December 1, 2020

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

Re: Notice of Exempt Modification New Cingular Wireless PCS LLC ("AT&T") Site CT2019
170 Ingham Hill Road, Old Saybrook, CT 06475 (the "Property")
Latitude: 41.309881 N Longitude: 72.397526 W

Dear Ms. Bachman:

AT&T currently maintains (9) antennas at the 150-foot level on the existing 150' monopole tower ("Tower") at 170 Ingham Hill Road, Old Saybrook, CT. The Tower is owned by Crown Castle, LLC ("Crown") and the property is owned by Carol & Robert Lorenz. AT&T intends to modify its facility by replacing (3) antennas with (2) OPA65R-BU4BA & (1) OPA65R-BU8BA antennas, replacing (6) RRUs with (3) 4449 B5/B12 and (3) E2 B29 RRUs. The height of AT&Ts existing and proposed antennas & RRUs is 150'.

This modification includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

The facility received Siting Council approval on September 26, 1985 under Docket 51. The approval included a condition that the tower shall not be taller than 150'. AT&T proposed modifications will not change the height of the tower and therefore comply with the approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("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 to R.C.S.A §16-50j-73, a copy of this letter is being sent the Honorable Carl P. Fortuna, Jr., First Selectman, Town of Old Saybrook as elected official, Ms. Christina M. Costa, Interim Town Planner/Zoning Enforcement Officer, Town of Old Saybrook, and Carol & Robert Lorenz, as property owners. Crown, the towner owner, received a copy by email.

The planned modification of the facility falls squarely within those activities explicitly provided for in R.C.S.A §16-50j-72(b)(2). Specifically:

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

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

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

4. The operation of the modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Hollis M. Redding

Hollis M. Redding
SAI Communications, LLC
12 Industrial Way
Salem, NH 03079
Mobile: 860-834-6964
hredding@saigrp.com

Enclosures

Cc: Honorable Carl P. Fortuna, Jr., First Selectman, Town of Old Saybrook
Ms. Christina M. Costa, Interim Town Planner/Zoning Enforcement Officer, Town of Old Saybrook
Carol & Robert Lorenz, property owners
Crown Castle, tower owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							8.44%
AT&T	1	352	152	0.0059	850	0.5667	0.10%
AT&T	1	424	152	0.0072	1900	1.0000	0.07%
AT&T	2	1476	152	0.0498	700	0.4667	1.07%
AT&T	1	1000	152	0.0169	850	0.5667	0.30%
AT&T	1	1000	152	0.0169	850	0.5667	0.30%
AT&T	2	3664	152	0.1236	1900	1.0000	1.24%
AT&T	1	4842	152	0.0817	2100	1.0000	0.82%
AT&T	1	1285	152	0.0217	2300	1.0000	0.22%
Site Total							12.55%

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

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

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							8.44%
AT&T	1	1476	150	0.0256	700	0.4667	0.55%
AT&T	1	1000	150	0.0173	850	0.5667	0.31%
AT&T	1	1000	150	0.0173	850	0.5667	0.31%
AT&T	1	2951	150	0.0512	700	0.4667	1.10%
AT&T	1	3837	150	0.0665	2100	1.0000	0.67%
AT&T	1	352	150	0.0061	850	0.5667	0.11%
AT&T	1	3664	150	0.0635	700	0.4667	1.36%
AT&T	2	3664	150	0.1271	1900	1.0000	1.27%
AT&T	1	1285	150	0.0223	2300	1.0000	0.22%
Site Total							14.33%

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

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

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
- NEW AT&T ANTENNAS: (OPA65R-BU4BA) @ POS. 1 (TYP. OF 1 PER ALPHA & GAMMA SECTORS, TOTAL OF 2).
- NEW AT&T ANTENNAS: (OPA65R-BU8BA) @ POS. 1 (TOTAL OF 1 FOR BETA SECTOR).
- NEW AT&T RRUS: 4449 B5/B12 (700/850) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: E2 B29 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- BASEBAND CONFIGURATION AS PER PD / SECTION-7.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: (7770) @ POS. 1 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS 11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: 4478 B5 (850) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING (TT19-08BP111-001) TMA'S (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING (CM1007-DBPXBC-003) IN SHELTER (TOTAL OF 6).

ITEMS TO REMAIN:
- (6) ANTENNAS, (6) RRU'S, (2) RRU'S (ON GROUND), (3) RRUW (ON GROUND), (3) SURGE ARRESTORS, (12) COAX CABLES, (6) DC POWER & (2) FIBER.

SITE ADDRESS:	170 INGHAM HILL ROAD OLD SAYBROOK, CT 06475
LATITUDE:	41.309881° N, 41° 18' 35.57" N
LONGITUDE:	72.397526° W, 72° 23' 51.10" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	150'-2"±
RAD CENTER:	150'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT2019

SITE NAME: OLD SAYBROOK

FA CODE: 10034982

PACE ID: MRCTB049041, MRCTB049045

PROJECT: LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

DRAWING INDEX

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CROWN SITE SITE NAME: OLD SAYBROOK
CROWN SITE SITE #: 841289

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.3 MI. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 1.4 MI. MERGE ONTO CT-9 S VIA EXIT 22S ON THE LEFT TOWARD MIDDLETOWN/OLD SAYBROOK. 29.3 MI. MERGE ONTO I-95 S / GOVERNOR JOHN DAVIS LODGE TURNPIKE TOWARD NEW HAVEN/N.Y. CITY. 2.1 MI. TAKE THE ELM ST EXIT, EXIT 67. 0.2 MI. TURN RIGHT ONTO ELM ST. 0.0 MI. ELM ST BECOMES INGHAM HILL RD. 0.6 MI. 170 INGHAM HILL RD IS ON THE 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 MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE SITE # ID: 841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/16/20	ISSUED FOR CONSTRUCTION	AM	HC	DPH
A	11/03/20	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

AT&T

TITLE SHEET

LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	T-1	1

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 STANDARDS) 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.

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 AND #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 TO 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 SHALL BE 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. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

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

8. 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.

9. 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.

10. 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.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

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

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (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.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. 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.

18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. **APPLICABLE BUILDING CODES:**
    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.

    BUILDING CODE: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

    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, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

    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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	[illegible]		

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE SITE # ID: 841289

170 INGHAM HILL ROAD
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES

LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

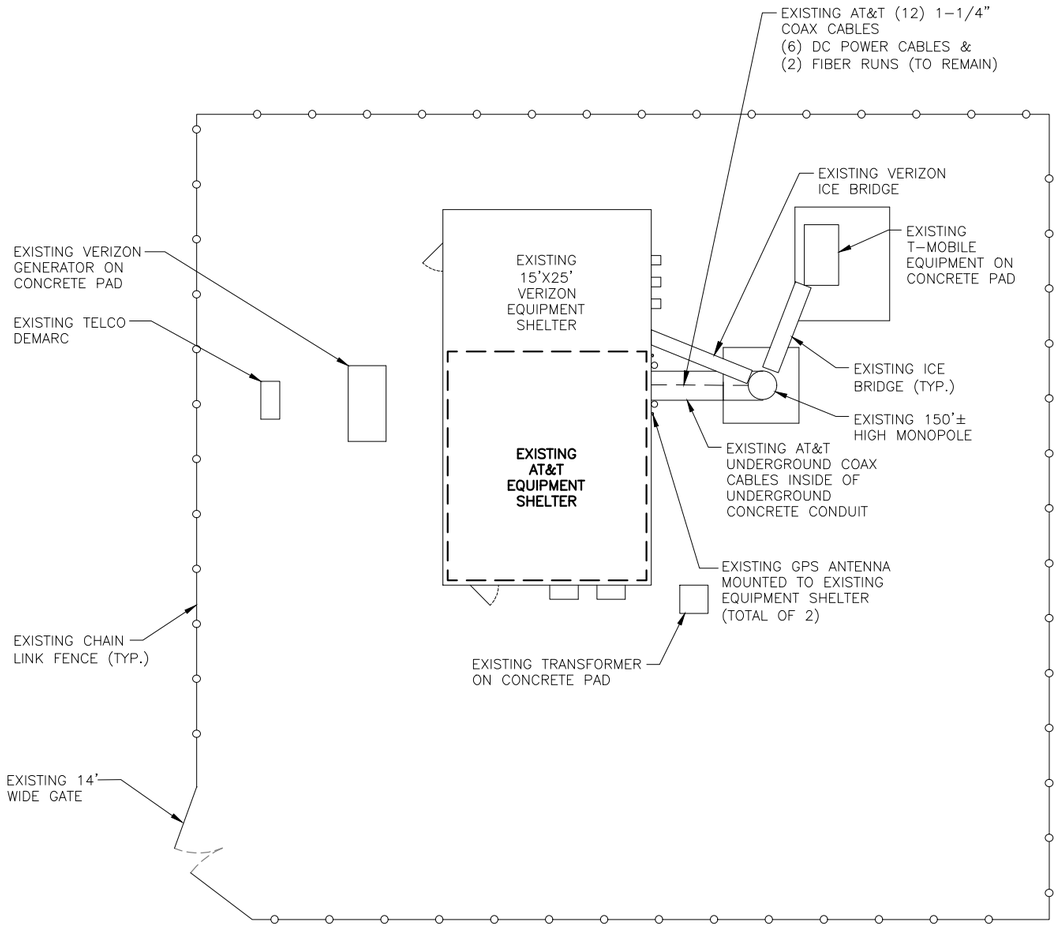
SITE NUMBER	DRAWING NUMBER	REV
CT2019	GN-1	1

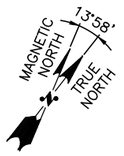
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

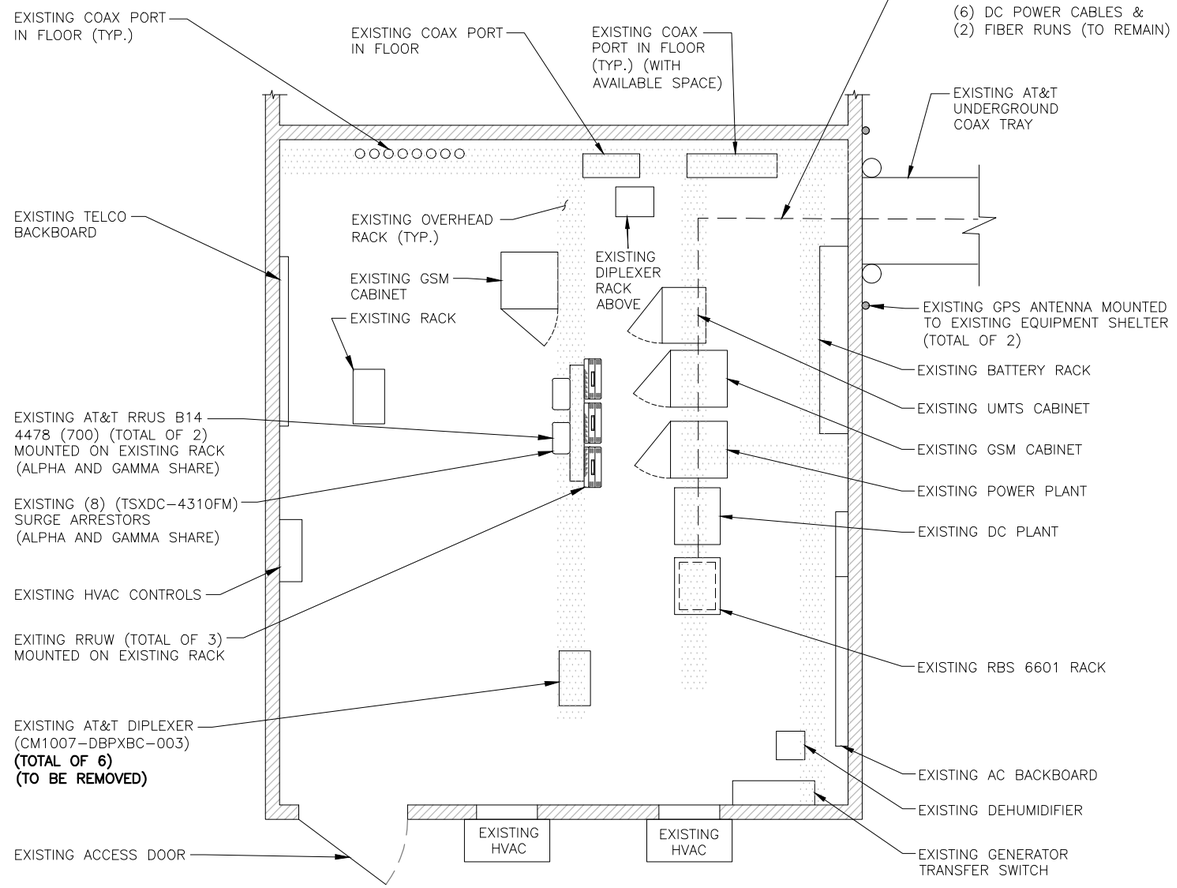
REFER TO **STRUCTURAL ANALYSIS** BY: CROWN CASTLE, DATED: NOVEMBER 04, 2020, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

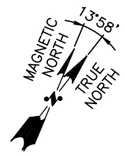




COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"





EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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

HUDSON Design Group LLC
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FAX: (978) 336-5586

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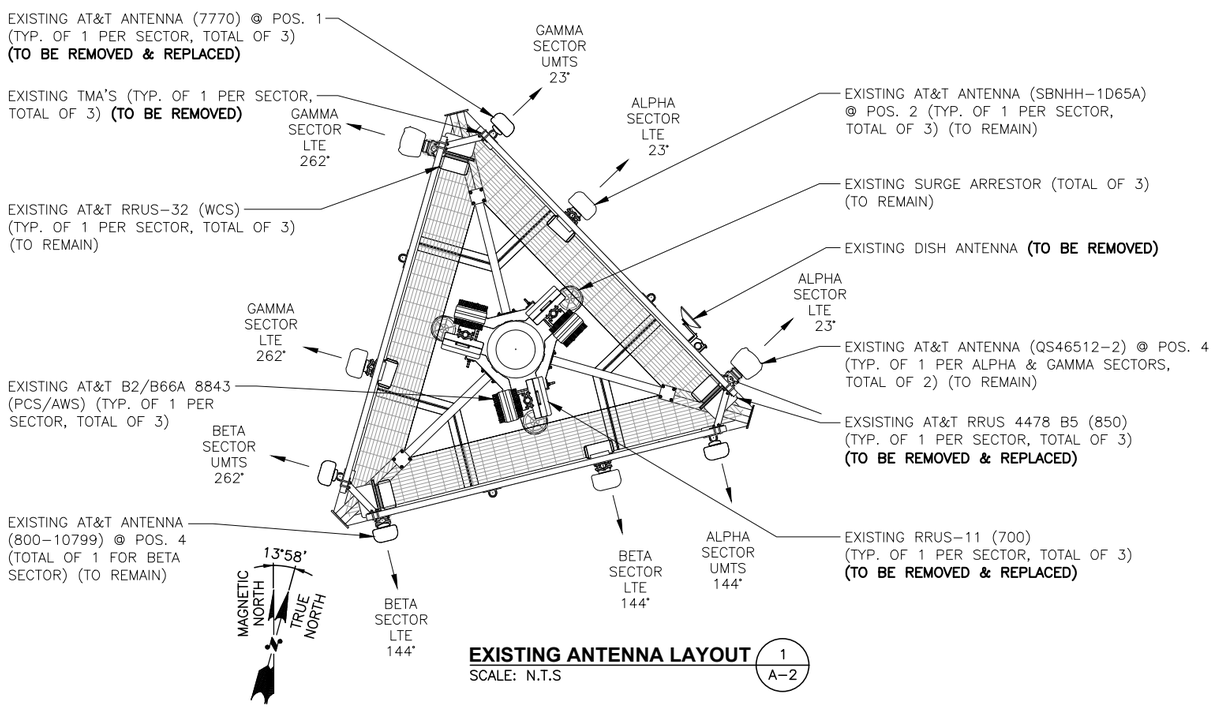
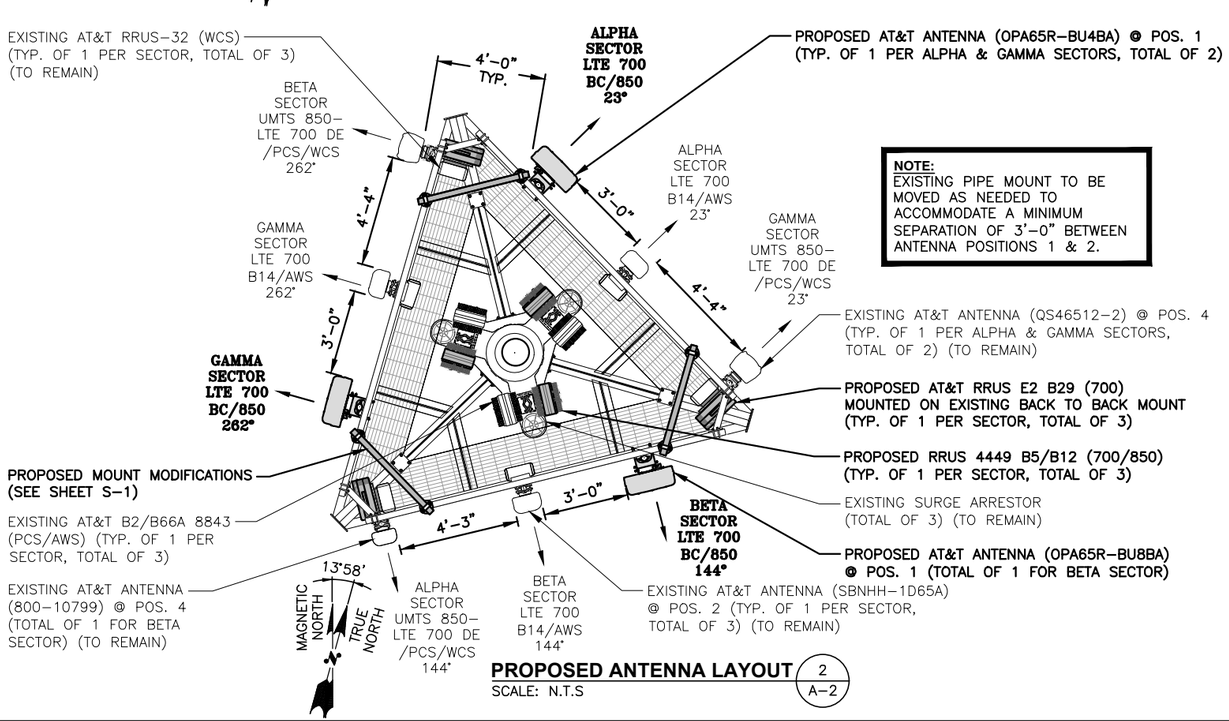
AT&T

COMPOUND & EQUIPMENT PLANS
LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	A-1	1

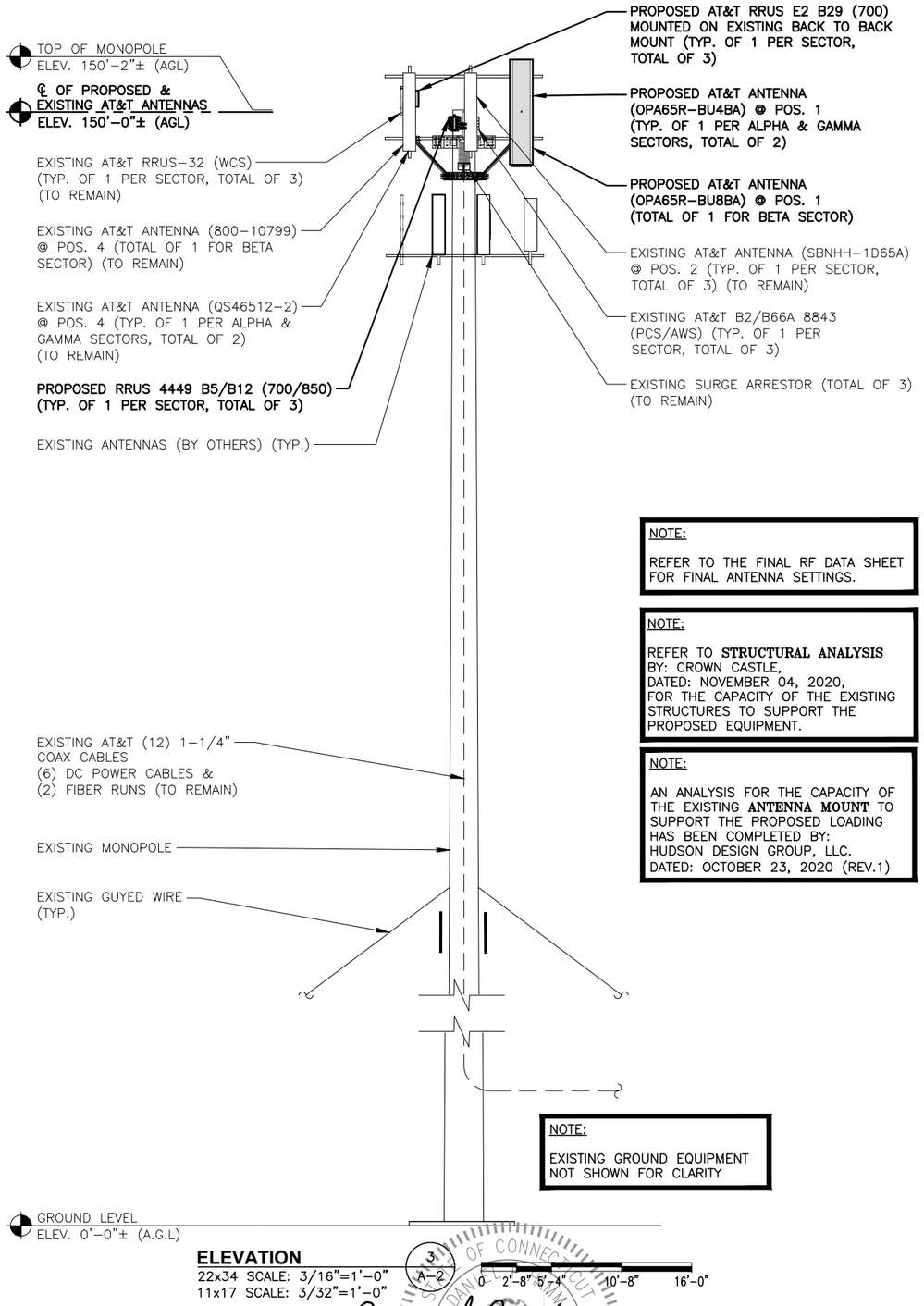


EXISTING ANTENNA LAYOUT 1 / A-2
SCALE: N.T.S



NOTE:
EXISTING PIPE MOUNT TO BE MOVED AS NEEDED TO ACCOMMODATE A MINIMUM SEPARATION OF 3'-0" BETWEEN ANTENNA POSITIONS 1 & 2.

PROPOSED ANTENNA LAYOUT 2 / A-2
SCALE: N.T.S



NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: CROWN CASTLE, DATED: NOVEMBER 04, 2020, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: OCTOBER 23, 2020 (REV.1)

NOTE:
EXISTING GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION 3 / A-2
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"
0 2'-8" 5'-4" 10'-8" 16'-0"

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
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12 INDUSTRIAL WAY
SALEM, NH 03079

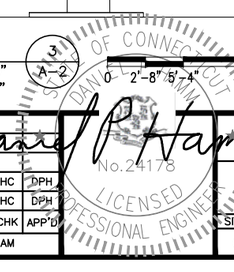
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE SITE # ID: 841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/16/20	ISSUED FOR CONSTRUCTION	AM	HC	DPH
A	11/03/20	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM



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ANTENNA LAYOUTS & ELEVATION
LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	A-2	1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	**PROPOSED**	**LTE 700 BC/850**	**OPA65R-BU4BA**	**48X11.7X10.1**	**150'-0"±**	**23°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**17.9"x13.2"x10.4"**	(E)(2) DC & (1) FIBER	(E) (1) RAYCAP DC6-48-60-18-8F
A2	EXISTING	LTE 700 B14/AWS	SBNHH-1D65A	55X11.9X7.1	150'-0"±	23°	–	(E)(G)(1) B14 4478 (700) (E)(1) B2/B66A 8843 (PCS/AWS)	– –	(2) 1-1/4" COAX	
A3	–	–	–	–	–	–	–	–	–	–	
A4	EXISTING	UMTS 850-LTE 700 DE /PCS/WCS	QS46512-2	52X12X10.8	150'-0"±	23°	–	(E)(1) RRUS-32 (WCS) **(P)(1) RRUS E2 B29 (700)**	– **20.4"X18.5"X7.5"**	(2) 1-1/4" COAX	
B1	**PROPOSED**	**LTE 700 BC/850**	**OPA65R-BU8BA**	**95.9X11.7X8.4**	**150'-0"±**	**144°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**17.9"x13.2"x10.4"**	(2) 1-1/4" COAX	(E) (1) RAYCAP DC6-48-60-18-8F
B2	EXISTING	LTE 700 B14/AWS	SBNHH-1D65A	55X11.9X7.1	150'-0"±	144°	–	(E)(G)(1) B14 4478 (700) (E)(1) B2/B66A 8843 (PCS/AWS)	– –	–	
B3	–	–	–	–	–	–	–	–	–	–	
B4	EXISTING	UMTS 850-LTE 700 DE /PCS/WCS	800-10799	106X14.8X6.7	150'-0"±	144°	–	(E)(1) RRUS-32 (WCS) **(P)(1) RRUS E2 B29 (700)**	– **20.4"X18.5"X7.5"**	(2) 1-1/4" COAX (E)(2) DC & (1) FIBER	
C1	**PROPOSED**	**LTE 700 BC/850**	**OPA65R-BU4BA**	**48X11.7X10.1**	**150'-0"±**	**262°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**17.9"x13.2"x10.4"**	(2) 1-1/4" COAX (E)(2) DC	(E) (1) RAYCAP DC6-48-60-0-8F
C2	EXISTING	LTE 700 B14/AWS	SBNHH-1D65A	55X11.9X7.1	150'-0"±	262°	–	(E)(1) B2/B66A 8843 (PCS/AWS)	–	–	
C3	–	–	–	–	–	–	–	–	–	–	
C4	EXISTING	UMTS 850-LTE 700 DE /PCS/WCS	QS46512-2	52X12X10.8	150'-0"±	262°	–	(E)(1) RRUS-32 (WCS) **(P)(1) RRUS E2 B29 (700)**	– **20.4"X18.5"X7.5"**	(2) 1-1/4" COAX	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
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DATED: NOVEMBER 04, 2020,
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NOTE:
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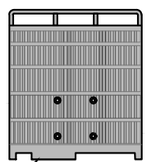
HUDSON DESIGN GROUP, LLC.
DATED: OCTOBER 23, 2020 (REV.1)

RRU CHART

QUANTITY	MODEL	L	W	D
2(E)(G)	B14 4478	18.1"x13.4"x8.3"		
3(E)	RRUS-32	27.2"x12.1"x7.0"		
3(E)	B2/B66A 8843	14.9"x13.2"x10.9"		
(3)(P)	**4449 (850/700)**	**17.9"x13.2"x10.4"**		
(3)(P)	**E2 B29 (700)**	**20.4"X18.5"X7.5"**		
3(E)(G)	RRUW	23.6"x13.8"x4.4"		

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / A-3)
SCALE: N.T.S

HUDSON Design Group LLC
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT · DANIEL P. HAMM · No.24178 · LICENSED PROFESSIONAL ENGINEER

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DETAILS
LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	A-3	1

NOTE:

MINIMUM OF 8" SEPARATION REQUIRED BETWEEN THE BACK OF ANTENNA AND THE RRH.

NOTE:

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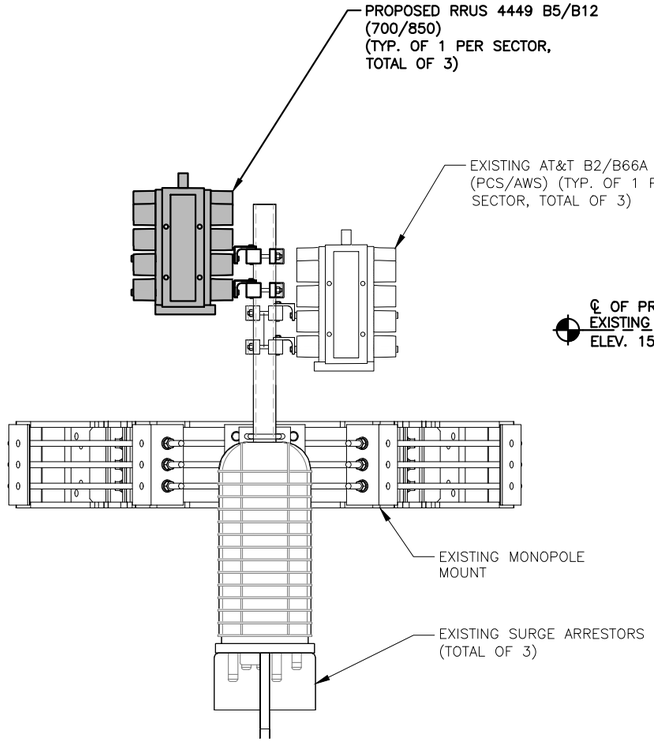
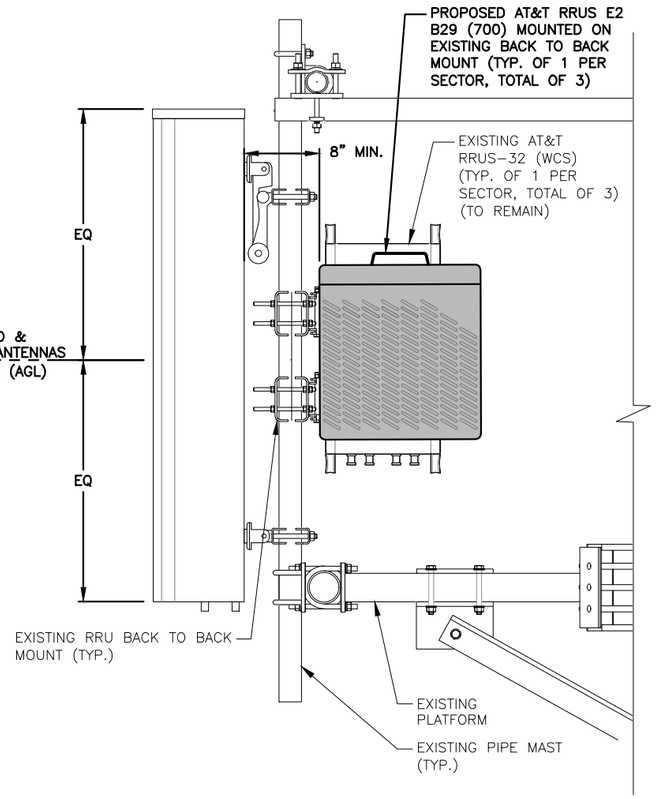
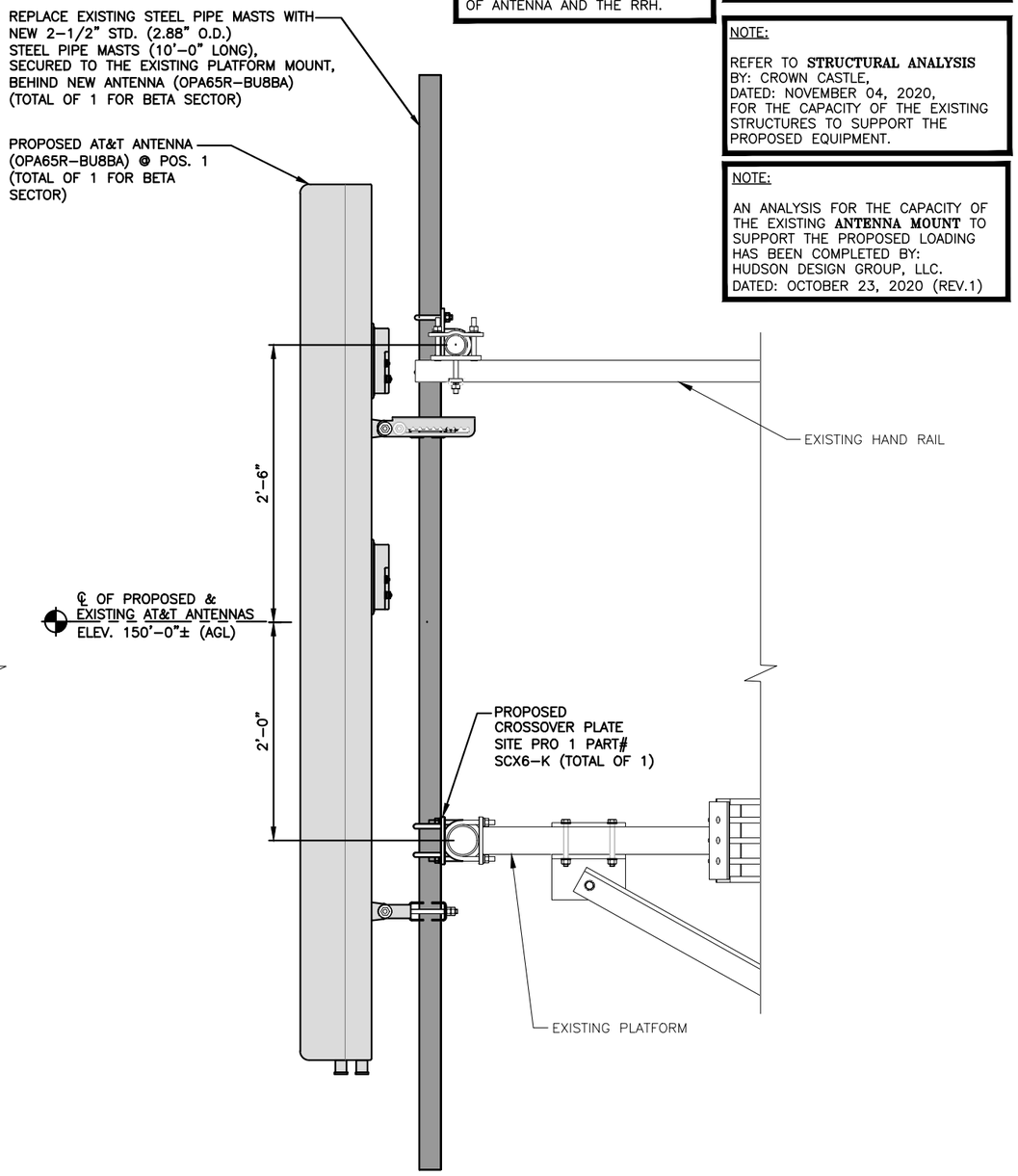


PROPOSED RRUS MOUNTING DETAIL (1 / A-4)
SCALE: N.T.S



PROPOSED RRUS MOUNTING DETAIL (2 / A-4)
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

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



PROPOSED MOUNT MODIFICATIONS DETAIL (3 / A-4)
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

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

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

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DETAILS

LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	A-4	1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

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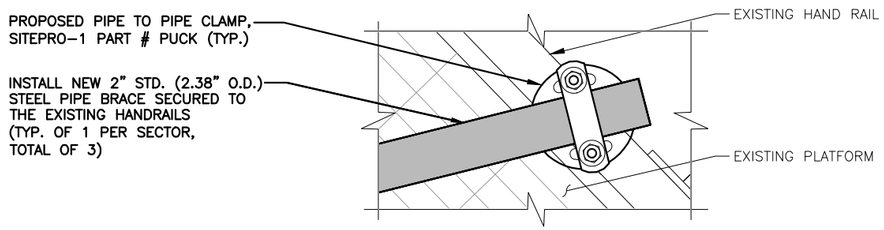
DETAILS

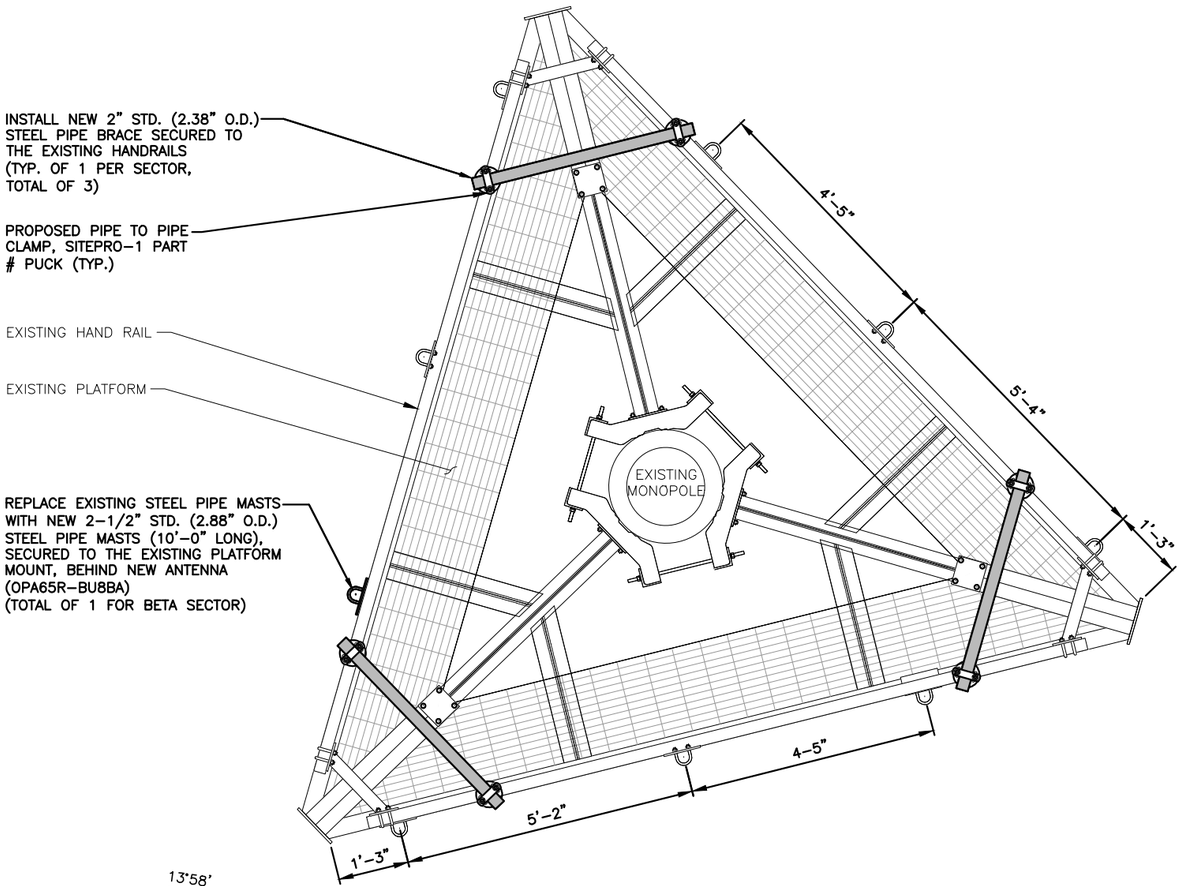
LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	SN-1	1



CONNECTION DETAIL 2 / S-1
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"

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



PROPOSED MOUNT MODIFICATIONS PLAN 1 / S-1
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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

NOTE:

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NOTE:

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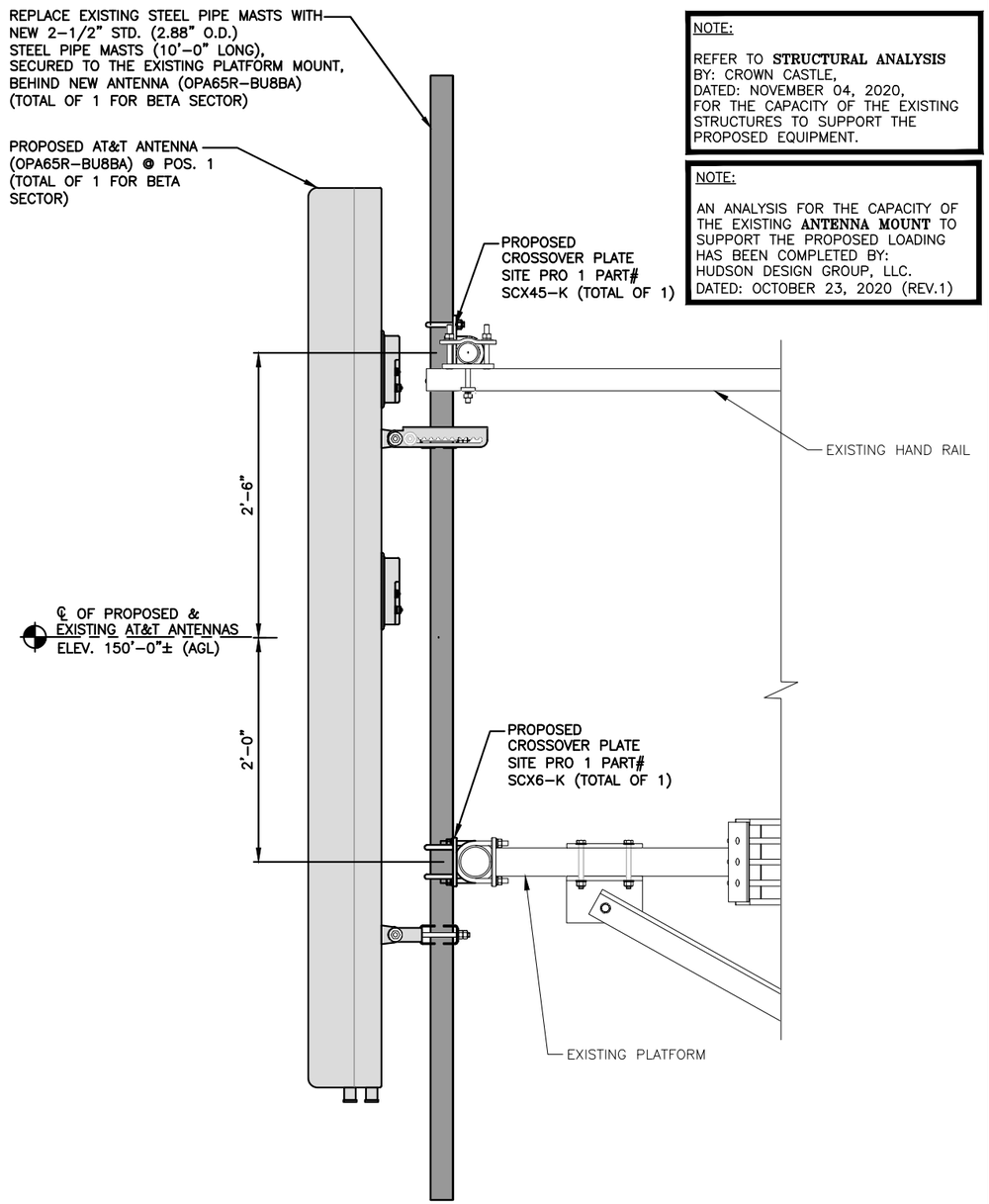

PROPOSED MOUNT MODIFICATIONS DETAIL 3 / S-1
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

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

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ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/16/20	ISSUED FOR CONSTRUCTION	AM	HC	DPH
A	11/03/20	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

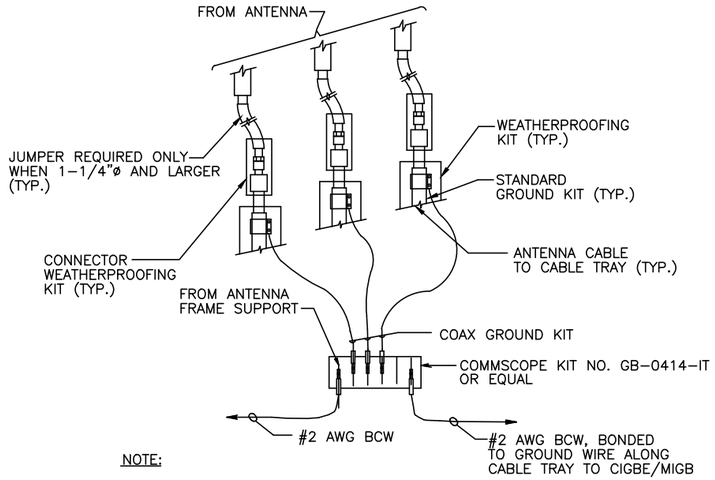
STATE OF CONNECTICUT DANIEL P. HAMM No.24178 LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS

LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	S-1	1



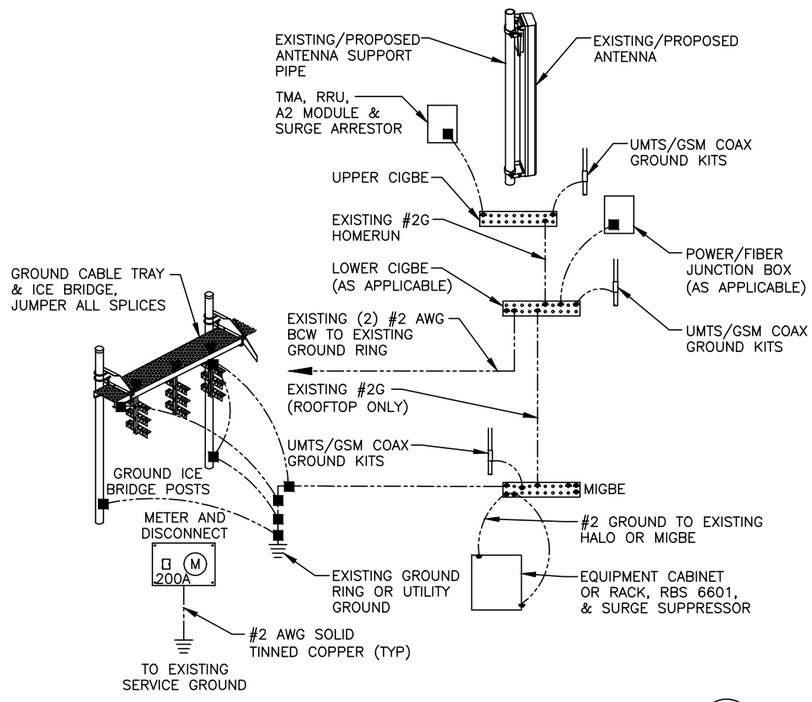
NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

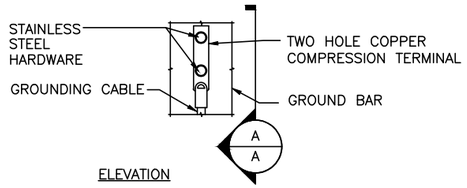
1 / G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1



NOTES:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G-1

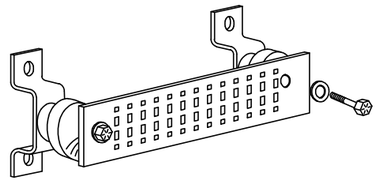
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
-48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

4 / G-1

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE SITE # ID: 841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/16/20	ISSUED FOR CONSTRUCTION	AM	HC	DPH
A	11/03/20	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

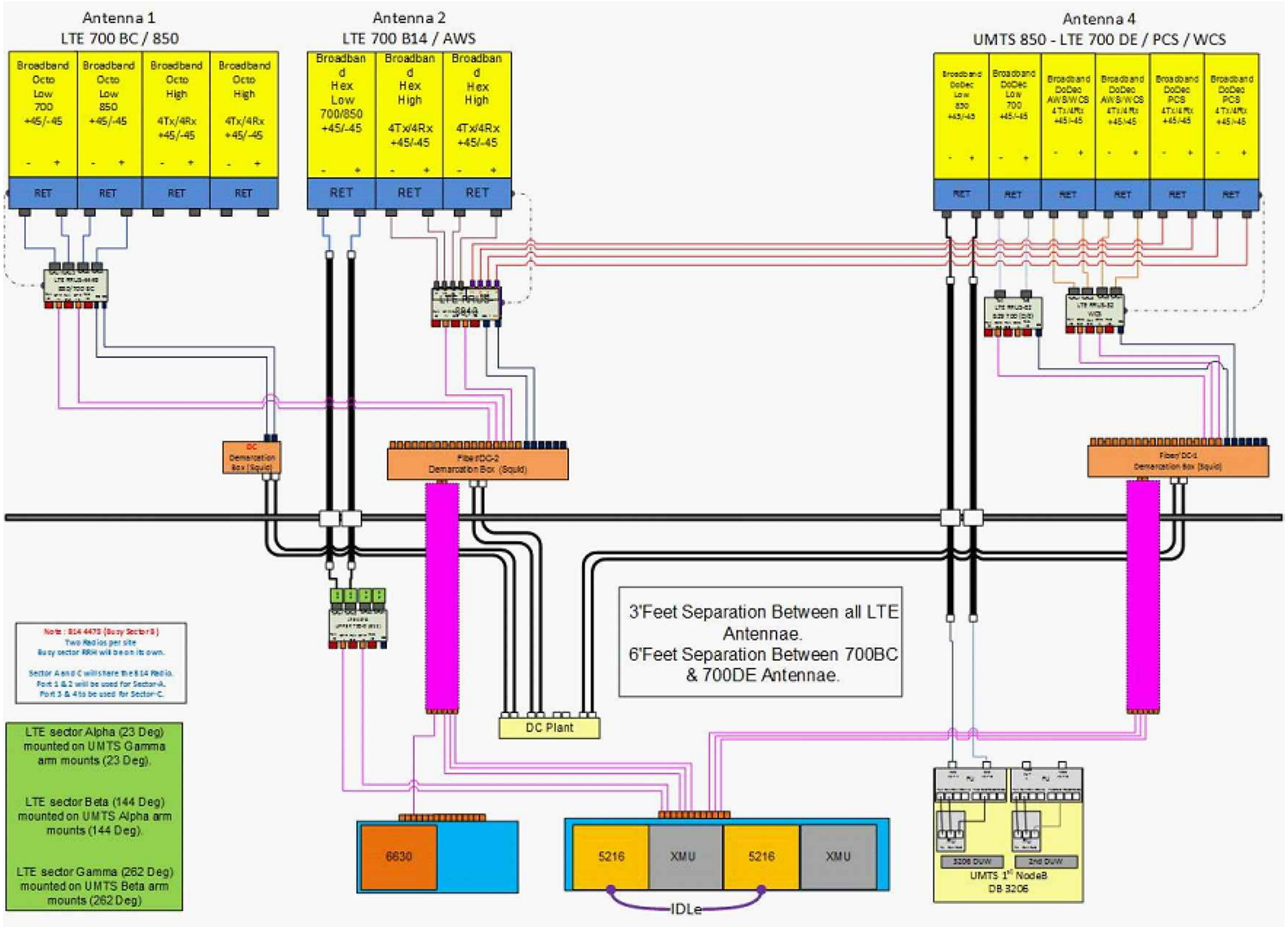
STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS

LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	G-1	1



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE SITE # ID: 841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

AT&T

RF PLUMBING DIAGRAM
LTE 7C_ ANTENNA RETROFIT 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2019	RF–1	1

Date: **November 04, 2020**

Denice Nicholson
Crown Castle
3 Corporate Dr
Clifton Park, NY 12065

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2019
	Carrier Site Name:	OLD SAYBROOK
	Carrier FA Number:	10034982
Crown Castle Designation:	**Crown Castle BU Number:**	841289
	Crown Castle Site Name:	OLD SAYBROOK
	Crown Castle JDE Job Number:	622867
	Crown Castle Work Order Number:	1895942
	Crown Castle Order Number:	531812 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1895942
Site Data:	**170 INGHAM HILL ROAD, OLD SAYBROOK, Middlesex County, CT** **Latitude *41° 18' 35.55"*, Longitude *-72° 23' 51.13"*** **150.167 Foot - Monopole Tower**	

Dear Denice Nicholson,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

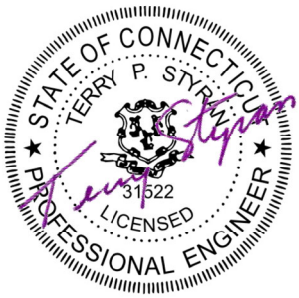
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity – 90%**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Dolly Hsu, E.I.T. / AM

Respectfully submitted by:



Terry P. Styran, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150.167 ft Monopole tower designed by ITT MEYER INC. The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
149.0	150.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	3 6 12	3/8 3/4 1-1/4
		2	cci antennas	OPA65R-BU4B w/ Mount Pipe		
		1	cci antennas	OPA65R-BU8B w/ Mount Pipe		
		3	ericsson	RADIO 4449 B5/B12		
		3	ericsson	RADIO 8843 B2/B66A		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS E2 B29		
		6	kaelus	DBC0061F1V51-2		
		1	kathrein	80010799 w/ Mount Pipe		
		3	powerwave technologies	TT19-08BP111-001		
		2	quintel technology	QS46512-2 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8C		
	149.0	1	tower mounts	Platform Mount [LP 404-1_KCKR]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	3	ericsson	AIR 21 B2A/B4P	6 4	1-1/4 1-5/8
		3	ericsson	AIR 32 B2A B66AA		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20		
		1	tower mounts	Platform Mount [LP 303-1_HR-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	133.0	3	antel	BXA-80080/4CF w/ Mount Pipe	6 2	1-1/4 1-5/8
		3	commscope	HBXX-6517DS-A2M w/ Mount Pipe		
		2	commscope	JAHH-45B-R3B w/ Mount Pipe		
		4	commscope	JAHH-65B-R3B w/ Mount Pipe		
		1	commscope	RC3DC-3315-PF-48		
		1	rfs celwave	DB-B1-6C-12AB-0Z		
		3	rfs celwave	FDJ85020Q4-S1		
		3	samsung telecommunications	B5/B13 RRH-BR04C		
		3	samsung telecommunications	PCS/AWS DULA-BAND RRH B2/B66		
	130.0	1	tower mounts	Platform Mount [LP 403-1]		
		1	tower mounts	Side Arm Mount [SO 102-3]		
71.0	72.0	2	kathrein	FMO	2	1/2
	71.0	2	tower mounts	Side Arm Mount [SO 305-1]		
22.0	22.0	1	maxrad	MYA-43012N	1	5/16
		1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH	4468634	CCISITES
4-POST-MODIFICATION INSPECTION	Hudson Design Group	4468635	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Associates	4489415	CCISITES
4-POST-MODIFICATION INSPECTION	SGS Towers	5874000	CCISITES
4-POST-MODIFICATION INSPECTION	SGS Towers	6444911	CCISITES
4-POST-MODIFICATION INSPECTION	ETS	9017983	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH (Mapping)	4591935	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ReliaPOLE (Mapping)	5204147	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group	4478711	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates	4489382	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	5293057	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	6254746	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	8122612	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	8292599	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 Standard.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150.17 - 145.17	Pole	TP16.31x15.53x0.25	Pole	10.5%	Pass
145.17 - 140.17	Pole	TP17.09x16.31x0.25	Pole	20.1%	Pass
140.17 - 135.17	Pole	TP17.87x17.09x0.25	Pole	34.8%	Pass
135.17 - 130.17	Pole	TP18.65x17.87x0.25	Pole	47.4%	Pass
130.17 - 125.17	Pole	TP19.43x18.65x0.25	Pole	66.1%	Pass
125.17 - 123.75	Pole	TP19.651x19.43x0.25	Pole	70.2%	Pass
123.75 - 123.5	Pole + Reinf.	TP19.69x19.651x0.5125	Reinf. 6 Tension Rupture	61.9%	Pass
123.5 - 118.5	Pole + Reinf.	TP20.47x19.69x0.5	Reinf. 6 Tension Rupture	74.9%	Pass
118.5 - 113.5	Pole + Reinf.	TP21.25x20.47x0.4875	Reinf. 6 Tension Rupture	86.9%	Pass
113.5 - 112.17	Pole + Reinf.	TP21.458x21.25x0.4875	Reinf. 6 Tension Rupture	90.0%	Pass
112.17 - 111.92	Pole + Reinf.	TP21.497x21.458x0.7	Reinf. 8 Tension Rupture	58.2%	Pass
111.92 - 110.17	Pole + Reinf.	TP21.77x21.497x0.7	Reinf. 8 Tension Rupture	60.9%	Pass
110.17 - 109.92	Pole + Reinf.	TP21.813x21.77x0.625	Reinf. 4 Tension Rupture	59.8%	Pass
109.92 - 104.92	Pole + Reinf.	TP22.672x21.813x0.6	Reinf. 4 Tension Rupture	66.4%	Pass
104.92 - 99.92	Pole + Reinf.	TP23.53x22.672x0.5875	Reinf. 4 Tension Rupture	72.5%	Pass
99.92 - 95	Pole + Reinf.	TP24.375x23.53x0.575	Reinf. 4 Tension Rupture	78.0%	Pass
95 - 94.75	Pole + Reinf.	TP24.418x24.375x0.7	Reinf. 1 Tension Rupture	77.0%	Pass
94.75 - 89.75	Pole + Reinf.	TP25.277x24.418x0.6875	Reinf. 1 Tension Rupture	82.3%	Pass
89.75 - 85.5	Pole + Reinf.	TP26.007x25.277x0.675	Reinf. 1 Tension Rupture	80.9%	Pass
85.5 - 85.25	Pole + Reinf.	TP26.049x26.007x0.8625	Reinf. 5 Tension Rupture	71.0%	Pass
85.25 - 85	Pole + Reinf.	TP26.092x26.049x0.8625	Reinf. 5 Tension Rupture	71.0%	Pass
85 - 84.75	Pole + Reinf.	TP26.135x26.092x0.8375	Reinf. 1 Tension Rupture	73.4%	Pass
84.75 - 83	Pole + Reinf.	TP26.436x26.135x0.8375	Reinf. 1 Tension Rupture	73.7%	Pass
83 - 82.65	Pole + Reinf.	TP26.496x26.436x0.7125	Reinf. 3 Tension Rupture	81.3%	Pass
82.65 - 82.42	Pole + Reinf.	TP26.536x26.496x0.7125	Reinf. 3 Tension Rupture	81.3%	Pass
82.42 - 77.42	Pole + Reinf.	TP27.395x26.536x0.6875	Reinf. 3 Tension Rupture	82.2%	Pass
77.42 - 73.75	Pole + Reinf.	TP28.64x27.395x0.6875	Reinf. 3 Tension Rupture	82.7%	Pass
73.75 - 69.17	Pole + Reinf.	TP28.079x27.4x0.725	Reinf. 2 Tension Rupture	79.5%	Pass
69.17 - 64.17	Pole + Reinf.	TP28.821x28.079x0.7125	Reinf. 2 Tension Rupture	80.1%	Pass
64.17 - 59.17	Pole + Reinf.	TP29.562x28.821x0.725	Reinf. 9 Tension Rupture	80.5%	Pass
59.17 - 54.17	Pole + Reinf.	TP30.304x29.562x0.7125	Reinf. 9 Tension Rupture	80.7%	Pass
54.17 - 49.17	Pole + Reinf.	TP31.045x30.304x0.7	Reinf. 9 Tension Rupture	80.5%	Pass

