
Leg5	g14X	78.29	0.000	-221.875	-174.599	-221.875
Leg5	g14XY	43.19	0.000	-122.408	-109.222	-122.408
Leg5	g14Y	51.58	199.881	0.000	135.971	199.881
Leg5	g15P	30.65	95.696	0.000	67.615	95.696
Leg5	g15X	72.42	0.000	-205.318	-162.700	-205.318
Leg5	g15XY	39.23	0.000	-111.203	-101.351	-111.203
Leg5	g15Y	60.45	188.719	0.000	129.166	188.719
Leg5	g16P	22.14	69.116	0.000	43.607	69.116
Leg5	g16X	78.36	0.000	-207.478	-179.692	-207.478
Leg5	g16XY	44.60	0.000	-118.108	-118.108	-112.687

Leg5	g16Y	53.15	165.940	0.000	105.948	165.940
Leg5	g17P	21.91	68.391	0.000	42.080	68.391
Leg5	g17X	79.27	0.000	-208.078	-180.709	-208.078
Leg5	g17XY	45.37	0.000	-119.097	-119.097	-113.292
Leg5	g17Y	52.86	165.021	0.000	104.217	165.021
Leg5	g18P	23.79	74.279	0.000	47.437	74.279
Leg5	g18X	85.87	0.000	-201.238	-171.170	-201.238
Leg5	g18XY	47.87	0.000	-112.195	-112.195	-111.669
Leg5	g18Y	53.68	167.595	0.000	108.173	167.595
Diag1	g19P	87.54	0.000	-7.110	-6.922	-7.110
Diag1	g19X	25.74	6.997	0.000	6.825	6.997
Diag1	g19XY	6.46	1.631	-0.525	1.631	-0.525
Diag1	g19Y	21.69	0.365	-1.762	-1.762	0.365
Diag2	g20P	13.68	3.615	-0.377	-0.377	3.615
Diag2	g20X	29.80	0.000	-3.726	-0.824	-3.726
Diag2	g20XY	87.12	0.000	-10.891	-7.428	-10.891
Diag2	g20Y	40.52	10.711	0.000	6.561	10.711
Diag2	g21P	12.75	3.371	0.000	3.371	2.643
Diag2	g21X	58.58	0.000	-5.561	-3.578	-5.561
Diag2	g21XY	36.10	0.000	-3.427	-1.237	-3.427
Diag2	g21Y	24.00	0.000	-3.001	-3.001	-2.798
Diag2	g22P	15.25	4.030	0.000	0.817	4.030
Diag2	g22X	30.23	0.224	-3.874	0.224	-3.874
Diag2	g22XY	84.70	0.000	-10.853	-6.601	-10.853
Diag2	g22Y	42.04	11.112	0.000	7.348	11.112
Diag2	g23P	11.38	3.008	0.000	3.008	2.887
Diag2	g23X	10.83	2.862	0.000	0.871	2.862
Diag2	g23XY	18.78	4.964	0.000	3.175	4.964
Diag2	g23Y	25.52	0.000	-3.270	-3.270	-2.471
Diag2	g24P	15.76	4.166	-1.107	-1.107	4.166
Diag2	g24X	56.75	0.000	-6.920	-1.617	-6.920
Diag2	g24XY	73.11	0.000	-8.914	-5.310	-8.914
Diag2	g24Y	43.32	11.450	0.000	6.818	11.450
Diag2	g25P	8.33	2.201	0.000	2.201	2.020
Diag2	g25X	45.59	0.000	-4.230	-4.125	-4.230
Diag2	g25XY	47.18	0.000	-4.378	-2.825	-4.378
Diag2	g25Y	37.98	0.000	-4.630	-4.630	-3.897
Diag3	g26P	26.84	8.514	0.000	2.562	8.514
Diag3	g26X	40.57	0.000	-10.139	-3.481	-10.139
Diag3	g26XY	57.71	0.000	-14.423	-14.110	-14.423
Diag3	g26Y	46.86	14.865	0.000	14.655	14.865
Diag3	g27P	27.92	8.857	0.000	8.857	6.831
Diag3	g27X	14.18	0.629	-3.543	-3.543	0.629
Diag3	g27XY	10.24	3.247	-1.012	3.247	-1.012
Diag3	g27Y	29.74	0.000	-7.432	-7.432	-5.074
Diag3	g28P	31.43	9.970	0.000	3.315	9.970
Diag3	g28X	37.96	0.000	-8.970	-3.039	-8.970
Diag3	g28XY	66.56	0.000	-15.728	-15.728	-15.611
Diag3	g28Y	45.50	14.431	0.000	14.431	14.047
Diag3	g29P	23.85	7.564	0.000	7.564	4.840
Diag3	g29X	12.15	1.794	-2.870	-2.870	1.794
Diag3	g29XY	13.20	4.188	-0.059	4.188	-0.059
Diag3	g29Y	39.57	0.000	-9.351	-9.351	-7.453
Diag3	g30P	28.66	9.091	0.000	3.064	9.091
Diag3	g30X	41.30	0.000	-10.062	-3.319	-10.062
Diag3	g30XY	58.18	0.000	-14.177	-14.177	-14.063
Diag3	g30Y	49.12	15.580	0.000	15.474	15.580
Diag3	g31P	29.51	9.359	0.000	9.359	7.663
Diag3	g31X	18.84	0.000	-4.590	-4.590	-0.545

Diag3	g31XY	11.38	2.247	-2.441	2.247	-2.441
Diag3	g31Y	29.50	0.000	-7.188	-7.188	-4.342
Diag3	g32P	23.64	7.499	0.000	0.590	7.499
Diag3	g32X	61.57	0.000	-14.346	-6.004	-14.346
Diag3	g32XY	53.21	0.000	-12.399	-12.399	-11.910
Diag3	g32Y	53.94	17.110	0.000	15.086	17.110
Diag3	g33P	18.98	6.019	0.000	6.019	3.980
Diag3	g33X	12.61	3.493	-2.939	-2.939	3.493
Diag3	g33XY	8.79	2.787	-0.678	2.787	-0.678
Diag3	g33Y	49.81	0.000	-11.607	-11.607	-9.615
Diag4	g34P	37.79	13.406	0.000	3.309	13.406
Diag4	g34X	41.48	0.000	-16.271	-5.761	-16.271
Diag4	g34XY	62.38	0.000	-24.469	-24.469	-19.399
Diag4	g34Y	68.13	24.170	0.000	24.170	19.994
Diag4	g35P	42.23	14.982	0.000	14.982	11.132
Diag4	g35X	14.59	3.185	-5.723	-5.723	3.185
Diag4	g35XY	14.84	5.264	-3.832	5.264	-3.832
Diag4	g35Y	29.52	0.000	-11.579	-11.579	-6.371
Diag4	g36P	45.61	16.181	0.000	5.260	16.181
Diag4	g36X	37.02	0.000	-14.544	-4.186	-14.544
Diag4	g36XY	63.65	0.000	-25.009	-25.009	-21.154
Diag4	g36Y	68.20	24.197	0.000	24.197	19.606
Diag4	g37P	29.23	10.372	0.000	10.372	4.585
Diag4	g37X	14.59	5.175	-4.179	-4.179	5.175
Diag4	g37XY	19.22	6.818	-1.837	6.818	-1.837
Diag4	g37Y	41.26	0.000	-16.209	-16.209	-12.897
Diag4	g38P	42.72	15.155	0.000	4.623	15.155
Diag4	g38X	42.07	0.000	-16.527	-5.271	-16.527
Diag4	g38XY	62.01	0.000	-24.362	-24.362	-20.321
Diag4	g38Y	71.20	25.259	0.000	25.259	21.522
Diag4	g39P	51.36	18.221	0.000	18.221	15.684
Diag4	g39X	21.13	0.000	-8.303	-8.303	-0.032
Diag4	g39XY	19.81	2.480	-7.330	2.480	-7.330
Diag4	g39Y	21.27	0.000	-8.358	-8.358	-1.704
Diag4	g40P	33.25	11.797	0.000	2.492	11.797
Diag4	g40X	55.66	0.000	-21.343	-9.671	-21.343
Diag4	g40XY	51.61	0.000	-19.791	-19.791	-15.440
Diag4	g40Y	71.17	25.248	0.000	25.248	25.134
Diag4	g41P	11.78	4.178	-2.210	4.178	-2.210
Diag4	g41X	28.89	10.249	-1.393	-1.393	10.249
Diag4	g41XY	21.61	7.668	0.000	7.668	0.920
Diag4	g41Y	62.22	0.000	-22.604	-22.604	-20.925
Diag10	g42P	93.19	0.000	-20.781	-20.781	-16.858
Diag10	g42X	59.51	13.270	0.000	13.270	9.435
Diag10	g42XY	44.18	9.852	-6.551	-6.551	9.852
Diag10	g42Y	28.59	6.376	-6.223	6.376	-6.223
Diag10	g43P	62.17	0.000	-16.106	-2.738	-16.106
Diag10	g43X	24.58	5.215	-7.066	-7.066	5.215
Diag10	g43XY	60.45	19.174	0.000	19.174	11.841
Diag10	g43Y	89.52	0.000	-23.193	-23.193	-17.645
Diag5	g44P	60.44	0.000	-9.700	-9.700	-6.674
Diag5	g44X	65.88	13.932	0.000	13.932	10.661
Diag5	g44XY	32.55	3.416	-5.224	-5.224	3.416
Diag5	g44Y	41.40	4.790	-6.645	4.790	-6.645
Diag5	g45P	71.49	15.117	0.000	15.117	10.291
Diag5	g45X	79.63	0.000	-12.778	-12.778	-6.860
Diag5	g45XY	28.83	6.097	-2.116	6.097	-2.116
Diag5	g45Y	43.34	9.164	0.000	0.195	9.164
Diag5	g46P	89.56	0.000	-11.751	-11.751	-8.229

Diag5	g46X	36.62	7.743	0.000	7.743	5.013
Diag5	g46XY	40.59	3.353	-5.326	-5.326	3.353
Diag5	g46Y	19.61	4.146	-2.220	4.146	-2.220
Diag5	g47P	38.94	1.256	-4.585	1.256	-4.585
Diag5	g47X	47.52	0.000	-6.236	-6.236	-0.033
Diag5	g47XY	40.41	8.545	0.000	8.545	3.207
Diag5	g47Y	90.26	0.000	-10.629	-10.629	-6.273
Diag6	g48P	0.00	0.000	0.000	0.000	0.000
Diag6	g48X	90.95	22.028	0.000	22.028	13.625
Diag6	g48XY	26.38	6.388	0.000	2.268	6.388
Diag6	g48Y	62.99	15.255	0.000	15.255	0.490
Diag6	g49P	67.96	16.460	0.000	16.460	1.178
Diag6	g49X	52.60	12.740	0.000	1.112	12.740
Diag6	g49XY	85.98	20.825	0.000	20.825	17.468
Diag6	g49Y	0.52	0.125	0.000	0.125	0.000
Diag7	g50P	86.76	13.615	0.000	13.615	9.312
Diag7	g50X	55.87	2.155	-1.029	-1.029	2.155
Diag7	g50XY	53.64	8.418	0.000	8.418	0.430
Diag7	g50Y	6.53	1.024	0.000	0.000	1.024
Diag7	g51P	0.00	0.000	0.000	0.000	0.000
Diag7	g51X	71.78	11.265	0.000	11.265	6.579
Diag7	g51XY	25.20	3.955	0.000	0.000	3.955
Diag7	g51Y	68.10	10.688	0.000	10.688	1.834
Diag8	g52P	71.22	9.664	0.000	9.664	1.194
Diag8	g52X	11.74	1.593	0.000	0.000	1.593
Diag8	g52XY	65.61	8.903	0.000	8.903	5.733
Diag8	g52Y	95.05	0.000	-1.246	0.000	-1.246
Diag8	g53P	0.00	0.000	0.000	0.000	0.000
Diag8	g53X	75.94	10.305	0.000	10.305	10.173
Diag8	g53XY	61.77	8.382	0.000	0.435	8.382
Diag8	g53Y	78.54	6.368	-1.029	6.368	-1.029
Diag9	g54P	39.49	11.698	0.000	11.698	0.894
Diag9	g54X	10.79	1.360	-0.594	-0.594	1.360
Diag9	g54XY	37.06	10.979	0.000	10.979	6.471
Diag9	g54Y	38.19	0.000	-2.100	-0.794	-2.100
Diag9	g55P	27.71	0.000	-1.524	-1.524	-1.271
Diag9	g55X	41.78	12.378	0.000	12.378	11.963
Diag9	g55XY	32.75	9.702	0.000	0.141	9.702
Diag9	g55Y	28.99	8.588	-1.209	8.588	-1.209
Horz1	g56P	15.51	0.000	-1.947	-1.947	-1.748
Horz1	g56Y	3.46	0.549	-0.134	0.549	-0.134
Horz2	g57P	38.40	7.084	0.000	3.915	7.084
Horz2	g57X	0.00	0.000	0.000	0.000	0.000
Horz1	g58P	21.31	3.379	0.000	3.379	1.036
Horz1	g58Y	22.14	3.512	0.000	3.512	1.901
Horz3	g59P	9.77	0.272	-0.556	0.272	-0.556
Horz3	g59X	26.15	5.333	0.000	5.333	4.627
Horz1	g60P	23.32	5.547	0.000	5.547	2.316
Horz1	g60Y	19.94	4.744	0.000	4.744	2.002
Horz6	g61P	8.66	1.931	0.000	1.931	1.029
Horz6	g61X	12.26	2.735	0.000	2.735	0.283
Horz1	g62P	22.00	5.233	0.000	5.233	3.431
Horz1	g62Y	9.43	2.244	-0.761	2.244	-0.761
Horz3	g63P	0.00	0.000	0.000	0.000	0.000
Horz3	g63X	46.11	9.402	0.000	7.527	9.402
Horz4	g64P	38.37	0.000	-5.999	-5.999	-3.695
Horz4	g64Y	34.05	0.000	-5.324	-5.324	-2.963
Horz4	g65P	15.01	3.175	-1.898	-1.898	3.175
Horz4	g65X	63.57	0.000	-9.938	-7.428	-9.938

Horz7	g66P	19.12	0.000	-0.972	-0.166	-0.972
Horz7	g66X	21.00	0.144	-1.068	-1.068	0.144
Horz7	g66XY	4.95	0.707	-0.252	-0.252	0.707
Horz7	g66Y	43.08	0.000	-2.190	-1.195	-2.190
Horz7	g67P	0.65	0.103	0.000	0.036	0.103
Horz7	g67X	5.31	0.000	-0.270	-0.270	-0.131
Horz7	g67XY	8.35	0.000	-0.425	-0.425	-0.303
Horz7	g67Y	8.56	0.000	-0.435	-0.435	-0.366
Horz5	g68P	16.74	0.000	-2.988	-1.384	-2.988
Horz5	g68X	39.45	0.000	-7.039	-7.039	-4.410
Horz5	g68XY	2.78	0.000	-0.497	-0.497	-0.374
Horz5	g68Y	30.87	0.000	-5.510	-5.510	-2.096
Horz5	g69P	2.91	0.000	-0.519	-0.393	-0.519
Horz5	g69X	34.59	0.000	-6.173	-6.173	-3.363
Horz5	g69XY	11.33	0.000	-2.022	-0.288	-2.022
Horz5	g69Y	31.56	0.000	-5.631	-5.631	-1.012
Horz5	g70P	8.77	0.000	-3.356	-1.839	-3.356
Horz5	g70Y	2.19	0.000	-0.837	-0.837	-0.407
Horz5	g71P	3.77	0.000	-1.441	-1.441	-1.030
Horz5	g71X	3.79	1.614	-0.642	-0.642	1.614
Inner1	g72P	0.00	0.000	0.000	0.000	0.000
Inner1	g72X	72.98	0.000	-2.420	-0.982	-2.420
Inner2	g73P	26.69	0.000	-2.276	-2.276	-0.461
Inner2	g73X	23.45	2.998	0.000	2.998	1.457
Inner3	g74P	22.58	0.000	-2.729	-2.729	-0.452
Inner3	g74X	13.71	1.984	-0.079	1.984	-0.079
Inner2	g75P	74.75	0.000	-6.375	-6.375	-5.341
Inner2	g75X	54.20	0.000	-4.622	-1.582	-4.622
Inner4	g76P	15.00	0.000	-0.612	-0.144	-0.612
Inner4	g76X	5.19	0.346	-0.212	-0.212	0.346
Inner4	g76XY	9.97	0.746	0.000	0.186	0.746
Inner4	g76Y	25.08	0.000	-1.023	-0.515	-1.023
TopCrArm	g77P	26.57	0.000	-10.666	-8.642	-10.666
TopCrArm	g77X	19.47	0.000	-7.816	-7.816	-5.316
TopCrArm	g77XY	15.58	7.823	0.000	7.226	7.823
TopCrArm	g77Y	29.60	0.000	-11.883	-11.883	-2.109
TopCrArm	g78P	20.20	0.000	-6.664	-6.664	-6.180
TopCrArm	g78Y	10.02	1.203	-3.306	-3.306	1.203
MdCrArm1	g79P	26.14	0.000	-12.529	-9.337	-12.529
MdCrArm1	g79X	22.27	0.000	-10.673	-10.673	-6.153
MdCrArm1	g79XY	11.94	7.572	0.000	7.572	7.549
MdCrArm1	g79Y	29.71	0.000	-14.240	-14.240	-1.567
MdCrArm2	g80P	18.88	0.000	-6.227	-6.227	-4.941
MdCrArm2	g80Y	11.79	0.712	-3.887	-3.887	0.712
BotCrArm	g81P	27.34	0.000	-10.977	-7.481	-10.977
BotCrArm	g81X	22.30	0.000	-8.954	-8.954	-4.478
BotCrArm	g81XY	15.64	7.929	0.000	7.929	6.759
BotCrArm	g81Y	34.03	0.000	-13.662	-13.662	-2.192
BotCrArm	g82P	22.30	0.000	-7.355	-7.355	-6.572
BotCrArm	g82Y	15.24	6.426	0.000	0.481	6.426
TopArmBr	g83P	24.74	3.487	-0.958	3.487	-0.958
TopArmBr	g83X	22.56	3.179	0.000	3.179	1.091
TopArmBr	g83XY	29.35	4.137	0.000	4.137	2.170
TopArmBr	g83Y	47.31	6.668	0.000	6.668	5.718
MidArmBr	g84P	23.13	4.197	-0.871	4.197	-0.871
MidArmBr	g84X	21.07	3.824	-0.071	3.824	-0.071
MidArmBr	g84XY	31.58	5.729	0.000	5.729	4.268
MidArmBr	g84Y	49.65	9.009	0.000	9.009	7.010
BotArmBr	g85P	14.88	2.097	-0.608	2.097	-0.608

BotArmBr	g85X	30.87	4.351	0.000	4.351	0.142
BotArmBr	g85XY	23.63	3.330	0.000	3.330	3.327
BotArmBr	g85Y	61.46	8.663	0.000	8.663	5.782
ShArmBr	g86P	66.99	0.000	-9.231	-9.231	-6.428
ShArmBr	g86X	10.41	0.000	-1.434	-1.434	-0.678
ShArmBr	g86XY	11.54	0.000	-1.590	-1.590	-0.334
ShArmBr	g86Y	23.85	5.044	0.000	4.977	5.044
ShieldAr	g87P	3.76	0.000	-1.011	-0.238	-1.011
ShieldAr	g87X	17.78	7.929	0.000	7.929	4.476
ShieldAr	g88P	2.89	0.000	-1.288	-0.234	-1.288
ShieldAr	g88X	17.75	7.917	0.000	7.917	4.729
M3	g89P	17.54	0.000	-2.573	-2.573	-2.310
M3	g89Y	3.43	0.726	-0.177	0.726	-0.177
M4	g90P	46.11	9.402	0.000	7.527	9.402
M4	g90X	0.00	0.000	0.000	0.000	0.000
Inner1	ig72P90P	2.12	0.159	-0.021	-0.021	0.159
Inner1	ig72P90X	47.85	0.000	-2.588	-0.970	-2.588

