From: Mark Roberts [mailto:mark.roberts@qcdevelopment.net]
Sent: Friday, March 03, 2017 4:41 PM
To: Cunliffe, Fred
Cc: CSC-DL Siting Council; Maine, Brennan
Subject: RE: EM-CING-052-170228-IncompleteLtr_BirdseyeRd_Farmington
Importance: High

Hello Fred – in follow-up to our conversation earlier this afternoon, firstly thank you for bringing the parcel ownership discrepancy to my attention. The attached filing has been revised to reflect the correct ownership entity and parcel ID. A copy of this filing is being sent via USPS Priority Mail to the property owner (GOIS Holdings of Connecticut LLC) and the revised filing will also be sent electronically to the other parties identified as Cc recipients.

Please let me know if you feel there is anything further.

Mark Roberts
QC Development
860-670-9068

From: Maine, Brennan [mailto:Brennan.Maine@ct.gov]
Sent: Friday, March 03, 2017 10:04 AM
To: Mark Roberts <mark.roberts@qcdevelopment.net>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: EM-CING-052-170228-IncompleteLtr_BirdseyeRd_Farmington

Sorry to email twice-I realized that I did not send you the correct Incomplete PDF file the first time.
Please see attached correspondence.

Brennan A. Maine
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051
Brennan.maine@ct.gov
(860) 827-2940

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

February 28, 2017

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT5255
130 Birdseye Road, Farmington, CT 06032
N 41-42-55.4
W 72-48-30.8

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 130-foot level of the existing 140-foot Monopole at 130 Birdseye Road, Farmington, CT. The tower is owned by Crown Castle and the property is owned by GOIS Holdings of Connecticut LLC. AT&T now intends to remove three (3) KMW antennas and replace them with three (3) CCI antennas. The antennas will be installed at the 130-foot level of the tower. AT&T will also remove (3) Ericsson RRUS-11 units and replace them with three (3) Ericsson RRUS-32 units, also at the 130-foot level of the tower.

A Zoning Permit was issued for this facility by the Town of Farmington on November 26, 1997. This approval was for a 140' tower. Since no change to the existing tower height is proposed, this modification therefore complies with the aforementioned approval.

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

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

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

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

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

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

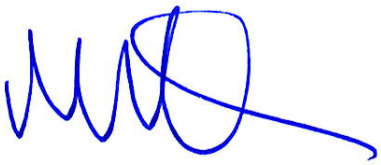
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

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

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Nancy Nickerson - as elected official (via e-mail)
William Warner – as Town Planner (via e-mail)
GOIS Holdings of CT – as property owner
Crown Castle - as tower owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							13.39%
AT&T GSM	2	565	130	0.0264	880	0.5867	0.45%
AT&T GSM	2	875	130	0.0409	1900	1.0000	0.41%
AT&T UMTS	1	283	130	0.0066	880	0.5867	0.11%
AT&T UMTS	4	525	130	0.0491	1900	1.0000	0.49%
AT&T LTE	1	1375	130	0.0322	734	0.4893	0.66%
Site Total							15.52%

*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*							13.39%
AT&T GSM	2	565	130	0.0264	880	0.5867	0.45%
AT&T GSM	2	875	130	0.0409	1900	1.0000	0.41%
AT&T UMTS	1	203	130	0.0047	880	0.5867	0.08%
AT&T UMTS	4	267	130	0.0250	1900	1.0000	0.25%
AT&T LTE	1	828	130	0.0194	734	0.4893	0.40%
AT&T LTE	1	3258	130	0.0762	1900	1.0000	0.76%
Site Total							15.74%

*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:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE BWE 2017 UPGRADE):
SITE ADDRESS:	130 BIRDSEYE ROAD FARMINGTON, CT 06032
LATITUDE:	41.7157919° N 41° 42' 56.85" N
LONGITUDE:	72.8105989° W 72° 48' 38.15" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
TOWER HEIGHT:	140'±
RAD CENTER:	130'±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT5255

SITE NAME: FARMINGTON-DEAD SWAMP WOOD

PROJECT: LTE BWE 2017 UPGRADE

DRAWING INDEX

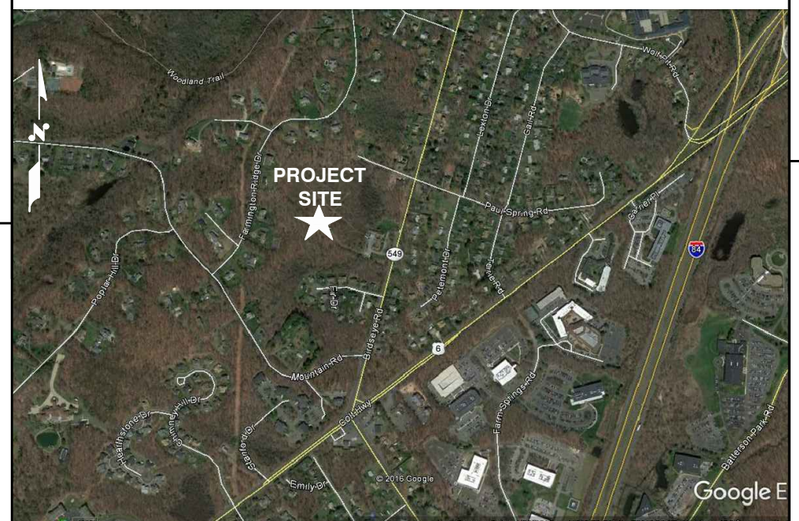
SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
RF-1	RF-PLUMBING DIAGRAM	1
G-1	GROUNDING DETAILS	1

CROWN CASTLE SITE NAME: EAST FARMINGTON
CROWN CASTLE SITE #: 876335

VICINITY MAP

DIRECTIONS TO SITE:

FROM ROCKY HILL, CT: MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 4.1 MILES. MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN. 11.0 MILES. MERGE ONTO I-84 W / US-6 W VIA EXIT 32 ON THE LEFT TOWARD WATERBURY. 1.4 MILES. MERGE ONTO US-6 W / COLT HWY VIA EXIT 38 TOWARD BRISTOL. 1.0 MILES. TURN RIGHT ONTO BIRD'S EYE RD. 0.2 MILES. ARRIVE AT 130 BIRD'S EYE ROAD.



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.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-888-DIG-SAFE
OR CALL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5255
SITE NAME: FARMINGTON-DEAD SWAMP WOOD
CROWN CASTLE SITE #876335
130 BIRDSEYE RD
FARMINGTON, CT 06032
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AN

STATE OF CONNECTICUT — No. 25571 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	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) 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 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 AWS 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. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH LTE 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 2012 WITH 2016 CT BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    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-G, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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	REFERENCE		

Hudson Design Groupllc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5255
SITE NAME: FARMINGTON-DEAD SWAMP WOOD
CROWN CASTLE SITE #876335
130 BIRDSEYE RD
FARMINGTON, CT 06032
HARTFORD COUNTY

at&t
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AN

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER
No. 25551

AT&T

GENERAL NOTES
(LTE BWE)

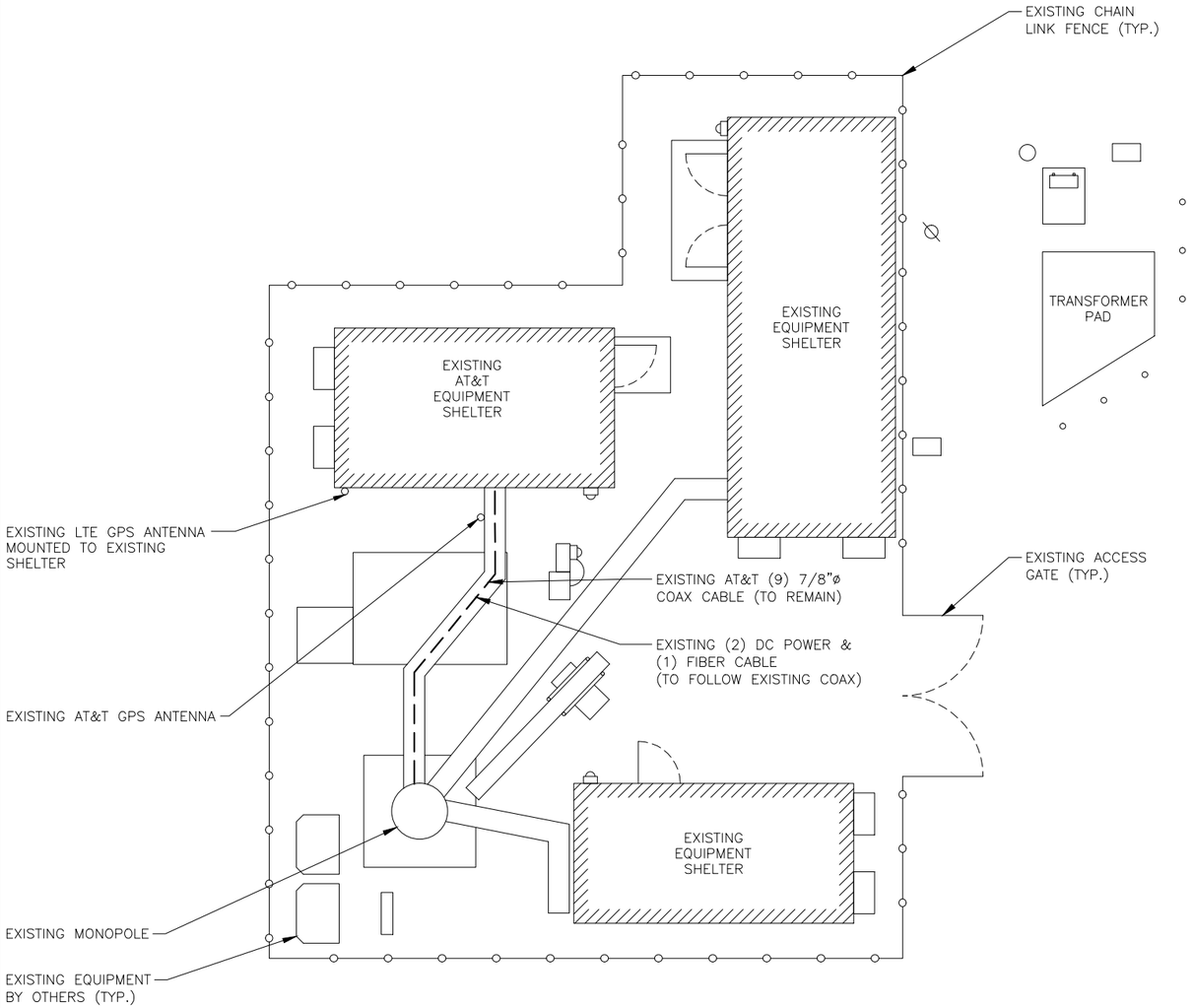
SITE NUMBER	DRAWING NUMBER	REV
CT5255	GN-1	1

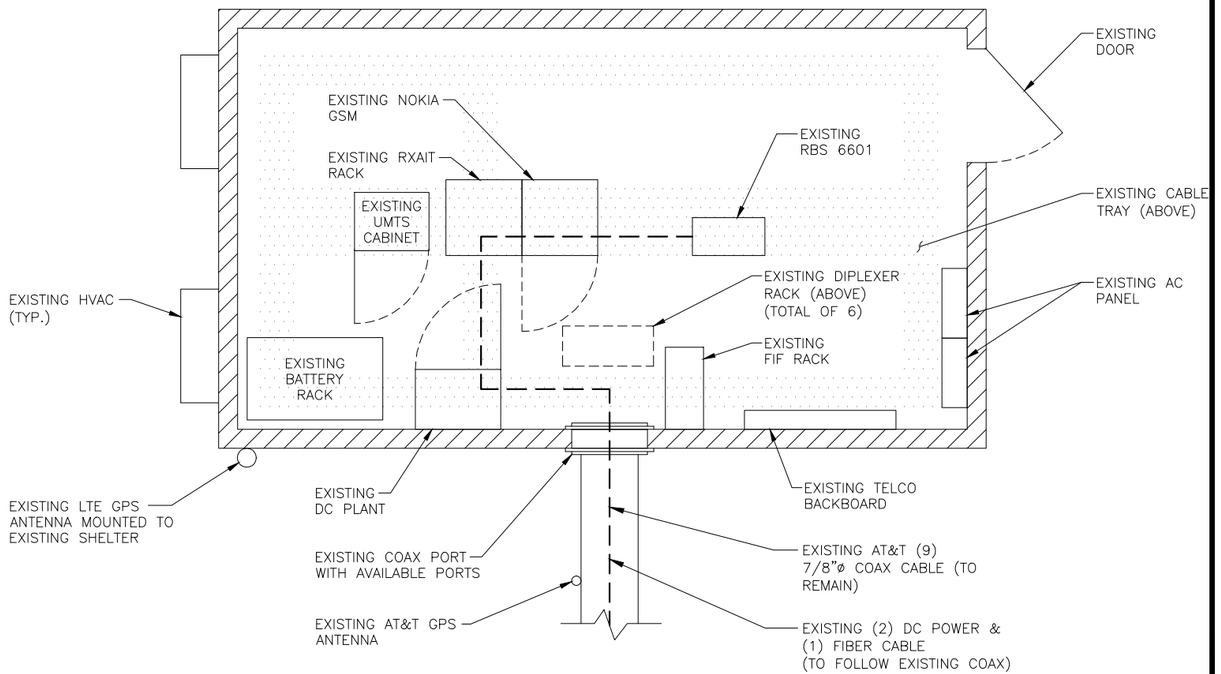
NOTE:

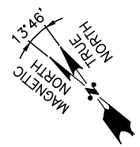
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

NOTE:

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







COMPOUND PLAN (1 / A–1)
22x34 SCALE: 3/16"=1'–0"
11x17 SCALE: 3/32"=1'–0"

0 2'–8" 5'–4" 10'–8" 16'–0"

EQUIPMENT PLAN (1 / A–1)
22x34 SCALE: 1/2"=1'–0"
11x17 SCALE: 1/4"=1'–0"

0 1'–0" 2'–0" 4'–0" 6'–0"

Hudson Design Group LLC
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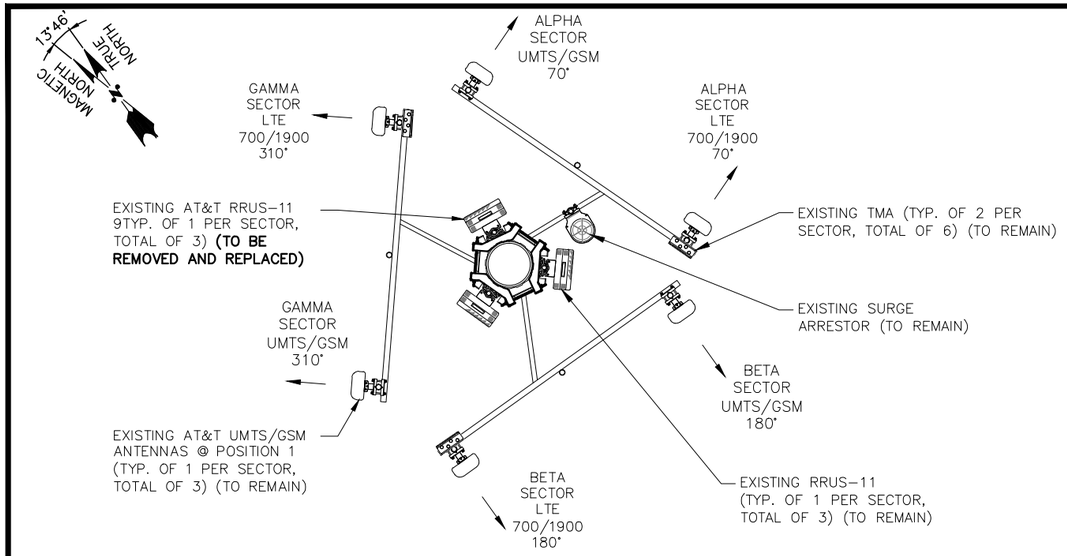
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AN

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25354
LICENSED PROFESSIONAL ENGINEER

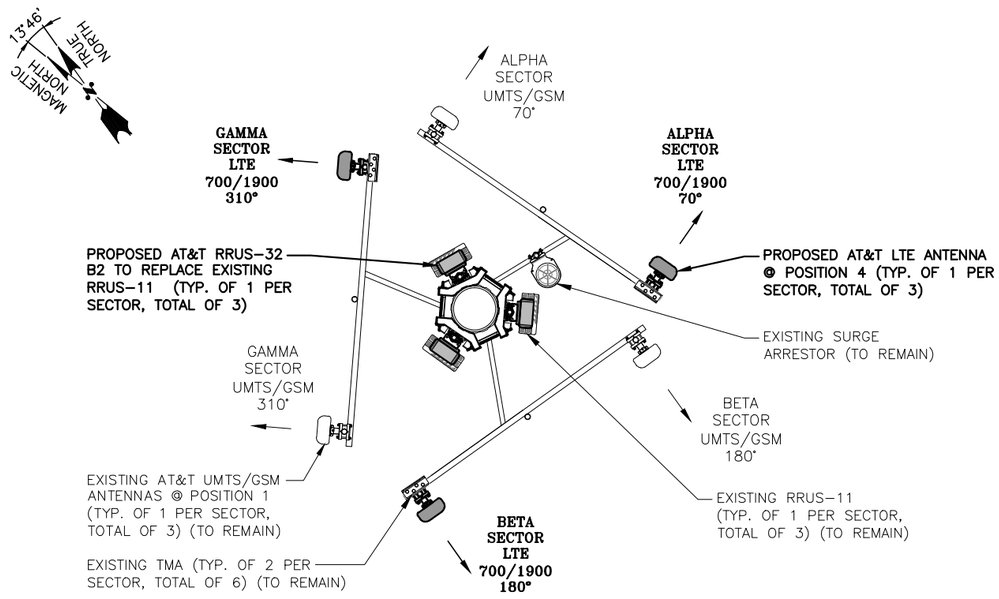
AT&T

COMPOUND & EQUIPMENT PLANS
(LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	A–1	1



EXISTING ANTENNA PLAN (1 / A-2)
SCALE: N.T.S



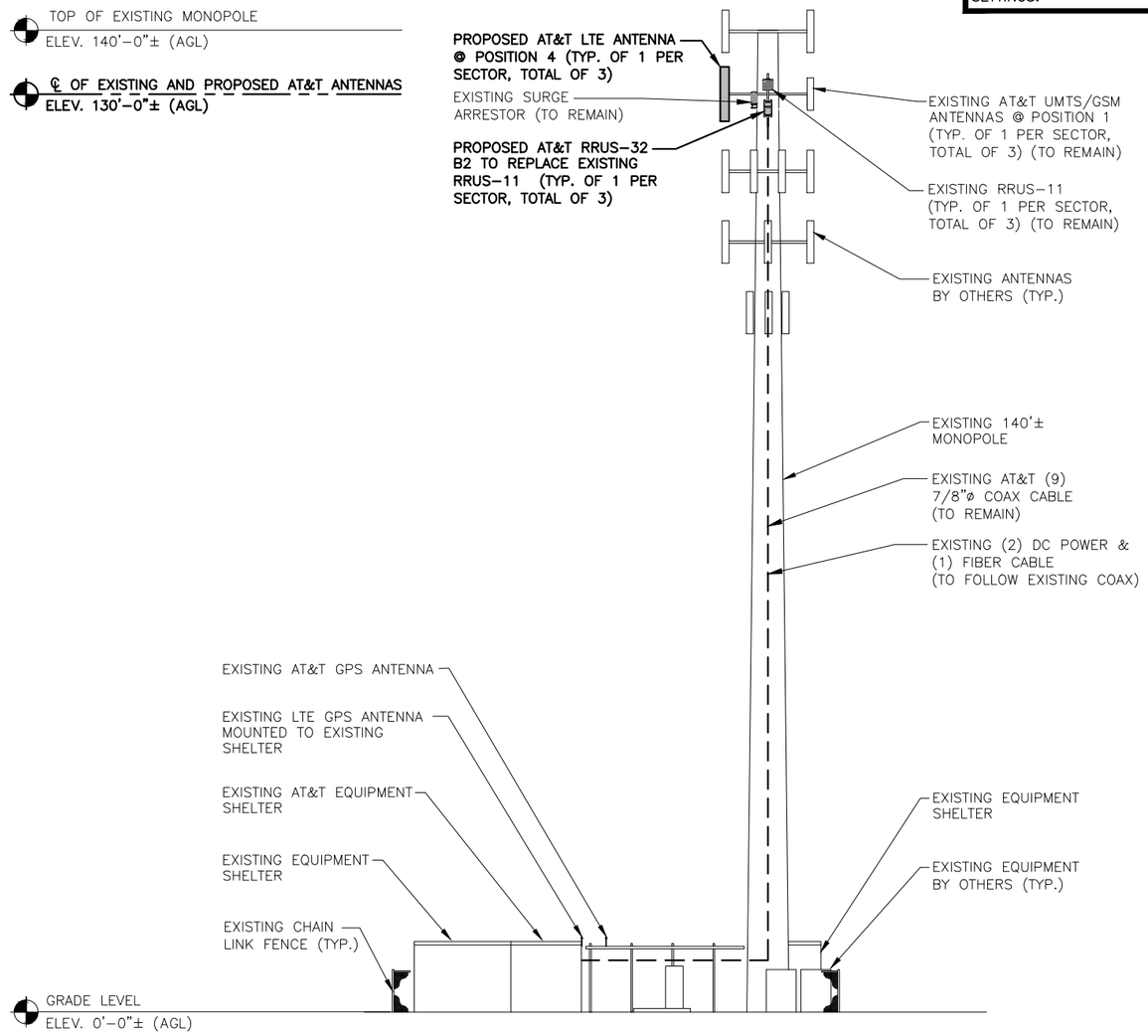
PROPOSED ANTENNA PLAN (2 / A-2)
SCALE: N.T.S