49.17 - 47.17	Pole + Reinf.	TP31.342x31.045x0.7	Reinf. 9 Tension Rupture	80.4%	Pass
47.17 - 46.92	Pole + Reinf.	TP31.379x31.342x0.7875	Reinf. 9 Tension Rupture	73.0%	Pass
46.92 - 43.42	Pole + Reinf.	TP31.898x31.379x0.775	Reinf. 9 Tension Rupture	72.8%	Pass
43.42 - 43.17	Pole + Reinf.	TP31.935x31.898x0.65	Reinf. 7 Tension Rupture	80.0%	Pass
43.17 - 38.17	Pole + Reinf.	TP32.677x31.935x0.65	Reinf. 7 Tension Rupture	79.4%	Pass
38.17 - 35.75	Pole + Reinf.	TP33.66x32.677x0.65	Reinf. 7 Tension Rupture	79.0%	Pass
35.75 - 30.54	Pole	TP33.161x32.286x0.4375	Pole	77.7%	Pass
30.54 - 25.54	Pole	TP34.001x33.161x0.4375	Pole	75.5%	Pass
25.54 - 20.54	Pole	TP34.84x34.001x0.4375	Pole	73.2%	Pass
20.54 - 15.54	Pole	TP35.68x34.84x0.4375	Pole	70.8%	Pass
15.54 - 10.54	Pole	TP36.52x35.68x0.4375	Pole	68.5%	Pass
10.54 - 5.54	Pole	TP37.36x36.52x0.4375	Pole	66.5%	Pass
5.54 - 0.54	Pole	TP38.2x37.36x0.4375	Pole	64.4%	Pass
0.54 - 0	Pole	TP38.29x38.2x0.4375	Pole	64.2%	Pass
L19	89.75 - 85.5	Guy A@88.6875	1 5/8	87.4%	Pass
L19	89.75 - 85.5	Guy B@88.6875	1 3/8	67.4%	Pass
L19	89.75 - 85.5	Guy C@88.6875	1 3/8	75.1%	Pass
				Summary	
			Pole	77.7%	Pass
			Reinforcement	90.0%	Pass
			Guy A (L19)	87.4%	Pass
			Guy B (L19)	67.4%	Pass
			Guy C (L19)	75.1%	Pass
			Overall	90.0%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	110.2	34.5	Pass
1	Flange Plates		55.4	Pass
1	Bridge Stiffeners		60.9	Pass
1	Guy Wire Bracket	88.8	85.3	Pass
1	Anchor Rods	0	77.1	Pass
1	Base Plate		64.0	Pass
1	Base Foundation (Structure)		58.1	Pass
1	Base Foundation (Soil Interaction)		81.9	Pass
1	Inner Guy Anchor Shaft		88.0	Pass
1	Inner Guy Anchor Foundation Structural		77.7	Pass
1	Inner Guy Anchor Foundation Soil Interaction		80.8	Pass
1	Outer Guy Anchor Shaft		54.2	Pass
1	Outer Guy Anchor Foundation Structural		36.0	Pass
1	Outer Guy Anchor Foundation Soil Interaction		56.4	Pass

Structure Rating (max from all components) =	**90%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

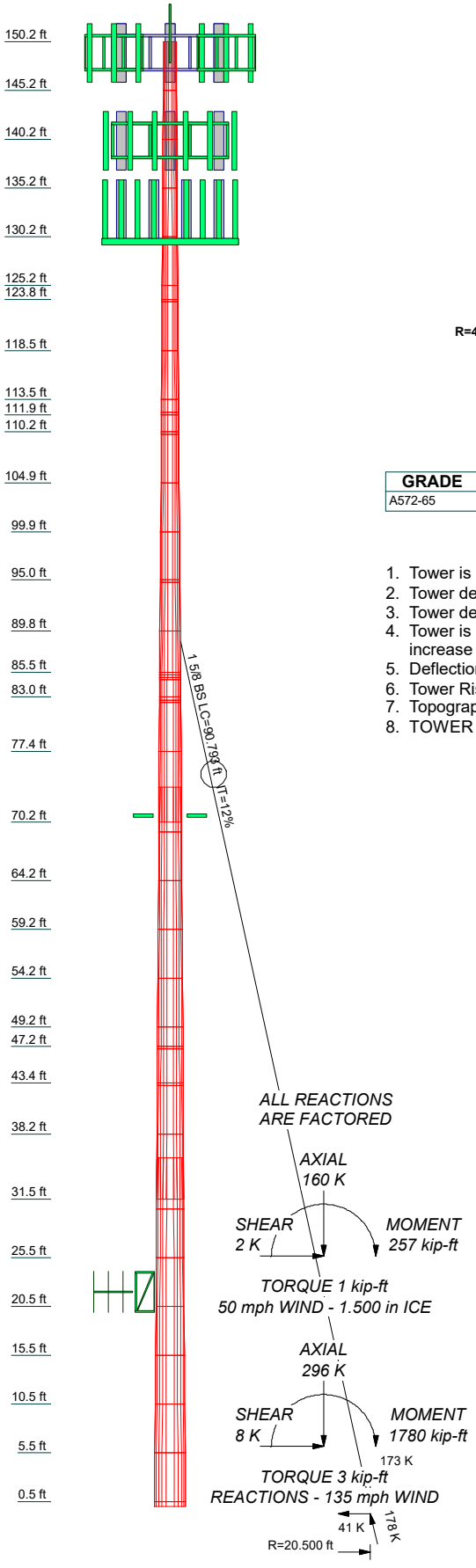
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

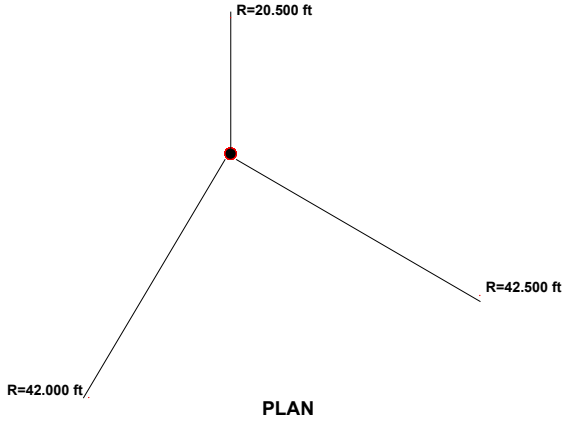
APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	76	8	9	10	13	14	15	16	17	18	19	26	27	28	29	30	31	32	33	35	36	37	38	39	40	41	42	43	44	45	46
Length (ft)	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	4.580	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	0.833
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.250	0.250	0.250	0.250	0.250	0.250	0.500	0.500	0.500	0.500	0.600	0.588	0.575	0.700	0.688	0.675	0.688	0.688	0.725	0.713	0.725	0.713	0.700	0.688	0.675	0.663	0.650	0.650	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
Socket Length (ft)																		3.580										4.210									
Top Dia (in)	15.530	16.310	17.090	17.870	18.650	19.430	19.698	20.478	21.258	21.838	22.672	23.530	24.428	25.277	26.127	26.977	27.827	28.677	29.527	30.377	31.227	32.077	32.927	33.777	34.627	35.477	36.327	37.177	38.027	38.877	39.727	40.577	41.427	42.277	43.127	43.977
Bot Dia (in)	16.310	17.090	17.870	18.650	19.430	20.210	20.478	21.258	22.038	22.672	23.530	24.428	25.277	26.127	26.977	27.827	28.677	29.527	30.377	31.227	32.077	32.927	33.777	34.627	35.477	36.327	37.177	38.027	38.877	39.727	40.577	41.427	42.277	43.127	43.977	44.827
Grade	A572-65																																			
Weight (K)	0.2	0.2	0.2	0.2	0.3	0.1	0.5	0.5	0.1	0.2	0.8	0.8	0.8	0.0	1.0	0.8	1.0	1.6	0.9	1.0	1.0	1.1	1.1	0.4	10.80	1.1	1.1	1.4	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.1



ALL REACTIONS ARE FACTORED



PLAN

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 87.4%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: **BU# 841289**			
Project:			
Client: Crown Castle	Drawn by: Dolly Hsu		App'd:
Code: TIA-222-H	Date: 11/03/20		Scale: NTS
Path: C:\Users\dhsu\Documents\Weekend WIP\841289\WO 1895942 - SA\Prod\841289_R.eri			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

3) Tower is located in Middlesex County, Connecticut.
4) Tower base elevation above sea level: 133.000 ft.
5) Basic wind speed of 135 mph.
6) Risk Category II.
7) Exposure Category B.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.000 ft.
11) Nominal ice thickness of 1.500 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56.000 pcf.
14) A wind speed of 50 mph is used in combination with ice.
15) Temperature drop of 50.000 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) Safety factor used in guy design is 0.9524.
20) Tower analysis based on target reliabilities in accordance with Annex S.
21) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
22) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules	
Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces	
Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA	
Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression	
Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable	
Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation	
Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque	
Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check	
Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption	
Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption	
Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles	
Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction	
Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow	
SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets	
SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments	
				Pole With Shroud Or No Appurtenances	
				Outside and Inside Corner Radii Are Known	

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.167-145.167	5.000	0.000	12	15.530	16.310	0.250	1.000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	145.167-140.167	5.000	0.000	12	16.310	17.090	0.250	1.000	A572-65 (65 ksi)
L3	140.167-135.167	5.000	0.000	12	17.090	17.870	0.250	1.000	A572-65 (65 ksi)
L4	135.167-130.167	5.000	0.000	12	17.870	18.650	0.250	1.000	A572-65 (65 ksi)
L5	130.167-125.167	5.000	0.000	12	18.650	19.430	0.250	1.000	A572-65 (65 ksi)
L6	125.167-123.750	1.417	0.000	12	19.430	19.651	0.250	1.000	A572-65 (65 ksi)
L7	123.750-123.500	0.250	0.000	12	19.651	19.690	0.512	2.050	A572-65 (65 ksi)
L8	123.500-118.500	5.000	0.000	12	19.690	20.470	0.500	2.000	A572-65 (65 ksi)
L9	118.500-113.500	5.000	0.000	12	20.470	21.250	0.487	1.950	A572-65 (65 ksi)
L10	113.500-112.167	1.333	0.000	12	21.250	21.458	0.487	1.950	A572-65 (65 ksi)
L11	112.167-111.917	0.250	0.000	12	21.458	21.497	0.700	2.800	A572-65 (65 ksi)
L12	111.917-110.167	1.750	0.000	12	21.497	21.770	0.700	2.800	A572-65 (65 ksi)
L13	110.167-109.917	0.250	0.000	12	21.770	21.813	0.625	2.500	A572-65 (65 ksi)
L14	109.917-104.917	5.000	0.000	12	21.813	22.672	0.600	2.400	A572-65 (65 ksi)
L15	104.917-99.917	5.000	0.000	12	22.672	23.530	0.588	2.350	A572-65 (65 ksi)
L16	99.917-95.000	4.917	0.000	12	23.530	24.375	0.575	2.300	A572-65 (65 ksi)
L17	95.000-94.750	0.250	0.000	12	24.375	24.418	0.700	2.800	A572-65 (65 ksi)
L18	94.750-89.750	5.000	0.000	12	24.418	25.277	0.688	2.750	A572-65 (65 ksi)
L19	89.750-85.500	4.250	0.000	12	25.277	26.007	0.675	2.700	A572-65 (65 ksi)
L20	85.500-85.250	0.250	0.000	12	26.007	26.049	0.863	3.450	A572-65 (65 ksi)
L21	85.250-85.000	0.250	0.000	12	26.049	26.092	0.863	3.450	A572-65 (65 ksi)
L22	85.000-84.750	0.250	0.000	12	26.092	26.135	0.838	3.350	A572-65 (65 ksi)
L23	84.750-83.000	1.750	0.000	12	26.135	26.436	0.838	3.350	A572-65 (65 ksi)
L24	83.000-82.650	0.350	0.000	12	26.436	26.496	0.713	2.850	A572-65 (65 ksi)
L25	82.650-82.417	0.233	0.000	12	26.496	26.536	0.713	2.850	A572-65 (65 ksi)
L26	82.417-77.417	5.000	0.000	12	26.536	27.395	0.688	2.750	A572-65 (65 ksi)
L27	77.417-70.167	7.250	3.580	12	27.395	28.640	0.688	2.750	A572-65 (65 ksi)
L28	70.167-69.167	4.580	0.000	12	27.400	28.079	0.725	2.900	A572-65 (65 ksi)
L29	69.167-64.167	5.000	0.000	12	28.079	28.821	0.713	2.850	A572-65 (65 ksi)
L30	64.167-59.167	5.000	0.000	12	28.821	29.562	0.725	2.900	A572-65 (65 ksi)
L31	59.167-54.167	5.000	0.000	12	29.562	30.304	0.713	2.850	A572-65 (65 ksi)
L32	54.167-49.167	5.000	0.000	12	30.304	31.045	0.700	2.800	A572-65 (65 ksi)
L33	49.167-47.167	2.000	0.000	12	31.045	31.342	0.700	2.800	A572-65 (65 ksi)
L34	47.167-46.917	0.250	0.000	12	31.342	31.379	0.787	3.150	A572-65 (65 ksi)
L35	46.917-43.417	3.500	0.000	12	31.379	31.898	0.775	3.100	A572-65 (65 ksi)
L36	43.417-43.167	0.250	0.000	12	31.898	31.935	0.650	2.600	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L37	43.167-38.167	5.000	0.000	12	31.935	32.677	0.650	2.600	(65 ksi) A572-65 (65 ksi)
L38	38.167-31.537	6.630	4.210	12	32.677	33.660	0.650	2.600	A572-65 (65 ksi)
L39	31.537-30.537	5.210	0.000	12	32.286	33.161	0.438	1.750	A572-65 (65 ksi)
L40	30.537-25.537	5.000	0.000	12	33.161	34.001	0.438	1.750	A572-65 (65 ksi)
L41	25.537-20.537	5.000	0.000	12	34.001	34.840	0.438	1.750	A572-65 (65 ksi)
L42	20.537-15.537	5.000	0.000	12	34.840	35.680	0.438	1.750	A572-65 (65 ksi)
L43	15.537-10.537	5.000	0.000	12	35.680	36.520	0.438	1.750	A572-65 (65 ksi)
L44	10.537-5.537	5.000	0.000	12	36.520	37.360	0.438	1.750	A572-65 (65 ksi)
L45	5.537-0.537	5.000	0.000	12	37.360	38.200	0.438	1.750	A572-65 (65 ksi)
L46	0.537-0.000	0.537		12	38.200	38.290	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.990	12.300	366.566	5.470	8.045	45.567	742.762	6.054	3.492	13.968
	16.797	12.928	425.616	5.749	8.449	50.377	862.414	6.363	3.701	14.804
L2	16.797	12.928	425.616	5.749	8.449	50.377	862.414	6.363	3.701	14.804
	17.605	13.556	490.691	6.029	8.853	55.429	994.273	6.672	3.910	15.64
L3	17.605	13.556	490.691	6.029	8.853	55.429	994.273	6.672	3.910	15.64
	18.412	14.184	562.082	6.308	9.257	60.722	1138.930	6.981	4.119	16.477
L4	18.412	14.184	562.082	6.308	9.257	60.722	1138.930	6.981	4.119	16.477
	19.220	14.812	640.082	6.587	9.661	66.256	1296.979	7.290	4.328	17.313
L5	19.220	14.812	640.082	6.587	9.661	66.256	1296.979	7.290	4.328	17.313
	20.027	15.440	724.983	6.866	10.065	72.032	1469.011	7.599	4.537	18.149
L6	20.027	15.440	724.983	6.866	10.065	72.032	1469.011	7.599	4.537	18.149
	20.256	15.618	750.339	6.946	10.179	73.713	1520.391	7.687	4.596	18.386
L7	20.163	31.583	1476.600	6.852	10.179	145.060	2991.992	15.544	3.893	7.596
	20.204	31.648	1485.646	6.866	10.199	145.659	3010.321	15.576	3.903	7.616
L8	20.208	30.896	1452.246	6.870	10.199	142.385	2942.645	15.206	3.937	7.874
	21.016	32.152	1636.626	7.149	10.603	154.348	3316.248	15.824	4.146	8.292
L9	21.020	31.368	1598.709	7.154	10.603	150.772	3239.417	15.438	4.179	8.573
	21.828	32.592	1793.324	7.433	11.008	162.918	3633.760	16.041	4.389	9.002
L10	21.828	32.592	1793.324	7.433	11.008	162.918	3633.760	16.041	4.389	9.002
	22.043	32.918	1847.748	7.507	11.115	166.236	3744.039	16.201	4.444	9.116
L11	21.968	46.789	2573.335	7.431	11.115	231.514	5214.275	23.028	3.875	5.535
	22.008	46.876	2587.867	7.445	11.135	232.399	5243.720	23.071	3.885	5.55
L12	22.008	46.876	2587.867	7.445	11.135	232.399	5243.720	23.071	3.885	5.55
	22.291	47.492	2691.123	7.543	11.277	238.641	5452.944	23.374	3.958	5.655
L13	22.317	42.554	2428.538	7.570	11.277	215.356	4920.876	20.944	4.159	6.655
	22.362	42.641	2443.363	7.585	11.299	216.244	4950.915	20.986	4.171	6.673
L14	22.371	40.983	2353.941	7.594	11.299	208.330	4769.722	20.171	4.238	7.063
	23.260	42.643	2651.549	7.902	11.744	225.780	5372.758	20.987	4.468	7.447
L15	23.264	41.778	2600.722	7.906	11.744	221.452	5269.769	20.562	4.502	7.662
	24.153	43.402	2916.062	8.214	12.189	239.242	5908.733	21.361	4.732	8.054
L16	24.158	42.502	2858.686	8.218	12.189	234.534	5792.472	20.918	4.765	8.287
	25.032	44.066	3185.934	8.520	12.626	252.327	6455.567	21.688	4.991	8.681
L17	24.988	53.363	3817.738	8.476	12.626	302.366	7735.772	26.264	4.656	6.652
	25.032	53.460	3838.547	8.491	12.648	303.480	7777.938	26.311	4.668	6.669
L18	25.037	52.533	3775.966	8.495	12.648	298.532	7651.130	25.855	4.701	6.839
	25.926	54.434	4200.911	8.803	13.093	320.845	8512.185	26.791	4.932	7.173
L19	25.930	53.472	4130.824	8.807	13.093	315.492	8370.170	26.317	4.965	7.356
	26.686	55.058	4509.530	9.069	13.471	334.748	9137.530	27.098	5.161	7.646
L20	26.620	69.831	5635.169	9.002	13.471	418.306	11418.381	34.369	4.658	5.401

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	26.664	69.951	5664.088	9.017	13.494	419.760	11476.978	34.428	4.670	5.414
L21	26.664	69.951	5664.088	9.017	13.494	419.760	11476.978	34.428	4.670	5.414
	26.709	70.070	5693.105	9.032	13.516	421.216	11535.773	34.486	4.681	5.428
L22	26.717	68.106	5544.537	9.041	13.516	410.224	11234.734	33.520	4.748	5.67
	26.762	68.222	5572.865	9.057	13.538	411.642	11292.135	33.577	4.760	5.683
L23	26.762	68.222	5572.865	9.057	13.538	411.642	11292.135	33.577	4.760	5.683
	27.073	69.033	5773.866	9.164	13.694	421.641	11699.419	33.976	4.840	5.779
L24	27.117	59.016	4984.406	9.209	13.694	363.990	10099.758	29.046	5.175	7.264
	27.179	59.154	5019.432	9.231	13.725	365.716	10170.730	29.114	5.191	7.286
L25	27.179	59.154	5019.432	9.231	13.725	365.716	10170.730	29.114	5.191	7.286
	27.221	59.246	5042.870	9.245	13.746	366.869	10218.221	29.159	5.202	7.301
L26	27.230	57.222	4880.073	9.254	13.746	355.025	9888.351	28.163	5.269	7.664
	28.119	59.123	5382.792	9.561	14.191	379.323	10906.996	29.099	5.499	7.999
L27	28.119	59.123	5382.792	9.561	14.191	379.323	10906.996	29.099	5.499	7.999
	29.408	61.880	6171.298	10.007	14.836	415.981	12504.722	30.455	5.833	8.484
L28	28.661	62.273	5655.874	9.550	14.193	398.490	11460.334	30.649	5.400	7.449
	28.814	63.859	6099.014	9.793	14.545	419.317	12358.255	31.429	5.582	7.7
L29	28.819	62.786	6002.079	9.797	14.545	412.653	12161.839	30.902	5.616	7.882
	29.586	64.488	6503.303	10.063	14.929	435.609	13177.455	31.739	5.814	8.161
L30	29.582	65.590	6608.572	10.058	14.929	442.660	13390.758	32.281	5.781	7.974
	30.349	67.321	7145.748	10.324	15.313	466.636	14479.224	33.133	5.980	8.248
L31	30.354	66.189	7031.682	10.328	15.313	459.187	14248.094	32.576	6.013	8.44
	31.122	67.890	7587.933	10.594	15.697	483.387	15375.210	33.413	6.212	8.719
L32	31.126	66.727	7464.263	10.598	15.697	475.509	15124.620	32.841	6.245	8.922
	31.894	68.399	8039.320	10.864	16.082	499.910	16289.842	33.664	6.444	9.206
L33	31.894	68.399	8039.320	10.864	16.082	499.910	16289.842	33.664	6.444	9.206
	32.201	69.067	8277.404	10.970	16.235	509.843	16772.265	33.993	6.524	9.32
L34	32.170	77.479	9232.534	10.939	16.235	568.674	18707.617	38.133	6.289	7.986
	32.208	77.573	9266.184	10.952	16.254	570.072	18775.801	38.179	6.299	7.999
L35	32.213	76.373	9130.285	10.956	16.254	561.712	18500.432	37.588	6.333	8.171
	32.750	77.668	9602.770	11.142	16.523	581.166	19457.815	38.226	6.472	8.351
L36	32.794	65.402	8151.367	11.187	16.523	493.326	16516.879	32.189	6.807	10.472
	32.833	65.480	8180.416	11.200	16.542	494.510	16575.741	32.227	6.817	10.487
L37	32.833	65.480	8180.416	11.200	16.542	494.510	16575.741	32.227	6.817	10.487
	33.600	67.032	8775.981	11.466	16.927	518.473	17782.516	32.991	7.015	10.793
L38	33.600	67.032	8775.981	11.466	16.927	518.473	17782.516	32.991	7.015	10.793
	34.618	69.090	9609.300	11.818	17.436	551.122	19471.047	34.004	7.279	11.198
L39	34.002	44.866	5808.611	11.402	16.724	347.323	11769.821	22.082	7.480	17.097
	34.176	46.099	6300.711	11.715	17.177	366.805	12766.948	22.688	7.715	17.633
L40	34.176	46.099	6300.711	11.715	17.177	366.805	12766.948	22.688	7.715	17.633
	35.046	47.282	6798.389	12.016	17.612	386.002	13775.380	23.271	7.940	18.148
L41	35.046	47.282	6798.389	12.016	17.612	386.002	13775.380	23.271	7.940	18.148
	35.915	48.465	7321.609	12.316	18.047	405.689	14835.564	23.853	8.165	18.662
L42	35.915	48.465	7321.609	12.316	18.047	405.689	14835.564	23.853	8.165	18.662
	36.785	49.648	7871.008	12.617	18.482	425.865	15948.796	24.435	8.390	19.177
L43	36.785	49.648	7871.008	12.617	18.482	425.865	15948.796	24.435	8.390	19.177
	37.654	50.831	8447.225	12.918	18.917	446.532	17116.368	25.018	8.615	19.691
L44	37.654	50.831	8447.225	12.918	18.917	446.532	17116.368	25.018	8.615	19.691
	38.524	52.015	9050.901	13.218	19.352	467.687	18339.579	25.600	8.840	20.206
L45	38.524	52.015	9050.901	13.218	19.352	467.687	18339.579	25.600	8.840	20.206
	39.393	53.198	9682.672	13.519	19.787	489.333	19619.719	26.182	9.065	20.72
L46	39.393	53.198	9682.672	13.519	19.787	489.333	19619.719	26.182	9.065	20.72
	39.486	53.325	9752.222	13.551	19.834	491.687	19760.646	26.245	9.089	20.775

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.167-145.167				1	1	1			
L2 145.167-140.167				1	1	1			
L3 140.167-135.167				1	1	1			
L4 135.167-130.167				1	1	1			
L5 130.167-125.167				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L6 125.167-123.750				1	1	1			
L7 123.750-123.500				1	1	0.921664			
L8 123.500-118.500				1	1	0.926745			
L9 118.500-113.500				1	1	0.933492			
L10 113.500-112.167				1	1	0.929321			
L11 112.167-111.917				1	1	0.8856			
L12 111.917-110.167				1	1	0.878753			
L13 110.167-109.917				1	1	1.07983			
L14 109.917-104.917				1	1	1.10005			
L15 104.917-99.917				1	1	1.1007			
L16 99.917-95.000				1	1	1.10342			
L17 95.000-94.750				1	1	1.06018			
L18 94.750-89.750				1	1	1.05709			
L19 89.750-85.500				1	1	1.05845			
L20 85.500-85.250				1	1	0.962568			
L21 85.250-85.000				1	1	0.961546			
L22 85.000-84.750				1	1	0.925837			
L23 84.750-83.000				1	1	0.919348			
L24 83.000-82.650				1	1	1.03793			
L25 82.650-82.417				1	1	1.037			
L26 82.417-77.417				1	1	1.05376			
L27 77.417-70.167				1	1	1.03994			
L28 70.167-69.167				1	1	0.947274			
L29 69.167-64.167				1	1	0.95192			
L30 64.167-59.167				1	1	0.925158			
L31 59.167-54.167				1	1	0.93059			
L32 54.167-49.167				1	1	0.936763			
L33 49.167-47.167				1	1	0.93288			
L34 47.167-46.917				1	1	0.913469			
L35 46.917-43.417				1	1	0.92042			
L36 43.417-43.167				1	1	0.954778			
L37 43.167-38.167				1	1	0.94603			
L38 38.167-31.537				1	1	0.94194			
L39 31.537-				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
30.537									
L40 30.537-25.537				1	1	1			
L41 25.537-20.537				1	1	1			
L42 20.537-15.537				1	1	1			
L43 15.537-10.537				1	1	1			
L44 10.537-5.537				1	1	1			
L45 5.537-0.537				1	1	1			
L46 0.537-0.000				1	1	1			

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
88.6875	BS	A	1 5/8	38.880	12%	24000.000	5.550	90.700	20.500	0.000	0.000	100%
		B	1 3/8	27.840	12%	0	3.970	97.790	42.500	0.000	0.000	100%
		C	1 3/8	27.840	12%	24000.000	3.970	97.580	42.000	-30.000	0.000	100%
						0						
						24000.000						

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
88.6875	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
88.688	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
88.6875	0.503	0.388	0.387		0.584 1.3 sec/pulse	0.678 1.4 sec/pulse	0.675 1.4 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
88.6875	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
88.6875	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
88.6875	A	44.344	0.033	0.005	1.313
	B	44.344	0.033	0.005	1.313
	C	44.344	0.033	0.005	1.313

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A(1-1/4) *	C	No	Surface Ar (CaAa)	130.000 - 109.750	6	6	-0.140 -0.070	1.550		0.600
LDF6-50A(1-1/4) *	C	No	Surface Ar (CaAa)	149.000 - 0.000	1	1	0.280 0.300	1.550		0.600
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8) *	A	No	Surface Ar (CaAa)	140.000 - 0.000	10	10	-0.480 -0.050	1.625		1.070
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	71.000 - 22.000	2	2	-0.050 0.000	0.630		0.150
LDF4-50A(1/2) *	C	No	Surface Ar (CaAa)	22.000 - 0.000	3	3	-0.050 0.000	0.630		0.150
Safety Line 3/8	C	No	Surface Ar (CaAa)	150.167 - 0.000	1	1	-0.210 -0.200	0.375		0.220

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*										
2011 Mod										
PL4x1	A	No	Surface Af (CaAa)	96.750 - 71.750	1	1	0.100 0.150	4.000	10.000	0.000
PL4x1	B	No	Surface Af (CaAa)	96.750 - 71.750	1	1	0.100 0.150	4.000	10.000	0.000
*										
2014 Mod										
6" x 1" Plate	A	No	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
6" x 1" Plate	B	No	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
6" x 1" Plate	C	No	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
*										
6.5" x 1.25" Plate	A	No	Surface Af (CaAa)	110.000 - 85.000	1	1	0.000 0.100	6.500	15.500	0.000
6.5" x 1.25" Plate	B	No	Surface Af (CaAa)	110.000 - 85.000	1	1	0.000 0.100	6.500	15.500	0.000
6.5" x 1.25" Plate	C	No	Surface Af (CaAa)	110.000 - 80.000	1	1	0.100 0.150	6.500	15.500	0.000
*										
4.5" x 1" Plate	A	No	Surface Af (CaAa)	125.750 - 110.750	1	1	0.000 0.100	4.500	11.000	0.000
4.5" x 1" Plate	B	No	Surface Af (CaAa)	125.750 - 110.750	1	1	0.000 0.100	4.500	11.000	0.000
4.5" x 1" Plate	C	No	Surface Af (CaAa)	125.750 - 110.750	1	1	0.000 0.100	4.500	11.000	0.000
*										
2016 Mod										
CCI 6.5" x 1.25" Plate	A	No	Surface Af (CaAa)	49.917 - 29.917	1	1	0.000 0.100	6.500	15.500	0.000
CCI 6.5" x 1.25" Plate	B	No	Surface Af (CaAa)	49.917 - 29.917	1	1	0.000 0.100	6.500	15.500	0.000
CCI 6.5" x 1.25" Plate	C	No	Surface Af (CaAa)	49.917 - 29.917	1	1	0.000 0.100	6.500	15.500	0.000
*										
CCI 6.5" x 3" Plate	A	No	Surface Af (CaAa)	109.500 - 103.000	1	1	0.000 0.100	6.500	19.000	61.258
CCI 6.5" x 3" Plate	B	No	Surface Af (CaAa)	109.500 - 103.000	1	1	0.000 0.100	6.500	19.000	61.258
CCI 6.5" x 3" Plate	C	No	Surface Af (CaAa)	109.500 - 103.000	1	1	0.000 0.100	6.500	19.000	61.258
*										
CCI 6.5" x 3" Plate	A	No	Surface Af (CaAa)	117.000 - 110.500	1	1	0.000 0.100	6.500	19.000	61.258
CCI 6.5" x 3" Plate	B	No	Surface Af (CaAa)	117.000 - 110.500	1	1	0.000 0.100	6.500	19.000	61.258
CCI 6.5" x 3" Plate	C	No	Surface Af (CaAa)	117.000 - 110.500	1	1	0.000 0.100	6.500	19.000	61.258
*										
CCI 6.5" x 1.25" Plate	A	No	Surface Af (CaAa)	116.917 - 103.080	1	1	0.000 0.100	6.500	15.500	27.651
CCI 6.5" x 1.25" Plate	B	No	Surface Af (CaAa)	116.917 - 103.080	1	1	0.000 0.100	6.500	15.500	27.651
CCI 6.5" x 1.25" Plate	C	No	Surface Af (CaAa)	116.917 - 103.080	1	1	0.000 0.100	6.500	15.500	27.651
*										
CCI 4.5" x 1" Plate	A	No	Surface Af (CaAa)	87.000 - 41.917	1	1	0.300 0.350	4.500	11.000	0.000
CCI 4.5" x 1" Plate	C	No	Surface Af (CaAa)	87.000 - 41.917	1	1	0.300 0.350	4.500	11.000	0.000
*										
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF6-50A(1-1/4)	C	No	No	Inside Pole	109.750 - 0.000	6	No Ice	0.000	0.600
							1/2" Ice	0.000	0.600
							1" Ice	0.000	0.600
							2" Ice	0.000	0.600
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	1.300
							1/2" Ice	0.000	1.300
							1" Ice	0.000	1.300
							2" Ice	0.000	1.300
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	1.300
							1/2" Ice	0.000	1.300
							1" Ice	0.000	1.300
							2" Ice	0.000	1.300
LDF6-50A(1-1/4)	C	No	No	Inside Pole	149.000 - 0.000	11	No Ice	0.000	0.600
							1/2" Ice	0.000	0.600
							1" Ice	0.000	0.600
							2" Ice	0.000	0.600
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	149.000 - 0.000	3	No Ice	0.000	0.057
							1/2" Ice	0.000	0.057
							1" Ice	0.000	0.057
							2" Ice	0.000	0.057
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	149.000 - 0.000	6	No Ice	0.000	0.584
							1/2" Ice	0.000	0.584
							1" Ice	0.000	0.584
							2" Ice	0.000	0.584
*									
LDF4P-50A(1/2")	C	No	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150
							1" Ice	0.000	0.150
							2" Ice	0.000	0.150
*									
*									
*									
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.167-145.167	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.782	0.000	0.043
L2	145.167-140.167	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.962	0.000	0.055
L3	140.167-135.167	A	0.000	0.000	7.854	0.000	0.052
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.962	0.000	0.055
L4	135.167-130.167	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.962	0.000	0.055
L5	130.167-125.167	A	0.000	0.000	8.562	0.000	0.053
		B	0.000	0.000	0.437	0.000	0.000
		C	0.000	0.000	5.894	0.000	0.086
L6	125.167-123.750	A	0.000	0.000	3.365	0.000	0.015
		B	0.000	0.000	1.063	0.000	0.000
		C	0.000	0.000	2.653	0.000	0.025
L7	123.750-123.500	A	0.000	0.000	0.594	0.000	0.003
		B	0.000	0.000	0.188	0.000	0.000

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.468	0.000	0.004
L8	123.500-118.500	A	0.000	0.000	11.875	0.000	0.053
		B	0.000	0.000	3.750	0.000	0.000
		C	0.000	0.000	9.363	0.000	0.087
L9	118.500-113.500	A	0.000	0.000	18.477	0.000	0.362
		B	0.000	0.000	10.352	0.000	0.309
		C	0.000	0.000	15.964	0.000	0.396
L10	113.500-112.167	A	0.000	0.000	5.715	0.000	0.133
		B	0.000	0.000	3.548	0.000	0.119
		C	0.000	0.000	5.045	0.000	0.142
L11	112.167-111.917	A	0.000	0.000	1.072	0.000	0.025
		B	0.000	0.000	0.666	0.000	0.022
		C	0.000	0.000	0.946	0.000	0.027
L12	111.917-110.167	A	0.000	0.000	6.789	0.000	0.154
		B	0.000	0.000	3.945	0.000	0.135
		C	0.000	0.000	5.910	0.000	0.166
L13	110.167-109.917	A	0.000	0.000	0.767	0.000	0.010
		B	0.000	0.000	0.361	0.000	0.007
		C	0.000	0.000	0.641	0.000	0.011
L14	109.917-104.917	A	0.000	0.000	22.756	0.000	0.473
		B	0.000	0.000	14.631	0.000	0.419
		C	0.000	0.000	15.749	0.000	0.506
L15	104.917-99.917	A	0.000	0.000	17.120	0.000	0.222
		B	0.000	0.000	8.995	0.000	0.168
		C	0.000	0.000	9.958	0.000	0.255
L16	99.917-95.000	A	0.000	0.000	14.484	0.000	0.053
		B	0.000	0.000	6.493	0.000	0.000
		C	0.000	0.000	6.273	0.000	0.086
L17	95.000-94.750	A	0.000	0.000	0.844	0.000	0.003
		B	0.000	0.000	0.438	0.000	0.000
		C	0.000	0.000	0.319	0.000	0.004
L18	94.750-89.750	A	0.000	0.000	16.875	0.000	0.053
		B	0.000	0.000	8.750	0.000	0.000
		C	0.000	0.000	6.379	0.000	0.087
L19	89.750-85.500	A	0.000	0.000	15.469	0.000	0.045
		B	0.000	0.000	7.438	0.000	0.000
		C	0.000	0.000	6.547	0.000	0.074
L20	85.500-85.250	A	0.000	0.000	1.031	0.000	0.003
		B	0.000	0.000	0.438	0.000	0.000
		C	0.000	0.000	0.506	0.000	0.004
L21	85.250-85.000	A	0.000	0.000	1.031	0.000	0.003
		B	0.000	0.000	0.438	0.000	0.000
		C	0.000	0.000	0.506	0.000	0.004
L22	85.000-84.750	A	0.000	0.000	1.010	0.000	0.003
		B	0.000	0.000	0.417	0.000	0.000
		C	0.000	0.000	0.756	0.000	0.004
L23	84.750-83.000	A	0.000	0.000	7.073	0.000	0.019
		B	0.000	0.000	2.917	0.000	0.000
		C	0.000	0.000	5.295	0.000	0.031
L24	83.000-82.650	A	0.000	0.000	1.415	0.000	0.004
		B	0.000	0.000	0.583	0.000	0.000
		C	0.000	0.000	1.059	0.000	0.006
L25	82.650-82.417	A	0.000	0.000	0.943	0.000	0.002
		B	0.000	0.000	0.389	0.000	0.000
		C	0.000	0.000	0.706	0.000	0.004
L26	82.417-77.417	A	0.000	0.000	20.208	0.000	0.053
		B	0.000	0.000	8.333	0.000	0.000
		C	0.000	0.000	12.331	0.000	0.087
L27	77.417-70.167	A	0.000	0.000	28.246	0.000	0.078
		B	0.000	0.000	11.028	0.000	0.000
		C	0.000	0.000	14.188	0.000	0.127
L28	70.167-69.167	A	0.000	0.000	3.375	0.000	0.011
		B	0.000	0.000	1.000	0.000	0.000
		C	0.000	0.000	2.068	0.000	0.018
L29	69.167-64.167	A	0.000	0.000	16.875	0.000	0.053
		B	0.000	0.000	5.000	0.000	0.000
		C	0.000	0.000	10.342	0.000	0.089
L30	64.167-59.167	A	0.000	0.000	16.875	0.000	0.053
		B	0.000	0.000	5.000	0.000	0.000

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	10.342	0.000	0.089
L31	59.167-54.167	A	0.000	0.000	16.875	0.000	0.053
		B	0.000	0.000	5.000	0.000	0.000
		C	0.000	0.000	10.342	0.000	0.089
L32	54.167-49.167	A	0.000	0.000	16.855	0.000	0.053
		B	0.000	0.000	4.979	0.000	0.000
		C	0.000	0.000	10.322	0.000	0.089
L33	49.167-47.167	A	0.000	0.000	6.918	0.000	0.021
		B	0.000	0.000	2.167	0.000	0.000
		C	0.000	0.000	4.304	0.000	0.035
L34	47.167-46.917	A	0.000	0.000	0.865	0.000	0.003
		B	0.000	0.000	0.271	0.000	0.000
		C	0.000	0.000	0.538	0.000	0.004
L35	46.917-43.417	A	0.000	0.000	12.104	0.000	0.037
		B	0.000	0.000	3.792	0.000	0.000
		C	0.000	0.000	7.531	0.000	0.062
L36	43.417-43.167	A	0.000	0.000	0.865	0.000	0.003
		B	0.000	0.000	0.271	0.000	0.000
		C	0.000	0.000	0.538	0.000	0.004
L37	43.167-38.167	A	0.000	0.000	14.479	0.000	0.053
		B	0.000	0.000	5.417	0.000	0.000
		C	0.000	0.000	7.946	0.000	0.089
L38	38.167-31.537	A	0.000	0.000	17.955	0.000	0.071
		B	0.000	0.000	7.182	0.000	0.000
		C	0.000	0.000	9.294	0.000	0.118
L39	31.537-30.537	A	0.000	0.000	2.708	0.000	0.011
		B	0.000	0.000	1.083	0.000	0.000
		C	0.000	0.000	1.402	0.000	0.018
L40	30.537-25.537	A	0.000	0.000	8.797	0.000	0.053
		B	0.000	0.000	0.672	0.000	0.000
		C	0.000	0.000	2.264	0.000	0.089
L41	25.537-20.537	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.685	0.000	0.089
L42	20.537-15.537	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.908	0.000	0.089
L43	15.537-10.537	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.908	0.000	0.089
L44	10.537-5.537	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.908	0.000	0.089
L45	5.537-0.537	A	0.000	0.000	8.125	0.000	0.053
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.908	0.000	0.089
L46	0.537-0.000	A	0.000	0.000	0.873	0.000	0.006
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.205	0.000	0.010

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.167-145.167	A	1.481	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	3.398	0.000	0.081
L2	145.167-140.167	A	1.476	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	3.914	0.000	0.099
L3	140.167-135.167	A	1.471	0.000	0.000	11.594	0.000	0.169
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	3.904	0.000	0.099
L4	135.167-130.167	A	1.465	0.000	0.000	11.988	0.000	0.174
		B		0.000	0.000	0.000	0.000	0.000

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	3.893	0.000	0.099
L5	130.167-125.167	A	1.460	0.000	0.000	12.586	0.000	0.179
		B		0.000	0.000	0.605	0.000	0.005
		C		0.000	0.000	11.869	0.000	0.208
L6	125.167-123.750	A	1.456	0.000	0.000	4.864	0.000	0.062
		B		0.000	0.000	1.470	0.000	0.013
		C		0.000	0.000	4.731	0.000	0.072
L7	123.750-123.500	A	1.455	0.000	0.000	0.858	0.000	0.011
		B		0.000	0.000	0.259	0.000	0.002
		C		0.000	0.000	0.835	0.000	0.013
L8	123.500-118.500	A	1.452	0.000	0.000	17.155	0.000	0.220
		B		0.000	0.000	5.184	0.000	0.047
		C		0.000	0.000	16.678	0.000	0.252
L9	118.500-113.500	A	1.446	0.000	0.000	24.832	0.000	0.616
		B		0.000	0.000	12.868	0.000	0.444
		C		0.000	0.000	24.342	0.000	0.648
L10	113.500-112.167	A	1.442	0.000	0.000	7.535	0.000	0.211
		B		0.000	0.000	4.346	0.000	0.165
		C		0.000	0.000	7.402	0.000	0.219
L11	112.167-111.917	A	1.441	0.000	0.000	1.413	0.000	0.040
		B		0.000	0.000	0.815	0.000	0.031
		C		0.000	0.000	1.388	0.000	0.041
L12	111.917-110.167	A	1.439	0.000	0.000	8.957	0.000	0.246
		B		0.000	0.000	4.772	0.000	0.186
		C		0.000	0.000	8.781	0.000	0.257
L13	110.167-109.917	A	1.438	0.000	0.000	1.021	0.000	0.019
		B		0.000	0.000	0.423	0.000	0.011
		C		0.000	0.000	0.995	0.000	0.021
L14	109.917-104.917	A	1.435	0.000	0.000	29.509	0.000	0.770
		B		0.000	0.000	17.559	0.000	0.598
		C		0.000	0.000	21.645	0.000	0.730
L15	104.917-99.917	A	1.428	0.000	0.000	22.947	0.000	0.445
		B		0.000	0.000	11.006	0.000	0.274
		C		0.000	0.000	14.825	0.000	0.402
L16	99.917-95.000	A	1.421	0.000	0.000	20.122	0.000	0.239
		B		0.000	0.000	8.388	0.000	0.072
		C		0.000	0.000	10.465	0.000	0.183
L17	95.000-94.750	A	1.417	0.000	0.000	1.176	0.000	0.014
		B		0.000	0.000	0.579	0.000	0.005
		C		0.000	0.000	0.532	0.000	0.009
L18	94.750-89.750	A	1.413	0.000	0.000	23.499	0.000	0.269
		B		0.000	0.000	11.576	0.000	0.099
		C		0.000	0.000	10.618	0.000	0.186
L19	89.750-85.500	A	1.406	0.000	0.000	21.501	0.000	0.241
		B		0.000	0.000	9.827	0.000	0.084
		C		0.000	0.000	10.554	0.000	0.170
L20	85.500-85.250	A	1.402	0.000	0.000	1.431	0.000	0.016
		B		0.000	0.000	0.578	0.000	0.005
		C		0.000	0.000	0.787	0.000	0.011
L21	85.250-85.000	A	1.402	0.000	0.000	1.431	0.000	0.016
		B		0.000	0.000	0.578	0.000	0.005
		C		0.000	0.000	0.787	0.000	0.011
L22	85.000-84.750	A	1.401	0.000	0.000	1.410	0.000	0.015
		B		0.000	0.000	0.557	0.000	0.005
		C		0.000	0.000	1.107	0.000	0.014
L23	84.750-83.000	A	1.400	0.000	0.000	9.866	0.000	0.108
		B		0.000	0.000	3.896	0.000	0.033
		C		0.000	0.000	7.745	0.000	0.098
L24	83.000-82.650	A	1.398	0.000	0.000	1.973	0.000	0.021
		B		0.000	0.000	0.779	0.000	0.007
		C		0.000	0.000	1.548	0.000	0.020
L25	82.650-82.417	A	1.397	0.000	0.000	1.315	0.000	0.014
		B		0.000	0.000	0.519	0.000	0.004
		C		0.000	0.000	1.032	0.000	0.013
L26	82.417-77.417	A	1.393	0.000	0.000	28.159	0.000	0.306
		B		0.000	0.000	11.119	0.000	0.094
		C		0.000	0.000	18.575	0.000	0.251
L27	77.417-70.167	A	1.382	0.000	0.000	39.268	0.000	0.427
		B		0.000	0.000	14.597	0.000	0.121

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	22.516	0.000	0.326
L28	70.167-69.167	A	1.374	0.000	0.000	4.679	0.000	0.053
		B		0.000	0.000	1.276	0.000	0.010
		C		0.000	0.000	3.551	0.000	0.049
L29	69.167-64.167	A	1.368	0.000	0.000	23.352	0.000	0.260
		B		0.000	0.000	6.368	0.000	0.051
		C		0.000	0.000	17.681	0.000	0.242
L30	64.167-59.167	A	1.357	0.000	0.000	23.317	0.000	0.258
		B		0.000	0.000	6.357	0.000	0.051
		C		0.000	0.000	17.626	0.000	0.240
L31	59.167-54.167	A	1.346	0.000	0.000	23.280	0.000	0.256
		B		0.000	0.000	6.346	0.000	0.050
		C		0.000	0.000	17.566	0.000	0.238
L32	54.167-49.167	A	1.333	0.000	0.000	23.197	0.000	0.254
		B		0.000	0.000	6.291	0.000	0.049
		C		0.000	0.000	17.458	0.000	0.236
L33	49.167-47.167	A	1.324	0.000	0.000	9.452	0.000	0.103
		B		0.000	0.000	2.697	0.000	0.021
		C		0.000	0.000	7.148	0.000	0.096
L34	47.167-46.917	A	1.321	0.000	0.000	1.181	0.000	0.013
		B		0.000	0.000	0.337	0.000	0.003
		C		0.000	0.000	0.893	0.000	0.012
L35	46.917-43.417	A	1.316	0.000	0.000	16.519	0.000	0.179
		B		0.000	0.000	4.713	0.000	0.037
		C		0.000	0.000	12.477	0.000	0.166
L36	43.417-43.167	A	1.310	0.000	0.000	1.179	0.000	0.013
		B		0.000	0.000	0.336	0.000	0.003
		C		0.000	0.000	0.890	0.000	0.012
L37	43.167-38.167	A	1.302	0.000	0.000	19.765	0.000	0.223
		B		0.000	0.000	6.719	0.000	0.052
		C		0.000	0.000	13.962	0.000	0.205
L38	38.167-31.537	A	1.282	0.000	0.000	24.473	0.000	0.278
		B		0.000	0.000	8.882	0.000	0.067
		C		0.000	0.000	16.727	0.000	0.256
L39	31.537-30.537	A	1.267	0.000	0.000	3.691	0.000	0.042
		B		0.000	0.000	1.340	0.000	0.010
		C		0.000	0.000	2.523	0.000	0.039
L40	30.537-25.537	A	1.254	0.000	0.000	12.551	0.000	0.163
		B		0.000	0.000	0.827	0.000	0.006
		C		0.000	0.000	6.654	0.000	0.146
L41	25.537-20.537	A	1.230	0.000	0.000	11.694	0.000	0.155
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.863	0.000	0.140
L42	20.537-15.537	A	1.200	0.000	0.000	11.656	0.000	0.152
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	6.044	0.000	0.141
L43	15.537-10.537	A	1.162	0.000	0.000	11.609	0.000	0.149
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.920	0.000	0.138
L44	10.537-5.537	A	1.107	0.000	0.000	11.540	0.000	0.145
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.741	0.000	0.135
L45	5.537-0.537	A	1.004	0.000	0.000	11.411	0.000	0.137
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.407	0.000	0.129
L46	0.537-0.000	A	0.788	0.000	0.000	1.197	0.000	0.013
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.505	0.000	0.013

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.167-145.167	-0.322	0.780	-0.230	1.899

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L2	145.167-140.167	-0.434	0.935	-0.415	2.129
L3	140.167-135.167	-4.926	0.623	-4.065	1.200
L4	135.167-130.167	-5.104	0.631	-4.236	1.215
L5	130.167-125.167	-3.425	2.472	-2.713	2.664
L6	125.167-123.750	-2.396	1.785	-2.059	2.077
L7	123.750-123.500	-2.410	1.795	-2.071	2.089
L8	123.500-118.500	-2.447	1.824	-2.104	2.121
L9	118.500-113.500	-1.514	1.129	-1.539	1.551
L10	113.500-112.167	-1.329	0.991	-1.389	1.399
L11	112.167-111.917	-1.331	0.992	-1.392	1.402
L12	111.917-110.167	-1.481	1.104	-1.538	1.549
L13	110.167-109.917	-2.101	1.429	-2.021	1.890
L14	109.917-104.917	-1.840	0.142	-2.035	0.463
L15	104.917-99.917	-2.631	0.164	-2.764	0.578
L16	99.917-95.000	-3.229	-0.148	-3.114	0.345
L17	95.000-94.750	-2.589	-0.711	-2.544	-0.244
L18	94.750-89.750	-2.625	-0.721	-2.579	-0.248
L19	89.750-85.500	-2.881	-1.000	-2.822	-0.526
L20	85.500-85.250	-3.212	-1.417	-3.139	-0.958
L21	85.250-85.000	-3.216	-1.419	-3.143	-0.960
L22	85.000-84.750	-3.262	0.026	-3.161	0.269
L23	84.750-83.000	-3.279	0.025	-3.177	0.270
L24	83.000-82.650	-3.294	0.025	-3.193	0.271
L25	82.650-82.417	-3.299	0.025	-3.198	0.272
L26	82.417-77.417	-3.145	-0.667	-3.068	-0.309
L27	77.417-70.167	-3.225	-1.234	-3.147	-0.696
L28	70.167-69.167	-3.983	-0.404	-3.657	0.442
L29	69.167-64.167	-4.026	-0.409	-3.702	0.442
L30	64.167-59.167	-4.098	-0.417	-3.775	0.445
L31	59.167-54.167	-4.168	-0.425	-3.847	0.449
L32	54.167-49.167	-4.243	-0.433	-3.925	0.452
L33	49.167-47.167	-4.169	-0.426	-3.897	0.444
L34	47.167-46.917	-4.185	-0.428	-3.914	0.445
L35	46.917-43.417	-4.210	-0.431	-3.940	0.445
L36	43.417-43.167	-4.234	-0.434	-3.965	0.445
L37	43.167-38.167	-3.835	0.395	-3.589	1.281
L38	38.167-31.537	-3.727	0.734	-3.499	1.622
L39	31.537-30.537	-3.718	0.732	-3.491	1.618
L40	30.537-25.537	-5.852	1.153	-4.968	2.278
L41	25.537-20.537	-6.385	1.327	-5.333	2.472
L42	20.537-15.537	-6.373	1.490	-5.371	2.583
L43	15.537-10.537	-6.427	1.504	-5.452	2.583
L44	10.537-5.537	-6.480	1.516	-5.540	2.567
L45	5.537-0.537	-6.532	1.529	-5.647	2.503
L46	0.537-0.000	-6.560	1.536	-5.781	2.308