*** 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	0	0	0.0000	0.0000	0.0000	17.17	17.17	0
2P	0.06115	-0.02315	-0.008975	0.0344	0.2413	-0.0149	14.01	13.93	18.99
3P	0.1017	-0.01733	-0.01479	0.0592	0.0562	-0.1472	11.35	11.23	34.99
4P	0.09516	-0.0259	-0.03085	-0.0630	-0.0111	-0.2791	8.658	8.537	50.97
5P	0.09118	0.002639	-0.03292	-0.1749	0.0576	-0.3315	7.321	7.233	58.97
6P	0.09217	0.03457	-0.03398	-0.1610	-0.0011	-0.3842	5.967	5.91	66.97
7P	0.07923	0.07276	-0.03595	-0.2522	0.0299	-0.4397	4.579	4.573	74.96
8P	0.09768	0.1127	-0.0418	-0.3611	0.1149	-0.4693	4.598	4.613	81.87
9P	0.1025	0.1527	-0.04669	-0.3857	0.0643	-0.4962	4.602	4.653	88.21
10P	0.1168	0.1983	-0.05077	-0.4223	0.1235	-0.5238	4.617	4.698	94.56
11P	0.1274	0.2456	-0.05421	-0.4431	0.0872	-0.5510	4.627	4.746	100.9
12P	0.1438	0.3042	-0.06025	-0.5083	0.1232	-0.5885	4.644	4.804	107.8
13P	0.156	0.3613	-0.06496	-0.5413	0.1134	-0.6227	4.656	4.861	114.2
14P	0.1727	0.4274	-0.06889	-0.5691	0.1318	-0.6593	4.673	4.927	120.9
15P	0.1863	0.4867	-0.07127	-0.5801	0.1186	-0.6916	4.686	4.987	126.9
16P	0.2042	0.5628	-0.07424	-0.6106	0.1245	-0.7197	4.704	5.063	134.2
17P	0.2191	0.6341	-0.0765	-0.6159	0.1280	-0.7456	4.719	5.134	140.9
18P	0.2378	0.71	-0.07827	-0.6318	0.1402	-0.7727	4.738	5.21	147.9
19P	0.2542	0.8526	-0.06927	-0.6665	0.1259	-0.7546	0.2542	5.353	154.9
20P	0.1961	0.8528	-0.01772	-0.6494	0.1251	-0.7347	0.1961	0.8528	155
21P	0.07155	-0.02154	0.005055	-0.2080	0.1148	-0.0586	14.02	2.791	19.01
22P	0.06135	-0.032	0.03954	-0.0349	-0.5460	-0.0302	2.874	13.92	19.04
23P	0.0295	-0.01669	0.007867	-0.1168	-0.0039	-0.3445	11.28	-0.01669	35.01
24P	0.1017	-0.002455	-0.04168	-0.0385	-0.0823	-0.1736	0.1017	11.25	34.96
25P	0.207	0.11	-0.1244	-0.4093	0.0322	-0.5320	0.207	18.78	74.88
26P	0.3304	0.2902	-0.2213	-0.5790	0.0829	-0.6838	0.3304	22.96	100.8
27P	0.3681	0.5402	-0.2212	-0.6588	0.1128	-0.7516	0.3681	19.21	126.8
28P	0.5077	0.8511	-0.2917	-0.7161	0.1258	-0.8238	0.5077	23.52	154.7
1X	0	0	0	0.0000	0.0000	0.0000	17.17	-17.17	0
1XY	0	0	0	0.0000	0.0000	0.0000	-17.17	-17.17	0
1Y	0	0	0	0.0000	0.0000	0.0000	-17.17	17.17	0
2X	-0.01244	-0.02074	0.005629	0.0675	-0.0775	-0.2263	13.94	-13.97	19.01
2XY	-0.0107	0.02804	0.00671	-0.1026	-0.0461	0.0220	-13.96	-13.92	19.01
2Y	0.06355	0.02621	-0.01648	-0.1309	0.2677	-0.1266	-13.89	13.98	18.98
3X	-0.01964	-0.01652	0.006868	0.0788	-0.0650	-0.3288	11.23	-11.27	35.01
3XY	-0.01831	0.05523	0.01122	-0.1140	-0.0123	-0.0620	-11.27	-11.19	35.01
3Y	0.102	0.05436	-0.02726	-0.1357	0.0847	-0.2543	-11.15	11.3	34.97
4X	-0.0155	-0.02303	0.01193	-0.0302	-0.0063	-0.3804	8.547	-8.586	51.01
4XY	-0.0121	0.08726	0.01274	-0.1289	-0.0179	-0.2100	-8.575	-8.476	51.01
4Y	0.0963	0.08468	-0.03011	-0.1714	0.0242	-0.3416	-8.467	8.648	50.97
5X	-0.00754	0.001062	0.01175	-0.1411	-0.0323	-0.4054	7.222	-7.229	59.01
5XY	-0.007329	0.1014	0.01442	-0.1648	0.0145	-0.2732	-7.237	-7.129	59.01
5Y	0.09036	0.1019	-0.03008	-0.1853	-0.0035	-0.3792	-7.14	7.332	58.97
6X	-0.003096	0.03282	0.009727	-0.1799	0.0039	-0.4296	5.872	-5.842	67.01
6XY	0.004295	0.1225	0.01397	-0.2105	-0.0047	-0.3259	-5.871	-5.752	67.01
6Y	0.0815	0.1208	-0.02952	-0.2155	0.0712	-0.3969	-5.794	5.996	66.97
7X	0.01319	0.07429	0.008059	-0.2567	0.0289	-0.4576	4.513	-4.426	75.01
7XY	0.0106	0.147	0.01384	-0.2719	0.0087	-0.3820	-4.489	-4.353	75.01
7Y	0.08741	0.1466	-0.0299	-0.2959	0.0787	-0.4178	-4.413	4.647	74.97
8X	0.01265	0.1117	0.01056	-0.3528	0.0313	-0.4821	4.513	-4.388	81.92

8XY	0.01969	0.19	0.01846	-0.4089	0.0477	-0.4162	-4.48	-4.31	81.93
8Y	0.08837	0.1902	-0.03364	-0.3956	0.0613	-0.4511	-4.412	4.69	81.88
9X	0.02152	0.153	0.01251	-0.3847	0.0620	-0.5046	4.522	-4.347	88.27
9XY	0.02108	0.2369	0.02223	-0.4339	0.0320	-0.4477	-4.479	-4.263	88.28
9Y	0.1043	0.2353	-0.03689	-0.4346	0.1227	-0.4819	-4.396	4.735	88.22
10X	0.02568	0.1973	0.01395	-0.4263	0.0492	-0.5270	4.526	-4.303	94.62
10XY	0.02958	0.2867	0.02517	-0.4733	0.0647	-0.4794	-4.47	-4.213	94.64
10Y	0.113	0.2863	-0.03953	-0.4764	0.0852	-0.5121	-4.387	4.786	94.57
11X	0.03509	0.2473	0.01506	-0.4581	0.0791	-0.5497	4.535	-4.253	101
11XY	0.03494	0.3413	0.02739	-0.4933	0.0509	-0.5111	-4.465	-4.159	101
11Y	0.1275	0.34	-0.04186	-0.4933	0.1290	-0.5432	-4.373	4.84	101
12X	0.04158	0.3036	0.01718	-0.4979	0.0804	-0.5865	4.542	-4.196	107.9
12XY	0.0479	0.4017	0.03136	-0.5371	0.0787	-0.5563	-4.452	-4.098	107.9
12Y	0.1395	0.4023	-0.04602	-0.5342	0.1066	-0.5842	-4.361	4.902	107.9
13X	0.05516	0.362	0.01862	-0.5414	0.0960	-0.6203	4.555	-4.138	114.3
13XY	0.05438	0.465	0.03436	-0.5828	0.0774	-0.5978	-4.446	-4.035	114.3
13Y	0.1554	0.463	-0.04937	-0.5771	0.1329	-0.6223	-4.345	4.963	114.2
14X	0.06438	0.4268	0.01946	-0.5778	0.0956	-0.6562	4.564	-4.073	121
14XY	0.06866	0.5342	0.03647	-0.6154	0.0912	-0.6419	-4.431	-3.966	121
14Y	0.1707	0.5338	-0.05221	-0.6189	0.1313	-0.6624	-4.329	5.034	120.9
15X	0.07841	0.4888	0.01982	-0.5900	0.1140	-0.6883	4.578	-4.011	127
15XY	0.07707	0.5997	0.03763	-0.6080	0.0928	-0.6811	-4.423	-3.9	127
15Y	0.1869	0.598	-0.0539	-0.6097	0.1386	-0.6984	-4.313	5.098	126.9
16X	0.08889	0.563	0.02062	-0.5973	0.1338	-0.7264	4.589	-3.937	134.3
16XY	0.09729	0.6769	0.03912	-0.6273	0.0968	-0.6821	-4.403	-3.823	134.3
16Y	0.2027	0.6768	-0.05602	-0.6254	0.1255	-0.6969	-4.297	5.177	134.2
17X	0.1112	0.6349	0.02079	-0.6259	0.1186	-0.7610	4.611	-3.865	141
17XY	0.1039	0.7524	0.03974	-0.6475	0.1073	-0.6833	-4.396	-3.748	141
17Y	0.2202	0.7503	-0.05732	-0.6404	0.1389	-0.6958	-4.28	5.25	140.9
18X	0.1166	0.7119	0.0212	-0.6412	0.0321	-0.7965	4.617	-3.788	148
18XY	0.1288	0.8305	0.03988	-0.6414	0.2004	-0.6854	-4.371	-3.67	148
18Y	0.2369	0.8295	-0.05807	-0.6480	0.1319	-0.6944	-4.263	5.329	147.9
19X	0.1383	0.8535	0.03364	-0.6573	0.1243	-0.7419	0.1383	-3.647	155
21X	0.0531	-0.02126	0.02448	-0.0893	0.0497	-0.2996	14	-2.834	19.02
21XY	-0.02523	0.02677	-0.007206	0.1837	0.0773	-0.2390	-13.98	-2.786	18.99
21Y	0.01623	0.02647	0.01658	0.1176	0.1415	-0.4420	-13.93	2.839	19.02
22X	-0.01085	0.04323	-0.005668	0.0000	0.0253	-0.1441	2.802	-13.91	18.99
22XY	-0.01077	0.04174	0.001135	-0.0343	0.0830	0.0945	-2.823	-13.91	19
22Y	0.06214	-0.01962	-0.04356	-0.0667	-0.6352	-0.2137	-2.75	13.93	18.96
23Y	0.04204	0.05461	-0.01523	-0.0841	0.0354	-0.3807	-11.21	0.05461	34.98
24X	-0.01868	0.1217	-0.01076	-0.0174	0.0358	-0.1762	-0.01868	-11.13	34.99
25X	-0.1051	0.1147	0.07913	-0.2786	0.0347	-0.4988	-0.1051	-18.56	75.08
26X	-0.1579	0.3	0.1529	-0.3825	0.0818	-0.6475	-0.1579	-22.37	101.2
27X	-0.09781	0.5491	0.1613	-0.5018	0.1174	-0.7234	-0.09781	-18.12	127.2
28X	-0.101	0.8564	0.246	-0.6735	0.1243	-0.7633	-0.101	-21.81	155.2
i0.50E148S	0.1822	0.7759	-0.02529	-0.5929	0.1378	-0.7477	0.1822	0.7759	148

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
1P	-27.35	0.0	-21.30	0.0	0.0	-159.15	0.0	0.0	162.88	0.0	-3.30	0.0	-4.9	0.0	0.0	-0.98	0.0	0.0
1X	15.24	0.0	-9.12	0.0	0.0	54.80	0.0	0.0	57.61	0.0	-3.03	0.0	1.3	0.0	0.0	0.95	0.0	0.0
1XY	-19.22	0.0	-24.99	0.0	0.0	113.28	0.0	0.0	117.59	0.0	2.23	0.0	1.0	0.0	0.0	-0.52	0.0	0.0
1Y	13.42	0.0	-17.75	0.0	0.0	-103.65	0.0	0.0	106.01	0.0	1.99	0.0	-6.0	0.0	0.0	-0.04	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	-0.6753	27.3461	21.3014	-158.4747	0.0000	0.0000	0.0000
2P	0.0000	0.0000	-1.1655	0.0000	-0.0000	1.1655	0.0611	-0.0232	-0.0090
3P	0.0000	0.0000	-0.8667	0.0000	-0.0000	0.8667	0.1017	-0.0173	-0.0148
4P	0.0000	0.0000	-0.9288	-0.0000	0.0000	0.9288	0.0952	-0.0259	-0.0309
5P	0.0000	0.0000	-0.6263	0.0000	0.0000	0.6263	0.0912	0.0026	-0.0329
6P	0.0000	0.0000	-0.6396	-0.0000	-0.0000	0.6396	0.0922	0.0346	-0.0340
7P	0.0000	0.0000	-0.7295	-0.0000	0.0000	0.7295	0.0792	0.0728	-0.0359
8P	0.0000	0.0000	-0.4712	-0.0000	-0.0000	0.4712	0.0977	0.1127	-0.0418
9P	0.0000	0.0000	-0.4003	-0.0000	0.0000	0.4003	0.1025	0.1527	-0.0467
10P	0.0000	0.0000	-0.4011	0.0000	0.0000	0.4011	0.1168	0.1983	-0.0508
11P	0.0000	0.0000	-0.5278	0.0000	0.0000	0.5278	0.1274	0.2456	-0.0542
12P	0.0000	0.0000	-0.3326	0.0000	0.0000	0.3326	0.1438	0.3042	-0.0602
13P	0.0000	0.0000	-0.2514	0.0000	0.0000	0.2514	0.1560	0.3613	-0.0650
14P	-0.0380	-0.1590	-3.7543	0.0380	0.1590	3.7543	0.1727	0.4274	-0.0689
15P	0.0000	0.0000	-0.3864	0.0000	0.0000	0.3864	0.1863	0.4867	-0.0713
16P	0.0000	0.0000	-0.2626	0.0000	0.0000	0.2626	0.2042	0.5628	-0.0742
17P	0.0000	0.0000	-0.2010	0.0000	0.0000	0.2010	0.2191	0.6341	-0.0765
18P	1.1340	0.2600	-0.3621	-1.1340	-0.2600	0.3621	0.2378	0.7100	-0.0783
19P	0.0000	0.0000	-0.2163	0.0000	0.0000	0.2164	0.2542	0.8526	-0.0693
20P	0.0000	0.0000	-0.1839	-0.0000	0.0000	0.1839	0.1961	0.8528	-0.0177
21P	0.0000	0.0000	-0.2774	-0.0000	-0.0000	0.2774	0.0716	-0.0215	0.0051
22P	0.0000	0.0000	-0.2774	0.0000	0.0000	0.2774	0.0613	-0.0320	0.0395
23P	0.0000	0.0000	-0.3683	0.0000	-0.0000	0.3683	0.0295	-0.0167	0.0079
24P	0.0000	0.0000	-0.3683	0.0000	-0.0000	0.3683	0.1017	-0.0025	-0.0417
25P	4.8890	5.6030	-3.3008	-4.8890	-5.6030	3.3008	0.2070	0.1100	-0.1244
26P	4.8890	5.6030	-3.3797	-4.8890	-5.6030	3.3797	0.3304	0.2902	-0.2213
27P	4.8890	5.6030	-3.3015	-4.8890	-5.6030	3.3015	0.3681	0.5402	-0.2212
28P	3.2590	3.9980	-1.5511	-3.2590	-3.9980	1.5511	0.5077	0.8511	-0.2917
1X	0.0000	0.3008	-0.6753	-15.2399	8.8239	55.4778	0.0000	0.0000	0.0000
1XY	0.0000	0.3008	-0.6753	19.2241	24.6848	113.9599	0.0000	0.0000	0.0000
1Y	0.0000	0.0000	-0.6753	-13.4234	17.7537	-102.9737	0.0000	0.0000	0.0000
2X	0.0000	0.7924	-2.4075	-0.0000	-0.7924	2.4075	-0.0124	-0.0207	0.0056
2XY	0.0000	0.9214	-2.4075	-0.0000	-0.9214	2.4075	-0.0107	0.0280	0.0067
2Y	0.0000	0.0000	-1.1655	0.0000	-0.0000	1.1655	0.0635	0.0262	-0.0165
3X	0.0000	0.5631	-1.6027	0.0000	-0.5631	1.6027	-0.0196	-0.0165	0.0069
3XY	0.0000	0.6401	-1.6027	-0.0000	-0.6401	1.6027	-0.0183	0.0552	0.0112
3Y	0.0000	0.0000	-0.8667	-0.0000	-0.0000	0.8667	0.1020	0.0544	-0.0273
4X	0.0000	0.6428	-1.6648	-0.0000	-0.6428	1.6648	-0.0155	-0.0230	0.0119
4XY	0.0000	0.7198	-1.6648	-0.0000	-0.7198	1.6648	-0.0121	0.0873	0.0127
4Y	0.0000	0.0000	-0.9288	-0.0000	0.0000	0.9288	0.0963	0.0847	-0.0301
5X	0.0000	0.3053	-0.6263	-0.0000	-0.3053	0.6263	-0.0075	0.0011	0.0117
5XY	0.0000	0.3053	-0.6263	-0.0000	-0.3053	0.6263	-0.0073	0.1014	0.0144
5Y	0.0000	0.0000	-0.6263	-0.0000	-0.0000	0.6263	0.0904	0.1019	-0.0301
6X	0.0000	0.4590	-1.3756	-0.0000	-0.4590	1.3756	-0.0031	0.0328	0.0097
6XY	0.0000	0.5360	-1.3756	-0.0000	-0.5360	1.3756	0.0043	0.1225	0.0140
6Y	0.0000	0.0000	-0.6396	-0.0000	0.0000	0.6396	0.0815	0.1208	-0.0295
7X	0.0000	0.2788	-0.7295	-0.0000	-0.2788	0.7295	0.0132	0.0743	0.0081
7XY	0.0000	0.2788	-0.7295	-0.0000	-0.2788	0.7295	0.0106	0.1470	0.0138
7Y	0.0000	0.0000	-0.7295	0.0000	-0.0000	0.7295	0.0874	0.1466	-0.0299
8X	0.0000	0.3928	-1.0692	-0.0000	-0.3928	1.0692	0.0126	0.1117	0.0106
8XY	0.0000	0.4548	-1.0692	-0.0000	-0.4548	1.0692	0.0197	0.1900	0.0185
8Y	0.0000	0.0000	-0.4712	-0.0000	0.0000	0.4712	0.0884	0.1902	-0.0336
9X	0.0000	0.2191	-0.4003	-0.0000	-0.2191	0.4003	0.0215	0.1530	0.0125

9XY	0.0000	0.2191	-0.4003	-0.0000	-0.2191	0.4003	0.0211	0.2369	0.0222
9Y	0.0000	0.0000	-0.4003	-0.0000	0.0000	0.4003	0.1043	0.2353	-0.0369
10X	0.0000	0.3595	-0.9991	-0.0000	-0.3595	0.9991	0.0257	0.1973	0.0140
10XY	0.0000	0.4215	-0.9991	0.0000	-0.4215	0.9991	0.0296	0.2867	0.0252
10Y	0.0000	0.0000	-0.4011	-0.0000	0.0000	0.4011	0.1130	0.2863	-0.0395
11X	0.0000	0.2254	-0.5278	0.0000	-0.2254	0.5278	0.0351	0.2473	0.0151
11XY	0.0000	0.2254	-0.5278	0.0000	-0.2254	0.5278	0.0349	0.3413	0.0274
11Y	0.0000	0.0000	-0.5278	0.0000	-0.0000	0.5278	0.1275	0.3400	-0.0419
12X	0.0000	0.3453	-0.9306	-0.0000	-0.3453	0.9306	0.0416	0.3036	0.0172
12XY	0.0000	0.4073	-0.9306	0.0000	-0.4073	0.9306	0.0479	0.4017	0.0314
12Y	0.0000	0.0000	-0.3326	-0.0000	0.0000	0.3326	0.1395	0.4023	-0.0460
13X	0.0000	0.1763	-0.2514	0.0000	-0.1763	0.2514	0.0552	0.3620	0.0186
13XY	0.0000	0.1763	-0.2514	0.0000	-0.1763	0.2514	0.0544	0.4650	0.0344
13Y	0.0000	0.0000	-0.2514	-0.0000	0.0000	0.2514	0.1554	0.4630	-0.0494
14X	0.0430	0.1192	-1.8933	-0.0430	-0.1192	1.8933	0.0644	0.4268	0.0195
14XY	-0.0140	0.1642	-2.9993	0.0140	-0.1642	2.9993	0.0687	0.5342	0.0365
14Y	-0.0570	-0.2330	-6.7183	0.0570	0.2330	6.7183	0.1707	0.5338	-0.0522
15X	0.0000	0.1770	-0.3864	0.0000	-0.1770	0.3864	0.0784	0.4888	0.0198
15XY	0.0000	0.1770	-0.3864	0.0000	-0.1770	0.3864	0.0771	0.5997	0.0376
15Y	0.0000	0.0000	-0.3864	0.0000	-0.0000	0.3864	0.1869	0.5980	-0.0539
16X	0.0000	0.1640	-0.2626	0.0000	-0.1640	0.2626	0.0889	0.5630	0.0206
16XY	0.0000	0.3820	-0.9066	0.0000	-0.3820	0.9066	0.0973	0.6769	0.0391
16Y	0.0000	0.0000	-0.2626	-0.0000	0.0000	0.2626	0.2027	0.6768	-0.0560
17X	0.0000	0.1335	-0.2010	0.0000	-0.1335	0.2010	0.1112	0.6349	0.0208
17XY	0.0000	0.1335	-0.2010	-0.0000	-0.1335	0.2010	0.1039	0.7524	0.0397
17Y	0.0000	0.0000	-0.2010	-0.0000	0.0000	0.2010	0.2202	0.7503	-0.0573
18X	-0.8370	1.2941	-0.3841	0.8370	-1.2941	0.3841	0.1166	0.7119	0.0212
18XY	0.8590	2.3511	-0.8371	-0.8590	-2.3511	0.8371	0.1288	0.8305	0.0399
18Y	-1.1090	0.4220	-0.3481	1.1090	-0.4220	0.3481	0.2369	0.8295	-0.0581
19X	0.0000	0.0000	-0.2163	0.0000	0.0000	0.2163	0.1383	0.8535	0.0336
21X	0.0000	0.0000	-0.2774	-0.0000	-0.0000	0.2774	0.0531	-0.0213	0.0245
21XY	0.0000	0.0000	-0.2774	0.0000	-0.0000	0.2774	-0.0252	0.0268	-0.0072
21Y	0.0000	0.0000	-0.2774	0.0000	-0.0000	0.2774	0.0162	0.0265	0.0166
22X	0.0000	0.2114	-0.2774	0.0000	-0.2114	0.2774	-0.0109	0.0432	-0.0057
22XY	0.0000	0.2114	-0.2774	-0.0000	-0.2114	0.2774	-0.0108	0.0417	0.0011
22Y	0.0000	0.0000	-0.2774	-0.0000	-0.0000	0.2774	0.0621	-0.0196	-0.0436
23Y	0.0000	0.0000	-0.3683	0.0000	-0.0000	0.3683	0.0420	0.0546	-0.0152
24X	0.0000	0.4283	-0.3683	0.0000	-0.4283	0.3683	-0.0187	0.1217	-0.0108
25X	0.0000	10.8260	-4.5858	0.0000	-10.8260	4.5858	-0.1051	0.1147	0.0791
26X	0.0000	10.8260	-4.6647	0.0000	-10.8260	4.6647	-0.1579	0.3000	0.1529
27X	0.0000	10.8281	-4.5865	0.0000	-10.8281	4.5865	-0.0978	0.5491	0.1613
28X	0.0000	2.9748	-1.0931	0.0000	-2.9748	1.0931	-0.1010	0.8564	0.2460
i0.50E148S	0.0000	0.0000	-0.0466	0.0000	0.0000	0.0466	0.1822	0.7759	-0.0253