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

NOTE:

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



ELEVATION (3 / A-2)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5255
SITE NAME: FARMINGTON-DEAD SWAMP WOOD
CROWN CASTLE SITE #876335
130 BIRDSEYE RD
FARMINGTON, CT 06032
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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A	01/16/17	ISSUED FOR REVIEW	AN	AT	DPH

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 21557
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION (LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	A-2	1

NOTE:

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NOTE:

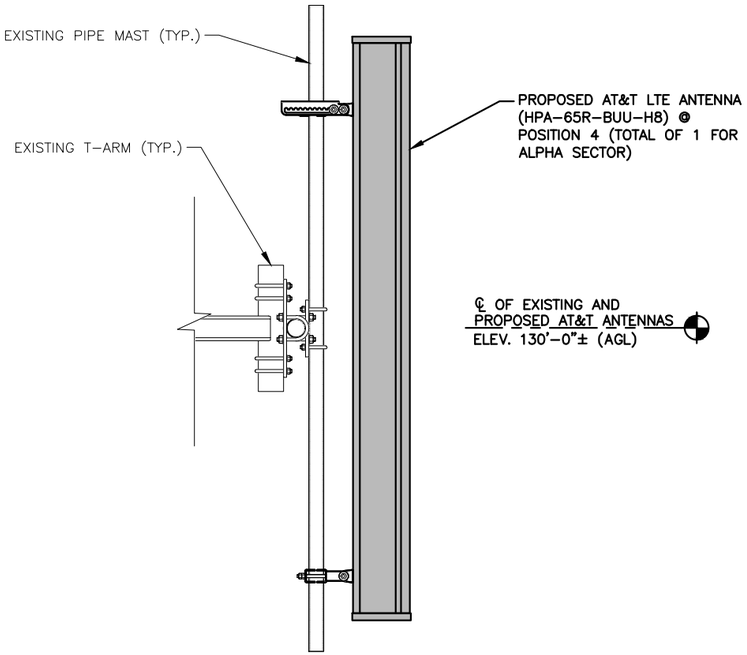
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

EXISTING ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	ANDREW	SBNH–1D6565C	96.4x11.9x7.1
BETA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	KMW	AM–X–CD–16–65–00T–RET	72x11.8x5.9
GAMMA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	KMW	AM–X–CD–16–65–00T–RET	72x11.8x5.9

PROPOSED ANTENNA SCHEDULE

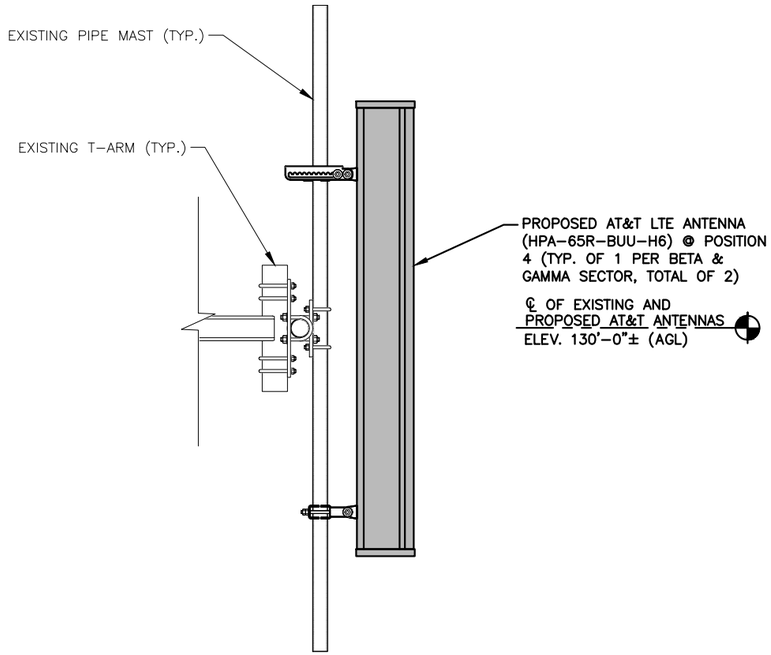
SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	CCI	HPA–65R–BUU–H8	92.4x14.8x7.4
BETA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	CCI	HPA–65R–BUU–H6	72x14.8x9
GAMMA	POWERWAVE	7770	55x11x5
	–	–	–
	–	–	–
	CCI	HPA–65R–BUU–H6	72x14.8x9



PROPOSED LTE ANTENNA MOUNTING DETAIL (ALPHA SECTOR) 1 A–3

SCALE: N.T.S

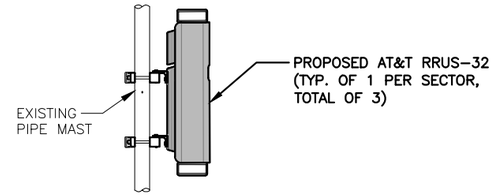
0 0'–6" 1'–0" 2'–0" 3'–0"



PROPOSED LTE ANTENNA MOUNTING DETAIL (BETA & GAMMA SECTOR) 2 A–3

SCALE: N.T.S

0 0'–6" 1'–0" 2'–0" 3'–0"



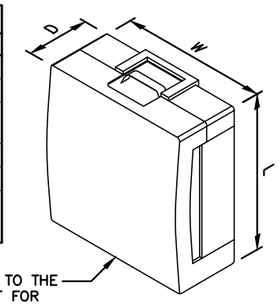
PROPOSED RRU MOUNTING DETAIL 3 A–3

SCALE: N.T.S

RRU CHART

QUANTITY	MODEL	L	W	D
3(E)	RRUS–11	19.7"	17.0"	7.2"
–	RRUS–12	20.4"	18.5"	7.5"
3(P)	RRUS–32	27.2"	12.1"	7.0"
–	RRUS–E2	20.4"	18.5"	7.5"
–	LTE–A2	16.4"	15.2"	3.4"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRH DETAIL 4 A–3

SCALE: N.T.S

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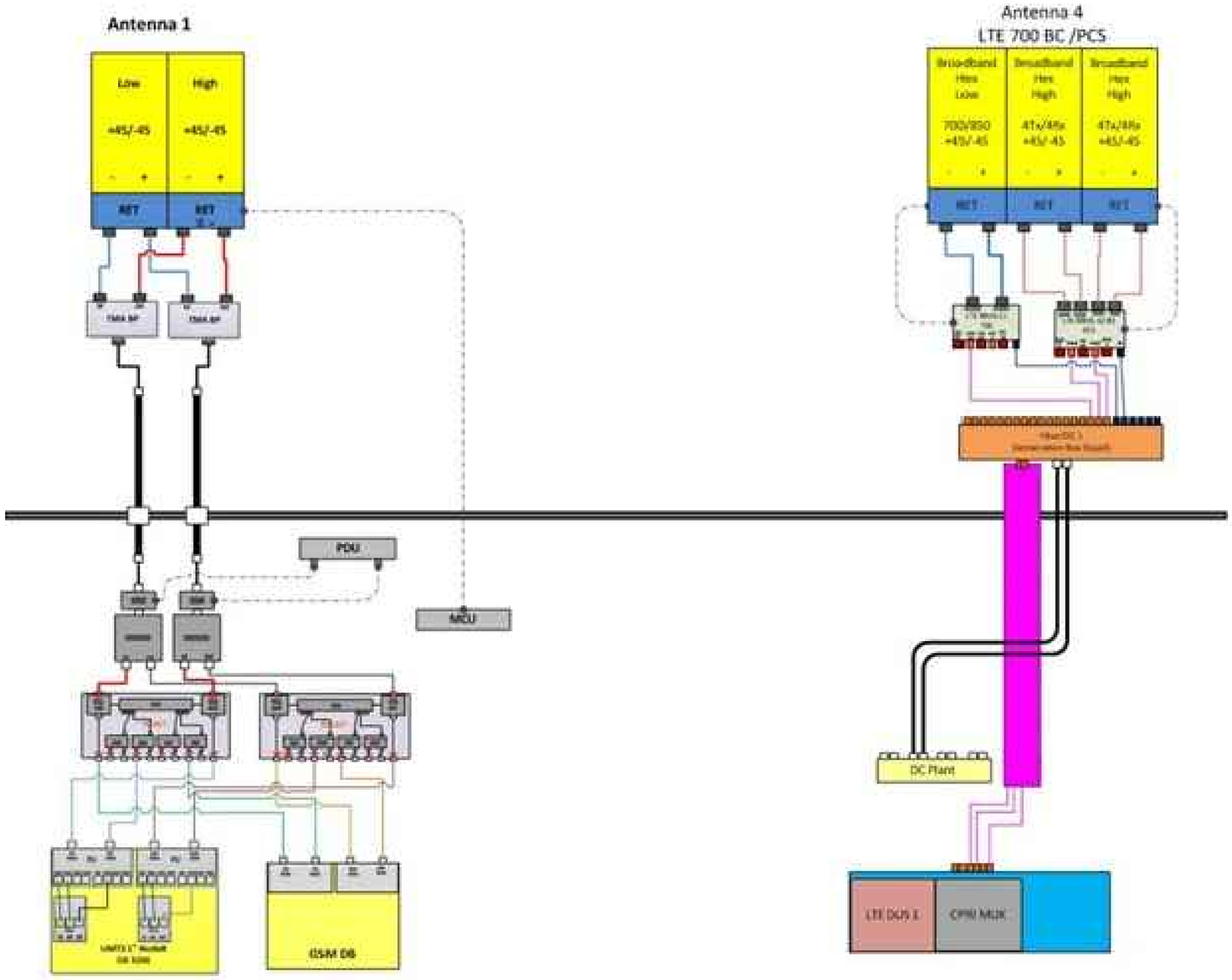
STATE OF CONNECTICUT
DEREK J. CREASER
No. 28556
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	A–3	1



RF PLUMBING DIAGRAM 1
SCALE: N.T.S RF–1

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.

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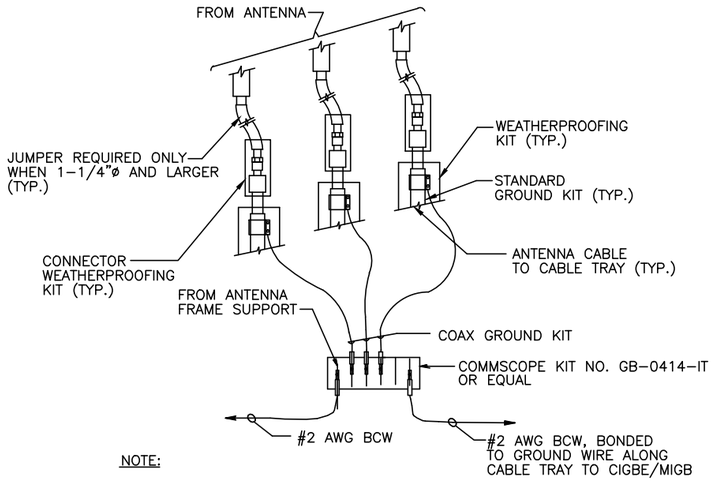
STATE OF CONNECTICUT
DEREK J. CREASER
No. 21551
LICENSED PROFESSIONAL ENGINEER

AT&T

RF PLUMBING DIAGRAM
(LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	RF–1	1



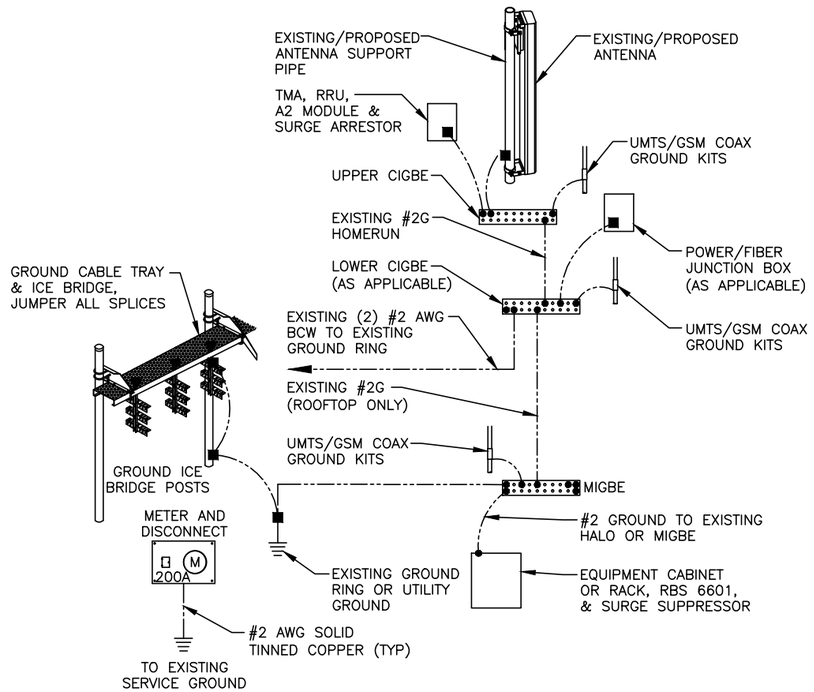
NOTE:

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

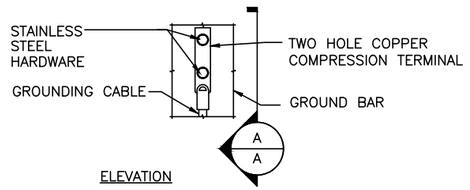
1 / G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1



NOTE:

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

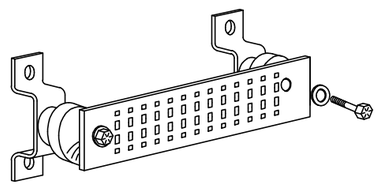
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL

SCALE: N.T.S

4 / G-1

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1600 OSGOOD STREET
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AN

STATE OF CONNECTICUT · DEREK J. CREASER · No. 21557 · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
(LTE BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT5255	G-1	1

Date: **December 30, 2016**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Velocitel, Inc. d.b.a. FDH Velocitel
6521 Meridien Drive
Raleigh, North Carolina 27616
919.755.1012

Subject: Structural Analysis Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5255
	Carrier Site Name:	Farmington - Dead Swamp Wood
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	EAST FARMINGTON
	Crown Castle JDE Job Number:	413615
	Crown Castle Work Order Number:	1340814
	Crown Castle Application Number:	372461 Rev. 1
Engineering Firm Designation:	**FDH Velocitel Project Number:**	16PYKA1400
Site Data:	**3 A Birdseye Road, Farmington, Hartford County, CT** **Latitude *41° 42' 56.94"*, Longitude *-72° 48' 37.42"*** **140 Foot - Monopole Tower**	

Dear Charles McGuirt,

FDH Velocitel is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 984538, in accordance with application 372461, revision 1.

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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the *2016 Connecticut State Building Code* based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the *TIA-222-G Standard per Exception #5 of Section 1609.1.1.* Exposure Category B and Risk Category II were used in this analysis.

We at *FDH Velocitel* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:

Kelsey Sargent, EI
Project Engineer I

Reviewed by:

Dennis D. Abel, PE
Director of Structural Engineering
CT PE License No. 23247

STATE OF CONNECTICUT DENNIS D. ABEL No. 23247 LICENSED PROFESSIONAL ENGINEER

12-30-2016

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by SUMMIT in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
129.0	130.0	3	ericsson	TME-RRUS 32	-	-	-
128.0	130.0	1	cci antennas	HPA-65R-BUU-H8			
		2	cci antennas	HPA-65R-BUU-H6			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	140.0	3	rfs celwave	APXV9ERR18-C-A20	3	1-1/4	1
		3	rfs celwave	APXVTM14-C-120			
		3	alcatel lucent	TD-RRH8x20-25			
		1	crown mounts	Platform Mount [LP 1201-1]			
137.0	140.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
	137.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	crown mounts	Side Arm Mount [SO 102-3]			
129.0	130.0	3	ericsson	TME-RRUS 11-700	-	-	1
	129.0	1	crown mounts	Side Arm Mount [SO 102-3]			
128.0	130.0	1	andrew	SBNH-1D6565C	-	-	2
		2	kmw communications	AM-X-CD-16-65-00T-RET			
		3	ericsson	RRUS-11			
		3	powerwave technologies	7770.00	1 2 9	3/8 3/4 7/8	1
	128.0	1	raycap	DC6-48-60-18-8F			
		6	powerwave technologies	LGP21401			
		1	crown mounts	T-Arm Mount [TA 602-3]			
110.0	110.0	1	raycap	TME-DB-T16Z-8AB-0Z	--	--	2
		1	crown mounts	Side Arm Mount [SO 102-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
108.0	109.0	9	andrew	SBNHH-1D65B	14	1-5/8	1
		3	alcatel lucent	RRH2x60-PCS			
		3	alcatel lucent	RRH2X60-700			
		2	rfs/celwave	DB-T1-6Z-8AB-0Z			
		3	antel	BXA-70063-4CF-EDIN-X			
	108.0	1	crown mounts	Platform Mount [LP 304-1]			
100.0	100.0	3	commscope	LNX-6515DS-VTM	12 1	7/8 1-5/8	1
		3	ericsson	RRUS 11 B12			
		3	ericsson	Ericsson AIR 21 B2A B4P			
		3	ericsson	Ericsson AIR 21 B4A B2P			
		3	ericsson	KRY 112 144/1			
		1	crown mounts	T-Arm Mount [TA 602-3]			
90.0	90.0	1	crown mounts	Pipe Mount [PM 601-3]	-	-	1
70.0	72.0	2	lucent	KS24019-L112A	2	5/16	1
	70.0	2	crown mounts	Side Arm Mount [SO 701-1]			
49.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	49.0	1	crown mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Existing Equipment- To Be Removed; Not Considered in Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	1531892	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford & Company	1440555	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, Inc.	1615361	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	2397525	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	3262310	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	3672042	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	4456376	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	1397390	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group	2397526	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3412577	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3413367	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4836319	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4836434	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	5400317	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) 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. FDH Velocitel should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP17.025x16x0.25	Pole	7.0%	Pass
135 - 130	Pole	TP18.05x17.025x0.25	Pole	13.6%	Pass
130 - 125	Pole	TP19.075x18.05x0.25	Pole	22.9%	Pass
125 - 120	Pole	TP20.099x19.075x0.25	Pole	31.0%	Pass
120 - 115	Pole	TP21.124x20.099x0.25	Pole	37.7%	Pass
115 - 110	Pole	TP22.149x21.124x0.25	Pole	43.5%	Pass
110 - 105	Pole	TP23.174x22.149x0.25	Pole	51.9%	Pass
105 - 102.33	Pole	TP23.721x23.174x0.25	Pole	56.5%	Pass
102.33 - 102.08	Pole + Reinf.	TP23.773x23.721x0.3875	Reinf. 7 Tension Rupture	51.5%	Pass
102.08 - 97.08	Pole + Reinf.	TP24.797x23.773x0.375	Reinf. 7 Tension Rupture	60.0%	Pass
97.08 - 95	Pole + Reinf.	TP25.89x24.797x0.375	Reinf. 7 Tension Rupture	63.5%	Pass
95 - 90.75	Pole + Reinf.	TP25.595x24.724x0.3563	Pole	55.2%	Pass
90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.3563	Pole	60.2%	Pass
85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.3563	Pole	60.5%	Pass
85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.5625	Reinf. 6 Tension Rupture	55.0%	Pass
85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.5625	Reinf. 6 Tension Rupture	57.4%	Pass
82.5 - 82.25	Pole	TP27.338x27.287x0.3125	Pole	67.6%	Pass
82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.55	Reinf. 5 Tension Rupture	61.7%	Pass
77.15 - 76.92	Pole + Reinf.	TP28.431x28.383x0.55	Reinf. 5 Tension Rupture	61.9%	Pass
76.92 - 71.92	Pole + Reinf.	TP29.457x28.431x0.5375	Reinf. 5 Tension Rupture	65.8%	Pass
71.92 - 66.92	Pole + Reinf.	TP30.482x29.457x0.525	Reinf. 5 Tension Rupture	69.4%	Pass
66.92 - 66.67	Pole + Reinf.	TP30.534x30.482x0.525	Reinf. 5 Tension Rupture	69.5%	Pass
66.67 - 66.42	Pole + Reinf.	TP30.585x30.534x0.5125	Reinf. 4 Tension Rupture	68.4%	Pass
66.42 - 61.42	Pole + Reinf.	TP31.61x30.585x0.5125	Reinf. 4 Tension Rupture	71.7%	Pass
61.42 - 60	Pole + Reinf.	TP31.901x31.61x0.5063	Reinf. 4 Tension Rupture	72.6%	Pass
60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.5125	Reinf. 4 Tension Rupture	67.1%	Pass
59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.5125	Reinf. 4 Tension Rupture	69.9%	Pass
54.75 - 51	Pole + Reinf.	TP34.67x32.978x0.5063	Reinf. 4 Tension Rupture	71.8%	Pass
51 - 45.5	Pole + Reinf.	TP34.25x33.122x0.55	Reinf. 4 Tension Rupture	73.8%	Pass
45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.55	Reinf. 4 Tension Rupture	74.3%	Pass
44.25 - 44	Pole + Reinf.	TP34.557x34.506x0.675	Reinf. 3 Tension Rupture	63.3%	Pass
44 - 39	Pole + Reinf.	TP35.583x34.557x0.6625	Reinf. 3 Tension Rupture	65.1%	Pass
39 - 34	Pole + Reinf.	TP36.608x35.583x0.65	Reinf. 3 Tension Rupture	66.8%	Pass
34 - 29	Pole + Reinf.	TP37.633x36.608x0.6375	Reinf. 3 Tension Rupture	68.3%	Pass
29 - 27.75	Pole + Reinf.	TP37.89x37.633x0.6375	Reinf. 3 Tension Rupture	68.7%	Pass
27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x0.6375	Reinf. 3 Tension Rupture	67.4%	Pass