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	7	LDF6-50A(1-1/4)	145.17 - 149.00	1.0000	1.0000
L1	23	Safety Line 3/8	145.17 - 150.17	1.0000	1.0000
L2	7	LDF6-50A(1-1/4)	140.17 - 145.17	1.0000	1.0000
L2	23	Safety Line 3/8	140.17 - 145.17	1.0000	1.0000
L3	7	LDF6-50A(1-1/4)	135.17 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L3	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	140.17 135.17 - 140.00	1.0000	1.0000
L3	23	Safety Line 3/8	135.17 - 140.17	1.0000	1.0000
L4	7	LDF6-50A(1-1/4)	130.17 - 135.17	1.0000	1.0000
L4	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	130.17 - 135.17	1.0000	1.0000
L4	23	Safety Line 3/8	130.17 - 135.17	1.0000	1.0000
L5	3	LDF6-50A(1-1/4)	125.17 - 130.00	1.0000	1.0000
L5	7	LDF6-50A(1-1/4)	125.17 - 130.17	1.0000	1.0000
L5	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	125.17 - 130.17	1.0000	1.0000
L5	23	Safety Line 3/8	125.17 - 130.17	1.0000	1.0000
L5	38	4.5" x 1" Plate	125.17 - 125.75	1.0000	1.0000
L5	39	4.5" x 1" Plate	125.17 - 125.75	1.0000	1.0000
L5	40	4.5" x 1" Plate	125.17 - 125.75	1.0000	1.0000
L6	3	LDF6-50A(1-1/4)	123.75 - 125.17	1.0000	1.0000
L6	7	LDF6-50A(1-1/4)	123.75 - 125.17	1.0000	1.0000
L6	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	123.75 - 125.17	1.0000	1.0000
L6	23	Safety Line 3/8	123.75 - 125.17	1.0000	1.0000
L6	38	4.5" x 1" Plate	123.75 - 125.17	1.0000	1.0000
L6	39	4.5" x 1" Plate	123.75 - 125.17	1.0000	1.0000
L6	40	4.5" x 1" Plate	123.75 - 125.17	1.0000	1.0000
L7	3	LDF6-50A(1-1/4)	123.50 - 123.75	1.0000	1.0000
L7	7	LDF6-50A(1-1/4)	123.50 - 123.75	1.0000	1.0000
L7	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	123.50 - 123.75	1.0000	1.0000
L7	23	Safety Line 3/8	123.50 - 123.75	1.0000	1.0000
L7	38	4.5" x 1" Plate	123.50 - 123.75	1.0000	1.0000
L7	39	4.5" x 1" Plate	123.50 - 123.75	1.0000	1.0000
L7	40	4.5" x 1" Plate	123.50 - 123.75	1.0000	1.0000
L8	3	LDF6-50A(1-1/4)	118.50 - 123.50	1.0000	1.0000
L8	7	LDF6-50A(1-1/4)	118.50 - 123.50	1.0000	1.0000
L8	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	118.50 - 123.50	1.0000	1.0000
L8	23	Safety Line 3/8	118.50 - 123.50	1.0000	1.0000
L8	38	4.5" x 1" Plate	118.50 - 123.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L8	39	4.5" x 1" Plate	118.50 - 123.50	1.0000	1.0000
L8	40	4.5" x 1" Plate	118.50 - 123.50	1.0000	1.0000
L9	3	LDF6-50A(1-1/4)	113.50 - 118.50	1.0000	1.0000
L9	7	LDF6-50A(1-1/4)	113.50 - 118.50	1.0000	1.0000
L9	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	113.50 - 118.50	1.0000	1.0000
L9	23	Safety Line 3/8	113.50 - 118.50	1.0000	1.0000
L9	38	4.5" x 1" Plate	113.50 - 118.50	1.0000	1.0000
L9	39	4.5" x 1" Plate	113.50 - 118.50	1.0000	1.0000
L9	40	4.5" x 1" Plate	113.50 - 118.50	1.0000	1.0000
L9	51	CCI 6.5" x 3" Plate	113.50 - 117.00	1.0000	1.0000
L9	52	CCI 6.5" x 3" Plate	113.50 - 117.00	1.0000	1.0000
L9	53	CCI 6.5" x 3" Plate	113.50 - 117.00	1.0000	1.0000
L9	55	CCI 6.5" x 1.25" Plate	113.50 - 116.92	1.0000	1.0000
L9	56	CCI 6.5" x 1.25" Plate	113.50 - 116.92	1.0000	1.0000
L9	57	CCI 6.5" x 1.25" Plate	113.50 - 116.92	1.0000	1.0000
L10	3	LDF6-50A(1-1/4)	112.17 - 113.50	1.0000	1.0000
L10	7	LDF6-50A(1-1/4)	112.17 - 113.50	1.0000	1.0000
L10	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	112.17 - 113.50	1.0000	1.0000
L10	23	Safety Line 3/8	112.17 - 113.50	1.0000	1.0000
L10	38	4.5" x 1" Plate	112.17 - 113.50	1.0000	1.0000
L10	39	4.5" x 1" Plate	112.17 - 113.50	1.0000	1.0000
L10	40	4.5" x 1" Plate	112.17 - 113.50	1.0000	1.0000
L10	51	CCI 6.5" x 3" Plate	112.17 - 113.50	1.0000	1.0000
L10	52	CCI 6.5" x 3" Plate	112.17 - 113.50	1.0000	1.0000
L10	53	CCI 6.5" x 3" Plate	112.17 - 113.50	1.0000	1.0000
L10	55	CCI 6.5" x 1.25" Plate	112.17 - 113.50	1.0000	1.0000
L10	56	CCI 6.5" x 1.25" Plate	112.17 - 113.50	1.0000	1.0000
L10	57	CCI 6.5" x 1.25" Plate	112.17 - 113.50	1.0000	1.0000
L11	3	LDF6-50A(1-1/4)	111.92 - 112.17	1.0000	1.0000
L11	7	LDF6-50A(1-1/4)	111.92 - 112.17	1.0000	1.0000
L11	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	111.92 - 112.17	1.0000	1.0000
L11	23	Safety Line 3/8	111.92 - 112.17	1.0000	1.0000
L11	38	4.5" x 1" Plate	111.92 - 112.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L11	39	4.5" x 1" Plate	111.92 - 112.17	1.0000	1.0000
L11	40	4.5" x 1" Plate	111.92 - 112.17	1.0000	1.0000
L11	51	CCI 6.5" x 3" Plate	111.92 - 112.17	1.0000	1.0000
L11	52	CCI 6.5" x 3" Plate	111.92 - 112.17	1.0000	1.0000
L11	53	CCI 6.5" x 3" Plate	111.92 - 112.17	1.0000	1.0000
L11	55	CCI 6.5" x 1.25" Plate	111.92 - 112.17	1.0000	1.0000
L11	56	CCI 6.5" x 1.25" Plate	111.92 - 112.17	1.0000	1.0000
L11	57	CCI 6.5" x 1.25" Plate	111.92 - 112.17	1.0000	1.0000
L12	3	LDF6-50A(1-1/4)	110.17 - 111.92	1.0000	1.0000
L12	7	LDF6-50A(1-1/4)	110.17 - 111.92	1.0000	1.0000
L12	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	110.17 - 111.92	1.0000	1.0000
L12	23	Safety Line 3/8	110.17 - 111.92	1.0000	1.0000
L12	38	4.5" x 1" Plate	110.75 - 111.92	1.0000	1.0000
L12	39	4.5" x 1" Plate	110.75 - 111.92	1.0000	1.0000
L12	40	4.5" x 1" Plate	110.75 - 111.92	1.0000	1.0000
L12	51	CCI 6.5" x 3" Plate	110.50 - 111.92	1.0000	1.0000
L12	52	CCI 6.5" x 3" Plate	110.50 - 111.92	1.0000	1.0000
L12	53	CCI 6.5" x 3" Plate	110.50 - 111.92	1.0000	1.0000
L12	55	CCI 6.5" x 1.25" Plate	110.17 - 111.92	1.0000	1.0000
L12	56	CCI 6.5" x 1.25" Plate	110.17 - 111.92	1.0000	1.0000
L12	57	CCI 6.5" x 1.25" Plate	110.17 - 111.92	1.0000	1.0000
L13	3	LDF6-50A(1-1/4)	109.92 - 110.17	1.0000	1.0000
L13	7	LDF6-50A(1-1/4)	109.92 - 110.17	1.0000	1.0000
L13	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	109.92 - 110.17	1.0000	1.0000
L13	23	Safety Line 3/8	109.92 - 110.17	1.0000	1.0000
L13	34	6.5" x 1.25" Plate	109.92 - 110.00	1.0000	1.0000
L13	35	6.5" x 1.25" Plate	109.92 - 110.00	1.0000	1.0000
L13	36	6.5" x 1.25" Plate	109.92 - 110.00	1.0000	1.0000
L13	55	CCI 6.5" x 1.25" Plate	109.92 - 110.17	1.0000	1.0000
L13	56	CCI 6.5" x 1.25" Plate	109.92 - 110.17	1.0000	1.0000
L13	57	CCI 6.5" x 1.25" Plate	109.92 - 110.17	1.0000	1.0000
L14	3	LDF6-50A(1-1/4)	109.75 - 109.92	1.0000	1.0000
L14	7	LDF6-50A(1-1/4)	104.92 - 109.92	1.0000	1.0000
L14	14	MLE HYBRID	104.92 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		9POWER/18FIBER RL 2(1-5/8)	109.92		
L14	23	Safety Line 3/8	104.92 - 109.92	1.0000	1.0000
L14	34	6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L14	35	6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L14	36	6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L14	47	CCI 6.5" x 3" Plate	104.92 - 109.50	1.0000	1.0000
L14	48	CCI 6.5" x 3" Plate	104.92 - 109.50	1.0000	1.0000
L14	49	CCI 6.5" x 3" Plate	104.92 - 109.50	1.0000	1.0000
L14	55	CCI 6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L14	56	CCI 6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L14	57	CCI 6.5" x 1.25" Plate	104.92 - 109.92	1.0000	1.0000
L15	7	LDF6-50A(1-1/4)	99.92 - 104.92	1.0000	1.0000
L15	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	99.92 - 104.92	1.0000	1.0000
L15	23	Safety Line 3/8	99.92 - 104.92	1.0000	1.0000
L15	34	6.5" x 1.25" Plate	99.92 - 104.92	1.0000	1.0000
L15	35	6.5" x 1.25" Plate	99.92 - 104.92	1.0000	1.0000
L15	36	6.5" x 1.25" Plate	99.92 - 104.92	1.0000	1.0000
L15	47	CCI 6.5" x 3" Plate	103.00 - 104.92	1.0000	1.0000
L15	48	CCI 6.5" x 3" Plate	103.00 - 104.92	1.0000	1.0000
L15	49	CCI 6.5" x 3" Plate	103.00 - 104.92	1.0000	1.0000
L15	55	CCI 6.5" x 1.25" Plate	103.08 - 104.92	1.0000	1.0000
L15	56	CCI 6.5" x 1.25" Plate	103.08 - 104.92	1.0000	1.0000
L15	57	CCI 6.5" x 1.25" Plate	103.08 - 104.92	1.0000	1.0000
L16	7	LDF6-50A(1-1/4)	95.00 - 99.92	1.0000	1.0000
L16	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	95.00 - 99.92	1.0000	1.0000
L16	23	Safety Line 3/8	95.00 - 99.92	1.0000	1.0000
L16	26	PL4x1	95.00 - 96.75	1.0000	1.0000
L16	27	PL4x1	95.00 - 96.75	1.0000	1.0000
L16	34	6.5" x 1.25" Plate	95.00 - 99.92	1.0000	1.0000
L16	35	6.5" x 1.25" Plate	95.00 - 99.92	1.0000	1.0000
L16	36	6.5" x 1.25" Plate	95.00 - 99.92	1.0000	1.0000
L17	7	LDF6-50A(1-1/4)	94.75 - 95.00	1.0000	1.0000
L17	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	94.75 - 95.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L17	23	Safety Line 3/8	94.75 - 95.00	1.0000	1.0000
L17	26	PL4x1	94.75 - 95.00	1.0000	1.0000
L17	27	PL4x1	94.75 - 95.00	1.0000	1.0000
L17	34	6.5" x 1.25" Plate	94.75 - 95.00	1.0000	1.0000
L17	35	6.5" x 1.25" Plate	94.75 - 95.00	1.0000	1.0000
L17	36	6.5" x 1.25" Plate	94.75 - 95.00	1.0000	1.0000
L18	7	LDF6-50A(1-1/4)	89.75 - 94.75	1.0000	1.0000
L18	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	89.75 - 94.75	1.0000	1.0000
L18	23	Safety Line 3/8	89.75 - 94.75	1.0000	1.0000
L18	26	PL4x1	89.75 - 94.75	1.0000	1.0000
L18	27	PL4x1	89.75 - 94.75	1.0000	1.0000
L18	34	6.5" x 1.25" Plate	89.75 - 94.75	1.0000	1.0000
L18	35	6.5" x 1.25" Plate	89.75 - 94.75	1.0000	1.0000
L18	36	6.5" x 1.25" Plate	89.75 - 94.75	1.0000	1.0000
L19	7	LDF6-50A(1-1/4)	85.50 - 89.75	1.0000	1.0000
L19	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	85.50 - 89.75	1.0000	1.0000
L19	23	Safety Line 3/8	85.50 - 89.75	1.0000	1.0000
L19	26	PL4x1	85.50 - 89.75	1.0000	1.0000
L19	27	PL4x1	85.50 - 89.75	1.0000	1.0000
L19	34	6.5" x 1.25" Plate	85.50 - 89.75	1.0000	1.0000
L19	35	6.5" x 1.25" Plate	85.50 - 89.75	1.0000	1.0000
L19	36	6.5" x 1.25" Plate	85.50 - 89.75	1.0000	1.0000
L19	59	CCI 4.5" x 1" Plate	85.50 - 87.00	1.0000	1.0000
L19	61	CCI 4.5" x 1" Plate	85.50 - 87.00	1.0000	1.0000
L20	7	LDF6-50A(1-1/4)	85.25 - 85.50	1.0000	1.0000
L20	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	85.25 - 85.50	1.0000	1.0000
L20	23	Safety Line 3/8	85.25 - 85.50	1.0000	1.0000
L20	26	PL4x1	85.25 - 85.50	1.0000	1.0000
L20	27	PL4x1	85.25 - 85.50	1.0000	1.0000
L20	34	6.5" x 1.25" Plate	85.25 - 85.50	1.0000	1.0000
L20	35	6.5" x 1.25" Plate	85.25 - 85.50	1.0000	1.0000
L20	36	6.5" x 1.25" Plate	85.25 - 85.50	1.0000	1.0000
L20	59	CCI 4.5" x 1" Plate	85.25 - 85.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L20	61	CCI 4.5" x 1" Plate	85.25 - 85.50	1.0000	1.0000
L21	7	LDF6-50A(1-1/4)	85.00 - 85.25	1.0000	1.0000
L21	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	85.00 - 85.25	1.0000	1.0000
L21	23	Safety Line 3/8	85.00 - 85.25	1.0000	1.0000
L21	26	PL4x1	85.00 - 85.25	1.0000	1.0000
L21	27	PL4x1	85.00 - 85.25	1.0000	1.0000
L21	34	6.5" x 1.25" Plate	85.00 - 85.25	1.0000	1.0000
L21	35	6.5" x 1.25" Plate	85.00 - 85.25	1.0000	1.0000
L21	36	6.5" x 1.25" Plate	85.00 - 85.25	1.0000	1.0000
L21	59	CCI 4.5" x 1" Plate	85.00 - 85.25	1.0000	1.0000
L21	61	CCI 4.5" x 1" Plate	85.00 - 85.25	1.0000	1.0000
L22	7	LDF6-50A(1-1/4)	84.75 - 85.00	1.0000	1.0000
L22	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	84.75 - 85.00	1.0000	1.0000
L22	23	Safety Line 3/8	84.75 - 85.00	1.0000	1.0000
L22	26	PL4x1	84.75 - 85.00	1.0000	1.0000
L22	27	PL4x1	84.75 - 85.00	1.0000	1.0000
L22	30	6" x 1" Plate	84.75 - 85.00	1.0000	1.0000
L22	31	6" x 1" Plate	84.75 - 85.00	1.0000	1.0000
L22	32	6" x 1" Plate	84.75 - 85.00	1.0000	1.0000
L22	36	6.5" x 1.25" Plate	84.75 - 85.00	1.0000	1.0000
L22	59	CCI 4.5" x 1" Plate	84.75 - 85.00	1.0000	1.0000
L22	61	CCI 4.5" x 1" Plate	84.75 - 85.00	1.0000	1.0000
L23	7	LDF6-50A(1-1/4)	83.00 - 84.75	1.0000	1.0000
L23	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	83.00 - 84.75	1.0000	1.0000
L23	23	Safety Line 3/8	83.00 - 84.75	1.0000	1.0000
L23	26	PL4x1	83.00 - 84.75	1.0000	1.0000
L23	27	PL4x1	83.00 - 84.75	1.0000	1.0000
L23	30	6" x 1" Plate	83.00 - 84.75	1.0000	1.0000
L23	31	6" x 1" Plate	83.00 - 84.75	1.0000	1.0000
L23	32	6" x 1" Plate	83.00 - 84.75	1.0000	1.0000
L23	36	6.5" x 1.25" Plate	83.00 - 84.75	1.0000	1.0000
L23	59	CCI 4.5" x 1" Plate	83.00 - 84.75	1.0000	1.0000
L23	61	CCI 4.5" x 1" Plate	83.00 - 84.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	7	LDF6-50A(1-1/4)	82.65 - 83.00	1.0000	1.0000
L24	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	82.65 - 83.00	1.0000	1.0000
L24	23	Safety Line 3/8	82.65 - 83.00	1.0000	1.0000
L24	26	PL4x1	82.65 - 83.00	1.0000	1.0000
L24	27	PL4x1	82.65 - 83.00	1.0000	1.0000
L24	30	6" x 1" Plate	82.65 - 83.00	1.0000	1.0000
L24	31	6" x 1" Plate	82.65 - 83.00	1.0000	1.0000
L24	32	6" x 1" Plate	82.65 - 83.00	1.0000	1.0000
L24	36	6.5" x 1.25" Plate	82.65 - 83.00	1.0000	1.0000
L24	59	CCI 4.5" x 1" Plate	82.65 - 83.00	1.0000	1.0000
L24	61	CCI 4.5" x 1" Plate	82.65 - 83.00	1.0000	1.0000
L25	7	LDF6-50A(1-1/4)	82.42 - 82.65	1.0000	1.0000
L25	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	82.42 - 82.65	1.0000	1.0000
L25	23	Safety Line 3/8	82.42 - 82.65	1.0000	1.0000
L25	26	PL4x1	82.42 - 82.65	1.0000	1.0000
L25	27	PL4x1	82.42 - 82.65	1.0000	1.0000
L25	30	6" x 1" Plate	82.42 - 82.65	1.0000	1.0000
L25	31	6" x 1" Plate	82.42 - 82.65	1.0000	1.0000
L25	32	6" x 1" Plate	82.42 - 82.65	1.0000	1.0000
L25	36	6.5" x 1.25" Plate	82.42 - 82.65	1.0000	1.0000
L25	59	CCI 4.5" x 1" Plate	82.42 - 82.65	1.0000	1.0000
L25	61	CCI 4.5" x 1" Plate	82.42 - 82.65	1.0000	1.0000
L26	7	LDF6-50A(1-1/4)	77.42 - 82.42	1.0000	1.0000
L26	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	77.42 - 82.42	1.0000	1.0000
L26	23	Safety Line 3/8	77.42 - 82.42	1.0000	1.0000
L26	26	PL4x1	77.42 - 82.42	1.0000	1.0000
L26	27	PL4x1	77.42 - 82.42	1.0000	1.0000
L26	30	6" x 1" Plate	77.42 - 82.42	1.0000	1.0000
L26	31	6" x 1" Plate	77.42 - 82.42	1.0000	1.0000
L26	32	6" x 1" Plate	77.42 - 82.42	1.0000	1.0000
L26	36	6.5" x 1.25" Plate	80.00 - 82.42	1.0000	1.0000
L26	59	CCI 4.5" x 1" Plate	77.42 - 82.42	1.0000	1.0000
L26	61	CCI 4.5" x 1" Plate	77.42 - 82.42	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L27	7	LDF6-50A(1-1/4)	70.17 - 77.42	1.0000	1.0000
L27	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	70.17 - 77.42	1.0000	1.0000
L27	19	LDF4-50A(1/2)	70.17 - 71.00	1.0000	1.0000
L27	23	Safety Line 3/8	70.17 - 77.42	1.0000	1.0000
L27	26	PL4x1	71.75 - 77.42	1.0000	1.0000
L27	27	PL4x1	71.75 - 77.42	1.0000	1.0000
L27	30	6" x 1" Plate	70.17 - 77.42	1.0000	1.0000
L27	31	6" x 1" Plate	70.17 - 77.42	1.0000	1.0000
L27	32	6" x 1" Plate	70.17 - 77.42	1.0000	1.0000
L27	59	CCI 4.5" x 1" Plate	70.17 - 77.42	1.0000	1.0000
L27	61	CCI 4.5" x 1" Plate	70.17 - 77.42	1.0000	1.0000
L28	7	LDF6-50A(1-1/4)	69.17 - 70.17	1.0000	1.0000
L28	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	69.17 - 70.17	1.0000	1.0000
L28	19	LDF4-50A(1/2)	69.17 - 70.17	1.0000	1.0000
L28	23	Safety Line 3/8	69.17 - 70.17	1.0000	1.0000
L28	30	6" x 1" Plate	69.17 - 70.17	1.0000	1.0000
L28	31	6" x 1" Plate	69.17 - 70.17	1.0000	1.0000
L28	32	6" x 1" Plate	69.17 - 70.17	1.0000	1.0000
L28	59	CCI 4.5" x 1" Plate	69.17 - 70.17	1.0000	1.0000
L28	61	CCI 4.5" x 1" Plate	69.17 - 70.17	1.0000	1.0000
L29	7	LDF6-50A(1-1/4)	64.17 - 69.17	1.0000	1.0000
L29	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	64.17 - 69.17	1.0000	1.0000
L29	19	LDF4-50A(1/2)	64.17 - 69.17	1.0000	1.0000
L29	23	Safety Line 3/8	64.17 - 69.17	1.0000	1.0000
L29	30	6" x 1" Plate	64.17 - 69.17	1.0000	1.0000
L29	31	6" x 1" Plate	64.17 - 69.17	1.0000	1.0000
L29	32	6" x 1" Plate	64.17 - 69.17	1.0000	1.0000
L29	59	CCI 4.5" x 1" Plate	64.17 - 69.17	1.0000	1.0000
L29	61	CCI 4.5" x 1" Plate	64.17 - 69.17	1.0000	1.0000
L30	7	LDF6-50A(1-1/4)	59.17 - 64.17	1.0000	1.0000
L30	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	59.17 - 64.17	1.0000	1.0000
L30	19	LDF4-50A(1/2)	59.17 - 64.17	1.0000	1.0000
L30	23	Safety Line 3/8	59.17 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	30	6" x 1" Plate	64.17 59.17 - 64.17	1.0000	1.0000
L30	31	6" x 1" Plate	59.17 - 64.17	1.0000	1.0000
L30	32	6" x 1" Plate	59.17 - 64.17	1.0000	1.0000
L30	59	CCI 4.5" x 1" Plate	59.17 - 64.17	1.0000	1.0000
L30	61	CCI 4.5" x 1" Plate	59.17 - 64.17	1.0000	1.0000
L31	7	LDF6-50A(1-1/4)	54.17 - 59.17	1.0000	1.0000
L31	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	54.17 - 59.17	1.0000	1.0000
L31	19	LDF4-50A(1/2)	54.17 - 59.17	1.0000	1.0000
L31	23	Safety Line 3/8	54.17 - 59.17	1.0000	1.0000
L31	30	6" x 1" Plate	54.17 - 59.17	1.0000	1.0000
L31	31	6" x 1" Plate	54.17 - 59.17	1.0000	1.0000
L31	32	6" x 1" Plate	54.17 - 59.17	1.0000	1.0000
L31	59	CCI 4.5" x 1" Plate	54.17 - 59.17	1.0000	1.0000
L31	61	CCI 4.5" x 1" Plate	54.17 - 59.17	1.0000	1.0000
L32	7	LDF6-50A(1-1/4)	49.17 - 54.17	1.0000	1.0000
L32	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	49.17 - 54.17	1.0000	1.0000
L32	19	LDF4-50A(1/2)	49.17 - 54.17	1.0000	1.0000
L32	23	Safety Line 3/8	49.17 - 54.17	1.0000	1.0000
L32	30	6" x 1" Plate	50.00 - 54.17	1.0000	1.0000
L32	31	6" x 1" Plate	50.00 - 54.17	1.0000	1.0000
L32	32	6" x 1" Plate	50.00 - 54.17	1.0000	1.0000
L32	43	CCI 6.5" x 1.25" Plate	49.17 - 49.92	1.0000	1.0000
L32	44	CCI 6.5" x 1.25" Plate	49.17 - 49.92	1.0000	1.0000
L32	45	CCI 6.5" x 1.25" Plate	49.17 - 49.92	1.0000	1.0000
L32	59	CCI 4.5" x 1" Plate	49.17 - 54.17	1.0000	1.0000
L32	61	CCI 4.5" x 1" Plate	49.17 - 54.17	1.0000	1.0000
L33	7	LDF6-50A(1-1/4)	47.17 - 49.17	1.0000	1.0000
L33	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	47.17 - 49.17	1.0000	1.0000
L33	19	LDF4-50A(1/2)	47.17 - 49.17	1.0000	1.0000
L33	23	Safety Line 3/8	47.17 - 49.17	1.0000	1.0000
L33	43	CCI 6.5" x 1.25" Plate	47.17 - 49.17	1.0000	1.0000
L33	44	CCI 6.5" x 1.25" Plate	47.17 - 49.17	1.0000	1.0000
L33	45	CCI 6.5" x 1.25" Plate	47.17 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			49.17		
L33	59	CCI 4.5" x 1" Plate	47.17 - 49.17	1.0000	1.0000
L33	61	CCI 4.5" x 1" Plate	47.17 - 49.17	1.0000	1.0000
L34	7	LDF6-50A(1-1/4)	46.92 - 47.17	1.0000	1.0000
L34	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	46.92 - 47.17	1.0000	1.0000
L34	19	LDF4-50A(1/2)	46.92 - 47.17	1.0000	1.0000
L34	23	Safety Line 3/8	46.92 - 47.17	1.0000	1.0000
L34	43	CCI 6.5" x 1.25" Plate	46.92 - 47.17	1.0000	1.0000
L34	44	CCI 6.5" x 1.25" Plate	46.92 - 47.17	1.0000	1.0000
L34	45	CCI 6.5" x 1.25" Plate	46.92 - 47.17	1.0000	1.0000
L34	59	CCI 4.5" x 1" Plate	46.92 - 47.17	1.0000	1.0000
L34	61	CCI 4.5" x 1" Plate	46.92 - 47.17	1.0000	1.0000
L35	7	LDF6-50A(1-1/4)	43.42 - 46.92	1.0000	1.0000
L35	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	43.42 - 46.92	1.0000	1.0000
L35	19	LDF4-50A(1/2)	43.42 - 46.92	1.0000	1.0000
L35	23	Safety Line 3/8	43.42 - 46.92	1.0000	1.0000
L35	43	CCI 6.5" x 1.25" Plate	43.42 - 46.92	1.0000	1.0000
L35	44	CCI 6.5" x 1.25" Plate	43.42 - 46.92	1.0000	1.0000
L35	45	CCI 6.5" x 1.25" Plate	43.42 - 46.92	1.0000	1.0000
L35	59	CCI 4.5" x 1" Plate	43.42 - 46.92	1.0000	1.0000
L35	61	CCI 4.5" x 1" Plate	43.42 - 46.92	1.0000	1.0000
L36	7	LDF6-50A(1-1/4)	43.17 - 43.42	1.0000	1.0000
L36	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	43.17 - 43.42	1.0000	1.0000
L36	19	LDF4-50A(1/2)	43.17 - 43.42	1.0000	1.0000
L36	23	Safety Line 3/8	43.17 - 43.42	1.0000	1.0000
L36	43	CCI 6.5" x 1.25" Plate	43.17 - 43.42	1.0000	1.0000
L36	44	CCI 6.5" x 1.25" Plate	43.17 - 43.42	1.0000	1.0000
L36	45	CCI 6.5" x 1.25" Plate	43.17 - 43.42	1.0000	1.0000
L36	59	CCI 4.5" x 1" Plate	43.17 - 43.42	1.0000	1.0000
L36	61	CCI 4.5" x 1" Plate	43.17 - 43.42	1.0000	1.0000
L37	7	LDF6-50A(1-1/4)	38.17 - 43.17	1.0000	1.0000
L37	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	38.17 - 43.17	1.0000	1.0000
L37	19	LDF4-50A(1/2)	38.17 - 43.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L37	23	Safety Line 3/8	38.17 - 43.17	1.0000	1.0000
L37	43	CCI 6.5" x 1.25" Plate	38.17 - 43.17	1.0000	1.0000
L37	44	CCI 6.5" x 1.25" Plate	38.17 - 43.17	1.0000	1.0000
L37	45	CCI 6.5" x 1.25" Plate	38.17 - 43.17	1.0000	1.0000
L37	59	CCI 4.5" x 1" Plate	41.92 - 43.17	1.0000	1.0000
L37	61	CCI 4.5" x 1" Plate	41.92 - 43.17	1.0000	1.0000
L38	7	LDF6-50A(1-1/4)	31.54 - 38.17	1.0000	1.0000
L38	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	31.54 - 38.17	1.0000	1.0000
L38	19	LDF4-50A(1/2)	31.54 - 38.17	1.0000	1.0000
L38	23	Safety Line 3/8	31.54 - 38.17	1.0000	1.0000
L38	43	CCI 6.5" x 1.25" Plate	31.54 - 38.17	1.0000	1.0000
L38	44	CCI 6.5" x 1.25" Plate	31.54 - 38.17	1.0000	1.0000
L38	45	CCI 6.5" x 1.25" Plate	31.54 - 38.17	1.0000	1.0000
L39	7	LDF6-50A(1-1/4)	30.54 - 31.54	1.0000	1.0000
L39	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	30.54 - 31.54	1.0000	1.0000
L39	19	LDF4-50A(1/2)	30.54 - 31.54	1.0000	1.0000
L39	23	Safety Line 3/8	30.54 - 31.54	1.0000	1.0000
L39	43	CCI 6.5" x 1.25" Plate	30.54 - 31.54	1.0000	1.0000
L39	44	CCI 6.5" x 1.25" Plate	30.54 - 31.54	1.0000	1.0000
L39	45	CCI 6.5" x 1.25" Plate	30.54 - 31.54	1.0000	1.0000
L40	7	LDF6-50A(1-1/4)	25.54 - 30.54	1.0000	1.0000
L40	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	25.54 - 30.54	1.0000	1.0000
L40	19	LDF4-50A(1/2)	25.54 - 30.54	1.0000	1.0000
L40	23	Safety Line 3/8	25.54 - 30.54	1.0000	1.0000
L40	43	CCI 6.5" x 1.25" Plate	29.92 - 30.54	1.0000	1.0000
L40	44	CCI 6.5" x 1.25" Plate	29.92 - 30.54	1.0000	1.0000
L40	45	CCI 6.5" x 1.25" Plate	29.92 - 30.54	1.0000	1.0000
L41	7	LDF6-50A(1-1/4)	20.54 - 25.54	1.0000	1.0000
L41	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	20.54 - 25.54	1.0000	1.0000
L41	19	LDF4-50A(1/2)	22.00 - 25.54	1.0000	1.0000
L41	20	LDF4-50A(1/2)	20.54 - 22.00	1.0000	1.0000
L41	23	Safety Line 3/8	20.54 - 25.54	1.0000	1.0000
L42	7	LDF6-50A(1-1/4)	15.54 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			20.54		
L42	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	15.54 - 20.54	1.0000	1.0000
L42	20	LDF4-50A(1/2)	15.54 - 20.54	1.0000	1.0000
L42	23	Safety Line 3/8	15.54 - 20.54	1.0000	1.0000
L43	7	LDF6-50A(1-1/4)	10.54 - 15.54	1.0000	1.0000
L43	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	10.54 - 15.54	1.0000	1.0000
L43	20	LDF4-50A(1/2)	10.54 - 15.54	1.0000	1.0000
L43	23	Safety Line 3/8	10.54 - 15.54	1.0000	1.0000
L44	7	LDF6-50A(1-1/4)	5.54 - 10.54	1.0000	1.0000
L44	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	5.54 - 10.54	1.0000	1.0000
L44	20	LDF4-50A(1/2)	5.54 - 10.54	1.0000	1.0000
L44	23	Safety Line 3/8	5.54 - 10.54	1.0000	1.0000
L45	7	LDF6-50A(1-1/4)	0.54 - 5.54	1.0000	1.0000
L45	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	0.54 - 5.54	1.0000	1.0000
L45	20	LDF4-50A(1/2)	0.54 - 5.54	1.0000	1.0000
L45	23	Safety Line 3/8	0.54 - 5.54	1.0000	1.0000
L46	7	LDF6-50A(1-1/4)	0.00 - 0.54	1.0000	1.0000
L46	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	0.00 - 0.54	1.0000	1.0000
L46	20	LDF4-50A(1/2)	0.00 - 0.54	1.0000	1.0000
L46	23	Safety Line 3/8	0.00 - 0.54	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L5	38	4.5" x 1" Plate	125.17 - 125.75	Auto	0.0000
L5	39	4.5" x 1" Plate	125.17 - 125.75	Auto	0.0000
L5	40	4.5" x 1" Plate	125.17 - 125.75	Auto	0.0000
L6	38	4.5" x 1" Plate	123.75 - 125.17	Auto	0.0000
L6	39	4.5" x 1" Plate	123.75 - 125.17	Auto	0.0000
L6	40	4.5" x 1" Plate	123.75 - 125.17	Auto	0.0000
L7	38	4.5" x 1" Plate	123.50 - 123.75	Auto	0.1337
L7	39	4.5" x 1" Plate	123.50 - 123.75	Auto	0.1337
L7	40	4.5" x 1" Plate	123.50 - 123.75	Auto	0.1337
L8	38	4.5" x 1" Plate	118.50 -	Auto	0.1019

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L8	39	4.5" x 1" Plate	123.50 - 118.50	Auto	0.1019
L8	40	4.5" x 1" Plate	123.50 - 118.50	Auto	0.1019
L9	38	4.5" x 1" Plate	123.50 - 113.50	Auto	0.0480
L9	39	4.5" x 1" Plate	118.50 - 113.50	Auto	0.0480
L9	40	4.5" x 1" Plate	118.50 - 113.50	Auto	0.0480
L9	51	CCI 6.5" x 3" Plate	118.50 - 113.50	Auto	0.3361
L9	52	CCI 6.5" x 3" Plate	117.00 - 113.50	Auto	0.3361
L9	53	CCI 6.5" x 3" Plate	117.00 - 113.50	Auto	0.3361
L9	55	CCI 6.5" x 1.25" Plate	117.00 - 113.50	Auto	0.3358
L9	56	CCI 6.5" x 1.25" Plate	116.92 - 113.50	Auto	0.3358
L9	57	CCI 6.5" x 1.25" Plate	116.92 - 113.50	Auto	0.3358
L10	38	4.5" x 1" Plate	116.92 - 112.17	Auto	0.0186
L10	39	4.5" x 1" Plate	113.50 - 112.17	Auto	0.0186
L10	40	4.5" x 1" Plate	113.50 - 112.17	Auto	0.0186
L10	51	CCI 6.5" x 3" Plate	113.50 - 112.17	Auto	0.3206
L10	52	CCI 6.5" x 3" Plate	113.50 - 112.17	Auto	0.3206
L10	53	CCI 6.5" x 3" Plate	113.50 - 112.17	Auto	0.3206
L10	55	CCI 6.5" x 1.25" Plate	113.50 - 112.17	Auto	0.3206
L10	56	CCI 6.5" x 1.25" Plate	113.50 - 112.17	Auto	0.3206
L10	57	CCI 6.5" x 1.25" Plate	113.50 - 112.17	Auto	0.3206
L11	38	4.5" x 1" Plate	113.50 - 111.92	Auto	0.1378
L11	39	4.5" x 1" Plate	112.17 - 111.92	Auto	0.1378
L11	40	4.5" x 1" Plate	112.17 - 111.92	Auto	0.1378
L11	51	CCI 6.5" x 3" Plate	112.17 - 111.92	Auto	0.4031
L11	52	CCI 6.5" x 3" Plate	112.17 - 111.92	Auto	0.4031
L11	53	CCI 6.5" x 3" Plate	112.17 - 111.92	Auto	0.4031
L11	55	CCI 6.5" x 1.25" Plate	112.17 - 111.92	Auto	0.4031
L11	56	CCI 6.5" x 1.25" Plate	112.17 - 111.92	Auto	0.4031
L11	57	CCI 6.5" x 1.25" Plate	112.17 - 111.92	Auto	0.4031
L12	38	4.5" x 1" Plate	111.92 - 110.75	Auto	0.1312
L12	39	4.5" x 1" Plate	111.92 - 110.75	Auto	0.1312
L12	40	4.5" x 1" Plate	111.92 - 110.75	Auto	0.1312
L12	51	CCI 6.5" x 3" Plate	111.92 - 110.50	Auto	0.3977
L12	52	CCI 6.5" x 3" Plate	111.92 - 110.50	Auto	0.3977

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L12	53	CCI 6.5" x 3" Plate	111.92 - 110.50	Auto	0.3977
L12	55	CCI 6.5" x 1.25" Plate	111.92 - 110.17	Auto	0.3966
L12	56	CCI 6.5" x 1.25" Plate	111.92 - 110.17	Auto	0.3966
L12	57	CCI 6.5" x 1.25" Plate	111.92 - 110.17	Auto	0.3966
L13	34	6.5" x 1.25" Plate	111.92 - 109.92	Auto	0.3586
L13	35	6.5" x 1.25" Plate	110.00 - 109.92	Auto	0.3586
L13	36	6.5" x 1.25" Plate	110.00 - 109.92	Auto	0.3586
L13	55	CCI 6.5" x 1.25" Plate	110.00 - 109.92	Auto	0.3592
L13	56	CCI 6.5" x 1.25" Plate	110.17 - 109.92	Auto	0.3592
L13	57	CCI 6.5" x 1.25" Plate	110.17 - 109.92	Auto	0.3592
L14	34	6.5" x 1.25" Plate	110.17 - 104.92	Auto	0.3303
L14	35	6.5" x 1.25" Plate	109.92 - 104.92	Auto	0.3303
L14	36	6.5" x 1.25" Plate	109.92 - 104.92	Auto	0.3303
L14	47	CCI 6.5" x 3" Plate	109.92 - 104.92	Auto	0.3288
L14	48	CCI 6.5" x 3" Plate	109.50 - 104.92	Auto	0.3288
L14	49	CCI 6.5" x 3" Plate	109.50 - 104.92	Auto	0.3288
L14	55	CCI 6.5" x 1.25" Plate	109.50 - 104.92	Auto	0.3303
L14	56	CCI 6.5" x 1.25" Plate	109.92 - 104.92	Auto	0.3303
L14	57	CCI 6.5" x 1.25" Plate	109.92 - 104.92	Auto	0.3303
L15	34	6.5" x 1.25" Plate	109.92 - 104.92	Auto	0.2898
L15	35	6.5" x 1.25" Plate	104.92 - 99.92	Auto	0.2898
L15	36	6.5" x 1.25" Plate	104.92 - 99.92	Auto	0.2898
L15	47	CCI 6.5" x 3" Plate	104.92 - 103.00	Auto	0.3007
L15	48	CCI 6.5" x 3" Plate	104.92 - 103.00	Auto	0.3007
L15	49	CCI 6.5" x 3" Plate	104.92 - 103.00	Auto	0.3007
L15	55	CCI 6.5" x 1.25" Plate	104.92 - 103.08	Auto	0.3010
L15	56	CCI 6.5" x 1.25" Plate	104.92 - 103.08	Auto	0.3010
L15	57	CCI 6.5" x 1.25" Plate	104.92 - 103.08	Auto	0.3010
L16	26	PL4x1	104.92 - 95.00	Auto	0.0000
L16	27	PL4x1	96.75 - 95.00	Auto	0.0000
L16	34	6.5" x 1.25" Plate	96.75 - 95.00	Auto	0.2495
L16	35	6.5" x 1.25" Plate	99.92 - 95.00	Auto	0.2495
L16	36	6.5" x 1.25" Plate	99.92 - 95.00	Auto	0.2495
L17	26	PL4x1	99.92 - 94.75	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L17	27	PL4x1	95.00 94.75 - 95.00	Auto	0.0000
L17	34	6.5" x 1.25" Plate	94.75 - 95.00	Auto	0.2827
L17	35	6.5" x 1.25" Plate	94.75 - 95.00	Auto	0.2827
L17	36	6.5" x 1.25" Plate	94.75 - 95.00	Auto	0.2827
L18	26	PL4x1	89.75 - 94.75	Auto	0.0000
L18	27	PL4x1	89.75 - 94.75	Auto	0.0000
L18	34	6.5" x 1.25" Plate	89.75 - 94.75	Auto	0.2590
L18	35	6.5" x 1.25" Plate	89.75 - 94.75	Auto	0.2590
L18	36	6.5" x 1.25" Plate	89.75 - 94.75	Auto	0.2590
L19	26	PL4x1	85.50 - 89.75	Auto	0.0000
L19	27	PL4x1	85.50 - 89.75	Auto	0.0000
L19	34	6.5" x 1.25" Plate	85.50 - 89.75	Auto	0.2211
L19	35	6.5" x 1.25" Plate	85.50 - 89.75	Auto	0.2211
L19	36	6.5" x 1.25" Plate	85.50 - 89.75	Auto	0.2211
L19	59	CCI 4.5" x 1" Plate	85.50 - 87.00	Auto	0.0000
L19	61	CCI 4.5" x 1" Plate	85.50 - 87.00	Auto	0.0000
L20	26	PL4x1	85.25 - 85.50	Auto	0.0000
L20	27	PL4x1	85.25 - 85.50	Auto	0.0000
L20	34	6.5" x 1.25" Plate	85.25 - 85.50	Auto	0.2825
L20	35	6.5" x 1.25" Plate	85.25 - 85.50	Auto	0.2825
L20	36	6.5" x 1.25" Plate	85.25 - 85.50	Auto	0.2825
L20	59	CCI 4.5" x 1" Plate	85.25 - 85.50	Auto	0.0000
L20	61	CCI 4.5" x 1" Plate	85.25 - 85.50	Auto	0.0000
L21	26	PL4x1	85.00 - 85.25	Auto	0.0000
L21	27	PL4x1	85.00 - 85.25	Auto	0.0000
L21	34	6.5" x 1.25" Plate	85.00 - 85.25	Auto	0.2807
L21	35	6.5" x 1.25" Plate	85.00 - 85.25	Auto	0.2807
L21	36	6.5" x 1.25" Plate	85.00 - 85.25	Auto	0.2807
L21	59	CCI 4.5" x 1" Plate	85.00 - 85.25	Auto	0.0000
L21	61	CCI 4.5" x 1" Plate	85.00 - 85.25	Auto	0.0000
L22	26	PL4x1	84.75 - 85.00	Auto	0.0000
L22	27	PL4x1	84.75 - 85.00	Auto	0.0000
L22	30	6" x 1" Plate	84.75 - 85.00	Auto	0.2077
L22	31	6" x 1" Plate	84.75 -	Auto	0.2077

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L22	32	6" x 1" Plate	84.75 - 85.00	Auto	0.2077
L22	36	6.5" x 1.25" Plate	84.75 - 85.00	Auto	0.2686
L22	59	CCI 4.5" x 1" Plate	84.75 - 85.00	Auto	0.0000
L22	61	CCI 4.5" x 1" Plate	84.75 - 85.00	Auto	0.0000
L23	26	PL4x1	83.00 - 84.75	Auto	0.0000
L23	27	PL4x1	83.00 - 84.75	Auto	0.0000
L23	30	6" x 1" Plate	83.00 - 84.75	Auto	0.2000
L23	31	6" x 1" Plate	83.00 - 84.75	Auto	0.2000
L23	32	6" x 1" Plate	83.00 - 84.75	Auto	0.2000
L23	36	6.5" x 1.25" Plate	83.00 - 84.75	Auto	0.2615
L23	59	CCI 4.5" x 1" Plate	83.00 - 84.75	Auto	0.0000
L23	61	CCI 4.5" x 1" Plate	83.00 - 84.75	Auto	0.0000
L24	26	PL4x1	82.65 - 83.00	Auto	0.0000
L24	27	PL4x1	82.65 - 83.00	Auto	0.0000
L24	30	6" x 1" Plate	82.65 - 83.00	Auto	0.1361
L24	31	6" x 1" Plate	82.65 - 83.00	Auto	0.1361
L24	32	6" x 1" Plate	82.65 - 83.00	Auto	0.1361
L24	36	6.5" x 1.25" Plate	82.65 - 83.00	Auto	0.2026
L24	59	CCI 4.5" x 1" Plate	82.65 - 83.00	Auto	0.0000
L24	61	CCI 4.5" x 1" Plate	82.65 - 83.00	Auto	0.0000
L25	26	PL4x1	82.42 - 82.65	Auto	0.0000
L25	27	PL4x1	82.42 - 82.65	Auto	0.0000
L25	30	6" x 1" Plate	82.42 - 82.65	Auto	0.1339
L25	31	6" x 1" Plate	82.42 - 82.65	Auto	0.1339
L25	32	6" x 1" Plate	82.42 - 82.65	Auto	0.1339
L25	36	6.5" x 1.25" Plate	82.42 - 82.65	Auto	0.2005
L25	59	CCI 4.5" x 1" Plate	82.42 - 82.65	Auto	0.0000
L25	61	CCI 4.5" x 1" Plate	82.42 - 82.65	Auto	0.0000
L26	26	PL4x1	77.42 - 82.42	Auto	0.0000
L26	27	PL4x1	77.42 - 82.42	Auto	0.0000
L26	30	6" x 1" Plate	77.42 - 82.42	Auto	0.1026
L26	31	6" x 1" Plate	77.42 - 82.42	Auto	0.1026
L26	32	6" x 1" Plate	77.42 - 82.42	Auto	0.1026
L26	36	6.5" x 1.25" Plate	80.00 -	Auto	0.1808

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L26	59	CCI 4.5" x 1" Plate	82.42 77.42 -	Auto	0.0000
L26	61	CCI 4.5" x 1" Plate	82.42 77.42 -	Auto	0.0000
L27	26	PL4x1	82.42 71.75 -	Auto	0.0000
L27	27	PL4x1	77.42 71.75 -	Auto	0.0000
L27	30	6" x 1" Plate	77.42 70.17 -	Auto	0.0556
L27	31	6" x 1" Plate	77.42 70.17 -	Auto	0.0556
L27	32	6" x 1" Plate	77.42 70.17 -	Auto	0.0556
L27	59	CCI 4.5" x 1" Plate	77.42 70.17 -	Auto	0.0000
L27	61	CCI 4.5" x 1" Plate	77.42 70.17 -	Auto	0.0000
L28	30	6" x 1" Plate	77.42 69.17 -	Auto	0.0729
L28	31	6" x 1" Plate	70.17 69.17 -	Auto	0.0729
L28	32	6" x 1" Plate	70.17 69.17 -	Auto	0.0729
L28	59	CCI 4.5" x 1" Plate	70.17 69.17 -	Auto	0.0000
L28	61	CCI 4.5" x 1" Plate	70.17 69.17 -	Auto	0.0000
L29	30	6" x 1" Plate	70.17 64.17 -	Auto	0.0475
L29	31	6" x 1" Plate	69.17 64.17 -	Auto	0.0475
L29	32	6" x 1" Plate	69.17 64.17 -	Auto	0.0475
L29	59	CCI 4.5" x 1" Plate	69.17 64.17 -	Auto	0.0000
L29	61	CCI 4.5" x 1" Plate	69.17 64.17 -	Auto	0.0000
L30	30	6" x 1" Plate	69.17 59.17 -	Auto	0.0199
L30	31	6" x 1" Plate	64.17 59.17 -	Auto	0.0199
L30	32	6" x 1" Plate	64.17 59.17 -	Auto	0.0199
L30	59	CCI 4.5" x 1" Plate	64.17 59.17 -	Auto	0.0000
L30	61	CCI 4.5" x 1" Plate	64.17 59.17 -	Auto	0.0000
L31	30	6" x 1" Plate	64.17 54.17 -	Auto	0.0000
L31	31	6" x 1" Plate	59.17 54.17 -	Auto	0.0000
L31	32	6" x 1" Plate	59.17 54.17 -	Auto	0.0000
L31	59	CCI 4.5" x 1" Plate	59.17 54.17 -	Auto	0.0000
L31	61	CCI 4.5" x 1" Plate	59.17 54.17 -	Auto	0.0000
L32	30	6" x 1" Plate	59.17 50.00 -	Auto	0.0000
L32	31	6" x 1" Plate	54.17 50.00 -	Auto	0.0000
L32	32	6" x 1" Plate	54.17 50.00 -	Auto	0.0000
L32	43	CCI 6.5" x 1.25" Plate	54.17 49.17 -	Auto	0.0109
L32	44	CCI 6.5" x 1.25" Plate	49.92 49.17 -	Auto	0.0109

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L32	45	CCI 6.5" x 1.25" Plate	49.92 49.17 -	Auto	0.0109
L32	59	CCI 4.5" x 1" Plate	49.92 49.17 -	Auto	0.0000
L32	61	CCI 4.5" x 1" Plate	54.17 49.17 -	Auto	0.0000
L33	43	CCI 6.5" x 1.25" Plate	54.17 47.17 -	Auto	0.0030
L33	44	CCI 6.5" x 1.25" Plate	49.17 47.17 -	Auto	0.0030
L33	45	CCI 6.5" x 1.25" Plate	49.17 47.17 -	Auto	0.0030
L33	59	CCI 4.5" x 1" Plate	49.17 47.17 -	Auto	0.0000
L33	61	CCI 4.5" x 1" Plate	49.17 47.17 -	Auto	0.0000
L34	43	CCI 6.5" x 1.25" Plate	49.17 46.92 -	Auto	0.0317
L34	44	CCI 6.5" x 1.25" Plate	47.17 46.92 -	Auto	0.0317
L34	45	CCI 6.5" x 1.25" Plate	47.17 46.92 -	Auto	0.0317
L34	59	CCI 4.5" x 1" Plate	47.17 46.92 -	Auto	0.0000
L34	61	CCI 4.5" x 1" Plate	47.17 46.92 -	Auto	0.0000
L35	43	CCI 6.5" x 1.25" Plate	47.17 43.42 -	Auto	0.0151
L35	44	CCI 6.5" x 1.25" Plate	46.92 43.42 -	Auto	0.0151
L35	45	CCI 6.5" x 1.25" Plate	46.92 43.42 -	Auto	0.0151
L35	59	CCI 4.5" x 1" Plate	46.92 43.42 -	Auto	0.0000
L35	61	CCI 4.5" x 1" Plate	46.92 43.42 -	Auto	0.0000
L36	43	CCI 6.5" x 1.25" Plate	46.92 43.17 -	Auto	0.0000
L36	44	CCI 6.5" x 1.25" Plate	43.42 43.17 -	Auto	0.0000
L36	45	CCI 6.5" x 1.25" Plate	43.42 43.17 -	Auto	0.0000
L36	59	CCI 4.5" x 1" Plate	43.42 43.17 -	Auto	0.0000
L36	61	CCI 4.5" x 1" Plate	43.42 43.17 -	Auto	0.0000
L37	43	CCI 6.5" x 1.25" Plate	43.42 38.17 -	Auto	0.0000
L37	44	CCI 6.5" x 1.25" Plate	43.17 38.17 -	Auto	0.0000
L37	45	CCI 6.5" x 1.25" Plate	43.17 38.17 -	Auto	0.0000
L37	59	CCI 4.5" x 1" Plate	43.17 41.92 -	Auto	0.0000
L37	61	CCI 4.5" x 1" Plate	43.17 41.92 -	Auto	0.0000
L38	43	CCI 6.5" x 1.25" Plate	43.17 31.54 -	Auto	0.0000
L38	44	CCI 6.5" x 1.25" Plate	38.17 31.54 -	Auto	0.0000
L38	45	CCI 6.5" x 1.25" Plate	38.17 31.54 -	Auto	0.0000
L39	43	CCI 6.5" x 1.25" Plate	38.17 30.54 -	Auto	0.0000
L39	44	CCI 6.5" x 1.25" Plate	31.54 30.54 -	Auto	0.0000
L39	45	CCI 6.5" x 1.25" Plate	31.54 30.54 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L40	43	CCI 6.5" x 1.25" Plate	31.54 29.92 - 30.54	Auto	0.0000
L40	44	CCI 6.5" x 1.25" Plate	29.92 - 30.54	Auto	0.0000
L40	45	CCI 6.5" x 1.25" Plate	29.92 - 30.54	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe Mount [PM 701-1]	C	None		0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice	10.610 12.540 14.470 18.330	10.610 12.540 14.470 18.330	0.278 0.370 0.462 0.646
*									
*									
OPA65R-BU4B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.000 4.410 4.840 5.730	4.240 4.660 5.090 6.000	0.076 0.125 0.182 0.322
OPA65R-BU8B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.870 9.680 10.510 12.210	7.930 8.730 9.550 11.240	0.107 0.192 0.291 0.531
OPA65R-BU4B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.000 4.410 4.840 5.730	4.240 4.660 5.090 6.000	0.076 0.125 0.182 0.322
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
QS46512-2 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	149.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.950 3.250 3.550 4.190	3.330 3.630 3.940 4.600	0.095 0.149 0.212 0.366
QS46512-2 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	149.000	No Ice 1/2"	2.950 3.250	3.330 3.630	0.095 0.149

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.000			Ice	3.550	3.940	0.212
						1" Ice	4.190	4.600	0.366
						2" Ice			
80010799 w/ Mount Pipe	B	From Leg	4.000	0.000	149.000	No Ice	9.910	6.150	0.144
			0.000			1/2"	10.670	6.870	0.243
			1.000			Ice	11.440	7.600	0.356
						1" Ice	13.020	9.110	0.629
						2" Ice			
TT19-08BP111-001	A	From Leg	4.000	0.000	149.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			1.000			Ice	0.743	0.626	0.029
						1" Ice	0.971	0.840	0.049
						2" Ice			
TT19-08BP111-001	B	From Leg	4.000	0.000	149.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			1.000			Ice	0.743	0.626	0.029
						1" Ice	0.971	0.840	0.049
						2" Ice			
TT19-08BP111-001	C	From Leg	4.000	0.000	149.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			1.000			Ice	0.743	0.626	0.029
						1" Ice	0.971	0.840	0.049
						2" Ice			
(2) DBC0061F1V51-2	A	From Leg	4.000	0.000	149.000	No Ice	0.413	0.433	0.025
			0.000			1/2"	0.496	0.518	0.031
			1.000			Ice	0.586	0.609	0.038
						1" Ice	0.788	0.815	0.057
						2" Ice			
DBC0061F1V51-2	B	From Leg	4.000	0.000	149.000	No Ice	0.413	0.433	0.025
			0.000			1/2"	0.496	0.518	0.031
			1.000			Ice	0.586	0.609	0.038
						1" Ice	0.788	0.815	0.057
						2" Ice			
(3) DBC0061F1V51-2	C	From Leg	4.000	0.000	149.000	No Ice	0.413	0.433	0.025
			0.000			1/2"	0.496	0.518	0.031
			1.000			Ice	0.586	0.609	0.038
						1" Ice	0.788	0.815	0.057
						2" Ice			
DC6-48-60-18-8C	A	From Leg	4.000	0.000	149.000	No Ice	1.145	1.145	0.026
			0.000			1/2"	1.792	1.792	0.047
			1.000			Ice	2.002	2.002	0.070
						1" Ice	2.451	2.451	0.125
						2" Ice			
DC6-48-60-18-8C	B	From Leg	4.000	0.000	149.000	No Ice	1.145	1.145	0.026
			0.000			1/2"	1.792	1.792	0.047
			1.000			Ice	2.002	2.002	0.070
						1" Ice	2.451	2.451	0.125
						2" Ice			
DC6-48-60-18-8C	B	From Leg	4.000	0.000	149.000	No Ice	1.145	1.145	0.026
			0.000			1/2"	1.792	1.792	0.047
			1.000			Ice	2.002	2.002	0.070
						1" Ice	2.451	2.451	0.125
						2" Ice			
RRUS 32	A	From Leg	4.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000			1/2"	3.083	1.968	0.077
			1.000			Ice	3.316	2.166	0.103
						1" Ice	3.805	2.583	0.165
						2" Ice			
RRUS 32	B	From Leg	4.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000			1/2"	3.083	1.968	0.077
			1.000			Ice	3.316	2.166	0.103
						1" Ice	3.805	2.583	0.165
						2" Ice			
RRUS 32	C	From Leg	4.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000			1/2"	3.083	1.968	0.077