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.
g20P	g20X	Short only	-0.38	-0.82	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g20X	g20P	Short only	-0.82	-0.38	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g21X	g21XY	Short only	-3.58	-1.24	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g21XY	g21X	Short only	-1.24	-3.58	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g24P	g24X	Short only	-1.11	-1.62	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6
g24X	g24P	Short only	-1.62	-1.11	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6
g25X	g25XY	Short only	-4.13	-2.83	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6

g25XY	g25X	Short only	-2.83	-4.13	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6
g32X	g32P	Short only	-6.00	0.59	23.30	0.750	0.500	0.500	128.94	126.85	5	20.63	1.000	144.09	134.81	6
g41Y	g41P	Short only	-22.60	4.18	38.35	0.750	0.500	0.500	104.58	108.43	2	36.33	1.000	106.38	113.19	3
g43P	g43Y	Short only	-2.74	-23.19	28.74	0.784	0.567	0.567	152.69	144.95	5	25.91	1.000	173.14	152.68	6
g43Y	g43P	Short only	-23.19	-2.74	28.74	0.784	0.567	0.567	152.69	144.95	5	25.91	1.000	173.14	152.68	6
g47Y	g47P	Short only	-10.63	1.26	13.12	0.771	0.542	0.542	195.05	177.23	5	11.78	1.000	229.08	187.08	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	5.386	50.00	50.00	10.77
2	3.169	50.00	50.00	6.34
3	8.136	50.00	50.00	16.27
4	11.759	50.00	50.00	23.52
5	8.168	50.00	50.00	16.34
6	11.788	50.00	50.00	23.58
7	8.136	50.00	50.00	16.27
8	11.757	50.00	50.00	23.51
10	1.898	50.00	50.00	3.80
11	0.993	50.00	50.00	1.99
12	1.062	50.00	50.00	2.12
13	1.139	50.00	50.00	2.28
14	1.450	50.00	50.00	2.90
15	1.785	50.00	50.00	3.57
16	1.699	50.00	50.00	3.40
17	2.535	50.00	50.00	5.07
18	0.263	50.00	50.00	0.53
19	3.758	50.00	50.00	7.52
20	0.333	50.00	50.00	0.67
21	0.401	50.00	50.00	0.80
22	0.471	50.00	50.00	0.94
23	0.640	50.00	50.00	1.28
24	0.929	50.00	50.00	1.86
25	0.867	50.00	50.00	1.73
26	1.165	50.00	50.00	2.33
27	0.201	50.00	50.00	0.40
28	0.241	50.00	50.00	0.48
29	0.241	50.00	50.00	0.48
30	0.201	50.00	50.00	0.40
31	1.218	50.00	50.00	2.44
32	1.588	50.00	50.00	3.18
33	2.639	50.00	50.00	5.28
34	1.237	50.00	50.00	2.47
35	3.004	50.00	50.00	6.01
36	6.723	50.00	50.00	13.45
38	0.984	50.00	50.00	1.97
40	1.016	50.00	50.00	2.03
41	1.084	50.00	50.00	2.17
42	1.162	50.00	50.00	2.32
43	1.476	50.00	50.00	2.95
44	1.814	50.00	50.00	3.63
45	1.726	50.00	50.00	3.45
46	2.578	50.00	50.00	5.16

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 11

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	0	0	0.0000	0.0000	0.0000	17.17	17.17	0
2P	0.02894	-0.002966	-0.01361	0.0145	0.1146	-0.1786	13.98	13.95	18.99
3P	0.04434	0.007566	-0.0249	0.0539	0.1104	-0.2979	11.29	11.26	34.98
4P	0.06474	0.0121	-0.03633	-0.0856	0.0479	-0.2805	8.628	8.575	50.96
5P	0.06549	0.04231	-0.03893	-0.1974	0.0965	-0.2743	7.295	7.272	58.96
6P	0.07652	0.07786	-0.03948	-0.2063	0.0340	-0.2697	5.952	5.953	66.96
7P	0.06909	0.1206	-0.04159	-0.3285	0.0594	-0.2694	4.569	4.621	74.96
8P	0.09549	0.1748	-0.04933	-0.5029	0.1620	-0.2657	4.595	4.675	81.86
9P	0.1022	0.231	-0.0559	-0.5332	0.0981	-0.2623	4.602	4.731	88.2
10P	0.1231	0.2936	-0.0614	-0.5848	0.1811	-0.2600	4.623	4.794	94.55
11P	0.1382	0.3602	-0.06609	-0.6182	0.1322	-0.2566	4.638	4.86	100.9
12P	0.1627	0.4409	-0.07426	-0.7075	0.1859	-0.2603	4.663	4.941	107.8
13P	0.1799	0.5217	-0.0807	-0.7576	0.1719	-0.2633	4.68	5.022	114.2
14P	0.2047	0.6136	-0.08613	-0.8016	0.1991	-0.2670	4.705	5.114	120.9
15P	0.2237	0.6985	-0.08977	-0.8230	0.1797	-0.2697	4.724	5.198	126.9
16P	0.2514	0.8067	-0.09432	-0.8712	0.1888	-0.2970	4.751	5.307	134.2
17P	0.2717	0.9095	-0.09754	-0.8895	0.1879	-0.3222	4.772	5.409	140.9
18P	0.2994	1.018	-0.0999	-0.8808	0.2073	-0.3489	4.799	5.518	147.9
19P	0.3226	1.159	-0.08652	-0.9381	0.1939	-0.3056	0.3226	5.659	154.9
20P	0.2999	1.159	-0.01339	-0.9265	0.1943	-0.2855	0.2999	1.159	155
21P	0.005039	-0.00193	0.0001095	-0.0974	0.0600	0.1746	13.96	2.811	19
22P	0.02915	0.02243	0.02475	0.0095	-0.2505	-0.0213	2.842	13.97	19.02
23P	-0.002714	0.007644	0.001605	-0.1555	0.0530	-0.0498	11.25	0.007644	35
24P	0.04594	0.1969	0.005093	-0.0054	-0.0296	-0.0099	0.04594	11.45	35.01
25P	0.1259	0.1369	-0.1462	-0.4935	0.0737	-0.2228	0.1259	18.81	74.85
26P	0.2163	0.376	-0.2761	-0.7240	0.1482	-0.2630	0.2163	23.05	100.7
27P	0.295	0.718	-0.2923	-0.8911	0.1828	-0.2985	0.295	19.39	126.7
28P	0.4332	1.157	-0.3907	-0.9677	0.1930	-0.3752	0.4332	23.83	154.6
1X	0	0	0	0.0000	0.0000	0.0000	17.17	-17.17	0
1XY	0	0	0	0.0000	0.0000	0.0000	-17.17	-17.17	0
1Y	0	0	0	0.0000	0.0000	0.0000	-17.17	17.17	0
2X	-0.00388	-0.0007563	0.00611	0.0053	-0.0245	-0.1496	13.95	-13.95	19.01
2XY	-0.002768	0.006524	0.01434	-0.0071	-0.0041	0.0667	-13.95	-13.94	19.01
2Y	0.02969	0.005561	-0.01409	-0.0003	0.0907	0.1184	-13.92	13.96	18.99
3X	-0.0004865	0.007994	0.01035	0.0313	-0.0064	-0.1889	11.25	-11.24	35.01
3XY	0.001045	0.01967	0.0239	-0.0851	0.0448	0.0463	-11.25	-11.23	35.02
3Y	0.04751	0.01898	-0.02338	-0.0642	0.0294	0.1621	-11.2	11.27	34.98
4X	0.01191	0.01378	0.01665	-0.0951	0.0532	-0.1748	8.575	-8.549	51.02
4XY	0.01605	0.0597	0.02708	-0.1547	0.0215	-0.0486	-8.547	-8.503	51.03
4Y	0.0635	0.05833	-0.02798	-0.1563	0.0463	0.0424	-8.5	8.621	50.97
5X	0.02249	0.04069	0.01747	-0.1968	0.0203	-0.1665	7.252	-7.189	59.02
5XY	0.0227	0.08245	0.02924	-0.1989	0.0662	-0.0914	-7.207	-7.148	59.03
5Y	0.06588	0.08243	-0.02858	-0.1774	-0.0308	-0.0199	-7.164	7.312	58.97
6X	0.02829	0.0755	0.01637	-0.2492	0.0722	-0.1652	5.903	-5.8	67.02
6XY	0.03808	0.1133	0.02886	-0.2432	0.0414	-0.1219	-5.837	-5.762	67.03
6Y	0.06148	0.1102	-0.02779	-0.2348	0.0761	-0.0454	-5.814	5.985	66.97
7X	0.04842	0.1219	0.0158	-0.3548	0.1023	-0.1681	4.548	-4.378	75.02
7XY	0.04487	0.1493	0.02902	-0.3393	0.0608	-0.1520	-4.455	-4.351	75.03
7Y	0.08035	0.1501	-0.02868	-0.3570	0.1085	-0.0728	-4.42	4.65	74.97
8X	0.05506	0.1742	0.01958	-0.4857	0.1018	-0.1738	4.555	-4.326	81.93

8XY	0.06389	0.2045	0.03575	-0.5147	0.1315	-0.1595	-4.436	-4.296	81.95
8Y	0.08202	0.204	-0.03321	-0.4990	0.0967	-0.0991	-4.418	4.704	81.88
9X	0.07311	0.2306	0.02259	-0.5326	0.1461	-0.1791	4.573	-4.269	88.28
9XY	0.07285	0.2626	0.04126	-0.5462	0.1064	-0.1664	-4.427	-4.237	88.3
9Y	0.1049	0.2613	-0.03725	-0.5455	0.1782	-0.1233	-4.395	4.761	88.22
10X	0.0857	0.2927	0.02497	-0.5917	0.1310	-0.1840	4.586	-4.207	94.63
10XY	0.09046	0.3263	0.04568	-0.5983	0.1510	-0.1738	-4.41	-4.174	94.66
10Y	0.1171	0.3251	-0.0406	-0.6029	0.1266	-0.1465	-4.383	4.825	94.57
11X	0.1046	0.3615	0.02691	-0.6329	0.1653	-0.1893	4.605	-4.139	101
11XY	0.1046	0.3949	0.04919	-0.6305	0.1327	-0.1808	-4.395	-4.105	101
11Y	0.138	0.3945	-0.04373	-0.6416	0.1919	-0.1710	-4.362	4.894	101
12X	0.1198	0.4409	0.03091	-0.6952	0.1601	-0.2047	4.62	-4.059	107.9
12XY	0.1276	0.4761	0.05559	-0.7196	0.1615	-0.1987	-4.372	-4.024	108
12Y	0.1553	0.476	-0.04948	-0.7112	0.1678	-0.1954	-4.345	4.976	107.9
13X	0.1427	0.5217	0.03372	-0.7547	0.1819	-0.2189	4.643	-3.978	114.3
13XY	0.1423	0.5596	0.06039	-0.7771	0.1603	-0.2151	-4.358	-3.94	114.3
13Y	0.1793	0.5579	-0.05414	-0.7712	0.2006	-0.2183	-4.321	5.058	114.2
14X	0.1612	0.6134	0.03573	-0.8141	0.1854	-0.2340	4.661	-3.887	121
14XY	0.1664	0.6534	0.06396	-0.8256	0.1769	-0.2326	-4.334	-3.847	121.1
14Y	0.2005	0.6522	-0.05817	-0.8329	0.1939	-0.2423	-4.3	5.152	120.9
15X	0.1845	0.7005	0.03699	-0.8322	0.1954	-0.2475	4.684	-3.8	127
15XY	0.1828	0.7413	0.0661	-0.8371	0.1762	-0.2482	-4.317	-3.759	127.1
15Y	0.224	0.7405	-0.06121	-0.8453	0.2124	-0.2640	-4.276	5.24	126.9
16X	0.2024	0.8075	0.03922	-0.8610	0.2170	-0.2919	4.702	-3.692	134.3
16XY	0.2135	0.8513	0.06885	-0.8939	0.1530	-0.2421	-4.286	-3.649	134.3
16Y	0.2466	0.8508	-0.06523	-0.8853	0.1974	-0.2522	-4.253	5.351	134.2
17X	0.2363	0.91	0.03964	-0.8863	0.1890	-0.3319	4.736	-3.59	141
17XY	0.2244	0.9578	0.06971	-0.9116	0.1779	-0.2376	-4.276	-3.542	141.1
17Y	0.2736	0.9561	-0.06774	-0.9174	0.2117	-0.2416	-4.226	5.456	140.9
18X	0.2448	1.02	0.04006	-0.9257	0.0481	-0.3721	4.745	-3.48	148
18XY	0.2627	1.069	0.0697	-0.9299	0.3240	-0.2346	-4.237	-3.431	148.1
18Y	0.2965	1.068	-0.06907	-0.8972	0.1971	-0.2303	-4.203	5.568	147.9
19X	0.2774	1.16	0.05952	-0.9288	0.1943	-0.2962	0.2774	-3.34	155.1
21X	0.02971	-0.001486	0.007217	-0.0379	0.0320	0.1300	13.98	-2.814	19.01
21XY	-0.01792	0.006033	0.003644	-0.0832	0.0321	-0.4313	-13.97	-2.806	19
21Y	0.04229	0.005657	-0.004614	-0.0802	0.0511	-0.4542	-13.91	2.818	19
22X	-0.003067	0.03198	0.001813	0.0004	0.0202	0.0006	2.809	-13.92	19
22XY	-0.003241	0.02171	0.006521	-0.0021	0.0620	0.1319	-2.816	-13.93	19.01
22Y	0.02945	0.01918	-0.02001	0.0055	-0.3701	0.0554	-2.783	13.97	18.98
23Y	0.04894	0.01875	-0.004616	-0.1431	0.0366	-0.2296	-11.2	0.01875	35
24X	0.0002981	0.1358	-0.005867	-0.0267	0.0419	-0.0087	0.0002981	-11.11	34.99
25X	0.007508	0.1384	0.126	-0.4483	0.0777	-0.1603	0.007508	-18.53	75.13
26X	0.04523	0.3818	0.2403	-0.6376	0.1463	-0.1926	0.04523	-22.29	101.2
27X	0.1238	0.7245	0.255	-0.8142	0.1891	-0.2447	0.1238	-17.95	127.3
28X	0.1784	1.163	0.3592	-0.9515	0.1939	-0.3251	0.1784	-21.51	155.4
i0.50E148S	0.2788	1.052	-0.04138	-0.8315	0.2034	-0.3018	0.2788	1.052	148

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 %
1P	-33.70	0.0	-32.95	0.0	0.0	-196.26	0.0	0.0	201.83	0.0	-1.29	0.0	-2.8	0.0	0.0	0.66	0.0	0.0
1X	19.61	0.0	-14.82	0.0	0.0	82.55	0.0	0.0	86.13	0.0	-0.77	0.0	0.6	0.0	0.0	0.81	0.0	0.0
1XY	-34.17	0.0	-33.07	0.0	0.0	175.56	0.0	0.0	181.88	0.0	0.24	0.0	0.5	0.0	0.0	-0.55	0.0	0.0
1Y	19.37	0.0	-20.04	0.0	0.0	-111.45	0.0	0.0	114.88	0.0	0.06	0.0	-2.8	0.0	0.0	-1.17	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	0.2478	-0.2251	33.6954	32.6999	-196.0309	0.0000	0.0000	0.0000
2P	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	0.0289	-0.0030	-0.0136
3P	0.0000	0.6475	-0.5717	0.0000	-0.6475	0.5717	0.0443	0.0076	-0.0249
4P	0.0000	0.4189	-0.3484	-0.0000	-0.4189	0.3484	0.0647	0.0121	-0.0363
5P	0.0000	0.4189	-0.3484	0.0000	-0.4189	0.3484	0.0655	0.0423	-0.0389
6P	0.0000	0.4189	-0.3484	0.0000	-0.4189	0.3484	0.0765	0.0779	-0.0395
7P	0.0000	0.6849	-0.5656	0.0000	-0.6849	0.5656	0.0691	0.1206	-0.0416
8P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.0955	0.1748	-0.0493
9P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1022	0.2310	-0.0559
10P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1231	0.2936	-0.0614
11P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1382	0.3602	-0.0661
12P	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1627	0.4409	-0.0743
13P	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1799	0.5217	-0.0807
14P	-0.1220	-0.4070	-0.6571	0.1220	0.4070	0.6571	0.2047	0.6136	-0.0861
15P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.2237	0.6985	-0.0898
16P	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2514	0.8067	-0.0943
17P	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2717	0.9095	-0.0975
18P	4.3030	1.2380	-0.2311	-4.3030	-1.2380	0.2311	0.2994	1.0181	-0.0999
19P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.3226	1.1590	-0.0865
20P	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.2999	1.1594	-0.0134
21P	0.0000	0.4764	-0.4484	0.0000	-0.4764	0.4484	0.0050	-0.0019	0.0001
22P	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	0.0292	0.0224	0.0248
23P	0.0000	0.6475	-0.5717	-0.0000	-0.6475	0.5717	-0.0027	0.0076	0.0016
24P	0.0000	0.6475	-0.5717	-0.0000	-0.6475	0.5717	0.0459	0.1969	0.0051
25P	4.2970	5.1370	-1.5371	-4.2970	-5.1370	1.5371	0.1259	0.1369	-0.1462
26P	4.2970	5.1370	-1.5371	-4.2970	-5.1370	1.5371	0.2163	0.3760	-0.2761
27P	4.2970	5.1370	-1.5371	-4.2970	-5.1370	1.5371	0.2950	0.7180	-0.2923
28P	2.6080	3.1930	-0.5501	-2.6080	-3.1930	0.5501	0.4332	1.1570	-0.3907
1X	0.0000	0.2478	-0.2251	-19.6136	14.5725	82.7747	0.0000	0.0000	0.0000
1XY	0.0000	0.2478	-0.2251	34.1657	32.8225	175.7822	0.0000	0.0000	0.0000
1Y	0.0000	0.2478	-0.2251	-19.3726	19.7885	-111.2209	0.0000	0.0000	0.0000
2X	0.0000	1.4094	-0.7854	0.0000	-1.4094	0.7854	-0.0039	-0.0008	0.0061
2XY	0.0000	1.8754	-0.7854	0.0000	-1.8754	0.7854	-0.0028	0.0065	0.0143
2Y	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	0.0297	0.0056	-0.0141
3X	0.0000	1.2005	-0.7717	0.0000	-1.2005	0.7717	-0.0005	0.0080	0.0103
3XY	0.0000	1.4765	-0.7717	-0.0000	-1.4765	0.7717	0.0010	0.0197	0.0239
3Y	0.0000	0.6475	-0.5717	-0.0000	-0.6475	0.5717	0.0475	0.0190	-0.0234
4X	0.0000	0.9719	-0.5484	0.0000	-0.9719	0.5484	0.0119	0.0138	0.0167
4XY	0.0000	1.2479	-0.5484	-0.0000	-1.2479	0.5484	0.0160	0.0597	0.0271
4Y	0.0000	0.4189	-0.3484	-0.0000	-0.4189	0.3484	0.0635	0.0583	-0.0280
5X	0.0000	0.4189	-0.3484	0.0000	-0.4189	0.3484	0.0225	0.0407	0.0175
5XY	0.0000	0.4189	-0.3484	-0.0000	-0.4189	0.3484	0.0227	0.0824	0.0292
5Y	0.0000	0.4189	-0.3484	-0.0000	-0.4189	0.3484	0.0659	0.0824	-0.0286
6X	0.0000	0.9719	-0.5484	0.0000	-0.9719	0.5484	0.0283	0.0755	0.0164
6XY	0.0000	1.2479	-0.5484	-0.0000	-1.2479	0.5484	0.0381	0.1133	0.0289
6Y	0.0000	0.4189	-0.3484	-0.0000	-0.4189	0.3484	0.0615	0.1102	-0.0278
7X	0.0000	0.6849	-0.5656	-0.0000	-0.6849	0.5656	0.0484	0.1219	0.0158
7XY	0.0000	0.6849	-0.5656	0.0000	-0.6849	0.5656	0.0449	0.1493	0.0290
7Y	0.0000	0.6849	-0.5656	0.0000	-0.6849	0.5656	0.0804	0.1501	-0.0287
8X	0.0000	0.7150	-0.3791	0.0000	-0.7150	0.3791	0.0551	0.1742	0.0196
8XY	0.0000	0.9400	-0.3791	-0.0000	-0.9400	0.3791	0.0639	0.2045	0.0357
8Y	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.0820	0.2040	-0.0332
9X	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.0731	0.2306	0.0226