27.5 - 24.08	Pole + Reinf.	TP38.642x37.941x0.6375	Reinf. 3 Tension Rupture	68.3%	Pass
24.08 - 23.83	Pole + Reinf.	TP38.693x38.642x0.55	Reinf. 2 Tension Rupture	75.0%	Pass
23.83 - 18.83	Pole + Reinf.	TP39.718x38.693x0.5375	Reinf. 2 Tension Rupture	76.3%	Pass
18.83 - 18.08	Pole + Reinf.	TP39.872x39.718x0.5375	Reinf. 2 Tension Rupture	76.5%	Pass
18.08 - 17.83	Pole + Reinf.	TP39.923x39.872x0.6375	Reinf. 1 Tension Rupture	74.8%	Pass
17.83 - 12.83	Pole + Reinf.	TP40.948x39.923x0.625	Reinf. 1 Tension Rupture	76.0%	Pass
12.83 - 7.83	Pole + Reinf.	TP41.974x40.948x0.625	Reinf. 1 Tension Rupture	77.1%	Pass
7.83 - 2.83	Pole + Reinf.	TP42.999x41.974x0.6125	Reinf. 1 Tension Rupture	78.1%	Pass
2.83 - 0	Pole + Reinf.	TP43.58x42.999x0.6125	Reinf. 1 Tension Rupture	78.6%	Pass
				Summary	
			Pole	67.6%	Pass
			Reinforcement	78.6%	Pass
			Overall	78.6%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	68.4	Pass
1	Base Plate	0	61.8	Pass
1	Base Transfer Stiffeners	0	91.8	Pass
1	Base Foundation	0	37.7	Pass
1	Base Foundation Soil Interaction	0	28.9	Pass

Structure Rating (max from all components) =	**91.8%**

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

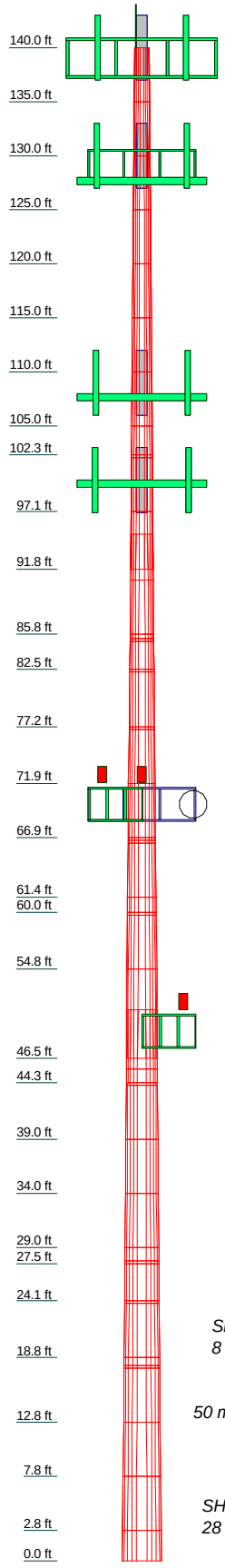
4.1) Recommendations

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

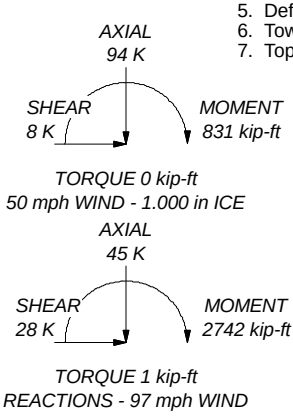
APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.250		16.000	17.025		0.2
2	5.00	12	0.250		17.025	18.050		0.2
3	5.00	12	0.250		18.050	19.075		0.3
4	5.00	12	0.250		19.075	20.099		0.3
5	5.00	12	0.250		20.099	21.124		0.3
6	5.00	12	0.250		21.124	22.149		0.3
7	5.00	12	0.250		22.149	23.174		0.3
8	5.00	12	0.250		23.174	24.199		0.2
9	0.25	12	0.375		23.723	24.797		0.0
10	5.00	12	0.375		24.797	25.890		0.5
11	4.25	12	0.375	3.25	24.797	25.890		0.5
12	0.33	12	0.375		24.797	25.890		0.0
13	5.00	12	0.375		25.890	27.024		0.6
14	0.25	12	0.375		27.024	28.158		0.0
15	0.25	12	0.375		28.158	29.292		0.0
16	0.25	12	0.375		29.292	30.426		0.0
17	0.25	12	0.375		30.426	31.560		0.0
18	5.10	12	0.550		31.560	32.978		0.9
19	0.23	12	0.550		32.978	34.396		0.0
20	5.00	12	0.525		34.396	35.814		0.9
21	5.00	12	0.525		35.814	37.232		0.9
22	0.25	12	0.525		37.232	38.650		0.0
23	0.25	12	0.525		38.650	40.068		0.0
24	5.00	12	0.525		40.068	41.486		0.8
25	0.25	12	0.525		41.486	42.904		0.0
26	0.25	12	0.525		42.904	44.322		0.0
27	5.00	12	0.525		44.322	45.740		0.9
28	5.50	12	0.506	4.50	45.740	47.158	A607-65	1.6
29	0.25	12	0.506		47.158	48.576		0.0
30	0.25	12	0.506		48.576	49.994		0.0
31	0.25	12	0.506		49.994	51.412		0.0
32	5.00	12	0.662		51.412	52.830		1.2
33	5.00	12	0.650		52.830	54.248		1.2
34	5.00	12	0.637		54.248	55.666		1.2
35	0.25	12	0.637		55.666	57.084		0.0
36	0.25	12	0.637		57.084	58.502		0.0
37	5.42	12	0.637		58.502	59.920		0.9
38	0.25	12	0.637		59.920	61.338		0.0
39	5.00	12	0.537		61.338	62.756		1.3
40	0.25	12	0.537		62.756	64.174		0.0
41	0.25	12	0.537		64.174	65.592		0.0
42	5.00	12	0.625		65.592	67.010		1.3
43	5.00	12	0.625		67.010	68.428		1.4
44	5.00	12	0.613		68.428	69.846		1.4
45	2.83	12	0.613		69.846	71.264		0.8



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 1.000 in ICE

TORQUE 1 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	140	RRH2X60-PCS	108
APXV9ERR18-C-A20	139	RRH2X60-PCS	108
APXV9ERR18-C-A20	139	RRH2X60-PCS	108
APXV9ERR18-C-A20	139	RRH2x60-700	108
APXVTM14-C-120	139	RRH2x60-700	108
APXVTM14-C-120	139	RRH2x60-700	108
APXVTM14-C-120	139	(2) DB-T1-6Z-8AB-0Z	108
TD-RRH8x20-25	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
TD-RRH8x20-25	139		
TD-RRH8x20-25	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
Platform Mount [LP 1201-1]	139		
Miscellaneous [NA 510-3]	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
PCS 1900MHz 4x45W-65MHz	137	Platform Mount [LP 304-1]	108
PCS 1900MHz 4x45W-65MHz	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
PCS 1900MHz 4x45W-65MHz	137		
800MHz 2X50W RRH W/FILTER	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137		
800MHz 2X50W RRH W/FILTER	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
Side Arm Mount [SO 102-3]	137		
TME-RRUS-11-700	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-11-700	129		
TME-RRUS-11-700	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-32	129		
TME-RRUS-32	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-32	129		
Side Arm Mount [SO 102-3]	129	LNX-6515DS-VTM w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128	LNX-6515DS-VTM w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128	LNX-6515DS-VTM w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128	RRUS 11 B12	100
HPA-65R-BUU-H8 w/ Mount Pipe	128	RRUS 11 B12	100
HPA-65R-BUU-H6 w/ Mount Pipe	128	RRUS 11 B12	100
HPA-65R-BUU-H6 w/ Mount Pipe	128	KRY 112 144/1	100
(2) LGP21401	128	KRY 112 144/1	100
(2) LGP21401	128	KRY 112 144/1	100
(2) LGP21401	128	T-Arm Mount [TA 602-3]	100
DC6-48-60-18-8F	128	Pipe Mount [PM 601-3]	90
Empty Mount Pipe	128	KS24019-L112A	70
Empty Mount Pipe	128	Side Arm Mount [SO 701-1]	70
Empty Mount Pipe	128	KS24019-L112A	70
T-Arm Mount [TA 602-3]	128	Side Arm Mount [SO 701-1]	70
(3) SBNHH-1D65B w/ Mount Pipe	108	KS24019-L112A	49
(3) SBNHH-1D65B w/ Mount Pipe	108	Side Arm Mount [SO 701-1]	49
(3) SBNHH-1D65B w/ Mount Pipe	108		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

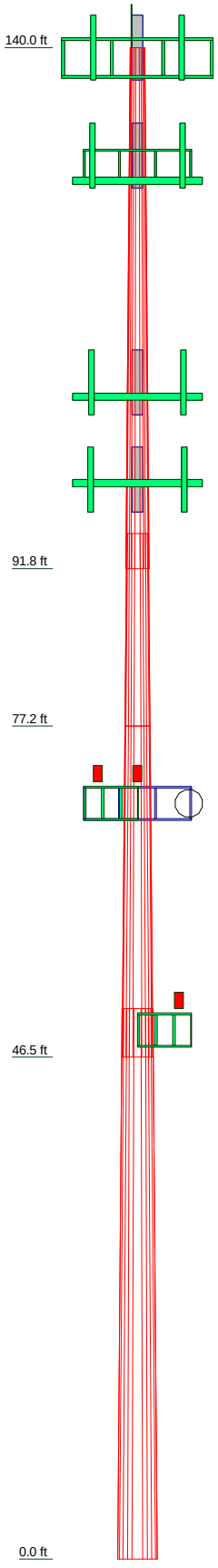
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

FDH VELOCITEL ENGINEERING INNOVATION
Tower Analysis

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: 9197551012
FAX: 9197551031

Job: ***East Farmington, BU# 876335***			
Project: ***16PYKA1400***			
Client: Crown Castle	Drawn by: Kelsey Sargent	App'd:	
Code: TIA-222-G	Date: 12/30/16	Scale: NTS	
Path:		Dwg No. E-1	

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	48.25	12	0.250	3.25	16.000	25.890	A607-60	2.7
2	17.83	12	0.313		24.724	28.380		1.6
3	30.67	12	0.313	4.50	28.380	34.670	A607-65	3.3
4	51.00	12	0.375		33.122	43.580		8.0
								15.6



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PCS 1900MHz 4x45W-65MHz	137	Platform Mount [LP 304-1]	108
PCS 1900MHz 4x45W-65MHz	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137		
800MHz 2X50W RRH W/FILTER	137	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	100
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TME-RRUS-11-700	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-11-700	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-11-700	129		
TME-RRUS-32	129	Ericsson AIR 21 B2A/B4P w/ Mount Pipe	100
TME-RRUS-32	129		
TME-RRUS-32	129	LNX-6515DS-VTM w/ Mount Pipe	100
Side Arm Mount [SO 102-3]	129	LNX-6515DS-VTM w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128	LNX-6515DS-VTM w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128	RRUS 11 B12	100
7770.00 w/ Mount Pipe	128	RRUS 11 B12	100
HPA-65R-BUU-H8 w/ Mount Pipe	128	RRUS 11 B12	100
HPA-65R-BUU-H6 w/ Mount Pipe	128	KRY 112 144/1	100
HPA-65R-BUU-H6 w/ Mount Pipe	128	KRY 112 144/1	100
(2) LGP21401	128	KRY 112 144/1	100
(2) LGP21401	128	T-Arm Mount [TA 602-3]	100
(2) LGP21401	128	Pipe Mount [PM 601-3]	90
DC6-48-60-18-8F	128	KS24019-L112A	70
Empty Mount Pipe	128	Side Arm Mount [SO 701-1]	70
Empty Mount Pipe	128	KS24019-L112A	70
Empty Mount Pipe	128	Side Arm Mount [SO 701-1]	70
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4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

FDH VELOCITEL ENGINEERING INNOVATION

Tower Analysis

FDH Velocitel
6521 Meridien Drive, Suite 107
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Job: ***East Farmington, BU# 876335***			
Project: ***16PYKA1400***			
Client: Crown Castle	Drawn by: Kelsey Sargent		App'd:
Code: TIA-222-G	Date: 12/30/16		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G 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				

Tapered Pole Section Geometry

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*
L1	140.00-135.00	5.00	0.00	12	16.000	17.025	0.250	1.000	A607-60 (60 ksi)
L2	135.00-130.00	5.00	0.00	12	17.025	18.050	0.250	1.000	A607-60 (60 ksi)
L3	130.00-125.00	5.00	0.00	12	18.050	19.075	0.250	1.000	A607-60 (60 ksi)
L4	125.00-120.00	5.00	0.00	12	19.075	20.099	0.250	1.000	A607-60 (60 ksi)
L5	120.00-115.00	5.00	0.00	12	20.099	21.124	0.250	1.000	A607-60 (60 ksi)
L6	115.00-110.00	5.00	0.00	12	21.124	22.149	0.250	1.000	A607-60 (60 ksi)
L7	110.00-105.00	5.00	0.00	12	22.149	23.174	0.250	1.000	A607-60

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
									(60 ksi)
L8	105.00-102.33	2.67	0.00	12	23.174	23.721	0.250	1.000	A607-60 (60 ksi)
L9	102.33-102.08	0.25	0.00	12	23.721	23.773	0.388	1.550	A607-60 (60 ksi)
L10	102.08-97.08	5.00	0.00	12	23.773	24.797	0.375	1.500	A607-60 (60 ksi)
L11	97.08-91.75	5.33	3.25	12	24.797	25.890	0.375	1.500	A607-60 (60 ksi)
L12	91.75-90.75	4.25	0.00	12	24.724	25.595	0.356	1.425	A607-65 (65 ksi)
L13	90.75-85.75	5.00	0.00	12	25.595	26.620	0.356	1.425	A607-65 (65 ksi)
L14	85.75-85.33	0.42	0.00	12	26.620	26.706	0.356	1.425	A607-65 (65 ksi)
L15	85.33-85.08	0.25	0.00	12	26.706	26.758	0.563	2.250	A607-65 (65 ksi)
L16	85.08-82.50	2.58	0.00	12	26.758	27.287	0.563	2.250	A607-65 (65 ksi)
L17	82.50-82.25	0.25	0.00	12	27.287	27.338	0.313	1.250	A607-65 (65 ksi)
L18	82.25-77.15	5.10	0.00	12	27.337	28.383	0.550	2.200	A607-65 (65 ksi)
L19	77.15-76.92	0.23	0.00	12	28.383	28.431	0.550	2.200	A607-65 (65 ksi)
L20	76.92-71.92	5.00	0.00	12	28.431	29.457	0.537	2.150	A607-65 (65 ksi)
L21	71.92-66.92	5.00	0.00	12	29.457	30.482	0.525	2.100	A607-65 (65 ksi)
L22	66.92-66.67	0.25	0.00	12	30.482	30.534	0.525	2.100	A607-65 (65 ksi)
L23	66.67-66.42	0.25	0.00	12	30.534	30.585	0.512	2.050	A607-65 (65 ksi)
L24	66.42-61.42	5.00	0.00	12	30.585	31.610	0.512	2.050	A607-65 (65 ksi)
L25	61.42-60.00	1.42	0.00	12	31.610	31.901	0.506	2.025	A607-65 (65 ksi)
L26	60.00-59.75	0.25	0.00	12	31.901	31.952	0.512	2.050	A607-65 (65 ksi)
L27	59.75-54.75	5.00	0.00	12	31.952	32.978	0.512	2.050	A607-65 (65 ksi)
L28	54.75-46.50	8.25	4.50	12	32.978	34.670	0.506	2.025	A607-65 (65 ksi)
L29	46.50-45.50	5.50	0.00	12	33.122	34.250	0.550	2.200	A607-65 (65 ksi)
L30	45.50-44.25	1.25	0.00	12	34.250	34.506	0.550	2.200	A607-65 (65 ksi)
L31	44.25-44.00	0.25	0.00	12	34.506	34.557	0.675	2.700	A607-65 (65 ksi)
L32	44.00-39.00	5.00	0.00	12	34.557	35.583	0.662	2.650	A607-65 (65 ksi)
L33	39.00-34.00	5.00	0.00	12	35.583	36.608	0.650	2.600	A607-65 (65 ksi)
L34	34.00-29.00	5.00	0.00	12	36.608	37.633	0.637	2.550	A607-65 (65 ksi)
L35	29.00-27.75	1.25	0.00	12	37.633	37.890	0.637	2.550	A607-65 (65 ksi)
L36	27.75-27.50	0.25	0.00	12	37.890	37.941	0.637	2.550	A607-65 (65 ksi)
L37	27.50-24.08	3.42	0.00	12	37.941	38.642	0.637	2.550	A607-65 (65 ksi)
L38	24.08-23.83	0.25	0.00	12	38.642	38.693	0.550	2.200	A607-65 (65 ksi)
L39	23.83-18.83	5.00	0.00	12	38.693	39.718	0.537	2.150	A607-65 (65 ksi)
L40	18.83-18.08	0.75	0.00	12	39.718	39.872	0.537	2.150	A607-65 (65 ksi)
L41	18.08-17.83	0.25	0.00	12	39.872	39.923	0.637	2.550	A607-65 (65 ksi)
L42	17.83-12.83	5.00	0.00	12	39.923	40.948	0.625	2.500	A607-65 (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
L43	12.83-7.83	5.00	0.00	12	40.948	41.974	0.625	2.500	A607-65 (65 ksi)
L44	7.83-2.83	5.00	0.00	12	41.974	42.999	0.613	2.450	A607-65 (65 ksi)
L45	2.83-0.00	2.83		12	42.999	43.580	0.613	2.450	A607-65 (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	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
L2	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
L3	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
L4	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
L5	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
	21.870	16.804	934.589	7.473	10.942	85.410	1893.732	8.270	4.991	19.965
L6	21.870	16.804	934.589	7.473	10.942	85.410	1893.732	8.270	4.991	19.965
	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
L7	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
L8	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
	24.558	18.894	1328.610	8.403	12.288	108.125	2692.123	9.299	5.687	22.749
L9	24.558	29.115	2023.364	8.354	12.288	164.666	4099.885	14.329	5.319	13.726
	24.611	29.179	2036.724	8.372	12.314	165.396	4126.955	14.361	5.333	13.761
L10	24.611	28.253	1974.186	8.376	12.314	160.318	4000.236	13.905	5.366	14.309
	25.672	29.490	2245.137	8.743	12.845	174.785	4549.256	14.514	5.641	15.042
L11	25.672	29.490	2245.137	8.743	12.845	174.785	4549.256	14.514	5.641	15.042
	26.803	30.809	2560.117	9.134	13.411	190.897	5187.491	15.163	5.934	15.823
L12	26.286	27.953	2118.528	8.724	12.807	165.420	4292.711	13.757	5.671	15.919
	26.498	28.952	2354.016	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
L13	26.498	28.952	2354.016	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
L14	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
	27.649	30.227	2678.836	9.433	13.834	193.643	5428.047	14.877	6.203	17.411
L15	27.649	47.353	4131.194	9.360	13.834	298.628	8370.918	23.306	5.650	10.044
	27.702	47.446	4155.539	9.378	13.860	299.812	8420.249	23.351	5.664	10.069
L16	27.702	47.446	4155.539	9.378	13.860	299.812	8420.249	23.351	5.664	10.069
	28.249	48.404	4412.395	9.567	14.134	312.173	8940.708	23.823	5.805	10.321
L17	28.249	27.143	2520.771	9.657	14.134	178.342	5107.766	13.359	6.475	20.721
	28.302	27.194	2535.168	9.675	14.161	179.024	5136.939	13.384	6.489	20.765
L18	28.302	47.441	4345.086	9.590	14.161	306.839	8804.321	23.349	5.852	10.641
	29.385	49.293	4874.245	9.964	14.703	331.522	9876.542	24.261	6.133	11.15
L19	29.385	49.293	4874.245	9.964	14.703	331.522	9876.542	24.261	6.133	11.15
	29.434	49.378	4899.428	9.982	14.727	332.674	9927.569	24.302	6.146	11.174
L20	29.434	48.277	4794.520	9.986	14.727	325.550	9714.997	23.761	6.179	11.496
	30.496	50.052	5343.020	10.353	15.259	350.163	10826.407	24.634	6.454	12.007
L21	30.496	48.909	5225.534	10.358	15.259	342.464	10588.348	24.072	6.487	12.357
	31.558	50.643	5801.143	10.725	15.790	367.396	11754.689	24.925	6.762	12.881
L22	31.558	50.643	5801.143	10.725	15.790	367.396	11754.689	24.925	6.762	12.881
	31.611	50.730	5830.947	10.743	15.816	368.664	11815.080	24.968	6.776	12.907
L23	31.611	49.542	5699.231	10.748	15.816	360.336	11548.187	24.383	6.810	13.287
	31.664	49.627	5728.484	10.766	15.843	361.579	11607.462	24.425	6.823	13.314
L24	31.664	49.627	5728.484	10.766	15.843	361.579	11607.462	24.425	6.823	13.314
	32.726	51.319	6334.758	11.133	16.374	386.874	12835.936	25.258	7.098	13.85
L25	32.726	50.704	6261.278	11.135	16.374	382.387	12687.047	24.955	7.115	14.054
	33.026	51.177	6438.438	11.239	16.525	389.624	13046.022	25.188	7.193	14.208
L26	33.026	51.799	6514.033	11.237	16.525	394.199	13199.198	25.494	7.176	14.002
	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
L27	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
	34.141	53.576	7207.702	11.623	17.083	421.934	14604.759	26.368	7.465	14.565
L28	34.141	52.933	7123.916	11.625	17.083	417.029	14434.985	26.052	7.481	14.778