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.000			Ice	3.316	2.166	0.103
						1" Ice	3.805	2.583	0.165
						2" Ice			
RADIO 8843 B2/B66A	A	From Leg	4.000	0.000	149.000	No Ice	1.644	1.384	0.075
			0.000			1/2"	1.804	1.532	0.093
			1.000			Ice	1.972	1.688	0.113
						1" Ice	2.329	2.022	0.164
						2" Ice			
RADIO 8843 B2/B66A	B	From Leg	4.000	0.000	149.000	No Ice	1.644	1.384	0.075
			0.000			1/2"	1.804	1.532	0.093
			1.000			Ice	1.972	1.688	0.113
						1" Ice	2.329	2.022	0.164
						2" Ice			
RADIO 8843 B2/B66A	C	From Leg	4.000	0.000	149.000	No Ice	1.644	1.384	0.075
			0.000			1/2"	1.804	1.532	0.093
			1.000			Ice	1.972	1.688	0.113
						1" Ice	2.329	2.022	0.164
						2" Ice			
RADIO 4449 B5/B12	A	From Leg	4.000	0.000	149.000	No Ice	1.644	1.300	0.073
			0.000			1/2"	1.804	1.445	0.090
			1.000			Ice	1.972	1.597	0.110
						1" Ice	2.329	1.924	0.159
						2" Ice			
RADIO 4449 B5/B12	B	From Leg	4.000	0.000	149.000	No Ice	1.644	1.300	0.073
			0.000			1/2"	1.804	1.445	0.090
			1.000			Ice	1.972	1.597	0.110
						1" Ice	2.329	1.924	0.159
						2" Ice			
RADIO 4449 B5/B12	C	From Leg	4.000	0.000	149.000	No Ice	1.644	1.300	0.073
			0.000			1/2"	1.804	1.445	0.090
			1.000			Ice	1.972	1.597	0.110
						1" Ice	2.329	1.924	0.159
						2" Ice			
RRUS E2 B29	A	From Leg	4.000	0.000	149.000	No Ice	3.145	1.285	0.060
			0.000			1/2"	3.365	1.438	0.083
			1.000			Ice	3.592	1.600	0.110
						1" Ice	4.069	1.954	0.173
						2" Ice			
RRUS E2 B29	B	From Leg	4.000	0.000	149.000	No Ice	3.145	1.285	0.060
			0.000			1/2"	3.365	1.438	0.083
			1.000			Ice	3.592	1.600	0.110
						1" Ice	4.069	1.954	0.173
						2" Ice			
RRUS E2 B29	C	From Leg	4.000	0.000	149.000	No Ice	3.145	1.285	0.060
			0.000			1/2"	3.365	1.438	0.083
			1.000			Ice	3.592	1.600	0.110
						1" Ice	4.069	1.954	0.173
						2" Ice			
4' x 2" Pipe Mount	A	From Leg	4.000	0.000	149.000	No Ice	0.785	0.785	0.029
			0.000			1/2"	1.028	1.028	0.035
			1.000			Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
						2" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	A	From Leg	1.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			1.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	B	From Leg	1.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	1.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
Platform Mount [LP 404-1_KCKR]	C	None		0.000	149.000	No Ice	35.820	35.820	2.318
						1/2"	45.850	45.850	3.016
						Ice	55.760	55.760	3.886
						1" Ice	75.770	75.770	6.142
						2" Ice			
*									
AIR 21 B2A/B4P	A	From Leg	4.000	0.000	140.000	No Ice	5.924	4.219	0.083
			0.000			1/2"	6.288	4.562	0.124
			0.000			Ice	6.659	4.913	0.170
						1" Ice	7.422	5.634	0.278
						2" Ice			
AIR 21 B2A/B4P	B	From Leg	4.000	0.000	140.000	No Ice	5.924	4.219	0.083
			0.000			1/2"	6.288	4.562	0.124
			0.000			Ice	6.659	4.913	0.170
						1" Ice	7.422	5.634	0.278
						2" Ice			
AIR 21 B2A/B4P	C	From Leg	4.000	0.000	140.000	No Ice	5.924	4.219	0.083
			0.000			1/2"	6.288	4.562	0.124
			0.000			Ice	6.659	4.913	0.170
						1" Ice	7.422	5.634	0.278
						2" Ice			
KRY 112 144/1	A	From Leg	4.000	0.000	140.000	No Ice	0.350	0.175	0.011
			0.000			1/2"	0.426	0.234	0.014
			0.000			Ice	0.509	0.301	0.019
						1" Ice	0.698	0.456	0.032
						2" Ice			
KRY 112 144/1	B	From Leg	4.000	0.000	140.000	No Ice	0.350	0.175	0.011
			0.000			1/2"	0.426	0.234	0.014
			0.000			Ice	0.509	0.301	0.019
						1" Ice	0.698	0.456	0.032
						2" Ice			
KRY 112 144/1	C	From Leg	4.000	0.000	140.000	No Ice	0.350	0.175	0.011
			0.000			1/2"	0.426	0.234	0.014
			0.000			Ice	0.509	0.301	0.019
						1" Ice	0.698	0.456	0.032
						2" Ice			
AIR 32 B2A B66AA	A	From Leg	4.000	0.000	140.000	No Ice	6.850	4.963	0.143
			0.000			1/2"	7.241	5.334	0.191
			0.000			Ice	7.640	5.711	0.244
						1" Ice	8.457	6.486	0.367
						2" Ice			
AIR 32 B2A B66AA	B	From Leg	4.000	0.000	140.000	No Ice	6.850	4.963	0.143
			0.000			1/2"	7.241	5.334	0.191
			0.000			Ice	7.640	5.711	0.244
						1" Ice	8.457	6.486	0.367
						2" Ice			
AIR 32 B2A B66AA	C	From Leg	4.000	0.000	140.000	No Ice	6.850	4.963	0.143

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000 0.000			1/2" Ice 1" Ice 2" Ice	7.241 7.640 8.457	5.334 5.711 6.486	0.191 0.244 0.367
APXVAARR24_43-U-NA20	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.670 15.430 16.210 17.810	5.320 5.990 6.680 8.080	0.153 0.266 0.387 0.656
APXVAARR24_43-U-NA20	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.670 15.430 16.210 17.810	5.320 5.990 6.680 8.080	0.153 0.266 0.387 0.656
APXVAARR24_43-U-NA20	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.670 15.430 16.210 17.810	5.320 5.990 6.680 8.080	0.153 0.266 0.387 0.656
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
(3) 8' x 2.875" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.300 3.132 3.620 4.620	2.300 3.132 3.620 4.620	0.041 0.057 0.080 0.141
(3) 8' x 2.875" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.300 3.132 3.620 4.620	2.300 3.132 3.620 4.620	0.029 0.046 0.068 0.129
(3) 8' x 2.875" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.300 3.132 3.620 4.620	2.300 3.132 3.620 4.620	0.029 0.046 0.068 0.129
Platform Mount [LP 303-1_HR-1] *	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	17.090 21.470 25.720 33.960	17.090 21.470 25.720 33.960	1.495 1.881 2.346 3.518
BXA-80080/4CF w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.037 5.421 5.813 6.624	4.033 4.655 5.281 6.561	0.033 0.077 0.127 0.248
BXA-80080/4CF w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.037 5.421 5.813 6.624	4.033 4.655 5.281 6.561	0.033 0.077 0.127 0.248

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-80080/4CF w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.037 5.421 5.813 6.624	4.033 4.655 5.281 6.561	0.033 0.077 0.127 0.248
HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.970 8.730 9.500 11.110	5.990 6.720 7.470 9.020	0.078 0.141 0.216 0.399
HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.970 8.730 9.500 11.110	5.990 6.720 7.470 9.020	0.078 0.141 0.216 0.399
HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.970 8.730 9.500 11.110	5.990 6.720 7.470 9.020	0.078 0.141 0.216 0.399
DB-B1-6C-12AB-0Z	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.364 3.597 3.838 4.343	2.192 2.395 2.606 3.049	0.021 0.050 0.082 0.158
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
(2) JAHH-45B-R3B w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.260 8.830 9.410 10.610	4.390 4.910 5.430 6.530	0.123 0.201 0.290 0.504
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
PCS/AWS DULA-BAND RRH B2/B66	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
PCS/AWS DULA-BAND RRH B2/B66	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
PCS/AWS DULA-BAND RRH B2/B66	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
FDJ85020Q4-S1	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.958 1.093 1.236 1.544	0.357 0.433 0.517 0.707	0.024 0.033 0.045 0.075
FDJ85020Q4-S1	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.958 1.093 1.236 1.544	0.357 0.433 0.517 0.707	0.024 0.033 0.045 0.075

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
FDJ85020Q4-S1	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.958 1.093 1.236 1.544	0.357 0.433 0.517 0.707	0.024 0.033 0.045 0.075
B5/B13 RRH-BR04C	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
B5/B13 RRH-BR04C	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
B5/B13 RRH-BR04C	C	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RC3DC-3315-PF-48	B	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.792 4.044 4.303 4.844	2.512 2.725 2.945 3.414	0.032 0.063 0.099 0.181
Side Arm Mount [SO 102-3]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.600 4.180 4.750 5.900	3.600 4.180 4.750 5.900	0.075 0.105 0.135 0.195
Platform Mount [LP 403-1]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	18.940 23.310 27.740 36.770	18.940 23.310 27.740 36.770	1.500 1.902 2.374 3.530
* GPS (3"x7")	C	From Leg	4.000 0.000 4.000	0.000	134.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.175 0.234 0.301 0.456	0.175 0.234 0.301 0.456	0.008 0.010 0.013 0.023
* FMO	B	From Leg	4.000 0.000 1.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.400 8.815 9.237 10.104	8.400 8.815 9.237 10.104	0.010 0.181 0.361 0.747
10' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.375 3.403 4.448 5.911	2.375 3.403 4.448 5.911	0.037 0.054 0.079 0.148
6' x 2" Mount Pipe	B	From Leg	1.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
Side Arm Mount [SO 305-1]	B	From Leg	2.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.530 0.780 1.060 1.730	1.520 2.070 2.660 3.910	0.030 0.044 0.064 0.125
FMO	C	From Leg	4.000 0.000 1.000	0.000	71.000	No Ice 1/2" Ice Ice	8.400 8.815 9.237	8.400 8.815 9.237	0.010 0.181 0.361

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice 2" Ice	10.104	10.104	0.747
10' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.375 3.403 4.448 5.911	2.375 3.403 4.448 5.911	0.037 0.054 0.079 0.148
6' x 2" Mount Pipe	C	From Leg	1.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
Side Arm Mount [SO 305-1]	C	From Leg	2.000 0.000 0.000	0.000	71.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.530 0.780 1.060 1.730	1.520 2.070 2.660 3.910	0.030 0.044 0.064 0.125
*									
*									
MYA-43012N	C	From Leg	3.000 0.000 0.000	0.000	22.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.620 1.116 1.612 2.604	0.620 1.116 1.612 2.604	0.005 0.006 0.008 0.011
4' x 2" Pipe Mount	C	From Leg	3.000 0.000 0.000	0.000	22.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.785 1.028 1.281 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0.000 0.000	0.000	22.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.850 1.140 1.430 2.010	1.670 2.340 3.010 4.350	0.065 0.079 0.093 0.121
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight K
*										

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy

Comb. No.	Description
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150.167 - 145.167	Pole	Max Tension	4	0.000	-0.000	-0.000
			Max. Compression	14	-12.472	-2.001	-0.331
			Max. Mx	5	-4.792	-32.114	-0.948
			Max. My	8	-5.139	-0.869	-30.215
			Max. Vy	5	7.244	-32.114	-0.948
			Max. Vx	8	6.891	-0.869	-30.215
			Max. Torque	2			-1.471
L2	145.167 - 140.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-13.021	-2.111	-0.450
			Max. Mx	5	-5.093	-69.264	-2.179
			Max. My	8	-5.456	-1.540	-65.576
			Max. Vy	5	7.621	-69.264	-2.179
			Max. Vx	8	7.254	-1.540	-65.576
			Max. Torque	2			-1.471
L3	140.167 - 135.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-21.794	-2.158	-0.359
			Max. Mx	5	-8.635	-132.052	-3.642
			Max. My	8	-9.237	-2.252	-125.590
			Max. Vy	5	12.922	-132.052	-3.642
			Max. Vx	8	12.389	-2.252	-125.590
			Max. Torque	8			1.471
L4	135.167 - 130.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-22.585	-2.114	-0.508
			Max. Mx	5	-9.101	-197.535	-5.377
			Max. My	8	-9.715	-2.925	-188.446
			Max. Vy	5	13.298	-197.535	-5.377

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	12.745	-2.925	-188.446
			Max. Torque	2			-1.470
L5	130.167 - 125.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.083	-3.182	-0.732
			Max. Mx	5	-12.790	-299.018	-8.608
			Max. My	8	-13.643	-5.005	-285.516
			Max. Vy	5	18.561	-299.018	-8.608
			Max. Vx	8	17.752	-5.005	-285.516
			Max. Torque	8			1.850
L6	125.167 - 123.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.382	-3.204	-0.801
			Max. Mx	5	-12.958	-325.353	-9.395
			Max. My	8	-13.814	-5.388	-310.710
			Max. Vy	5	18.662	-325.353	-9.395
			Max. Vx	8	17.842	-5.388	-310.710
			Max. Torque	8			1.847
L7	123.75 - 123.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.449	-3.209	-0.814
			Max. Mx	5	-13.024	-330.016	-9.550
			Max. My	8	-13.878	-5.456	-315.167
			Max. Vy	5	18.685	-330.016	-9.550
			Max. Vx	8	17.832	-5.456	-315.167
			Max. Torque	8			1.847
L8	123.5 - 118.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33.788	-3.280	-1.062
			Max. Mx	5	-13.838	-424.335	-12.361
			Max. My	8	-14.707	-6.808	-405.287
			Max. Vy	5	19.095	-424.335	-12.361
			Max. Vx	8	18.216	-6.808	-405.287
			Max. Torque	8			1.846
L9	118.5 - 113.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-36.521	-3.353	-1.321
			Max. Mx	5	-15.772	-521.666	-15.305
			Max. My	8	-16.667	-8.172	-498.047
			Max. Vy	5	19.880	-521.666	-15.305
			Max. Vx	8	18.907	-8.172	-498.047
			Max. Torque	8			1.844
L10	113.5 - 112.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-37.415	-3.373	-1.392
			Max. Mx	5	-16.417	-548.290	-16.122
			Max. My	8	-17.321	-8.538	-523.369
			Max. Vy	5	20.116	-548.290	-16.122
			Max. Vx	8	19.113	-8.538	-523.369
			Max. Torque	8			1.818
L11	112.167 - 111.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-37.594	-3.378	-1.407
			Max. Mx	5	-16.565	-553.322	-16.299
			Max. My	8	-17.469	-8.608	-528.147
			Max. Vy	5	20.180	-553.322	-16.299
			Max. Vx	8	19.128	-8.608	-528.147
			Max. Torque	8			1.811
L12	111.917 - 110.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.743	-3.404	-1.502
			Max. Mx	5	-17.397	-588.825	-17.384
			Max. My	8	-18.313	-9.093	-561.873
			Max. Vy	5	20.470	-588.825	-17.384
			Max. Vx	8	19.422	-9.093	-561.873
			Max. Torque	8			1.810
L13	110.167 - 109.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.857	-3.410	-1.517

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	-17.496	-593.942	-17.563
			Max. My	8	-18.412	-9.163	-566.725
			Max. Vy	5	20.512	-593.942	-17.563
			Max. Vx	8	19.418	-9.163	-566.725
			Max. Torque	8			1.801
L14	109.917 - 104.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-42.387	-3.485	-1.713
			Max. Mx	5	-20.148	-698.423	-20.860
			Max. My	8	-21.092	-10.567	-665.764
			Max. Vy	5	21.349	-698.423	-20.860
			Max. Vx	8	20.210	-10.567	-665.764
			Max. Torque	8			1.800
L15	104.917 - 99.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-44.814	-3.567	-1.918
			Max. Mx	5	-21.964	-806.455	-24.375
			Max. My	8	-22.923	-11.989	-767.956
			Max. Vy	5	21.917	-806.455	-24.375
			Max. Vx	8	20.704	-11.989	-767.956
			Max. Torque	8			1.765
L16	99.917 - 95	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.516	-3.651	-2.111
			Max. Mx	5	-23.195	-915.003	-27.946
			Max. My	8	-24.161	-13.393	-870.470
			Max. Vy	5	22.297	-915.003	-27.946
			Max. Vx	8	21.039	-13.393	-870.470
			Max. Torque	2			-1.763
L17	95 - 94.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.615	-3.657	-2.121
			Max. Mx	5	-23.282	-920.576	-28.150
			Max. My	8	-24.247	-13.464	-875.724
			Max. Vy	5	22.340	-920.576	-28.150
			Max. Vx	8	21.029	-13.464	-875.724
			Max. Torque	2			-1.761
L18	94.75 - 89.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-48.584	-3.747	-2.292
			Max. Mx	5	-24.690	-1033.019	-31.870
			Max. My	8	-25.664	-14.894	-981.827
			Max. Vy	5	22.724	-1033.019	-31.870
			Max. Vx	8	21.429	-14.894	-981.827
			Max. Torque	2			-1.761
L19	89.75 - 85.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-270.767	-936.809	-422.425
			Max. Mx	5	-24.992	-1057.177	-32.677
			Max. My	8	-25.968	-15.198	-1004.615
			Max. Vy	5	22.811	-1057.177	-32.677
			Max. Vx	8	21.507	-15.198	-1004.615
			Max. Torque	7			5.179
		Guy A	Bottom Tension	6	178.023		
			Top Tension	6	178.490		
			Top Cable Vert	6	173.593		
			Top Cable Norm	6	40.966		
			Top Cable Tan	6	6.770		
			Bot Cable Vert	6	-173.035		
			Bot Cable Norm	6	41.219		
			Bot Cable Tan	6	7.229		
		Guy B	Bottom Tension	11	98.180		
			Top Tension	11	98.527		
			Top Cable Vert	11	89.150		
			Top Cable Norm	11	41.943		
			Top Cable Tan	11	0.790		
			Bot Cable Vert	11	-88.612		
			Bot Cable Norm	11	42.264		
			Bot Cable Tan	11	1.015		
		Guy C	Bottom Tension	4	109.473		
			Top Tension	4	109.817		
			Top Cable Vert	4	99.497		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Norm	4	46.421		
			Top Cable Tan	4	2.260		
			Bot Cable Vert	4	-98.960		
			Bot Cable Norm	4	46.746		
			Bot Cable Tan	4	2.481		
L20	85.5 - 85.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-270.853	-940.191	-423.752
			Max. Mx	5	-262.832	-1040.429	-8.234
			Max. My	2	-148.198	7.574	861.200
			Max. Vy	6	13.611	-940.191	-423.752
			Max. Vx	2	14.224	7.574	861.200
			Max. Torque	7			5.171
L21	85.25 - 85	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-270.931	-943.558	-425.057
			Max. Mx	5	-262.910	-1042.909	-10.782
			Max. My	2	-148.272	7.420	857.645
			Max. Vy	6	13.583	-943.558	-425.057
			Max. Vx	2	14.227	7.420	857.645
			Max. Torque	7			5.170
L22	85 - 84.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-271.005	-946.917	-426.360
			Max. Mx	5	-262.983	-1045.382	-13.330
			Max. My	2	-148.346	7.265	854.089
			Max. Vy	6	13.552	-946.917	-426.360
			Max. Vx	2	14.230	7.265	854.089
			Max. Torque	7			5.170
L23	84.75 - 83	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-271.511	-970.224	-435.392
			Max. Mx	5	-263.489	-1062.463	-31.152
			Max. My	2	-148.408	7.108	850.535
			Max. Vy	6	13.435	-970.224	-435.392
			Max. Vx	2	14.328	7.108	850.535
			Max. Torque	7			5.172
L24	83 - 82.65	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-271.621	-974.848	-437.197
			Max. Mx	5	-263.595	-1065.837	-34.730
			Max. My	2	-148.904	6.027	825.619
			Max. Vy	6	13.269	-974.848	-437.197
			Max. Vx	2	14.264	6.027	825.619
			Max. Torque	7			5.167
L25	82.65 - 82.4167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-271.690	-977.920	-438.396
			Max. Mx	5	-263.663	-1068.074	-37.119
			Max. My	2	-148.999	5.811	820.632
			Max. Vy	6	13.266	-977.920	-438.396
			Max. Vx	2	14.256	5.811	820.632
			Max. Torque	7			5.166
L26	82.4167 - 77.4167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-273.136	-1041.541	-463.118
			Max. Mx	5	-265.095	-1113.751	-87.978
			Max. My	2	-149.058	5.664	817.307
			Max. Vy	6	13.122	-990.964	-443.452
			Max. Vx	2	14.386	3.176	760.114
			Max. Torque	7			5.167
L27	77.4167 - 70.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-274.213	-1085.690	-480.310
			Max. Mx	5	-266.161	-1144.722	-125.100
			Max. My	8	-185.003	-25.833	-762.923
			Max. Vy	6	12.304	-1056.495	-468.938
			Max. Vx	2	14.404	1.787	728.245
			Max. Torque	7			5.159
L28	70.167 - 69.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-276.580	-1141.682	-503.004
			Max. Mx	5	-268.530	-1184.750	-171.526
			Max. My	8	-188.151	-31.843	-711.210

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	6	12.635	-1141.682	-503.004
			Max. Vx	2	13.046	-1.992	643.410
			Max. Torque	7			3.825
L29	69.167 - 64.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-278.021	-1202.104	-527.770
			Max. Mx	5	-269.958	-1228.337	-221.268
			Max. My	8	-188.425	-32.664	-705.025
			Max. Vy	6	12.473	-1154.089	-508.077
			Max. Vx	2	13.029	-2.620	630.418
			Max. Torque	7			3.824
L30	64.167 - 59.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-279.476	-1258.637	-551.107
			Max. Mx	5	-271.402	-1268.381	-270.027
			Max. My	8	-189.806	-36.703	-674.000
			Max. Vy	6	11.676	-1213.713	-532.548
			Max. Vx	2	12.908	-5.762	565.755
			Max. Torque	7			3.819
L31	59.167 - 54.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-280.947	-1311.428	-573.089
			Max. Mx	6	-280.947	-1311.428	-573.089
			Max. My	7	-235.348	-857.993	-661.489
			Max. Vy	6	10.923	-1269.494	-555.612
			Max. Vx	2	12.723	-8.893	501.830
			Max. Torque	7			3.816
L32	54.167 - 49.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-282.435	-1360.534	-593.745
			Max. Mx	6	-282.435	-1360.534	-593.745
			Max. My	7	-236.798	-906.810	-650.661
			Max. Vy	6	10.181	-1321.544	-577.326
			Max. Vx	2	12.492	-12.006	438.926
			Max. Torque	7			3.813
L33	49.167 - 47.1667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-283.036	-1379.171	-601.648
			Max. Mx	6	-283.036	-1379.171	-601.648
			Max. My	7	-238.267	-953.528	-639.463
			Max. Vy	12	9.861	375.953	171.385
			Max. Vx	2	12.219	-15.093	377.261
			Max. Torque	7			3.811
L34	47.1667 - 46.9167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-283.121	-1381.465	-602.628
			Max. Mx	6	-283.121	-1381.465	-602.628
			Max. My	7	-238.860	-971.630	-634.918
			Max. Vy	12	9.750	356.389	157.614
			Max. Vx	2	12.085	-16.320	352.986
			Max. Torque	7			3.810
L35	46.9167 - 43.4167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-284.262	-1412.761	-616.000
			Max. Mx	6	-284.262	-1412.761	-616.000
			Max. My	7	-238.943	-973.872	-634.352
			Max. Vy	12	9.750	353.958	155.902
			Max. Vx	2	12.084	-16.473	349.969
			Max. Torque	7			3.810
L36	43.4167 - 43.1667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-284.339	-1414.944	-616.941
			Max. Mx	6	-284.339	-1414.944	-616.941
			Max. My	7	-240.077	-1004.780	-626.420
			Max. Vy	12	9.547	320.274	132.159
			Max. Vx	2	11.840	-18.606	308.158
			Max. Torque	7			3.809
L37	43.1667 - 38.1667	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	6	-285.808	-1456.579	-634.961
			Max. Mx	6	-285.808	-1456.579	-634.961
			Max. My	6	-285.808	-1456.579	-634.961
			Max. Vy	12	9.545	317.894	130.480
			Max. Vx	2	11.835	-18.758	305.203
			Max. Torque	7			3.809
L38	38.1667 - 31.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-286.527	-1475.410	-643.210
			Max. Mx	6	-286.527	-1475.410	-643.210
			Max. My	6	-286.527	-1475.410	-643.210
			Max. Vy	12	9.273	270.985	97.352
			Max. Vx	2	11.499	-21.771	246.956
			Max. Torque	7			3.808
L39	31.537 - 30.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-288.790	-1514.351	-660.492
			Max. Mx	6	-288.790	-1514.351	-660.492
			Max. My	6	-288.790	-1514.351	-660.492
			Max. Vy	12	8.848	211.043	54.888
			Max. Vx	2	10.987	-25.703	172.480
			Max. Torque	7			3.807
L40	30.537 - 25.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-289.947	-1546.951	-675.277
			Max. Mx	6	-289.947	-1546.951	-675.277
			Max. My	6	-289.947	-1546.951	-675.277
			Max. Vy	12	8.797	202.249	48.639
			Max. Vx	2	10.920	-26.291	161.545
			Max. Torque	7			3.807
L41	25.537 - 20.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-291.237	-1573.199	-687.948
			Max. Mx	6	-291.237	-1573.199	-687.948
			Max. My	6	-291.237	-1573.199	-687.948
			Max. Vy	12	8.519	159.076	17.978
			Max. Vx	2	10.559	-29.179	107.907
			Max. Torque	7			3.805
L42	20.537 - 15.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-292.429	-1594.399	-698.423
			Max. Mx	6	-292.429	-1594.399	-698.423
			Max. My	6	-292.429	-1594.399	-698.423
			Max. Vy	12	8.127	117.845	-11.746
			Max. Vx	2	10.059	-31.609	56.105
			Max. Torque	7			3.447
L43	15.537 - 10.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-293.640	-1610.362	-706.885
			Max. Mx	6	-293.640	-1610.362	-706.885
			Max. My	6	-293.640	-1610.362	-706.885
			Max. Vy	11	7.842	252.493	-264.178
			Max. Vx	2	9.610	-34.265	6.966
			Max. Torque	7			3.447
L44	10.537 - 5.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-294.871	-1621.512	-713.523
			Max. Mx	6	-294.871	-1621.512	-713.523
			Max. My	6	-294.871	-1621.512	-713.523
			Max. Vy	11	7.518	214.239	-280.484
			Max. Vx	2	9.124	-36.830	-39.848
			Max. Torque	7			3.446
L45	5.537 - 0.537	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-296.124	-1628.262	-718.517
			Max. Mx	6	-296.124	-1628.262	-718.517
			Max. My	6	-296.124	-1628.262	-718.517
			Max. Vy	11	7.150	177.703	-295.893
			Max. Vx	2	8.606	-39.302	-84.160

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	7			3.446
L46	0.537 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-296.260	-1628.741	-718.963
			Max. Mx	6	-296.260	-1628.741	-718.963
			Max. My	6	-296.260	-1628.741	-718.963
			Max. Vy	11	6.745	143.090	-310.409
			Max. Vx	2	8.058	-41.677	-125.806
			Max. Torque	7			3.446

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	6	296.260	-0.870	-0.822
	Max. H_x	3	148.510	2.730	-6.998
	Max. H_z	8	207.640	-0.390	3.821
	Max. M_x	21	-42.083	-0.386	0.956
	Max. M_z	6	1628.741	-0.870	-0.822
	Max. Torsion	7	3.446	-3.553	2.254
	Min. Vert	32	116.056	0.156	0.161
	Min. H_x	11	222.678	-6.691	-2.804
	Min. H_z	2	173.098	-0.483	-8.004
	Min. M_x	6	-718.963	-0.870	-0.822
	Min. M_z	9	-329.235	-1.899	2.652
	Min. Torsion	4	-3.265	0.718	-7.367
Guy C @ 42 ft Elev 0 ft Azimuth 211 deg	Max. Vert	9	-0.457	-0.044	0.070
	Max. H_x	10	-0.603	0.005	0.198
	Max. H_z	4	-98.960	-26.015	38.917
	Min. Vert	4	-98.960	-26.015	38.917
	Min. H_x	5	-95.346	-26.480	36.635
	Min. H_z	9	-0.457	-0.044	0.070
Guy B @ 42.5 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.256	-0.006	-0.002
	Max. H_x	11	-88.612	37.110	20.253
	Max. H_z	12	-86.036	35.600	20.397
	Min. Vert	11	-88.612	37.110	20.253
	Min. H_x	5	-0.344	-0.008	0.115
	Min. H_z	7	-0.383	0.110	-0.053
Guy A @ 20.5 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-3.382	-0.002	-0.523
	Max. H_x	10	-135.332	1.957	-31.494
	Max. H_z	2	-3.382	-0.002	-0.523
	Min. Vert	6	-173.035	-7.229	-41.219
	Min. H_x	6	-173.035	-7.229	-41.219
	Min. H_z	6	-173.035	-7.229	-41.219

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	121.198	0.374	0.894	67.334	-41.468	-0.011
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	173.098	0.483	8.004	130.114	-41.927	1.573
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	148.510	-2.730	6.998	139.796	-75.952	2.959

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	226.920	-0.718	7.367	496.064	-892.527	3.265
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	288.141	-0.514	4.651	716.698	-1493.056	0.692
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	296.260	0.870	0.822	718.963	-1628.741	-2.294
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	252.020	3.553	-2.254	526.619	-1278.310	-3.446
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	207.640	0.390	-3.821	336.521	-75.526	-1.747
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	253.480	1.899	-2.652	454.237	329.235	-1.374
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	261.802	5.165	-0.068	452.725	287.736	-1.916
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	222.678	6.691	2.804	311.910	139.493	-2.314
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	166.927	6.493	4.643	118.845	-32.669	-1.741
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	176.426	4.044	7.176	127.696	-39.182	-0.206
1.2 Dead+1.0 Ice+1.0 Temp+Guy	142.550	0.288	0.612	53.138	-32.250	-0.008
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	147.057	0.296	2.285	75.448	-31.064	0.308
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	144.450	-0.464	2.069	74.950	-36.452	0.556
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	148.870	-0.585	1.702	94.665	-98.913	0.629
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	158.694	-0.082	1.228	127.528	-198.523	0.474
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	160.180	0.302	0.470	126.712	-223.591	0.186
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	151.265	0.392	-0.391	86.906	-152.556	-0.103
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	141.057	0.386	-0.956	42.083	-46.891	-0.337
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	144.949	0.988	-0.708	47.150	-21.649	-0.537
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	148.479	1.590	-0.106	54.384	-21.542	-0.615
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	149.167	1.867	0.659	56.941	-28.816	-0.546
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	149.849	1.690	1.469	64.898	-31.263	-0.340
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	149.230	1.103	2.071	72.380	-31.246	-0.026
Dead+Wind 0 deg - Service+Guy	125.612	0.398	2.166	82.452	-41.705	0.293
Dead+Wind 30 deg - Service+Guy	122.541	-0.210	1.984	80.075	-43.540	0.501
Dead+Wind 60 deg - Service+Guy	119.393	-0.636	1.519	75.764	-46.993	0.562
Dead+Wind 90 deg - Service+Guy	120.178	-0.570	1.003	80.948	-75.735	0.451
Dead+Wind 120 deg - Service+Guy	120.663	-0.281	0.440	80.555	-90.974	0.213
Dead+Wind 150 deg -	116.056	-0.156	-0.161	59.475	-53.537	-0.054

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service+Guy						
Dead+Wind 180 deg - Service+Guy	116.788	0.356	-0.365	52.871	-41.903	-0.318
Dead+Wind 210 deg - Service+Guy	119.829	0.959	-0.192	54.851	-39.698	-0.501
Dead+Wind 240 deg - Service+Guy	123.317	1.412	0.281	60.155	-39.099	-0.562
Dead+Wind 270 deg - Service+Guy	126.220	1.595	0.917	67.774	-38.978	-0.483
Dead+Wind 300 deg - Service+Guy	127.783	1.445	1.551	75.249	-39.258	-0.282
Dead+Wind 330 deg - Service+Guy	127.629	1.005	2.010	80.229	-39.992	-0.001

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-45.281	0.000	0.000	45.281	0.000	0.000%
2	-0.232	-54.211	-31.339	0.232	54.211	31.339	0.000%
3	15.689	-54.154	-27.255	-15.689	54.154	27.255	0.000%
4	27.187	-54.084	-15.475	-27.187	54.084	15.475	0.000%
5	31.588	-54.023	0.236	-31.588	54.023	-0.236	0.000%
6	27.450	-53.970	15.895	-27.450	53.970	-15.895	0.000%
7	16.191	-53.937	27.652	-16.191	53.937	-27.652	0.000%
8	0.232	-53.951	31.416	-0.233	53.951	-31.416	0.000%
9	-15.710	-54.008	27.291	15.710	54.008	-27.291	0.000%
10	-27.055	-54.078	15.398	27.055	54.078	-15.398	0.000%
11	-31.445	-54.139	-0.236	31.445	54.139	0.236	0.000%
12	-27.483	-54.192	-15.913	27.483	54.192	15.913	0.000%
13	-16.210	-54.224	-27.685	16.210	54.224	27.685	0.000%
14	0.000	-89.766	0.000	0.000	89.766	0.000	0.000%
15	-0.034	-89.822	-6.405	0.034	89.822	6.405	0.000%
16	3.175	-89.799	-5.515	-3.175	89.799	5.515	0.000%
17	5.558	-89.770	-3.178	-5.558	89.770	3.178	0.000%
18	6.413	-89.743	0.036	-6.413	89.743	-0.036	0.000%
19	5.593	-89.720	3.238	-5.593	89.720	-3.238	0.000%
20	3.245	-89.705	5.564	-3.245	89.705	-5.564	0.000%
21	0.034	-89.710	6.411	-0.034	89.710	-6.411	0.000%
22	-3.178	-89.733	5.520	3.178	89.733	-5.520	0.000%
23	-5.552	-89.763	3.175	5.552	89.763	-3.175	0.000%
24	-6.406	-89.789	-0.036	6.406	89.789	0.036	0.000%
25	-5.598	-89.813	-3.240	5.598	89.813	3.240	0.000%
26	-3.248	-89.827	-5.569	3.248	89.827	5.569	0.000%
27	-0.043	-45.305	-5.830	0.043	45.305	5.830	0.000%
28	2.919	-45.294	-5.070	-2.919	45.294	5.070	0.000%
29	5.058	-45.281	-2.879	-5.058	45.281	2.879	0.000%
30	5.877	-45.270	0.044	-5.877	45.270	-0.044	0.000%
31	5.107	-45.260	2.957	-5.107	45.260	-2.957	0.000%
32	3.012	-45.254	5.144	-3.012	45.254	-5.144	0.000%
33	0.043	-45.256	5.845	-0.043	45.256	-5.845	0.000%
34	-2.923	-45.267	5.077	2.923	45.267	-5.077	0.000%
35	-5.033	-45.280	2.865	5.033	45.280	-2.865	0.000%
36	-5.850	-45.291	-0.044	5.850	45.291	0.044	0.000%
37	-5.113	-45.301	-2.961	5.113	45.301	2.961	0.000%
38	-3.016	-45.307	-5.150	3.016	45.307	5.150	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	5	0.00000001	0.00006784
2	Yes	6	0.00000001	0.00099573
3	Yes	7	0.00000001	0.00025160
4	Yes	10	0.00000001	0.00030558
5	Yes	12	0.00000001	0.00068414
6	Yes	13	0.00000001	0.00043053
7	Yes	11	0.00000001	0.00047338
8	Yes	8	0.00000001	0.00026391
9	Yes	9	0.00000001	0.00045011
10	Yes	9	0.00000001	0.00047665
11	Yes	8	0.00000001	0.00039031
12	Yes	7	0.00000001	0.00012800
13	Yes	7	0.00000001	0.00018981
14	Yes	6	0.00000001	0.00031087
15	Yes	6	0.00000001	0.00090726
16	Yes	7	0.00000001	0.00019227
17	Yes	9	0.00000001	0.00022111
18	Yes	9	0.00000001	0.00071697
19	Yes	9	0.00000001	0.00080264
20	Yes	9	0.00000001	0.00046975
21	Yes	7	0.00000001	0.00073719
22	Yes	7	0.00000001	0.00065282
23	Yes	7	0.00000001	0.00060243
24	Yes	7	0.00000001	0.00019345
25	Yes	7	0.00000001	0.00013640
26	Yes	6	0.00000001	0.00096353
27	Yes	5	0.00000001	0.00031526
28	Yes	5	0.00000001	0.00049099
29	Yes	5	0.00000001	0.00085427
30	Yes	7	0.00000001	0.00031566
31	Yes	7	0.00000001	0.00047581
32	Yes	6	0.00000001	0.00050579
33	Yes	5	0.00000001	0.00049845
34	Yes	5	0.00000001	0.00040558
35	Yes	5	0.00000001	0.00052993
36	Yes	5	0.00000001	0.00037298
37	Yes	5	0.00000001	0.00027735
38	Yes	5	0.00000001	0.00024374

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150.167 - 145.167	15.160	31	1.225	0.010
L2	145.167 - 140.167	13.881	31	1.215	0.009
L3	140.167 - 135.167	12.622	31	1.186	0.008
L4	135.167 - 130.167	11.404	31	1.137	0.007
L5	130.167 - 125.167	10.249	31	1.066	0.006
L6	125.167 - 123.75	9.181	31	0.970	0.005
L7	123.75 - 123.5	8.898	31	0.940	0.005
L8	123.5 - 118.5	8.849	31	0.937	0.005
L9	118.5 - 113.5	7.900	31	0.874	0.005
L10	113.5 - 112.167	7.023	31	0.802	0.004
L11	112.167 - 111.917	6.802	31	0.782	0.004
L12	111.917 - 110.167	6.761	31	0.779	0.004
L13	110.167 - 109.917	6.479	31	0.760	0.004
L14	109.917 - 104.917	6.440	31	0.757	0.004
L15	104.917 - 99.917	5.682	31	0.690	0.003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L16	99.917 - 95	4.997	31	0.620	0.003
L17	95 - 94.75	4.396	31	0.548	0.003
L18	94.75 - 89.75	4.367	31	0.545	0.003
L19	89.75 - 85.5	3.830	31	0.483	0.003
L20	85.5 - 85.25	3.423	31	0.435	0.002
L21	85.25 - 85	3.401	31	0.433	0.002
L22	85 - 84.75	3.378	31	0.432	0.002
L23	84.75 - 83	3.356	31	0.429	0.002
L24	83 - 82.65	3.201	31	0.416	0.002
L25	82.65 - 82.4167	3.171	31	0.413	0.002
L26	82.4167 - 77.4167	3.151	31	0.411	0.002
L27	77.4167 - 70.167	2.744	31	0.368	0.002
L28	73.747 - 69.167	2.473	31	0.340	0.002
L29	69.167 - 64.167	2.156	31	0.320	0.002
L30	64.167 - 59.167	1.838	31	0.288	0.002
L31	59.167 - 54.167	1.552	31	0.259	0.002
L32	54.167 - 49.167	1.295	31	0.233	0.001
L33	49.167 - 47.1667	1.064	31	0.208	0.001
L34	47.1667 - 46.9167	0.979	31	0.199	0.001
L35	46.9167 - 43.4167	0.969	31	0.198	0.001
L36	43.4167 - 43.1667	0.829	31	0.184	0.001
L37	43.1667 - 38.1667	0.819	31	0.183	0.001
L38	38.1667 - 31.537	0.639	31	0.161	0.001
L39	35.747 - 30.537	0.560	31	0.152	0.001
L40	30.537 - 25.537	0.401	31	0.136	0.001
L41	25.537 - 20.537	0.273	31	0.109	0.001
L42	20.537 - 15.537	0.172	31	0.084	0.001
L43	15.537 - 10.537	0.096	31	0.061	0.000
L44	10.537 - 5.537	0.043	31	0.040	0.000
L45	5.537 - 0.537	0.012	31	0.020	0.000
L46	0.537 - 0	0.000	31	0.000	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
151.000	Pipe Mount [PM 701-1]	31	15.160	1.225	0.010	12296
149.000	OPA65R-BU4B w/ Mount Pipe	31	14.861	1.223	0.010	12296
140.000	AIR 21 B2A/B4P	31	12.581	1.185	0.008	6768
134.000	GPS (3"x7")	31	11.128	1.122	0.007	4239
130.000	BXA-80080/4CF w/ Mount Pipe	31	10.212	1.064	0.006	3378
88.688	Guy	31	3.724	0.469	0.003	4127
71.000	FMO	31	2.280	0.328	0.002	10649
22.000	MYA-43012N	31	0.199	0.091	0.001	11646

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150.167 - 145.167	140.499	6	9.168	0.165
L2	145.167 - 140.167	130.983	6	9.118	0.160
L3	140.167 -	121.577	6	8.960	0.153

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
	135.167				
L4	135.167 - 130.167	112.387	6	8.688	0.143
L5	130.167 - 125.167	103.541	6	8.296	0.131
L6	125.167 - 123.75	95.168	6	7.765	0.116
L7	123.75 - 123.5	92.900	6	7.596	0.111
L8	123.5 - 118.5	92.505	6	7.580	0.111
L9	118.5 - 113.5	84.784	6	7.229	0.101
L10	113.5 - 112.167	77.451	6	6.829	0.090
L11	112.167 - 111.917	75.567	6	6.718	0.087
L12	111.917 - 110.167	75.217	6	6.703	0.087
L13	110.167 - 109.917	72.789	6	6.596	0.084
L14	109.917 - 104.917	72.445	6	6.579	0.084
L15	104.917 - 99.917	65.772	6	6.209	0.074
L16	99.917 - 95	59.493	6	5.817	0.064
L17	95 - 94.75	53.723	6	5.416	0.054
L18	94.75 - 89.75	53.440	6	5.399	0.053
L19	89.75 - 85.5	47.982	6	5.048	0.045
L20	85.5 - 85.25	43.626	6	4.763	0.037
L21	85.25 - 85	43.378	6	4.750	0.037
L22	85 - 84.75	43.130	6	4.737	0.037
L23	84.75 - 83	42.883	6	4.724	0.036
L24	83 - 82.65	41.171	6	4.634	0.034
L25	82.65 - 82.4167	40.833	6	4.612	0.034
L26	82.4167 - 77.4167	40.608	6	4.598	0.034
L27	77.4167 - 70.167	35.962	6	4.291	0.028
L28	73.747 - 69.167	32.753	6	4.074	0.024
L29	69.167 - 64.167	28.917	6	3.911	0.022
L30	64.167 - 59.167	24.980	6	3.619	0.018
L31	59.167 - 54.167	21.340	6	3.341	0.015
L32	54.167 - 49.167	17.988	6	3.068	0.012
L33	49.167 - 47.1667	14.919	6	2.800	0.010
L34	47.1667 - 46.9167	13.768	6	2.696	0.010
L35	46.9167 - 43.4167	13.628	6	2.685	0.010
L36	43.4167 - 43.1667	11.721	6	2.522	0.009
L37	43.1667 - 38.1667	11.589	6	2.509	0.008
L38	38.1667 - 31.537	9.102	6	2.246	0.007
L39	35.747 - 30.537	7.995	6	2.123	0.006
L40	30.537 - 25.537	5.770	6	1.921	0.006
L41	25.537 - 20.537	3.951	6	1.558	0.004
L42	20.537 - 15.537	2.502	6	1.214	0.003
L43	15.537 - 10.537	1.402	6	0.890	0.002
L44	10.537 - 5.537	0.631	6	0.585	0.001
L45	5.537 - 0.537	0.171	6	0.298	0.001
L46	0.537 - 0	0.002	6	0.028	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
151.000	Pipe Mount [PM 701-1]	6	140.499	9.168	0.181	2519
149.000	OPA65R-BU4B w/ Mount Pipe	6	138.274	9.161	0.180	2519
140.000	AIR 21 B2A/B4P	6	121.266	8.953	0.167	1374
134.000	GPS (3"x7")	6	110.287	8.606	0.154	830

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.000	BXA-80080/4CF w/ Mount Pipe	6	103.253	8.281	0.142	648
88.688	Guy	6	46.869	4.970	0.043	865
71.000	FMO	6	30.429	3.976	0.023	1273
22.000	MYA-43012N	6	2.889	1.310	0.004	840

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
L19	88.688 (A) (49)	1 5/8 BS	38.880	324.001	178.490	204.116	0.952	1.089
	88.688 (B) (48)	1 3/8 BS	27.840	232.000	98.527	146.157	0.952	1.413
	88.688 (C) (47)	1 3/8 BS	27.840	232.000	109.817	146.157	0.952	1.268

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150.167 - 149.167	TP16.31x15.53x0.25	5.000	0.000	0.0	12.426	-0.293	726.920	0.000
	149.167 - 148.167					12.552	-4.566	734.266	0.006
	148.167 - 147.167					12.677	-4.617	741.613	0.006
	147.167 - 146.167					12.803	-4.669	748.959	0.006
	146.167 - 145.167					12.928	-4.723	756.306	0.006
L2	145.167 - 144.167	TP17.09x16.31x0.25	5.000	0.000	0.0	13.054	-4.781	763.652	0.006
	144.167 - 143.167					13.179	-4.839	770.998	0.006
	143.167 - 142.167					13.305	-4.899	778.345	0.006
	142.167 - 141.167					13.431	-4.960	785.691	0.006
	141.167 - 140.167					13.556	-5.021	793.038	0.006
L3	140.167 - 139.167	TP17.87x17.09x0.25	5.000	0.000	0.0	13.682	-8.188	800.384	0.010
	139.167 - 138.167					13.807	-8.268	807.731	0.010
	138.167 - 137.167					13.933	-8.350	815.077	0.010
	137.167 - 136.167					14.059	-8.434	822.423	0.010
	136.167 - 135.167					14.184	-8.519	829.770	0.010
L4	135.167 - 134.167	TP18.65x17.87x0.25	5.000	0.000	0.0	14.310	-8.607	837.116	0.010
	134.167 -					14.435	-8.705	844.463	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	133.167								
	133.167 - 132.167					14.561	-8.796	851.809	0.010
	132.167 - 131.167					14.686	-8.889	859.156	0.010
	131.167 - 130.167					14.812	-8.984	866.502	0.010
L5	130.167 - 129.167	TP19.43x18.65x0.25	5.000	0.000	0.0	14.938	-12.149	873.848	0.014
	129.167 - 128.167					15.063	-12.264	881.195	0.014
	128.167 - 127.167					15.189	-12.382	888.541	0.014
	127.167 - 126.167					15.314	-12.502	895.888	0.014
	126.167 - 125.167					15.440	-12.624	903.234	0.014
L6	125.167 - 123.75 (6)	TP19.651x19.43x0.25	1.417	0.000	0.0	15.618	-12.792	913.644	0.014
L7	123.75 - 123.5 (7)	TP19.69x19.651x0.513	0.250	0.000	0.0	31.648	-12.859	1851.390	0.007
L8	123.5 - 122.5	TP20.47x19.69x0.5	5.000	0.000	0.0	31.147	-13.012	1822.110	0.007
	122.5 - 121.5					31.398	-13.175	1836.800	0.007
	121.5 - 120.5					31.649	-13.340	1851.490	0.007
	120.5 - 119.5					31.901	-13.506	1866.190	0.007
	119.5 - 118.5					32.152	-13.675	1880.880	0.007
L9	118.5 - 117.5	TP21.25x20.47x0.488	5.000	0.000	0.0	31.612	-14.057	1849.330	0.008
	117.5 - 116.5					31.857	-14.442	1863.660	0.008
	116.5 - 115.5					32.102	-14.828	1877.980	0.008
	115.5 - 114.5					32.347	-15.217	1892.310	0.008
	114.5 - 113.5					32.592	-15.607	1906.630	0.008
L10	113.5 - 112.167 (10)	TP21.458x21.25x0.488	1.333	0.000	0.0	32.918	-16.252	1925.730	0.008
L11	112.167 - 111.917 (11)	TP21.497x21.458x0.7	0.250	0.000	0.0	46.876	-16.400	2742.270	0.006
L12	111.917 - 110.167 (12)	TP21.77x21.497x0.7	1.750	0.000	0.0	47.492	-17.230	2778.270	0.006
L13	110.167 - 109.917 (13)	TP21.813x21.77x0.625	0.250	0.000	0.0	42.641	-17.330	2494.480	0.007
L14	109.917 - 108.917	TP22.672x21.813x0.6	5.000	0.000	0.0	41.315	-17.847	2416.940	0.007
	108.917 - 107.917					41.647	-18.376	2436.350	0.008
	107.917 - 106.917					41.979	-18.908	2455.760	0.008
	106.917 - 105.917					42.311	-19.441	2475.170	0.008
	105.917 - 104.917					42.643	-19.976	2494.590	0.008
L15	104.917 - 103.917	TP23.53x22.672x0.588	5.000	0.000	0.0	42.103	-20.335	2463.010	0.008
	103.917 - 102.917					42.428	-20.697	2482.010	0.008
	102.917 - 101.917					42.752	-21.060	2501.020	0.008
	101.917 - 100.917					43.077	-21.425	2520.030	0.009
	100.917 - 99.917					43.402	-21.793	2539.030	0.009
L16	99.917 - 98.6877	TP24.375x23.53x0.575	4.917	0.000	0.0	42.893	-22.093	2509.230	0.009
	98.6877 - 97.4585					43.284	-22.400	2532.100	0.009
	97.4585 - 96.2292					43.675	-22.710	2554.970	0.009
	96.2292 - 95					44.066	-23.022	2577.840	0.009
L17	95 - 94.75 (17)	TP24.418x24.375x0.7	0.250	0.000	0.0	53.460	-23.110	3127.410	0.007
L18	94.75 - 93.75	TP25.277x24.418x0.688	5.000	0.000	0.0	52.913	-23.379	3095.430	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	93.75 - 92.75					53.293	-23.660	3117.670	0.008
	92.75 - 91.75					53.674	-23.944	3139.910	0.008
	91.75 - 90.75					54.054	-24.229	3162.160	0.008
	90.75 - 89.75					54.434	-24.516	3184.400	0.008
L19	89.75 - 88.6875	TP26.007x25.277x0.675	4.250	0.000	0.0	53.868	-24.818	3151.290	0.008
	88.6875 - 87.625					53.868	-262.030	3151.290	0.083
	87.625 - 86.5625					54.265	-262.319	3174.500	0.083
	86.5625 - 85.5					54.661	-262.470	3197.700	0.082
L20	85.5 - 85.25 (20)	TP26.049x26.007x0.863	0.250	0.000	0.0	69.831	-262.757	4085.130	0.064
L21	85.25 - 85 (21)	TP26.092x26.049x0.863	0.250	0.000	0.0	69.951	-262.835	4092.110	0.064
L22	85 - 84.75 (22)	TP26.135x26.092x0.838	0.250	0.000	0.0	68.106	-262.912	3984.220	0.066
L23	84.75 - 83 (23)	TP26.436x26.135x0.838	1.750	0.000	0.0	68.222	-262.992	3990.990	0.066
L24	83 - 82.65 (24)	TP26.496x26.436x0.713	0.350	0.000	0.0	59.016	-271.525	3452.440	0.079
L25	82.65 - 82.4167 (25)	TP26.536x26.496x0.713	0.233	0.000	0.0	59.154	-271.626	3460.500	0.078
L26	82.4167 - 81.4167	TP27.395x26.536x0.688	5.000	0.000	0.0	57.222	-271.699	3347.510	0.081
	81.4167 - 80.4167					57.603	-271.987	3369.750	0.081
	80.4167 - 79.4167					57.983	-272.275	3391.990	0.080
	79.4167 - 78.4167					58.363	-272.566	3414.240	0.080
	78.4167 - 77.4167					58.743	-272.857	3436.480	0.079
L27	77.4167 - 76.1935	TP28.64x27.395x0.688	7.250	0.000	0.0	59.123	-273.152	3458.720	0.079
	76.1935 - 74.9702					59.589	-273.509	3485.930	0.078
	74.9702 - 73.747					60.054	-273.868	3513.140	0.078
	73.747 - 70.167					60.519	-135.186	3540.340	0.038
L28	73.747 - 70.167	TP28.079x27.4x0.725	4.580	0.000	0.0	62.273	-139.047	3642.980	0.038
	70.167 - 69.167					63.513	-276.307	3715.480	0.074
L29	69.167 - 68.167	TP28.821x28.079x0.713	5.000	0.000	0.0	62.786	-276.594	3673.010	0.075
	68.167 - 67.167					63.127	-276.880	3692.910	0.075
	67.167 - 66.167					63.467	-277.167	3712.810	0.075
	66.167 - 65.167					63.807	-277.455	3732.720	0.074
	65.167 - 64.167					64.147	-277.744	3752.620	0.074
L30	64.167 - 63.167	TP29.562x28.821x0.725	5.000	0.000	0.0	65.590	-278.034	3837.000	0.072
	63.167 - 62.167					65.936	-278.322	3857.260	0.072
	62.167 - 61.167					66.282	-278.612	3877.510	0.072
	61.167 - 60.167					66.629	-278.903	3897.770	0.072
	60.167 - 59.167					66.975	-279.195	3918.020	0.071
L31	59.167 - 58.167	TP30.304x29.562x0.713	5.000	0.000	0.0	66.189	-279.488	3872.050	0.072
	58.167 -					66.529	-279.780	3891.950	0.072

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	57.167								
	57.167 - 56.167					66.869	-280.072	3911.860	0.072
	56.167 - 55.167					67.210	-280.366	3931.760	0.071
	55.167 - 54.167					67.550	-280.661	3951.670	0.071
L32	54.167 - 53.167	TP31.045x30.304x0.7	5.000	0.000	0.0	66.727	-280.958	3903.540	0.072
	53.167 - 52.167					67.062	-281.253	3923.100	0.072
	52.167 - 51.167					67.396	-281.549	3942.650	0.071
	51.167 - 50.167					67.730	-281.846	3962.210	0.071
	50.167 - 49.167					68.064	-282.145	3981.760	0.071
L33	49.167 - 48.1668	TP31.342x31.045x0.7	2.000	0.000	0.0	68.399	-282.444	4001.320	0.071
	48.1668 - 47.1667					68.733	-282.744	4020.870	0.070
L34	47.1667 - 46.9167 (34)	TP31.379x31.342x0.788	0.250	0.000	0.0	77.479	-283.041	4532.510	0.062
L35	46.9167 - 45.75	TP31.898x31.379x0.775	3.500	0.000	0.0	76.373	-283.127	4467.800	0.063
	45.75 - 44.5834					76.804	-283.506	4493.060	0.063
	44.5834 - 43.4167					77.236	-283.888	4518.320	0.063
L36	43.4167 - 43.1667 (36)	TP31.935x31.898x0.65	0.250	0.000	0.0	65.402	-284.267	3826.050	0.074
L37	43.1667 - 42.1667	TP32.677x31.935x0.65	5.000	0.000	0.0	65.480	-284.344	3830.590	0.074
	42.1667 - 41.1667					65.790	-284.636	3848.740	0.074
	41.1667 - 40.1667					66.101	-284.929	3866.900	0.074
	40.1667 - 39.1667					66.411	-285.224	3885.060	0.073
	39.1667 - 38.1667					66.722	-285.519	3903.220	0.073
L38	38.1667 - 36.9569	TP33.66x32.677x0.65	6.630	0.000	0.0	67.032	-285.816	3921.380	0.073
	36.9569 - 35.747					67.408	-286.175	3943.350	0.073
	35.747 - 31.537					67.783	-172.304	3965.310	0.043
L39	35.747 - 31.537	TP33.161x32.286x0.438	5.210	0.000	0.0	44.866	-114.236	2624.670	0.044
	31.537 - 30.537					45.862	-288.571	2682.940	0.108
L40	30.537 - 29.537	TP34.001x33.161x0.438	5.000	0.000	0.0	46.099	-288.800	2696.790	0.107
	29.537 - 28.537					46.335	-289.030	2710.630	0.107
	28.537 - 27.537					46.572	-289.260	2724.470	0.106
	27.537 - 26.537					46.809	-289.491	2738.310	0.106
	26.537 - 25.537					47.045	-289.723	2752.160	0.105
L41	25.537 - 24.537	TP34.84x34.001x0.438	5.000	0.000	0.0	47.282	-289.955	2766.000	0.105
	24.537 - 23.537					47.519	-290.188	2779.840	0.104
	23.537 - 22.537					47.755	-290.421	2793.680	0.104
	22.537 - 21.537					47.992	-290.656	2807.530	0.104

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	21.537 - 20.537					48.229	-291.007	2821.370	0.103
L42	20.537 - 19.537	TP35.68x34.84x0.438	5.000	0.000	0.0	48.465	-291.243	2835.210	0.103
	19.537 - 18.537					48.702	-291.480	2849.050	0.102
	18.537 - 17.537					48.938	-291.717	2862.900	0.102
	17.537 - 16.537					49.175	-291.955	2876.740	0.101
	16.537 - 15.537					49.412	-292.194	2890.580	0.101
L43	15.537 - 14.537	TP36.52x35.68x0.438	5.000	0.000	0.0	49.648	-292.434	2904.420	0.101
	14.537 - 13.537					49.885	-292.674	2918.270	0.100
	13.537 - 12.537					50.121	-292.915	2932.110	0.100
	12.537 - 11.537					50.358	-293.157	2945.950	0.100
	11.537 - 10.537					50.595	-293.400	2959.790	0.099
L44	10.537 - 9.537	TP37.36x36.52x0.438	5.000	0.000	0.0	50.831	-293.643	2973.640	0.099
	9.537 - 8.537					51.068	-293.888	2987.480	0.098
	8.537 - 7.537					51.305	-294.133	3001.320	0.098
	7.537 - 6.537					51.541	-294.379	3015.160	0.098
	6.537 - 5.537					51.778	-294.626	3029.010	0.097
L45	5.537 - 4.537	TP38.2x37.36x0.438	5.000	0.000	0.0	52.014	-294.874	3042.850	0.097
	4.537 - 3.537					52.251	-295.122	3056.690	0.097
	3.537 - 2.537					52.488	-295.372	3070.530	0.096
	2.537 - 1.537					52.724	-295.622	3084.380	0.096
	1.537 - 0.537					52.961	-295.873	3098.220	0.095
L46	0.537 - 0 (46)	TP38.29x38.2x0.438	0.537	0.000	0.0	53.198	-296.125	3112.060	0.095