9XY	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.0728	0.2626	0.0413
9Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1049	0.2613	-0.0373
10X	0.0000	0.7150	-0.3791	-0.0000	-0.7150	0.3791	0.0857	0.2927	0.0250
10XY	0.0000	0.9400	-0.3791	-0.0000	-0.9400	0.3791	0.0905	0.3263	0.0457
10Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1171	0.3251	-0.0406
11X	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1046	0.3615	0.0269
11XY	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1046	0.3949	0.0492
11Y	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1380	0.3945	-0.0437
12X	0.0000	0.7150	-0.3791	-0.0000	-0.7150	0.3791	0.1198	0.4409	0.0309
12XY	0.0000	0.9400	-0.3791	-0.0000	-0.9400	0.3791	0.1276	0.4761	0.0556
12Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1553	0.4760	-0.0495
13X	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1427	0.5217	0.0337
13XY	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1423	0.5596	0.0604
13Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.1793	0.5579	-0.0541
14X	0.1140	-0.0660	-2.1621	-0.1140	0.0660	2.1621	0.1612	0.6134	0.0357
14XY	-0.0150	-0.0440	-3.5551	0.0150	0.0440	3.5551	0.1664	0.6534	0.0640
14Y	0.0160	-0.7940	-0.9241	-0.0160	0.7940	0.9241	0.2005	0.6522	-0.0582
15X	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1845	0.7005	0.0370
15XY	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.1828	0.7413	0.0661
15Y	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.2240	0.7405	-0.0612
16X	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2024	0.8075	0.0392
16XY	0.0000	0.9920	-0.3921	-0.0000	-0.9920	0.3921	0.2135	0.8513	0.0689
16Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2466	0.8508	-0.0652
17X	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2363	0.9100	0.0396
17XY	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2244	0.9578	0.0697
17Y	0.0000	0.2660	-0.2171	-0.0000	-0.2660	0.2171	0.2736	0.9561	-0.0677
18X	-3.2600	4.7480	-0.2411	3.2600	-4.7480	0.2411	0.2448	1.0199	0.0401
18XY	3.3130	8.7060	-0.3631	-3.3130	-8.7060	0.3631	0.2627	1.0695	0.0697
18Y	-4.3500	1.9400	-0.2261	4.3500	-1.9400	0.2261	0.2965	1.0683	-0.0691
19X	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.2774	1.1601	0.0595
21X	0.0000	0.4764	-0.4484	0.0000	-0.4764	0.4484	0.0297	-0.0015	0.0072
21XY	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	-0.0179	0.0060	0.0036
21Y	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	0.0423	0.0057	-0.0046
22X	0.0000	0.4764	-0.4484	-0.0000	-0.4764	0.4484	-0.0031	0.0320	0.0018
22XY	0.0000	0.4764	-0.4484	0.0000	-0.4764	0.4484	-0.0032	0.0217	0.0065
22Y	0.0000	0.4764	-0.4484	0.0000	-0.4764	0.4484	0.0294	0.0192	-0.0200
23Y	0.0000	0.6475	-0.5717	-0.0000	-0.6475	0.5717	0.0489	0.0187	-0.0046
24X	0.0000	0.6475	-0.5717	-0.0000	-0.6475	0.5717	0.0003	0.1358	-0.0059
25X	4.4310	8.0520	-2.2281	-4.4310	-8.0520	2.2281	0.0075	0.1384	0.1260
26X	4.4310	8.0520	-2.2281	-4.4310	-8.0520	2.2281	0.0452	0.3818	0.2403
27X	4.4310	8.0520	-2.2281	-4.4310	-8.0520	2.2281	0.1238	0.7245	0.2550
28X	0.0840	1.9250	-0.3851	-0.0840	-1.9250	0.3851	0.1784	1.1630	0.3592
i0.50E148S	0.0000	0.2660	-0.2171	0.0000	-0.2660	0.2171	0.2788	1.0519	-0.0414

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)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
g21X	g21XY	Short only	-5.56	-3.43	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g21XY	g21X	Short only	-3.43	-5.56	12.50	0.750	0.500	0.500	175.41	162.26	5	9.49	1.000	227.66	186.21	6
g25X	g25XY	Short only	-4.23	-4.38	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6
g25XY	g25X	Short only	-4.38	-4.23	12.19	0.750	0.500	0.500	178.09	164.30	5	9.28	1.000	231.13	188.35	6
g31X	g31XY	Short only	-0.55	-2.44	24.37	0.750	0.500	0.500	125.17	123.98	5	21.45	1.000	139.87	132.22	6
g31XY	g31X	Short only	-2.44	-0.55	24.37	0.750	0.500	0.500	125.17	123.98	5	21.45	1.000	139.87	132.22	6
g39X	g39XY	Short only	-0.03	-7.33	39.29	0.750	0.500	0.500	101.52	106.14	2	37.00	1.000	103.26	111.63	3

g39XY	g39X	Short only	-7.33	-0.03	39.29	0.750	0.500	0.500	101.52	106.14	2	37.00	1.000	103.26	111.63	3
g41P	g41Y	Short only	-2.21	-20.93	38.35	0.750	0.500	0.500	104.58	108.43	2	36.33	1.000	106.38	113.19	3
g41Y	g41P	Short only	-20.93	-2.21	38.35	0.750	0.500	0.500	104.58	108.43	2	36.33	1.000	106.38	113.19	3
g43P	g43Y	Short only	-16.11	-17.64	28.74	0.784	0.567	0.567	152.69	144.95	5	25.91	1.000	173.14	152.68	6
g43Y	g43P	Short only	-17.64	-16.11	28.74	0.784	0.567	0.567	152.69	144.95	5	25.91	1.000	173.14	152.68	6
g45X	g45XY	Short only	-6.86	-2.12	16.05	0.777	0.553	0.553	172.78	160.26	5	14.51	1.000	198.88	168.51	6
g45XY	g45X	Short only	-2.12	-6.86	16.05	0.777	0.553	0.553	172.78	160.26	5	14.51	1.000	198.88	168.51	6
g47P	g47Y	Short only	-4.59	-6.27	13.12	0.771	0.542	0.542	195.05	177.23	5	11.78	1.000	229.08	187.08	6
g47Y	g47P	Short only	-6.27	-4.59	13.12	0.771	0.542	0.542	195.05	177.23	5	11.78	1.000	229.08	187.08	6
g74P	g74X	Short only	-0.45	-0.08	12.09	0.750	0.500	0.500	154.28	146.16	5	9.26	1.000	196.32	166.94	6
g74X	g74P	Short only	-0.08	-0.45	12.09	0.750	0.500	0.500	154.28	146.16	5	9.26	1.000	196.32	166.94	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	4.159	50.00	50.00	8.32
2	1.965	50.00	50.00	3.93
3	6.871	50.00	50.00	13.74
4	9.457	50.00	50.00	18.91
5	6.871	50.00	50.00	13.74
6	9.457	50.00	50.00	18.91
7	6.871	50.00	50.00	13.74
8	9.457	50.00	50.00	18.91
10	2.166	50.00	50.00	4.33
11	0.809	50.00	50.00	1.62
12	0.809	50.00	50.00	1.62
13	0.809	50.00	50.00	1.62
14	1.116	50.00	50.00	2.23
15	1.116	50.00	50.00	2.23
16	1.427	50.00	50.00	2.85
17	1.613	50.00	50.00	3.23
18	0.343	50.00	50.00	0.69
19	0.783	50.00	50.00	1.57
20	0.343	50.00	50.00	0.69
21	0.343	50.00	50.00	0.69
22	0.343	50.00	50.00	0.69
23	0.545	50.00	50.00	1.09
24	0.545	50.00	50.00	1.09
25	0.864	50.00	50.00	1.73
26	0.654	50.00	50.00	1.31
27	0.343	50.00	50.00	0.69
28	0.343	50.00	50.00	0.69
29	0.343	50.00	50.00	0.69
30	0.343	50.00	50.00	0.69
31	4.484	50.00	50.00	8.97
32	5.765	50.00	50.00	11.53
33	9.322	50.00	50.00	18.64
34	4.768	50.00	50.00	9.54
35	3.555	50.00	50.00	7.11
36	1.218	50.00	50.00	2.44
38	1.067	50.00	50.00	2.13
40	1.014	50.00	50.00	2.03
41	1.014	50.00	50.00	2.03

42	1.014	50.00	50.00	2.03
43	1.363	50.00	50.00	2.73
44	1.363	50.00	50.00	2.73
45	1.666	50.00	50.00	3.33
46	2.033	50.00	50.00	4.07

*** 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 Curve	Angle No. Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Cont-rol 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 No. Of Member Comp.	Length Bolts (ft)
Leg1	L3x3x3/16	SAE	3X3X0.1875	36.0	1.80	Comp	1.80	g1Y	-0.200	NESC Ext	11.113	44.600	40.781	1.000	1.000	1.000	167.55	167.55	8.322	4 4
Leg2	L4x4x1/4	SAE	4X4X0.25	36.0	65.99	Comp	65.99	g4X	-28.494	NESC Ext	43.178	44.600	54.375	1.000	1.000	1.000	109.89	109.89	7.280	1 4
Leg3	L5x5x5/16	SAE	5X5X0.3125	50.0	79.53	Comp	79.53	g7X	-81.757	NESC Ext	102.806	0.000	0.000	1.000	1.000	1.000	76.66	76.66	6.350	1 0
Leg4	L6x6x9/16	SAE	6X6X0.5625	50.0	80.11	Comp	80.11	g12X	-201.997	NESC Ext	252.165	312.200	856.405	1.000	1.000	1.000	70.27	70.27	6.910	1 28
Leg5	L8x8x1/2	SAE	8X8X0.5	50.0	85.87	Comp	85.87	g18X	-201.238	NESC Ext	234.356	312.200	761.249	0.600	0.600	0.600	88.47	88.47	19.537	1 28
Diag1	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	36.0	87.54	Comp	87.54	g19P	-7.110	NESC Ext	8.122	33.600	27.187	1.000	1.000	1.000	231.21	204.78	9.460	5 2
Diag2	L2x2x5/16	SAE	2X2X0.3125	36.0	87.12	Comp	87.12	g20XY	-10.891	NESC Ext	12.501	33.600	33.984	0.750	0.500	0.500	175.41	162.26	11.402	5 2
Diag3	L3X2.5X1/4	SAU	3X2.5X0.25	36.0	66.56	Comp	66.56	g28XY	-15.728	NESC Hea	23.631	33.450	40.781	0.750	0.500	0.500	127.77	125.96	11.244	5 3
Diag4	L4X3X1/4	SAU	4X3X0.25	36.0	71.20	Tens	63.65	g36XY	-25.009	NESC Hea	39.288	55.750	67.969	0.750	0.500	0.500	101.52	106.14	11.015	2 5
Diag5	L3X3X1/4	SAE	3X3X0.25	36.0	90.26	Cross	90.26	g47Y	-10.629	NESC Hea	11.776	22.300	27.187	1.000	0.542	0.542	229.08	187.08	17.754	6 2
Diag6	L2.5x2x1/4	SAU	2.5X2X0.25	36.0	90.95	Tens	0.00	g49Y	0.000		5.156	33.450	40.781	1.000	0.500	0.500	280.79	242.56	18.345	5 3
Diag7	L2.5x2x3/16	SAU	2.5X2X0.1875	36.0	86.76	Tens	55.87	g50X	-1.029	NESC Hea	1.843	22.300	20.391	0.500	1.000	0.500	427.97	354.71	21.398	5 2
Diag8	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	36.0	95.05	Comp	95.05	g52Y	-1.246	NESC Ext	1.310	22.300	20.391	1.000	0.500	0.500	368.00	368.00	16.468	4 2
Diag9	L3x2.5x1/4	SAU	3X2.5X0.25	36.0	41.78	Tens	38.19	g54Y	-2.100	NESC Ext	5.499	33.450	40.781	1.000	0.500	0.500	305.13	261.11	24.029	5 3
Horz1	L3X3X3/16	SAE	3X3X0.1875	36.0	23.32	Tens	15.51	g56P	-1.947	NESC Hea	12.554	22.300	20.391	1.000	1.000	1.000	181.21	157.64	9.000	6 2
Horz2	L2X2X3/16	SAE	2X2X0.1875	36.0	38.40	Tens	0.00	g57P	0.000		2.705	33.450	30.586	1.000	1.000	1.000	274.11	274.11	9.000	4 3
Horz3	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	46.11	Tens	9.77	g59P	-0.556	NESC Ext	5.696	22.300	20.391	1.000	1.000	1.000	252.93	201.75	9.000	6 2
Horz4	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	36.0	63.57	Comp	63.57	g65X	-9.938	NESC Ext	15.634	22.300	27.187	1.000	0.500	0.500	188.89	162.37	17.126	6 2
Horz5	**L3.5X3.5X1/4**	**SAE**	**3.5X3.5X0.25**	**36.0**	**39.45**	**Comp**	**39.45**	**g68X**	**-7.039**	**NESC Hea**	**17.846**	**22.300**	**27.187**	**1.000**	**1.000**	**1.000**				

192.58 164.64 11.138 6 2 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g69P g69Y g71P ??

Horz6	L2.5X2X5/16	SAU	2.5X2X0.3125	36.0	12.26	Tens	0.00	g61X	0.000		9.046	22.300	33.984	1.000	1.000	1.000	255.92	203.59	9.000	6	2
Inner1	L3x3x1/4	SAE	2X2X0.1875	36.0	72.98	Comp	72.98	g72X	-2.420	NESC Ext	3.316	11.150	10.195	2.000	1.000	1.000	247.54	247.54	6.364	4	1
Inner2	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	74.75	Comp	74.75	g75P	-6.375	NESC Hea	8.528	22.300	20.391	0.750	0.500	0.500	178.85	164.88	12.728	5	2
Inner3	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	22.58	Comp	22.58	g74P	-2.729	NESC Hea	12.085	22.300	20.391	0.750	0.500	0.500	154.28	146.16	12.728	5	2
TopCrArm	L4X4X1/4	SAE	4X4X0.25	36.0	29.60	Comp	29.60	g77Y	-11.883	NESC Hea	40.145	55.750	67.969	0.500	0.500	0.500	112.21	116.10	14.867	3	5
TopArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	36.0	47.31	Tens	11.64	g83P	-0.958	NESC Ext	8.230	33.450	30.586	0.670	0.330	0.330	167.84	167.84	16.554	4	3
MdCrArm1	L4X4X1/4	SAE	4X4X0.25	50.0	29.71	Comp	29.71	g79Y	-14.240	NESC Hea	47.928	66.900	81.562	0.330	0.330	0.330	93.24	106.62	18.719	3	6
MidArmBr	2.5x2x1/4	SAU	2.5X2X0.25	36.0	49.65	Tens	12.01	g84P	-0.871	NESC Ext	7.246	33.450	40.781	0.670	0.330	0.330	204.63	204.63	19.954	4	3
BotCrArm	L4X4X1/4	SAE	4X4X0.25	36.0	34.03	Comp	34.03	g81Y	-13.662	NESC Hea	40.145	55.750	67.969	0.500	0.500	0.500	112.21	116.10	14.867	3	5
BotArmBr	2.5x2x3/16	SAU	2.5X2X0.1875	36.0	61.46	Tens	7.25	g85P	-0.608	NESC Ext	8.391	33.450	30.586	0.670	0.330	0.330	166.22	166.22	16.395	4	3
ShArmBr	L4x3x1/4	SAU	4X3X0.25	36.0	66.99	Comp	66.99	g86P	-9.231	NESC Hea	13.780	22.300	27.187	1.000	0.500	0.500	187.36	187.36	19.985	4	2
ShieldAr	4ST10	ST	ST4x10	36.0	17.78	Tens	3.76	g87P	-1.011	NESC Ext	26.876	44.600	107.880	1.000	1.000	1.000	194.68	176.95	18.170	5	4
Mast	12" Sch. 40 Pwmnt	Pipe 12" Std.		35.0	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
M1	L3x3x1/4	SAE	3X3X0.25	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
M2	C12x20.7	CHA	12X20.7	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
Diag10	L3X3X3/8	SAE	3X3X0.375	36.0	93.19	Comp	93.19	g42P	-20.781	NESC Hea	28.743	22.300	40.781	0.784	0.567	0.567	152.69	144.95	13.173	5	2
MdCrArm2	L4X4X1/4	SAE	4X4X0.25	36.0	18.88	Comp	18.88	g80P	-6.227	NESC Hea	32.984	66.900	81.562	1.000	1.000	1.000	135.85	129.75	9.000	6	6
Inner4	L2.5X2X3/16	SAU	2.5X2X0.1875	36.0	25.08	Comp	25.08	g76Y	-1.023	NESC Ext	4.081	11.150	10.195	1.000	0.500	0.500	238.35	238.35	15.751	4	1
Horz7	**L3X3X3/16**	**SAE**	**3X3X0.1875**	**36.0**	**43.08**	**Comp**	**43.08**	**g66Y**	**-2.190**	**NESC Ext**	**5.085**	**22.300**	**20.391**	**2.000**	**1.000**	**1.000**	**287.54**	**247.71**	**11.250**	**5**	**2**

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g67P g67X g67XY g67Y ??