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
	35.893	55.691	8296.663	12.231	17.959	461.976	16811.289	27.410	7.935	15.674
L29	35.246	57.685	7811.575	11.661	17.157	455.294	15828.369	28.391	7.403	13.459
	35.458	59.682	8651.434	12.065	17.741	487.641	17530.151	29.374	7.705	14.009
L30	35.458	59.682	8651.434	12.065	17.741	487.641	17530.151	29.374	7.705	14.009
	35.723	60.136	8850.350	12.156	17.874	495.147	17933.208	29.597	7.774	14.134
L31	35.723	73.532	10742.280	12.112	17.874	600.994	21766.771	36.190	7.439	11.02
	35.776	73.643	10791.187	12.130	17.901	602.834	21865.871	36.245	7.452	11.041
L32	35.776	72.306	10603.077	12.134	17.901	592.326	21484.709	35.587	7.486	11.299
	36.838	74.494	11594.678	12.501	18.432	629.057	23493.961	36.663	7.761	11.714
L33	36.838	73.114	11388.131	12.506	18.432	617.851	23075.441	35.985	7.794	11.991
	37.899	75.260	12420.591	12.873	18.963	654.993	25167.485	37.041	8.069	12.414
L34	37.899	73.838	12194.442	12.877	18.963	643.067	24709.246	36.341	8.102	12.71
	38.961	75.943	13267.207	13.244	19.494	680.577	26882.957	37.377	8.377	13.141
L35	38.961	75.943	13267.207	13.244	19.494	680.577	26882.957	37.377	8.377	13.141
	39.226	76.469	13544.885	13.336	19.627	690.121	27445.608	37.636	8.446	13.249
L36	39.226	76.469	13544.885	13.336	19.627	690.121	27445.608	37.636	8.446	13.249
	39.279	76.575	13600.881	13.355	19.653	692.038	27559.072	37.688	8.460	13.27
L37	39.279	76.575	13600.881	13.355	19.653	692.038	27559.072	37.688	8.460	13.27
	40.005	78.013	14381.779	13.605	20.016	718.502	29141.384	38.396	8.647	13.565
L38	40.005	67.460	12493.710	13.637	20.016	624.176	25315.643	33.202	8.882	16.149
	40.058	67.551	12544.221	13.655	20.043	625.869	25417.992	33.247	8.896	16.174
L39	40.058	66.037	12271.181	13.660	20.043	612.246	24864.740	32.502	8.929	16.612
	41.119	67.812	13287.238	14.027	20.574	645.827	26923.546	33.375	9.204	17.124
L40	41.119	67.812	13287.238	14.027	20.574	645.827	26923.546	33.375	9.204	17.124
	41.278	68.078	13444.320	14.082	20.654	650.941	27241.837	33.506	9.245	17.2
L41	41.278	80.538	15824.282	14.046	20.654	766.173	32064.285	39.639	8.977	14.082
	41.332	80.644	15886.392	14.064	20.680	768.193	32190.137	39.690	8.991	14.103
L42	41.332	79.088	15589.766	14.069	20.680	753.849	31589.092	38.925	9.024	14.439
	42.393	81.151	16842.092	14.436	21.211	794.014	34126.644	39.940	9.299	14.879
L43	42.393	81.151	16842.092	14.436	21.211	794.014	34126.644	39.940	9.299	14.879
	43.454	83.214	18159.750	14.803	21.742	835.222	36796.576	40.956	9.574	15.318
L44	43.454	81.575	17812.700	14.807	21.742	819.260	36093.359	40.149	9.607	15.686
	44.516	83.597	19170.468	15.174	22.274	860.684	38844.566	41.144	9.882	16.134
L45	44.516	83.597	19170.468	15.174	22.274	860.684	38844.566	41.144	9.882	16.134
	45.117	84.743	19969.545	15.382	22.574	884.609	40463.712	41.708	10.038	16.388

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				1	1	1			
140.00-135.00									
L2				1	1	1			
135.00-130.00									
L3				1	1	1			
130.00-125.00									
L4				1	1	1			
125.00-120.00									
L5				1	1	1			
120.00-115.00									
L6				1	1	1			
115.00-110.00									
L7				1	1	1			
110.00-105.00									
L8				1	1	1			
105.00-102.33									
L9				1	1	0.949603			
102.33-102.08									
L10				1	1	0.967553			
102.08-97.08									
L11				1	1	0.96239			
97.08-91.75									
L12				1	1	1.29378			
91.75-90.75									
L13				1	1	1.27752			
90.75-85.75									
L14				1	1	1.27622			
85.75-85.33									
L15				1	1	0.999035			
85.33-85.08									

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
L16 85.08-82.50				1	1	0.990257			
L17 82.50-82.25				1	1	1			
L18 82.25-77.15				1	1	1.05411			
L19 77.15-76.92				1	1	1.05328			
L20 76.92-71.92				1	1	1.0597			
L21 71.92-66.92				1	1	1.06772			
L22 66.92-66.67				1	1	1.06691			
L23 66.67-66.42				1	1	0.955849			
L24 66.42-61.42				1	1	0.944436			
L25 61.42-60.00				1	1	0.952769			
L26 60.00-59.75				1	1	1.05661			
L27 59.75-54.75				1	1	1.04249			
L28 54.75-46.50				1	1	1.04503			
L29 46.50-45.50				1	1	0.969769			
L30 45.50-44.25				1	1	0.967596			
L31 44.25-44.00				1	1	0.954148			
L32 44.00-39.00				1	1	0.959879			
L33 39.00-34.00				1	1	0.966553			
L34 34.00-29.00				1	1	0.974162			
L35 29.00-27.75				1	1	0.971506			
L36 27.75-27.50				1	1	0.97098			
L37 27.50-24.08				1	1	0.963923			
L38 24.08-23.83				1	1	1.14044			
L39 23.83-18.83				1	1	1.15431			
L40 18.83-18.08				1	1	1.15252			
L41 18.08-17.83				1	1	0.973709			
L42 17.83-12.83				1	1	0.982878			
L43 12.83-7.83				1	1	0.973384			
L44 7.83-2.83				1	1	0.98374			
L45 2.83-0.00				1	1	0.978717			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.000 0.000	0.375		0.22

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***									
LDF5-50A(7/8")	A	Surface Ar (CaAa)	100.00 - 0.00	12	6	0.350 0.450	1.090		0.33
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	A	Surface Ar (CaAa)	100.00 - 0.00	1	1	0.340 0.340	1.625		1.07
***									
9207(5/16")	A	Surface Ar (CaAa)	70.00 - 0.00	2	1	0.460 0.460	0.330		0.60
***									
Aero MP305	A	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	5.330	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	5.330	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	46.70 - 11.70	1	1	-0.100 0.100	5.330	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	0.400 0.500	5.330	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	-0.500 -0.400	5.330	14.840	0.00
***									
Aero MP305	A	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	5.330	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	5.330	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	5.330	14.840	0.00
***									
Aero MP305	A	Surface Af (CaAa)	49.00 - 45.00	1	1	-0.100 0.100	5.330	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	49.00 - 46.70	1	1	-0.100 0.100	5.330	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	49.00 - 46.50	1	1	-0.100 0.100	5.330	14.840	0.00
***									
Aero MP303	A	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	4.060	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	4.060	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	4.060	11.260	0.00
***									
Aero MP305	A	Surface Af (CaAa)	26.50 - 16.50	1	1	-0.100 0.100	5.330	14.840	0.00
***									
Aero MP303	A	Surface Af (CaAa)	86.50 - 64.50	1	1	-0.100 0.100	4.060	11.260	0.00
***									
Aero MP303	B	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	4.060	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	4.060	11.260	0.00
***									
Aero MP303	A	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	4.060	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	4.060	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	4.060	11.260	0.00
***									
6" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	30.50 - 0.00	1	1	-0.100 0.100	6.000	14.500	0.00
***									
6" x 1" Flat Plate (G)	B	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	6.000	14.000	0.00
6" x 1" Flat Plate (G)	A	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	6.000	14.000	0.00
***									
6" x 1" Flat Plate (G)	A	Surface Af (CaAa)	62.00 - 47.00	1	1	-0.500 -0.400	6.000	14.000	0.00
***									
6" x 1" Flat Plate (G)	A	Surface Af	84.50 - 64.50	1	1	-0.500	6.000	14.000	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				-0.400			
6" x 1" Flat Plate (G)	A	Surface Af (CaAa)	84.50 - 64.50	1	1	-0.500 -0.400	6.000	14.000	0.00
***									
6" x 1" Flat Plate (G)	C	Surface Af (CaAa)	95.00 - 80.00	1	1	-0.400 -0.300	6.000	14.000	0.00
6" x 1" Flat Plate (G)	C	Surface Af (CaAa)	95.00 - 80.00	1	1	-0.500 -0.400	6.000	14.000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
HB114-1-08U4-M5J(1 1/4")	B	No	Inside Pole	139.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
***								
LDF5-50A(7/8")	B	No	Inside Pole	128.00 - 0.00	9	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
FB-L98B-002-75000(3/8")	B	No	Inside Pole	128.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	128.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
2" Rigid Conduit	B	No	Inside Pole	128.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
***								
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	108.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	108.00 - 0.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
***								
LDF4-50A(1/2")	B	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
5/16"	B	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20

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	140.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.188	0.000	0.00
L2	135.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.00
L3	130.00-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.188	0.000	0.00
L4	125.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.188	0.000	0.00
L5	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00

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
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.188	0.000	0.00
L6	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.188	0.000	0.00
L7	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.188	0.000	0.04
L8	105.00-102.33	A	0.000	0.000	0.792	0.000	0.00
		B	0.000	0.000	0.792	0.000	0.03
		C	0.000	0.000	0.892	0.000	0.03
L9	102.33-102.08	A	0.000	0.000	0.169	0.000	0.00
		B	0.000	0.000	0.169	0.000	0.00
		C	0.000	0.000	0.179	0.000	0.00
L10	102.08-97.08	A	0.000	0.000	5.768	0.000	0.01
		B	0.000	0.000	3.383	0.000	0.05
		C	0.000	0.000	3.571	0.000	0.06
L11	97.08-91.75	A	0.000	0.000	6.774	0.000	0.03
		B	0.000	0.000	2.422	0.000	0.05
		C	0.000	0.000	9.122	0.000	0.07
L12	91.75-90.75	A	0.000	0.000	0.817	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	2.038	0.000	0.01
L13	90.75-85.75	A	0.000	0.000	4.590	0.000	0.03
		B	0.000	0.000	0.507	0.000	0.05
		C	0.000	0.000	10.695	0.000	0.06
L14	85.75-85.33	A	0.000	0.000	0.627	0.000	0.00
		B	0.000	0.000	0.284	0.000	0.00
		C	0.000	0.000	1.140	0.000	0.01
L15	85.33-85.08	A	0.000	0.000	0.373	0.000	0.00
		B	0.000	0.000	0.169	0.000	0.00
		C	0.000	0.000	0.679	0.000	0.00
L16	85.08-82.50	A	0.000	0.000	7.852	0.000	0.01
		B	0.000	0.000	1.746	0.000	0.03
		C	0.000	0.000	7.003	0.000	0.03
L17	82.50-82.25	A	0.000	0.000	0.873	0.000	0.00
		B	0.000	0.000	0.169	0.000	0.00
		C	0.000	0.000	0.679	0.000	0.00
L18	82.25-77.15	A	0.000	0.000	19.067	0.000	0.03
		B	0.000	0.000	4.703	0.000	0.05
		C	0.000	0.000	9.394	0.000	0.06
L19	77.15-76.92	A	0.000	0.000	0.973	0.000	0.00
		B	0.000	0.000	0.316	0.000	0.00
		C	0.000	0.000	0.324	0.000	0.00
L20	76.92-71.92	A	0.000	0.000	20.849	0.000	0.03
		B	0.000	0.000	3.665	0.000	0.05
		C	0.000	0.000	3.853	0.000	0.06
L21	71.92-66.92	A	0.000	0.000	21.392	0.000	0.03
		B	0.000	0.000	3.824	0.000	0.05
		C	0.000	0.000	4.012	0.000	0.06
L22	66.92-66.67	A	0.000	0.000	1.102	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L23	66.67-66.42	A	0.000	0.000	1.104	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L24	66.42-61.42	A	0.000	0.000	14.403	0.000	0.03
		B	0.000	0.000	4.442	0.000	0.05
		C	0.000	0.000	4.629	0.000	0.06
L25	61.42-60.00	A	0.000	0.000	3.880	0.000	0.01
		B	0.000	0.000	1.259	0.000	0.01
		C	0.000	0.000	1.312	0.000	0.02
L26	60.00-59.75	A	0.000	0.000	0.684	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L27	59.75-54.75	A	0.000	0.000	13.689	0.000	0.03
		B	0.000	0.000	4.442	0.000	0.05
		C	0.000	0.000	4.629	0.000	0.06
L28	54.75-46.50	A	0.000	0.000	22.087	0.000	0.05
		B	0.000	0.000	7.151	0.000	0.09
		C	0.000	0.000	7.816	0.000	0.10

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
L29	46.50-45.50	A	0.000	0.000	2.738	0.000	0.01
		B	0.000	0.000	1.000	0.000	0.01
		C	0.000	0.000	0.926	0.000	0.01
L30	45.50-44.25	A	0.000	0.000	3.866	0.000	0.01
		B	0.000	0.000	2.360	0.000	0.01
		C	0.000	0.000	1.157	0.000	0.02
L31	44.25-44.00	A	0.000	0.000	0.684	0.000	0.00
		B	0.000	0.000	0.472	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L32	44.00-39.00	A	0.000	0.000	13.689	0.000	0.03
		B	0.000	0.000	9.442	0.000	0.05
		C	0.000	0.000	4.629	0.000	0.06
L33	39.00-34.00	A	0.000	0.000	13.689	0.000	0.03
		B	0.000	0.000	9.442	0.000	0.05
		C	0.000	0.000	4.629	0.000	0.06
L34	34.00-29.00	A	0.000	0.000	15.189	0.000	0.03
		B	0.000	0.000	9.442	0.000	0.05
		C	0.000	0.000	4.629	0.000	0.06
L35	29.00-27.75	A	0.000	0.000	4.672	0.000	0.01
		B	0.000	0.000	2.360	0.000	0.01
		C	0.000	0.000	1.157	0.000	0.02
L36	27.75-27.50	A	0.000	0.000	0.934	0.000	0.00
		B	0.000	0.000	0.472	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L37	27.50-24.08	A	0.000	0.000	14.919	0.000	0.02
		B	0.000	0.000	6.452	0.000	0.04
		C	0.000	0.000	3.164	0.000	0.04
L38	24.08-23.83	A	0.000	0.000	1.157	0.000	0.00
		B	0.000	0.000	0.472	0.000	0.00
		C	0.000	0.000	0.231	0.000	0.00
L39	23.83-18.83	A	0.000	0.000	20.464	0.000	0.03
		B	0.000	0.000	6.775	0.000	0.05
		C	0.000	0.000	7.591	0.000	0.06
L40	18.83-18.08	A	0.000	0.000	2.720	0.000	0.00
		B	0.000	0.000	0.666	0.000	0.01
		C	0.000	0.000	2.027	0.000	0.01
L41	18.08-17.83	A	0.000	0.000	0.907	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.676	0.000	0.00
L42	17.83-12.83	A	0.000	0.000	14.873	0.000	0.03
		B	0.000	0.000	4.442	0.000	0.05
		C	0.000	0.000	13.513	0.000	0.06
L43	12.83-7.83	A	0.000	0.000	13.689	0.000	0.03
		B	0.000	0.000	4.442	0.000	0.05
		C	0.000	0.000	10.077	0.000	0.06
L44	7.83-2.83	A	0.000	0.000	13.689	0.000	0.03
		B	0.000	0.000	4.442	0.000	0.05
		C	0.000	0.000	9.071	0.000	0.06
L45	2.83-0.00	A	0.000	0.000	7.756	0.000	0.02
		B	0.000	0.000	2.517	0.000	0.03
		C	0.000	0.000	5.140	0.000	0.04

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	140.00-135.00	A	2.307	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	2.494	0.000	0.04
L2	135.00-130.00	A	2.298	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	2.486	0.000	0.04
L3	130.00-125.00	A	2.289	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	2.477	0.000	0.04
L4	125.00-120.00	A	2.280	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.05

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	2.468	0.000	0.04
L5	120.00-115.00	A	2.271	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	2.458	0.000	0.04
L6	115.00-110.00	A	2.261	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	2.448	0.000	0.04
L7	110.00-105.00	A	2.251	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	2.438	0.000	0.07
L8	105.00-102.33	A	2.243	0.000	0.000	1.115	0.000	0.02
		B		0.000	0.000	1.115	0.000	0.05
		C		0.000	0.000	2.413	0.000	0.07
L9	102.33-102.08	A	2.239	0.000	0.000	0.238	0.000	0.00
		B		0.000	0.000	0.238	0.000	0.01
		C		0.000	0.000	0.360	0.000	0.01
L10	102.08-97.08	A	2.234	0.000	0.000	10.559	0.000	0.19
		B		0.000	0.000	4.762	0.000	0.14
		C		0.000	0.000	7.183	0.000	0.18
L11	97.08-91.75	A	2.222	0.000	0.000	13.957	0.000	0.26
		B		0.000	0.000	3.405	0.000	0.12
		C		0.000	0.000	14.473	0.000	0.29
L12	91.75-90.75	A	2.214	0.000	0.000	1.980	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	3.098	0.000	0.06
L13	90.75-85.75	A	2.207	0.000	0.000	10.704	0.000	0.20
		B		0.000	0.000	0.712	0.000	0.06
		C		0.000	0.000	16.167	0.000	0.30
L14	85.75-85.33	A	2.200	0.000	0.000	1.296	0.000	0.02
		B		0.000	0.000	0.399	0.000	0.01
		C		0.000	0.000	1.696	0.000	0.03
L15	85.33-85.08	A	2.199	0.000	0.000	0.772	0.000	0.01
		B		0.000	0.000	0.237	0.000	0.01
		C		0.000	0.000	1.009	0.000	0.02
L16	85.08-82.50	A	2.195	0.000	0.000	13.664	0.000	0.21
		B		0.000	0.000	2.447	0.000	0.07
		C		0.000	0.000	10.410	0.000	0.19
L17	82.50-82.25	A	2.192	0.000	0.000	1.484	0.000	0.02
		B		0.000	0.000	0.237	0.000	0.01
		C		0.000	0.000	1.008	0.000	0.02
L18	82.25-77.15	A	2.184	0.000	0.000	31.981	0.000	0.49
		B		0.000	0.000	6.585	0.000	0.17
		C		0.000	0.000	14.872	0.000	0.30
L19	77.15-76.92	A	2.177	0.000	0.000	1.602	0.000	0.02
		B		0.000	0.000	0.442	0.000	0.01
		C		0.000	0.000	0.552	0.000	0.01
L20	76.92-71.92	A	2.169	0.000	0.000	34.293	0.000	0.53
		B		0.000	0.000	5.124	0.000	0.14
		C		0.000	0.000	7.481	0.000	0.19
L21	71.92-66.92	A	2.154	0.000	0.000	36.423	0.000	0.58
		B		0.000	0.000	5.503	0.000	0.14
		C		0.000	0.000	7.845	0.000	0.18
L22	66.92-66.67	A	2.146	0.000	0.000	1.915	0.000	0.03
		B		0.000	0.000	0.329	0.000	0.01
		C		0.000	0.000	0.446	0.000	0.01
L23	66.67-66.42	A	2.145	0.000	0.000	1.917	0.000	0.03
		B		0.000	0.000	0.329	0.000	0.01
		C		0.000	0.000	0.446	0.000	0.01
L24	66.42-61.42	A	2.137	0.000	0.000	26.896	0.000	0.45
		B		0.000	0.000	6.578	0.000	0.15
		C		0.000	0.000	8.902	0.000	0.19
L25	61.42-60.00	A	2.126	0.000	0.000	7.094	0.000	0.12
		B		0.000	0.000	1.861	0.000	0.04
		C		0.000	0.000	2.517	0.000	0.05
L26	60.00-59.75	A	2.123	0.000	0.000	1.251	0.000	0.02
		B		0.000	0.000	0.328	0.000	0.01
		C		0.000	0.000	0.444	0.000	0.01
L27	59.75-54.75	A	2.113	0.000	0.000	24.972	0.000	0.43
		B		0.000	0.000	6.555	0.000	0.15
		C		0.000	0.000	8.856	0.000	0.19
L28	54.75-46.50	A	2.087	0.000	0.000	39.274	0.000	0.68