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150.167 - 149.167	TP16.31x15.53x0.25	1.081	285.687	0.004	0.000	285.687	0.000
	149.167 - 148.167		10.786	291.537	0.037	0.000	291.537	0.000
	148.167 - 147.167		17.945	297.446	0.060	0.000	297.446	0.000
	147.167 - 146.167		25.178	303.414	0.083	0.000	303.414	0.000
	146.167 - 145.167		32.487	309.443	0.105	0.000	309.443	0.000
L2	145.167 - 144.167	TP17.09x16.31x0.25	39.870	315.530	0.126	0.000	315.530	0.000
	144.167 - 143.167		47.329	321.677	0.147	0.000	321.677	0.000
	143.167 - 142.167		54.863	327.882	0.167	0.000	327.882	0.000
	142.167 - 141.167		62.473	334.147	0.187	0.000	334.147	0.000
	141.167 - 140.167		70.159	340.472	0.206	0.000	340.472	0.000
L3	140.167 - 139.167	TP17.87x17.09x0.25	81.934	346.856	0.236	0.000	346.856	0.000
	139.167 - 138.167		94.715	353.299	0.268	0.000	353.299	0.000
	138.167 -		107.571	359.802	0.299	0.000	359.802	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	137.167							
	137.167 - 136.167		120.503	366.363	0.329	0.000	366.363	0.000
	136.167 - 135.167		133.507	372.984	0.358	0.000	372.984	0.000
L4	135.167 - 134.167	TP18.65x17.87x0.25	146.587	379.664	0.386	0.000	379.664	0.000
	134.167 - 133.167		159.759	386.404	0.413	0.000	386.404	0.000
	133.167 - 132.167		172.996	393.203	0.440	0.000	393.203	0.000
	132.167 - 131.167		186.305	400.062	0.466	0.000	400.062	0.000
	131.167 - 130.167		199.688	406.979	0.491	0.000	406.979	0.000
L5	130.167 - 129.167	TP19.43x18.65x0.25	227.993	413.956	0.551	0.000	413.956	0.000
	129.167 - 128.167		246.552	420.992	0.586	0.000	420.992	0.000
	128.167 - 127.167		265.176	428.087	0.619	0.000	428.087	0.000
	127.167 - 126.167		283.865	435.243	0.652	0.000	435.243	0.000
	126.167 - 125.167		302.618	442.456	0.684	0.000	442.456	0.000
L6	125.167 - 123.75 (6)	TP19.651x19.43x0.25	329.301	452.780	0.727	0.000	452.780	0.000
L7	123.75 - 123.5 (7)	TP19.69x19.651x0.513	334.035	894.717	0.373	0.000	894.717	0.000
L8	123.5 - 122.5	TP20.47x19.69x0.5	352.960	889.058	0.397	0.000	889.058	0.000
	122.5 - 121.5		371.977	903.633	0.412	0.000	903.633	0.000
	121.5 - 120.5		391.075	918.333	0.426	0.000	918.333	0.000
	120.5 - 119.5		410.255	933.150	0.440	0.000	933.150	0.000
	119.5 - 118.5		429.515	948.083	0.453	0.000	948.083	0.000
L9	118.5 - 117.5	TP21.25x20.47x0.488	448.894	940.808	0.477	0.000	940.808	0.000
	117.5 - 116.5		468.429	955.617	0.490	0.000	955.617	0.000
	116.5 - 115.5		488.119	970.533	0.503	0.000	970.533	0.000
	115.5 - 114.5		507.965	985.567	0.515	0.000	985.567	0.000
	114.5 - 113.5		527.966	1000.725	0.528	0.000	1000.725	0.000
L10	113.5 - 112.167 (10)	TP21.458x21.25x0.488	554.881	1021.100	0.543	0.000	1021.100	0.000
L11	112.167 - 111.917 (11)	TP21.497x21.458x0.7	559.981	1427.508	0.392	0.000	1427.508	0.000
L12	111.917 - 110.167 (12)	TP21.77x21.497x0.7	595.846	1465.850	0.406	0.000	1465.850	0.000
L13	110.167 - 109.917 (13)	TP21.813x21.77x0.625	601.028	1328.275	0.452	0.000	1328.275	0.000
L14	109.917 - 108.917	TP22.672x21.813x0.6	621.781	1300.758	0.478	0.000	1300.758	0.000
	108.917 - 107.917		642.726	1322.025	0.486	0.000	1322.025	0.000
	107.917 - 106.917		663.849	1343.458	0.494	0.000	1343.458	0.000
	106.917 - 105.917		685.150	1365.075	0.502	0.000	1365.075	0.000
	105.917 - 104.917		706.628	1386.858	0.510	0.000	1386.858	0.000
L15	104.917 - 103.917	TP23.53x22.672x0.588	728.250	1381.792	0.527	0.000	1381.792	0.000
	103.917 - 102.917		749.983	1403.475	0.534	0.000	1403.475	0.000
	102.917 - 101.917		771.828	1425.325	0.542	0.000	1425.325	0.000
	101.917 - 100.917		793.783	1447.350	0.548	0.000	1447.350	0.000
	100.917 - 99.917		815.849	1469.542	0.555	0.000	1469.542	0.000
L16	99.917 - 98.6877	TP24.375x23.53x0.575	843.100	1467.575	0.574	0.000	1467.575	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	98.6877 - 97.4585		870.467	1494.775	0.582	0.000	1494.775	0.000
	97.4585 - 96.2292		897.958	1522.225	0.590	0.000	1522.225	0.000
	96.2292 - 95		925.558	1549.917	0.597	0.000	1549.917	0.000
L17	95 - 94.75 (17)	TP24.418x24.375x0.7	931.200	1864.125	0.500	0.000	1864.125	0.000
L18	94.75 - 93.75	TP25.277x24.418x0.688	953.758	1860.750	0.513	0.000	1860.750	0.000
	93.75 - 92.75		976.408	1887.958	0.517	0.000	1887.958	0.000
	92.75 - 91.75		999.142	1915.375	0.522	0.000	1915.375	0.000
	91.75 - 90.75		1021.967	1942.983	0.526	0.000	1942.983	0.000
	90.75 - 89.75		1044.867	1970.792	0.530	0.000	1970.792	0.000
L19	89.75 - 88.6875	TP26.007x25.277x0.675	1069.292	1967.150	0.544	0.000	1967.150	0.000
	88.6875 - 87.625		1005.533	1967.150	0.511	0.000	1967.150	0.000
	87.625 - 86.5625		1016.442	1996.608	0.509	0.000	1996.608	0.000
	86.5625 - 85.5		1027.242	2026.292	0.507	0.000	2026.292	0.000
L20	85.5 - 85.25 (20)	TP26.049x26.007x0.863	1037.933	2569.450	0.404	0.000	2569.450	0.000
L21	85.25 - 85 (21)	TP26.092x26.049x0.863	1040.442	2578.375	0.404	0.000	2578.375	0.000
L22	85 - 84.75 (22)	TP26.135x26.092x0.838	1042.950	2519.800	0.414	0.000	2519.800	0.000
L23	84.75 - 83 (23)	TP26.436x26.135x0.838	1045.458	2528.517	0.413	0.000	2528.517	0.000
L24	83 - 82.65 (24)	TP26.496x26.436x0.713	1063.425	2235.808	0.476	0.000	2235.808	0.000
L25	82.65 - 82.4167 (25)	TP26.536x26.496x0.713	1068.367	2246.408	0.476	0.000	2246.408	0.000
L26	82.4167 - 81.4167	TP27.395x26.536x0.688	1071.667	2180.742	0.491	0.000	2180.742	0.000
	81.4167 - 80.4167		1085.650	2210.200	0.491	0.000	2210.200	0.000
	80.4167 - 79.4167		1099.458	2239.850	0.491	0.000	2239.850	0.000
	79.4167 - 78.4167		1113.100	2269.700	0.490	0.000	2269.700	0.000
	78.4167 - 77.4167		1126.558	2299.742	0.490	0.000	2299.742	0.000
L27	77.4167 - 76.1935	TP28.64x27.395x0.688	1139.858	2329.992	0.489	0.000	2329.992	0.000
	76.1935 - 74.9702		1155.883	2367.250	0.488	0.000	2367.250	0.000
	74.9702 - 73.747		1171.658	2404.817	0.487	0.000	2404.817	0.000
	73.747 - 70.167		601.098	2442.675	0.246	0.000	2442.675	0.000
L28	73.747 - 70.167	TP28.079x27.4x0.725	586.087	2447.725	0.239	0.000	2447.725	0.000
	70.167 - 69.167		1234.000	2547.442	0.484	0.000	2547.442	0.000
L29	69.167 - 68.167	TP28.821x28.079x0.713	1247.575	2534.717	0.492	0.000	2534.717	0.000
	68.167 - 67.167		1260.967	2562.617	0.492	0.000	2562.617	0.000
	67.167 - 66.167		1274.200	2590.667	0.492	0.000	2590.667	0.000
	66.167 - 65.167		1287.250	2618.867	0.492	0.000	2618.867	0.000
	65.167 - 64.167		1300.133	2647.225	0.491	0.000	2647.225	0.000
L30	64.167 - 63.167	TP29.562x28.821x0.725	1312.850	2719.042	0.483	0.000	2719.042	0.000
	63.167 - 62.167		1325.400	2748.183	0.482	0.000	2748.183	0.000
	62.167 -		1337.792	2777.483	0.482	0.000	2777.483	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	61.167							
	61.167 - 60.167		1350.017	2806.942	0.481	0.000	2806.942	0.000
	60.167 - 59.167		1362.083	2836.550	0.480	0.000	2836.550	0.000
L31	59.167 - 58.167	TP30.304x29.562x0.713	1374.000	2820.558	0.487	0.000	2820.558	0.000
	58.167 - 57.167		1385.750	2849.983	0.486	0.000	2849.983	0.000
	57.167 - 56.167		1397.342	2879.558	0.485	0.000	2879.558	0.000
	56.167 - 55.167		1408.775	2909.292	0.484	0.000	2909.292	0.000
	55.167 - 54.167		1420.050	2939.167	0.483	0.000	2939.167	0.000
L32	54.167 - 53.167	TP31.045x30.304x0.7	1431.175	2920.817	0.490	0.000	2920.817	0.000
	53.167 - 52.167		1442.142	2950.492	0.489	0.000	2950.492	0.000
	52.167 - 51.167		1452.950	2980.317	0.488	0.000	2980.317	0.000
	51.167 - 50.167		1463.600	3010.292	0.486	0.000	3010.292	0.000
	50.167 - 49.167		1474.100	3040.425	0.485	0.000	3040.425	0.000
L33	49.167 - 48.1668	TP31.342x31.045x0.7	1484.442	3070.700	0.483	0.000	3070.700	0.000
	48.1668 - 47.1667		1494.642	3101.133	0.482	0.000	3101.133	0.000
L34	47.1667 - 46.9167 (34)	TP31.379x31.342x0.788	1504.683	3493.083	0.431	0.000	3493.083	0.000
L35	46.9167 - 45.75	TP31.898x31.379x0.775	1507.175	3450.317	0.437	0.000	3450.317	0.000
	45.75 - 44.5834		1518.692	3489.925	0.435	0.000	3489.925	0.000
	44.5834 - 43.4167		1530.033	3529.758	0.433	0.000	3529.758	0.000
L36	43.4167 - 43.1667 (36)	TP31.935x31.898x0.65	1541.208	3030.258	0.509	0.000	3030.258	0.000
L37	43.1667 - 42.1667	TP32.677x31.935x0.65	1543.583	3037.525	0.508	0.000	3037.525	0.000
	42.1667 - 41.1667		1552.983	3066.683	0.506	0.000	3066.683	0.000
	41.1667 - 40.1667		1562.208	3095.983	0.505	0.000	3095.983	0.000
	40.1667 - 39.1667		1571.283	3125.425	0.503	0.000	3125.425	0.000
	39.1667 - 38.1667		1580.200	3155.008	0.501	0.000	3155.008	0.000
L38	38.1667 - 36.9569	TP33.66x32.677x0.65	1588.958	3184.725	0.499	0.000	3184.725	0.000
	36.9569 - 35.747		1599.350	3220.867	0.497	0.000	3220.867	0.000
	35.747 - 31.537		979.700	3257.208	0.301	0.000	3257.208	0.000
L39	35.747 - 31.537	TP33.161x32.286x0.438	629.820	2133.433	0.295	0.000	2133.433	0.000
	31.537 - 30.537		1644.133	2229.875	0.737	0.000	2229.875	0.000
L40	30.537 - 29.537	TP34.001x33.161x0.438	1652.125	2253.100	0.733	0.000	2253.100	0.000
	29.537 - 28.537		1659.825	2276.442	0.729	0.000	2276.442	0.000
	28.537 - 27.537		1667.258	2299.908	0.725	0.000	2299.908	0.000
	27.537 - 26.537		1674.408	2323.492	0.721	0.000	2323.492	0.000
	26.537 - 25.537		1681.300	2347.192	0.716	0.000	2347.192	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L41	25.537 - 24.537	TP34.84x34.001x0.438	1687.917	2371.017	0.712	0.000	2371.017	0.000
	24.537 - 23.537		1694.267	2394.967	0.707	0.000	2394.967	0.000
	23.537 - 22.537		1700.367	2419.025	0.703	0.000	2419.025	0.000
	22.537 - 21.537		1706.208	2443.217	0.698	0.000	2443.217	0.000
	21.537 - 20.537		1711.600	2467.517	0.694	0.000	2467.517	0.000
L42	20.537 - 19.537	TP35.68x34.84x0.438	1717.042	2491.942	0.689	0.000	2491.942	0.000
	19.537 - 18.537		1722.233	2516.492	0.684	0.000	2516.492	0.000
	18.537 - 17.537		1727.192	2541.158	0.680	0.000	2541.158	0.000
	17.537 - 16.537		1731.908	2565.942	0.675	0.000	2565.942	0.000
	16.537 - 15.537		1736.400	2590.850	0.670	0.000	2590.850	0.000
L43	15.537 - 14.537	TP36.52x35.68x0.438	1740.658	2615.875	0.665	0.000	2615.875	0.000
	14.537 - 13.537		1744.700	2641.025	0.661	0.000	2641.025	0.000
	13.537 - 12.537		1748.517	2666.292	0.656	0.000	2666.292	0.000
	12.537 - 11.537		1752.117	2691.683	0.651	0.000	2691.683	0.000
	11.537 - 10.537		1755.500	2717.192	0.646	0.000	2717.192	0.000
L44	10.537 - 9.537	TP37.36x36.52x0.438	1758.683	2738.708	0.642	0.000	2738.708	0.000
	9.537 - 8.537		1761.650	2760.625	0.638	0.000	2760.625	0.000
	8.537 - 7.537		1764.425	2782.592	0.634	0.000	2782.592	0.000
	7.537 - 6.537		1766.992	2804.600	0.630	0.000	2804.600	0.000
	6.537 - 5.537		1769.375	2826.667	0.626	0.000	2826.667	0.000
L45	5.537 - 4.537	TP38.2x37.36x0.438	1771.558	2848.775	0.622	0.000	2848.775	0.000
	4.537 - 3.537		1773.558	2870.933	0.618	0.000	2870.933	0.000
	3.537 - 2.537		1775.375	2893.142	0.614	0.000	2893.142	0.000
	2.537 - 1.537		1777.008	2915.392	0.610	0.000	2915.392	0.000
	1.537 - 0.537		1778.467	2937.692	0.605	0.000	2937.692	0.000
L46	0.537 - 0 (46)	TP38.29x38.2x0.438	1779.750	2960.033	0.601	0.000	2960.033	0.000

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Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150.167 - 149.167	TP16.31x15.53x0.25	0.666	218.076	0.003	0.004	296.103	0.000
	149.167 - 148.167		7.125	220.280	0.032	0.536	302.118	0.002
	148.167 - 147.167		7.200	222.484	0.032	0.536	308.193	0.002
	147.167 - 146.167		7.275	224.688	0.032	0.536	314.330	0.002
	146.167 - 145.167		7.350	226.892	0.032	0.536	320.527	0.002
L2	145.167 - 144.167	TP17.09x16.31x0.25	7.425	229.096	0.032	0.536	326.783	0.002
	144.167 - 143.167		7.501	231.300	0.032	0.536	333.102	0.002
	143.167 - 142.167		7.577	233.503	0.032	0.536	339.479	0.002
	142.167 -		7.653	235.707	0.032	0.536	345.918	0.002

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	141.167							
	141.167 - 140.167		7.729	237.911	0.032	0.536	352.418	0.002
L3	140.167 - 139.167	TP17.87x17.09x0.25	12.760	240.115	0.053	0.544	358.977	0.002
	139.167 - 138.167		12.835	242.319	0.053	0.544	365.597	0.001
	138.167 - 137.167		12.911	244.523	0.053	0.544	372.277	0.001
	137.167 - 136.167		12.986	246.727	0.053	0.543	379.018	0.001
	136.167 - 135.167		13.061	248.931	0.052	0.543	385.820	0.001
L4	135.167 - 134.167	TP18.65x17.87x0.25	13.135	251.135	0.052	0.542	392.682	0.001
	134.167 - 133.167		13.219	253.339	0.052	0.542	399.604	0.001
	133.167 - 132.167		13.293	255.543	0.052	0.505	406.587	0.001
	132.167 - 131.167		13.367	257.747	0.052	0.504	413.631	0.001
	131.167 - 130.167		13.440	259.951	0.052	0.503	420.735	0.001
L5	130.167 - 129.167	TP19.43x18.65x0.25	18.548	262.155	0.071	0.846	427.899	0.002
	129.167 - 128.167		18.615	264.358	0.070	0.845	435.124	0.002
	128.167 - 127.167		18.681	266.562	0.070	0.843	442.410	0.002
	127.167 - 126.167		18.747	268.766	0.070	0.842	449.756	0.002
	126.167 - 125.167		18.811	270.970	0.069	0.841	457.162	0.002
L6	125.167 - 123.75 (6)	TP19.651x19.43x0.25	18.905	274.093	0.069	0.839	467.760	0.002
L7	123.75 - 123.5 (7)	TP19.69x19.651x0.513	19.026	555.418	0.034	0.838	936.942	0.001
L8	123.5 - 122.5	TP20.47x19.69x0.5	19.000	546.632	0.035	0.837	930.225	0.001
	122.5 - 121.5		19.082	551.040	0.035	0.836	945.283	0.001
	121.5 - 120.5		19.164	555.448	0.035	0.835	960.467	0.001
	120.5 - 119.5		19.245	559.856	0.034	0.834	975.775	0.001
	119.5 - 118.5		19.327	564.264	0.034	0.833	991.200	0.001
L9	118.5 - 117.5	TP21.25x20.47x0.488	19.483	554.799	0.035	0.832	982.800	0.001
	117.5 - 116.5		19.639	559.097	0.035	0.826	998.083	0.001
	116.5 - 115.5		19.795	563.395	0.035	0.819	1013.483	0.001
	115.5 - 114.5		19.951	567.692	0.035	0.813	1029.008	0.001
	114.5 - 113.5		20.106	571.990	0.035	0.806	1044.642	0.001
L10	113.5 - 112.167 (10)	TP21.458x21.25x0.488	20.336	577.719	0.035	0.799	1065.675	0.001
L11	112.167 - 111.917 (11)	TP21.497x21.458x0.7	20.522	822.682	0.025	0.791	1504.983	0.001
L12	111.917 - 110.167 (12)	TP21.77x21.497x0.7	20.684	833.481	0.025	0.788	1544.758	0.001
L13	110.167 - 109.917 (13)	TP21.813x21.77x0.625	20.835	748.345	0.028	0.778	1394.733	0.001
L14	109.917 - 108.917	TP22.672x21.813x0.6	20.888	725.082	0.029	0.777	1363.925	0.001
	108.917 - 107.917		21.067	730.906	0.029	0.772	1385.917	0.001
	107.917 - 106.917		21.245	736.729	0.029	0.767	1408.092	0.001
	106.917 - 105.917		21.423	742.552	0.029	0.761	1430.442	0.001
	105.917 - 104.917		21.601	748.376	0.029	0.756	1452.967	0.001
L15	104.917 - 103.917	TP23.53x22.672x0.588	21.712	738.902	0.029	0.751	1446.550	0.001
	103.917 - 102.917		21.824	744.604	0.029	0.749	1468.958	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	102.917 - 101.917		21.935	750.306	0.029	0.748	1491.542	0.001
	101.917 - 100.917		22.046	756.008	0.029	0.746	1514.300	0.000
	100.917 - 99.917		22.157	761.710	0.029	0.745	1537.233	0.000
L16	99.917 - 98.6877	TP24.375x23.53x0.575	22.254	752.770	0.030	0.743	1533.992	0.000
	98.6877 - 97.4585		22.351	759.630	0.029	0.741	1562.083	0.000
	97.4585 - 96.2292		22.447	766.491	0.029	0.739	1590.425	0.000
	96.2292 - 95		22.543	773.351	0.029	0.737	1619.017	0.000
L17	95 - 94.75 (17)	TP24.418x24.375x0.7	22.683	938.224	0.024	0.736	1957.408	0.000
L18	94.75 - 93.75	TP25.277x24.418x0.688	22.646	928.629	0.024	0.735	1952.442	0.000
	93.75 - 92.75		22.730	935.301	0.024	0.733	1980.600	0.000
	92.75 - 91.75		22.814	941.974	0.024	0.732	2008.967	0.000
	91.75 - 90.75		22.898	948.647	0.024	0.731	2037.525	0.000
	90.75 - 89.75		22.983	955.320	0.024	0.729	2066.292	0.000
L19	89.75 - 88.6875	TP26.007x25.277x0.675	23.072	945.388	0.024	0.728	2061.025	0.000
	88.6875 - 87.625		14.678	952.349	0.015	2.066	2061.025	0.001
	87.625 - 86.5625		14.539	959.310	0.015	2.069	2091.483	0.001
	86.5625 - 85.5		14.401	966.270	0.015	2.071	2122.175	0.001
L20	85.5 - 85.25 (20)	TP26.049x26.007x0.863	14.531	1227.630	0.012	2.075	2710.583	0.001
L21	85.25 - 85 (21)	TP26.092x26.049x0.863	14.511	1229.730	0.012	2.075	2719.850	0.001
L22	85 - 84.75 (22)	TP26.135x26.092x0.838	14.483	1197.300	0.012	2.076	2655.275	0.001
L23	84.75 - 83 (23)	TP26.436x26.135x0.838	14.216	1211.520	0.012	2.073	2664.317	0.001
L24	83 - 82.65 (24)	TP26.496x26.436x0.713	14.257	1038.150	0.014	4.907	2343.558	0.002
L25	82.65 - 82.4167 (25)	TP26.536x26.496x0.713	14.281	1039.760	0.014	4.907	2354.525	0.002
L26	82.4167 - 81.4167	TP27.395x26.536x0.688	14.084	1010.930	0.014	4.907	2283.392	0.002
	81.4167 - 80.4167		13.907	1017.600	0.014	4.906	2313.833	0.002
	80.4167 - 79.4167		13.733	1024.270	0.013	4.906	2344.483	0.002
	79.4167 - 78.4167		13.560	1030.940	0.013	4.905	2375.325	0.002
	78.4167 - 77.4167		13.391	1037.620	0.013	4.904	2406.375	0.002
L27	77.4167 - 76.1935	TP28.64x27.395x0.688	13.208	1045.780	0.013	4.904	2437.625	0.002
	76.1935 - 74.9702		12.999	1053.940	0.012	4.903	2476.133	0.002
	74.9702 - 73.747		12.794	1062.100	0.012	4.902	2514.933	0.002
	73.747 - 70.167		7.479	1085.990	0.007	2.737	2554.042	0.001
L28	73.747 - 70.167	TP28.079x27.4x0.725	6.451	1114.650	0.006	2.165	2564.392	0.001
	70.167 - 69.167		13.653	1120.720	0.012	2.616	2667.483	0.001
L29	69.167 - 68.167	TP28.821x28.079x0.713	13.480	1107.870	0.012	2.615	2652.575	0.001
	68.167 - 67.167		13.307	1113.840	0.012	2.615	2681.400	0.001
	67.167 - 66.167		13.135	1119.820	0.012	2.614	2710.383	0.001
	66.167 -		12.965	1125.790	0.012	2.614	2739.525	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	65.167							
	65.167 - 64.167		12.797	1131.760	0.011	2.614	2768.817	0.001
L30	64.167 - 63.167	TP29.562x28.821x0.725	12.630	1157.180	0.011	2.613	2844.825	0.001
	63.167 - 62.167		12.468	1163.250	0.011	2.613	2874.942	0.001
	62.167 - 61.167		12.307	1169.330	0.011	2.613	2905.208	0.001
	61.167 - 60.167		12.147	1175.410	0.010	2.612	2935.642	0.001
	60.167 - 59.167		11.990	1181.480	0.010	2.612	2966.225	0.001
L31	59.167 - 58.167	TP30.304x29.562x0.713	11.830	1167.590	0.010	2.612	2947.858	0.001
	58.167 - 57.167		11.669	1173.560	0.010	2.611	2978.242	0.001
	57.167 - 56.167		11.511	1179.530	0.010	2.611	3008.783	0.001
	56.167 - 55.167		11.354	1185.500	0.010	2.611	3039.475	0.001
	55.167 - 54.167		11.199	1191.470	0.009	2.610	3070.325	0.001
L32	54.167 - 53.167	TP31.045x30.304x0.7	11.041	1176.930	0.009	2.610	3049.500	0.001
	53.167 - 52.167		10.883	1182.800	0.009	2.610	3080.133	0.001
	52.167 - 51.167		10.727	1188.660	0.009	2.610	3110.917	0.001
	51.167 - 50.167		10.573	1194.530	0.009	2.609	3141.850	0.001
	50.167 - 49.167		10.421	1200.400	0.009	2.609	3172.942	0.001
L33	49.167 - 48.1668	TP31.342x31.045x0.7	10.269	1206.260	0.009	2.609	3204.183	0.001
	48.1668 - 47.1667		10.119	1212.130	0.008	2.609	3235.583	0.001
L34	47.1667 - 46.9167 (34)	TP31.379x31.342x0.788	10.043	1361.400	0.007	2.608	3654.567	0.001
L35	46.9167 - 45.75	TP31.898x31.379x0.775	9.950	1347.920	0.007	2.608	3608.233	0.001
	45.75 - 44.5834		9.806	1355.500	0.007	2.608	3649.150	0.001
	44.5834 - 43.4167		9.665	1363.070	0.007	2.608	3690.292	0.001
L36	43.4167 - 43.1667 (36)	TP31.935x31.898x0.65	9.567	1149.180	0.008	2.608	3154.975	0.001
L37	43.1667 - 42.1667	TP32.677x31.935x0.65	9.464	1154.620	0.008	2.607	3162.467	0.001
	42.1667 - 41.1667		9.303	1160.070	0.008	2.607	3192.525	0.001
	41.1667 - 40.1667		9.144	1165.520	0.008	2.607	3222.717	0.001
	40.1667 - 39.1667		8.987	1170.970	0.008	2.607	3253.058	0.001
	39.1667 - 38.1667		8.833	1176.410	0.008	2.607	3283.533	0.001
L38	38.1667 - 36.9569	TP33.66x32.677x0.65	8.670	1183.000	0.007	2.606	3314.158	0.001
	36.9569 - 35.747		8.484	1189.590	0.007	2.606	3351.392	0.001
	35.747 - 31.537		5.237	1212.530	0.004	1.586	3388.842	0.000
L39	35.747 - 31.537	TP33.161x32.286x0.438	3.232	804.883	0.004	1.020	2205.867	0.000
	31.537 - 30.537		8.055	809.036	0.010	2.605	2304.908	0.001
L40	30.537 - 29.537	TP34.001x33.161x0.438	7.773	813.188	0.010	2.605	2328.758	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	29.537 - 28.537		7.496	817.341	0.009	2.605	2352.725	0.001
	28.537 - 27.537		7.222	821.494	0.009	2.605	2376.817	0.001
	27.537 - 26.537		6.952	825.647	0.008	2.604	2401.033	0.001
	26.537 - 25.537		6.686	829.799	0.008	2.604	2425.367	0.001
L41	25.537 - 24.537	TP34.84x34.001x0.438	6.424	833.952	0.008	2.604	2449.825	0.001
	24.537 - 23.537		6.166	838.105	0.007	2.604	2474.408	0.001
	23.537 - 22.537		5.911	842.258	0.007	2.604	2499.108	0.001
	22.537 - 21.537		5.755	846.410	0.007	2.603	2523.942	0.001
	21.537 - 20.537		5.509	850.563	0.006	2.295	2548.892	0.001
L42	20.537 - 19.537	TP35.68x34.84x0.438	5.266	854.716	0.006	2.295	2573.958	0.001
	19.537 - 18.537		5.028	858.869	0.006	2.295	2599.158	0.001
	18.537 - 17.537		4.793	863.022	0.006	2.295	2624.475	0.001
	17.537 - 16.537		4.562	867.174	0.005	2.295	2649.917	0.001
	16.537 - 15.537		4.335	871.327	0.005	2.295	2675.483	0.001
L43	15.537 - 14.537	TP36.52x35.68x0.438	4.112	875.480	0.005	2.295	2701.167	0.001
	14.537 - 13.537		3.893	879.633	0.004	2.295	2726.975	0.001
	13.537 - 12.537		3.678	883.785	0.004	2.295	2752.908	0.001
	12.537 - 11.537		3.467	887.938	0.004	2.295	2778.958	0.001
	11.537 - 10.537		3.259	892.091	0.004	2.294	2805.142	0.001
L44	10.537 - 9.537	TP37.36x36.52x0.438	3.056	896.244	0.003	2.294	2831.442	0.001
	9.537 - 8.537		2.856	900.396	0.003	2.294	2857.858	0.001
	8.537 - 7.537		2.661	904.549	0.003	2.294	2884.408	0.001
	7.537 - 6.537		2.469	908.702	0.003	2.294	2911.075	0.001
	6.537 - 5.537		2.282	912.855	0.002	2.294	2937.867	0.001
L45	5.537 - 4.537	TP38.2x37.36x0.438	2.098	917.008	0.002	2.294	2964.775	0.001
	4.537 - 3.537		1.919	921.160	0.002	2.294	2991.817	0.001
	3.537 - 2.537		1.745	925.313	0.002	2.294	3018.975	0.001
	2.537 - 1.537		1.575	929.466	0.002	2.294	3046.258	0.001
	1.537 - 0.537		1.411	933.619	0.002	2.294	3073.658	0.001
L46	0.537 - 0 (46)	TP38.29x38.2x0.438	1.265	935.849	0.001	2.294	3101.183	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150.167 - 149.167	0.000	0.004	0.000	0.003	0.000	0.004	1.050	4.8.2
	149.167 - 148.167	0.006	0.037	0.000	0.032	0.002	0.044	1.050	4.8.2
	148.167 - 147.167	0.006	0.060	0.000	0.032	0.002	0.068	1.050	4.8.2
	147.167 -	0.006	0.083	0.000	0.032	0.002	0.090	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	146.167								
	146.167 - 145.167	0.006	0.105	0.000	0.032	0.002	0.112	1.050	4.8.2
L2	145.167 - 144.167	0.006	0.126	0.000	0.032	0.002	0.134	1.050	4.8.2
	144.167 - 143.167	0.006	0.147	0.000	0.032	0.002	0.155	1.050	4.8.2
	143.167 - 142.167	0.006	0.167	0.000	0.032	0.002	0.175	1.050	4.8.2
	142.167 - 141.167	0.006	0.187	0.000	0.032	0.002	0.194	1.050	4.8.2
	141.167 - 140.167	0.006	0.206	0.000	0.032	0.002	0.214	1.050	4.8.2
L3	140.167 - 139.167	0.010	0.236	0.000	0.053	0.002	0.249	1.050	4.8.2
	139.167 - 138.167	0.010	0.268	0.000	0.053	0.001	0.281	1.050	4.8.2
	138.167 - 137.167	0.010	0.299	0.000	0.053	0.001	0.312	1.050	4.8.2
	137.167 - 136.167	0.010	0.329	0.000	0.053	0.001	0.342	1.050	4.8.2
	136.167 - 135.167	0.010	0.358	0.000	0.052	0.001	0.371	1.050	4.8.2
L4	135.167 - 134.167	0.010	0.386	0.000	0.052	0.001	0.399	1.050	4.8.2
	134.167 - 133.167	0.010	0.413	0.000	0.052	0.001	0.427	1.050	4.8.2
	133.167 - 132.167	0.010	0.440	0.000	0.052	0.001	0.453	1.050	4.8.2
	132.167 - 131.167	0.010	0.466	0.000	0.052	0.001	0.479	1.050	4.8.2
	131.167 - 130.167	0.010	0.491	0.000	0.052	0.001	0.504	1.050	4.8.2
L5	130.167 - 129.167	0.014	0.551	0.000	0.071	0.002	0.570	1.050	4.8.2
	129.167 - 128.167	0.014	0.586	0.000	0.070	0.002	0.605	1.050	4.8.2
	128.167 - 127.167	0.014	0.619	0.000	0.070	0.002	0.639	1.050	4.8.2
	127.167 - 126.167	0.014	0.652	0.000	0.070	0.002	0.671	1.050	4.8.2
	126.167 - 125.167	0.014	0.684	0.000	0.069	0.002	0.703	1.050	4.8.2
L6	125.167 - 123.75 (6)	0.014	0.727	0.000	0.069	0.002	0.746	1.050	4.8.2
L7	123.75 - 123.5 (7)	0.007	0.373	0.000	0.034	0.001	0.382	1.050	4.8.2
L8	123.5 - 122.5	0.007	0.397	0.000	0.035	0.001	0.405	1.050	4.8.2
	122.5 - 121.5	0.007	0.412	0.000	0.035	0.001	0.420	1.050	4.8.2
	121.5 - 120.5	0.007	0.426	0.000	0.035	0.001	0.434	1.050	4.8.2
	120.5 - 119.5	0.007	0.440	0.000	0.034	0.001	0.448	1.050	4.8.2
	119.5 - 118.5	0.007	0.453	0.000	0.034	0.001	0.462	1.050	4.8.2
L9	118.5 - 117.5	0.008	0.477	0.000	0.035	0.001	0.486	1.050	4.8.2
	117.5 - 116.5	0.008	0.490	0.000	0.035	0.001	0.499	1.050	4.8.2
	116.5 - 115.5	0.008	0.503	0.000	0.035	0.001	0.512	1.050	4.8.2
	115.5 - 114.5	0.008	0.515	0.000	0.035	0.001	0.525	1.050	4.8.2
	114.5 - 113.5	0.008	0.528	0.000	0.035	0.001	0.537	1.050	4.8.2
L10	113.5 - 112.167 (10)	0.008	0.543	0.000	0.035	0.001	0.553	1.050	4.8.2
L11	112.167 - 111.917 (11)	0.006	0.392	0.000	0.025	0.001	0.399	1.050	4.8.2
L12	111.917 - 110.167 (12)	0.006	0.406	0.000	0.025	0.001	0.413	1.050	4.8.2
L13	110.167 - 109.917 (13)	0.007	0.452	0.000	0.028	0.001	0.460	1.050	4.8.2
L14	109.917 - 108.917	0.007	0.478	0.000	0.029	0.001	0.486	1.050	4.8.2
	108.917 - 107.917	0.008	0.486	0.000	0.029	0.001	0.495	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	107.917 - 106.917	0.008	0.494	0.000	0.029	0.001	0.503	1.050	4.8.2
	106.917 - 105.917	0.008	0.502	0.000	0.029	0.001	0.511	1.050	4.8.2
	105.917 - 104.917	0.008	0.510	0.000	0.029	0.001	0.518	1.050	4.8.2
L15	104.917 - 103.917	0.008	0.527	0.000	0.029	0.001	0.536	1.050	4.8.2
	103.917 - 102.917	0.008	0.534	0.000	0.029	0.001	0.544	1.050	4.8.2
	102.917 - 101.917	0.008	0.542	0.000	0.029	0.001	0.551	1.050	4.8.2
	101.917 - 100.917	0.009	0.548	0.000	0.029	0.000	0.558	1.050	4.8.2
	100.917 - 99.917	0.009	0.555	0.000	0.029	0.000	0.565	1.050	4.8.2
L16	99.917 - 98.6877	0.009	0.574	0.000	0.030	0.000	0.584	1.050	4.8.2
	98.6877 - 97.4585	0.009	0.582	0.000	0.029	0.000	0.592	1.050	4.8.2
	97.4585 - 96.2292	0.009	0.590	0.000	0.029	0.000	0.600	1.050	4.8.2
	96.2292 - 95	0.009	0.597	0.000	0.029	0.000	0.607	1.050	4.8.2
L17	95 - 94.75 (17)	0.007	0.500	0.000	0.024	0.000	0.508	1.050	4.8.2
L18	94.75 - 93.75	0.008	0.513	0.000	0.024	0.000	0.521	1.050	4.8.2
	93.75 - 92.75	0.008	0.517	0.000	0.024	0.000	0.525	1.050	4.8.2
	92.75 - 91.75	0.008	0.522	0.000	0.024	0.000	0.530	1.050	4.8.2
	91.75 - 90.75	0.008	0.526	0.000	0.024	0.000	0.534	1.050	4.8.2
	90.75 - 89.75	0.008	0.530	0.000	0.024	0.000	0.538	1.050	4.8.2
L19	89.75 - 88.6875	0.008	0.544	0.000	0.024	0.000	0.552	1.050	4.8.2
	88.6875 - 87.625	0.083	0.511	0.000	0.015	0.001	0.595	1.050	4.8.2
	87.625 - 86.5625	0.083	0.509	0.000	0.015	0.001	0.592	1.050	4.8.2
	86.5625 - 85.5	0.082	0.507	0.000	0.015	0.001	0.589	1.050	4.8.2
L20	85.5 - 85.25 (20)	0.064	0.404	0.000	0.012	0.001	0.468	1.050	4.8.2
L21	85.25 - 85 (21)	0.064	0.404	0.000	0.012	0.001	0.468	1.050	4.8.2
L22	85 - 84.75 (22)	0.066	0.414	0.000	0.012	0.001	0.480	1.050	4.8.2
L23	84.75 - 83 (23)	0.066	0.413	0.000	0.012	0.001	0.480	1.050	4.8.2
L24	83 - 82.65 (24)	0.079	0.476	0.000	0.014	0.002	0.555	1.050	4.8.2
L25	82.65 - 82.4167 (25)	0.078	0.476	0.000	0.014	0.002	0.554	1.050	4.8.2
L26	82.4167 - 81.4167	0.081	0.491	0.000	0.014	0.002	0.573	1.050	4.8.2
	81.4167 - 80.4167	0.081	0.491	0.000	0.014	0.002	0.572	1.050	4.8.2
	80.4167 - 79.4167	0.080	0.491	0.000	0.013	0.002	0.571	1.050	4.8.2
	79.4167 - 78.4167	0.080	0.490	0.000	0.013	0.002	0.570	1.050	4.8.2
	78.4167 - 77.4167	0.079	0.490	0.000	0.013	0.002	0.569	1.050	4.8.2
L27	77.4167 - 76.1935	0.079	0.489	0.000	0.013	0.002	0.568	1.050	4.8.2
	76.1935 - 74.9702	0.078	0.488	0.000	0.012	0.002	0.567	1.050	4.8.2
	74.9702 - 73.747	0.078	0.487	0.000	0.012	0.002	0.565	1.050	4.8.2
	73.747 - 70.167	0.038	0.246	0.000	0.007	0.001	0.284	1.050	4.8.2
L28	73.747 -	0.038	0.239	0.000	0.006	0.001	0.278	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	70.167								
	70.167 - 69.167	0.074	0.484	0.000	0.012	0.001	0.559	1.050	4.8.2
L29	69.167 - 68.167	0.075	0.492	0.000	0.012	0.001	0.568	1.050	4.8.2
	68.167 - 67.167	0.075	0.492	0.000	0.012	0.001	0.567	1.050	4.8.2
	67.167 - 66.167	0.075	0.492	0.000	0.012	0.001	0.567	1.050	4.8.2
	66.167 - 65.167	0.074	0.492	0.000	0.012	0.001	0.566	1.050	4.8.2
	65.167 - 64.167	0.074	0.491	0.000	0.011	0.001	0.565	1.050	4.8.2
L30	64.167 - 63.167	0.072	0.483	0.000	0.011	0.001	0.555	1.050	4.8.2
	63.167 - 62.167	0.072	0.482	0.000	0.011	0.001	0.555	1.050	4.8.2
	62.167 - 61.167	0.072	0.482	0.000	0.011	0.001	0.554	1.050	4.8.2
	61.167 - 60.167	0.072	0.481	0.000	0.010	0.001	0.553	1.050	4.8.2
	60.167 - 59.167	0.071	0.480	0.000	0.010	0.001	0.552	1.050	4.8.2
L31	59.167 - 58.167	0.072	0.487	0.000	0.010	0.001	0.559	1.050	4.8.2
	58.167 - 57.167	0.072	0.486	0.000	0.010	0.001	0.558	1.050	4.8.2
	57.167 - 56.167	0.072	0.485	0.000	0.010	0.001	0.557	1.050	4.8.2
	56.167 - 55.167	0.071	0.484	0.000	0.010	0.001	0.556	1.050	4.8.2
	55.167 - 54.167	0.071	0.483	0.000	0.009	0.001	0.554	1.050	4.8.2
L32	54.167 - 53.167	0.072	0.490	0.000	0.009	0.001	0.562	1.050	4.8.2
	53.167 - 52.167	0.072	0.489	0.000	0.009	0.001	0.561	1.050	4.8.2
	52.167 - 51.167	0.071	0.488	0.000	0.009	0.001	0.559	1.050	4.8.2
	51.167 - 50.167	0.071	0.486	0.000	0.009	0.001	0.557	1.050	4.8.2
	50.167 - 49.167	0.071	0.485	0.000	0.009	0.001	0.556	1.050	4.8.2
L33	49.167 - 48.1668	0.071	0.483	0.000	0.009	0.001	0.554	1.050	4.8.2
	48.1668 - 47.1667	0.070	0.482	0.000	0.008	0.001	0.552	1.050	4.8.2
L34	47.1667 - 46.9167 (34)	0.062	0.431	0.000	0.007	0.001	0.493	1.050	4.8.2
L35	46.9167 - 45.75	0.063	0.437	0.000	0.007	0.001	0.500	1.050	4.8.2
	45.75 - 44.5834	0.063	0.435	0.000	0.007	0.001	0.498	1.050	4.8.2
	44.5834 - 43.4167	0.063	0.433	0.000	0.007	0.001	0.496	1.050	4.8.2
L36	43.4167 - 43.1667 (36)	0.074	0.509	0.000	0.008	0.001	0.583	1.050	4.8.2
L37	43.1667 - 42.1667	0.074	0.508	0.000	0.008	0.001	0.582	1.050	4.8.2
	42.1667 - 41.1667	0.074	0.506	0.000	0.008	0.001	0.580	1.050	4.8.2
	41.1667 - 40.1667	0.074	0.505	0.000	0.008	0.001	0.578	1.050	4.8.2
	40.1667 - 39.1667	0.073	0.503	0.000	0.008	0.001	0.576	1.050	4.8.2
	39.1667 - 38.1667	0.073	0.501	0.000	0.008	0.001	0.574	1.050	4.8.2
L38	38.1667 - 36.9569	0.073	0.499	0.000	0.007	0.001	0.572	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	36.9569 - 35.747	0.073	0.497	0.000	0.007	0.001	0.569	1.050	4.8.2
	35.747 - 31.537	0.043	0.301	0.000	0.004	0.000	0.344	1.050	4.8.2
L39	35.747 - 31.537	0.044	0.295	0.000	0.004	0.000	0.339	1.050	4.8.2
	31.537 - 30.537	0.108	0.737	0.000	0.010	0.001	0.845	1.050	4.8.2
L40	30.537 - 29.537	0.107	0.733	0.000	0.010	0.001	0.840	1.050	4.8.2
	29.537 - 28.537	0.107	0.729	0.000	0.009	0.001	0.836	1.050	4.8.2
	28.537 - 27.537	0.106	0.725	0.000	0.009	0.001	0.831	1.050	4.8.2
	27.537 - 26.537	0.106	0.721	0.000	0.008	0.001	0.826	1.050	4.8.2
	26.537 - 25.537	0.105	0.716	0.000	0.008	0.001	0.822	1.050	4.8.2
L41	25.537 - 24.537	0.105	0.712	0.000	0.008	0.001	0.817	1.050	4.8.2
	24.537 - 23.537	0.104	0.707	0.000	0.007	0.001	0.812	1.050	4.8.2
	23.537 - 22.537	0.104	0.703	0.000	0.007	0.001	0.807	1.050	4.8.2
	22.537 - 21.537	0.104	0.698	0.000	0.007	0.001	0.802	1.050	4.8.2
	21.537 - 20.537	0.103	0.694	0.000	0.006	0.001	0.797	1.050	4.8.2
L42	20.537 - 19.537	0.103	0.689	0.000	0.006	0.001	0.792	1.050	4.8.2
	19.537 - 18.537	0.102	0.684	0.000	0.006	0.001	0.787	1.050	4.8.2
	18.537 - 17.537	0.102	0.680	0.000	0.006	0.001	0.782	1.050	4.8.2
	17.537 - 16.537	0.101	0.675	0.000	0.005	0.001	0.776	1.050	4.8.2
	16.537 - 15.537	0.101	0.670	0.000	0.005	0.001	0.771	1.050	4.8.2
L43	15.537 - 14.537	0.101	0.665	0.000	0.005	0.001	0.766	1.050	4.8.2
	14.537 - 13.537	0.100	0.661	0.000	0.004	0.001	0.761	1.050	4.8.2
	13.537 - 12.537	0.100	0.656	0.000	0.004	0.001	0.756	1.050	4.8.2
	12.537 - 11.537	0.100	0.651	0.000	0.004	0.001	0.750	1.050	4.8.2
	11.537 - 10.537	0.099	0.646	0.000	0.004	0.001	0.745	1.050	4.8.2
L44	10.537 - 9.537	0.099	0.642	0.000	0.003	0.001	0.741	1.050	4.8.2
	9.537 - 8.537	0.098	0.638	0.000	0.003	0.001	0.737	1.050	4.8.2
	8.537 - 7.537	0.098	0.634	0.000	0.003	0.001	0.732	1.050	4.8.2
	7.537 - 6.537	0.098	0.630	0.000	0.003	0.001	0.728	1.050	4.8.2
	6.537 - 5.537	0.097	0.626	0.000	0.002	0.001	0.723	1.050	4.8.2
L45	5.537 - 4.537	0.097	0.622	0.000	0.002	0.001	0.719	1.050	4.8.2
	4.537 - 3.537	0.097	0.618	0.000	0.002	0.001	0.714	1.050	4.8.2
	3.537 - 2.537	0.096	0.614	0.000	0.002	0.001	0.710	1.050	4.8.2
	2.537 - 1.537	0.096	0.610	0.000	0.002	0.001	0.705	1.050	4.8.2
	1.537 - 0.537	0.095	0.605	0.000	0.002	0.001	0.701	1.050	4.8.2
L46	0.537 - 0 (46)	0.095	0.601	0.000	0.001	0.001	0.696	1.050	4.8.2

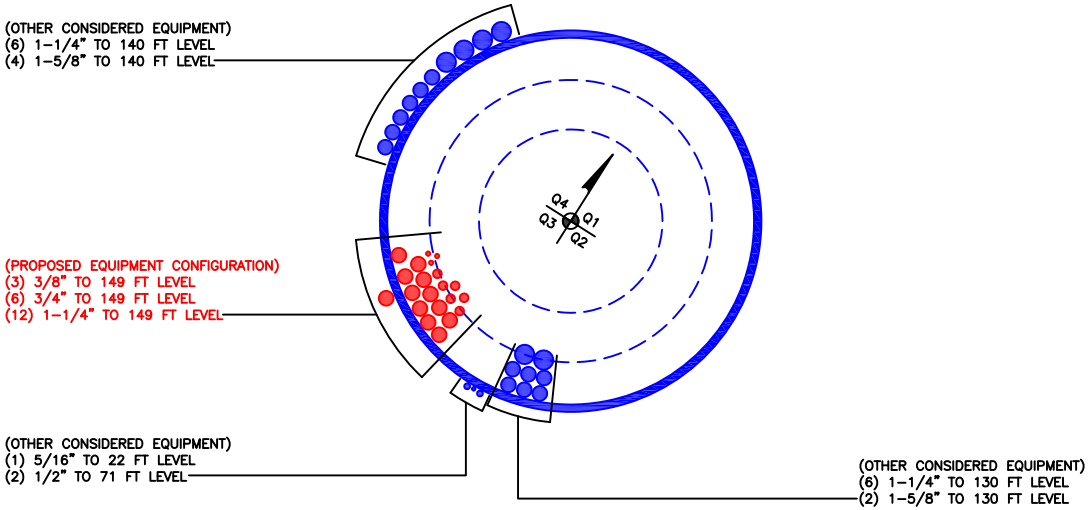
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150.167 - 145.167	Pole	TP16.31x15.53x0.25	1	-4.723	794.121	10.7	Pass
L2	145.167 - 140.167	Pole	TP17.09x16.31x0.25	2	-5.021	832.690	20.3	Pass
L3	140.167 - 135.167	Pole	TP17.87x17.09x0.25	3	-8.519	871.258	35.3	Pass
L4	135.167 - 130.167	Pole	TP18.65x17.87x0.25	4	-8.984	909.827	48.0	Pass
L5	130.167 - 125.167	Pole	TP19.43x18.65x0.25	5	-12.624	948.396	67.0	Pass
L6	125.167 - 123.75	Pole	TP19.651x19.43x0.25	6	-12.792	959.326	71.1	Pass
L7	123.75 - 123.5	Pole	TP19.69x19.651x0.513	7	-12.859	1943.959	36.3	Pass
L8	123.5 - 118.5	Pole	TP20.47x19.69x0.5	8	-13.675	1974.924	44.0	Pass
L9	118.5 - 113.5	Pole	TP21.25x20.47x0.488	9	-15.607	2001.961	51.1	Pass
L10	113.5 - 112.167	Pole	TP21.458x21.25x0.488	10	-16.252	2022.016	52.7	Pass
L11	112.167 - 111.917	Pole	TP21.497x21.458x0.7	11	-16.400	2879.383	38.0	Pass
L12	111.917 - 110.167	Pole	TP21.77x21.497x0.7	12	-17.230	2917.183	39.4	Pass
L13	110.167 - 109.917	Pole	TP21.813x21.77x0.625	13	-17.330	2619.204	43.8	Pass
L14	109.917 - 104.917	Pole	TP22.672x21.813x0.6	14	-19.976	2619.319	49.4	Pass
L15	104.917 - 99.917	Pole	TP23.53x22.672x0.588	15	-21.793	2665.981	53.8	Pass
L16	99.917 - 95	Pole	TP24.375x23.53x0.575	16	-23.022	2706.732	57.8	Pass
L17	95 - 94.75	Pole	TP24.418x24.375x0.7	17	-23.110	3283.780	48.3	Pass
L18	94.75 - 89.75	Pole	TP25.277x24.418x0.688	18	-24.516	3343.620	51.3	Pass
L19	89.75 - 85.5	Pole	TP26.007x25.277x0.675	19	-262.030	3308.854	56.6	Pass
L20	85.5 - 85.25	Pole	TP26.049x26.007x0.863	20	-262.757	4289.386	44.6	Pass
L21	85.25 - 85	Pole	TP26.092x26.049x0.863	21	-262.835	4296.715	44.6	Pass
L22	85 - 84.75	Pole	TP26.135x26.092x0.838	22	-262.912	4183.431	45.7	Pass
L23	84.75 - 83	Pole	TP26.436x26.135x0.838	23	-262.992	4190.539	45.7	Pass
L24	83 - 82.65	Pole	TP26.496x26.436x0.713	24	-271.525	3625.062	52.8	Pass
L25	82.65 - 82.4167	Pole	TP26.536x26.496x0.713	25	-271.626	3633.525	52.8	Pass
L26	82.4167 - 77.4167	Pole	TP27.395x26.536x0.688	26	-271.699	3514.885	54.6	Pass
L27	77.4167 - 70.167	Pole	TP28.64x27.395x0.688	27	-273.152	3631.656	54.1	Pass
L28	70.167 - 69.167	Pole	TP28.079x27.4x0.725	28	-276.307	3901.254	53.2	Pass
L29	69.167 - 64.167	Pole	TP28.821x28.079x0.713	29	-276.594	3856.660	54.1	Pass
L30	64.167 - 59.167	Pole	TP29.562x28.821x0.725	30	-278.034	4028.850	52.9	Pass
L31	59.167 - 54.167	Pole	TP30.304x29.562x0.713	31	-279.488	4065.652	53.3	Pass
L32	54.167 - 49.167	Pole	TP31.045x30.304x0.7	32	-280.958	4098.717	53.5	Pass
L33	49.167 - 47.1667	Pole	TP31.342x31.045x0.7	33	-282.444	4201.386	52.8	Pass
L34	47.1667 - 46.9167	Pole	TP31.379x31.342x0.788	34	-283.041	4759.135	47.0	Pass
L35	46.9167 - 43.4167	Pole	TP31.898x31.379x0.775	35	-283.127	4691.190	47.6	Pass
L36	43.4167 - 43.1667	Pole	TP31.935x31.898x0.65	36	-284.267	4017.352	55.5	Pass
L37	43.1667 - 38.1667	Pole	TP32.677x31.935x0.65	37	-284.344	4022.119	55.5	Pass
L38	38.1667 - 31.537	Pole	TP33.66x32.677x0.65	38	-285.816	4117.449	54.5	Pass
L39	31.537 - 30.537	Pole	TP33.161x32.286x0.438	39	-288.571	2817.087	80.5	Pass
L40	30.537 - 25.537	Pole	TP34.001x33.161x0.438	40	-288.800	2831.629	80.0	Pass
L41	25.537 - 20.537	Pole	TP34.84x34.001x0.438	41	-289.955	2904.300	77.8	Pass
L42	20.537 - 15.537	Pole	TP35.68x34.84x0.438	42	-291.243	2976.970	75.4	Pass
L43	15.537 - 10.537	Pole	TP36.52x35.68x0.438	43	-292.434	3049.641	73.0	Pass
L44	10.537 - 5.537	Pole	TP37.36x36.52x0.438	44	-293.643	3122.322	70.6	Pass
L45	5.537 - 0.537	Pole	TP38.2x37.36x0.438	45	-294.874	3194.992	68.5	Pass
L46	0.537 - 0	Pole	TP38.29x38.2x0.438	46	-296.125	3267.663	66.3	Pass
L19	89.75 - 85.5	Guy A@88.6875	1 5/8	49	178.490	204.116	87.4	Pass
L19	89.75 - 85.5	Guy B@88.6875	1 3/8	48	98.527	146.157	67.4	Pass
L19	89.75 - 85.5	Guy C@88.6875	1 3/8	47	109.817	146.157	75.1	Pass
							Summary	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
						Pole (L39)	80.5	Pass
						Guy A (L19)	87.4	Pass
						Guy B (L19)	67.4	Pass
						Guy C (L19)	75.1	Pass
						RATING =	**87.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(6) 1-1/4" TO 140 FT LEVEL
(4) 1-5/8" TO 140 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 3/8" TO 149 FT LEVEL
(6) 3/4" TO 149 FT LEVEL
(12) 1-1/4" TO 149 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 5/16" TO 22 FT LEVEL
(2) 1/2" TO 71 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-1/4" TO 130 FT LEVEL
(2) 1-5/8" TO 130 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 841289