M3	L3x3x1/4	SAE	3X3X0.25	36.0	17.54	Comp	17.54	g89P	-2.573	NESC Hea	14.670	33.600	27.187	1.000	1.000	1.000	182.43	167.61	9.000	5	2
M4	L2.5x2x3/16	SAU	2.5X2X0.1875	36.0	46.11	Tens	0.00	g90P	0.000		4.733	33.600	20.391	1.000	1.000	1.000	252.93	221.33	9.000	5	2

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Steel Size	Max Strength (ksi)	Usage %	Max Usage Control 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 Holes	Hole Diameter (in)

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     Leg1       L3x3x3/16   SAE       3X3X0.1875     36.0  1.80  Comp  0.00      g1Y   0.000           27.900   44.600   40.781   31.719  8.322     4
2.240     0.75
     Leg2        L4x4x1/4   SAE         4X4X0.25     36.0 65.99  Comp 63.19      g4Y  28.184NESC Ext   56.340   44.600   54.375   60.417  7.280     4
2.000     0.75
     Leg3       L5x5x5/16   SAE       5X5X0.3125     50.0 79.53  Comp 78.93      g8Y  87.847NESC Ext  111.305  133.800  203.906  213.235  6.910    12
3.430     0.75
     Leg4       L6x6x9/16   SAE       6X6X0.5625     50.0 80.11  Comp 79.42     g12Y 188.320NESC Ext  237.125  312.200  856.405  895.587  6.910    28
4.000     0.75
     Leg5        L8x8x1/2   SAE          8X8X0.5     50.0 85.87  Comp 60.45     g15Y 188.719NESC Ext  312.500  312.200  761.249  845.832  8.219    28
4.000     0.75
    Diag1    L2.5x2.5x1/4   SAE     2.5X2.5X0.25     36.0 87.54  Comp 25.74     g19X   6.997NESC Ext   32.987   33.600   27.187   27.187  9.460     2
1.000   0.6875
    Diag2       L2x2x5/16   SAE       2X2X0.3125     36.0 87.12  Comp 43.32     g24Y  11.450NESC Ext   30.299   33.600   33.984   26.432 11.576     2
1.000   0.6875
    Diag3      L3X2.5X1/4   SAU       3X2.5X0.25     36.0 66.56  Comp 53.94     g32Y  17.110NESC Ext   32.319   33.450   40.781   31.719 11.347     3
1.000     0.75
    Diag4        L4X3X1/4   SAU         4X3X0.25     36.0 71.20  Tens 71.20     g38Y  25.259NESC Hea   35.478   55.750   67.969   48.866 11.015     5
1.840     0.75
    Diag5        L3X3X1/4   SAE         3X3X0.25     36.0 90.26 Cross 71.49     g45P  15.117NESC Hea   40.581   22.300   27.187   21.146 15.414     2
1.000     0.75
    Diag6      L2.5x2x1/4   SAU       2.5X2X0.25     36.0 90.95  Tens 90.95     g48X  22.028NESC Hea   24.219   33.450   40.781   27.375 18.345     3
1.000     0.75
    Diag7     L2.5x2x3/16   SAU     2.5X2X0.1875     36.0 86.76  Tens 86.76     g50P  13.615NESC Hea   21.688   22.300   20.391   15.694 21.398     2
1.000     0.75
    Diag8 L1.75x1.75x3/16   SAE 1.75X1.75X0.1875     36.0 95.05  Comp 75.94     g53X  10.305NESC Hea   15.532   22.300   20.391   13.570 16.468     2
1.000     0.75
    Diag9      L3x2.5x1/4   SAU       3X2.5X0.25     36.0 41.78  Tens 41.78     g55X  12.378NESC Hea   32.319   33.450   40.781   29.625 24.029     3
1.000     0.75
    Horz1       L3X3X3/16   SAE       3X3X0.1875     36.0 23.32  Tens 23.32     g60P   5.547NESC Hea   30.760   33.450   30.586   23.789  9.000     3
1.000     0.75
    Horz2       L2X2X3/16   SAE       2X2X0.1875     36.0 38.40  Tens 38.40     g57P   7.084NESC Ext   18.448   33.450   30.586   23.789  9.000     3
1.000     0.75
    Horz3     L2.5X2X3/16   SAU     2.5X2X0.1875     36.0 46.11  Tens 46.11     g63X   9.402NESC Ext   21.688   22.300   20.391   26.654  9.000     2
1.000     0.75
    Horz4    L3.5X2.5X1/4   SAU     3.5X2.5X0.25     36.0 63.57  Comp 15.01     g65P   3.175NESC Ext   32.481   22.300   27.187   21.146 17.126     2
1.000     0.75
    Horz5    L3.5X3.5X1/4   SAE     3.5X3.5X0.25     36.0 39.45  Comp  3.79     g71X   1.614NESC Ext   42.606    0.000    0.000    0.000  5.625     0
2.000     0.75 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g69P
g69Y g71P  ??
    Horz6     L2.5X2X5/16   SAU     2.5X2X0.3125     36.0 12.26  Tens 12.26     g61X   2.735NESC Hea   34.850   22.300   33.984   44.424  9.000     2
1.000     0.75
   Inner1        L3x3x1/4   SAE       2X2X0.1875     36.0 72.98  Comp  2.12 ig72P90P   0.159NESC Ext   18.448   11.150   10.195    7.481  6.364     1
1.000     0.75
   Inner2     L2.5X2X3/16   SAU     2.5X2X0.1875     36.0 74.75  Comp 23.45     g73X   2.998NESC Hea   18.650   22.300   20.391   12.783 12.728     2
1.000     0.75
   Inner3   L2.5x2.5x3/16   SAE   2.5X2.5X0.1875     36.0 22.58  Comp 13.71     g74X   1.984NESC Hea   24.669   22.300   20.391   14.470 12.728     2
1.000     0.75
 TopCrArm        L4X4X1/4   SAE         4X4X0.25     36.0 29.60  Comp 15.58    g77XY   7.823NESC Ext   50.220   55.750   67.969   52.865 14.867     5
2.080     0.75
 TopArmBr      2.5x2x3/16   SAU     2.5X2X0.1875     36.0 47.31  Tens 47.31     g83Y   6.668NESC Hea   14.094   33.450   30.586   22.950 16.554     3
2.000     0.75
 MdCrArm1        L4X4X1/4   SAE         4X4X0.25     50.0 29.71  Comp 11.94    g79XY   7.572NESC Hea   70.425   66.900   81.562   63.437 18.719     6
2.000     0.75
 MidArmBr       2.5x2x1/4   SAU       2.5X2X0.25     36.0 49.65  Tens 49.65     g84Y   9.009NESC Hea   18.144   33.450   40.781   30.600 19.954     3
2.000     0.75
 BotCrArm        L4X4X1/4   SAE         4X4X0.25     36.0 34.03  Comp 15.64    g81XY   7.929NESC Hea   50.706   55.750   67.969   52.865 14.867     5
2.000     0.75
 BotArmBr      2.5x2x3/16   SAU     2.5X2X0.1875     36.0 61.46  Tens 61.46     g85Y   8.663NESC Hea   14.094   33.450   30.586   22.950 16.395     3
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2.000 0.75
ShArmBr L4x3x1/4 SAU 4X3X0.25 36.0 66.99 Comp 23.85 g86Y 5.044NESC Ext 40.581 22.300 27.187 21.146 19.985 2
1.000 0.75
ShieldAr 4ST10 ST ST4x10 36.0 17.78 Tens 17.78 g87X 7.929NESC Hea 83.203 44.600 107.880 83.907 18.170 4
2.000 0.75
Mast 12" Sch. 40 Pwmnt Pipe 12" Std. 35.0 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0
0.000 0
M1 L3x3x1/4 SAE 3X3X0.25 36.0 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0
0.000 0
M2 C12x20.7 CHA 12X20.7 36.0 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0
0.000 0
Diag10 L3X3X3/8 SAE 3X3X0.375 36.0 93.19 Comp 60.45 g43XY 19.174NESC Hea 60.011 33.600 40.781 31.719 13.173 2
1.000 0.6875
MdCrArm2 L4X4X1/4 SAE 4X4X0.25 36.0 18.88 Comp 1.73 g80Y 0.712NESC Ext 41.223 66.900 81.562 63.437 9.000 6
3.561 0.75
Inner4 L2.5X2X3/16 SAU 2.5X2X0.1875 36.0 25.08 Comp 9.97 g76XY 0.746NESC Ext 18.650 11.150 10.195 7.481 15.751 1
1.000 0.75
Horz7 L3X3X3/16 SAE 3X3X0.1875 36.0 43.08 Comp 4.46 g66XY 0.707NESC Ext 30.760 22.300 20.391 15.859 11.250 2
1.000 0.75 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g67P g67X g67XY g67Y ??
M3 L3x3x1/4 SAE 3X3X0.25 36.0 17.54 Comp 3.43 g89Y 0.726NESC Hea 36.131 33.600 27.187 21.146 9.000 2
1.890 0.6875
M4 L2.5x2x3/16 SAU 2.5X2X0.1875 36.0 46.11 Tens 46.11 g90P 9.402NESC Ext 22.067 33.600 20.391 20.391 9.000 2
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	93.19	g42P	Angle
NESC Extreme	95.05	g52Y	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	10.77	NESC Heavy	0.0
2	Clamp	6.34	NESC Heavy	0.0
3	Clamp	16.27	NESC Heavy	0.0
4	Clamp	23.52	NESC Heavy	0.0
5	Clamp	16.34	NESC Heavy	0.0
6	Clamp	23.58	NESC Heavy	0.0
7	Clamp	16.27	NESC Heavy	0.0
8	Clamp	23.51	NESC Heavy	0.0
10	Clamp	4.33	NESC Extreme	0.0
11	Clamp	1.99	NESC Heavy	0.0
12	Clamp	2.12	NESC Heavy	0.0
13	Clamp	2.28	NESC Heavy	0.0
14	Clamp	2.90	NESC Heavy	0.0
15	Clamp	3.57	NESC Heavy	0.0

16	Clamp	3.40	NESC Heavy	0.0
17	Clamp	5.07	NESC Heavy	0.0
18	Clamp	0.69	NESC Extreme	0.0
19	Clamp	7.52	NESC Heavy	0.0
20	Clamp	0.69	NESC Extreme	0.0
21	Clamp	0.80	NESC Heavy	0.0
22	Clamp	0.94	NESC Heavy	0.0
23	Clamp	1.28	NESC Heavy	0.0
24	Clamp	1.86	NESC Heavy	0.0
25	Clamp	1.73	NESC Heavy	0.0
26	Clamp	2.33	NESC Heavy	0.0
27	Clamp	0.69	NESC Extreme	0.0
28	Clamp	0.69	NESC Extreme	0.0
29	Clamp	0.69	NESC Extreme	0.0
30	Clamp	0.69	NESC Extreme	0.0
31	Clamp	8.97	NESC Extreme	0.0
32	Clamp	11.53	NESC Extreme	0.0
33	Clamp	18.64	NESC Extreme	0.0
34	Clamp	9.54	NESC Extreme	0.0
35	Clamp	7.11	NESC Extreme	0.0
36	Clamp	13.45	NESC Heavy	0.0
38	Clamp	2.13	NESC Extreme	0.0
40	Clamp	2.03	NESC Heavy	0.0
41	Clamp	2.17	NESC Heavy	0.0
42	Clamp	2.32	NESC Heavy	0.0
43	Clamp	2.95	NESC Heavy	0.0
44	Clamp	3.63	NESC Heavy	0.0
45	Clamp	3.45	NESC Heavy	0.0
46	Clamp	5.16	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	28P	3.259	3.998	1.551	5.386
NESC Heavy	2	Clamp	28X	0.000	2.975	1.093	3.169
NESC Heavy	3	Clamp	27P	4.889	5.603	3.301	8.136
NESC Heavy	4	Clamp	27X	0.000	10.828	4.586	11.759
NESC Heavy	5	Clamp	26P	4.889	5.603	3.380	8.168
NESC Heavy	6	Clamp	26X	0.000	10.826	4.665	11.788
NESC Heavy	7	Clamp	25P	4.889	5.603	3.301	8.136
NESC Heavy	8	Clamp	25X	0.000	10.826	4.586	11.757
NESC Heavy	10	Clamp	14X	0.043	0.119	1.893	1.898
NESC Heavy	11	Clamp	12X	0.000	0.345	0.931	0.993
NESC Heavy	12	Clamp	10X	0.000	0.360	0.999	1.062
NESC Heavy	13	Clamp	8X	0.000	0.393	1.069	1.139
NESC Heavy	14	Clamp	6X	0.000	0.459	1.376	1.450
NESC Heavy	15	Clamp	4X	0.000	0.643	1.665	1.785
NESC Heavy	16	Clamp	3X	0.000	0.563	1.603	1.699
NESC Heavy	17	Clamp	2X	0.000	0.792	2.407	2.535
NESC Heavy	18	Clamp	16P	0.000	0.000	0.263	0.263
NESC Heavy	19	Clamp	14P	-0.038	-0.159	3.754	3.758
NESC Heavy	20	Clamp	12P	0.000	0.000	0.333	0.333
NESC Heavy	21	Clamp	10P	0.000	0.000	0.401	0.401
NESC Heavy	22	Clamp	8P	0.000	0.000	0.471	0.471
NESC Heavy	23	Clamp	6P	0.000	0.000	0.640	0.640

NESC Heavy	24	Clamp	4P	0.000	0.000	0.929	0.929
NESC Heavy	25	Clamp	3P	0.000	0.000	0.867	0.867
NESC Heavy	26	Clamp	2P	0.000	0.000	1.165	1.165
NESC Heavy	27	Clamp	17P	0.000	0.000	0.201	0.201
NESC Heavy	28	Clamp	17X	0.000	0.134	0.201	0.241
NESC Heavy	29	Clamp	17XY	0.000	0.134	0.201	0.241
NESC Heavy	30	Clamp	17Y	0.000	0.000	0.201	0.201
NESC Heavy	31	Clamp	18P	1.134	0.260	0.362	1.218
NESC Heavy	32	Clamp	18X	-0.837	1.294	0.384	1.588
NESC Heavy	33	Clamp	18XY	0.859	2.351	0.837	2.639
NESC Heavy	34	Clamp	18Y	-1.109	0.422	0.348	1.237
NESC Heavy	35	Clamp	14XY	-0.014	0.164	2.999	3.004
NESC Heavy	36	Clamp	14Y	-0.057	-0.233	6.718	6.723
NESC Heavy	38	Clamp	16XY	0.000	0.382	0.907	0.984
NESC Heavy	40	Clamp	12XY	0.000	0.407	0.931	1.016
NESC Heavy	41	Clamp	10XY	0.000	0.422	0.999	1.084
NESC Heavy	42	Clamp	8XY	0.000	0.455	1.069	1.162
NESC Heavy	43	Clamp	6XY	0.000	0.536	1.376	1.476
NESC Heavy	44	Clamp	4XY	0.000	0.720	1.665	1.814
NESC Heavy	45	Clamp	3XY	0.000	0.640	1.603	1.726
NESC Heavy	46	Clamp	2XY	0.000	0.921	2.407	2.578
NESC Extreme	1	Clamp	28P	2.608	3.193	0.550	4.159
NESC Extreme	2	Clamp	28X	0.084	1.925	0.385	1.965
NESC Extreme	3	Clamp	27P	4.297	5.137	1.537	6.871
NESC Extreme	4	Clamp	27X	4.431	8.052	2.228	9.457
NESC Extreme	5	Clamp	26P	4.297	5.137	1.537	6.871
NESC Extreme	6	Clamp	26X	4.431	8.052	2.228	9.457
NESC Extreme	7	Clamp	25P	4.297	5.137	1.537	6.871
NESC Extreme	8	Clamp	25X	4.431	8.052	2.228	9.457
NESC Extreme	10	Clamp	14X	0.114	-0.066	2.162	2.166
NESC Extreme	11	Clamp	12X	0.000	0.715	0.379	0.809
NESC Extreme	12	Clamp	10X	0.000	0.715	0.379	0.809
NESC Extreme	13	Clamp	8X	0.000	0.715	0.379	0.809
NESC Extreme	14	Clamp	6X	0.000	0.972	0.548	1.116
NESC Extreme	15	Clamp	4X	0.000	0.972	0.548	1.116
NESC Extreme	16	Clamp	3X	0.000	1.200	0.772	1.427
NESC Extreme	17	Clamp	2X	0.000	1.409	0.785	1.613
NESC Extreme	18	Clamp	16P	0.000	0.266	0.217	0.343
NESC Extreme	19	Clamp	14P	-0.122	-0.407	0.657	0.783
NESC Extreme	20	Clamp	12P	0.000	0.266	0.217	0.343
NESC Extreme	21	Clamp	10P	0.000	0.266	0.217	0.343
NESC Extreme	22	Clamp	8P	0.000	0.266	0.217	0.343
NESC Extreme	23	Clamp	6P	0.000	0.419	0.348	0.545
NESC Extreme	24	Clamp	4P	0.000	0.419	0.348	0.545
NESC Extreme	25	Clamp	3P	0.000	0.647	0.572	0.864
NESC Extreme	26	Clamp	2P	0.000	0.476	0.448	0.654
NESC Extreme	27	Clamp	17P	0.000	0.266	0.217	0.343
NESC Extreme	28	Clamp	17X	0.000	0.266	0.217	0.343
NESC Extreme	29	Clamp	17XY	0.000	0.266	0.217	0.343
NESC Extreme	30	Clamp	17Y	0.000	0.266	0.217	0.343
NESC Extreme	31	Clamp	18P	4.303	1.238	0.231	4.484
NESC Extreme	32	Clamp	18X	-3.260	4.748	0.241	5.765
NESC Extreme	33	Clamp	18XY	3.313	8.706	0.363	9.322
NESC Extreme	34	Clamp	18Y	-4.350	1.940	0.226	4.768
NESC Extreme	35	Clamp	14XY	-0.015	-0.044	3.555	3.555
NESC Extreme	36	Clamp	14Y	0.016	-0.794	0.924	1.218
NESC Extreme	38	Clamp	16XY	0.000	0.992	0.392	1.067
NESC Extreme	40	Clamp	12XY	0.000	0.940	0.379	1.014
NESC Extreme	41	Clamp	10XY	0.000	0.940	0.379	1.014

NESC Extreme	42	Clamp	8XY	0.000	0.940	0.379	1.014
NESC Extreme	43	Clamp	6XY	0.000	1.248	0.548	1.363
NESC Extreme	44	Clamp	4XY	0.000	1.248	0.548	1.363
NESC Extreme	45	Clamp	3XY	0.000	1.476	0.772	1.666
NESC Extreme	46	Clamp	2XY	0.000	1.875	0.785	2.033

Overturning Moments For User Input Concentrated Loads:

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
NESC Heavy	62.680	17.907	50.526	6627.925	1962.294	-377.676
NESC Extreme	66.323	28.875	20.138	7153.407	3053.101	-87.028

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 29457.3
Total: 29457.3

*** End of Report

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Subject: Anchor Bolt Analysis for Tower #20003

Location: Manchester, CT

Rev. 0: 3/28/16

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 16002.002

Tower Anchor Bolt Analysis

Max Leg Reactions:

Uplift =	Uplift := 175·kips	(User Input)	
Shear =	Shear := 47.5·kips	(User Input)	
Compression =	Compression := 196·kips	(User Input)	

Original/Existing Anchor Bolt Data:

ASTM A36

Number of Anchor Bolts =	$N_1 := 4$	(User Input)	
Bolt Ultimate Strength =	$F_{u.1} := 58ksi$	(User Input)	
Bolt Yield Strength =	$F_{y.1} := 36ksi$	(User Input)	
Diameter of Bolts =	$D_1 := 1.5in$	(User Input)	
Threads per Inch =	$n_1 := 6$	(User Input)	
Coefficient of Friction =	$\mu_1 := 0.55$	(User Input)	
Embedment =	$E_1 := 6·ft$	(User Input)	

Outer Anchor Bolt Data: **(Added 10/15/04 per PJF job no. 34804-19 drawing S-1)**

ASTM A193 Gr B7 w/ G5 Epoxy Adhesive

Number of Anchor Bolts =	$N_2 := 4$	(User Input)	
Bolt Ultimate Strength =	$F_{u.2} := 125ksi$	(User Input)	
Bolt Yield Strength =	$F_{y.2} := 105ksi$	(User Input)	
Diameter of Bolts =	$D_2 := 1.0in$	(User Input)	
Threads per Inch =	$n_2 := 8$	(User Input)	
Ultimate Tension Force for G5 Epoxy =	$F_{t.G5} := 48.7·kips$	(User Input)	Based on 3000 psi concrete)
Anchor Plate Thickness =	$t := 2.5·in$	(User Input)	
Anchor Plate Yield Strength =	$F_y := 36·ksi$	(User Input)	

Existing Base Plate Data:

Plate Yield Strength =	$F_{ybp} := 36ksi$	(User Input)	
Base Plate Thickness =	$t_{bp} := 1.875in$	(User Input)	
Base Plate Width =	$W_{bp} := 14in$	(User Input)	
Distance from Bolt Center to Leg =	$b_d := 4.5·in$	(User Input)	
Weld Grade	E70XX	(User Input)	
Weld Yield Stress =	$F_w := 70·ksi$	(User Input)	
Weld Size =	$sw := 0.4375·in$	(User Input)	
Weld Area =	$A_w := 9.89·in^2$	(User Input)	
Grout Strength =	$f_c := 3000·psi$	(User Input)	

Reinforcement Plate Data:

Plate Yield Strength = $F_{yrp} := 36ksi$ (User Input)

Plate Thickness = $t_{rp} := 2.5in$ (User Input)

Plate Width = $W_{rp} := 7in$ (User Input)

Reinforcement Shim Plate Data:

Plate Length = $l_{rsp} := 9in$ (User Input)

Plate Width = $W_{rsp} := 2.5in$ (User Input)

Anchor Bolt Area:

Net Area of Bolt 1 = $A_{n.1} := \frac{\pi}{4}\cdot\left(D_1 - \frac{0.9743\cdot in}{n_1}\right)^2 = 1.405\cdot in^2$ (AISC 13th Ed. pg. 7-83)

Net Area of Bolt 2 = $A_{n.2} := \frac{\pi}{4}\cdot\left(D_2 - \frac{0.9743\cdot in}{n_2}\right)^2 = 0.606\cdot in^2$ (AISC 13th Ed. pg. 7-83)

Check ASTM A36 Anchor Bolts:

Tension Strength 1 = $F_{t.1} := A_{n.1}\cdot F_{y.1} = 50.6\cdot kips$

Shear Strength 1 = $F_{v.1} := A_{n.1}\cdot F_{y.1}\cdot 0.85\cdot \mu_1 = 23.7\cdot kips$

Shear per Bolt = $V := \frac{Shear}{N_1} = 11.875\cdot kips$ (Shear Force only Resisted by Original Anchor Bolts)

Tension per Bolt = $T := \frac{Uplift}{N_1 + N_2} = 21.88\cdot kips$

Check Combined Tension and Shear = $\frac{T}{F_{t.1}} + \frac{V}{F_{v.1}} = 0.935$ ASCE 10-97 EQ. (7.4-2)

$Condition1 := if\left(\frac{T}{F_{t.1}} + \frac{V}{F_{v.1}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

Check Combined Compression and Shear = $\frac{Shear - 0.3\cdot Compression}{F_{v.1}} = -0.478$ ASCE 10-97 EQ. (7.4-4)

$Condition2 := if\left(\frac{Shear - 0.3\cdot Compression}{F_{v.1}} \le 1.00, "OK", "Overstressed"\right)$

Condition2 = "OK"

Check Anchor Embedment = $12\cdot D_1\cdot\sqrt{\frac{F_{u.1}}{58\cdot ksi}} = 1.5ft$ ASCE 10-97 EQ. (7.5.2.1)

$Condition3 := if\left(12\cdot D_1\cdot\sqrt{\frac{F_{u.1}}{58\cdot ksi}} \le E_1, "OK", "Overstressed"\right)$

Condition3 = "OK"