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
		B		0.000	0.000	9.366	0.000	0.23
		C		0.000	0.000	13.561	0.000	0.31
L29	46.50-45.50	A	2.068	0.000	0.000	4.662	0.000	0.08
		B		0.000	0.000	1.417	0.000	0.03
		C		0.000	0.000	1.761	0.000	0.04
L30	45.50-44.25	A	2.062	0.000	0.000	6.769	0.000	0.11
		B		0.000	0.000	3.392	0.000	0.06
		C		0.000	0.000	2.189	0.000	0.05
L31	44.25-44.00	A	2.059	0.000	0.000	1.266	0.000	0.02
		B		0.000	0.000	0.678	0.000	0.01
		C		0.000	0.000	0.437	0.000	0.01
L32	44.00-39.00	A	2.046	0.000	0.000	25.250	0.000	0.41
		B		0.000	0.000	13.534	0.000	0.23
		C		0.000	0.000	8.722	0.000	0.18
L33	39.00-34.00	A	2.020	0.000	0.000	25.113	0.000	0.40
		B		0.000	0.000	13.482	0.000	0.23
		C		0.000	0.000	8.670	0.000	0.18
L34	34.00-29.00	A	1.991	0.000	0.000	27.055	0.000	0.42
		B		0.000	0.000	13.423	0.000	0.22
		C		0.000	0.000	8.610	0.000	0.18
L35	29.00-27.75	A	1.970	0.000	0.000	7.955	0.000	0.12
		B		0.000	0.000	3.345	0.000	0.06
		C		0.000	0.000	2.142	0.000	0.04
L36	27.75-27.50	A	1.965	0.000	0.000	1.589	0.000	0.02
		B		0.000	0.000	0.669	0.000	0.01
		C		0.000	0.000	0.428	0.000	0.01
L37	27.50-24.08	A	1.951	0.000	0.000	24.212	0.000	0.36
		B		0.000	0.000	9.119	0.000	0.15
		C		0.000	0.000	5.831	0.000	0.12
L38	24.08-23.83	A	1.937	0.000	0.000	1.844	0.000	0.03
		B		0.000	0.000	0.666	0.000	0.01
		C		0.000	0.000	0.425	0.000	0.01
L39	23.83-18.83	A	1.915	0.000	0.000	33.034	0.000	0.50
		B		0.000	0.000	9.583	0.000	0.17
		C		0.000	0.000	12.697	0.000	0.23
L40	18.83-18.08	A	1.887	0.000	0.000	4.447	0.000	0.07
		B		0.000	0.000	0.949	0.000	0.02
		C		0.000	0.000	3.159	0.000	0.05
L41	18.08-17.83	A	1.882	0.000	0.000	1.481	0.000	0.02
		B		0.000	0.000	0.316	0.000	0.01
		C		0.000	0.000	1.052	0.000	0.02
L42	17.83-12.83	A	1.852	0.000	0.000	25.622	0.000	0.38
		B		0.000	0.000	6.294	0.000	0.13
		C		0.000	0.000	20.922	0.000	0.32
L43	12.83-7.83	A	1.781	0.000	0.000	23.855	0.000	0.34
		B		0.000	0.000	6.222	0.000	0.13
		C		0.000	0.000	15.822	0.000	0.25
L44	7.83-2.83	A	1.666	0.000	0.000	23.256	0.000	0.32
		B		0.000	0.000	6.108	0.000	0.12
		C		0.000	0.000	14.070	0.000	0.22
L45	2.83-0.00	A	1.459	0.000	0.000	12.561	0.000	0.15
		B		0.000	0.000	3.344	0.000	0.06
		C		0.000	0.000	7.620	0.000	0.11

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.00-135.00	0.000	0.054	0.000	0.456
L2	135.00-130.00	0.000	0.054	0.000	0.465
L3	130.00-125.00	0.000	0.054	0.000	0.473
L4	125.00-120.00	0.000	0.054	0.000	0.480
L5	120.00-115.00	0.000	0.054	0.000	0.487
L6	115.00-110.00	0.000	0.054	0.000	0.493
L7	110.00-105.00	0.000	0.054	0.000	0.498

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L8	105.00-102.33	0.000	0.038	0.000	0.350
L9	102.33-102.08	0.000	0.027	0.000	0.254
L10	102.08-97.08	-0.079	-0.307	-0.127	-0.302
L11	97.08-91.75	0.780	-0.397	0.535	-0.491
L12	91.75-90.75	1.501	-0.399	1.093	-0.510
L13	90.75-85.75	1.435	-0.382	1.047	-0.496
L14	85.75-85.33	1.104	-0.293	0.788	-0.413
L15	85.33-85.08	1.106	-0.294	0.789	-0.413
L16	85.08-82.50	0.569	0.501	0.349	0.333
L17	82.50-82.25	0.449	0.686	0.248	0.510
L18	82.25-77.15	-0.093	0.685	-0.213	0.501
L19	77.15-76.92	-0.517	0.635	-0.562	0.462
L20	76.92-71.92	-0.854	0.596	-0.869	0.405
L21	71.92-66.92	-0.878	0.577	-0.879	0.308
L22	66.92-66.67	-0.850	0.554	-0.843	0.248
L23	66.67-66.42	-0.851	0.554	-0.844	0.248
L24	66.42-61.42	-0.498	0.060	-0.522	-0.221
L25	61.42-60.00	-0.425	0.218	-0.432	-0.127
L26	60.00-59.75	-0.426	0.219	-0.434	-0.127
L27	59.75-54.75	-0.430	0.222	-0.439	-0.127
L28	54.75-46.50	-0.435	0.206	-0.468	-0.156
L29	46.50-45.50	-1.250	-0.371	-1.105	-0.530
L30	45.50-44.25	-0.663	-0.612	-0.626	-0.767
L31	44.25-44.00	-0.527	-0.544	-0.542	-0.731
L32	44.00-39.00	-0.533	-0.549	-0.549	-0.738
L33	39.00-34.00	-0.542	-0.558	-0.560	-0.753
L34	34.00-29.00	-0.672	-0.629	-0.681	-0.816
L35	29.00-27.75	-0.931	-0.763	-0.919	-0.930
L36	27.75-27.50	-0.934	-0.765	-0.921	-0.932
L37	27.50-24.08	-1.146	-0.875	-1.092	-1.014
L38	24.08-23.83	-1.231	-0.920	-1.164	-1.050
L39	23.83-18.83	-0.993	-0.928	-0.939	-1.064
L40	18.83-18.08	-0.718	-0.911	-0.682	-1.046
L41	18.08-17.83	-0.719	-0.913	-0.684	-1.048
L42	17.83-12.83	-0.473	-0.808	-0.490	-0.975
L43	12.83-7.83	-0.408	-1.240	-0.449	-1.411
L44	7.83-2.83	-0.423	-1.408	-0.465	-1.576
L45	2.83-0.00	-0.427	-1.424	-0.467	-1.586