Work Order: 1895942

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150.167	40	0	12	15.53	21.77	0.25	Auto	A572-65
2	110.167	40	3.58	12	21.77	28.64	0.3125	Auto	A572-65
3	73.747	42.21	4.21	12	27.40	33.66	0.375	Auto	A572-65
4	35.747	35.747	0	12	32.29	38.29	0.4375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	73	95	plate	PL-4x1	2			E1				E1					
2	47.1667	85	plate	CCI-SFP-060100	2		E2				E2						
3	47.1667	83	plate	CCI-SFP-060100	1										E2		
4	85	110.167	plate	CCI-SFP-065125	2		E2				E2						
5	82.6667	110.167	plate	PL-6.5x1.25	1											E2	
6	112.167	123.75	plate	CCI-AFP-045100	3		E2				E2				E2		
7	32.667	47.1667	plate	CCI-CFP-065125	3		E3				E3				E3		
8	110.167	112.167	plate	BS-6.5x1.25	3	E2				E2				E2			
9	43.4167	85.5	plate	CCI-SFP-045100	2				E4				E4				
10																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	4	1	4	0.5	n/a	21.000	18.000	2.750	1.1875	A572-65
2	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
3	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
4	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
5	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
6	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
7	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
8	6.5	1.25	8.125	0.625	30.000	30.000	16.000	6.563	1.1875	A572-65
9	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	150.167 - 145.167	5		12	15.530	16.310	0.25	A572-65	1.000
2	145.167 - 140.167	5		12	16.310	17.090	0.25	A572-65	1.000
3	140.167 - 135.167	5		12	17.090	17.870	0.25	A572-65	1.000
4	135.167 - 130.167	5		12	17.870	18.650	0.25	A572-65	1.000
5	130.167 - 125.167	5		12	18.650	19.430	0.25	A572-65	1.000
6	125.167 - 123.75	1.417		12	19.430	19.651	0.25	A572-65	1.000
7	123.75 - 123.5	0.25		12	19.651	19.690	0.5125	A572-65	0.922
8	123.5 - 118.5	5		12	19.690	20.470	0.5	A572-65	0.927
9	118.5 - 113.5	5		12	20.470	21.250	0.4875	A572-65	0.933
10	113.5 - 112.167	1.333		12	21.250	21.458	0.4875	A572-65	0.929
11	112.167 - 111.917	0.25		12	21.458	21.497	0.7	A572-65	0.886
12	111.917 - 110.167	1.75	0	12	21.497	21.770	0.7	A572-65	0.879
13	110.167 - 109.917	0.25		12	21.770	21.813	0.625	A572-65	1.080
14	109.917 - 104.917	5		12	21.813	22.672	0.6	A572-65	1.100
15	104.917 - 99.917	5		12	22.672	23.530	0.5875	A572-65	1.101
16	99.917 - 95	4.917		12	23.530	24.375	0.575	A572-65	1.103
17	95 - 94.75	0.25		12	24.375	24.418	0.7	A572-65	1.060
18	94.75 - 89.75	5		12	24.418	25.277	0.6875	A572-65	1.057
19	89.75 - 85.5	4.25		12	25.277	26.007	0.675	A572-65	1.058
20	85.5 - 85.25	0.25		12	26.007	26.049	0.8625	A572-65	0.963
21	85.25 - 85	0.25		12	26.049	26.092	0.8625	A572-65	0.962
22	85 - 84.75	0.25		12	26.092	26.135	0.8375	A572-65	0.926
23	84.75 - 83	1.75		12	26.135	26.436	0.8375	A572-65	0.919
24	83 - 82.65	0.35		12	26.436	26.496	0.7125	A572-65	1.038
25	82.65 - 82.4167	0.2333		12	26.496	26.536	0.7125	A572-65	1.037
26	82.4167 - 77.4167	5		12	26.536	27.395	0.6875	A572-65	1.054
27	77.4167 - 73.747	7.2497	3.58	12	27.395	28.640	0.6875	A572-65	1.040
28	73.747 - 69.167	4.58		12	27.400	28.079	0.725	A572-65	0.947
29	69.167 - 64.167	5		12	28.079	28.821	0.7125	A572-65	0.952
30	64.167 - 59.167	5		12	28.821	29.562	0.725	A572-65	0.925
31	59.167 - 54.167	5		12	29.562	30.304	0.7125	A572-65	0.931
32	54.167 - 49.167	5		12	30.304	31.045	0.7	A572-65	0.937
33	49.167 - 47.1667	2.0003		12	31.045	31.342	0.7	A572-65	0.933
34	47.1667 - 46.9167	0.25		12	31.342	31.379	0.7875	A572-65	0.913
35	46.9167 - 43.4167	3.5		12	31.379	31.898	0.775	A572-65	0.920
36	43.4167 - 43.1667	0.25		12	31.898	31.935	0.65	A572-65	0.955
37	43.1667 - 38.1667	5		12	31.935	32.677	0.65	A572-65	0.946
38	38.1667 - 35.747	6.6297	4.21	12	32.677	33.660	0.65	A572-65	0.942
39	35.747 - 30.537	5.21		12	32.286	33.161	0.4375	A572-65	1.000
40	30.537 - 25.537	5		12	33.161	34.001	0.4375	A572-65	1.000
41	25.537 - 20.537	5		12	34.001	34.840	0.4375	A572-65	1.000
42	20.537 - 15.537	5		12	34.840	35.680	0.4375	A572-65	1.000
43	15.537 - 10.537	5		12	35.680	36.520	0.4375	A572-65	1.000
44	10.537 - 5.537	5		12	36.520	37.360	0.4375	A572-65	1.000
45	5.537 - 0.537	5		12	37.360	38.200	0.4375	A572-65	1.000
46	0.537 - 0	0.537		12	38.200	38.290	0.4375	A572-65	1.000

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150.167 - 145.167	4.72	32.49	7.35
2	145.167 - 140.167	5.02	70.16	7.73
3	140.167 - 135.167	8.52	133.51	13.06
4	135.167 - 130.167	8.98	199.69	13.44
5	130.167 - 125.167	12.62	302.62	18.81
6	125.167 - 123.75	12.79	329.30	18.90
7	123.75 - 123.5	12.86	334.04	19.03
8	123.5 - 118.5	13.67	429.52	19.33
9	118.5 - 113.5	15.61	527.97	20.11
10	113.5 - 112.167	16.25	554.88	20.34
11	112.167 - 111.917	16.40	559.98	20.52
12	111.917 - 110.167	17.23	595.85	20.68
13	110.167 - 109.917	17.33	601.03	20.83
14	109.917 - 104.917	19.98	706.63	21.60
15	104.917 - 99.917	21.79	815.85	22.16
16	99.917 - 95	23.02	925.56	22.54
17	95 - 94.75	23.11	931.20	22.68
18	94.75 - 89.75	24.52	1044.87	22.98
19	89.75 - 85.5	24.82	1069.29	23.07
20	85.5 - 85.25	262.83	1040.46	14.53
21	85.25 - 85	262.91	1042.97	14.51
22	85 - 84.75	262.98	1045.47	14.48
23	84.75 - 83	271.51	1063.44	14.42
24	83 - 82.65	271.62	1068.40	14.26
25	82.65 - 82.4167	271.69	1071.69	14.28
26	82.4167 - 77.4167	273.14	1139.86	13.39
27	77.4167 - 73.747	274.21	1187.19	12.79
28	73.747 - 69.167	276.58	1247.58	13.65
29	69.167 - 64.167	278.02	1312.86	12.80
30	64.167 - 59.167	279.48	1374.00	11.99
31	59.167 - 54.167	280.95	1431.18	11.20
32	54.167 - 49.167	282.43	1484.45	10.42
33	49.167 - 47.1667	283.04	1504.69	10.12
34	47.1667 - 46.9167	283.12	1507.19	10.04
35	46.9167 - 43.4167	284.26	1541.22	9.67
36	43.4167 - 43.1667	284.34	1543.59	9.57
37	43.1667 - 38.1667	285.81	1588.96	8.83
38	38.1667 - 35.747	286.53	1609.52	8.48
39	35.747 - 30.537	288.79	1652.12	8.06
40	30.537 - 25.537	289.95	1687.91	6.69
41	25.537 - 20.537	291.24	1717.04	5.51
42	20.537 - 15.537	292.43	1740.66	4.34
43	15.537 - 10.537	293.64	1758.68	3.26
44	10.537 - 5.537	294.87	1771.56	2.28
45	5.537 - 0.537	296.12	1779.75	1.41
46	0.537 - 0	296.26	1780.37	1.27

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150.17 - 145.17	Pole	TP16.31x15.53x0.25	Pole	10.5%	Pass
145.17 - 140.17	Pole	TP17.09x16.31x0.25	Pole	20.1%	Pass
140.17 - 135.17	Pole	TP17.87x17.09x0.25	Pole	34.8%	Pass
135.17 - 130.17	Pole	TP18.65x17.87x0.25	Pole	47.4%	Pass
130.17 - 125.17	Pole	TP19.43x18.65x0.25	Pole	66.1%	Pass
125.17 - 123.75	Pole	TP19.651x19.43x0.25	Pole	70.2%	Pass
123.75 - 123.5	Pole + Reinf.	TP19.69x19.651x0.5125	Reinf. 6 Tension Rupture	61.9%	Pass
123.5 - 118.5	Pole + Reinf.	TP20.47x19.69x0.5	Reinf. 6 Tension Rupture	74.9%	Pass
118.5 - 113.5	Pole + Reinf.	TP21.25x20.47x0.4875	Reinf. 6 Tension Rupture	86.9%	Pass
113.5 - 112.17	Pole + Reinf.	TP21.458x21.25x0.4875	Reinf. 6 Tension Rupture	90.0%	Pass
112.17 - 111.92	Pole + Reinf.	TP21.497x21.458x0.7	Reinf. 8 Tension Rupture	58.2%	Pass
111.92 - 110.17	Pole + Reinf.	TP21.77x21.497x0.7	Reinf. 8 Tension Rupture	60.9%	Pass
110.17 - 109.92	Pole + Reinf.	TP21.813x21.77x0.625	Reinf. 4 Tension Rupture	59.8%	Pass
109.92 - 104.92	Pole + Reinf.	TP22.672x21.813x0.6	Reinf. 4 Tension Rupture	66.4%	Pass
104.92 - 99.92	Pole + Reinf.	TP23.53x22.672x0.5875	Reinf. 4 Tension Rupture	72.5%	Pass
99.92 - 95	Pole + Reinf.	TP24.375x23.53x0.575	Reinf. 4 Tension Rupture	78.0%	Pass
95 - 94.75	Pole + Reinf.	TP24.418x24.375x0.7	Reinf. 1 Tension Rupture	77.0%	Pass
94.75 - 89.75	Pole + Reinf.	TP25.277x24.418x0.6875	Reinf. 1 Tension Rupture	82.3%	Pass
89.75 - 85.5	Pole + Reinf.	TP26.007x25.277x0.675	Reinf. 1 Tension Rupture	80.9%	Pass
85.5 - 85.25	Pole + Reinf.	TP26.049x26.007x0.8625	Reinf. 5 Tension Rupture	71.0%	Pass
85.25 - 85	Pole + Reinf.	TP26.092x26.049x0.8625	Reinf. 5 Tension Rupture	71.0%	Pass
85 - 84.75	Pole + Reinf.	TP26.135x26.092x0.8375	Reinf. 1 Tension Rupture	73.4%	Pass
84.75 - 83	Pole + Reinf.	TP26.436x26.135x0.8375	Reinf. 1 Tension Rupture	73.7%	Pass
83 - 82.65	Pole + Reinf.	TP26.496x26.436x0.7125	Reinf. 3 Tension Rupture	81.3%	Pass
82.65 - 82.42	Pole + Reinf.	TP26.536x26.496x0.7125	Reinf. 3 Tension Rupture	81.3%	Pass
82.42 - 77.42	Pole + Reinf.	TP27.395x26.536x0.6875	Reinf. 3 Tension Rupture	82.2%	Pass
77.42 - 73.75	Pole + Reinf.	TP28.64x27.395x0.6875	Reinf. 3 Tension Rupture	82.7%	Pass
73.75 - 69.17	Pole + Reinf.	TP28.079x27.4x0.725	Reinf. 2 Tension Rupture	79.5%	Pass
69.17 - 64.17	Pole + Reinf.	TP28.821x28.079x0.7125	Reinf. 2 Tension Rupture	80.1%	Pass
64.17 - 59.17	Pole + Reinf.	TP29.562x28.821x0.725	Reinf. 9 Tension Rupture	80.5%	Pass
59.17 - 54.17	Pole + Reinf.	TP30.304x29.562x0.7125	Reinf. 9 Tension Rupture	80.7%	Pass
54.17 - 49.17	Pole + Reinf.	TP31.045x30.304x0.7	Reinf. 9 Tension Rupture	80.5%	Pass
49.17 - 47.17	Pole + Reinf.	TP31.342x31.045x0.7	Reinf. 9 Tension Rupture	80.4%	Pass
47.17 - 46.92	Pole + Reinf.	TP31.379x31.342x0.7875	Reinf. 9 Tension Rupture	73.0%	Pass
46.92 - 43.42	Pole + Reinf.	TP31.898x31.379x0.775	Reinf. 9 Tension Rupture	72.8%	Pass
43.42 - 43.17	Pole + Reinf.	TP31.935x31.898x0.65	Reinf. 7 Tension Rupture	80.0%	Pass
43.17 - 38.17	Pole + Reinf.	TP32.677x31.935x0.65	Reinf. 7 Tension Rupture	79.4%	Pass
38.17 - 35.75	Pole + Reinf.	TP33.66x32.677x0.65	Reinf. 7 Tension Rupture	79.0%	Pass
35.75 - 30.54	Pole	TP33.161x32.286x0.4375	Pole	77.7%	Pass
30.54 - 25.54	Pole	TP34.001x33.161x0.4375	Pole	75.5%	Pass
25.54 - 20.54	Pole	TP34.84x34.001x0.4375	Pole	73.2%	Pass
20.54 - 15.54	Pole	TP35.68x34.84x0.4375	Pole	70.8%	Pass
15.54 - 10.54	Pole	TP36.52x35.68x0.4375	Pole	68.5%	Pass
10.54 - 5.54	Pole	TP37.36x36.52x0.4375	Pole	66.5%	Pass
5.54 - 0.54	Pole	TP38.2x37.36x0.4375	Pole	64.4%	Pass
0.54 - 0	Pole	TP38.29x38.2x0.4375	Pole	64.2%	Pass
				Summary	
			Pole	77.7%	Pass
			Reinforcement	90.0%	Pass
			Overall	90.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*									
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9
150.17 - 145.17	426	n/a	426	12.91	n/a	12.91	10.5%									
145.17 - 140.17	491	n/a	491	13.54	n/a	13.54	20.1%									
140.17 - 135.17	563	n/a	563	14.16	n/a	14.16	34.8%									
135.17 - 130.17	641	n/a	641	14.79	n/a	14.79	47.4%									
130.17 - 125.17	726	n/a	726	15.42	n/a	15.42	66.1%									
125.17 - 123.75	751	n/a	751	15.60	n/a	15.60	70.2%									
123.75 - 123.5	756	734	1490	15.63	13.50	29.13	35.0%						61.9%			
123.5 - 118.5	851	790	1640	16.25	13.50	29.75	42.3%						74.9%			
118.5 - 113.5	953	847	1800	16.88	13.50	30.38	49.5%						86.9%			
113.5 - 112.17	981	863	1845	17.05	13.50	30.55	51.4%						90.0%			
112.17 - 111.92	987	1621	2608	17.08	24.38	41.45	36.8%								58.2%	
111.92 - 110.17	1025	1659	2685	17.30	24.38	41.67	38.7%								60.9%	
110.17 - 109.92	1296	1153	2449	21.60	24.38	45.98	47.0%				59.8%	55.2%				
109.92 - 104.92	1457	1237	2694	22.47	24.38	46.84	52.2%				66.4%	61.3%				
104.92 - 99.92	1631	1324	2954	23.33	24.38	47.70	56.9%				72.5%	67.0%				
99.92 - 95	1814	1412	3227	24.18	24.38	48.55	61.1%				78.0%	72.1%				
95 - 94.75	1832	2065	3897	24.22	32.38	56.60	50.9%	77.0%			60.8%	70.3%				
94.75 - 89.75	2034	2203	4237	25.08	32.38	57.46	54.3%	82.3%			65.0%	75.0%				
89.75 - 85.5	2217	2323	4540	25.82	32.38	58.19	53.4%	80.9%			63.9%	73.6%				
85.5 - 85.25	2243	3459	5702	25.86	41.38	67.24	48.0%	68.1%			58.5%	71.0%				68.8%
85.25 - 85	2254	3470	5724	25.90	41.38	67.28	48.0%	68.1%			58.5%	71.0%				68.8%
85 - 84.75	2226	3386	5612	25.95	37.13	63.07	46.6%	73.4%	65.1%			72.7%				72.7%
84.75 - 83	2305	3460	5765	26.25	37.13	63.37	47.0%	73.7%	65.4%			72.9%				73.0%
83 - 82.65	2381	2683	5063	26.31	35.00	61.31	57.7%	74.9%	70.9%	81.3%						71.2%
82.65 - 82.42	2392	2690	5082	26.35	35.00	61.35	57.7%	75.0%	70.9%	81.3%						71.3%
82.42 - 77.42	2632	2860	5492	27.21	35.00	62.21	58.9%	76.1%	71.9%	82.2%						72.4%
77.42 - 73.75	2818	2988	5806	27.85	35.00	62.85	59.6%	76.7%	72.4%	82.7%						72.9%
73.75 - 69.17	3301	2835	6136	33.41	27.00	60.41	55.3%		79.5%	79.5%						79.4%
69.17 - 64.17	3573	2980	6553	34.30	27.00	61.30	55.7%		80.1%	80.1%						80.1%
64.17 - 59.17	3852	3327	7179	35.19	27.00	62.19	53.5%		80.4%	80.4%						80.5%
59.17 - 54.17	4152	3490	7642	36.09	27.00	63.09	53.5%		80.5%	80.5%						80.7%
54.17 - 49.17	4468	3656	8124	36.98	27.00	63.98	53.4%		80.2%	80.2%						80.5%
49.17 - 47.17	4599	3723	8322	37.34	27.00	64.34	53.4%		80.1%	80.1%						80.4%
47.17 - 46.92	4613	4639	9251	37.38	33.38	70.76	48.2%							71.2%		73.0%
46.92 - 43.42	4848	4786	9634	38.01	33.38	71.38	48.3%							71.0%		72.8%
43.42 - 43.17	4852	3400	8252	38.05	24.38	62.43	53.5%							80.0%		
43.17 - 38.17	5202	3552	8753	38.95	24.38	63.32	53.4%							79.4%		
38.17 - 35.75	5377	3626	9003	39.38	24.38	63.76	53.4%							79.0%		
35.75 - 30.54	6309	n/a	6309	46.03	n/a	46.03	77.7%									
30.54 - 25.54	6808	n/a	6808	47.21	n/a	47.21	75.5%									
25.54 - 20.54	7332	n/a	7332	48.40	n/a	48.40	73.2%									
20.54 - 15.54	7882	n/a	7882	49.58	n/a	49.58	70.8%									
15.54 - 10.54	8459	n/a	8459	50.76	n/a	50.76	68.5%									
10.54 - 5.54	9063	n/a	9063	51.94	n/a	51.94	66.5%									
5.54 - 0.54	9696	n/a	9696	53.12	n/a	53.12	64.4%									
0.54 - 0	9766	n/a	9766	53.25	n/a	53.25	64.2%									

Note: Section capacity checked in 5 degree increments.
Rating per TIA-222-H Section 15.5.

Bolted Bridge Stiffeners Reinforcement Check

TIA Rev. H

Description:

This sheet is for the analysis of a reinforced flange connection using existing bolted bridge stiffeners.

Assumptions / Notes:

1. For analysis purposes, load is distributed between flange bolts and existing bridge stiffeners.
2. The plastification of the pole is not considered.
3. All shear and axial loads are taken by the flange bolts.

1. PARAMETERS

Flange Elevation: 110.167'

1.1 tnxTower Reactions

Apply TIA-222-H Section 15.5? No / Yes

Moment: $M := 595.85kip \cdot ft$

Axial Load: $P := 17.23kip$

Shear Load: $V := 20.68kip$

1.2 Shaft Properties at the Flange

Upper Shaft Diameter: $D_{shaft1} := 21.77in$

Upper Shaft Thickness: $t_1 := 0.25in$

Lower Shaft Diameter: $D_{shaft2} := 21.77in$

Lower Shaft Thickness: $t_2 := 0.3125in$

Shaft Grade: $Fy_{shaft} := 65ksi$ $Fu_{shaft} := 80ksi$

1.3 Existing Bridge Stiffener Properties

(Verify existing bolted connection for reduced moment.)

Number of Existing Bridge Stiffeners: $N_{exist} := 3$

Existing Bridge Stiffener Grade: $Fy_{Ex} := 65ksi$ $Fu_{Ex} := 80ksi$

Diameter to the centroid of Existing Bridge Stiffeners: $BC_{exist} := 29.3in$

Thickness of Existing Bridge Stiffeners: $t_{exist} := 1.25in$

Width of Existing Bridge Stiffeners: $w_{exist} := 6.5in$

Gross Area of One Existing Bridge Stiffener: $A_{g\_exist} := w_{exist} \cdot t_{exist} = 8.13 \cdot in^2$

Moment of Inertia of Existing Bridge Stiffeners: $I_{exist} := \frac{N_{exist} \cdot BC_{exist}^2 \cdot A_{g\_exist}}{8} = 2615.71 \cdot in^4$

Radius of Gyration about x-axis: $r_{x2} := \frac{t_{exist}}{\sqrt{12}} = 0.36 \cdot in$

1.4 Flange Bolt Properties

Number of Flange Bolts: $N_{bolts} := 12$

Diameter of Flange Bolts: 1"

Bolt Circle of Flange Bolts: $BC_{bolts} := 25.5in$

Gross Area of One Flange Bolt: $A_{g\_bolts} := \frac{\pi}{4} \cdot D_{bolts}^{2} = 0.79 \cdot in^{2}$

Moment of Inertia of Flange Bolts: $I_{bolts} := \frac{N_{bolts} \cdot BC_{bolts}^{2} \cdot A_{g\_bolts}}{8} = 766.06 \cdot in^{4}$

1.5 Division of Forces

Total Gross Area: $A_{g\_total} := N_{exist} \cdot A_{g\_exist} + N_{bolts} \cdot A_{g\_bolts} = 33.8 \cdot in^{2}$

Total Moment of Inertia: $I_{total} := I_{exist} + I_{bolts} = 3381.77 \cdot in^{4}$

1.6 Reactions to Existing Bridge Stiffeners

Moment Reaction to Existing Bridge Stiffeners: $M_{exist} := M \cdot \left(\frac{I_{exist}}{I_{total}} \right) = 460.87 \cdot kip \cdot ft$

Axial Reaction to Existing Bridge Stiffeners: $P_{exist} := 0kip$

Shear Reaction to Existing Bridge Stiffeners: $V_{exist} := 0kip$

1.7 Reactions to Flange Bolts

(It is assumed that all shear and axial loads are taken by the flange bolts)

Moment Reaction to Flange Bolts: $M_{bolts} := M \cdot \left(\frac{I_{bolts}}{I_{total}} \right) = 134.98 \cdot kip \cdot ft$

Axial Reaction to Flange Bolts: $P_{bolts} := P = 17.23 \cdot kip$

Shear Reaction to Flange Bolts: $V_{bolts} := V = 20.68 \cdot kip$

Check Flange Connection in CCIplate with these Reactions

2. Existing Bridge Stiffener Checks

2.1 Maximum Axial Forces in Single Existing Bridge Stiffener

Outer Radius of Bolt Circle:

$$C := \frac{BC_{exist}}{2} = 14.65 \cdot in$$

Critical Compression Bending Stress:

$$P_{comp} := \frac{M_{exist} \cdot C}{I_{exist}} \cdot A_{g\_exist} + \frac{P_{exist}}{N_{exist}} = 251.67 \cdot kip$$

Critical Tension Bending Stress:

$$P_{tens} := \frac{M_{exist} \cdot C}{I_{exist}} \cdot A_{g\_exist} - \frac{P_{exist}}{N_{exist}} = 251.67 \cdot kip$$

2.2 Available Compression Strength

[AISC 15th Edition E3-1]

Resistance Factor:

$$\phi_c := 0.9$$

Unbraced Length:

$$L_u := 16in$$

Effective Length Factor:

$$K := 1.0$$

Effective Length of Member:

$$L_c := K \cdot L_u = 16 \cdot in$$

[AISC 15th Edition E3-2]

Strength of Bridge Stiffener:

$$Fy_{Ex} = 65 \cdot ksi \qquad Fu_{Ex} = 80 \cdot ksi$$

Elastic Buckling Stress:
[AISC 15th Ed., Eq. E3-4]

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{x2}}\right)^2} = 145.58 \cdot ksi$$

Determination of Crticial Stress:
[AISC 15th Ed., Eqs. E3-2 and E3-3]

$$F_{cr} := \begin{cases} \left(0.658^{\frac{Fy_{Ex}}{F_e}} \cdot Fy_{Ex}\right) & \text{if } 4.71 \cdot \sqrt{\frac{E}{Fy_{Ex}}} \geq \frac{L_c}{r_{x2}} \\ \left(0.877 \cdot F_e\right) & \text{otherwise} \end{cases}$$

$$F_{cr} = 53.92 \cdot ksi$$

Allowable Compressive Strength:
[AISC 15th Ed., Eqs. J4-6 and E3-1]

$$\phi P_n := \begin{cases} \left(\phi_c \cdot Fy_{Ex} \cdot A_{g\_exist}\right) & \text{if } \frac{L_c}{r_{x2}} \leq 25 \\ \left(\phi_c \cdot F_{cr} \cdot A_{g\_exist}\right) & \text{otherwise} \end{cases}$$

$$\phi P_n = 394.29 \cdot kip$$

Check Compressive Strength:

$$Check_{comp} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{comp}}{\phi P_n} \le 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{comp} = \text{"OK"}$

$Capacity_{comp} = 60.79 \cdot \%$

2.3 Available Tension Strength

Gross Section Yield [AISC 15th Edition Ch. D2]

Available Tension Yield Strength:

$$\phi P_{ty} := 0.9 \cdot Fy_{Ex} \cdot A_{g\_exist} = 475.31 \cdot kip$$

Net Section Fracture

Bolt Hole Diameter:

$BH := 1.1875in$

Thickness:

$T := t_{exist} = 1.25 \cdot in$

Net Area:

$$A_{net} := A_{g\_exist} - \left(BH + \frac{1}{16}in\right) \cdot T = 6.56 \cdot in^2$$

Net Area Limitation:

$$A_e := A_{net} = 6.56 \cdot in^2$$

Available Fractile Strength:

$$\phi P_{tr} := 0.75 \cdot Fu_{Ex} \cdot A_e = 393.75 \cdot kip$$

Tension Check

Controlling Mode of Failure:

$$Check_{mode} := \begin{cases} \text{"Fracture Controls"} & \text{if } \frac{P_{tens}}{\phi P_{tr}} > \frac{P_{tens}}{\phi P_{ty}} \\ \text{"Yield Controls"} & \text{otherwise} \end{cases}$$

$Check_{mode} = \text{"Fracture Controls"}$

$$\phi P_{nt} := \begin{cases} \phi P_{tr} & \text{if } Check_{mode} = \text{"Fracture Controls"} \\ \phi P_{ty} & \text{otherwise} \end{cases}$$

Controlling Tension Mode Check:

$$Check_{tension} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{tens}}{\phi P_{nt}} \le 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{tension} = \text{"OK"}$

$Capacity_{tension} = 60.87 \cdot \%$

SUMMARY

tnxTower Reactions: $M = 595.85 \cdot kip \cdot ft$ $P = 17.23 \cdot kip$ $V = 20.68 \cdot kip$

Flange Bolts:

Diameter of Flange Bolts: $D_{bolts} = 1 \cdot in$

Bolt Circle of Flange Bolts: $BC_{bolts} = 25.5 \cdot in$

Loads to Flange Bolts: $M_{bolts} = 134.98\ ft \cdot kip$ $P = 17.23 \cdot kip$ $V = 20.68 \cdot kip$

See CCIPlate for Flange Bolt and Plate Capacities

Existing Jump Plates:

Moment to Proposed Bridge Stiffeners: $M_{exist} = 460.87\ ft \cdot kip$

Number of Existing Bridge Stiffeners: $N_{exist} = 3$

Thickness: $t_{exist} = 1.25 \cdot in$

Width: $w_{exist} = 6.5 \cdot in$

Controlling Capacity of Existing Bridge Stiffeners: $Capacity_{exist} = 60.9 \cdot \%$

BU: 841289
WO: 1895942

Done by: D. Hsu
Checked By:
Date: 11/4/2020

Guy Lug Assembly

1. Guy Lug

1.1 Material Properties

Yield Strength of Guy Lug $Fy_{guylug} := 55ksi$

Ultimate Strength of Guy Lug $Fu_{guylug} := 70ksi$

Bottom Width of Guy Lug Plate $w_{b.guylug} := 6in$

Top Width of Guy Lug Plate $w_{t.guylug} := 6in$

Vertical Distance to Hole Center $y_{center} := 3in$

Diameter of Pin Hole $d_{pinhole} := 3.625in$

Length of the Guy Lug Plate $l_{guylug} := 15in$

Thickness of Guy Lug Plate $t := 1.5in$

Distance from the Pin Hole to the Edge in the Horizontal Direction $e_{x1} := 3in$

Distance from the Pin Hole to the Center of the Guy Lug in the Vertical Direction

$$e_{y1} := \frac{l_{guylug}}{2} - y_{center} = 4.5 \cdot in$$

1.2 Loads

TIA-222 Rev. H (Sec. 7.6.2)

Applied Load from TNX

$T_u := 178.49kip$

1.2.1 Shallow Angle

Shallowest Angle

$\phi_{Shallow} := 13deg = 13 \cdot deg$

Shallow Horizontal Force Component

$P_{H.Shallow} := T_u \cdot \cos(\phi_{Shallow}) = 173.915 \cdot kip$

Shallow Vertical Force Component

$P_{V.Shallow} := T_u \cdot \sin(\phi_{Shallow}) = 40.152 \cdot kip$

Shallow Moment

$M_{Shallow} := P_{H.Shallow} \cdot e_{y1} - P_{V.Shallow} \cdot e_{x1} = 662.164 \cdot kip \cdot in$

1.2.2 Steep Angle

Steepest Angle

$$\phi_{Steep} := 13deg = 13 \cdot deg$$

Steep Horizontal Force Component

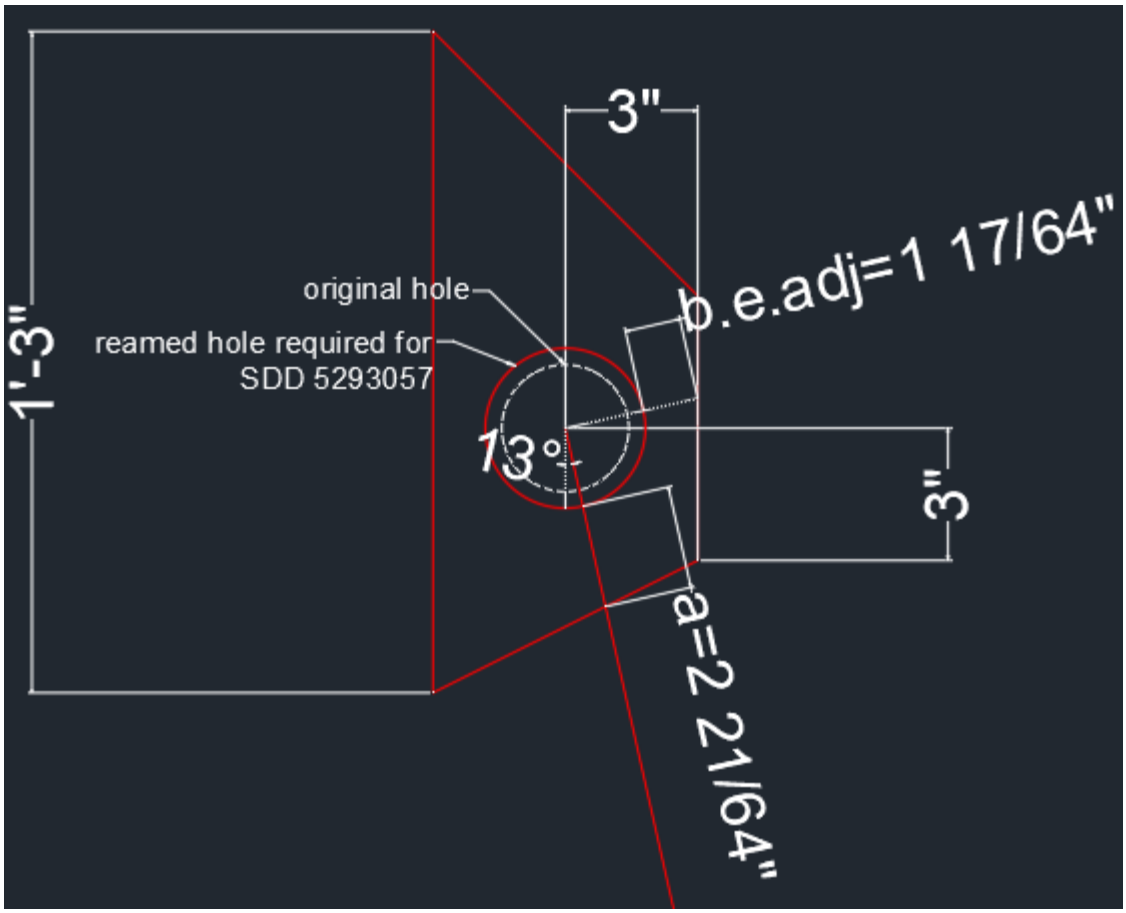
$$P_{H.Steep} := T_u \cdot \cos\left(\phi_{Steep}\right) = 173.915 \cdot kip$$

Steep Vertical Force Component

$$P_{V.Steep} := T_u \cdot \sin\left(\phi_{Steep}\right) = 40.152 \cdot kip$$

Steep Moment

$$M_{Steep} := P_{V.Steep} \cdot e_{x1} - P_{H.Steep} \cdot e_{y1} = -662.164 \cdot kip \cdot in$$



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1.3 Tensile Rupture

TIA-222 Rev. H (Sec. 4.9.8)

Tensile Rupture Reduction Factor

$\phi_{tensile.rupture} := 0.75$

Distance from Center of Hole to Edge of Guy Lug

$s_{edge} := w_{b.guylug} - e_{x1} = 3 \cdot in$

Shortest distance from edge of the pin hole to the edge of the member

$a := 2.328in$

$b_e := \begin{cases} (2 \cdot t + 0.63in) & \text{if } a > (2t + 0.63in) \\ a & \text{otherwise} \end{cases}$

$b_e = 2.328 \cdot in$

$b_{e.adj} := 1.266in$

Design Tensile Rupture Strength

$\phi P_{n.tensile.rupture} := \phi_{tensile.rupture} \cdot Fu_{guylug} \cdot 2 \cdot t \cdot b_{e.adj}$

$\phi P_{n.tensile.rupture} = 199.395 \cdot kip$

$$Ratio_{guylug.tensilerupture} := \frac{T_u}{1.05 \phi P_{n.tensile.rupture}} = 85.253 \cdot \%$$

1.4 Tensile Yield

TIA-222 Rev. H (Sec. 4.9.8)

Tensile Yield Reduction Factor

$\phi_{tensile.yield} := 0.9$

Design Tensile Yield Strength

$\phi P_{n.tensile.yield} := \phi_{tensile.yield} \cdot Fy_{guylug} \cdot s_{edge} \cdot 2 \cdot t$

$\phi P_{n.tensile.yield} = 445.5 \cdot kip$

$$Ratio_{guylug.tensileyield} := \frac{T_u}{1.05 \phi P_{n.tensile.yield}} = 38.157 \cdot \%$$

1.5 Shear Rupture

TIA-222 Rev. H (Sec. 4.9.8)

Shear Rupture Reduction Factor

$\phi_{shear.rupture} := 0.75$

Diameter of the Pin

$d_{pin} := d_{pinhole} - \frac{1}{8} in = 3.5 \cdot in$

Area on the Shear Failure Path

$A_{sf} := 2 \cdot t \cdot \left(a + \frac{d_{pin}}{2} \right) = 12.234 \cdot in^2$

Design Shear Rupture Strength

$\phi P_{n.shear.rupture} := 0.6 \cdot \phi_{shear.rupture} \cdot Fu_{guylug} \cdot A_{sf}$

$\phi P_{n.shear.rupture} = 385.371 \cdot kip$

$$Ratio_{guylug.shearrupture} := \frac{T_u}{1.05 \phi P_{n.shear.rupture}} = 44.111 \cdot \%$$

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1.6 Pin Bearing

TIA-222 Rev. H (Sec. 4.9.8)

Pin Bearing Reduction Factor

$\phi_{bearing} := 0.9$

Project Area in Bearing

$A_{pb} := d_{pin} \cdot t = 5.25 \cdot in^2$

Design Pin Bearing Strength

$\phi P_{n.Bearing} := 1.8 \cdot Fy_{guylug} \cdot A_{pb} \cdot \phi_{bearing}$

$\phi P_{n.Bearing} = 467.775 \cdot kip$

$$Ratio_{guylug.bearing} := \frac{T_u}{1.05 \phi P_{n.Bearing}} = 36.34 \cdot \%$$

2. Weld Check

2.1 Material Properties

Fillet Weld Reduction Factor

$\phi_{fillet.weld} := 0.75$

Size of the Weld

$w_{guylug} := 0.25in$

Filler Metal Classification Strength

$F_{exx.guylug} := 70ksi$

Horizontal Component of Eccentricity

$e_x := 2in$

Length of the Weld

$l_{weld} := l_{guylug} = 15 \cdot in$

$D := w_{guylug} \cdot \frac{16}{in} = 4$

2.2.1 Weld Check (from Table 8-4, Angle 15deg)

$$a_{weld} := \frac{e_x}{l_{weld}} = 0.133$$

$k := 0$

From Table 8-4: $C := 3.68$

$C_1 := 1$

$\phi R_n = \phi \cdot C \cdot C_1 \cdot D \cdot l_{weld}$

$\phi R_n := 0.75 \cdot C \cdot C_1 \cdot D \cdot \frac{2 \cdot l_{weld}}{in} \cdot kip = 331.2 \cdot kip$

$$Ratio_{weld} := \frac{T_u}{1.05 \phi R_n} = 51.326 \cdot \%$$

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3. Bolts

3.1 Material Properties

Ultimate Strength of Bolt	$Fu_{bolt} := 120ksi$
Diameter of Bolt	$d_{bolt} := 20mm$
Quantity of Bolts Connecting Backer Plate to Pole	$n_{bolts} := 10$
Vertical Distance between Adjacent Holes (Center to Center, Backer Plate)	$y_{holes} := 6in$
Vertical Distance between Top and Bottom Holes (Center to Center, Backer Plate)	$y_{top.bottom} := 3in$

Net Area of the Bolt $A_n := 0.49in^2$

Distance of the Center Line between the Top and Bottom Bolt Groups (Backer Plate)

$$d_{y.bolt} := y_{top.bottom} + y_{holes} = 9 \cdot in$$

3.2 Loads

3.2.1 Shallow Case - Bolts Connecting Backer Plate

Maximum Force in Bolt in the Shallow Angle Case

$$Load_{ubolt.shallow} := \left(\frac{P_{H.Shallow}}{n_{bolts}}\right) + \left(\frac{M_{Shallow}}{d_{y.bolt}}\right) \cdot \left(\frac{1}{2}\right) = 54.178 \cdot kip$$

3.2.2 Steep Case - Bolts Connecting Backer Plate

Maximum Force in Bolt in the Steep Angle Case

$$Load_{ubolt.steep} := \left(\frac{P_{H.Steep}}{n_{bolts}}\right) + \left(\frac{M_{Steep}}{d_{y.bolt}}\right) \cdot \left(\frac{1}{2}\right) = -19.395 \cdot kip$$

$$P_V := \max\left(P_{V.Steep}, P_{V.Shallow}\right) = 40.152 \cdot kip$$

$$P_H := \max\left(P_{H.Steep}, P_{H.Shallow}\right) = 173.915 \cdot kip$$

$$Load_{ubolt} := \max\left(Load_{ubolt.shallow}, Load_{ubolt.steep}\right) = 54.178 \cdot kip$$

$$Load_{ubolt.v} := \frac{P_V}{n_{bolts}} = 4.015 \cdot kip$$

3.3 Tensile Strength - bolt Connecting Backer Plate to Pole

U-Bolt Reduction Factor ANSI/TIA-222-H (4.9.6.1) $\phi_{bolt} := 0.75$

$$\phi R_{nt} := (32.9kip) \cdot 4$$

$$\phi R_{nt} = 131.6 \cdot kip$$

$$Ratio_{tension} := \frac{Load_{ubolt}}{1.05 \phi R_{nt}} = 39.209 \cdot \%$$

BU: 841289
WO: 1895942

Done by: D. Hsu
Checked By:
Date: 11/4/2020

3.4 Shear Strength - bolt Connecting Backer Plate to Pole

Connection Length Reduction Factor (ANSI/TIA-222-H 4.9.6.3) $R_b := 1.0$

$\phi R_{nv} := 24.9kip$

$$Ratio_{shear} := \frac{Load_{ubolt.v}}{1.05\phi R_{nv}} = 15.357 \cdot \%$$

3.5 Combined Shear and Tension - bolt Connecting Backer Plate to Pole

ANSI/TIA-222-H 4.9.6.4

$$Ratio_{shear.tens} := \left(\frac{Load_{ubolt}}{\phi R_{nt}}\right)^2 + \left(\frac{Load_{ubolt.v}}{\phi R_{nv}}\right)^2 = 19.549 \cdot \%$$

BU: 841289
WO: 1895942

Done by: D. Hsu
Checked By:
Date: 11/4/2020

4. Backer Plate

4.1 Material Properties

Total Width $w_{backer} := 13.75in$

Total Height $h_{backer} := 18in$

Vertical Distance from Edge to Center of Nearest Hole $y_{edge} := 3in$

Horizontal Center to Center spacing of consecutive holes $s_{horizontal} := 4in$

Vertical Center to Center spacing of consecutive holes $g_{vertical} := 3in$

Width of Holes $w_{hole} := 1.1875in$

Height of Holes $h_{hole} := 1.1875in$

Thickness $t_{backer} := 1.5in$

Yield Strength $Fy_{backer} := 55ksi$

Ultimate Strength $Fu_{backer} := 70ksi$

Gross Area $A_{g.backer} := w_{backer} \cdot t_{backer} = 20.625 \cdot in^2$

Net Area $A_{n.backer} := A_{g.backer} - \left[\left[2 \cdot \left(w_{hole} + \frac{1}{16} \cdot in\right)\right] \cdot t_{backer}\right] = 16.875 \cdot in^2$

Per ANSI/TIA-222-H the net area shall not be larger than 85% of the gross area.

$$Check_{A.n.backer} := \begin{cases} \text{"OK"} & \text{if } 0.85 \cdot A_{g.backer} \geq A_{n.backer} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{A.n.backer} = \text{"OK"}$

4.2 Loads

4.3 Bearing ANSI/TIA-222-H 4.9.6.2

Bearing factor $\phi_{bearing} := 0.8$

Distance between Edge of Hole and Edge of Connected Material

$$e_{y2} := y_{edge} - \frac{h_{hole}}{2} = 2.4063 \cdot in$$

Distance between Edge of Hole and Adjacent Hole

$$e_{y3} := y_{holes} - h_{hole} = 4.813 \cdot in$$

Distance between Edge of Hole and Non-adjacent Hole

$$e_{y4} := y_{top.bottom} - h_{hole} = 1.812 \cdot in$$

$$\phi R_{nBearing1} := \min\left(1.0 \cdot e_{y2} \cdot t_{backer} \cdot Fu_{backer}, 2.0 \cdot d_{bolt} \cdot t_{backer} \cdot Fu_{backer}\right) = 165.354 \cdot kip$$

$$\phi R_{nBearing1} = 165.354 \cdot kip$$

$$\phi R_{nBearing2} := \min\left(1.0 \cdot e_{y3} \cdot t_{backer} \cdot Fu_{backer}, 2.0 \cdot d_{bolt} \cdot t_{backer} \cdot Fu_{backer}\right) = 165.354 \cdot kip$$

$$\phi R_{nBearing2} = 165.354 \cdot kip$$

$$\phi R_{nBearing3} := \min\left(1.0 \cdot e_{y4} \cdot t_{backer} \cdot Fu_{backer}, 2.0 \cdot d_{bolt} \cdot t_{backer} \cdot Fu_{backer}\right) = 165.354 \cdot kip$$

$$\phi R_{nBearing3} = 165.354 \cdot kip$$

$$\phi R_{nBearingTotal} := \left(1 \cdot \phi R_{nBearing1}\right) + \left(2 \cdot \phi R_{nBearing2}\right) + \left(1 \cdot \phi R_{nBearing3}\right)$$

$$\phi R_{nBearingTotal} = 661.417 \cdot kip$$

$$Ratio_{bearing} := \frac{P_V}{1.05 \phi R_{nBearingTotal}} = 5.781 \cdot \%$$

4.4 Tension Yielding

ANSI/TIA-222-H 4.9.6.5

Factor for Tension Yielding

$$\phi_{Tensionyielding} := 0.9$$

$$\phi R_{tensionyielding} := Fy_{backer} \cdot A_{g.backer} \cdot \phi_{Tensionyielding} = 1.021 \times 10^{3} \cdot kip$$

$$Ration_{Tensionyielding} := \frac{P_V}{1.05 \phi R_{tensionyielding}} = 3.746 \cdot \%$$

BU: 841289
WO: 1895942

Done by: D. Hsu
Checked By:
Date: 11/4/2020

4.5 Tension Rupture

ANSI/TIA-222-H 4.9.6.5

Factor for Tension Rupture

$\phi_{Tensionrupture} := 0.75$

$\phi R_{tensionrupture} := Fu_{backer} \cdot A_{n.backer} \cdot \phi_{Tensionrupture} = 885.938 \cdot kip$

$$Ratio_{Tensionrupture} := \frac{P_V}{1.05 \phi R_{tensionrupture}} = 4.316 \cdot \%$$

4.6 Shear Yielding

ANSI/TIA-222-H 4.9.6.5

Factor for Shear Yielding

$\phi_{Shearyielding} := 1.0$

$\phi R_{shearyielding} := 0.6 Fy_{backer} \cdot A_{g.backer} \cdot \phi_{Shearyielding} = 680.625 \cdot kip$

$$Ratio_{Shearyielding} := \frac{P_H}{1.05 \phi R_{shearyielding}} = 24.336 \cdot \%$$

4.7 Shear Rupture

ANSI/TIA-222-H 4.9.6.5

Factor for Shear Rupture

$\phi_{Shearrupture} := 0.75$

$\phi R_{shearrupture} := 0.6 \cdot Fu_{backer} \cdot A_{n.backer} \cdot \phi_{Shearrupture} = 531.563 \cdot kip$

$$Ratio_{Shearrupture} := \frac{P_H}{1.05 \phi R_{shearrupture}} = 31.16 \cdot \%$$

Monopole Flange Plate Connection

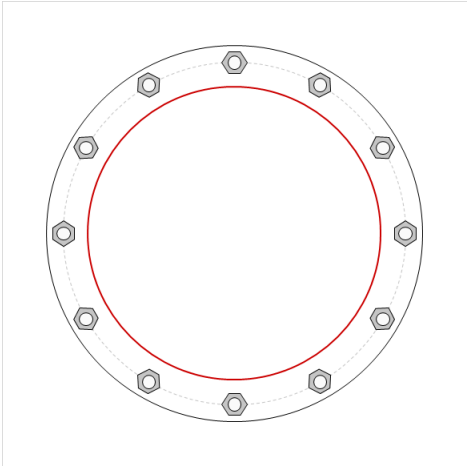
Elevation = 110.167 ft.

BU #	841289
Site Name	OLD SAYBROOK
Order #	531812 Rev. 0
TIA-222 Revision	H

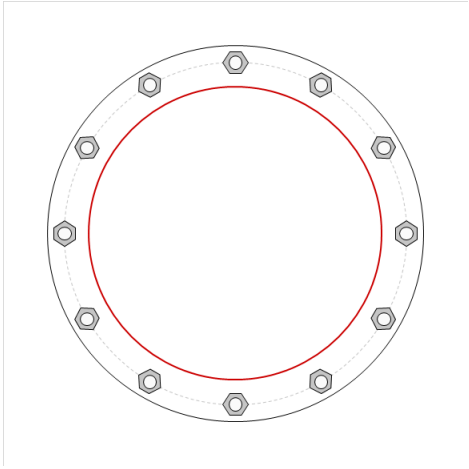
Applied Loads	
Moment (kip-ft)	134.98
Axial Force (kips)	17.23
Shear Force (kips)	20.68

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 25.5" BC

Top Plate Data

28" OD x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

28" OD x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

21.77" x 0.25" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

21.77" x 0.3125" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	19.72	
Allowable (kips)	54.48	
Stress Rating:	**34.5%**	Pass

Top Plate Capacity

Max Stress (ksi):	18.85	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**55.4%**	Pass
Tension Side Stress Rating:	**19.0%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	18.85	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**55.4%**	Pass
Tension Side Stress Rating:	**19.0%**	Pass

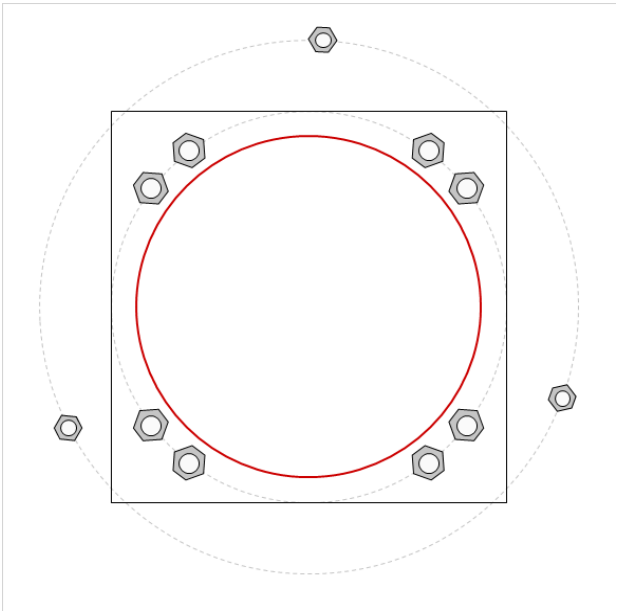
Monopole Base Plate Connection

Site Info	
BU #	841289
Site Name	OLD SAYBROOK
Order #	531812 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	1780.37
Axial Force (kips)	296.26
Shear Force (kips)	1.27

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (8) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 44" BC

Anchor Spacing: 6 in

GROUP 2: (3) 1-3/4" ø bolts (F1554-105 N; Fy=105 ksi, Fu=125 ksi) on 60" BC

pos. (deg): 87, 207, 340

Base Plate Data

44" OD x 2.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

38.29" x 0.4375" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

GROUP 1:		
Pu_c = 217.34	ϕPn_c = 268.39	**Stress Rating**
Vu = 0.16	ϕVn = 120.77	**77.1%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 140.45	ϕPn_t = 178.13	**Stress Rating**
Vu = 0	ϕVn = 112.75	**59.2%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	30.23	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**64.0%**	**Pass**

Pier and Pad Foundation

BU # :	841289
Site Name:	OLD SAYBROOK
App. Number:	531812 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	296.26	kips
Base Shear, Vu_comp:	1.2	kips
Moment, M_u:	1780.37	ft-kips
Tower Height, **H**:	150.17	ft
BP Dist. Above Fdn, bp_{dist}:	4.5	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	8	ft
Ext. Above Grade, **E**:	0.3	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	44	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	8.7	ft
Pad Width, **W**:	12	ft
Pad Thickness, **T**:	2.5	ft
Pad Rebar Size (Bottom), **Sp**:	7	
Pad Rebar Quantity (Bottom), **mp**:	13	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	135	pcf
Ultimate Gross Bearing, Qult:	30.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	42	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.4	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	2.7	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	226.81	1.20	**0.5%**	**Pass**
Bearing Pressure (ksf)	22.50	14.21	**63.2%**	**Pass**
*Overturning (kip*ft)*	2188.07	1791.62	**81.9%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	12461.80	1788.17	**13.7%**	**Pass**
Pier Compression (kip)	22913.28	354.37	**1.5%**	**Pass**
*Pad Flexure (kip*ft)*	879.26	418.80	**45.4%**	**Pass**
Pad Shear - 1-way (kips)	303.90	0.00	**0.0%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	1758.53	1072.90	**58.1%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**81.9%**
Structural Rating*:	**58.1%**

*0.18% minimum steel assumed

Version 3.4.0

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

BU#:	841289
Site Name:	OLD SAYBROOK
Order Number:	531812 Rev. 0
Location:	Inner

TIA-222 Revision: H

Design Reactions		
Shear, **S**:	41.00	kips
Uplift, **Ua**:	173.00	kips
Resultant Force, **Rf**:	177.8	kips
Tower Height, **H**:	150.17	ft
Guy Anchor Radius, **R**:	20.50	ft
Resultant Angle to Horizontal, **θ**:	76.7	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	8	ft
Anchor Width, **Wa**:	5	ft
Anchor Thickness, **Ta**:	2	ft
Anchor Length, **La**:	37	ft
Concrete Volume, **Vc**:	13.7	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	9	
No. of Bars in Top of Block:	12	
Guyed Anchor Front Rebar Size, **Saf**:	9	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:	1.75	in
Anchor Shaft Quantity. **n**:	2	
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:	1	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	4	ksi
Wt. Avg.Concrete Density, **δx**:	0.088	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	50	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	65	ksi

Design Checks	Capacity	Demand	Rating*	Check
Lateral Capacity (kips):	243.58	41.00	**16.0%**	**Pass**
Uplift Capacity (kips):	203.79	173.00	**80.8%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	740.25	189.63	**24.4%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	981.25	800.13	**77.7%**	**Pass**
Anchor Shaft (kips):	192.42	177.79	**88.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating:	**80.8%**
Structural Rating:	**77.7%**
Anchor Shaft Rating:	**88.0%**

Neglect Depth, **Neg**:	3.33	ft
Groundwater Level, **gw**:	2.7	ft

Soil Properties:	**No. of Soil Layers?**			4		
Layer	**φ, deg**	**cu, ksf**	**δ, pcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	0	0.000	110	2.70	0.000	
2	0	0.000	47.6	3.33		
3	1	0.000	47.6	4.00		80
4	42	0.000	72.6	8.00		100

*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

Version 3.4.0

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

BU#:	841289
Site Name:	OLD SAYBROOK
Order Number:	531812 Rev. 0
Location:	Inner

TIA-222 Revision: H

Design Reactions		
Shear, **S**:	47.00	kips
Uplift, **Ua**:	99.00	kips
Resultant Force, **Rf**:	109.6	kips
Tower Height, **H**:	150.17	ft
Guy Anchor Radius, **R**:	42.00	ft
Resultant Angle to Horizontal, **θ**:	64.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	8	ft
Anchor Width, **Wa**:	5	ft
Anchor Thickness, **Ta**:	2	ft
Anchor Length, **La**:	30	ft
Concrete Volume, **Vc**:	11.1	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	9	
No. of Bars in Top of Block:	12	
Guyed Anchor Front Rebar Size, **Saf**:	9	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:	1.75	in
Anchor Shaft Quantity. **n**:	2	
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:	1	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	4	ksi
Wt. Avg.Concrete Density, **δx**:	0.088	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	50	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	65	ksi

Design Checks	Capacity	Demand	Rating*	Check
Lateral Capacity (kips):	197.86	47.00	**22.6%**	**Pass**
Uplift Capacity (kips):	167.27	99.00	**56.4%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	740.25	176.25	**22.7%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	981.25	371.25	**36.0%**	**Pass**
Anchor Shaft (kips):	192.42	109.59	**54.2%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating:	**56.4%**
Structural Rating:	**36.0%**
Anchor Shaft Rating:	**54.2%**

Neglect Depth, **Neg**:	3.33	ft
Groundwater Level, **gw**:	2.7	ft

Soil Properties:	No. of Soil Layers?			4		
Layer	**φ, deg**	**cu, ksf**	**δ, pcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	0	0.000	110	2.70	0.000	
2	0	0.000	47.6	3.33		
3	1	0.000	47.6	4.00		80
4	42	0.000	72.6	8.00		100

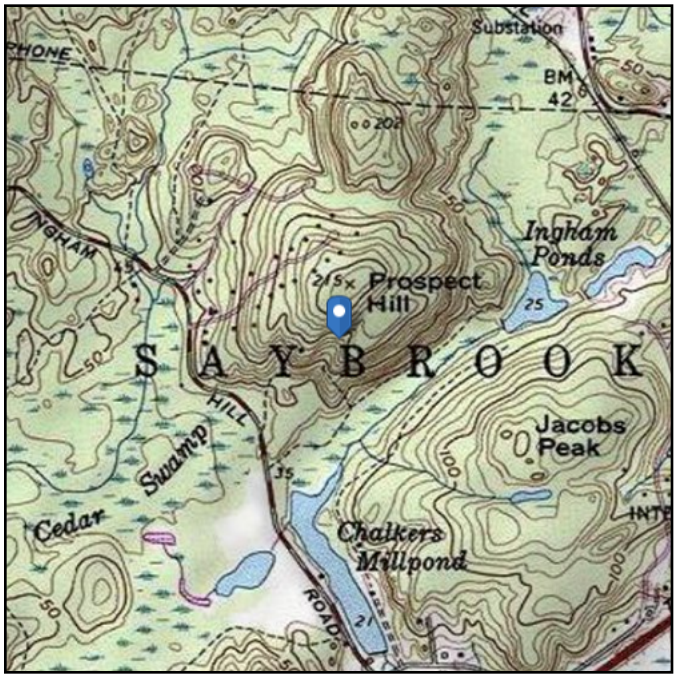
*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

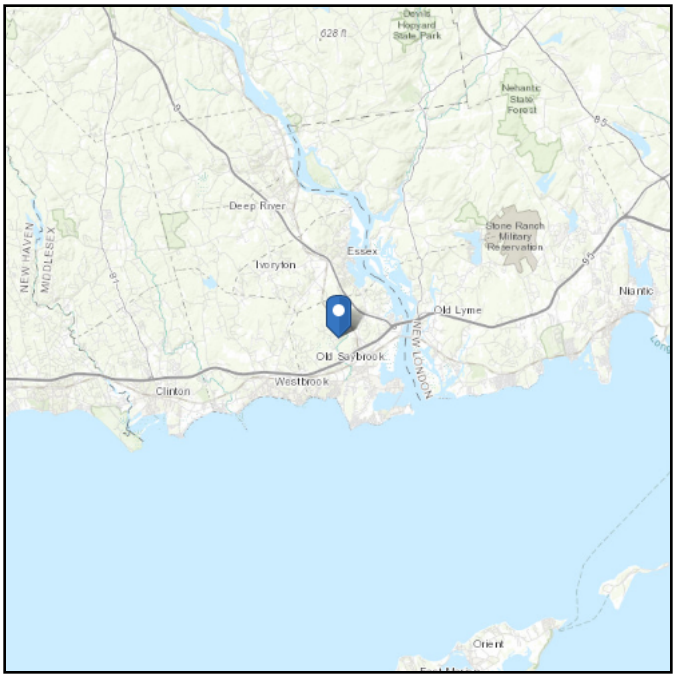
Version 3.4.0

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	133.08 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.309875
Soil Class:	D - Stiff Soil	**Longitude:**	-72.397536





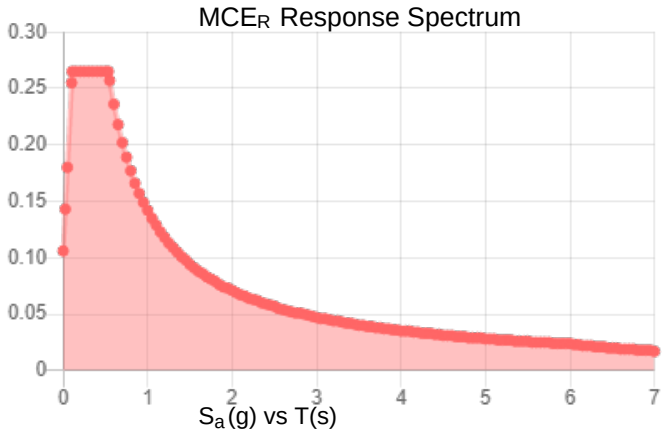
Seismic

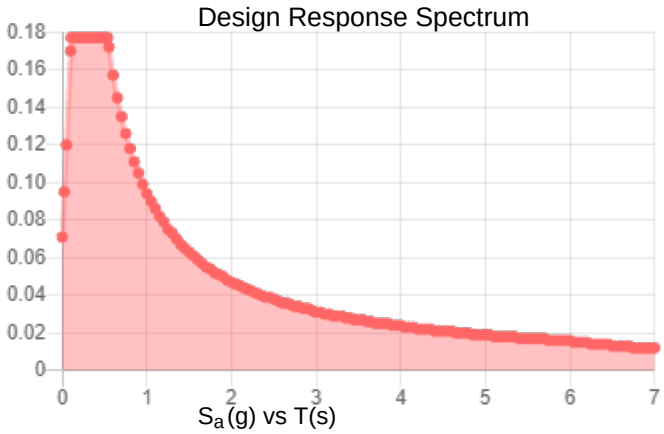
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.164	S_{DS} :	0.177
S_1 :	0.059	S_{D1} :	0.094
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.083
S_{MS} :	0.265	PGA_M :	0.133
S_{M1} :	0.142	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Oct 30 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Oct 30 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

October 20, 2020
October 23, 2020 (Rev. 1)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT2019 (LTE 7C)
	FA Number:	10034982
	PACE Number:	MRCTB049041
	PT Number:	2051A0WPXM
	Site Name:	OLD SAYBROOK
	Site Address:	170 Ingham Road Old Saybrook, CT 06475

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mount to determine their capability of supporting the following additional loading:

- (3) SBNHH-1D65A Antennas (55.6"x11.9"x7.1" - Wt. = 34 lbs. /each)
- (2) QS46512-2 Antennas (52.0"x12.0"x10.8" – Wt. = 75 lbs. /each)
- (1) 800-10799 Antennas (106.0"x14.8"x6.7"– Wt. = 108 lbs. /each)
- (3) B2/B66A 8843 RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each) (Tower Mount)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)
- **(2) OPA65R-BU4BA Antennas (48.0"x11.7"x10.1"– Wt. = 43 lbs. /each)**
- **(1) OPA65R-BU8BA Antennas (95.9"x11.7"x8.4" – Wt. = 69 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(3) RRUS-E2 B29 RRH's (20.4"x18.5"x7.5" – Wt. = 53 lbs. /each)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mount. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mount on March 3, 2016. HDG conducted a ground audit of the existing AT&T antenna mount on September 22, 2020.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 135 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.24 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 3; tower is located at the upper half of a hill.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.168 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.059.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing monopole with a ring mount. The connection is considered OK by visual inspection.