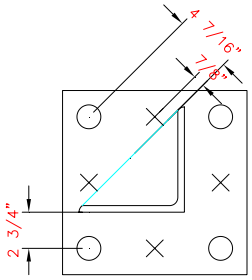
Base Plate to Leg Weld Check =

Weld Stress = $f_w := \frac{Uplift}{A_w} + \frac{Shear}{A_w} = 22.5 \cdot ksi$

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

Condition4 = "OK"

Check Base Plate:



Distance from Bolt Center to Leg = $b_{d1} := 2.75 \cdot in$ (User Input)

Distance from Bolt Center to Leg = $b_{d2} := 4.4375 \cdot in$ (User Input)

Distance from Bolt Center to Leg = $b_{d3} := 0.875 \cdot in$ (User Input)

Base Plate Area = $A_{bp} := W_{bp}^2 = 196 \cdot in^2$

Base Plate Section Modulus = $S_{bp} := \frac{W_{bp} \cdot t_{bp}^2}{6} = 8.203 \cdot in^3$

Compression Force in Plate = $\frac{Compression}{A_{bp}} = 1 \cdot ksi$

$Condition5 := if\left(\frac{Compression}{A_{bp}} \le F_{ybp}, "OK", "NG"\right)$

Condition5 = "OK"

Bending Force in Plate =

Maximum Bending Moment = $M_{max} := \begin{cases} (3 \cdot T \cdot b_{d1}) & \text{if } 3 \cdot T \cdot b_{d1} > T \cdot b_{d2} + 2 \cdot T \cdot b_{d3} \\ (T \cdot b_{d2} + 2 \cdot T \cdot b_{d3}) & \text{otherwise} \end{cases} = 180.469 \cdot k \cdot in$

$Condition6 := if\left(\frac{M_{max}}{S_{bp}} \le F_{ybp}, "OK", "NG"\right)$

Condition6 = "OK"

Check Grout:

Compression Force on Grout = $\frac{Compression}{A_{bp}} = 1 \cdot ksi$

$Condition7 := if\left(\frac{Compression}{A_{bp}} \le f_c, "OK", "NG"\right)$

Condition7 = "OK"

Check Concrete:

Strength Reduction Factor = $\phi_c := 0.65$

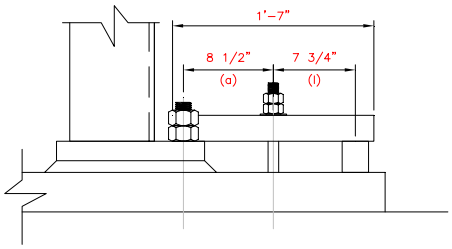
Concrete Bearing Capacity = $P_b := \phi_c \cdot 0.85 \cdot f_c = 1658\,psi$

Compression Force on Concrete = $\frac{Compression}{A_{bp}} = 1 \cdot ksi$

$Condition8 := if\left(\frac{Compression}{A_{bp}} \le P_b, "OK", "NG"\right)$

Condition8 = "OK"

Check ASTM A193 Gr B7 Bolts:



Distance Between Supports = $l := 7.75 \cdot in$

Distance From Load to First Support = $a := 8.5 \cdot in$

Tension Strength 2 = $F_{t.2} := \begin{cases} A_{n.2} \cdot F_{y.2} & \text{if } A_{n.2} \cdot F_{y.2} < F_{t.G5} \\ F_{t.G5} & \text{otherwise} \end{cases} = 48.7 \cdot kips$

Tension per Bolt = $T_2 := \frac{T}{l} \cdot (l + a) = 45.867 \cdot kips$

Check Tension on ASTM A193 Gr B7 Bolts = $\frac{T_2}{F_{t.2}} = 0.942$

$Condition9 := if\left(\frac{T_2}{F_{t.2}} \le 1.00, "OK", "Overstressed"\right)$

Condition9 = "OK"

Check Existing Reinforcement Plate:

Plate Section Modulus = $S_{rp} := \frac{W_{rp} \cdot t_{rp}^2}{6} = 7.292 \cdot in^3$

Bending Force in Plate From Tension on Bolts = $M_{max} := T \cdot a = 185.938 \cdot in \cdot k$

Bending Stress in Plate From Tension on Bolts = $f_{ybp} := \frac{M_{max}}{S_{rp}} = 25.5 \cdot ksi$

$Condition10 := if\left(\frac{M_{max}}{S_{rp}} \le F_{ybp}, "OK", "NG"\right)$

Condition10 = "OK"

Check Concrete:

Compression Force on Concrete = $\frac{T \cdot \frac{a}{l}}{W_{rsp} \cdot l_{rsp}} = 1.066 \cdot ksi$

$Condition11 := if\left(\frac{Compression}{A_{bp}} \le P_b, "OK", "NG"\right)$

Condition11 = "OK"

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Subject:	Foundation Analysis Tower # 20003
Location:	Manchester, CT
Rev. 0: 3/28/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.002

Foundation Analysis

Input Data:

Max. Reactions at Tower Leg:

Shear =	Shear := 47.5·1.1·kips = 52.3·kips	(User Input)
Compression =	Comp := 196·1.1·kips = 215.6·kips	(User Input)
Uplift =	Uplift := 175·1.1·kips = 192.5·kips	(User Input)

Tower Properties:

Tower Height =	$H_t := 155 \cdot ft$	(User Input)

Foundation Properties: (Refer to NUSCO drawing 01165-60003 dated 11-3-65)

Pier Height =	$P_H := 9.5 \cdot ft$	(User Input)
Pier Width Top =	$P_{w1} := 4 \cdot ft$	(User Input)
Pier Width Botttom =	$P_{w2} := 6 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 0.5 \cdot ft$	(User Input)
Pad Width =	$Pd_w := 12 \cdot ft$	(User Input)
Pad Thickness =	$Pd_t := 1.25 \cdot ft$	(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 =	$\phi := 30.0 \cdot deg$	(User Input)
Soil Bearing Capacity =	$BC_{soil} := 4000 \cdot psf$	(User Input)
Coefficient of Friction =	$\mu := 0.45$	(User Input)
Coefficient of Lateral Soil Pressure =	$K_p := \frac{1 + \sin(\phi)}{1 - \sin(\phi)} = 3$	

Calculated Data:

Volume of the Concrete Pad = $V_{pad} := Pd_w^2 \cdot Pd_t = 180 \cdot ft^3$

Volume of the Concrete Pier = $V_{pier} := \frac{(P_H)}{3} \cdot \left(P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2}\right) = 240.67 \cdot ft^3$

Resisting Pyramid Base 1 = $B_1 := Pd_w^2 = 144 ft^2$

Resisting Pyramid Base 2 = $B_2 := \left[2 \cdot \tan(\phi) \cdot (P_H - P_P) + Pd_w\right]^2 = 501 ft^2$

Volume of Soil = $V_{soil} := \left[\frac{(P_H - P_P)}{3} \cdot \left(B_1 + B_2 + \sqrt{B_1 \cdot B_2}\right)\right] - V_{pier} = 2502 \cdot ft^3$

Total Volume of Concrete = $V_{Conc} := V_{pad} + V_{pier} = 421 \cdot ft^3$

Mass of Concrete = $Mass_{Conc} := V_{Conc} \cdot \gamma c = 63.1 \cdot kips$

Mass of Soil = $Mass_{Soil} := V_{soil} \cdot \gamma s = 250 \cdot kips$

Total Mass = $Mass_{tot} := Mass_{Conc} + Mass_{Soil} = 313 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{tot}}{Uplift} = 1.63$

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

Uplift_Check = "OK"

Check Bearing:

Cross Sectional Area of Pad = $A_{pad} := Pd_w^2 = 144 ft^2$

Section Modulus of Pad = $S_{pad} := \frac{(Pd_w)^3}{6} = 288 \cdot ft^3$

Residual Mass of Concrete = $Mass_{Concr} := V_{Conc} \cdot (\gamma c - \gamma s) = 21 \cdot kips$

$Bearing := \frac{Comp + Mass_{Concr}}{A_{pad}} + \frac{\left[Shear \cdot (P_H + Pd_t)\right]}{S_{pad}} = 3.59 \cdot ksf$

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

Bearing_Check = "OK"

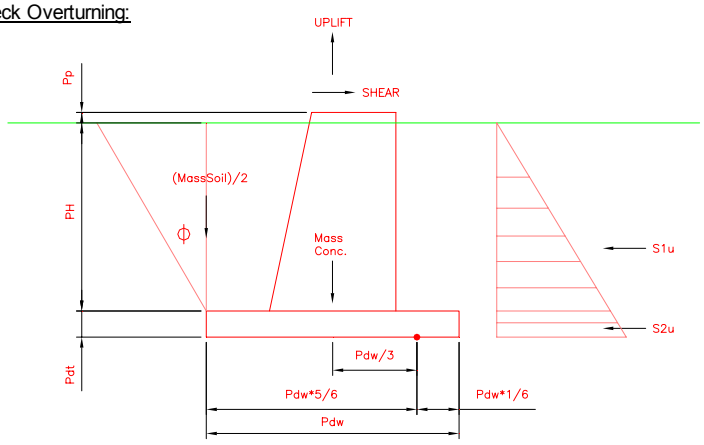
Check Sliding:

Sliding Resistance = $S_R := \mu \cdot (Mass_{Conc} + Comp) = 125.415 \cdot kips$

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

Sliding_Check = "OK"

Check Overturning:



Passive Pressure (on pier) =

$P1_{top} := K_p \cdot \gamma s \cdot 0 = 0 \cdot ksf$

$P1_{bot} := K_p \cdot \gamma s \cdot (P_H - P_P) = 2.7 \cdot ksf$

$P1_{ave} := \frac{P1_{top} + P1_{bot}}{2} = 1.35 \cdot ksf$

$A_1 := P_H \cdot \left[\frac{(P_{w1} + P_{w2})}{2} \right] = 47.5 ft^2$

Ultimate Shear =

$S1_u := P1_{ave} \cdot A_1 = 64.125 \cdot kip$

Passive Pressure (on pad) =

$P2_{top} := K_p \cdot \gamma s \cdot (P_H - P_P) = 2.7 \cdot ksf$

$P2_{bot} := K_p \cdot \gamma s \cdot (P_H + Pd_t - P_P) = 3.075 \cdot ksf$

$P2_{ave} := \frac{P2_{top} + P2_{bot}}{2} = 2.888 \cdot ksf$

$A_2 := Pd_t \cdot Pd_w = 15 ft^2$

Ultimate Shear =

$S2_u := P2_{ave} \cdot A_2 = 43.313 \cdot kip$

Overturning Moment =

$OM := Uplift \cdot \frac{Pd_w}{3} + Shear \cdot (P_H + Pd_t) = 1331.7 \cdot k \cdot ft$

Resisting Moment =

$RM := Mass_{Conc} \cdot \left(\frac{Pd_w}{3} \right) + \frac{Mass_{Soil}}{2} \cdot \left(\frac{5 \cdot Pd_w}{6} \right) + S1_u \cdot \left[Pd_t + \frac{1}{3} \cdot (P_H - P_P) \right] + S2_u \cdot \left(\frac{1}{3} \cdot Pd_t \right) = 1793.8 \cdot k \cdot ft$

$ActualFS := \frac{RM}{OM} = 1.35$

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

Overturning_Check = "OK"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV1209	DATE:	11/12/2014	RF DESIGN ENG:	Sohail Usmani
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	
REVISION:	Final	RF MANAGER:	Cameron Syme	RF DESIGN EMAIL:	su0170@att.com
INITIATIVE /PROJECT:	LTE 2C Carrier Add.				

RF PERF ENG:	Florian Ayo	RFDS PROGRAM TYPE:	2016 LTE Next Carrier
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE 2C
RF PERF EMAIL:		State:	Final
TRIDENT:		Status:	Approved
GSM FREQUENCY:	850, 1900	RFDS ID:	850030
UMTS FREQUENCY:	850, 1900	RFDS Version:	1.00
LTE FREQUENCY:	700, 1900	Created By:	su0170
		Date Created:	9/16/2015 1:09:47 PM
		Date Updated:	11/23/2015 8:43:26 AM
		Updated By:	mm093q
I-PLAN JOB # 1:	NER-RCTB-12-04145	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 2C
I-PLAN JOB # 2:		IPLAN PRD GRP || SUB GRP #2:	
I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:	
I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:	

Section 2 - LOCATION INFORMATION

USID:	59439	FA LOCATION CODE:	10035390	LOCATION NAME:	MANCHESTER CT., OLCOTT ST
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	190 OLCOTT STREET	CITY:	MANCHESTER	STATE:	CT
ZIP CODE:	06040	COUNTY:	HARTFORD	MSA / RSA:	
LATITUDE (D-M-S):	41d 46m 20.57196s	LONGITUDE (D-M-S):	-72d -33m -23.20596s	LAT (DEC. DEG.):	41.7723811
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	FROM MIDDLETOWN TAKE ROUTE 91 NORTH TO EXIT 29 FOLLOW TO ROUTE 84 EAST. FOLLOW 84 TO ROUTE 384, TAKE EXIT 1 SPENCER ST., AT END OF RAMP TAKE LEFT AT LIGHT ONTO SPENCER ST. TRAVEL .8 MILE TAKE LEFT ONTO OLCOTT ST. SITE IS .4 MILE ON RIGHT SIDE UNDER NU TRANSMISION LINES. WE SHARE A SHORT DRIVEWAY WITH NU AND THEIR SMALL SUB STATION. ADDRESS IS 190 OLCOTT ST. MANCHESTER METER: 89-223-438. NORTHEAST UTILITIES T-1-GSM CIRCUITS: HCGS:717129; HCGS:717130;HCGS:717128 UMTS CIRCUITS: 1:HCGS:742343 2:HCGS:742344 3:HCGS:753031 4:HCGS:753032 5:HCGS:760946 6:HCGS:760947 T-1 LOCATED IN SHELTER. GATE COMBO:0043/5509 SHELTER:GROUND LEVEL				

ORACLE PTN # 1:	2051A03K8M	PACE JOB # 1:	MRCTB016757
ORACLE PTN # 2:		PACE JOB # 2:	
ORACLE PTN # 3:		PACE JOB # 3:	
ORACLE PTN # 4:		PACE JOB # 4:	
SEARCH RING NAME:			
SEARCH RING ID:		CASPR INITIATIVE # 1:	
BTA:		CASPR INITIATIVE # 2:	
LONG (DEC. DEG.):	-72.5564461	CASPR INITIATIVE # 3:	
BORDER CELL WITH CONTOUR COORD:		CASPR INITIATIVE # 4:	
AM STUDY REQ'D (Y/N):	No		
FREQ COORD:			

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	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):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	UTILITY
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	156.00	FCC ASR NUMBER:	
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	156.00		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:	
MARKET LOCATION 850 MHz Band:	
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	CONNECTICUT STATE POLICE-H TROOP	1320		INTRADO_MIAMI		0		
SECTOR B	CONNECTICUT STATE POLICE-H TROOP	1320		INTRADO_MIAMI		0		
SECTOR C	CONNECTICUT STATE POLICE-H TROOP	1320		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	CONNECTICUT STATE POLICE-H TROOP	1320		INTRADO_MIAMI		0				
SECTOR B	CONNECTICUT STATE POLICE-H TROOP	1320		INTRADO_MIAMI		0				
SECTOR C	CONNECTICUT STATE POLICE-H TROOP	1320		INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	96646	96647	208899	300965					366915			
CTS COMMON ID:	032D1209	184D1209	CTV1209	CTU1209					CTL01209			
BTA/TID:	184G	184P	184U	184W					184L			
4-DIGIT SITE ID:	1209	1209	1209	1209					1209			
COW OR TOY?:	No	No	No	No					No			
CELL SITE TYPE:												
SITE TYPE:												
BTS LOCATION ID:												
ORIGINATING CO:												
CELLULAR NETWORK:												
OPS DISTRICT:	NORTH	CT-NORTH	CT-NORTH									
RF DISTRICT:	NORTH			NPO TRIAGE								
OPS ZONE:	NE_CT_N_TLDN_N_CS	NE_CT_N_TLDN_N__CS	NE_CT_N_TLDN_N__CS									
RF ZONE:	BCT06 - WINDHAM			BCT09								
BASE STATION TYPE:												
EQUIPMENT NAME:	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST					MANCHESTER CT. OLCOTT ST			
DISASTER PRIORITY:												

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	96646	96647	208899	300965					366915			
CTS COMMON ID:	032D1209	184D1209	CTV1209	CTU1209					CTL01209			
BTA/TID:	184G	184P	184U	184W					184L			
4-DIGIT SITE ID:	1209	1209	1209	1209					1209			
COW OR TOY?:	No	No	No	No					No			
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED					SECTORIZED			
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL					MACRO-CONVENTIONAL			
BTS LOCATION ID:	GROUND	GROUND	INTERNAL	INTERNAL					INTERNAL			
ORIGINATING CO:	CINGULAR	CINGULAR	CINGULAR	CINGULAR					CINGULAR			
CELLULAR NETWORK:	GOLD	GOLD	GOLD	GOLD					GOLD			
OPS DISTRICT:	CT-North	CT-North	CT-North	CT-North					CT-North			
RF DISTRICT:	NPO Triage	NPO Triage	Middletown	NPO Triage					NPO Triage			
OPS ZONE:	NE_CT_N_TLDN_N_CS	NE_CT_N_TLDN_N_CS	NE_CT_N_TLDN_N_CS	NE_CT_N_TLDN_N_CS					NE_CT_N_TLDN_N_CS			
RF ZONE:	Hotseat	Hotseat	BCT09	BCT09					Hotseat			
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY					BASE			
EQUIPMENT NAME:	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST	MANCHESTER CT., OLCOTT ST					MANCHESTER CT. OLCOTT ST			
DISASTER PRIORITY:	0	0	0	0					3			

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC												
BSC/RNC/MME POOL ID									FF01			
LAC	05009	05009	05990	05990								
RAC												
EQUIPMENT VENDOR												
EQUIPMENT TYPE	ULTRASITE	ULTRASITE										
LOCATION												
CABINET LOCATION												
MARKET STATE CODE												
AGPS	Yes	Yes	Yes	Yes					Yes			
NODE B NUMBER	0	0	0	0					1209			
PARENT NAME	BCT09	BCT09	MDTWCTNICRBR05	MDTWCTNICRBR05					FF01			

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC												
BSC/RNC/MME POOL ID	BCT09	BCT09	MDTWCTNICRBR05	MDTWCTNICRBR05					FF01			
LAC	05009	05009	05990	05990								
RAC												
EQUIPMENT VENDOR	NOKIA	NOKIA	ERICSSON	ERICSSON					ERICSSON			
EQUIPMENT TYPE	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR					6601 INDOOR MU			
LOCATION												
CABINET LOCATION												
MARKET STATE CODE									CT			
AGPS	Yes	Yes	Yes	Yes					Yes			
NODE B NUMBER	0	0	0	0					1209			
PARENT NAME	MIDDLETOWN-GSM MTSO-BSC-9	MIDDLETOWN-GSM MTSO-BSC-9	MIDDLETOWN RNC05	MIDDLETOWN RNC05								

Section 8 - RBS INDIVIDUAL INFORMATION - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID:	96646	96647			208899	300965											366915							
CELL ID/BCF:	032D1209	032D1209			CTV1209	CTV1209											CTL01209							
CTS COMMON ID:	032D1209	184D1209			CTV1209	CTU1209											CTL01209							
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID:																								
CELL ID/BCF:																								
CTS COMMON ID:																								

Section 8 - RBS INDIVIDUAL INFORMATION - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID:	96646	96647			208899	300965											366915		366915					
CELL ID/BCF:	032D1209	032D1209			CTV1209	CTV1209											CTL01209		CTL01209					
CTS COMMON ID:	032D1209	184D1209			CTV1209	CTU1209											CTL01209		CTL01209					
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID:																								
CELL ID/BCF:																								
CTS COMMON ID:																								

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59439.850.25G.1	59439.1900.25G.1			59439.850.3G.1	59439.1900.3G.2											59439.700.4G.1							
SECTOR A SOFT SECTOR ID	184G12091	184P12091			CTV12091	CTU12097											CTL01209_7A_1							
SECTOR B	184G12092	184P12092			CTV12092	CTU12098											CTL01209_7B_1							
SECTOR C	184G12093	184P12093			CTV12093	CTU12099											CTL01209_7C_1							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A SOFT SECTOR ID																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59439.850.25G.1	59439.1900.25G.1			59439.850.3G.1	59439.1900.3G.2											59439.700.4G.1		59439.1900.4G.111					
SECTOR A SOFT SECTOR ID	184G12091	184P12091			CTV12091	CTU12097											CTL01209_7A_1		CTL01209_9A_1					
SECTOR B	184G12092	184P12092			CTV12092	CTU12098											CTL01209_7B_1		CTL01209_9B_1					
SECTOR C	184G12093	184P12093			CTV12093	CTU12099											CTL01209_7C_1		CTL01209_9C_1					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A SOFT SECTOR ID																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59439.850.25G.1	59439.1900.25G.1			59439.850.3G.1	59439.1900.3G.2											59439.700.4G.1							
SECTOR A CELL NUMBER	0	0			0	0											15							
SECTOR B	0	0			0	0											16							
SECTOR C	0	0			0	0											17							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A CELL NUMBER																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59439.850.25G.1	59439.1900.25G.1			59439.850.3G.1	59439.1900.3G.2											59439.700.4G.1		59439.1900.4G.111					
SECTOR A CELL NUMBER	0	0			0	0											15		8					
SECTOR B	0	0			0	0											16		9					
SECTOR C	0	0			0	0											17		10					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A CELL NUMBER																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC	12091	12091			12091	12097																		
SECTOR B	12092	12092			12092	12098																		
SECTOR C	12093	12093			12093	12099																		
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC	12091	12091			12091	12097																		
SECTOR B	12092	12092			12092	12098																		
SECTOR C	12093	12093			12093	12099																		
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 11 - CURRENT RADIO COUNTS existing