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L2	1	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000
L3	1	Safety Line 3/8	125.00 - 130.00	1.0000	1.0000
L4	1	Safety Line 3/8	120.00 - 125.00	1.0000	1.0000
L5	1	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L6	1	Safety Line 3/8	110.00 - 115.00	1.0000	1.0000
L7	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L8	1	Safety Line 3/8	102.33 - 105.00	1.0000	1.0000
L8	50	Aero MP303	102.33 - 103.50	1.0000	1.0000
L8	51	Aero MP303	102.33 - 103.50	1.0000	1.0000
L8	52	Aero MP303	102.33 - 103.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L9	1	Safety Line 3/8	102.08 - 102.33	1.0000	1.0000
L9	50	Aero MP303	102.08 - 102.33	1.0000	1.0000
L9	51	Aero MP303	102.08 - 102.33	1.0000	1.0000
L9	52	Aero MP303	102.08 - 102.33	1.0000	1.0000
L10	1	Safety Line 3/8	97.08 - 102.08	1.0000	1.0000
L10	17	LDF5-50A(7/8")	97.08 - 100.00	1.0000	1.0000
L10	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	97.08 - 100.00	1.0000	1.0000
L10	50	Aero MP303	97.08 - 102.08	1.0000	1.0000
L10	51	Aero MP303	97.08 - 102.08	1.0000	1.0000
L10	52	Aero MP303	97.08 - 102.08	1.0000	1.0000
L11	1	Safety Line 3/8	91.75 - 97.08	1.0000	1.0000
L11	17	LDF5-50A(7/8")	91.75 - 97.08	1.0000	1.0000
L11	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	91.75 - 97.08	1.0000	1.0000
L11	50	Aero MP303	93.50 - 97.08	1.0000	1.0000
L11	51	Aero MP303	93.50 - 97.08	1.0000	1.0000
L11	52	Aero MP303	93.50 - 97.08	1.0000	1.0000
L11	64	6" x 1" Flat Plate (G)	91.75 - 95.00	1.0000	1.0000
L11	65	6" x 1" Flat Plate (G)	91.75 - 95.00	1.0000	1.0000
L13	1	Safety Line 3/8	85.75 - 90.75	1.0000	1.0000
L13	17	LDF5-50A(7/8")	85.75 - 90.75	1.0000	1.0000
L13	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	85.75 - 90.75	1.0000	1.0000
L13	45	Aero MP303	85.75 - 86.50	1.0000	1.0000
L13	47	Aero MP303	85.75 - 86.50	1.0000	1.0000
L13	48	Aero MP303	85.75 - 86.50	1.0000	1.0000
L13	64	6" x 1" Flat Plate (G)	85.75 - 90.75	1.0000	1.0000
L13	65	6" x 1" Flat Plate (G)	85.75 - 90.75	1.0000	1.0000
L14	1	Safety Line 3/8	85.33 - 85.75	1.0000	1.0000
L14	17	LDF5-50A(7/8")	85.33 - 85.75	1.0000	1.0000
L14	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	85.33 - 85.75	1.0000	1.0000
L14	45	Aero MP303	85.33 - 85.75	1.0000	1.0000
L14	47	Aero MP303	85.33 - 85.75	1.0000	1.0000
L14	48	Aero MP303	85.33 - 85.75	1.0000	1.0000
L14	64	6" x 1" Flat Plate (G)	85.33 - 85.75	1.0000	1.0000
L14	65	6" x 1" Flat Plate (G)	85.33 - 85.75	1.0000	1.0000
L15	1	Safety Line 3/8	85.08 - 85.33	1.0000	1.0000
L15	17	LDF5-50A(7/8")	85.08 - 85.33	1.0000	1.0000
L15	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	85.08 - 85.33	1.0000	1.0000
L15	45	Aero MP303	85.08 - 85.33	1.0000	1.0000
L15	47	Aero MP303	85.08 - 85.33	1.0000	1.0000
L15	48	Aero MP303	85.08 - 85.33	1.0000	1.0000
L15	64	6" x 1" Flat Plate (G)	85.08 - 85.33	1.0000	1.0000
L15	65	6" x 1" Flat Plate (G)	85.08 - 85.33	1.0000	1.0000
L16	1	Safety Line 3/8	82.50 - 85.08	1.0000	1.0000
L16	17	LDF5-50A(7/8")	82.50 - 85.08	1.0000	1.0000
L16	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	82.50 - 85.08	1.0000	1.0000
L16	45	Aero MP303	82.50 - 85.08	1.0000	1.0000
L16	47	Aero MP303	82.50 - 85.08	1.0000	1.0000
L16	48	Aero MP303	82.50 - 85.08	1.0000	1.0000
L16	61	6" x 1" Flat Plate (G)	82.50 - 84.50	1.0000	1.0000
L16	62	6" x 1" Flat Plate (G)	82.50 - 84.50	1.0000	1.0000
L16	64	6" x 1" Flat Plate (G)	82.50 - 85.08	1.0000	1.0000
L16	65	6" x 1" Flat Plate (G)	82.50 - 85.08	1.0000	1.0000
L17	1	Safety Line 3/8	82.25 - 82.50	1.0000	1.0000
L17	17	LDF5-50A(7/8")	82.25 - 82.50	1.0000	1.0000
L17	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	82.25 - 82.50	1.0000	1.0000
L17	45	Aero MP303	82.25 - 82.50	1.0000	1.0000
L17	47	Aero MP303	82.25 - 82.50	1.0000	1.0000
L17	48	Aero MP303	82.25 - 82.50	1.0000	1.0000
L17	61	6" x 1" Flat Plate (G)	82.25 - 82.50	1.0000	1.0000
L17	62	6" x 1" Flat Plate (G)	82.25 - 82.50	1.0000	1.0000
L17	64	6" x 1" Flat Plate (G)	82.25 - 82.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L17	65	6" x 1" Flat Plate (G)	82.25 - 82.50	1.0000	1.0000
L18	1	Safety Line 3/8	77.15 - 82.25	1.0000	1.0000
L18	17	LDF5-50A(7/8")	77.15 - 82.25	1.0000	1.0000
L18	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	77.15 - 82.25	1.0000	1.0000
L18	39	Aero MP303	77.15 - 79.00	1.0000	1.0000
L18	40	Aero MP303	77.15 - 79.00	1.0000	1.0000
L18	41	Aero MP303	77.15 - 79.00	1.0000	1.0000
L18	45	Aero MP303	77.15 - 82.25	1.0000	1.0000
L18	47	Aero MP303	77.15 - 82.25	1.0000	1.0000
L18	48	Aero MP303	77.15 - 82.25	1.0000	1.0000
L18	61	6" x 1" Flat Plate (G)	77.15 - 82.25	1.0000	1.0000
L18	62	6" x 1" Flat Plate (G)	77.15 - 82.25	1.0000	1.0000
L18	64	6" x 1" Flat Plate (G)	80.00 - 82.25	1.0000	1.0000
L18	65	6" x 1" Flat Plate (G)	80.00 - 82.25	1.0000	1.0000
L19	1	Safety Line 3/8	76.92 - 77.15	1.0000	1.0000
L19	17	LDF5-50A(7/8")	76.92 - 77.15	1.0000	1.0000
L19	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	76.92 - 77.15	1.0000	1.0000
L19	39	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	40	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	41	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	45	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	47	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	48	Aero MP303	76.92 - 77.15	1.0000	1.0000
L19	61	6" x 1" Flat Plate (G)	76.92 - 77.15	1.0000	1.0000
L19	62	6" x 1" Flat Plate (G)	76.92 - 77.15	1.0000	1.0000
L20	1	Safety Line 3/8	71.92 - 76.92	1.0000	1.0000
L20	17	LDF5-50A(7/8")	71.92 - 76.92	1.0000	1.0000
L20	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	71.92 - 76.92	1.0000	1.0000
L20	39	Aero MP303	71.92 - 76.92	1.0000	1.0000
L20	40	Aero MP303	71.92 - 76.92	1.0000	1.0000
L20	41	Aero MP303	71.92 - 76.92	1.0000	1.0000
L20	45	Aero MP303	71.92 - 76.92	1.0000	1.0000
L20	47	Aero MP303	76.50 - 76.92	1.0000	1.0000
L20	48	Aero MP303	76.50 - 76.92	1.0000	1.0000
L20	61	6" x 1" Flat Plate (G)	71.92 - 76.92	1.0000	1.0000
L20	62	6" x 1" Flat Plate (G)	71.92 - 76.92	1.0000	1.0000
L21	1	Safety Line 3/8	66.92 - 71.92	1.0000	1.0000
L21	17	LDF5-50A(7/8")	66.92 - 71.92	1.0000	1.0000
L21	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	66.92 - 71.92	1.0000	1.0000
L21	20	9207(5/16")	66.92 - 70.00	1.0000	1.0000
L21	31	Aero MP305	66.92 - 69.00	1.0000	1.0000
L21	32	Aero MP305	66.92 - 69.00	1.0000	1.0000
L21	33	Aero MP305	66.92 - 69.00	1.0000	1.0000
L21	39	Aero MP303	69.00 - 71.92	1.0000	1.0000
L21	40	Aero MP303	69.00 - 71.92	1.0000	1.0000
L21	41	Aero MP303	69.00 - 71.92	1.0000	1.0000
L21	45	Aero MP303	66.92 - 71.92	1.0000	1.0000
L21	61	6" x 1" Flat Plate (G)	66.92 - 71.92	1.0000	1.0000
L21	62	6" x 1" Flat Plate (G)	66.92 - 71.92	1.0000	1.0000
L22	1	Safety Line 3/8	66.67 - 66.92	1.0000	1.0000
L22	17	LDF5-50A(7/8")	66.67 - 66.92	1.0000	1.0000
L22	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	66.67 - 66.92	1.0000	1.0000
L22	20	9207(5/16")	66.67 - 66.92	1.0000	1.0000
L22	31	Aero MP305	66.67 - 66.92	1.0000	1.0000
L22	32	Aero MP305	66.67 - 66.92	1.0000	1.0000
L22	33	Aero MP305	66.67 - 66.92	1.0000	1.0000
L22	45	Aero MP303	66.67 - 66.92	1.0000	1.0000
L22	61	6" x 1" Flat Plate (G)	66.67 - 66.92	1.0000	1.0000
L22	62	6" x 1" Flat Plate (G)	66.67 - 66.92	1.0000	1.0000
L23	1	Safety Line 3/8	66.42 - 66.67	1.0000	1.0000
L23	17	LDF5-50A(7/8")	66.42 - 66.67	1.0000	1.0000
L23	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	66.42 - 66.67	1.0000	1.0000
L23	20	9207(5/16")	66.42 - 66.67	1.0000	1.0000
L23	31	Aero MP305	66.42 - 66.67	1.0000	1.0000
L23	32	Aero MP305	66.42 - 66.67	1.0000	1.0000
L23	33	Aero MP305	66.42 - 66.67	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L23	45	Aero MP303	66.42 - 66.67	1.0000	1.0000
L23	61	6" x 1" Flat Plate (G)	66.42 - 66.67	1.0000	1.0000
L23	62	6" x 1" Flat Plate (G)	66.42 - 66.67	1.0000	1.0000
L24	1	Safety Line 3/8	61.42 - 66.42	1.0000	1.0000
L24	17	LDF5-50A(7/8")	61.42 - 66.42	1.0000	1.0000
L24	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	61.42 - 66.42	1.0000	1.0000
L24	20	9207(5/16")	61.42 - 66.42	1.0000	1.0000
L24	31	Aero MP305	61.42 - 66.42	1.0000	1.0000
L24	32	Aero MP305	61.42 - 66.42	1.0000	1.0000
L24	33	Aero MP305	61.42 - 66.42	1.0000	1.0000
L24	45	Aero MP303	64.50 - 66.42	1.0000	1.0000
L24	59	6" x 1" Flat Plate (G)	61.42 - 62.00	1.0000	1.0000
L24	61	6" x 1" Flat Plate (G)	64.50 - 66.42	1.0000	1.0000
L24	62	6" x 1" Flat Plate (G)	64.50 - 66.42	1.0000	1.0000
L25	1	Safety Line 3/8	60.00 - 61.42	1.0000	1.0000
L25	17	LDF5-50A(7/8")	60.00 - 61.42	1.0000	1.0000
L25	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	60.00 - 61.42	1.0000	1.0000
L25	20	9207(5/16")	60.00 - 61.42	1.0000	1.0000
L25	31	Aero MP305	60.00 - 61.42	1.0000	1.0000
L25	32	Aero MP305	60.00 - 61.42	1.0000	1.0000
L25	33	Aero MP305	60.00 - 61.42	1.0000	1.0000
L25	59	6" x 1" Flat Plate (G)	60.00 - 61.42	1.0000	1.0000
L26	1	Safety Line 3/8	59.75 - 60.00	1.0000	1.0000
L26	17	LDF5-50A(7/8")	59.75 - 60.00	1.0000	1.0000
L26	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	59.75 - 60.00	1.0000	1.0000
L26	20	9207(5/16")	59.75 - 60.00	1.0000	1.0000
L26	31	Aero MP305	59.75 - 60.00	1.0000	1.0000
L26	32	Aero MP305	59.75 - 60.00	1.0000	1.0000
L26	33	Aero MP305	59.75 - 60.00	1.0000	1.0000
L26	59	6" x 1" Flat Plate (G)	59.75 - 60.00	1.0000	1.0000
L27	1	Safety Line 3/8	54.75 - 59.75	1.0000	1.0000
L27	17	LDF5-50A(7/8")	54.75 - 59.75	1.0000	1.0000
L27	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	54.75 - 59.75	1.0000	1.0000
L27	20	9207(5/16")	54.75 - 59.75	1.0000	1.0000
L27	31	Aero MP305	54.75 - 59.75	1.0000	1.0000
L27	32	Aero MP305	54.75 - 59.75	1.0000	1.0000
L27	33	Aero MP305	54.75 - 59.75	1.0000	1.0000
L27	59	6" x 1" Flat Plate (G)	54.75 - 59.75	1.0000	1.0000
L28	1	Safety Line 3/8	46.50 - 54.75	1.0000	1.0000
L28	17	LDF5-50A(7/8")	46.50 - 54.75	1.0000	1.0000
L28	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	46.50 - 54.75	1.0000	1.0000
L28	20	9207(5/16")	46.50 - 54.75	1.0000	1.0000
L28	27	Aero MP305	46.50 - 46.70	1.0000	1.0000
L28	31	Aero MP305	49.00 - 54.75	1.0000	1.0000
L28	32	Aero MP305	49.00 - 54.75	1.0000	1.0000
L28	33	Aero MP305	49.00 - 54.75	1.0000	1.0000
L28	35	Aero MP305	46.50 - 49.00	1.0000	1.0000
L28	36	Aero MP305	46.70 - 49.00	1.0000	1.0000
L28	37	Aero MP305	46.50 - 49.00	1.0000	1.0000
L28	59	6" x 1" Flat Plate (G)	47.00 - 54.75	1.0000	1.0000
L28	56	6" x 1" Flat Plate (G)	46.50 - 46.50	1.0000	1.0000
L28	57	6" x 1" Flat Plate (G)	46.50 - 46.50	1.0000	1.0000
L30	1	Safety Line 3/8	44.25 - 45.50	1.0000	1.0000
L30	17	LDF5-50A(7/8")	44.25 - 45.50	1.0000	1.0000
L30	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	44.25 - 45.50	1.0000	1.0000
L30	20	9207(5/16")	44.25 - 45.50	1.0000	1.0000
L30	25	Aero MP305	44.25 - 45.50	1.0000	1.0000
L30	26	Aero MP305	44.25 - 45.50	1.0000	1.0000
L30	27	Aero MP305	44.25 - 45.50	1.0000	1.0000
L30	35	Aero MP305	45.00 - 45.50	1.0000	1.0000
L30	56	6" x 1" Flat Plate (G)	44.25 - 45.50	1.0000	1.0000
L30	57	6" x 1" Flat Plate (G)	44.25 - 45.50	1.0000	1.0000
L31	1	Safety Line 3/8	44.00 - 44.25	1.0000	1.0000
L31	17	LDF5-50A(7/8")	44.00 - 44.25	1.0000	1.0000
L31	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	44.00 - 44.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L31	20	9207(5/16")	44.00 - 44.25	1.0000	1.0000
L31	25	Aero MP305	44.00 - 44.25	1.0000	1.0000
L31	26	Aero MP305	44.00 - 44.25	1.0000	1.0000
L31	27	Aero MP305	44.00 - 44.25	1.0000	1.0000
L31	56	6" x 1" Flat Plate (G)	44.00 - 44.25	1.0000	1.0000
L31	57	6" x 1" Flat Plate (G)	44.00 - 44.25	1.0000	1.0000
L32	1	Safety Line 3/8	39.00 - 44.00	1.0000	1.0000
L32	17	LDF5-50A(7/8")	39.00 - 44.00	1.0000	1.0000
L32	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	39.00 - 44.00	1.0000	1.0000
L32	20	9207(5/16")	39.00 - 44.00	1.0000	1.0000
L32	25	Aero MP305	39.00 - 44.00	1.0000	1.0000
L32	26	Aero MP305	39.00 - 44.00	1.0000	1.0000
L32	27	Aero MP305	39.00 - 44.00	1.0000	1.0000
L32	56	6" x 1" Flat Plate (G)	39.00 - 44.00	1.0000	1.0000
L32	57	6" x 1" Flat Plate (G)	39.00 - 44.00	1.0000	1.0000
L33	1	Safety Line 3/8	34.00 - 39.00	1.0000	1.0000
L33	17	LDF5-50A(7/8")	34.00 - 39.00	1.0000	1.0000
L33	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	34.00 - 39.00	1.0000	1.0000
L33	20	9207(5/16")	34.00 - 39.00	1.0000	1.0000
L33	25	Aero MP305	34.00 - 39.00	1.0000	1.0000
L33	26	Aero MP305	34.00 - 39.00	1.0000	1.0000
L33	27	Aero MP305	34.00 - 39.00	1.0000	1.0000
L33	56	6" x 1" Flat Plate (G)	34.00 - 39.00	1.0000	1.0000
L33	57	6" x 1" Flat Plate (G)	34.00 - 39.00	1.0000	1.0000
L34	1	Safety Line 3/8	29.00 - 34.00	1.0000	1.0000
L34	17	LDF5-50A(7/8")	29.00 - 34.00	1.0000	1.0000
L34	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	29.00 - 34.00	1.0000	1.0000
L34	20	9207(5/16")	29.00 - 34.00	1.0000	1.0000
L34	25	Aero MP305	29.00 - 34.00	1.0000	1.0000
L34	26	Aero MP305	29.00 - 34.00	1.0000	1.0000
L34	27	Aero MP305	29.00 - 34.00	1.0000	1.0000
L34	54	6" x 1.25" Flat Plate (G)	29.00 - 30.50	1.0000	1.0000
L34	56	6" x 1" Flat Plate (G)	29.00 - 34.00	1.0000	1.0000
L34	57	6" x 1" Flat Plate (G)	29.00 - 34.00	1.0000	1.0000
L35	1	Safety Line 3/8	27.75 - 29.00	1.0000	1.0000
L35	17	LDF5-50A(7/8")	27.75 - 29.00	1.0000	1.0000
L35	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	27.75 - 29.00	1.0000	1.0000
L35	20	9207(5/16")	27.75 - 29.00	1.0000	1.0000
L35	25	Aero MP305	27.75 - 29.00	1.0000	1.0000
L35	26	Aero MP305	27.75 - 29.00	1.0000	1.0000
L35	27	Aero MP305	27.75 - 29.00	1.0000	1.0000
L35	54	6" x 1.25" Flat Plate (G)	27.75 - 29.00	1.0000	1.0000
L35	56	6" x 1" Flat Plate (G)	27.75 - 29.00	1.0000	1.0000
L35	57	6" x 1" Flat Plate (G)	27.75 - 29.00	1.0000	1.0000
L36	1	Safety Line 3/8	27.50 - 27.75	1.0000	1.0000
L36	17	LDF5-50A(7/8")	27.50 - 27.75	1.0000	1.0000
L36	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	27.50 - 27.75	1.0000	1.0000
L36	20	9207(5/16")	27.50 - 27.75	1.0000	1.0000
L36	25	Aero MP305	27.50 - 27.75	1.0000	1.0000
L36	26	Aero MP305	27.50 - 27.75	1.0000	1.0000
L36	27	Aero MP305	27.50 - 27.75	1.0000	1.0000
L36	54	6" x 1.25" Flat Plate (G)	27.50 - 27.75	1.0000	1.0000
L36	56	6" x 1" Flat Plate (G)	27.50 - 27.75	1.0000	1.0000
L36	57	6" x 1" Flat Plate (G)	27.50 - 27.75	1.0000	1.0000
L37	1	Safety Line 3/8	24.08 - 27.50	1.0000	1.0000
L37	17	LDF5-50A(7/8")	24.08 - 27.50	1.0000	1.0000
L37	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	24.08 - 27.50	1.0000	1.0000
L37	20	9207(5/16")	24.08 - 27.50	1.0000	1.0000
L37	25	Aero MP305	24.08 - 27.50	1.0000	1.0000
L37	26	Aero MP305	24.08 - 27.50	1.0000	1.0000
L37	27	Aero MP305	24.08 - 27.50	1.0000	1.0000
L37	43	Aero MP305	24.08 - 26.50	1.0000	1.0000
L37	54	6" x 1.25" Flat Plate (G)	24.08 - 27.50	1.0000	1.0000
L37	56	6" x 1" Flat Plate (G)	24.08 - 27.50	1.0000	1.0000
L37	57	6" x 1" Flat Plate (G)	24.08 - 27.50	1.0000	1.0000
L38	1	Safety Line 3/8	23.83 - 24.08	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L38	17	LDF5-50A(7/8")	23.83 - 24.08	1.0000	1.0000
L38	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	23.83 - 24.08	1.0000	1.0000
L38	20	9207(5/16")	23.83 - 24.08	1.0000	1.0000
L38	25	Aero MP305	23.83 - 24.08	1.0000	1.0000
L38	26	Aero MP305	23.83 - 24.08	1.0000	1.0000
L38	27	Aero MP305	23.83 - 24.08	1.0000	1.0000
L38	43	Aero MP305	23.83 - 24.08	1.0000	1.0000
L38	54	6" x 1.25" Flat Plate (G)	23.83 - 24.08	1.0000	1.0000
L38	56	6" x 1" Flat Plate (G)	23.83 - 24.08	1.0000	1.0000
L38	57	6" x 1" Flat Plate (G)	23.83 - 24.08	1.0000	1.0000
L39	1	Safety Line 3/8	18.83 - 23.83	1.0000	1.0000
L39	17	LDF5-50A(7/8")	18.83 - 23.83	1.0000	1.0000
L39	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	18.83 - 23.83	1.0000	1.0000
L39	20	9207(5/16")	18.83 - 23.83	1.0000	1.0000
L39	25	Aero MP305	18.83 - 23.83	1.0000	1.0000
L39	26	Aero MP305	18.83 - 23.83	1.0000	1.0000
L39	27	Aero MP305	18.83 - 23.83	1.0000	1.0000
L39	28	Aero MP305	18.83 - 20.50	1.0000	1.0000
L39	29	Aero MP305	18.83 - 20.50	1.0000	1.0000
L39	43	Aero MP305	18.83 - 23.83	1.0000	1.0000
L39	54	6" x 1.25" Flat Plate (G)	18.83 - 23.83	1.0000	1.0000
L39	56	6" x 1" Flat Plate (G)	21.50 - 23.83	1.0000	1.0000
L39	57	6" x 1" Flat Plate (G)	21.50 - 23.83	1.0000	1.0000
L40	1	Safety Line 3/8	18.08 - 18.83	1.0000	1.0000
L40	17	LDF5-50A(7/8")	18.08 - 18.83	1.0000	1.0000
L40	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	18.08 - 18.83	1.0000	1.0000
L40	20	9207(5/16")	18.08 - 18.83	1.0000	1.0000
L40	25	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	26	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	27	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	28	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	29	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	43	Aero MP305	18.08 - 18.83	1.0000	1.0000
L40	54	6" x 1.25" Flat Plate (G)	18.08 - 18.83	1.0000	1.0000
L41	1	Safety Line 3/8	17.83 - 18.08	1.0000	1.0000
L41	17	LDF5-50A(7/8")	17.83 - 18.08	1.0000	1.0000
L41	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	17.83 - 18.08	1.0000	1.0000
L41	20	9207(5/16")	17.83 - 18.08	1.0000	1.0000
L41	25	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	26	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	27	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	28	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	29	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	43	Aero MP305	17.83 - 18.08	1.0000	1.0000
L41	54	6" x 1.25" Flat Plate (G)	17.83 - 18.08	1.0000	1.0000
L42	1	Safety Line 3/8	12.83 - 17.83	1.0000	1.0000
L42	17	LDF5-50A(7/8")	12.83 - 17.83	1.0000	1.0000
L42	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	12.83 - 17.83	1.0000	1.0000
L42	20	9207(5/16")	12.83 - 17.83	1.0000	1.0000
L42	25	Aero MP305	12.83 - 17.83	1.0000	1.0000
L42	26	Aero MP305	12.83 - 17.83	1.0000	1.0000
L42	27	Aero MP305	12.83 - 17.83	1.0000	1.0000
L42	28	Aero MP305	12.83 - 17.83	1.0000	1.0000
L42	29	Aero MP305	12.83 - 17.83	1.0000	1.0000
L42	43	Aero MP305	16.50 - 17.83	1.0000	1.0000
L42	54	6" x 1.25" Flat Plate (G)	12.83 - 17.83	1.0000	1.0000
L43	1	Safety Line 3/8	7.83 - 12.83	1.0000	1.0000
L43	17	LDF5-50A(7/8")	7.83 - 12.83	1.0000	1.0000
L43	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	7.83 - 12.83	1.0000	1.0000
L43	20	9207(5/16")	7.83 - 12.83	1.0000	1.0000
L43	25	Aero MP305	7.83 - 12.83	1.0000	1.0000
L43	26	Aero MP305	7.83 - 12.83	1.0000	1.0000
L43	27	Aero MP305	11.70 - 12.83	1.0000	1.0000
L43	28	Aero MP305	7.83 - 12.83	1.0000	1.0000
L43	29	Aero MP305	7.83 - 12.83	1.0000	1.0000
L43	54	6" x 1.25" Flat Plate (G)	7.83 - 12.83	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L44	1	Safety Line 3/8	2.83 - 7.83	1.0000	1.0000
L44	17	LDF5-50A(7/8")	2.83 - 7.83	1.0000	1.0000
L44	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	2.83 - 7.83	1.0000	1.0000
L44	20	9207(5/16")	2.83 - 7.83	1.0000	1.0000
L44	25	Aero MP305	2.83 - 7.83	1.0000	1.0000
L44	26	Aero MP305	2.83 - 7.83	1.0000	1.0000
L44	28	Aero MP305	2.83 - 7.83	1.0000	1.0000
L44	29	Aero MP305	2.83 - 7.83	1.0000	1.0000
L44	54	6" x 1.25" Flat Plate (G)	2.83 - 7.83	1.0000	1.0000
L45	1	Safety Line 3/8	0.00 - 2.83	1.0000	1.0000
L45	17	LDF5-50A(7/8")	0.00 - 2.83	1.0000	1.0000
L45	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	0.00 - 2.83	1.0000	1.0000
L45	20	9207(5/16")	0.00 - 2.83	1.0000	1.0000
L45	25	Aero MP305	0.00 - 2.83	1.0000	1.0000
L45	26	Aero MP305	0.00 - 2.83	1.0000	1.0000
L45	28	Aero MP305	0.00 - 2.83	1.0000	1.0000
L45	29	Aero MP305	0.00 - 2.83	1.0000	1.0000
L45	54	6" x 1.25" Flat Plate (G)	0.00 - 2.83	1.0000	1.0000

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
Lightning Rod	C	From Leg	0.00	0.0000	140.00	No Ice	0.25	0.25	0.03
			0.00			1/2" Ice	0.66	0.66	0.03
			2.00			1" Ice	0.97	0.97	0.04
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APXV9ERR18-C-A20	A	From Leg	4.00	0.0000	139.00	No Ice	8.02	5.81	0.06
			0.00			1/2" Ice	8.48	6.27	0.11
			1.00			1" Ice	8.94	6.73	0.17
APXV9ERR18-C-A20	B	From Leg	4.00	0.0000	139.00	No Ice	8.02	5.81	0.06
			0.00			1/2" Ice	8.48	6.27	0.11
			1.00			1" Ice	8.94	6.73	0.17
APXV9ERR18-C-A20	C	From Leg	4.00	0.0000	139.00	No Ice	8.02	5.81	0.06
			0.00			1/2" Ice	8.48	6.27	0.11
			1.00			1" Ice	8.94	6.73	0.17
APXVTM14-C-120	A	From Leg	4.00	0.0000	139.00	No Ice	6.34	3.61	0.06
			0.00			1/2" Ice	6.72	3.97	0.10
			1.00			1" Ice	7.10	4.33	0.14
APXVTM14-C-120	B	From Leg	4.00	0.0000	139.00	No Ice	6.34	3.61	0.06
			0.00			1/2" Ice	6.72	3.97	0.10
			1.00			1" Ice	7.10	4.33	0.14
APXVTM14-C-120	C	From Leg	4.00	0.0000	139.00	No Ice	6.34	3.61	0.06
			0.00			1/2" Ice	6.72	3.97	0.10
			1.00			1" Ice	7.10	4.33	0.14
TD-RRH8x20-25	A	From Leg	4.00	0.0000	139.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			1.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	B	From Leg	4.00	0.0000	139.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			1.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	C	From Leg	4.00	0.0000	139.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			1.00			1" Ice	4.20	1.64	0.12
Platform Mount [LP 1201-1]	C	None		0.0000	139.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50

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	30.50	30.50	2.90
Miscellaneous [NA 510-3]	C	None		0.0000	139.00	No Ice	19.70	19.70	0.52
						1/2" Ice	28.20	28.20	0.72
						1" Ice	36.70	36.70	0.92
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PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00	0.0000	137.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00	0.0000	137.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00	0.0000	137.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00	0.0000	137.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			3.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00	0.0000	137.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			3.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00	0.0000	137.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			3.00			1" Ice	2.43	2.29	0.11
Side Arm Mount [SO 102-3]	C	None		0.0000	137.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
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TME-RRUS-11-700	A	From Leg	2.00	0.0000	129.00	No Ice	2.85	1.53	0.05
			0.00			1/2" Ice	3.08	1.81	0.08
			1.00			1" Ice	3.32	2.10	0.11
TME-RRUS-11-700	B	From Leg	2.00	0.0000	129.00	No Ice	2.85	1.53	0.05
			0.00			1/2" Ice	3.08	1.81	0.08
			1.00			1" Ice	3.32	2.10	0.11
TME-RRUS-11-700	C	From Leg	2.00	0.0000	129.00	No Ice	2.85	1.53	0.05
			0.00			1/2" Ice	3.08	1.81	0.08
			1.00			1" Ice	3.32	2.10	0.11
TME-RRUS-32	A	From Leg	2.00	0.0000	129.00	No Ice	2.77	1.67	0.06
			0.00			1/2" Ice	2.99	1.86	0.08
			1.00			1" Ice	3.22	2.05	0.11
TME-RRUS-32	B	From Leg	2.00	0.0000	129.00	No Ice	2.77	1.67	0.06
			0.00			1/2" Ice	2.99	1.86	0.08
			1.00			1" Ice	3.22	2.05	0.11
TME-RRUS-32	C	From Leg	2.00	0.0000	129.00	No Ice	2.77	1.67	0.06
			0.00			1/2" Ice	2.99	1.86	0.08
			1.00			1" Ice	3.22	2.05	0.11
Side Arm Mount [SO 102-3]	C	None		0.0000	129.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
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7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	12.98	9.18	0.09
			0.00			1/2" Ice	13.56	10.48	0.19
			2.00			1" Ice	14.15	11.49	0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
(2) LGP21401	A	From Leg	4.00	0.0000	128.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	128.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	C	From Leg	4.00	0.0000	128.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	128.00	No Ice	1.21	1.21	0.03
			0.00			1/2" Ice	1.89	1.89	0.05
			0.00			1" Ice	2.11	2.11	0.08
Empty Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
Empty Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
Empty Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
T-Arm Mount [TA 602-3]	C	None		0.0000	128.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
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(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	8.62	7.30	0.07
			0.00			1/2" Ice	9.28	8.58	0.14
			1.00			1" Ice	9.91	9.72	0.22
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	8.62	7.30	0.07
			0.00			1/2" Ice	9.28	8.58	0.14
			1.00			1" Ice	9.91	9.72	0.22
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	8.62	7.30	0.07
			0.00			1/2" Ice	9.28	8.58	0.14
			1.00			1" Ice	9.91	9.72	0.22
RRH2X60-PCS	A	From Leg	4.00	0.0000	108.00	No Ice	2.20	1.65	0.05
			0.00			1/2" Ice	2.39	1.83	0.07
			1.00			1" Ice	2.59	2.01	0.09
RRH2X60-PCS	B	From Leg	4.00	0.0000	108.00	No Ice	2.20	1.65	0.05
			0.00			1/2" Ice	2.39	1.83	0.07
			1.00			1" Ice	2.59	2.01	0.09
RRH2X60-PCS	C	From Leg	4.00	0.0000	108.00	No Ice	2.20	1.65	0.05
			0.00			1/2" Ice	2.39	1.83	0.07
			1.00			1" Ice	2.59	2.01	0.09
RRH2x60-700	A	From Leg	4.00	0.0000	108.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.76	2.05	0.08
			1.00			1" Ice	4.03	2.29	0.11
RRH2x60-700	B	From Leg	4.00	0.0000	108.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.76	2.05	0.08
			1.00			1" Ice	4.03	2.29	0.11
RRH2x60-700	C	From Leg	4.00	0.0000	108.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.76	2.05	0.08
			1.00			1" Ice	4.03	2.29	0.11
(2) DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	108.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	5.43	4.18	0.04
			0.00			1/2" Ice	6.07	5.21	0.08