Based on our evaluation, we have determined that the existing mount **IS NOT CAPABLE** of supporting the proposed installation. HDG recommends the following modifications:

- **Install new 2" std. (2.38" O.D.) pipe brace secured to the existing handrail (typ. of 1 per sector, total of 3). Reference the attached sketch.**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 7C) Mount Rating	139	LC3	109%	**FAIL**
Modified (LTE 7C) Mount Rating	103	LC1	92%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC dated February 22, 2018.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mount must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

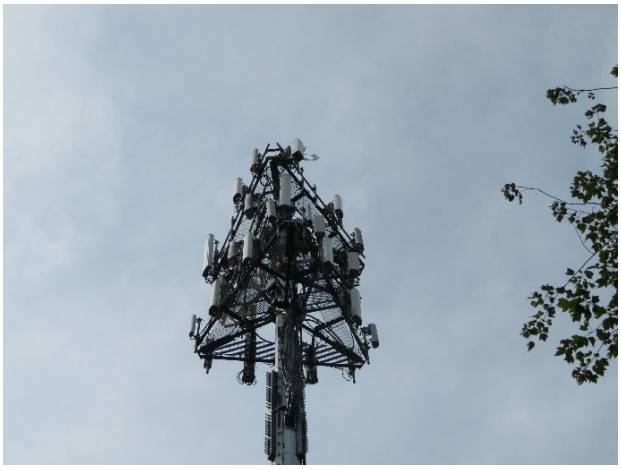
Respectfully Submitted,
Hudson Design Group LLC

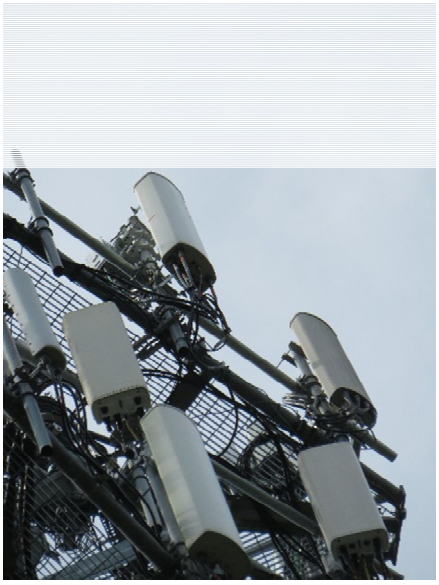
Michael Cabral
Vice President

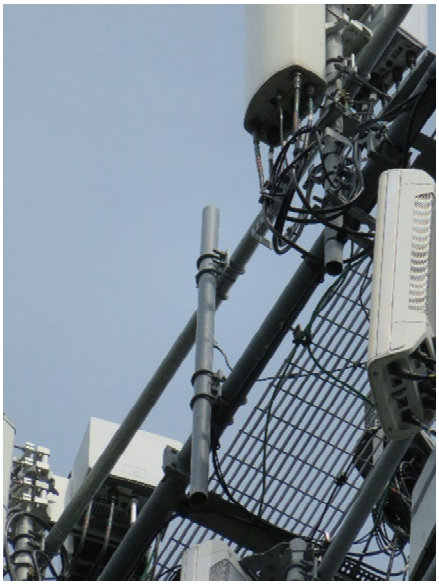
STATE OF CONNECTICUT
DANIEL HAMM
24178
LICENSED
PROFESSIONAL ENGINEER

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:







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Wind & Ice
Calculations

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$

	z=	152 (ft)
	z_g=	1200 (ft)
K_z= **1.114**	α=	7.0

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}= **1.200104481**	K_h=	4.9951408
	K_c=	0.9 (from Table 2-4)
(If Category 1 then K_{zt}=1.0)	K_t=	0.53 (from Table 2-5)
	f=	2 (from Table 2-5)
Category= **3**	z=	152
	z_s=	220 (Mean elevation of base of structure above sea level)
	H=	189 (Ht. of the crest above surrounding terrain)
	K_{zt}=	1.20 (from 2.6.6.2.1)
	K_e=	0.99 (from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =	t_i =	1.00 in
Importance Factor =	I=	1.00 (from Table 2-3)
	K_{iz} =	1.17 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.24 in

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Project Name: OLD SAYBROOK
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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	156	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.114	(from 2.6.5.2)
		K_{zt}=	1.2	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**58.78**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**8.06**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.90**	V_{max}=	135	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{-1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.24** **in** | **Angle =** **0 (deg)** | **Equivalent Angle =** **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
800-10799 Antenna	106.0	14.8	6.7	10.89	7.16	1.41	**900**	**148**	**44**
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	4.67	1.30	**350**	**61**	**17**
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	8.20	1.44	**659**	**113**	**33**
QS46512-2 Antenna	52.0	12.0	10.8	4.33	4.33	1.28	**326**	**57**	**16**
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	4.10	1.27	**291**	**51**	**14**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**161**	**29**	**8**
RRUS-32 B30 RRH(Side)	27.2	7.0	12.1	1.32	3.89	1.26	**98**	**20**	**5**
RRUS-32 B30 RRH(Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	**55**	**14**	**3**
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.10	1.20	**185**	**32**	**9**
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.72	1.21	**76**	**15**	**4**
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	5.44	1.33	**42**	**11**	**2**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**96**	**18**	**5**
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**116**	**21**	**6**
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	11.93	1.56	**17**	**7**	**1**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**67**	**13**	**3**
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	**14**		
3" Pipe	3.5	12.0	-	0.29	0.29	1.20	**21**		
2-1/2x1-1/2 Angle	2.5	12.0	-	0.21	0.21	2.00	**24**		
PL 8x5/8	0.6	12.0	-	0.05	0.05	2.00	**6**		
HSS 3x3	3.0	12.0	-	0.25	0.25	1.25	**18**		

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.24	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	900	491	798
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	350	230	320
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	659	586	641
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	326	299	319
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	291	257	283
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	161	98	145
RRUS-32 B30 RRH(Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	87	161	105
RRUS-32 B30 RRH(Shielded)	27.2	3.0	12.1	0.57	2.29	8.99	2.25	1.47	1.20	49	161	77
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	185	76	158
RRUS-E2 B29 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	92	185	116
RRUS-E2 B29 RRH (Shielded)	20.4	4.6	18.5	0.66	2.62	4.41	1.10	1.28	1.20	49	185	83
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	96	80	92
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	116	82	107
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	17	82	33

WIND LOADS WITH ICE:

800-10799 Antenna	108.5	17.3	9.2	13.02	6.92	6.28	11.81	1.37	1.56	144	87	129
SBNHH-1D65A Antenna	58.1	14.4	9.6	5.80	3.87	4.04	6.06	1.27	1.36	59	42	55
OPA65R-BU8BA Antenna	98.4	14.2	12.6	9.69	8.60	6.94	7.82	1.40	1.43	109	99	107
QS46512-2 Antenna	54.5	14.5	13.3	5.48	5.03	3.76	4.10	1.26	1.27	55	52	55
OPA65R-BU4BA Antenna	50.5	14.2	12.6	4.97	4.41	3.56	4.01	1.25	1.27	50	45	49
RRUS-32 B30 RRH	29.7	14.6	9.5	3.01	1.95	2.04	3.13	1.20	1.23	29	19	27
RRUS-32 B30 RRH(Side)	29.7	7.3	14.6	1.50	3.01	4.07	2.04	1.27	1.20	15	29	19
RRUS-32 B30 RRH(Shielded)	29.7	3.6	14.6	0.75	3.01	8.14	2.04	1.44	1.20	9	29	14
RRUS-E2 B29 RRH	22.9	21.0	10.0	3.33	1.59	1.09	2.29	1.20	1.20	32	15	28
RRUS-E2 B29 RRH (Side)	22.9	10.5	21.0	1.67	3.33	2.18	1.09	1.20	1.20	16	32	20
RRUS-E2 B29 RRH (Shielded)	22.9	5.2	21.0	0.83	3.33	4.36	1.09	1.28	1.20	9	32	15
B2/B66A 8843 RRH	17.4	15.7	13.4	1.89	1.62	1.11	1.30	1.20	1.20	18	16	18
B5/B12 4449 RRH	20.4	15.7	11.9	2.22	1.68	1.30	1.72	1.20	1.20	21	16	20
B5/B12 4449 RRH (Shielded)	20.4	4.0	11.9	0.56	1.68	5.12	1.72	1.32	1.20	6	16	9

WIND LOADS AT 30 MPH:

800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	44	24	39
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	16
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	33	29	32
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	16	15	16
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	14	13	14
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 B30 RRH(Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	4	8	5
RRUS-32 B30 RRH(Shielded)	27.2	3.0	12.1	0.57	2.29	8.99	2.25	1.47	1.20	2	8	4
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	9	4	8
RRUS-E2 B29 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	5	9	6
RRUS-E2 B29 RRH (Shielded)	20.4	4.6	18.5	0.66	2.62	4.41	1.10	1.28	1.20	2	9	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	5
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	6	4	5
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	1	4	2

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.24	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	900	491	593
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	350	230	260
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	659	586	605
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	326	299	306
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	291	257	266
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	161	98	114
RRUS-32 B30 RRH(Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	123	161	152
RRUS-32 B30 RRH(Shielded)	27.2	6.8	12.1	1.29	2.29	4.00	2.25	1.27	1.20	96	161	145
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	185	76	103
RRUS-E2 B29 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	139	185	173
RRUS-E2 B29 RRH (Shielded)	20.4	10.4	18.5	1.47	2.62	1.96	1.10	1.20	1.20	104	185	165
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	96	80	84
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	116	82	91
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	17	82	66

WIND LOADS WITH ICE:

800-10799 Antenna	108.5	17.3	9.2	13.02	6.92	6.28	11.81	1.37	1.56	144	87	101
SBNHH-1D65A Antenna	58.1	14.4	9.6	5.80	3.87	4.04	6.06	1.27	1.36	59	42	47
OPA65R-BU8BA Antenna	98.4	14.2	12.6	9.69	8.60	6.94	7.82	1.40	1.43	109	99	101
QS46512-2 Antenna	54.5	14.5	13.3	5.48	5.03	3.76	4.10	1.26	1.27	55	52	53
OPA65R-BU4BA Antenna	50.5	14.2	12.6	4.97	4.41	3.56	4.01	1.25	1.27	50	45	46
RRUS-32 B30 RRH	29.7	14.6	9.5	3.01	1.95	2.04	3.13	1.20	1.23	29	19	22
RRUS-32 B30 RRH(Side)	29.7	10.9	14.6	2.25	3.01	2.71	2.04	1.21	1.20	22	29	27
RRUS-32 B30 RRH(Shielded)	29.7	8.2	14.6	1.69	3.01	3.62	2.04	1.25	1.20	17	29	26
RRUS-E2 B29 RRH	22.9	21.0	10.0	3.33	1.59	1.09	2.29	1.20	1.20	32	15	20
RRUS-E2 B29 RRH (Side)	22.9	15.7	21.0	2.50	3.33	1.45	1.09	1.20	1.20	24	32	30
RRUS-E2 B29 RRH (Shielded)	22.9	11.8	21.0	1.88	3.33	1.94	1.09	1.20	1.20	18	32	29
B2/B66A 8843 RRH	17.4	15.7	13.4	1.89	1.62	1.11	1.30	1.20	1.20	18	16	16
B5/B12 4449 RRH	20.4	15.7	11.9	2.22	1.68	1.30	1.72	1.20	1.20	21	16	18
B5/B12 4449 RRH (Shielded)	20.4	4.0	11.9	0.56	1.68	5.12	1.72	1.32	1.20	6	16	14

WIND LOADS AT 30 MPH:

800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	44	24	29
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	13
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	33	29	30
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	16	15	15
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	14	13	13
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	6
RRUS-32 B30 RRH(Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	6	8	7
RRUS-32 B30 RRH(Shielded)	27.2	6.8	12.1	1.29	2.29	4.00	2.25	1.27	1.20	5	8	7
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	9	4	5
RRUS-E2 B29 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	7	9	9
RRUS-E2 B29 RRH (Shielded)	20.4	10.4	18.5	1.47	2.62	1.96	1.10	1.20	1.20	5	9	8
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	6	4	4
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	1	4	3

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.24	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	900	491	491
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	350	230	230
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	659	586	586
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	326	299	299
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	291	257	257
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	161	98	98
RRUS-32 B30 RRH(Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	98	161	161
RRUS-32 B30 RRH(Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	55	161	161
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	185	76	76
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	76	185	185
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	42	185	185
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	96	80	80
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	116	82	82
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	17	82	82

WIND LOADS WITH ICE:

800-10799 Antenna	108.5	17.3	9.2	13.02	6.92	6.28	11.81	1.37	1.56	144	87	87
SBNHH-1D65A Antenna	58.1	14.4	9.6	5.80	3.87	4.04	6.06	1.27	1.36	59	42	42
OPA65R-BU8BA Antenna	98.4	14.2	12.6	9.69	8.60	6.94	7.82	1.40	1.43	109	99	99
QS46512-2 Antenna	54.5	14.5	13.3	5.48	5.03	3.76	4.10	1.26	1.27	55	52	52
OPA65R-BU4BA Antenna	50.5	14.2	12.6	4.97	4.41	3.56	4.01	1.25	1.27	50	45	45
RRUS-32 B30 RRH	29.7	14.6	9.5	3.01	1.95	2.04	3.13	1.20	1.23	29	19	19
RRUS-32 B30 RRH(Side)	29.7	9.5	14.6	1.95	3.01	3.13	2.04	1.23	1.20	19	29	29
RRUS-32 B30 RRH(Shielded)	29.7	6.0	14.6	1.23	3.01	4.96	2.04	1.31	1.20	13	29	29
RRUS-E2 B29 RRH	22.9	21.0	10.0	3.33	1.59	1.09	2.29	1.20	1.20	32	15	15
RRUS-E2 B29 RRH (Side)	22.9	10.0	21.0	1.59	3.33	2.29	1.09	1.20	1.20	15	32	32
RRUS-E2 B29 RRH (Shielded)	22.9	6.2	21.0	0.99	3.33	3.67	1.09	1.25	1.20	10	32	32
B2/B66A 8843 RRH	17.4	15.7	13.4	1.89	1.62	1.11	1.30	1.20	1.20	18	16	16
B5/B12 4449 RRH	20.4	15.7	11.9	2.22	1.68	1.30	1.72	1.20	1.20	21	16	16
B5/B12 4449 RRH (Shielded)	20.4	4.0	11.9	0.56	1.68	5.12	1.72	1.32	1.20	6	16	16

WIND LOADS AT 30 MPH:

800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	44	24	24
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	11
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	33	29	29
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	16	15	15
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	14	13	13
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 B30 RRH(Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	8
RRUS-32 B30 RRH(Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	3	8	8
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	9	4	4
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	4	9	9
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	9	9
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	6	4	4
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	1	4	4

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.24	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	900	491	593
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	350	230	260
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	659	586	605
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	326	299	306
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	291	257	266
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	161	98	114
RRUS-32 B30 RRH(Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	123	161	152
RRUS-32 B30 RRH(Shielded)	27.2	6.8	12.1	1.29	2.29	4.00	2.25	1.27	1.20	96	161	145
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	185	76	103
RRUS-E2 B29 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	139	185	173
RRUS-E2 B29 RRH (Shielded)	20.4	10.4	18.5	1.47	2.62	1.96	1.10	1.20	1.20	104	185	165
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	96	80	84
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	116	82	91
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	17	82	66

WIND LOADS WITH ICE:

800-10799 Antenna	108.5	17.3	9.2	13.02	6.92	6.28	11.81	1.37	1.56	144	87	101
SBNHH-1D65A Antenna	58.1	14.4	9.6	5.80	3.87	4.04	6.06	1.27	1.36	59	42	47
OPA65R-BU8BA Antenna	98.4	14.2	12.6	9.69	8.60	6.94	7.82	1.40	1.43	109	99	101
QS46512-2 Antenna	54.5	14.5	13.3	5.48	5.03	3.76	4.10	1.26	1.27	55	52	53
OPA65R-BU4BA Antenna	50.5	14.2	12.6	4.97	4.41	3.56	4.01	1.25	1.27	50	45	46
RRUS-32 B30 RRH	29.7	14.6	9.5	3.01	1.95	2.04	3.13	1.20	1.23	29	19	22
RRUS-32 B30 RRH(Side)	29.7	10.9	14.6	2.25	3.01	2.71	2.04	1.21	1.20	22	29	27
RRUS-32 B30 RRH(Shielded)	29.7	8.2	14.6	1.69	3.01	3.62	2.04	1.25	1.20	17	29	26
RRUS-E2 B29 RRH	22.9	21.0	10.0	3.33	1.59	1.09	2.29	1.20	1.20	32	15	20
RRUS-E2 B29 RRH (Side)	22.9	15.7	21.0	2.50	3.33	1.45	1.09	1.20	1.20	24	32	30
RRUS-E2 B29 RRH (Shielded)	22.9	11.8	21.0	1.88	3.33	1.94	1.09	1.20	1.20	18	32	29
B2/B66A 8843 RRH	17.4	15.7	13.4	1.89	1.62	1.11	1.30	1.20	1.20	18	16	16
B5/B12 4449 RRH	20.4	15.7	11.9	2.22	1.68	1.30	1.72	1.20	1.20	21	16	18
B5/B12 4449 RRH (Shielded)	20.4	4.0	11.9	0.56	1.68	5.12	1.72	1.32	1.20	6	16	14

WIND LOADS AT 30 MPH:

800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	44	24	29
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	13
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	33	29	30
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	16	15	15
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	14	13	13
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	6
RRUS-32 B30 RRH(Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	6	8	7
RRUS-32 B30 RRH(Shielded)	27.2	6.8	12.1	1.29	2.29	4.00	2.25	1.27	1.20	5	8	7
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	9	4	5
RRUS-E2 B29 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	7	9	9
RRUS-E2 B29 RRH (Shielded)	20.4	10.4	18.5	1.47	2.62	1.96	1.10	1.20	1.20	5	9	8
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	6	4	4
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	1	4	3

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.24	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	900	491	798
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	350	230	320
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	659	586	641
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	326	299	319
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	291	257	283
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	161	98	145
RRUS-32 B30 RRH(Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	87	161	105
RRUS-32 B30 RRH(Shielded)	27.2	3.0	12.1	0.57	2.29	8.99	2.25	1.47	1.20	49	161	77
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	185	76	158
RRUS-E2 B29 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	92	185	116
RRUS-E2 B29 RRH (Shielded)	20.4	4.6	18.5	0.66	2.62	4.41	1.10	1.28	1.20	49	185	83
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	96	80	92
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	116	82	107
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	17	82	33

WIND LOADS WITH ICE:

800-10799 Antenna	108.5	17.3	9.2	13.02	6.92	6.28	11.81	1.37	1.56	144	87	129
SBNHH-1D65A Antenna	58.1	14.4	9.6	5.80	3.87	4.04	6.06	1.27	1.36	59	42	55
OPA65R-BU8BA Antenna	98.4	14.2	12.6	9.69	8.60	6.94	7.82	1.40	1.43	109	99	107
QS46512-2 Antenna	54.5	14.5	13.3	5.48	5.03	3.76	4.10	1.26	1.27	55	52	55
OPA65R-BU4BA Antenna	50.5	14.2	12.6	4.97	4.41	3.56	4.01	1.25	1.27	50	45	49
RRUS-32 B30 RRH	29.7	14.6	9.5	3.01	1.95	2.04	3.13	1.20	1.23	29	19	27
RRUS-32 B30 RRH(Side)	29.7	7.3	14.6	1.50	3.01	4.07	2.04	1.27	1.20	15	29	19
RRUS-32 B30 RRH(Shielded)	29.7	3.6	14.6	0.75	3.01	8.14	2.04	1.44	1.20	9	29	14
RRUS-E2 B29 RRH	22.9	21.0	10.0	3.33	1.59	1.09	2.29	1.20	1.20	32	15	28
RRUS-E2 B29 RRH (Side)	22.9	10.5	21.0	1.67	3.33	2.18	1.09	1.20	1.20	16	32	20
RRUS-E2 B29 RRH (Shielded)	22.9	5.2	21.0	0.83	3.33	4.36	1.09	1.28	1.20	9	32	15
B2/B66A 8843 RRH	17.4	15.7	13.4	1.89	1.62	1.11	1.30	1.20	1.20	18	16	18
B5/B12 4449 RRH	20.4	15.7	11.9	2.22	1.68	1.30	1.72	1.20	1.20	21	16	20
B5/B12 4449 RRH (Shielded)	20.4	4.0	11.9	0.56	1.68	5.12	1.72	1.32	1.20	6	16	9

WIND LOADS AT 30 MPH:

800-10799 Antenna	106.0	14.8	6.7	10.89	4.93	7.16	15.82	1.41	1.69	44	24	39
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	16
OPA65R-BU8BA Antenna	95.9	11.7	10.1	7.79	6.73	8.20	9.50	1.44	1.48	33	29	32
QS46512-2 Antenna	52.0	12.0	10.8	4.33	3.90	4.33	4.81	1.28	1.30	16	15	16
OPA65R-BU4BA Antenna	48.0	11.7	10.1	3.90	3.37	4.10	4.75	1.27	1.30	14	13	14
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 B30 RRH(Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	4	8	5
RRUS-32 B30 RRH(Shielded)	27.2	3.0	12.1	0.57	2.29	8.99	2.25	1.47	1.20	2	8	4
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	9	4	8
RRUS-E2 B29 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	5	9	6
RRUS-E2 B29 RRH (Shielded)	20.4	4.6	18.5	0.66	2.62	4.41	1.10	1.28	1.20	2	9	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	5
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	6	4	5
B5/B12 4449 RRH (Shielded)	17.9	1.5	9.4	0.19	1.17	11.93	1.90	1.56	1.20	1	4	2

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice:	1.24	in.
Density of ice:	56	pcf

800-10799 Antenna

Weight of ice based on total radial SF area:

Height (in):	106.0	
Width (in):	14.8	
Depth (in):	6.7	
Total weight of ice on object:	234	lbs
Weight of object:	108.0	lbs
Combined weight of ice and object:	342	lbs

SBNHH-1D65A Antenna

Weight of ice based on total radial SF area:

Height (in):	55.6	
Width (in):	11.9	
Depth (in):	7.1	
Total weight of ice on object:	106	lbs
Weight of object:	34.0	lbs
Combined weight of ice and object:	140	lbs

OPA65R-BU8BA Antenna

Weight of ice based on total radial SF area:

Height (in):	95.9	
Width (in):	11.7	
Depth (in):	8.4	
Total weight of ice on object:	189	lbs
Weight of object:	69.0	lbs
Combined weight of ice and object:	258	lbs

QS46512-2 Antenna

Weight of ice based on total radial SF area:

Height (in):	52.0	
Width (in):	12.0	
Depth (in):	10.8	
Total weight of ice on object:	114	lbs
Weight of object:	75.0	lbs
Combined weight of ice and object:	189	lbs

OPA65R-BU4BA Antenna

Weight of ice based on total radial SF area:

Height (in):	48.0	
Width (in):	11.7	
Depth (in):	10.1	
Total weight of ice on object:	101	lbs
Weight of object:	43.0	lbs
Combined weight of ice and object:	144	lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:	52	lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:	112	lbs

RRUS-E2 B29 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:	55	lbs
Weight of object:	53.0	lbs
Combined weight of ice and object:	108	lbs

B14 4478 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:	39	lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:	99	lbs

Date: 10/23/2020
Project Name: OLD SAYBROOK
Project No.: CT2019
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:		35 lbs
Weight of object:	72.0 lbs	
Combined weight of ice and object:		107 lbs

B5/B12 4449 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		39 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		112 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		33 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		66 lbs

HSS 3x3

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		8 plf

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		7 plf

L 3x3 Angles

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		8 plf

L 2-1/2x1-1/2 Angles

Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	1.5	
Per foot weight of ice on object:		6 plf

PL 8x5/8

Weight of ice based on total radial SF area:

Height (in):	8	
Width (in):	0.625	
Per foot weight of ice on object:		14 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

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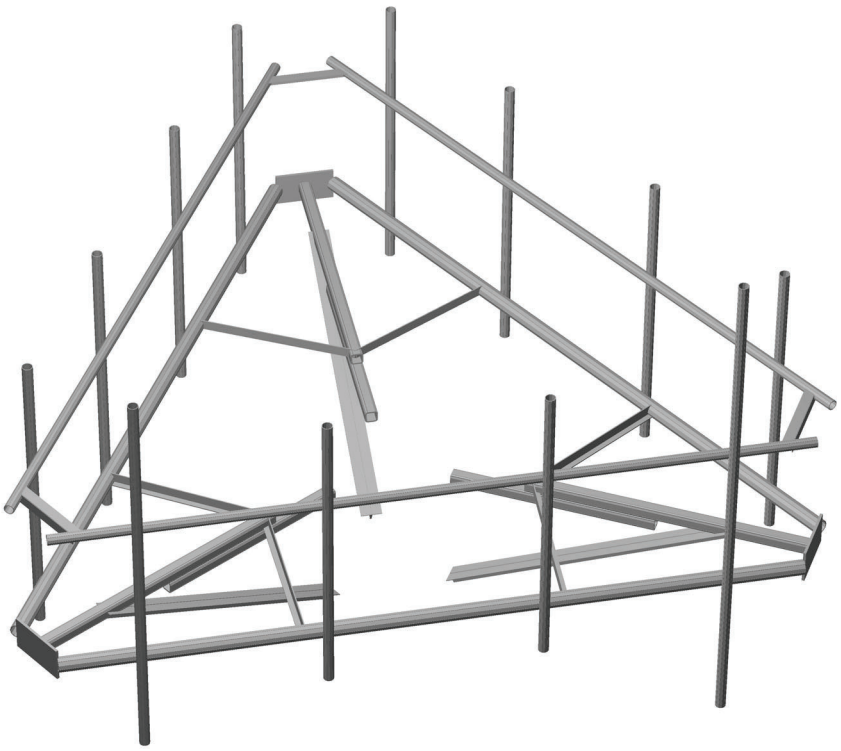

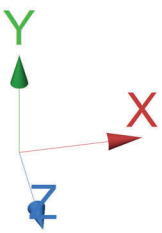

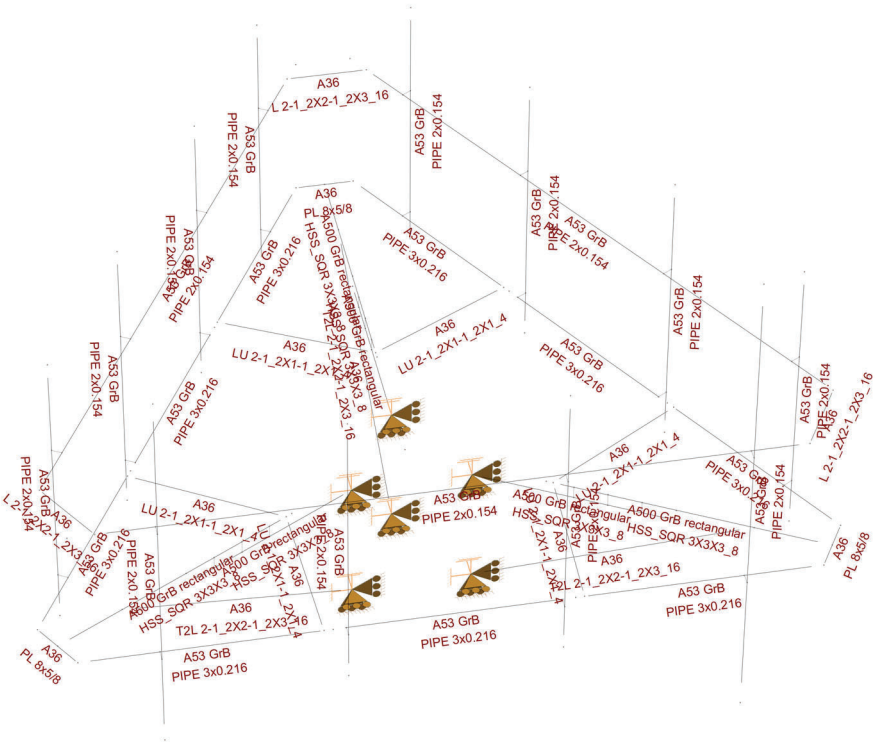
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L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2x0.154
A36
PL 8x5/8
A500 GrB rectangular
HSS_SQR 3X3X3_8
A53 GrB
PIPE 3x0.216
A36
LU 2-1_2X1-1_2X1_4
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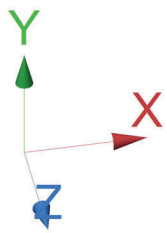
T2L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2x0.154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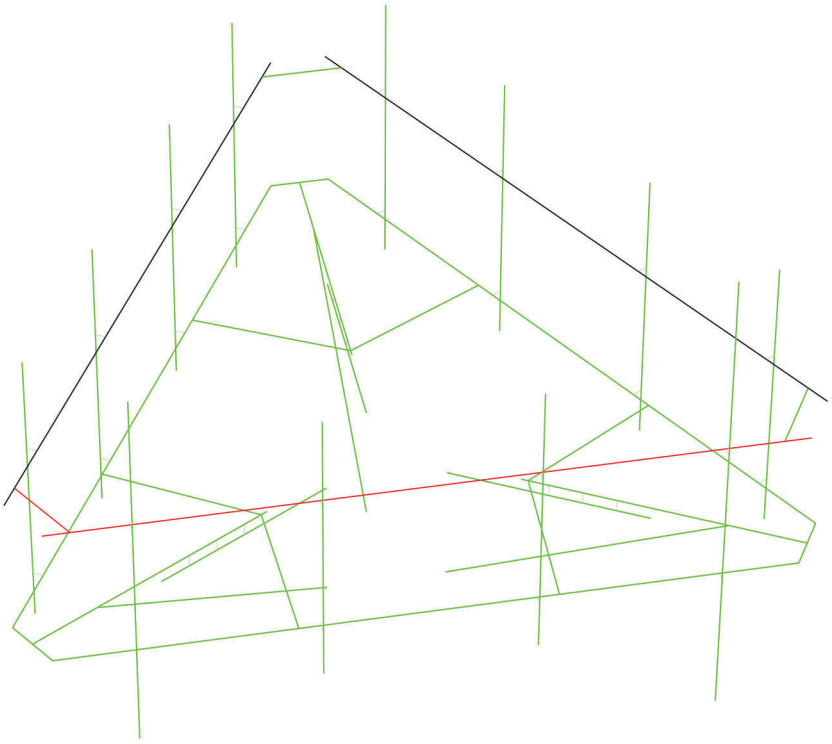

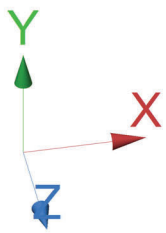
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X
Z

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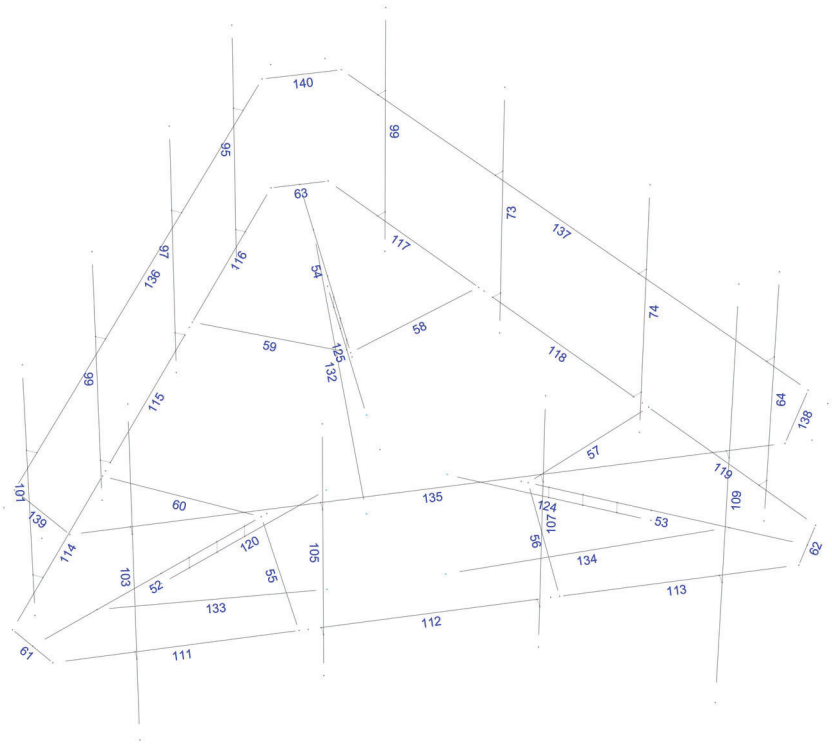

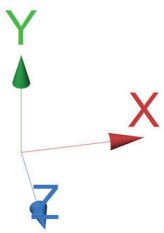

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Load data

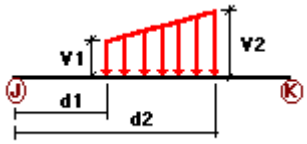
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	52	y	-0.01	0.00	0.00	No	0.00	No
	53	y	-0.01	0.00	0.00	No	0.00	No
	54	y	-0.01	0.00	0.00	No	0.00	No
W0	52	z	-0.018	0.00	0.00	No	0.00	No
	53	z	-0.018	0.00	0.00	No	0.00	No
	55	z	-0.024	0.00	0.00	No	0.00	No
	56	z	-0.024	0.00	0.00	No	0.00	No
	57	z	-0.024	0.00	0.00	No	0.00	No
	58	z	-0.024	0.00	0.00	No	0.00	No
	59	z	-0.024	0.00	0.00	No	0.00	No
	60	z	-0.024	0.00	0.00	No	0.00	No
	61	z	-0.06	0.00	0.00	No	0.00	No
	62	z	-0.06	0.00	0.00	No	0.00	No
	63	z	-0.06	0.00	0.00	No	0.00	No

	64	z	-0.014	0.00	0.00	No	0.00	No
	66	z	-0.014	0.00	0.00	No	0.00	No
	95	z	-0.014	0.00	0.00	No	0.00	No
	97	z	-0.014	0.00	0.00	No	0.00	No
	74	z	-0.014	0.00	0.00	No	0.00	No
	99	z	-0.014	0.00	0.00	No	0.00	No
	73	z	-0.014	0.00	0.00	No	0.00	No
	101	z	-0.014	0.00	0.00	No	0.00	No
	105	z	-0.014	0.00	0.00	No	0.00	No
	111	z	-0.021	0.00	0.00	No	0.00	No
	112	z	-0.021	0.00	0.00	No	0.00	No
	113	z	-0.021	0.00	0.00	No	0.00	No
	114	z	-0.021	0.00	0.00	No	0.00	No
	115	z	-0.021	0.00	0.00	No	0.00	No
	116	z	-0.021	0.00	0.00	No	0.00	No
	117	z	-0.021	0.00	0.00	No	0.00	No
	118	z	-0.021	0.00	0.00	No	0.00	No
	119	z	-0.021	0.00	0.00	No	0.00	No
	120	z	-0.018	0.00	0.00	No	0.00	No
	124	z	-0.018	0.00	0.00	No	0.00	No
	132	z	-0.024	0.00	0.00	No	0.00	No
	133	z	-0.024	0.00	0.00	No	0.00	No
	134	z	-0.024	0.00	0.00	No	0.00	No
	135	z	-0.014	0.00	0.00	No	0.00	No
	136	z	-0.014	0.00	0.00	No	0.00	No
	137	z	-0.014	0.00	0.00	No	0.00	No
	138	z	-0.024	0.00	0.00	No	0.00	No
	139	z	-0.024	0.00	0.00	No	0.00	No
	140	z	-0.024	0.00	0.00	No	0.00	No
W30	52	x	-0.018	0.00	0.00	No	0.00	No
	53	x	-0.018	0.00	0.00	No	0.00	No
	54	x	-0.018	0.00	0.00	No	0.00	No
	55	x	-0.024	0.00	0.00	No	0.00	No
	56	x	-0.024	0.00	0.00	No	0.00	No
	57	x	-0.024	0.00	0.00	No	0.00	No
	58	x	-0.024	0.00	0.00	No	0.00	No
	59	x	-0.024	0.00	0.00	No	0.00	No
	60	x	-0.024	0.00	0.00	No	0.00	No
	61	x	-0.06	0.00	0.00	No	0.00	No
	62	x	-0.06	0.00	0.00	No	0.00	No
	95	x	-0.014	0.00	0.00	No	0.00	No
	97	x	-0.014	0.00	0.00	No	0.00	No
	74	x	-0.014	0.00	0.00	No	0.00	No
	99	x	-0.014	0.00	0.00	No	0.00	No
	101	x	-0.014	0.00	0.00	No	0.00	No
	103	x	-0.014	0.00	0.00	No	0.00	No
	105	x	-0.014	0.00	0.00	No	0.00	No
	107	x	-0.014	0.00	0.00	No	0.00	No
	109	x	-0.014	0.00	0.00	No	0.00	No
	114	x	-0.021	0.00	0.00	No	0.00	No
	115	x	-0.021	0.00	0.00	No	0.00	No
	116	x	-0.021	0.00	0.00	No	0.00	No
	117	x	-0.021	0.00	0.00	No	0.00	No
	118	x	-0.021	0.00	0.00	No	0.00	No
	119	x	-0.021	0.00	0.00	No	0.00	No
	120	x	-0.018	0.00	0.00	No	0.00	No
	124	x	-0.018	0.00	0.00	No	0.00	No
	125	x	-0.018	0.00	0.00	No	0.00	No
	132	x	-0.024	0.00	0.00	No	0.00	No
	133	x	-0.024	0.00	0.00	No	0.00	No

	134	x	-0.024	0.00	0.00	No	0.00	No
	136	x	-0.014	0.00	0.00	No	0.00	No
	137	x	-0.014	0.00	0.00	No	0.00	No
	138	x	-0.024	0.00	0.00	No	0.00	No
	139	x	-0.024	0.00	0.00	No	0.00	No
Di	52	y	-0.008	0.00	0.00	No	0.00	No
	53	y	-0.008	0.00	0.00	No	0.00	No
	54	y	-0.008	0.00	0.00	No	0.00	No
	55	y	-0.006	0.00	0.00	No	0.00	No
	56	y	-0.006	0.00	0.00	No	0.00	No
	57	y	-0.006	0.00	0.00	No	0.00	No
	58	y	-0.006	0.00	0.00	No	0.00	No
	59	y	-0.006	0.00	0.00	No	0.00	No
	60	y	-0.006	0.00	0.00	No	0.00	No
	61	y	-0.014	0.00	0.00	No	0.00	No
	62	y	-0.014	0.00	0.00	No	0.00	No
	63	y	-0.014	0.00	0.00	No	0.00	No
	64	y	-0.005	0.00	0.00	No	0.00	No
	66	y	-0.005	0.00	0.00	No	0.00	No
	95	y	-0.005	0.00	0.00	No	0.00	No
	97	y	-0.005	0.00	0.00	No	0.00	No
	74	y	-0.005	0.00	0.00	No	0.00	No
	99	y	-0.005	0.00	0.00	No	0.00	No
	73	y	-0.005	0.00	0.00	No	0.00	No
	101	y	-0.005	0.00	0.00	No	0.00	No
	103	y	-0.005	0.00	0.00	No	0.00	No
	105	y	-0.005	0.00	0.00	No	0.00	No
	107	y	-0.005	0.00	0.00	No	0.00	No
	109	y	-0.005	0.00	0.00	No	0.00	No
	111	y	-0.007	0.00	0.00	No	0.00	No
	112	y	-0.007	0.00	0.00	No	0.00	No
	113	y	-0.007	0.00	0.00	No	0.00	No
	114	y	-0.007	0.00	0.00	No	0.00	No
	115	y	-0.007	0.00	0.00	No	0.00	No
	116	y	-0.007	0.00	0.00	No	0.00	No
	117	y	-0.007	0.00	0.00	No	0.00	No
	118	y	-0.007	0.00	0.00	No	0.00	No
	119	y	-0.007	0.00	0.00	No	0.00	No
	120	y	-0.008	0.00	0.00	No	0.00	No
	124	y	-0.008	0.00	0.00	No	0.00	No
	125	y	-0.008	0.00	0.00	No	0.00	No
	132	y	-0.007	0.00	0.00	No	0.00	No
	133	y	-0.007	0.00	0.00	No	0.00	No
	134	y	-0.007	0.00	0.00	No	0.00	No
	135	y	-0.005	0.00	0.00	No	0.00	No
	136	y	-0.005	0.00	0.00	No	0.00	No
	137	y	-0.005	0.00	0.00	No	0.00	No
	138	y	-0.007	0.00	0.00	No	0.00	No
	139	y	-0.007	0.00	0.00	No	0.00	No
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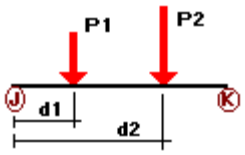
Concentrated forces on members



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DL	64	y	-0.038	1.00	No
		y	-0.038	4.50	No
		y	-0.06	3.00	No
		y	-0.053	3.00	No
	66	y	-0.022	1.00	No
		y	-0.022	4.00	No
		y	-0.073	3.00	No
	95	y	-0.038	1.00	No
		y	-0.038	4.50	No
		y	-0.06	3.00	No
		y	-0.053	3.00	No
	99	y	-0.017	1.00	No
		y	-0.017	4.50	No
	73	y	-0.017	1.00	No
		y	-0.017	4.50	No
	101	y	-0.022	1.00	No
		y	-0.022	4.00	No
		y	-0.073	3.00	No
	103	y	-0.054	0.50	No
		y	-0.054	7.50	No
		y	-0.06	2.00	No
		y	-0.053	2.00	No
	107	y	-0.017	1.00	No
		y	-0.017	4.50	No
	109	y	-0.035	1.50	No
		y	-0.035	8.50	No
		y	-0.073	3.00	No
W0	64	z	-0.153	1.00	No
		z	-0.153	4.50	No
		z	-0.165	3.00	No
	66	z	-0.133	1.00	No
		z	-0.133	4.00	No
		z	-0.066	3.00	No
	95	z	-0.153	1.00	No
		z	-0.153	4.50	No
		z	-0.165	3.00	No
	99	z	-0.131	1.00	No
		z	-0.131	4.50	No
	73	z	-0.131	1.00	No
		z	-0.131	4.50	No
	101	z	-0.133	1.00	No
		z	-0.133	4.00	No
		z	-0.066	3.00	No
	103	z	-0.45	0.50	No
		z	-0.45	7.50	No
		z	-0.055	2.00	No
		z	-0.042	2.00	No
	107	z	-0.176	1.00	No
		z	-0.176	4.50	No
	109	z	-0.33	1.50	No
		z	-0.33	8.50	No
		z	-0.017	3.00	No
W30	64	x	-0.16	1.00	No
		x	-0.16	4.50	No

		x	-0.083	3.00	No
	66	x	-0.142	1.00	No
		x	-0.142	4.00	No
		x	-0.033	3.00	No
	95	x	-0.16	1.00	No
		x	-0.16	4.50	No
		x	-0.083	3.00	No
	99	x	-0.161	1.00	No
		x	-0.161	4.50	No
	73	x	-0.161	1.00	No
		x	-0.161	4.50	No
	101	x	-0.142	1.00	No
		x	-0.142	4.00	No
		x	-0.033	3.00	No
	103	x	-0.246	0.50	No
		x	-0.246	7.50	No
		x	-0.185	2.00	No
	107	x	-0.116	1.00	No
		x	-0.116	4.50	No
	109	x	-0.294	1.50	No
		x	-0.294	8.50	No
		x	-0.082	3.00	No
Di	64	y	-0.057	1.00	No
		y	-0.057	4.50	No
		y	-0.052	3.00	No
		y	-0.055	3.00	No
	66	y	-0.051	1.00	No
		y	-0.051	4.00	No
		y	-0.039	3.00	No
	95	y	-0.057	1.00	No
		y	-0.057	4.50	No
		y	-0.052	3.00	No
		y	-0.055	3.00	No
	99	y	-0.053	1.00	No
		y	-0.053	4.50	No
	73	y	-0.053	1.00	No
		y	-0.053	4.50	No
	101	y	-0.051	1.00	No
		y	-0.051	4.00	No
		y	-0.039	3.00	No
	103	y	-0.117	0.50	No
		y	-0.117	7.50	No
		y	-0.052	2.00	No
		y	-0.055	2.00	No
	107	y	-0.053	1.00	No
		y	-0.053	4.50	No
	109	y	-0.095	1.50	No
		y	-0.095	8.50	No
		y	-0.039	3.00	No
Wi0	64	z	-0.027	1.00	No
		z	-0.027	4.50	No
		z	-0.029	3.00	No
	66	z	-0.024	1.00	No
		z	-0.024	4.00	No
		z	-0.014	3.00	No
	95	z	-0.027	1.00	No
		z	-0.027	4.50	No
		z	-0.029	3.00	No
	99	z	-0.024	1.00	No
		z	-0.024	4.50	No

	73	z	-0.024	1.00	No
		z	-0.024	4.50	No
	101	z	-0.024	1.00	No
		z	-0.024	4.00	No
		z	-0.014	3.00	No
	103	z	-0.074	0.50	No
		z	-0.074	7.50	No
		z	-0.014	2.00	No
		z	-0.011	2.00	No
	107	z	-0.031	1.00	No
		z	-0.031	4.50	No
	109	z	-0.057	1.50	No
		z	-0.057	8.50	No
		z	-0.007	3.00	No
Wi30	64	x	-0.028	1.00	No
		x	-0.028	4.50	No
		x	-0.015	3.00	No
	66	x	-0.025	1.00	No
		x	-0.025	4.00	No
		x	-0.009	3.00	No
	95	x	-0.028	1.00	No
		x	-0.028	4.50	No
		x	-0.015	3.00	No
	99	x	-0.028	1.00	No
		x	-0.028	4.50	No
	73	x	-0.028	1.00	No
		x	-0.028	4.50	No
	101	x	-0.025	1.00	No
		x	-0.025	4.00	No
		x	-0.009	3.00	No
	103	x	-0.044	0.50	No
		x	-0.044	7.50	No
		x	-0.032	2.00	No
	107	x	-0.022	1.00	No
		x	-0.022	4.50	No
	109	x	-0.05	1.50	No
		x	-0.05	8.50	No
		x	-0.016	3.00	No
WL0	64	z	-0.008	1.00	No
		z	-0.008	4.50	No
		z	-0.008	3.00	No
	66	z	-0.007	1.00	No
		z	-0.007	4.00	No
		z	-0.003	3.00	No
	95	z	-0.008	1.00	No
		z	-0.008	4.50	No
		z	-0.008	3.00	No
	99	z	-0.007	1.00	No
		z	-0.007	4.50	No
	73	z	-0.007	1.00	No
		z	-0.007	4.50	No
	101	z	-0.007	1.00	No
		z	-0.007	4.00	No
		z	-0.003	3.00	No
	103	z	-0.023	0.50	No
		z	-0.023	7.50	No
		z	-0.003	2.00	No
		z	-0.002	2.00	No
	107	z	-0.009	1.00	No
		z	-0.009	4.50	No

	109	z	-0.017	1.50	No
		z	-0.017	8.50	No
		z	-0.001	3.00	No
WL30	64	x	-0.008	1.00	No
		x	-0.008	4.50	No
		x	-0.004	3.00	No
	66	x	-0.007	1.00	No
		x	-0.007	4.00	No
		x	-0.002	3.00	No
	95	x	-0.008	1.00	No
		x	-0.008	4.50	No
		x	-0.004	3.00	No
	99	x	-0.008	1.00	No
		x	-0.008	4.50	No
	73	x	-0.008	1.00	No
		x	-0.008	4.50	No
	101	x	-0.007	1.00	No
		x	-0.007	4.00	No
		x	-0.002	3.00	No
	103	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.009	2.00	No
	107	x	-0.006	1.00	No
		x	-0.006	4.50	No
	109	x	-0.015	1.50	No
		x	-0.015	8.50	No
		x	-0.004	3.00	No
LL1	112	y	-0.25	50.00	Yes
LL2	111	y	-0.25	100.00	Yes
LLa1	109	y	-0.25	50.00	Yes
LLa2	107	y	-0.25	50.00	Yes
LLa3	105	y	-0.25	50.00	Yes
LLa4	103	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC15=1.2DL+1.5LL1
LC16=1.2DL+1.5LL2
LC17=1.2DL+WL0+1.5LLa1
LC18=1.2DL+WL30+1.5LLa1
LC19=1.2DL-WL0+1.5LLa1
LC20=1.2DL-WL30+1.5LLa1
LC21=1.2DL+WL0+1.5LLa2
LC22=1.2DL+WL30+1.5LLa2
LC23=1.2DL-WL0+1.5LLa2
LC24=1.2DL-WL30+1.5LLa2
LC25=1.2DL+WL0+1.5LLa3
LC26=1.2DL+WL30+1.5LLa3
LC27=1.2DL-WL0+1.5LLa3
LC28=1.2DL-WL30+1.5LLa3
LC29=1.2DL+WL0+1.5LLa4
LC30=1.2DL+WL30+1.5LLa4
LC31=1.2DL-WL0+1.5LLa4
LC32=1.2DL-WL30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X3_8	**52**	LC2 at 27.68%	0.25	OK	Eq. H1-1b
		53	LC4 at 72.32%	0.23	OK	Eq. H1-1b
		54	LC1 at 26.79%	0.25	OK	Eq. H1-1b
		120	LC3 at 100.00%	**0.27**	**OK**	Eq. H1-1b
		124	LC3 at 0.00%	0.23	OK	Eq. H1-1b
		125	LC1 at 50.00%	0.15	OK	Eq. H1-1b
	L 2-1_2X2-1_2X3_16	**138**	LC3 at 0.00%	0.95	OK	Eq. H2-1
		139	LC3 at 100.00%	**1.09**	**N.G.**	Eq. H2-1
		140	LC2 at 0.00%	0.50	OK	Eq. H2-1
	LU 2-1_2X1-1_2X1_4	**55**	LC1 at 100.00%	0.87	OK	Eq. H2-1
		56	LC1 at 0.00%	**0.89**	**OK**	Eq. H2-1
		57	LC3 at 100.00%	0.66	OK	Eq. H2-1
		58	LC2 at 0.00%	0.76	OK	Eq. H2-1
		59	LC4 at 100.00%	0.77	OK	Eq. H2-1
		60	LC4 at 0.00%	0.70	OK	Eq. H2-1