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

Section 12 - CURRENT T1 COUNTS existing

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

Section 13 - NEW/PROPOSED RADIO COUNTS

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

Section 14 - NEW/PROPOSED T1 COUNTS

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

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET				AM-X-CD-16-65-00T-RET		AM-X-CD-16-65-00T-RET							
ANTENNA VENDOR	KMW				KMW		KMW							
ANTENNA SIZE (H x W x D)	72X11.8X5.9				72X11.8X5.9		72X11.8X5.9							
ANTENNA WEIGHT	48.5				48.5		48.5							
AZIMUTH	143				143		60							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	165				165		165							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT	2				2		2							
Antenna RET Motor (QTY/MODEL)		Built-In				Built-In		Built-In						
SURGE ARRESTOR (QTY/MODEL)							2	Andrew APTDC-BDFDM-DB Broadband						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	Powerwave / LGP 21901	2	Powerwave CM1007-DBPXBC-003						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006			1	Kathrein / 860-10006		LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI / DTMABP7819VG12A			1	CCI / DTMABP7819VG12A	1	CCI / DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH			1	Kathrein SBT 782-11055 (BTS)	1	Kathrein SBT 782-11055 (BTS)						
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)			1	Kathrein / 860-10006	1	LTE RRH						
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
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 Component1 (QTY/MODEL)														
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1														
Local Market Note2														
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59439.A.850.3G.1	CTV12091			UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1		2	None	RFS 1-5/8 (850)	195	None			NO				
	PORT 3		59439.A.1900.3G.2	CTU12097			UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29		0	None	RFS 1-5/8 (1900)	195	None			NO				
ANTENNA POSITION 3	PORT 1		59439.A.850.25G.1	184G12091			GSM 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1		2	None	RFS 1-5/8 (850)	195	None			NO	12.58	155.95		
	PORT 3		59439.A.1900.25G.1	184P12091			GSM 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29		0	None	RFS 1-5/8 (1900)	195	None			NO	28.18	465.58		
ANTENNA POSITION 4	PORT 1		59439.A.850.25G.1	CTL01209_7A_1			LTE 700	AM-X-CD-16-65-00T-RET_725MHz_14DT	16.1		14	Bottom	RFS 1-5/8	195	None							

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET				AM-X-CD-16-65-00T-RET		AM-X-CD-16-65-00T-RET							
ANTENNA VENDOR	KMW				KMW		KMW							
ANTENNA SIZE (H x W x D)	72X11.8X5.9				72X11.8X5.9		72X11.8X5.9							
ANTENNA WEIGHT	48.5				48.5		48.5							
AZIMUTH	263				263		180							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	165				165		165							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	8				8		8							
FEEDER AMOUNT	2				2		2							
Antenna RET Motor (QTY/MODEL)		Built-In				Built-In		Built-In						
SURGE ARRESTOR (QTY/MODEL)							2	Andrew APTDC-BDFDM-DB Broadband						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	Powerwave / LGP 21901	2	Powerwave CM1007-DBPXBC-003						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006			1	Kathrein / 860-10006		LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI / DTMABP7819VG12A			1	CCI / DTMABP7819VG12A	1	CCI / DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH			1	Kathrein SBT 782-11055 (BTS)	1	Kathrein SBT 782-11055 (BTS)						
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)			1	Kathrein / 860-10006	1	LTE RRH						
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
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 Component1 (QTY/MODEL)														
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1														
Local Market Note2														
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59439.B.850.3G.1	CTV12092			UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1		2	None	RFS 1-5/8 (850)	195	None			NO				
	PORT 3		59439.B.1900.3G.2	CTU12098			UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29		0	None	RFS 1-5/8 (1900)	195	None			NO				
ANTENNA POSITION 3	PORT 1		59439.B.850.25G.1	184G12092			GSM 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1		2	None	RFS 1-5/8 (850)	195	None			NO	12.58	155.95		
	PORT 3		59439.B.1900.25G.1	184P12092			GSM 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29		0	None	RFS 1-5/8 (1900)	195	None			NO	28.18	465.58		
ANTENNA POSITION 4	PORT 1		59439.B.850.25G.1	CTL01209_7B_1			LTE 700	AM-X-CD-16-65-00T-RET_725MHz_11DT	16.1		11	Bottom	RFS 1-5/8	195	None							

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET		AM-X-CD-16-65-00T-RET	AM-X-CD-16-65-00T-RET			
ANTENNA VENDOR	KMW		KMW	KMW			
ANTENNA SIZE (H x W x D)	72X11.8X5.9		72X11.8X5.9	72X11.8X5.9			
ANTENNA WEIGHT	48.5		48.5	48.5			
AZIMUTH	23		23	310			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	165		165	165			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	8		8	8			
FEEDER AMOUNT	2		2	2			
Antenna RET Motor (QTY/MODEL)	Built-In		Built-In	Built-In			
SURGE ARRESTOR (QTY/MODEL)				2 Andrew APTDC-BDFDM-DB Broadband			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901	2 Powerwave CM1007-DBPXBC-003			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006		1 Kathrein / 860-10006	LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 CCI / DTMABP7819VG12A		1 CCI / DTMABP7819VG12A	1 CCI / DTMABP7819VG12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Andrew ABT-DFDM-ADBH		1 Kathrein SBT 782-11055 (BTS)	1 Kathrein SBT 782-11055 (BTS)			
PDU FOR TMAS (QTY/MODEL)	1 LGP 12104 (1900 AND 850 Bypass TMA)		1 Kathrein / 860-10006	1 LTE RRH			
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
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 Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1							
Local Market Note2							
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59439.C.850.3G.1	CTV12093			UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1		2	None	RFS 1-5/8 (850)	195	None			NO				
	PORT 3		59439.C.1900.3G.2	CTU12099			UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29		0	None	RFS 1-5/8 (1900)	195	None			NO				
ANTENNA POSITION 3	PORT 1		59439.C.850.25G.1	184G12093			GSM 850	XDUO1416-80-0C	13.8		0	None	RFS 1-5/8 (850)	195	None			NO	12.58	155.95		
	PORT 3		59439.C.1900.25G.1	184P12093			GSM 1900	XDUO1416-80-0P	16.1		0	None	RFS 1-5/8 (1900)	195	None			NO	28.18	465.58		
ANTENNA POSITION 4	PORT 1		59439.C.850.25G.1	CTL01209_7C_1			LTE 700	AM-X-CD-16-65-00T-RET_725MHz_10DT	16.1		10	Bottom	RFS 1-5/8	195	None							

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H6			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				57			
AZIMUTH				60			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				165			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				2			
Antenna RET Motor (QTY/MODEL)				Built-In			
SURGE ARRESTOR (QTY/MODEL)				6 Andrew APTDC-BDFDM-DBW			
DIPLEXER (QTY/MODEL)				2 DBC2055F1V1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 CCI WCS TMABPD7823VG12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				1 AiSG Diplexer			
PDU FOR TMAS (QTY/MODEL)				1 LTE RRH			
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.						
Local Market Note2							
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3	59439.A.1900.4G.111		CTL01209_9A_1	CTL01209_9A_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_06DT	16.1	60	6	Bottom	RFS 1-5/8	195	None	0				3258.37	7	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H6			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				57			
AZIMUTH				180			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				165			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				2			
Antenna RET Motor (QTY/MODEL)				Built-In			
SURGE ARRESTOR (QTY/MODEL)				6 Andrew APTDC-BDFDM-DBW			
DIPLEXER (QTY/MODEL)				2 Kaelus DBC2055F1V1-2			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 CCI WCS TMABPD7823VG12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				1 AiSG Diplexer			
PDU FOR TMAS (QTY/MODEL)				1 LTE RRH			
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.						
Local Market Note2							
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3	59439.B.1900.4G.111		CTL01209_9B_1	CTL01209_9B_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_06DT	16.1	180	4	Bottom	RFS 1-5/8	195	None	0				3258.37	15	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H6			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				57			
AZIMUTH				310			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				165			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT				2			
Antenna RET Motor (QTY/MODEL)				Built-In			
SURGE ARRESTOR (QTY/MODEL)				6 Andrew APTDC-BDFDM-DBW			
DIPLEXER (QTY/MODEL)				2 Kaelus DBC2055F1V1-2			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)				2 CCI WCS TMABPD7823VG12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)				1 Kathrein SBT 782-11055 (BTS)			
PDU FOR TMAS (QTY/MODEL)				1 LTE RRH			
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.						
Local Market Note2							
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3	59439.C.1900.4G.111		CTL01209_9C_1	CTL01209_9C_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_06DT	16.1	310	8	Bottom	RFS 1-5/8	195	None	0				3258.37	23	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET				AM-X-CD-16-65-00T-RET		OPA-65R-LCUU-H6							
ANTENNA VENDOR	KMW				KMW		CCI Antennas							
ANTENNA SIZE (H x W x D)	72X11.8X5.9				72X11.8X5.9		72X14.8X7.4							
ANTENNA WEIGHT	48.5				48.5		57							
AZIMUTH	143				143		60							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	165				165		165							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT	2				2		4							
Antenna RET Motor (QTY/MODEL)		Built-In				Built-In		Built-In						
SURGE ARRESTOR (QTY/MODEL)							8	Andrew APTDC-BDFDM-DB Broadband						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	Powerwave / LGP 21901	1	Kaelus DBC2055F1V1-2						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006			1	Kathrein / 860-10006		LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI / DTMABP7819VG12A			1	CCI / DTMABP7819VG12A	2	CCI WCS TMABPD7823VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH			1	Kathrein SBT 782-11055 (BTS)	1	AiSG Diplexer						
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)			1	Kathrein / 860-10006	1	LTE RRH						
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)														
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.													
Local Market Note2	LTE RRH will power TMA													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59439.A.850.3G.1	59439.A.850.3G.1	CTV12091			UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	143	2	None	RFS 1-5/8 (850)	195	None	0		NO		497.74	1	
	PORT 3	59439.A.1900.3G.2	59439.A.1900.3G.2	CTU12097			UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	143	0	None	RFS 1-5/8 (850)	195	None	0		NO		579.43	1	
ANTENNA POSITION 3	PORT 1	59439.A.850.25G.1	59439.A.850.25G.1	184G12091			GSM 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	143	2	None	RFS 1-5/8 (850)	195	None	0		NO	12.58	155.95	5	
	PORT 3	59439.A.1900.25G.1	59439.A.1900.25G.1	184P12091			GSM 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	143	0	None	RFS 1-5/8 (850)	195	None	0		NO	28.18	465.58	5	
ANTENNA POSITION 4	PORT 1	59439.A.700.4G.1	59439.A.850.25G.1	CTL01209_7A_1	CTL01209_7A_1		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	15	60	14	Bottom	RFS 1-5/8	195	None	0				827.94	7	
	PORT 3	59439.A.1900.4G.111		CTL01209_9A_1	CTL01209_9A_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_06DT	16.1	60	6	Bottom	RFS 1-5/8	195	None	0				3258.37	7	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET				AM-X-CD-16-65-00T-RET		OPA-65R-LCUU-H6							
ANTENNA VENDOR	KMW				KMW		CCI Antennas							
ANTENNA SIZE (H x W x D)	72X11.8X5.9				72X11.8X5.9		72X14.8X9							
ANTENNA WEIGHT	48.5				48.5		57							
AZIMUTH	263				263		180							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	165				165		165							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	8				8		0							
FEEDER AMOUNT	2				2		4							
Antenna RET Motor (QTY/MODEL)		Built-In				Built-In		Built-In						
SURGE ARRESTOR (QTY/MODEL)							8	Andrew APTDC-BDFDM-DB Broadband						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	Powerwave / LGP 21901	1	Kaelus DBC2055F1V1-2						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)								LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI / DTMABP7819VG12A			1	CCI / DTMABP7819VG12A	2	CCI WCS TMABPD7823VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH			1	Kathrein SBT 782-11055 (BTS)	1	AiSG Diplexer						
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)			1	Kathrein / 860-10006	1	LTE RRH						
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)														
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.													
Local Market Note2	LTE RRH will power TMA													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59439.B.850.3G.1	59439.B.850.3G.1	CTV12092	CTV12092		UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	263	2	None	RFS 1-5/8 (850)	195	None	0		NO		497.74	9	
	PORT 3	59439.B.1900.3G.2	59439.B.1900.3G.2	CTU12098	CTU12098		UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	263	0	None	RFS 1-5/8 (850)	195	None	0		NO		579.43	9	
ANTENNA POSITION 3	PORT 1	59439.B.850.25G.1	59439.B.850.25G.1	184G12092			GSM 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	263	2	None	RFS 1-5/8 (850)	195	None	0		NO	12.58	155.95	13	
	PORT 3	59439.B.1900.25G.1	59439.B.1900.25G.1	184P12092			GSM 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	263	0	None	RFS 1-5/8 (850)	195	None	0		NO	28.18	465.58	13	
ANTENNA POSITION 4	PORT 1	59439.B.700.4G.1		CTL01209_7B_1	CTL01209_7B_1		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	15	180	11	Bottom	RFS 1-5/8	195	None	0				827.94	15	
	PORT 3	59439.B.1900.4G.111		CTL01209_9B_1	CTL01209_9B_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_04DT	16.1	180	4	Bottom	RFS 1-5/8	195	None	0				3258.37	15	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	AM-X-CD-16-65-00T-RET				AM-X-CD-16-65-00T-RET		OPA-65R-LCUU-H6							
ANTENNA VENDOR	KMW				KMW		CCI Antennas							
ANTENNA SIZE (H x W x D)	72X11.8X5.9				72X11.8X5.9		72X14.8X9							
ANTENNA WEIGHT	48.5				48.5		57							
AZIMUTH	23				23		310							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	165				165		165							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	8				8		0							
FEEDER AMOUNT	2				2		4							
Antenna RET Motor (QTY/MODEL)		Built-In				Built-In		Built-In						
SURGE ARRESTOR (QTY/MODEL)							8	Andrew APTDC-BDFDM-DB Broadband						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901			2	Powerwave / LGP 21901	1	Kaelus DBC2055F1V1-2						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)								LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI / DTMABP7819VG12A			1	CCI / DTMABP7819VG12A	1	CCI WCS TMABPD7823VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH			1	Kathrein SBT 782-11055 (BTS)	1	AiSG Diplexer						
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)			1	Kathrein / 860-10006	1	LTE RRH						
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)														
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1	Replace existing LTE 700 ANT on POS 4 with 1 OCTO 6' all 3 sectors.No position change. Add 2 COAX per sector on POS 4.Replace existing TMA with CCI twin TMABPD7823VG12A (Twin AWS-PCS-WCS w/ 700/850 Bypass).Replace existing diplexer with twin Kaelus.Add LTE RRUS-12 and RRUS-A2.protector.													
Local Market Note2	LTE RRH will power TMA													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59439.C.850.3G.1	59439.C.850.3G.1	CTV12093			UMTS 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	23	2	None	RFS 1-5/8 (850)	195	None	0		NO		497.74	17	
	PORT 3	59439.C.1900.3G.2	59439.C.1900.3G.2	CTU12099			UMTS 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	23	0	None	RFS 1-5/8 (850)	195	None	0		NO		579.43	17	
ANTENNA POSITION 3	PORT 1	59439.C.850.25G.1	59439.C.850.25G.1	184G12093			GSM 850	AM-X-CD-16-65-00T-RET_850MHz_02DT	16.1	23	0	None	RFS 1-5/8 (850)	195	None	0		NO	12.58	155.95	21	
	PORT 3	59439.C.1900.25G.1	59439.C.1900.25G.1	184P12093			GSM 1900	AM-X-CD-16-65-00T-RET_1920MHz_00DT	17.29	23	0	None	RFS 1-5/8 (850)	195	None	0		NO	28.18	465.58	21	
ANTENNA POSITION 4	PORT 1	59439.C.700.4G.1	59439.C.850.25G.1	CTL01209_7C_1	CTL01209_7C_1		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	15	310	10	Bottom	RFS 1-5/8	195	None	0				827.94	23	
	PORT 3	59439.C.1900.4G.111		CTL01209_9C_1	CTL01209_9C_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_06DT	16.1	310	8	Bottom	RFS 1-5/8	195	None	0				3258.37	23	

Diagram - Sector	A	Diagram File Name - CT1209_LTE2C_BOTTOM_ABC_BrStd_Rev2.vsd					
Atoll Site Name -	CTV1209	Location Name -	MANCHESTER CT., OLCOTT ST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

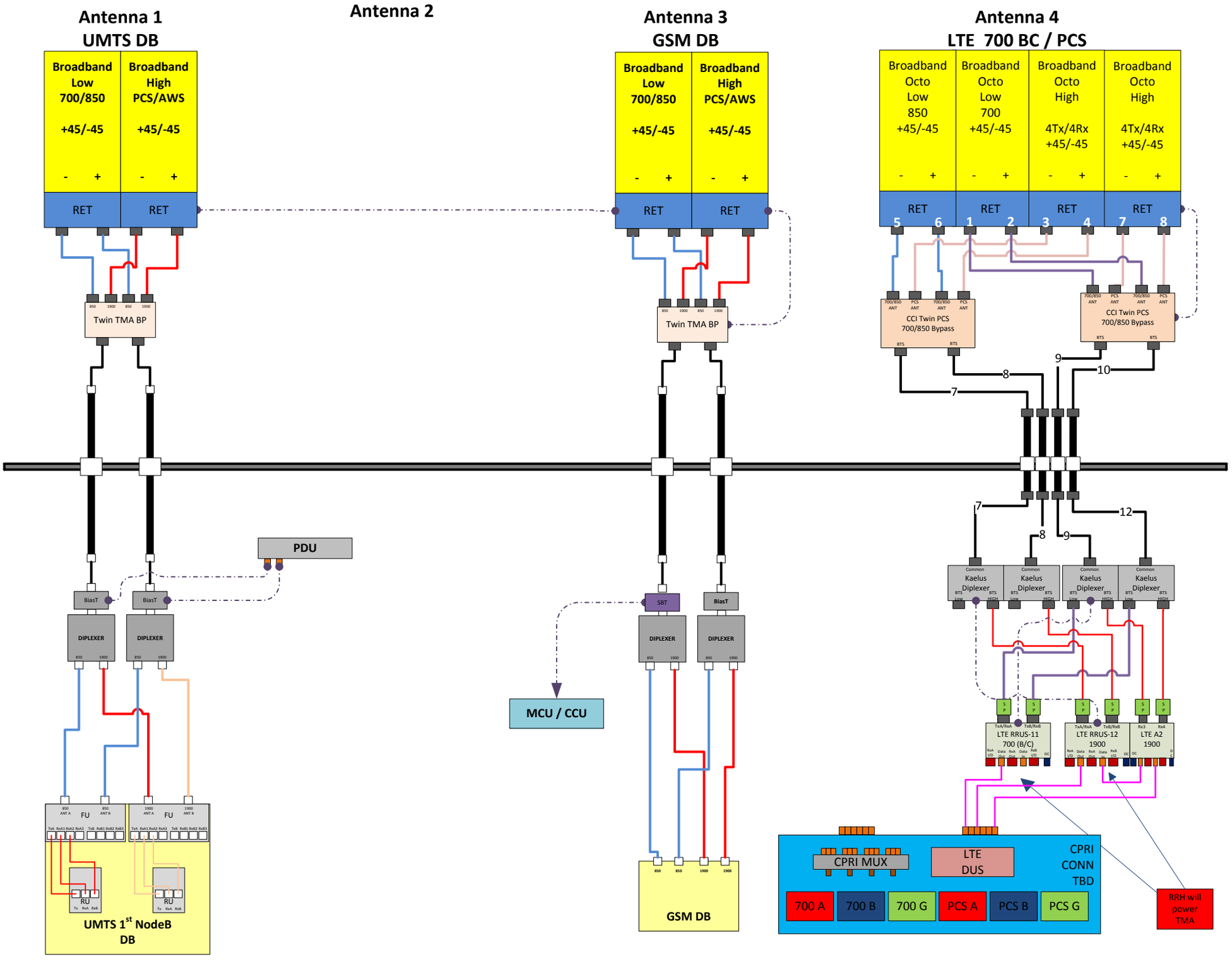


Diagram - Sector	B	Diagram File Name - CT1209_LTE2C_BOTTOM_ABC_BrStd_Rev2.vsd					
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Comments:							