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
			1.00			1" Ice	6.58	5.95	0.14
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	5.43	4.18	0.04
			0.00			1/2" Ice	6.07	5.21	0.08
			1.00			1" Ice	6.58	5.95	0.14
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	5.43	4.18	0.04
			0.00			1/2" Ice	6.07	5.21	0.08
			1.00			1" Ice	6.58	5.95	0.14
Platform Mount [LP 304-1]	C	None		0.0000	108.00	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62
						1" Ice	27.42	27.42	1.90
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Ericsson AIR 21 B4A/B2P w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.24
Ericsson AIR 21 B4A/B2P w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.24
Ericsson AIR 21 B4A/B2P w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.24
Ericsson AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.25
Ericsson AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.25
Ericsson AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	6.60	6.02	0.12
			0.00			1/2" Ice	7.22	7.10	0.18
			0.00			1" Ice	7.74	7.89	0.25
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
RRUS 11 B12	A	From Leg	4.00	0.0000	100.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	100.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	100.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
KRY 112 144/1	A	From Leg	4.00	0.0000	100.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	100.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	100.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
T-Arm Mount [TA 602-3]	C	None		0.0000	100.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
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Pipe Mount [PM 601-3]	C	None		0.0000	90.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
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KS24019-L112A	A	From Leg	3.00	0.0000	70.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			2.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	A	From Leg	1.50	0.0000	70.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
KS24019-L112A	C	From Leg	3.00	0.0000	70.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			2.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	70.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
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KS24019-L112A	B	From Leg	3.00	0.0000	49.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			2.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	B	From Leg	1.50	0.0000	49.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

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	140 - 135	Pole	Max Tension	39	0.00	-0.00	-0.00
			Max. Compression	26	-10.79	0.05	-0.03
			Max. Mx	20	-4.17	20.54	-0.01
			Max. My	14	-4.17	0.02	-20.53
			Max. Vy	20	-4.98	20.54	-0.01
			Max. Vx	2	-4.98	0.02	20.51
			Max. Torque	24			0.01
L2	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.42	0.05	-0.02
			Max. Mx	20	-4.44	46.30	0.00
			Max. My	14	-4.44	0.02	-46.29
			Max. Vy	20	-5.33	46.30	0.00
			Max. Vx	2	-5.33	0.02	46.27
			Max. Torque	24			0.01
L3	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.31	0.05	1.18
			Max. Mx	20	-6.61	87.17	0.20
			Max. My	2	-6.60	0.02	87.72
			Max. Vy	20	-8.79	87.17	0.20
			Max. Vx	2	-8.86	0.02	87.72
			Max. Torque	8			0.39
L4	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.04	0.06	1.20
			Max. Mx	20	-6.98	132.02	0.21
			Max. My	2	-6.97	0.02	132.91
			Max. Vy	20	-9.16	132.02	0.21
			Max. Vx	2	-9.23	0.02	132.91
			Max. Torque	8			0.39
L5	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.80	0.06	1.23
			Max. Mx	20	-7.38	178.73	0.22
			Max. My	2	-7.37	0.02	179.97
			Max. Vy	20	-9.53	178.73	0.22
			Max. Vx	2	-9.60	0.02	179.97
			Max. Torque	8			0.39
L6	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.59	0.07	1.25
			Max. Mx	20	-7.81	227.34	0.23
			Max. My	2	-7.80	0.02	228.93
			Max. Vy	20	-9.92	227.34	0.23
			Max. Vx	2	-9.99	0.02	228.93
			Max. Torque	8			0.39
L7	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.33	0.08	3.76
			Max. Mx	20	-10.95	294.30	0.66

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-10.93	0.03	297.44
			Max. Vy	20	-14.65	294.30	0.66
			Max. Vx	2	-14.90	0.03	297.44
			Max. Torque	8			1.07
L8	105 - 102.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.88	0.08	3.78
			Max. Mx	20	-11.25	333.68	0.66
			Max. My	2	-11.23	0.03	337.48
			Max. Vy	20	-14.86	333.68	0.66
			Max. Vx	2	-15.11	0.03	337.48
			Max. Torque	8			1.07
L9	102.33 - 102.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.95	0.08	3.78
			Max. Mx	20	-11.30	337.39	0.66
			Max. My	2	-11.28	0.03	341.26
			Max. Vy	20	-14.87	337.39	0.66
			Max. Vx	2	-15.12	0.03	341.26
			Max. Torque	8			1.07
L10	102.08 - 97.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.67	0.12	3.93
			Max. Mx	20	-14.11	421.91	0.69
			Max. My	2	-14.10	0.03	426.92
			Max. Vy	20	-18.42	421.91	0.69
			Max. Vx	2	-18.63	0.03	426.92
			Max. Torque	8			1.07
L11	97.08 - 91.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.34	0.08	4.03
			Max. Mx	20	-14.44	460.43	0.71
			Max. My	2	-14.43	0.04	465.84
			Max. Vy	20	-18.63	460.43	0.71
			Max. Vx	2	-18.80	0.04	465.84
			Max. Torque	8			1.07
L12	91.75 - 90.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.48	-0.03	4.22
			Max. Mx	20	-15.63	540.59	0.75
			Max. My	2	-15.63	0.04	546.62
			Max. Vy	20	-19.09	540.59	0.75
			Max. Vx	2	-19.21	0.04	546.62
			Max. Torque	8			1.07
L13	90.75 - 85.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.65	-0.23	4.44
			Max. Mx	20	-16.87	637.85	0.79
			Max. My	2	-16.87	0.05	644.43
			Max. Vy	20	-19.70	637.85	0.79
			Max. Vx	2	-19.79	0.05	644.43
			Max. Torque	8			1.07
L14	85.75 - 85.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.82	-0.25	4.46
			Max. Mx	20	-16.96	646.13	0.80
			Max. My	2	-16.96	0.06	652.75
			Max. Vy	20	-19.74	646.13	0.80
			Max. Vx	2	-19.82	0.06	652.75
			Max. Torque	8			1.07
L15	85.33 - 85.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.93	-0.26	4.47
			Max. Mx	20	-17.03	651.07	0.80
			Max. My	2	-17.02	0.06	657.71
			Max. Vy	20	-19.76	651.07	0.80
			Max. Vx	2	-19.84	0.06	657.71
			Max. Torque	8			1.07
L16	85.08 - 82.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.13	-0.32	4.48
			Max. Mx	20	-17.63	702.40	0.82
			Max. My	2	-17.63	0.06	709.20
			Max. Vy	20	-20.04	702.40	0.82
			Max. Vx	2	-20.08	0.06	709.20
			Max. Torque	8			1.07
L17	82.5 - 82.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.22	-0.33	4.48
			Max. Mx	20	-17.67	707.42	0.82

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-17.68	0.06	714.22
			Max. Vy	20	-20.06	707.42	0.82
			Max. Vx	2	-20.09	0.06	714.22
			Max. Torque	8			1.07
L18	82.25 - 77.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.69	-0.25	4.44
			Max. Mx	20	-18.95	811.10	0.87
			Max. My	2	-18.96	0.07	817.85
			Max. Vy	20	-20.61	811.10	0.87
			Max. Vx	2	-20.55	0.07	817.85
			Max. Torque	8			1.07
L19	77.15 - 76.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.81	-0.24	4.44
			Max. Mx	20	-19.02	815.91	0.87
			Max. My	2	-19.03	0.07	822.65
			Max. Vy	20	-20.64	815.91	0.87
			Max. Vx	2	-20.57	0.07	822.65
			Max. Torque	8			1.07
L20	76.9167 - 71.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.18	0.04	4.45
			Max. Mx	20	-20.30	920.39	0.92
			Max. My	2	-20.31	0.08	926.60
			Max. Vy	20	-21.16	920.39	0.92
			Max. Vx	2	-21.01	0.08	926.60
			Max. Torque	8			1.07
L21	71.9167 - 66.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.95	0.76	4.75
			Max. Mx	20	-21.78	1028.05	1.12
			Max. My	2	-21.80	0.33	1033.18
			Max. Vy	20	-21.80	1028.05	1.12
			Max. Vx	2	-21.55	0.33	1033.18
			Max. Torque	8			1.15
L22	66.9167 - 66.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.07	0.77	4.76
			Max. Mx	20	-21.85	1033.50	1.12
			Max. My	2	-21.87	0.33	1038.57
			Max. Vy	20	-21.82	1033.50	1.12
			Max. Vx	2	-21.56	0.33	1038.57
			Max. Torque	8			1.15
L23	66.667 - 66.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.19	0.79	4.76
			Max. Mx	20	-21.91	1038.96	1.13
			Max. My	2	-21.93	0.34	1043.96
			Max. Vy	20	-21.85	1038.96	1.13
			Max. Vx	2	-21.59	0.34	1043.96
			Max. Torque	8			1.15
L24	66.417 - 61.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.43	0.96	4.99
			Max. Mx	20	-23.13	1149.47	1.24
			Max. My	2	-23.15	0.41	1152.97
			Max. Vy	20	-22.37	1149.47	1.24
			Max. Vx	2	-22.01	0.41	1152.97
			Max. Torque	8			1.15
L25	61.417 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.07	1.01	5.05
			Max. Mx	20	-23.47	1181.26	1.27
			Max. My	2	-23.50	0.43	1184.24
			Max. Vy	20	-22.52	1181.26	1.27
			Max. Vx	2	-22.14	0.43	1184.24
			Max. Torque	8			1.15
L26	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.18	1.02	5.06
			Max. Mx	20	-23.55	1186.89	1.28
			Max. My	2	-23.58	0.43	1189.78
			Max. Vy	20	-22.54	1186.89	1.28

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-22.15	0.43	1189.78
			Max. Torque	8			1.15
L27	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.55	1.17	5.25
			Max. Mx	20	-24.92	1300.84	1.39
			Max. My	2	-24.95	0.50	1301.59
			Max. Vy	20	-23.06	1300.84	1.39
			Max. Vx	2	-22.57	0.50	1301.59
			Max. Torque	8			1.15
L28	54.75 - 46.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.34	1.28	5.40
			Max. Mx	20	-25.97	1387.97	1.48
			Max. My	2	-26.00	0.55	1386.80
			Max. Vy	20	-23.43	1387.97	1.48
			Max. Vx	2	-22.88	0.55	1386.80
			Max. Torque	8			1.15
L29	46.5 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.63	1.07	5.39
			Max. Mx	20	-28.62	1518.53	1.45
			Max. My	2	-28.65	0.38	1514.21
			Max. Vy	20	-24.11	1518.53	1.45
			Max. Vx	2	-23.46	0.38	1514.21
			Max. Torque	20			-1.07
L30	45.5 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.26	1.13	5.49
			Max. Mx	20	-28.98	1548.73	1.46
			Max. My	2	-29.01	0.38	1543.60
			Max. Vy	20	-24.23	1548.73	1.46
			Max. Vx	2	-23.56	0.38	1543.60
			Max. Torque	20			-1.07
L31	44.25 - 44	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.40	1.14	5.51
			Max. Mx	20	-29.08	1554.79	1.47
			Max. My	2	-29.11	0.38	1549.49
			Max. Vy	20	-24.25	1554.79	1.47
			Max. Vx	2	-23.57	0.38	1549.49
			Max. Torque	20			-1.07
L32	44 - 39	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.17	1.32	5.89
			Max. Mx	20	-30.76	1677.27	1.53
			Max. My	2	-30.79	0.40	1668.41
			Max. Vy	20	-24.76	1677.27	1.53
			Max. Vx	2	-23.99	0.40	1668.41
			Max. Torque	20			-1.07
L33	39 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.95	1.49	6.23
			Max. Mx	20	-32.47	1802.23	1.60
			Max. My	2	-32.50	0.42	1789.34
			Max. Vy	20	-25.24	1802.23	1.60
			Max. Vx	2	-24.38	0.42	1789.34
			Max. Torque	20			-1.07
L34	34 - 29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.78	1.70	6.60
			Max. Mx	20	-34.22	1929.55	1.66
			Max. My	2	-34.25	0.44	1912.19
			Max. Vy	20	-25.71	1929.55	1.66
			Max. Vx	2	-24.76	0.44	1912.19
			Max. Torque	20			-1.07
L35	29 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.51	1.78	6.70
			Max. Mx	20	-34.66	1961.75	1.68
			Max. My	2	-34.69	0.44	1943.19
			Max. Vy	20	-25.82	1961.75	1.68
			Max. Vx	2	-24.85	0.44	1943.19
			Max. Torque	20			-1.07
L36	27.75 - 27.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.65	1.79	6.72
			Max. Mx	20	-34.76	1968.20	1.68
			Max. My	2	-34.78	0.44	1949.41
			Max. Vy	20	-25.84	1968.20	1.68
			Max. Vx	2	-24.86	0.44	1949.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	20			-1.07
L37	27.5 - 24.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.68	2.05	7.04
			Max. Mx	20	-35.97	2057.00	1.73
			Max. My	2	-35.99	0.46	2034.82
			Max. Vy	20	-26.16	2057.00	1.73
			Max. Vx	2	-25.13	0.46	2034.82
			Max. Torque	20			-1.07
L38	24.083 - 23.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.83	2.07	7.07
			Max. Mx	20	-36.07	2063.54	1.73
			Max. My	2	-36.09	0.46	2041.10
			Max. Vy	20	-26.17	2063.54	1.73
			Max. Vx	2	-25.13	0.46	2041.10
			Max. Torque	20			-1.07
L39	23.833 - 18.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.82	2.41	7.55
			Max. Mx	20	-37.91	2195.41	1.80
			Max. My	2	-37.93	0.48	2167.69
			Max. Vy	20	-26.60	2195.41	1.80
			Max. Vx	2	-25.50	0.48	2167.69
			Max. Torque	20			-1.07
L40	18.833 - 18.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.28	2.44	7.62
			Max. Mx	20	-38.20	2215.37	1.81
			Max. My	2	-38.22	0.48	2186.83
			Max. Vy	20	-26.65	2215.37	1.81
			Max. Vx	2	-25.55	0.48	2186.83
			Max. Torque	20			-1.07
L41	18.083 - 17.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.43	2.46	7.64
			Max. Mx	20	-38.30	2222.04	1.81
			Max. My	2	-38.31	0.48	2193.22
			Max. Vy	20	-26.67	2222.04	1.81
			Max. Vx	2	-25.56	0.48	2193.22
			Max. Torque	20			-1.07
L42	17.833 - 12.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.40	2.63	8.07
			Max. Mx	20	-40.16	2356.43	1.88
			Max. My	2	-40.18	0.50	2321.98
			Max. Vy	20	-27.10	2356.43	1.88
			Max. Vx	2	-25.94	0.50	2321.98
			Max. Torque	20			-1.07
L43	12.833 - 7.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.27	2.76	8.57
			Max. Mx	20	-42.06	2492.84	1.95
			Max. My	2	-42.07	0.52	2452.62
			Max. Vy	20	-27.48	2492.84	1.95
			Max. Vx	2	-26.32	0.52	2452.62
			Max. Torque	20			-1.07
L44	7.833 - 2.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.08	2.89	9.07
			Max. Mx	20	-43.99	2631.12	2.02
			Max. My	2	-43.99	0.54	2585.15
			Max. Vy	20	-27.86	2631.12	2.02
			Max. Vx	2	-26.70	0.54	2585.15
			Max. Torque	20			-1.07
L45	2.833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.61	2.95	9.32
			Max. Mx	20	-45.09	2710.31	2.06
			Max. My	2	-45.09	0.55	2661.08
			Max. Vy	20	-28.08	2710.31	2.06
			Max. Vx	2	-26.92	0.55	2661.08
			Max. Torque	20			-1.07

Maximum Reactions

Location	*Condition*	*Gov. Load Comb.*	*Vertical K*	*Horizontal, X K*	*Horizontal, Z K*
Pole	Max. Vert	29	93.61	-6.91	4.01
	Max. H_x	20	45.11	28.06	0.00
	Max. H_z	2	45.11	0.00	26.90
	Max. M_x	2	2661.08	0.00	26.90
	Max. M_z	8	2709.82	-28.06	-0.00
	Max. Torsion	8	1.07	-28.06	-0.00
	Min. Vert	11	33.83	-23.07	-13.45
	Min. H_x	8	45.11	-28.06	-0.00
	Min. H_z	14	45.11	-0.00	-26.90
	Min. M_x	14	-2657.56	-0.00	-26.90
	Min. M_z	20	-2710.31	28.06	0.00
	Min. Torsion	20	-1.07	28.06	0.00

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	37.59	0.00	0.00	-1.39	0.19	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	45.11	-0.00	-26.90	-2661.08	0.55	-0.02
0.9 Dead+1.6 Wind 0 deg - No Ice	33.83	-0.00	-26.90	-2630.45	0.48	-0.02
1.2 Dead+1.6 Wind 30 deg - No Ice	45.11	13.43	-23.48	-2309.18	-1316.83	-0.56
0.9 Dead+1.6 Wind 30 deg - No Ice	33.83	13.43	-23.48	-2282.57	-1301.98	-0.55
1.2 Dead+1.6 Wind 60 deg - No Ice	45.11	24.58	-14.31	-1383.62	-2367.65	-0.89
0.9 Dead+1.6 Wind 60 deg - No Ice	33.83	24.58	-14.31	-1367.70	-2341.23	-0.87
1.2 Dead+1.6 Wind 90 deg - No Ice	45.11	28.06	0.00	-1.45	-2709.82	-1.07
0.9 Dead+1.6 Wind 90 deg - No Ice	33.83	28.06	0.00	-0.99	-2679.52	-1.05
1.2 Dead+1.6 Wind 120 deg - No Ice	45.11	23.07	13.45	1327.94	-2276.68	-0.91
0.9 Dead+1.6 Wind 120 deg - No Ice	33.83	23.07	13.45	1313.31	-2250.92	-0.89
1.2 Dead+1.6 Wind 150 deg - No Ice	45.11	13.39	23.41	2310.48	-1319.97	-0.51
0.9 Dead+1.6 Wind 150 deg - No Ice	33.83	13.39	23.41	2284.74	-1305.08	-0.50
1.2 Dead+1.6 Wind 180 deg - No Ice	45.11	0.00	26.90	2657.56	-0.06	0.02
0.9 Dead+1.6 Wind 180 deg - No Ice	33.83	0.00	26.90	2627.85	-0.12	0.02
1.2 Dead+1.6 Wind 210 deg - No Ice	45.11	-13.43	23.48	2305.66	1317.32	0.55
0.9 Dead+1.6 Wind 210 deg - No Ice	33.83	-13.43	23.48	2279.97	1302.33	0.54
1.2 Dead+1.6 Wind 240 deg - No Ice	45.11	-24.58	14.31	1380.11	2368.13	0.87
0.9 Dead+1.6 Wind 240 deg - No Ice	33.83	-24.58	14.31	1365.10	2341.59	0.85
1.2 Dead+1.6 Wind 270 deg - No Ice	45.11	-28.06	-0.00	-2.06	2710.31	1.07
0.9 Dead+1.6 Wind 270 deg - No Ice	33.83	-28.06	-0.00	-1.60	2679.88	1.05
1.2 Dead+1.6 Wind 300 deg - No Ice	45.11	-23.07	-13.45	-1331.46	2277.17	0.93

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
0.9 Dead+1.6 Wind 300 deg - No Ice	33.83	-23.07	-13.45	-1315.91	2251.28	0.91
1.2 Dead+1.6 Wind 330 deg - No Ice	45.11	-13.39	-23.41	-2314.00	1320.46	0.52
0.9 Dead+1.6 Wind 330 deg - No Ice	33.83	-13.39	-23.41	-2287.34	1305.44	0.52
1.2 Dead+1.0 Ice+1.0 Temp	93.61	-0.00	-0.00	-9.32	2.95	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	93.61	-0.00	-7.34	-807.22	3.17	-0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	93.61	3.62	-6.31	-692.47	-388.55	-0.21
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	93.61	6.91	-4.01	-426.04	-714.04	-0.32
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	93.61	7.91	0.00	-9.30	-820.44	-0.38
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	93.61	6.14	3.57	383.77	-673.31	-0.32
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	93.61	3.53	6.15	668.95	-386.11	-0.17
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	93.61	0.00	7.34	788.28	2.83	0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	93.61	-3.62	6.31	673.52	394.54	0.21
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	93.61	-6.91	4.01	407.09	720.03	0.32
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	93.61	-7.91	-0.00	-9.64	826.43	0.38
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	93.61	-6.14	-3.57	-402.72	679.30	0.32
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	93.61	-3.53	-6.15	-687.90	392.10	0.17
Dead+Wind 0 deg - Service	37.59	-0.00	-5.75	-566.85	0.27	-0.00
Dead+Wind 30 deg - Service	37.59	2.87	-5.02	-492.04	-279.82	-0.12
Dead+Wind 60 deg - Service	37.59	5.26	-3.06	-295.29	-503.29	-0.20
Dead+Wind 90 deg - Service	37.59	6.00	0.00	-1.39	-576.03	-0.23
Dead+Wind 120 deg - Service	37.59	4.94	2.88	281.24	-483.88	-0.20
Dead+Wind 150 deg - Service	37.59	2.87	5.01	490.14	-280.49	-0.11
Dead+Wind 180 deg - Service	37.59	0.00	5.75	563.93	0.14	0.00
Dead+Wind 210 deg - Service	37.59	-2.87	5.02	489.12	280.22	0.12
Dead+Wind 240 deg - Service	37.59	-5.26	3.06	292.37	503.69	0.20
Dead+Wind 270 deg - Service	37.59	-6.00	-0.00	-1.52	576.43	0.23
Dead+Wind 300 deg - Service	37.59	-4.94	-2.88	-284.16	484.28	0.20
Dead+Wind 330 deg - Service	37.59	-2.87	-5.01	-493.06	280.89	0.11