PIPE 2x0.154	**64**	LC4 at 81.25%	0.62	OK	Eq. H1-1b
	66	LC1 at 81.25%	0.73	OK	Eq. H1-1b
	95	LC1 at 81.25%	0.82	OK	Eq. H1-1b
	97	LC1 at 81.25%	0.66	OK	Eq. H1-1b
	74	LC3 at 81.25%	0.73	OK	Eq. H1-1b
	99	LC3 at 81.25%	0.71	OK	Eq. H1-1b
	73	LC1 at 81.25%	0.75	OK	Eq. H1-1b
	101	LC2 at 81.25%	0.65	OK	Eq. H1-1b
	103	LC1 at 35.42%	0.92	OK	Eq. H1-1b
	105	LC2 at 33.33%	0.65	OK	Eq. H1-1b
	107	LC3 at 81.25%	0.66	OK	Eq. H1-1b
	109	LC2 at 39.58%	0.74	OK	Eq. H1-1b
	135	LC3 at 10.71%	**1.01**	**N.G.**	Eq. H1-1b
	136	LC1 at 10.71%	0.81	With warnings	Eq. H1-1b
	137	LC1 at 89.29%	0.71	With warnings	Eq. H1-1b
PIPE 3x0.216	**111**	LC3 at 68.75%	**0.31**	**OK**	Eq. H1-1b
	112	LC4 at 6.25%	0.23	OK	Eq. H1-1b
	113	LC4 at 100.00%	0.26	OK	Eq. H1-1b
	114	LC2 at 0.00%	0.30	OK	Eq. H3-6
	115	LC2 at 0.00%	0.21	OK	Eq. H1-1b
	116	LC1 at 100.00%	0.30	OK	Eq. H1-1b
	117	LC1 at 0.00%	0.29	OK	Eq. H1-1b
	118	LC3 at 6.25%	0.21	OK	Eq. H1-1b
	119	LC4 at 100.00%	0.29	OK	Eq. H3-6
PL 8x5/8	**61**	LC4 at 46.88%	0.32	OK	Eq. H1-1b
	62	LC2 at 53.13%	0.32	OK	Eq. H1-1b
	63	LC3 at 50.00%	**0.41**	**OK**	Eq. H1-1b
T2L 2-1_2X2-1_2X3_16	**132**	LC1 at 100.00%	0.86	OK	Eq. H2-1
	133	LC2 at 100.00%	**0.89**	**OK**	Eq. H2-1
	134	LC4 at 0.00%	0.83	OK	Eq. H2-1

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
107	-2.4167	0.00	4.667	0
108	-6.9167	0.00	4.667	0
109	-2.4168	0.00	1.3953	0
110	-7.4998	0.00	3.657	0
111	-5.2498	0.00	-0.2401	0
112	0.00	0.00	-2.7902	0
113	-2.8331	0.00	-4.4259	0
114	-0.5831	0.00	-8.323	0
115	2.4167	0.00	4.667	0
116	6.9167	0.00	4.667	0
117	2.4168	0.00	1.3953	0
118	7.4998	0.00	3.657	0
119	5.2498	0.00	-0.2401	0
120	2.8331	0.00	-4.4259	0
121	0.5831	0.00	-8.323	0
122	-7.2084	0.00	4.1618	0
123	7.2084	0.00	4.1618	0
124	0.00	0.00	-8.323	0
128	6.9233	5.00	2.2575	0
129	1.5066	5.00	-7.1245	0
137	6.9233	-1.00	2.2575	0

139	1.5066	-1.00	-7.1245	0
147	3.2149	5.00	-4.1656	0
148	3.2149	-1.00	-4.1656	0
149	5.2149	5.00	-0.7014	0
150	5.2149	-1.00	-0.7014	0
191	-1.5066	5.00	-7.1245	0
192	-1.5066	-1.00	-7.1245	0
195	-3.2149	5.00	-4.1656	0
196	-3.2149	-1.00	-4.1656	0
199	-5.2149	5.00	-0.7014	0
200	-5.2149	-1.00	-0.7014	0
203	-6.9233	5.00	2.2575	0
204	-6.9233	-1.00	2.2575	0
208	-5.4167	-2.00	4.867	0
211	-2.00	5.00	4.867	0
212	-2.00	-1.00	4.867	0
215	2.00	5.00	4.867	0
216	2.00	-1.00	4.867	0
219	5.4167	7.00	4.867	0
220	5.4167	-3.00	4.867	0
223	5.1651	0.00	-0.3878	0
224	2.9151	0.00	-4.2849	0
229	-5.1684	0.00	-0.3821	0
230	-2.9184	0.00	-4.2792	0
231	2.2533	0.00	4.667	0
232	-2.2467	0.00	4.667	0
244	4.6138	0.00	2.6638	0
250	0.00	0.00	-5.3275	0
252	-4.6138	0.00	2.6638	0
255	-4.6138	-0.25	2.6638	0
257	4.6138	-0.25	2.6638	0
258	0.00	-0.25	-5.3275	0
260	-1.1543	-0.25	0.6664	0
261	1.1543	-0.25	0.6664	0
262	0.00	-0.25	-1.3323	0
277	-2.5336	0.00	1.4628	0
280	2.5336	0.00	1.4628	0
283	0.00	0.00	-2.9252	0
286	-5.9108	0.00	3.4126	0
289	5.9108	0.00	3.4126	0
292	0.00	0.00	-6.8253	0
293	0.00	-2.75	-1.3323	0
294	-1.1543	-2.75	0.6664	0
295	1.1543	-2.75	0.6664	0
297	0.5417	3.00	-8.3957	0
298	7.5417	3.00	3.7287	0
299	7.2917	3.00	3.2957	0
300	0.7917	3.00	-7.9627	0
311	-7.5417	3.00	3.7287	0
312	-7.2917	3.00	3.2957	0
314	-0.5417	3.00	-8.3957	0
315	-0.7917	3.00	-7.9627	0
316	7.00	3.00	4.667	0
317	6.50	3.00	4.667	0
319	-7.00	3.00	4.667	0
320	-6.50	3.00	4.667	0
323	-2.00	3.00	4.867	0
340	3.0417	3.00	-4.0656	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
260	1	1	1	1	1	1
261	1	1	1	1	1	1
262	1	1	1	1	1	1
293	1	1	1	1	1	1
294	1	1	1	1	1	1
295	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
52	122	109		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
53	117	123		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
54	124	112		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
55	277	107		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
56	115	280		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
57	280	119		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
58	120	283		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
59	283	113		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
60	111	277		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
61	110	108		PL 8x5/8	A36	0.00	0.00	0.00
62	116	118		PL 8x5/8	A36	0.00	0.00	0.00
63	121	114		PL 8x5/8	A36	0.00	0.00	0.00
64	128	137		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
66	129	139		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
95	191	192		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
97	195	196		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
74	149	150		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
99	199	200		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
73	147	148		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
101	203	204		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
103	207	208		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
105	211	212		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
107	215	216		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
109	219	220		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
111	232	108		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
112	232	231		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
113	231	116		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
114	110	229		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
115	229	230		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
116	230	114		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
117	121	224		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
118	224	223		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
119	223	118		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
120	255	260		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
124	261	257		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
125	262	258		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
132	293	292		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
133	294	286		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
134	289	295		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
135	319	316		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
136	311	314		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
137	297	298		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
138	299	317		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
139	320	312		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

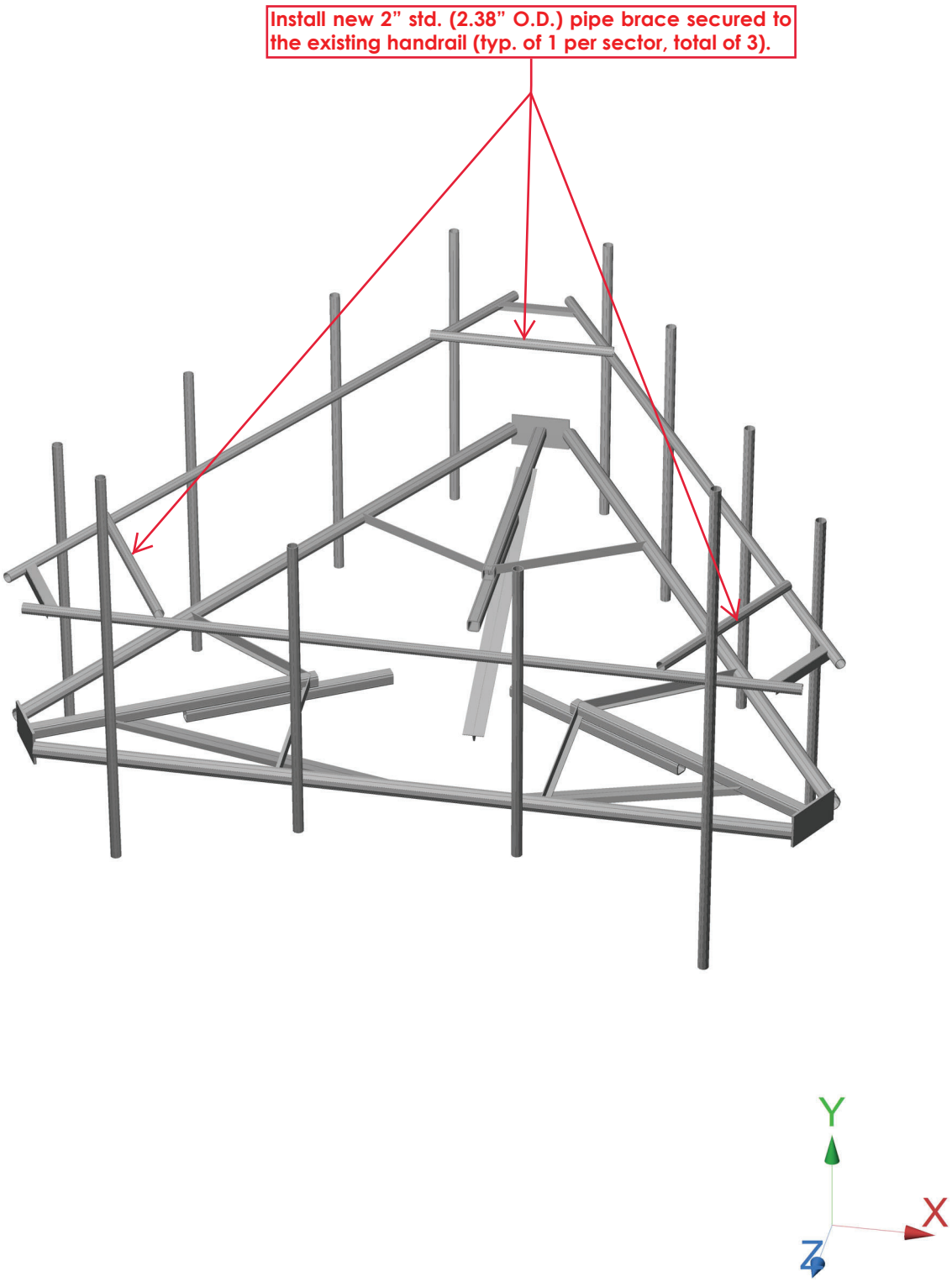
140	300	315		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
64	0.00	2	1.00	0.00	0.00
66	0.00	2	1.00	0.00	0.00
95	0.00	2	1.00	0.00	0.00
97	0.00	2	-0.50	0.00	0.866
74	0.00	2	-0.50	0.00	-0.866
99	0.00	2	1.00	0.00	0.00
73	0.00	2	1.00	0.00	0.00
101	0.00	2	1.00	0.00	0.00
103	0.00	2	1.00	0.00	0.00
105	0.00	2	1.00	0.00	0.00
107	0.00	2	1.00	0.00	0.00
109	0.00	2	1.00	0.00	0.00
138	90.00	0	0.00	0.00	0.00
139	90.00	0	0.00	0.00	0.00
140	180.00	0	0.00	0.00	0.00

HUDSON
Design Group LLC

Mount Calculations
(Modified Conditions)


Install new 2" std. (2.38" O.D.) pipe brace secured to the existing handrail (typ. of 1 per sector, total of 3).
Y
X
Z

Current Date: 10/19/2020 2:24 PM
Units system: English
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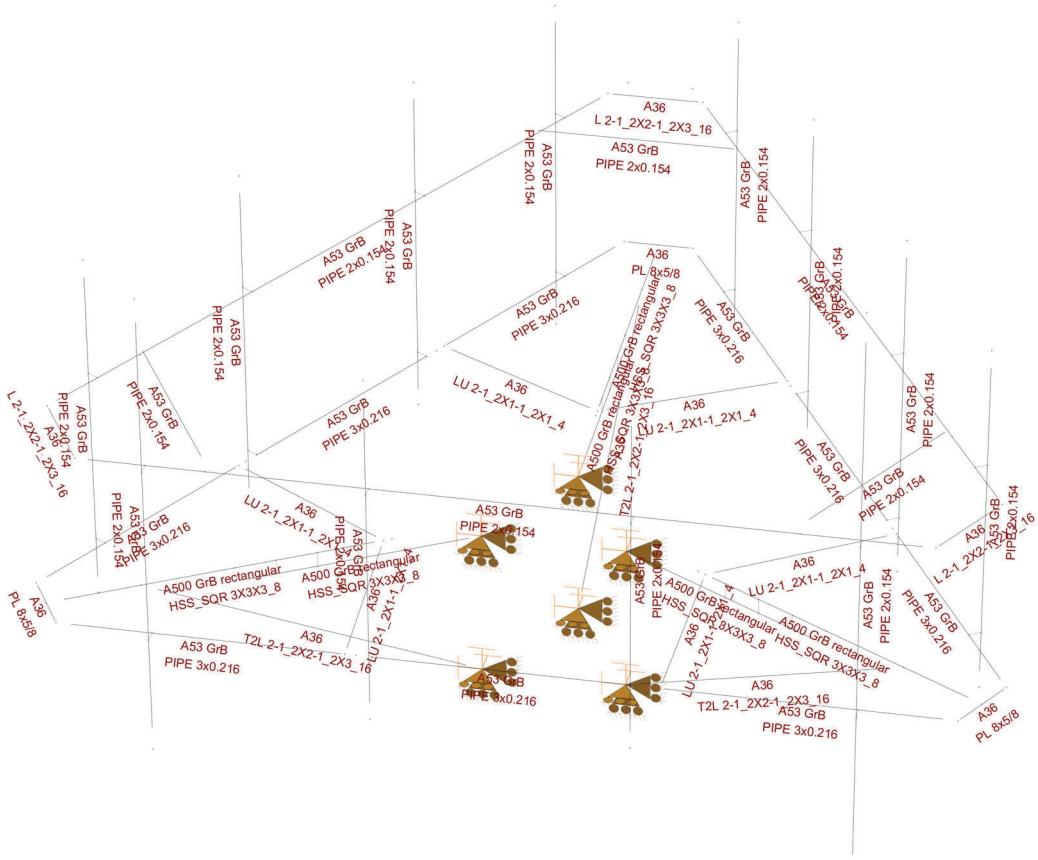

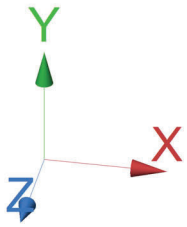

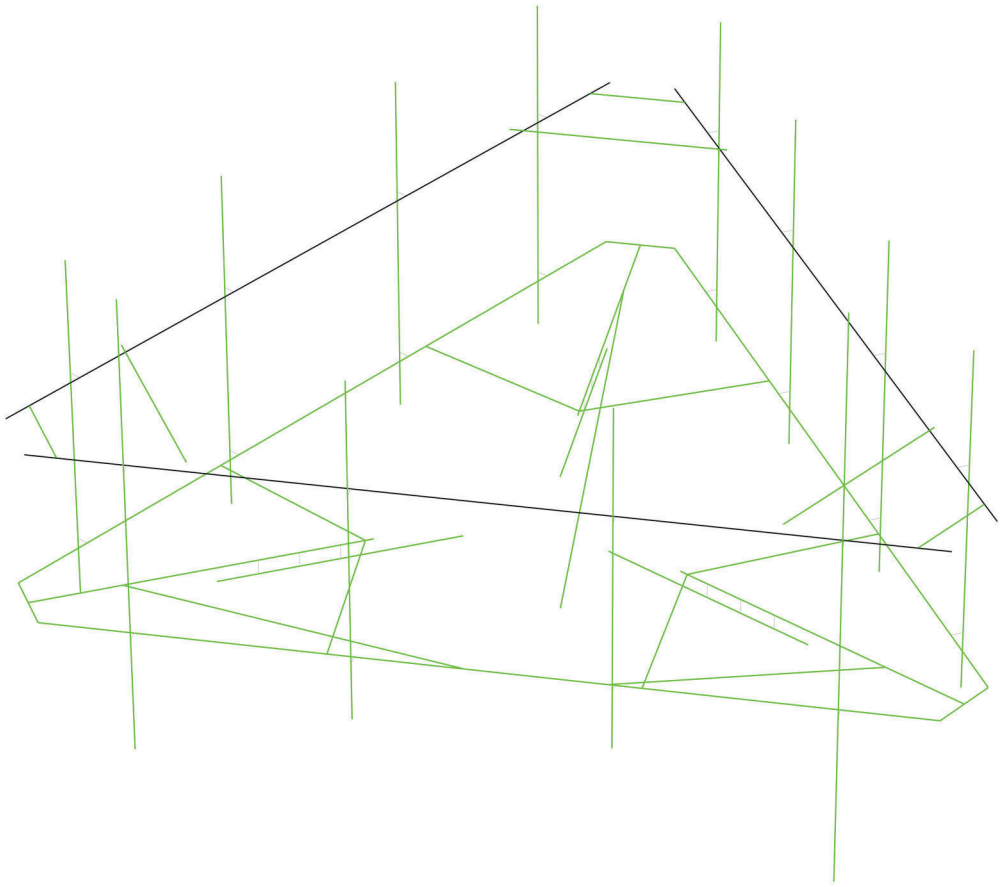

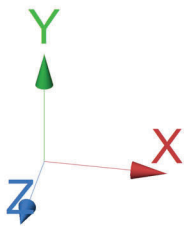
Y
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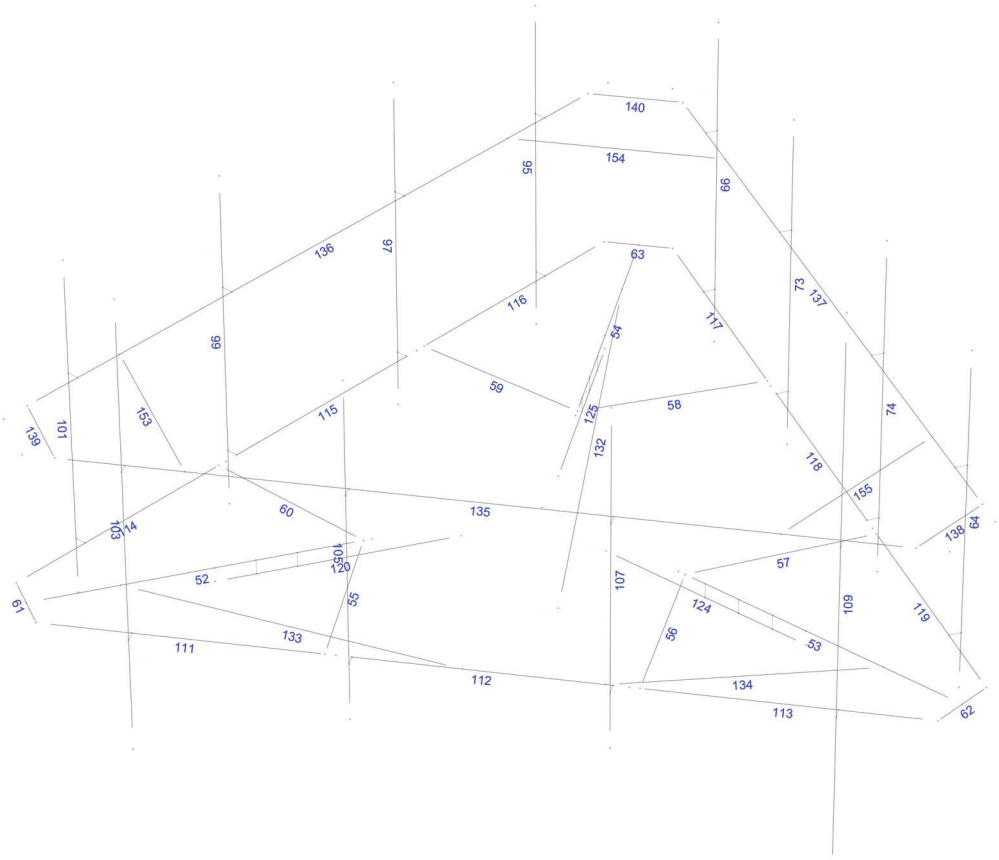
140
154
96
66
136
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116
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137
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74
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101
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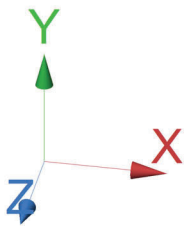
Y
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Current Date: 10/23/2020 3:55 PM
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Load data

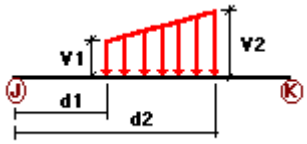
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members

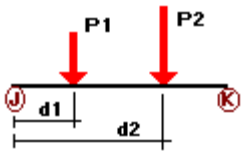


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	52	y	-0.01	0.00	0.00	No	0.00	No
	53	y	-0.01	0.00	0.00	No	0.00	No
	54	y	-0.01	0.00	0.00	No	0.00	No
W0	52	z	-0.018	0.00	0.00	No	0.00	No
	53	z	-0.018	0.00	0.00	No	0.00	No
	55	z	-0.024	0.00	0.00	No	0.00	No
	56	z	-0.024	0.00	0.00	No	0.00	No
	57	z	-0.024	0.00	0.00	No	0.00	No
	58	z	-0.024	0.00	0.00	No	0.00	No
	59	z	-0.024	0.00	0.00	No	0.00	No
	60	z	-0.024	0.00	0.00	No	0.00	No
	61	z	-0.06	0.00	0.00	No	0.00	No
	62	z	-0.06	0.00	0.00	No	0.00	No
	63	z	-0.06	0.00	0.00	No	0.00	No

	64	z	-0.014	0.00	0.00	No	0.00	No
	66	z	-0.014	0.00	0.00	No	0.00	No
	95	z	-0.014	0.00	0.00	No	0.00	No
	97	z	-0.014	0.00	0.00	No	0.00	No
	74	z	-0.014	0.00	0.00	No	0.00	No
	99	z	-0.014	0.00	0.00	No	0.00	No
	73	z	-0.014	0.00	0.00	No	0.00	No
	101	z	-0.014	0.00	0.00	No	0.00	No
	105	z	-0.014	0.00	0.00	No	0.00	No
	111	z	-0.021	0.00	0.00	No	0.00	No
	112	z	-0.021	0.00	0.00	No	0.00	No
	113	z	-0.021	0.00	0.00	No	0.00	No
	114	z	-0.021	0.00	0.00	No	0.00	No
	115	z	-0.021	0.00	0.00	No	0.00	No
	116	z	-0.021	0.00	0.00	No	0.00	No
	117	z	-0.021	0.00	0.00	No	0.00	No
	118	z	-0.021	0.00	0.00	No	0.00	No
	119	z	-0.021	0.00	0.00	No	0.00	No
	120	z	-0.018	0.00	0.00	No	0.00	No
	124	z	-0.018	0.00	0.00	No	0.00	No
	132	z	-0.024	0.00	0.00	No	0.00	No
	133	z	-0.024	0.00	0.00	No	0.00	No
	134	z	-0.024	0.00	0.00	No	0.00	No
	135	z	-0.014	0.00	0.00	No	0.00	No
	136	z	-0.014	0.00	0.00	No	0.00	No
	137	z	-0.014	0.00	0.00	No	0.00	No
	138	z	-0.024	0.00	0.00	No	0.00	No
	139	z	-0.024	0.00	0.00	No	0.00	No
	140	z	-0.024	0.00	0.00	No	0.00	No
W30	52	x	-0.018	0.00	0.00	No	0.00	No
	53	x	-0.018	0.00	0.00	No	0.00	No
	54	x	-0.018	0.00	0.00	No	0.00	No
	55	x	-0.024	0.00	0.00	No	0.00	No
	56	x	-0.024	0.00	0.00	No	0.00	No
	57	x	-0.024	0.00	0.00	No	0.00	No
	58	x	-0.024	0.00	0.00	No	0.00	No
	59	x	-0.024	0.00	0.00	No	0.00	No
	60	x	-0.024	0.00	0.00	No	0.00	No
	61	x	-0.06	0.00	0.00	No	0.00	No
	62	x	-0.06	0.00	0.00	No	0.00	No
	95	x	-0.014	0.00	0.00	No	0.00	No
	97	x	-0.014	0.00	0.00	No	0.00	No
	74	x	-0.014	0.00	0.00	No	0.00	No
	99	x	-0.014	0.00	0.00	No	0.00	No
	101	x	-0.014	0.00	0.00	No	0.00	No
	103	x	-0.014	0.00	0.00	No	0.00	No
	105	x	-0.014	0.00	0.00	No	0.00	No
	107	x	-0.014	0.00	0.00	No	0.00	No
	109	x	-0.014	0.00	0.00	No	0.00	No
	114	x	-0.021	0.00	0.00	No	0.00	No
	115	x	-0.021	0.00	0.00	No	0.00	No
	116	x	-0.021	0.00	0.00	No	0.00	No
	117	x	-0.021	0.00	0.00	No	0.00	No
	118	x	-0.021	0.00	0.00	No	0.00	No
	119	x	-0.021	0.00	0.00	No	0.00	No
	120	x	-0.018	0.00	0.00	No	0.00	No
	124	x	-0.018	0.00	0.00	No	0.00	No
	125	x	-0.018	0.00	0.00	No	0.00	No
	132	x	-0.024	0.00	0.00	No	0.00	No
	133	x	-0.024	0.00	0.00	No	0.00	No

	134	x	-0.024	0.00	0.00	No	0.00	No
	136	x	-0.014	0.00	0.00	No	0.00	No
	137	x	-0.014	0.00	0.00	No	0.00	No
	138	x	-0.024	0.00	0.00	No	0.00	No
	139	x	-0.024	0.00	0.00	No	0.00	No
Di	52	y	-0.008	0.00	0.00	No	0.00	No
	53	y	-0.008	0.00	0.00	No	0.00	No
	54	y	-0.008	0.00	0.00	No	0.00	No
	55	y	-0.006	0.00	0.00	No	0.00	No
	56	y	-0.006	0.00	0.00	No	0.00	No
	57	y	-0.006	0.00	0.00	No	0.00	No
	58	y	-0.006	0.00	0.00	No	0.00	No
	59	y	-0.006	0.00	0.00	No	0.00	No
	60	y	-0.006	0.00	0.00	No	0.00	No
	61	y	-0.014	0.00	0.00	No	0.00	No
	62	y	-0.014	0.00	0.00	No	0.00	No
	63	y	-0.014	0.00	0.00	No	0.00	No
	64	y	-0.005	0.00	0.00	No	0.00	No
	66	y	-0.005	0.00	0.00	No	0.00	No
	95	y	-0.005	0.00	0.00	No	0.00	No
	97	y	-0.005	0.00	0.00	No	0.00	No
	74	y	-0.005	0.00	0.00	No	0.00	No
	99	y	-0.005	0.00	0.00	No	0.00	No
	73	y	-0.005	0.00	0.00	No	0.00	No
	101	y	-0.005	0.00	0.00	No	0.00	No
	103	y	-0.005	0.00	0.00	No	0.00	No
	105	y	-0.005	0.00	0.00	No	0.00	No
	107	y	-0.005	0.00	0.00	No	0.00	No
	109	y	-0.005	0.00	0.00	No	0.00	No
	111	y	-0.007	0.00	0.00	No	0.00	No
	112	y	-0.007	0.00	0.00	No	0.00	No
	113	y	-0.007	0.00	0.00	No	0.00	No
	114	y	-0.007	0.00	0.00	No	0.00	No
	115	y	-0.007	0.00	0.00	No	0.00	No
	116	y	-0.007	0.00	0.00	No	0.00	No
	117	y	-0.007	0.00	0.00	No	0.00	No
	118	y	-0.007	0.00	0.00	No	0.00	No
	119	y	-0.007	0.00	0.00	No	0.00	No
	120	y	-0.008	0.00	0.00	No	0.00	No
	124	y	-0.008	0.00	0.00	No	0.00	No
	125	y	-0.008	0.00	0.00	No	0.00	No
	132	y	-0.007	0.00	0.00	No	0.00	No
	133	y	-0.007	0.00	0.00	No	0.00	No
	134	y	-0.007	0.00	0.00	No	0.00	No
	135	y	-0.005	0.00	0.00	No	0.00	No
	136	y	-0.005	0.00	0.00	No	0.00	No
	137	y	-0.005	0.00	0.00	No	0.00	No
	138	y	-0.007	0.00	0.00	No	0.00	No
	139	y	-0.007	0.00	0.00	No	0.00	No
	140	y	-0.007	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	64	y	-0.038	1.00	No
		y	-0.038	4.50	No
		y	-0.06	3.00	No
		y	-0.053	3.00	No
	66	y	-0.022	1.00	No
		y	-0.022	4.00	No
		y	-0.073	3.00	No
	95	y	-0.038	1.00	No
		y	-0.038	4.50	No
		y	-0.06	3.00	No
		y	-0.053	3.00	No
	99	y	-0.017	1.00	No
		y	-0.017	4.50	No
	73	y	-0.017	1.00	No
		y	-0.017	4.50	No
	101	y	-0.022	1.00	No
		y	-0.022	4.00	No
		y	-0.073	3.00	No
	103	y	-0.054	0.50	No
		y	-0.054	7.50	No
		y	-0.06	2.00	No
		y	-0.053	2.00	No
	107	y	-0.017	1.00	No
		y	-0.017	4.50	No
	109	y	-0.035	1.50	No
		y	-0.035	8.50	No
		y	-0.073	3.00	No
W0	64	z	-0.153	1.00	No
		z	-0.153	4.50	No
		z	-0.165	3.00	No
	66	z	-0.133	1.00	No
		z	-0.133	4.00	No
		z	-0.066	3.00	No
	95	z	-0.153	1.00	No
		z	-0.153	4.50	No
		z	-0.165	3.00	No
	99	z	-0.131	1.00	No
		z	-0.131	4.50	No
	73	z	-0.131	1.00	No
		z	-0.131	4.50	No
	101	z	-0.133	1.00	No
		z	-0.133	4.00	No
		z	-0.066	3.00	No
	103	z	-0.45	0.50	No
		z	-0.45	7.50	No
		z	-0.055	2.00	No
		z	-0.042	2.00	No
	107	z	-0.176	1.00	No
		z	-0.176	4.50	No
	109	z	-0.33	1.50	No
		z	-0.33	8.50	No
		z	-0.017	3.00	No
W30	64	x	-0.16	1.00	No
		x	-0.16	4.50	No

		x	-0.083	3.00	No
	66	x	-0.142	1.00	No
		x	-0.142	4.00	No
		x	-0.033	3.00	No
	95	x	-0.16	1.00	No
		x	-0.16	4.50	No
		x	-0.083	3.00	No
	99	x	-0.161	1.00	No
		x	-0.161	4.50	No
	73	x	-0.161	1.00	No
		x	-0.161	4.50	No
	101	x	-0.142	1.00	No
		x	-0.142	4.00	No
		x	-0.033	3.00	No
	103	x	-0.246	0.50	No
		x	-0.246	7.50	No
		x	-0.185	2.00	No
	107	x	-0.116	1.00	No
		x	-0.116	4.50	No
	109	x	-0.294	1.50	No
		x	-0.294	8.50	No
		x	-0.082	3.00	No
Di	64	y	-0.057	1.00	No
		y	-0.057	4.50	No
		y	-0.052	3.00	No
		y	-0.055	3.00	No
	66	y	-0.051	1.00	No
		y	-0.051	4.00	No
		y	-0.039	3.00	No
	95	y	-0.057	1.00	No
		y	-0.057	4.50	No
		y	-0.052	3.00	No
		y	-0.055	3.00	No
	99	y	-0.053	1.00	No
		y	-0.053	4.50	No
	73	y	-0.053	1.00	No
		y	-0.053	4.50	No
	101	y	-0.051	1.00	No
		y	-0.051	4.00	No
		y	-0.039	3.00	No
	103	y	-0.117	0.50	No
		y	-0.117	7.50	No
		y	-0.052	2.00	No
		y	-0.055	2.00	No
	107	y	-0.053	1.00	No
		y	-0.053	4.50	No
	109	y	-0.095	1.50	No
		y	-0.095	8.50	No
		y	-0.039	3.00	No
Wi0	64	z	-0.027	1.00	No
		z	-0.027	4.50	No
		z	-0.029	3.00	No
	66	z	-0.024	1.00	No
		z	-0.024	4.00	No
		z	-0.014	3.00	No
	95	z	-0.027	1.00	No
		z	-0.027	4.50	No
		z	-0.029	3.00	No
	99	z	-0.024	1.00	No
		z	-0.024	4.50	No

	73	z	-0.024	1.00	No
		z	-0.024	4.50	No
	101	z	-0.024	1.00	No
		z	-0.024	4.00	No
		z	-0.014	3.00	No
	103	z	-0.074	0.50	No
		z	-0.074	7.50	No
		z	-0.014	2.00	No
		z	-0.011	2.00	No
	107	z	-0.031	1.00	No
		z	-0.031	4.50	No
	109	z	-0.057	1.50	No
		z	-0.057	8.50	No
		z	-0.007	3.00	No
Wi30	64	x	-0.028	1.00	No
		x	-0.028	4.50	No
		x	-0.015	3.00	No
	66	x	-0.025	1.00	No
		x	-0.025	4.00	No
		x	-0.009	3.00	No
	95	x	-0.028	1.00	No
		x	-0.028	4.50	No
		x	-0.015	3.00	No
	99	x	-0.028	1.00	No
		x	-0.028	4.50	No
	73	x	-0.028	1.00	No
		x	-0.028	4.50	No
	101	x	-0.025	1.00	No
		x	-0.025	4.00	No
		x	-0.009	3.00	No
	103	x	-0.044	0.50	No
		x	-0.044	7.50	No
		x	-0.032	2.00	No
	107	x	-0.022	1.00	No
		x	-0.022	4.50	No
	109	x	-0.05	1.50	No
		x	-0.05	8.50	No
		x	-0.016	3.00	No
WL0	64	z	-0.008	1.00	No
		z	-0.008	4.50	No
		z	-0.008	3.00	No
	66	z	-0.007	1.00	No
		z	-0.007	4.00	No
		z	-0.003	3.00	No
	95	z	-0.008	1.00	No
		z	-0.008	4.50	No
		z	-0.008	3.00	No
	99	z	-0.007	1.00	No
		z	-0.007	4.50	No
	73	z	-0.007	1.00	No
		z	-0.007	4.50	No
	101	z	-0.007	1.00	No
		z	-0.007	4.00	No
		z	-0.003	3.00	No
	103	z	-0.023	0.50	No
		z	-0.023	7.50	No
		z	-0.003	2.00	No
		z	-0.002	2.00	No
	107	z	-0.009	1.00	No
		z	-0.009	4.50	No

	109	z	-0.017	1.50	No
		z	-0.017	8.50	No
		z	-0.001	3.00	No
WL30	64	x	-0.008	1.00	No
		x	-0.008	4.50	No
		x	-0.004	3.00	No
	66	x	-0.007	1.00	No
		x	-0.007	4.00	No
		x	-0.002	3.00	No
	95	x	-0.008	1.00	No
		x	-0.008	4.50	No
		x	-0.004	3.00	No
	99	x	-0.008	1.00	No
		x	-0.008	4.50	No
	73	x	-0.008	1.00	No
		x	-0.008	4.50	No
	101	x	-0.007	1.00	No
		x	-0.007	4.00	No
		x	-0.002	3.00	No
	103	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.009	2.00	No
	107	x	-0.006	1.00	No
		x	-0.006	4.50	No
	109	x	-0.015	1.50	No
		x	-0.015	8.50	No
		x	-0.004	3.00	No
LL1	112	y	-0.25	50.00	Yes
LL2	111	y	-0.25	100.00	Yes
LLa1	109	y	-0.25	50.00	Yes
LLa2	107	y	-0.25	50.00	Yes
LLa3	105	y	-0.25	50.00	Yes
LLa4	103	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC15=1.2DL+1.5LL1
LC16=1.2DL+1.5LL2
LC17=1.2DL+WL0+1.5LLa1
LC18=1.2DL+WL30+1.5LLa1
LC19=1.2DL-WL0+1.5LLa1
LC20=1.2DL-WL30+1.5LLa1
LC21=1.2DL+WL0+1.5LLa2
LC22=1.2DL+WL30+1.5LLa2
LC23=1.2DL-WL0+1.5LLa2
LC24=1.2DL-WL30+1.5LLa2
LC25=1.2DL+WL0+1.5LLa3
LC26=1.2DL+WL30+1.5LLa3
LC27=1.2DL-WL0+1.5LLa3
LC28=1.2DL-WL30+1.5LLa3
LC29=1.2DL+WL0+1.5LLa4
LC30=1.2DL+WL30+1.5LLa4
LC31=1.2DL-WL0+1.5LLa4
LC32=1.2DL-WL30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X3_8	**52**	LC2 at 27.68%	0.25	OK	Eq. H1-1b
		53	LC4 at 72.32%	0.23	OK	Eq. H1-1b
		54	LC1 at 26.79%	0.25	OK	Eq. H1-1b
		120	LC3 at 100.00%	**0.26**	**OK**	Eq. H1-1b
		124	LC4 at 0.00%	0.22	OK	Eq. H1-1b
		125	LC1 at 50.00%	0.15	OK	Eq. H1-1b
	L 2-1_2X2-1_2X3_16	**138**	LC3 at 100.00%	0.34	OK	Eq. H2-1
		139	LC1 at 0.00%	**0.48**	**OK**	Eq. H2-1
		140	LC4 at 0.00%	0.20	OK	Eq. H2-1
	LU 2-1_2X1-1_2X1_4	**55**	LC1 at 100.00%	0.61	OK	Eq. H2-1
		56	LC1 at 0.00%	**0.64**	**OK**	Eq. H2-1
		57	LC3 at 100.00%	0.56	OK	Eq. H2-1
		58	LC2 at 0.00%	0.63	OK	Eq. H2-1
		59	LC4 at 100.00%	0.63	OK	Eq. H2-1
		60	LC4 at 0.00%	0.57	OK	Eq. H2-1

PIPE 2x0.154	**64**	LC4 at 81.25%	0.62	OK	Eq. H1-1b
	66	LC1 at 81.25%	0.76	OK	Eq. H1-1b
	95	LC1 at 81.25%	0.83	OK	Eq. H1-1b
	97	LC3 at 81.25%	0.58	OK	Eq. H1-1b
	74	LC3 at 81.25%	0.70	OK	Eq. H1-1b
	99	LC3 at 81.25%	0.70	OK	Eq. H1-1b
	73	LC1 at 81.25%	0.81	OK	Eq. H1-1b
	101	LC2 at 81.25%	0.66	OK	Eq. H1-1b
	103	LC1 at 35.42%	**0.92**	**OK**	Eq. H1-1b
	105	LC2 at 33.33%	0.70	OK	Eq. H1-1b
	107	LC4 at 81.25%	0.68	OK	Eq. H1-1b
	109	LC2 at 39.58%	0.74	OK	Eq. H1-1b
	135	LC2 at 11.81%	0.75	With warnings	Eq. H1-1b
	136	LC3 at 18.06%	0.66	With warnings	Eq. H1-1b
	137	LC5 at 81.94%	0.66	With warnings	Eq. H1-1b
	153	LC3 at 100.00%	0.84	OK	Eq. H1-1b
	154	LC2 at 100.00%	0.43	OK	Eq. H1-1b
	155	LC3 at 100.00%	0.66	OK	Eq. H1-1b
PIPE 3x0.216	**111**	LC3 at 68.75%	**0.36**	**OK**	Eq. H1-1b
	112	LC4 at 6.25%	0.24	OK	Eq. H1-1b
	113	LC3 at 68.75%	0.30	OK	Eq. H1-1b
	114	LC2 at 0.00%	0.26	OK	Eq. H1-1b
	115	LC1 at 6.25%	0.23	OK	Eq. H1-1b
	116	LC1 at 100.00%	0.28	OK	Eq. H1-1b
	117	LC1 at 0.00%	0.28	OK	Eq. H1-1b
	118	LC3 at 6.25%	0.22	OK	Eq. H1-1b
	119	LC4 at 100.00%	0.26	OK	Eq. H1-1b
PL 8x5/8	**61**	LC4 at 46.88%	0.32	OK	Eq. H1-1b
	62	LC2 at 53.13%	0.32	OK	Eq. H1-1b
	63	LC3 at 50.00%	**0.41**	**OK**	Eq. H1-1b
T2L 2-1_2X2-1_2X3_16	**132**	LC1 at 100.00%	0.85	OK	Eq. H2-1
	133	LC2 at 100.00%	**0.87**	**OK**	Eq. H2-1
	134	LC4 at 0.00%	0.82	OK	Eq. H2-1

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
107	-2.4167	0.00	4.667	0
108	-6.9167	0.00	4.667	0
109	-2.4168	0.00	1.3953	0
110	-7.4998	0.00	3.657	0
111	-5.2498	0.00	-0.2401	0
112	0.00	0.00	-2.7902	0
113	-2.8331	0.00	-4.4259	0
114	-0.5831	0.00	-8.323	0
115	2.4167	0.00	4.667	0
116	6.9167	0.00	4.667	0
117	2.4168	0.00	1.3953	0
118	7.4998	0.00	3.657	0
119	5.2498	0.00	-0.2401	0
120	2.8331	0.00	-4.4259	0
121	0.5831	0.00	-8.323	0
122	-7.2084	0.00	4.1618	0
123	7.2084	0.00	4.1618	0
124	0.00	0.00	-8.323	0
128	6.9233	5.00	2.2575	0
129	1.5066	5.00	-7.1245	0
137	6.9233	-1.00	2.2575	0

139	1.5066	-1.00	-7.1245	0
146	0.00	0.00	0.00	0
147	3.2149	5.00	-4.1656	0
148	3.2149	-1.00	-4.1656	0
149	5.2149	5.00	-0.7014	0
150	5.2149	-1.00	-0.7014	0
191	-1.5066	5.00	-7.1245	0
192	-1.5066	-1.00	-7.1245	0
195	-3.2149	5.00	-4.1656	0
196	-3.2149	-1.00	-4.1656	0
199	-5.2149	5.00	-0.7014	0
200	-5.2149	-1.00	-0.7014	0
203	-6.9233	5.00	2.2575	0
204	-6.9233	-1.00	2.2575	0
207	-5.4167	6.00	4.867	0
208	-5.4167	-2.00	4.867	0
211	-2.00	5.00	4.867	0
212	-2.00	-1.00	4.867	0
215	2.00	5.00	4.867	0
216	2.00	-1.00	4.867	0
219	5.4167	7.00	4.867	0
220	5.4167	-3.00	4.867	0
223	5.1651	0.00	-0.3878	0
224	2.9151	0.00	-4.2849	0
229	-5.1684	0.00	-0.3821	0
230	-2.9184	0.00	-4.2792	0
231	2.2533	0.00	4.667	0
232	-2.2467	0.00	4.667	0
244	4.6138	0.00	2.6638	0
250	0.00	0.00	-5.3275	0
252	-4.6138	0.00	2.6638	0
255	-4.6138	-0.25	2.6638	0
257	4.6138	-0.25	2.6638	0
258	0.00	-0.25	-5.3275	0
260	-1.1543	-0.25	0.6664	0
261	1.1543	-0.25	0.6664	0
262	0.00	-0.25	-1.3323	0
277	-2.5336	0.00	1.4628	0
280	2.5336	0.00	1.4628	0
283	0.00	0.00	-2.9252	0
286	-5.9108	0.00	3.4126	0
289	5.9108	0.00	3.4126	0
292	0.00	0.00	-6.8253	0
293	0.00	-2.75	-1.3323	0
294	-1.1543	-2.75	0.6664	0
295	1.1543	-2.75	0.6664	0
297	0.5417	3.00	-8.3957	0
298	7.5417	3.00	3.7287	0
299	7.2917	3.00	3.2957	0
300	0.7917	3.00	-7.9627	0
311	-7.5417	3.00	3.7287	0
312	-7.2917	3.00	3.2957	0
314	-0.5417	3.00	-8.3957	0
315	-0.7917	3.00	-7.9627	0
316	7.00	3.00	4.667	0
317	6.50	3.00	4.667	0
319	-7.00	3.00	4.667	0
320	-6.50	3.00	4.667	0
346	6.2917	3.00	1.5636	0
347	-6.2917	3.00	1.5636	0

348	-1.7917	3.00	-6.2306	0
349	4.50	3.00	4.667	0
350	-4.50	3.00	4.667	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
260	1	1	1	1	1	1
261	1	1	1	1	1	1
262	1	1	1	1	1	1
293	1	1	1	1	1	1
294	1	1	1	1	1	1
295	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
52	122	109		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
53	117	123		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
54	124	112		HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
55	277	107		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
56	115	280		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
57	280	119		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
58	120	283		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
59	283	113		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
60	111	277		LU 2-1_2X1-1_2X1_4	A36	0.00	0.00	0.00
61	110	108		PL 8x5/8	A36	0.00	0.00	0.00
62	116	118		PL 8x5/8	A36	0.00	0.00	0.00
63	121	114		PL 8x5/8	A36	0.00	0.00	0.00
64	128	137		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
66	129	139		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
95	191	192		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
97	195	196		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
74	149	150		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
99	199	200		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
73	147	148		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
101	203	204		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
103	207	208		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
105	211	212		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
107	215	216		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
109	219	220		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
111	232	108		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
112	232	231		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
113	231	116		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
114	110	229		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
115	229	230		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
116	230	114		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
117	121	224		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
118	224	223		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
119	223	118		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00

120	255	260	HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
124	261	257	HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
125	262	258	HSS_SQR 3X3X3_8	A500 GrB rectangular	0.00	0.00	0.00
132	293	292	T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
133	294	286	T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
134	289	295	T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
135	319	316	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
136	311	314	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
137	297	298	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
138	299	317	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
139	320	312	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
140	300	315	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
153	347	350	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
154	345	348	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
155	346	349	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
64	0.00	2	1.00	0.00	0.00
66	0.00	2	1.00	0.00	0.00
95	0.00	2	1.00	0.00	0.00
97	0.00	2	-0.50	0.00	0.866
74	0.00	2	-0.50	0.00	-0.866
99	0.00	2	1.00	0.00	0.00
73	0.00	2	1.00	0.00	0.00
101	0.00	2	1.00	0.00	0.00
103	0.00	2	1.00	0.00	0.00
105	0.00	2	1.00	0.00	0.00
107	0.00	2	1.00	0.00	0.00
109	0.00	2	1.00	0.00	0.00
138	90.00	0	0.00	0.00	0.00
139	90.00	0	0.00	0.00	0.00
140	180.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
153	0.00	2.00	0.00	0.00	2.00	0.00
154	0.00	2.00	0.00	0.00	2.00	0.00
155	0.00	2.00	0.00	0.00	2.00	0.00

170 INGHAM HILL RD

Location	170 INGHAM HILL RD	**MBLU**	051/ 033/ / /
Acct#	00559800	**Owner**	LORENZ CAROL J & ROBERT A
Assessment	$176,700	**Appraisal**	$303,200
PID	3322	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$163,400	$139,800	$303,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$114,400	$62,300	$176,700

Owner of Record

Owner	LORENZ CAROL J & ROBERT A	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	P O BOX 351 CENTER OSSIPEE N H, NH 03814-0351	**Book & Page**	0211/0890
		Sale Date	03/15/1984

Ownership History

Ownership History
No Data for Ownership History

Building Information

Building 1 : Section 1

Year Built: 1959
Living Area: 1,383

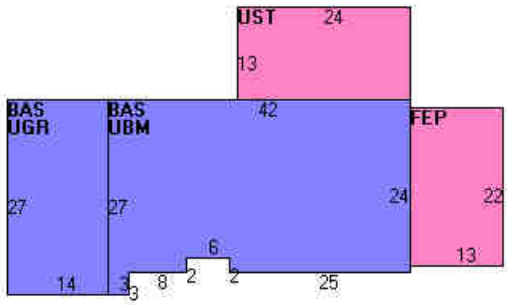
Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential

Grade:	Average
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Plastered
Interior Wall 2	
Interior Flr 1	Vinyl/Asphalt
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	1
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	6 Rooms
Bath Style:	Average
Kitchen Style:	Modern
Num Kitchens	01
Cndtn	
Usrfld 103	
Usrfld 104	
Usrfld 105	
Usrfld 106	
Usrfld 107	
Num Park	
Fireplaces	
Usrfld 108	
Usrfld 101	
Usrfld 102	
Usrfld 100	
Usrfld 300	
Usrfld 301	

Building Photo

(http://images.vgsi.com/photos/OldSaybrookCTPhotos//\00\01\97\10.jpg)

Building Layout



(http://images.vgsi.com/photos/OldSaybrookCTPhotos//Sketches/3322_33

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,383	1,383
FEP	Porch, Enclosed,Framed	286	0
UBM	Basement, Unfinished	1,005	0
UGR	Garage, Unfinished	378	0
UST	Utility, Storage, Unfinished	312	0
		3,364	1,383

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #

FPL1	FIREPLACE 1 ST	1.00 UNITS	$2,300	1

Land

Land Use

Use Code	1010
Description	Single Family
Zone	AA-1

Land Line Valuation

Size (Acres)	11.8
Depth	0
Assessed Value	$62,300
Appraised Value	$139,800

Outbuildings

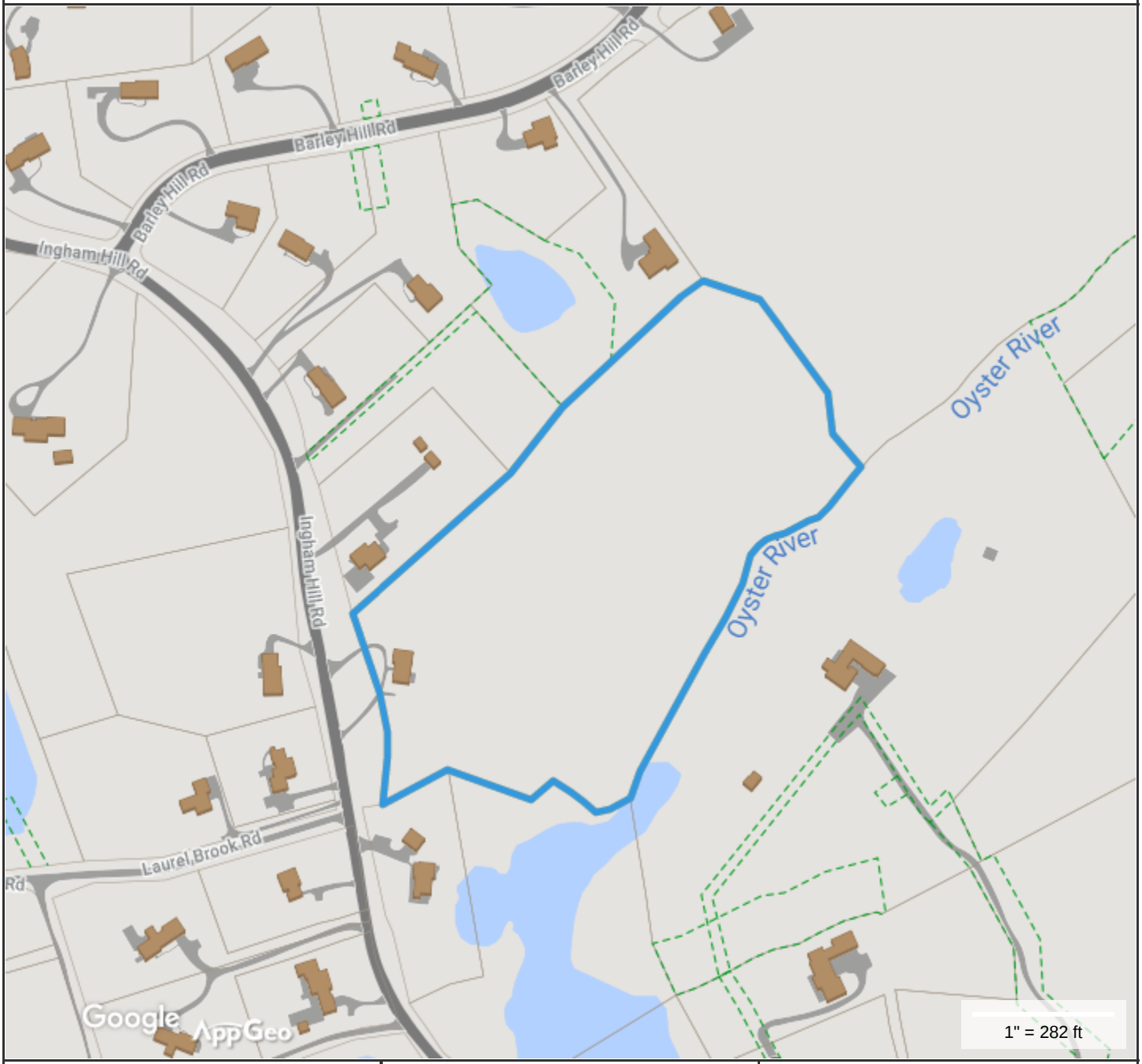
Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$163,400	$139,800	$303,200
2016	$147,200	$139,800	$287,000
2015	$145,700	$139,800	$285,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$114,400	$62,300	$176,700
2016	$103,000	$62,300	$165,300
2015	$102,000	$62,300	$164,300

170 Ingham Hill Road, Old Saybrook, CT



Property Information

Property ID	051/033-0000
Location	170 INGHAM HILL RD
Owner	LORENZ CAROL J & ROBERT A

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Old Saybrook, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated July 2018
Data updated 11/19/2018

DOCKET NO. 51

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN HARTFORD AND MIDDLESEX COUNTIES.	:	CONNECTICUT SITING COUNCIL
	:	September 26, 1985

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut be issued to Southern New England Telephone Company (SNET) for the construction, operation, and maintenance of a telecommunications tower and associated equipment building to provide cellular service at sites in Old Saybrook and Enfield, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in this matter, and subject to the following conditions:

1. The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed
   a) 150' at the Old Saybrook site; and
   b) 150' at the Enfield site;
2. A fence not lower than eight feet shall surround each tower and its associated equipment building;
3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;
4. The applicant or its sucessor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due

consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;

5. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
6. The applicant shall submit a development and management plan (D&M) for the Old Saybrook site pursuant to sections 16-50j-75 through 16-50j-77 of the regulations of state agencies, except that irrelevant items in section 16-50j-76 need only be identified as such. The D&M plan shall include erosion control measures, reseeding plans, and tree removal plans. The applicant shall comply with the reporting requirements of section 16-50j-77 for both sites;
7. Construction activities shall take place during daylight working hours;
8. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and removed, or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;
9. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the

Hartford Courant, the Middletown Press, and the Old Saybrook Pictorial.

The parties to this proceeding are

Southern New England Telephone Company (Applicant)
227 Church Street
New Haven, Connecticut 06506
Attn: Peter J. Tyrrell
Senior Attorney
Room 314

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 26th day of September, 1985.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
Owen L. Clark	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz	Yes
William H. Smith	Yes
Colin C. Tait	Absent

STATE OF CONNECTICUT)
: ss. New Britain, September 26, 1985
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood, Executive Director
Connecticut Siting Council

6325 Ardrey Kell Rd, Suite 600
Charlotte, NC 28277

Phone: (704) 405-6552
Fax: (724) 416-6297
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL
M. Bachman

,

Re: Application for Zoning/Building Permit
Crown Castle telecommunications site at: 170 INGHAM HILL ROAD, OLD SAYBROOK, CT 06475

NEW CINGULAR WIRELESS PCS, LLC ("Crown Castle") hereby authorizes AT&T MOBILITY, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name: 841289/OLD SAYBROOK
Customer Site ID: CT2019/OLD SAYBROOK
Site Address: 170 INGHAM HILL ROAD, OLD SAYBROOK, CT 06475
APN:

Crown Castle

By: Zachary Plummer Date: 11/25/20

Zachary Plummer
Real Estate Specialist

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SAI GROUP
39 WESTVIEW DR
MERIDEN CT 06450-4723

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Ref#: Ols Saybrk

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SHIP TO:

CAROL J & ROBERT A LORENZ
PO BOX 351
CTR OSSIPEE NH 03814-0351

USPS TRACKING #

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Electronic Rate Approved #038555749

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PRIORITY MAIL 1-DAY™

HOLLIS REDDING
SAI GROUP
39 WESTVIEW DR
MERIDEN CT 06450-4723

Expected Delivery Date: 12/03/20

0005

C011

SHIP TO:

HON CARL P. FORTUNA, JR 1ST SELECTMAN MS
TOWN OF OLD SAYBROOK
302 MAIN ST
OLD SAYBROOK CT 06475-2384

USPS TRACKING #

9405 5036 9930 0148 5872 40

Electronic Rate Approved #038555749

Hollis Redding

To: George, Sarah
Subject: AT&T Wireless CSC Filing Old Saybrook-170 Ingham Hill Road Crown ID 841289

Hi Sarah-

Attached please find the AT&T Wireless Exempt Modification which was filed with the CT Siting Council on December 1, 2020.

Thank you. Hollis

Hollis M. Redding

SAI Communications LLC
Mobile: 860-834-6964
hredding@saigrp.com