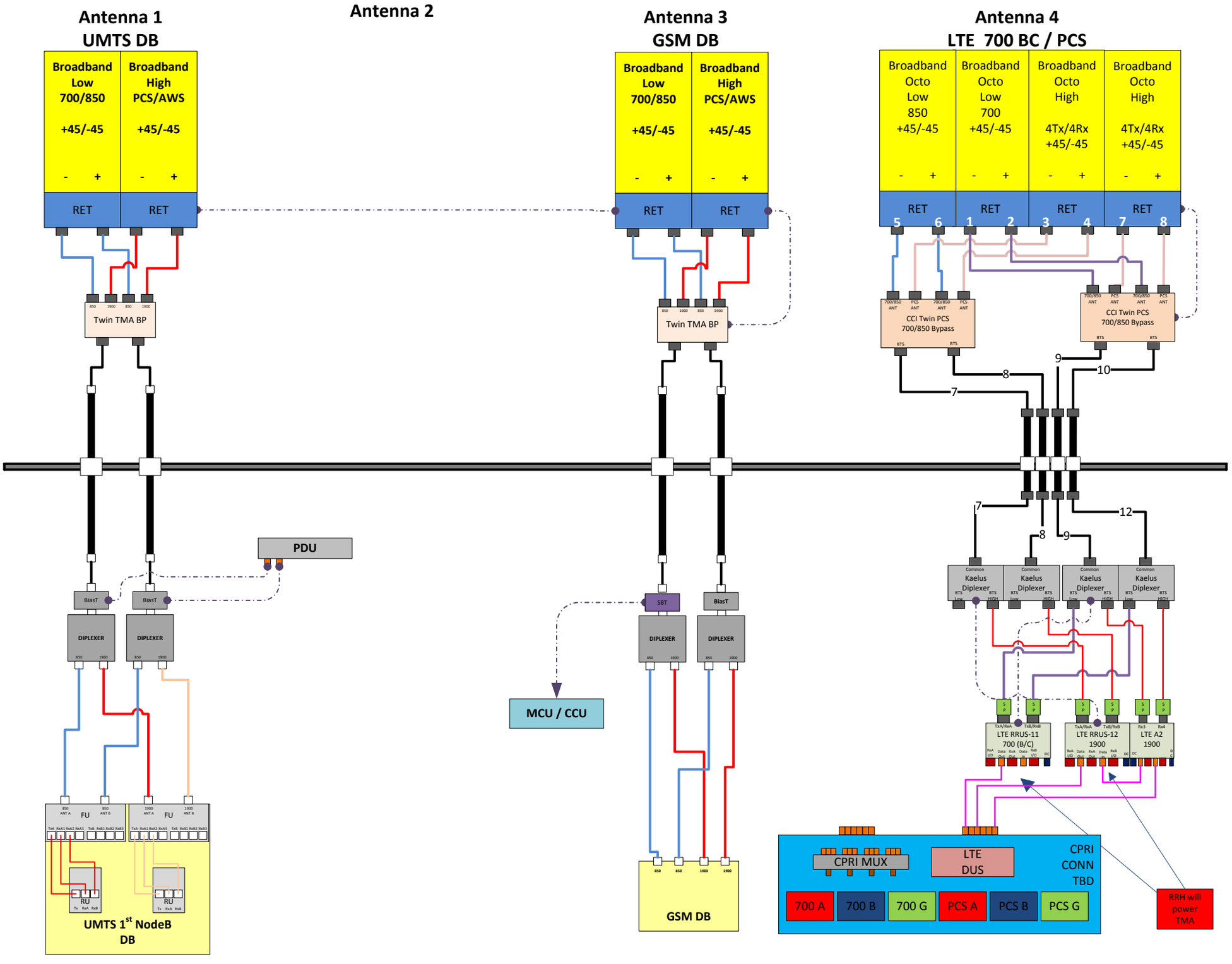
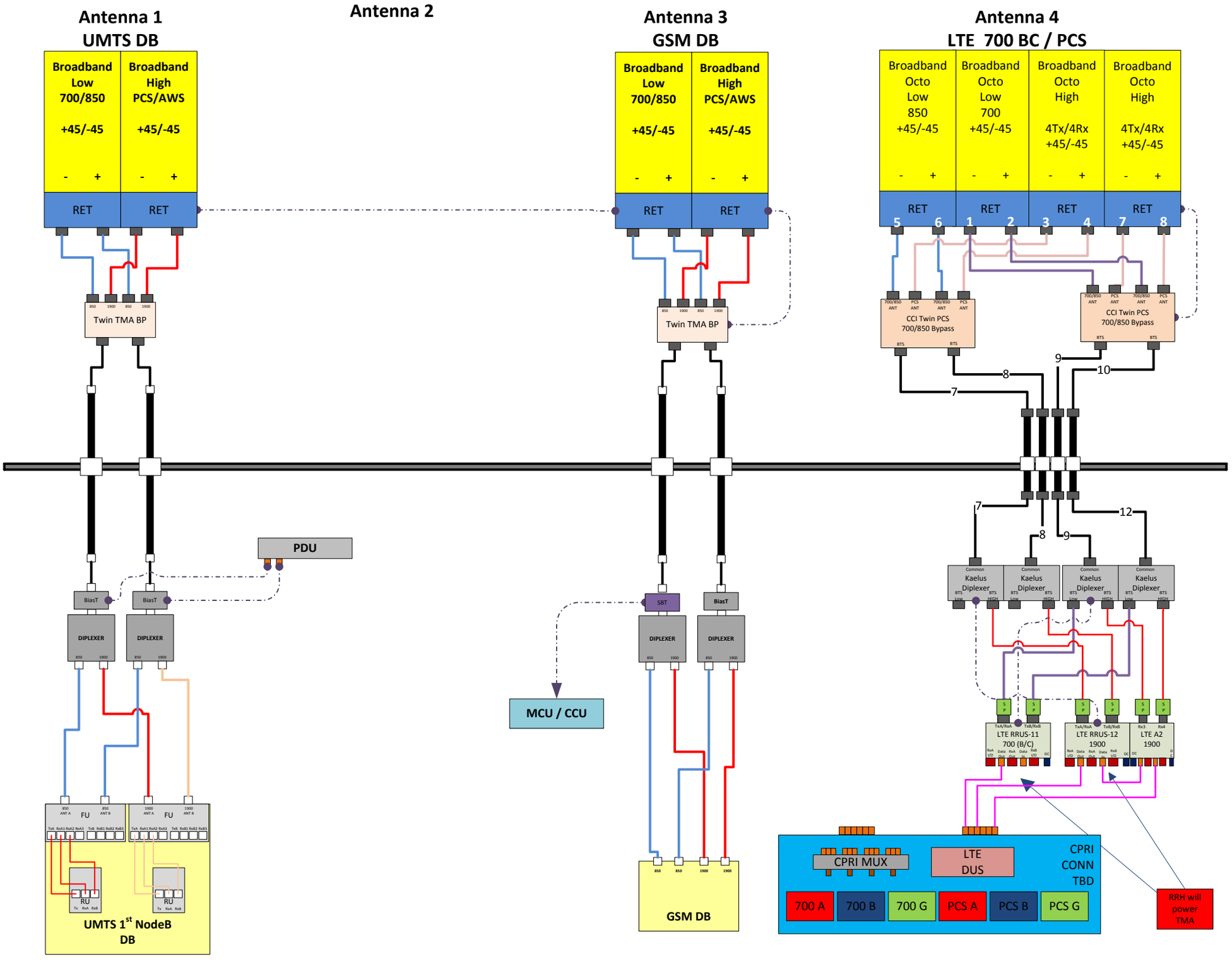


Diagram - Sector	C	Diagram File Name - CT1209_LTE2C_BOTTOM_ABC_BrStd_Rev2.vsd					
Atoll Site Name -	CTV1209	Location Name -	MANCHESTER CT., OLCOTT ST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							



WORKFLOW SUMMARY						
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments
09/17/2015	Preliminary / In Progress	su0170	Preliminary / Submitted for Approval	NA515M	Promote	
09/30/2015	Preliminary / Submitted for Approval	NA515M	Preliminary / Approved	BG144B	Promote	
11/17/2015	Preliminary / Approved	BG144B	Final / RF Approval	om636a	Promote	
11/21/2015	Final / RF Approval	om636a	Final / RF Approval	MM093Q	Re-Assign	
11/23/2015	Final / RF Approval	MM093Q	Final / Approved	BG144B	Promote	LTE Final RFDS

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H6

Octoport Multi-Band Antenna Array

The CCI Octoport Multi-Band Antenna Array is an industry first 8-port antenna with full WCS Band Coverage. With four high band ports covering PCS, AWS and WCS bands, two 700 MHZ ports, and two 850 MHz ports our octoport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

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

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2155 MHz and WCS 2300 MHz coverage in a single enclosure.

Benefits

- **RET System allows Independent Tilt of each band specific paired port**
- **Reduces tower loading**
- **Frees up space for tower mounted Remote Radio Heads**
- **Single radome with eight ports**
- **All Band design simplifies radio assignments**
- **Sharp elevation beam eases network planning**

Features

- High Band Ports include WCS Band
- Four High Band ports with four Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome

Applications

- 4x4 MIMO on High Band and Dual 2x2 MIMO on 700 & 850 Low Bands
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count

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65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H6

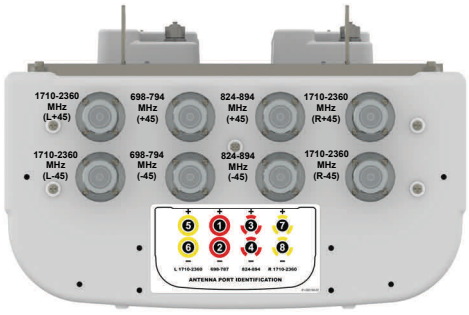
OPA-65R Multi-Band Antenna

Electrical Specifications

Frequency Range	2 X Low Band Ports (L) which cover the range from 698-787	2 X Low Band Ports (C) which cover the range from 824-894	4 X High Band Ports (H1 & H2) which cover the full range from 1710-2360 MHz			
			1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	13.8 dBi	14.6 dBi	17.0 dBi	16.3 dBi	17.4 dBi	17.6 dBi
Azimuth Beamwidth (-3dB)	66°	61°	60°	68°	64°	60°
Elevation Beamwidth (-3dB)	12.2°	10.3°	5.7°	6.3°	5.1°	4.5°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -18 dB	< -19 dB	< -19 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 30 dB	> 27 dB	> 32 dB	> 32 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 27 dB	> 25 dB	> 27 dB	> 27 dB	> 28 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 22 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 16 dB	> 14 dB	> 17 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical Specifications

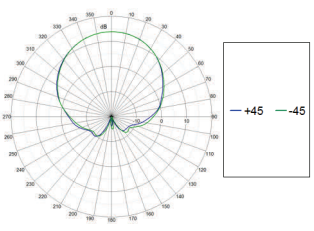
Dimensions (LxWxD)	72.0 x 14.8 x 7.4 inches (1828 x 376 x 189 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	247 lbs (1099 N) @ 100 mph
Side Wind Load	142 lbs (631 N) @ 100 mph
Equivalent Flat Plate Area	9.7 ft^2 (0.9 m^2)
Weight (w/o RET/Mounting)	73 lbs (33 kg)
RET System Weight	7.0 lbs (3.0 kg)
Connector	8; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



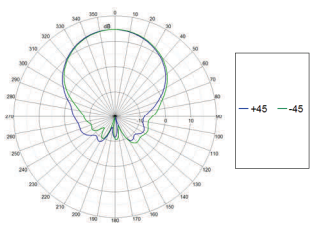
Bottom View

Rear View

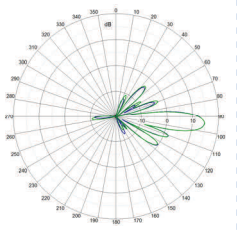
Antenna Patterns*



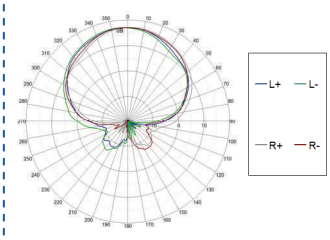
737 MHz Azimuth



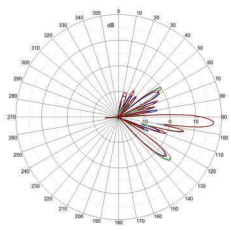
887 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



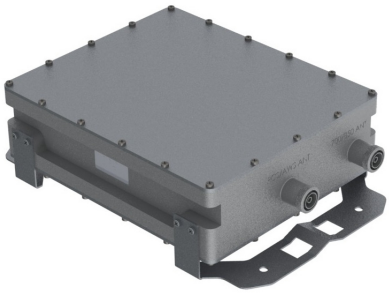
Elevation 4°

*Typical antenna patterns. For detail information on antenna pattern, please contact us at info@cciproducts.com. All specifications are subject to change without notice.

Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass

Tel: 201-342-3338 Fax: 201-342-3339 www.cciproducts.com

General Information



CCI's Triple Band TMA with 700/850 bypass contains two triple band TMA's in a single housing. The TMA's are fully duplexed and share a single LNA for all three bands. The bypass path provides excellent isolation to the TMA path. Separate antenna ports for the bypass path and TMA path are combined onto a single BTS port. Low noise high linearity amplifiers improve the uplink sensitivity and the receive performance of base stations. The TMA is fully compliant with the latest AISG 2.0 specification. The TMA supports CDMA, EDGE/GSM, UMTS and LTE BTS equipment. The TMA is ideally suited for sites upgraded to quad-band using the existing infrastructure. The TMA allows the sharing of feeder lines for both AWS and PCS bands thus reducing tower loading, leasing, and installation costs. The input and output connectors are located inline for ease of installation in space constrained areas such as uni-pole structures and stealth antennas.

Model TMABPDB7823VG12A

Contents:

Features:

- Small lightweight unit
- Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass
- Independent Gain Control
- High linearity
- Lightning protected
- Fail-safe bypass mode
- High reliability

Technical Description

The TMA system is an outdoor quad band tower mount unit which provides low noise amplification of PCS, AWS, and WCS uplink signals combined with 700/850 bypassed signals from separate antenna ports to a common BTS port. The tower mount unit consists of 14 band-pass filters, two redundant low noise amplifiers (LNA) with bypass failure circuitry, two bias tees, AISG control circuitry, and lightning protection circuitry all housed in an IP68 enclosure suited to long life masthead mounting. The AWS, PCS and WCS paths are dual duplexed to separate the low power uplink signals from the high power down link signals at the BTS and antenna ports. The AWS, PCS, and WCS uplink signals are amplified with a dedicated ultra-low noise PHEMT LNA with adjustable gain control. The unit provides protection against lightning strikes via a multistage surge protection circuit. DC power and AISG 2.0 control is provided via the BTS feeder cable. The unit operates in current window alarm (CWA) mode until a valid AISG message is detected, at which point it automatically switches to AISG mode. Once in AISG mode, the unit can only switch back to CWA mode with the receipt of an AISG CCI vendor defined command. In CWA mode, the unit requires 12VDC at each BTS port and follows typical current window convention. In AISG mode, the unit will accept 10-30 VDC from either BTS port. In AISG mode, the unit does not require an AISG 2.0 compatible site control unit (SCU) and may also be powered by a standard power distribution unit (PDU).

An optional Site Control Unit (SCU) is available to power up to 32 AISG modules per sector and to provide the monitoring and alarm functions for the system. The SCU is housed in a single (1U) 1.75" x 19" rack and contains dual redundant power supplies capable of being "hot swapped" that provide a regulated DC supply voltage on the RF coax for the tower mount amplifiers.

CCI Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass Typical Specifications

Description	Typical Specifications			
Electrical Specifications	**700/850**	**PCS**	**AWS**	**WCS**
Receive Frequency Range	-	1850 – 1910 MHz	1710 – 1755 MHz	2305 – 2320 MHz
Transmit Frequency Range	-	1930 – 1990 MHz	2110 – 2155 MHz	2345 – 2360 MHz
Bypass Frequency Range	698 - 894 MHz	-	-	-
Amplifier Gain	-	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG
Gain Variation	-	±1.0 dB	±1.0 dB	±1.0 dB
System Noise Figure	-	1.4 dB Typ.	1.3 dB Typ.	1.3 dB Typ.
Input Third Order Intercept Point	-	+12 dBm Min at Max. Gain		
Input / Output Return Loss	18 dB Min all ports, 12 dB Min. Bypass Mode			
Insertion Loss	0.25 dB Typ.			
Transmit Passband	-	0.5 dB Typical	0.4 dB Typical	0.4 dB Typical
Bypass Mode, (PCS/AWS/WCS) Rx Passband	-	2.5 dB Typ.	2.5 dB Typ.	2.5 dB Typ.
Filter Characteristics				
Continuous Average Power	200 Watts max			
Peak Envelope Power	2 KW max			
Intermodulation Performance				
IMD at ANT port in Rx Band	< -112 dBm (-155 dBc) [2 tones at +43 dBm]			
Operating Voltage	+10V to +30V DC provided via coax or AISG			
Power Consumption	<2.0 Watts			
Mechanical Specifications				
Connectors	DIN 7-16 female x 2; AISG x 1			
Dimensions (Body Only)	10.63” (H) x 11.024” (W) x 3.72” (D); (290.60 (H) x 280.00 (W) x 95.0 (D) mm)			
Dimensions (with Conn. & Bracket)	14.25” (H) x 11.024” (W) x 4.11” (D); (362.00 (H) x 280.00 (W) x 104.40 (D) mm)			
Weight	23.1 Lbs. (10.5 Kg) - with Brackets; 22 Lbs. (10 Kg) - without brackets			
Mounting	Pole/Wall Mounting Bracket			
Environmental Specifications				
Operating Temperature	-40˚ C to +65˚C			
Lightning Protection	8/20us, ±2KA max, 10 strikes each, IEC61000-4-5			
Enclosure	IP68			
MTBF	>500,000 hours			

All specifications are subject to change. The latest specifications are available at www.cciproducts.com

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT1209

Manchester CT
190 Olcott Street
Manchester, CT 06040

June 30, 2016

EBI Project Number: 6216003044

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	2.77 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 30, 2016

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

Emissions Analysis for Site: **CT1209 – Manchester CT**

EBI Consulting was directed to analyze the proposed AT&T facility located at **190 Olcott Street, Manchester, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **190 Olcott Street, Manchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 GSM channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **KMW AM-X-CD-16-65-00T-RET and the CCI OPA-65R-LCUU-H6** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerlines of the proposed antennas are **165 feet** above ground level (AGL) for **Sector A**, **165 feet** above ground level (AGL) for **Sector B** and **165 feet** above ground level (AGL) for Sector C.

11) Emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active database. Values in this database are provided by the individual carriers themselves. The CSC database shows that MetroPCS also has emission values registered at this site.

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.85 / 15.25 dBd	Gain:	13.85 / 15.25 dBd	Gain:	13.85 / 15.25 dBd
Height (AGL):	**165 feet**	Height (AGL):	**165 feet**	Height (AGL):	**165 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	3,465.76	ERP (W):	3,465.76	ERP (W):	3,465.76
Antenna A1 MPE%	**0.65 %**	Antenna B1 MPE%	**0.65 %**	Antenna C1 MPE%	**0.65 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.85 / 15.25 dBd	Gain:	13.85 / 15.25 dBd	Gain:	13.85 / 15.25 dBd
Height (AGL):	**165 feet**	Height (AGL):	**165 feet**	Height (AGL):	**165 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	3,465.76	ERP (W):	3,465.76	ERP (W):	3,465.76
Antenna A2 MPE%	**0.65 %**	Antenna B2 MPE%	**0.65 %**	Antenna C2 MPE%	**0.65 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	11.65 / 14.85 dBd	Gain:	11.65 / 14.85 dBd	Gain:	11.65 / 14.85 dBd
Height (AGL):	**165 feet**	Height (AGL):	**165 feet**	Height (AGL):	**165 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,420.52	ERP (W):	5,420.52	ERP (W):	5,420.52
Antenna A3 MPE%	**1.06 %**	Antenna B3 MPE%	**1.06 %**	Antenna C3 MPE%	**1.06 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.36 %**
MetroPCS	0.41 %
Site Total MPE %:	**2.77 %**

AT&T Sector A Total:	2.36 %
AT&T Sector B Total:	2.36 %
AT&T Sector C Total:	2.36 %
Site Total:	2.77 %

AT&T _ Max Values Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	727.98	165	2.07	850 MHz	567	0.37 %
AT&T 1900 MHz (PCS) UMTS	2	1,004.90	165	2.86	1900 MHz (PCS)	1000	0.29 %
AT&T 850 MHz GSM	2	727.98	165	2.07	850 MHz	567	0.37 %
AT&T 1900 MHz (PCS) GSM	2	1,004.90	165	2.86	1900 MHz (PCS)	1000	0.29 %
AT&T 700 MHz LTE	2	877.31	165	2.50	700 MHz	467	0.53 %
AT&T 1900 MHz (PCS) LTE	2	1,832.95	165	5.21	1900 MHz (PCS)	1000	0.52 %
						Total*:	**2.36 %**

NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	2.36 %
Sector B:	2.36 %
Sector C:	2.36 %
AT&T Maximum Total (per sector):	2.36 %
Site Total:	2.77 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.77 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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