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-37.59	0.00	0.00	37.59	0.00	0.000%
2	-0.00	-45.11	-26.90	0.00	45.11	26.90	0.000%
3	-0.00	-33.83	-26.90	0.00	33.83	26.90	0.000%
4	13.43	-45.11	-23.48	-13.43	45.11	23.48	0.000%
5	13.43	-33.83	-23.48	-13.43	33.83	23.48	0.000%
6	24.58	-45.11	-14.31	-24.58	45.11	14.31	0.000%
7	24.58	-33.83	-14.31	-24.58	33.83	14.31	0.000%
8	28.06	-45.11	0.00	-28.06	45.11	-0.00	0.000%
9	28.06	-33.83	0.00	-28.06	33.83	-0.00	0.000%
10	23.07	-45.11	13.45	-23.07	45.11	-13.45	0.000%
11	23.07	-33.83	13.45	-23.07	33.83	-13.45	0.000%
12	13.39	-45.11	23.41	-13.39	45.11	-23.41	0.000%
13	13.39	-33.83	23.41	-13.39	33.83	-23.41	0.000%
14	0.00	-45.11	26.90	-0.00	45.11	-26.90	0.000%
15	0.00	-33.83	26.90	-0.00	33.83	-26.90	0.000%
16	-13.43	-45.11	23.48	13.43	45.11	-23.48	0.000%
17	-13.43	-33.83	23.48	13.43	33.83	-23.48	0.000%
18	-24.58	-45.11	14.31	24.58	45.11	-14.31	0.000%
19	-24.58	-33.83	14.31	24.58	33.83	-14.31	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
20	-28.06	-45.11	-0.00	28.06	45.11	0.00	0.000%
21	-28.06	-33.83	-0.00	28.06	33.83	0.00	0.000%
22	-23.07	-45.11	-13.45	23.07	45.11	13.45	0.000%
23	-23.07	-33.83	-13.45	23.07	33.83	13.45	0.000%
24	-13.39	-45.11	-23.41	13.39	45.11	23.41	0.000%
25	-13.39	-33.83	-23.41	13.39	33.83	23.41	0.000%
26	0.00	-93.61	0.00	0.00	93.61	0.00	0.000%
27	-0.00	-93.61	-7.34	0.00	93.61	7.34	0.000%
28	3.62	-93.61	-6.31	-3.62	93.61	6.31	0.000%
29	6.91	-93.61	-4.01	-6.91	93.61	4.01	0.000%
30	7.91	-93.61	0.00	-7.91	93.61	-0.00	0.000%
31	6.14	-93.61	3.57	-6.14	93.61	-3.57	0.000%
32	3.53	-93.61	6.15	-3.53	93.61	-6.15	0.000%
33	0.00	-93.61	7.34	-0.00	93.61	-7.34	0.000%
34	-3.62	-93.61	6.31	3.62	93.61	-6.31	0.000%
35	-6.91	-93.61	4.01	6.91	93.61	-4.01	0.000%
36	-7.91	-93.61	-0.00	7.91	93.61	0.00	0.000%
37	-6.14	-93.61	-3.57	6.14	93.61	3.57	0.000%
38	-3.53	-93.61	-6.15	3.53	93.61	6.15	0.000%
39	-0.00	-37.59	-5.75	0.00	37.59	5.75	0.000%
40	2.87	-37.59	-5.02	-2.87	37.59	5.02	0.000%
41	5.26	-37.59	-3.06	-5.26	37.59	3.06	0.000%
42	6.00	-37.59	0.00	-6.00	37.59	-0.00	0.000%
43	4.94	-37.59	2.88	-4.94	37.59	-2.88	0.000%
44	2.87	-37.59	5.01	-2.87	37.59	-5.01	0.000%
45	0.00	-37.59	5.75	-0.00	37.59	-5.75	0.000%
46	-2.87	-37.59	5.02	2.87	37.59	-5.02	0.000%
47	-5.26	-37.59	3.06	5.26	37.59	-3.06	0.000%
48	-6.00	-37.59	-0.00	6.00	37.59	0.00	0.000%
49	-4.94	-37.59	-2.88	4.94	37.59	2.88	0.000%
50	-2.87	-37.59	-5.01	2.87	37.59	5.01	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00020713
3	Yes	5	0.00000001	0.00007457
4	Yes	6	0.00000001	0.00088567
5	Yes	6	0.00000001	0.00028808
6	Yes	6	0.00000001	0.00095003
7	Yes	6	0.00000001	0.00030747
8	Yes	5	0.00000001	0.00073468
9	Yes	5	0.00000001	0.00033499
10	Yes	6	0.00000001	0.00087511
11	Yes	6	0.00000001	0.00028518
12	Yes	6	0.00000001	0.00090825
13	Yes	6	0.00000001	0.00029627
14	Yes	5	0.00000001	0.00020470
15	Yes	5	0.00000001	0.00007326
16	Yes	6	0.00000001	0.00090700
17	Yes	6	0.00000001	0.00029605
18	Yes	6	0.00000001	0.00091185
19	Yes	6	0.00000001	0.00029417
20	Yes	5	0.00000001	0.00074467
21	Yes	5	0.00000001	0.00033966
22	Yes	6	0.00000001	0.00091372
23	Yes	6	0.00000001	0.00029864
24	Yes	6	0.00000001	0.00089187
25	Yes	6	0.00000001	0.00028993
26	Yes	5	0.00000001	0.00022665
27	Yes	7	0.00000001	0.00029964
28	Yes	7	0.00000001	0.00037492
29	Yes	7	0.00000001	0.00039434
30	Yes	7	0.00000001	0.00029873

31	Yes	7	0.00000001	0.00036208
32	Yes	7	0.00000001	0.00036365
33	Yes	7	0.00000001	0.00029070
34	Yes	7	0.00000001	0.00036770
35	Yes	7	0.00000001	0.00038027
36	Yes	7	0.00000001	0.00030000
37	Yes	7	0.00000001	0.00037867
38	Yes	7	0.00000001	0.00037528
39	Yes	4	0.00000001	0.00074978
40	Yes	5	0.00000001	0.00019240
41	Yes	5	0.00000001	0.00022435
42	Yes	4	0.00000001	0.00099107
43	Yes	5	0.00000001	0.00018587
44	Yes	5	0.00000001	0.00020449
45	Yes	4	0.00000001	0.00074412
46	Yes	5	0.00000001	0.00020531
47	Yes	5	0.00000001	0.00019739
48	Yes	4	0.00000001	0.00099335
49	Yes	5	0.00000001	0.00021137
50	Yes	5	0.00000001	0.00019501

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	140 - 135	19.7462	41	1.3244	0.0025
L2	135 - 130	18.3611	41	1.3188	0.0025
L3	130 - 125	16.9890	41	1.3002	0.0025
L4	125 - 120	15.6425	41	1.2692	0.0023
L5	120 - 115	14.3359	41	1.2248	0.0021
L6	115 - 110	13.0809	41	1.1709	0.0020
L7	110 - 105	11.8863	41	1.1099	0.0018
L8	105 - 102.33	10.7587	41	1.0424	0.0016
L9	102.33 - 102.08	10.1868	41	1.0028	0.0014
L10	102.08 - 97.08	10.1343	41	1.0003	0.0014
L11	97.08 - 91.75	9.1149	41	0.9460	0.0012
L12	95 - 90.75	8.7080	41	0.9218	0.0011
L13	90.75 - 85.75	7.9002	41	0.8873	0.0010
L14	85.75 - 85.33	7.0082	41	0.8159	0.0009
L15	85.33 - 85.08	6.9368	41	0.8098	0.0008
L16	85.08 - 82.5	6.8944	41	0.8074	0.0008
L17	82.5 - 82.25	6.4648	41	0.7827	0.0008
L18	82.25 - 77.15	6.4240	41	0.7784	0.0008
L19	77.15 - 76.9167	5.6197	41	0.7274	0.0007
L20	76.9167 - 71.9167	5.5842	41	0.7250	0.0007
L21	71.9167 - 66.9167	4.8522	41	0.6729	0.0006
L22	66.9167 - 66.667	4.1756	41	0.6191	0.0005
L23	66.667 - 66.417	4.1433	41	0.6164	0.0005
L24	66.417 - 61.417	4.1111	41	0.6137	0.0005
L25	61.417 - 60	3.4975	41	0.5584	0.0004
L26	60 - 59.75	3.3341	41	0.5427	0.0004
L27	59.75 - 54.75	3.3057	41	0.5399	0.0004
L28	54.75 - 46.5	2.7692	41	0.4847	0.0004
L29	51 - 45.5	2.4049	41	0.4430	0.0003
L30	45.5 - 44.25	1.9123	41	0.4077	0.0003
L31	44.25 - 44	1.8073	41	0.3945	0.0003
L32	44 - 39	1.7867	41	0.3923	0.0003
L33	39 - 34	1.3992	41	0.3477	0.0002
L34	34 - 29	1.0585	41	0.3030	0.0002
L35	29 - 27.75	0.7648	41	0.2582	0.0002
L36	27.75 - 27.5	0.6986	41	0.2472	0.0001
L37	27.5 - 24.083	0.6857	41	0.2450	0.0001
L38	24.083 - 23.833	0.5212	41	0.2149	0.0001
L39	23.833 - 18.833	0.5100	41	0.2124	0.0001
L40	18.833 - 18.083	0.3143	41	0.1614	0.0001
L41	18.083 - 17.833	0.2896	41	0.1539	0.0001
L42	17.833 - 12.833	0.2816	41	0.1517	0.0001
L43	12.833 - 7.833	0.1454	41	0.1085	0.0001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L44	7.833 - 2.833	0.0540	41	0.0661	0.0000
L45	2.833 - 0	0.0070	41	0.0237	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	41	19.7462	1.3244	0.0025	23030
139.00	APXV9ERR18-C-A20	41	19.4687	1.3238	0.0025	23030
137.00	PCS 1900MHz 4x45W-65MHz	41	18.9143	1.3222	0.0025	23030
129.00	TME-RRUS-11-700	41	16.7172	1.2950	0.0025	10536
128.00	7770.00 w/ Mount Pipe	41	16.4466	1.2893	0.0024	9552
108.00	(3) SBNHH-1D65B w/ Mount Pipe	41	11.4268	1.0850	0.0017	4243
100.00	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	41	9.7032	0.9791	0.0013	4932
90.00	Pipe Mount [PM 601-3]	41	7.7619	0.8790	0.0010	4568
70.00	KS24019-L112A	41	4.5862	0.6523	0.0006	5350
49.00	KS24019-L112A	41	2.2204	0.4305	0.0003	7507

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	92.7880	6	6.2379	0.0115
L2	135 - 130	86.2862	6	6.2114	0.0115
L3	130 - 125	79.8451	6	6.1231	0.0115
L4	125 - 120	73.5239	6	5.9768	0.0109
L5	120 - 115	67.3888	6	5.7676	0.0100
L6	115 - 110	61.4956	6	5.5131	0.0092
L7	110 - 105	55.8848	6	5.2258	0.0085
L8	105 - 102.33	50.5874	6	4.9076	0.0073
L9	102.33 - 102.08	47.9001	6	4.7211	0.0065
L10	102.08 - 97.08	47.6538	6	4.7093	0.0064
L11	97.08 - 91.75	42.8628	6	4.4537	0.0055
L12	95 - 90.75	40.9505	6	4.3400	0.0052
L13	90.75 - 85.75	37.1534	6	4.1772	0.0047
L14	85.75 - 85.33	32.9597	6	3.8410	0.0040
L15	85.33 - 85.08	32.6235	6	3.8122	0.0039
L16	85.08 - 82.5	32.4245	6	3.8010	0.0039
L17	82.5 - 82.25	30.4044	6	3.6845	0.0037
L18	82.25 - 77.15	30.2122	6	3.6646	0.0036
L19	77.15 - 76.9167	26.4300	6	3.4242	0.0032
L20	76.9167 - 71.9167	26.2631	6	3.4131	0.0032
L21	71.9167 - 66.9167	22.8204	6	3.1676	0.0028
L22	66.9167 - 66.667	19.6385	6	2.9141	0.0024
L23	66.667 - 66.417	19.4866	6	2.9014	0.0024
L24	66.417 - 61.417	19.3351	6	2.8884	0.0024
L25	61.417 - 60	16.4487	6	2.6278	0.0021
L26	60 - 59.75	15.6802	6	2.5541	0.0020
L27	59.75 - 54.75	15.5469	6	2.5411	0.0019
L28	54.75 - 46.5	13.0234	6	2.2810	0.0016
L29	51 - 45.5	11.3097	6	2.0846	0.0014
L30	45.5 - 44.25	8.9927	6	1.9183	0.0013
L31	44.25 - 44	8.4988	6	1.8559	0.0012
L32	44 - 39	8.4019	6	1.8456	0.0012
L33	39 - 34	6.5797	6	1.6359	0.0010
L34	34 - 29	4.9774	6	1.4254	0.0009
L35	29 - 27.75	3.5958	6	1.2143	0.0007
L36	27.75 - 27.5	3.2847	6	1.1626	0.0007
L37	27.5 - 24.083	3.2241	6	1.1522	0.0007

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L38	24.083 - 23.833	2.4503	6	1.0107	0.0006
L39	23.833 - 18.833	2.3977	6	0.9988	0.0006
L40	18.833 - 18.083	1.4777	6	0.7589	0.0004
L41	18.083 - 17.833	1.3613	6	0.7235	0.0004
L42	17.833 - 12.833	1.3237	6	0.7135	0.0004
L43	12.833 - 7.833	0.6833	6	0.5102	0.0003
L44	7.833 - 2.833	0.2537	6	0.3108	0.0002
L45	2.833 - 0	0.0330	6	0.1113	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	6	92.7880	6.2379	0.0115	5000
139.00	APXV9ERR18-C-A20	6	91.4856	6.2352	0.0115	5000
137.00	PCS 1900MHz 4x45W-65MHz	6	88.8830	6.2271	0.0115	5000
129.00	TME-RRUS-11-700	6	78.5692	6.0985	0.0115	2283
128.00	7770.00 w/ Mount Pipe	6	77.2986	6.0718	0.0114	2073
108.00	(3) SBNHH-1D65B w/ Mount Pipe	6	53.7261	5.1080	0.0081	917
100.00	Ericsson AIR 21 B4A/B2P w/ Mount Pipe	6	45.6280	4.6096	0.0060	1064
90.00	Pipe Mount [PM 601-3]	6	36.5030	4.1384	0.0047	981
70.00	KS24019-L112A	6	21.5695	3.0707	0.0027	1143
49.00	KS24019-L112A	6	10.4417	2.0256	0.0014	1599

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	140 - 135 (1)	TP17.025x16x0.25	5.00	0.00	0.0	13.504	-4.16	918.80	0.005
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.00	0.00	0.0	14.329	-4.44	974.93	0.005
L3	130 - 125 (3)	TP19.075x18.05x0.25	5.00	0.00	0.0	15.154	-6.60	1031.07	0.006
L4	125 - 120 (4)	TP20.099x19.075x0.25	5.00	0.00	0.0	15.979	-6.97	1087.20	0.006
L5	120 - 115 (5)	TP21.124x20.099x0.25	5.00	0.00	0.0	16.804	-7.37	1143.33	0.006
L6	115 - 110 (6)	TP22.149x21.124x0.25	5.00	0.00	0.0	17.629	-7.80	1199.47	0.007
L7	110 - 105 (7)	TP23.174x22.149x0.25	5.00	0.00	0.0	18.454	-10.93	1249.34	0.009
L8	105 - 102.33 (8)	TP23.721x23.174x0.25	2.67	0.00	0.0	18.895	-11.23	1269.52	0.009
L9	102.33 - 102.08 (9)	TP23.773x23.721x0.388	0.25	0.00	0.0	29.179	-11.28	1985.32	0.006
L10	102.08 - 97.08 (10)	TP24.797x23.773x0.375	5.00	0.00	0.0	29.490	-14.10	2006.51	0.007
L11	97.08 - 91.75 (11)	TP25.89x24.797x0.375	5.33	0.00	0.0	30.005	-14.43	2041.54	0.007
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	4.25	0.00	0.0	28.952	-15.63	2134.07	0.007
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	5.00	0.00	0.0	30.128	-16.87	2220.75	0.008
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	0.42	0.00	0.0	30.227	-16.96	2228.03	0.008
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.563	0.25	0.00	0.0	47.446	-17.02	3497.24	0.005
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.563	2.58	0.00	0.0	48.404	-17.63	3567.86	0.005
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.313	0.25	0.00	0.0	27.194	-17.68	2004.49	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.55	5.10	0.00	0.0	49.293	-18.96	3633.39	0.005
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.55	0.23	0.00	0.0	49.378	-19.03	3639.64	0.005
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.538	5.00	0.00	0.0	50.052	-20.26	3689.35	0.005
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.525	5.00	0.00	0.0	50.643	-21.75	3732.89	0.006
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.525	0.25	0.00	0.0	50.730	-21.82	3739.28	0.006
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	0.25	0.00	0.0	49.627	-21.88	3658.00	0.006
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	5.00	0.00	0.0	51.319	-23.10	3782.75	0.006
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1.42	0.00	0.0	51.178	-23.44	3772.29	0.006
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	0.25	0.00	0.0	51.884	-23.52	3824.34	0.006
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	5.00	0.00	0.0	53.576	-24.89	3949.09	0.006
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	8.25	0.00	0.0	54.187	-25.94	3994.10	0.006
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	5.50	0.00	0.0	59.682	-28.60	4399.19	0.007
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	1.25	0.00	0.0	60.136	-28.96	4432.65	0.007
L31	44.25 - 44 (31)	TP34.557x34.506x0.675	0.25	0.00	0.0	73.644	-29.06	5428.26	0.005
L32	44 - 39 (32)	TP35.583x34.557x0.663	5.00	0.00	0.0	74.494	-30.74	5490.92	0.006
L33	39 - 34 (33)	TP36.608x35.583x0.65	5.00	0.00	0.0	75.260	-32.46	5547.42	0.006
L34	34 - 29 (34)	TP37.633x36.608x0.638	5.00	0.00	0.0	75.943	-34.21	5597.77	0.006
L35	29 - 27.75 (35)	TP37.89x37.633x0.638	1.25	0.00	0.0	76.469	-34.65	5636.55	0.006
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.638	0.25	0.00	0.0	76.575	-34.75	5644.31	0.006
L37	27.5 - 24.083 (37)	TP38.642x37.941x0.638	3.42	0.00	0.0	78.013	-35.96	5750.33	0.006
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	0.25	0.00	0.0	67.551	-36.06	4979.18	0.007
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	5.00	0.00	0.0	67.812	-37.90	4998.41	0.008
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	0.75	0.00	0.0	68.078	-38.19	5018.03	0.008
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	0.25	0.00	0.0	80.644	-38.29	5944.25	0.006
L42	17.833 - 12.833 (42)	TP40.948x39.923x0.625	5.00	0.00	0.0	81.151	-40.16	5981.64	0.007
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	5.00	0.00	0.0	83.214	-42.06	6133.73	0.007
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	5.00	0.00	0.0	83.597	-43.99	6161.93	0.007
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	2.83	0.00	0.0	84.743	-45.09	6246.38	0.007

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	140 - 135 (1)	TP17.025x16x0.25	20.56	311.84	0.066	0.00	311.84	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	46.33	351.40	0.132	0.00	351.40	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	87.72	393.33	0.223	0.00	393.33	0.000
L4	125 - 120 (4)	TP20.099x19.075x0.25	132.91	437.62	0.304	0.00	437.62	0.000
L5	120 - 115 (5)	TP21.124x20.099x0.25	179.97	484.27	0.372	0.00	484.27	0.000
L6	115 - 110 (6)	TP22.149x21.124x0.25	228.93	533.29	0.429	0.00	533.29	0.000
L7	110 - 105 (7)	TP23.174x22.149x0.25	297.44	581.75	0.511	0.00	581.75	0.000
L8	105 - 102.33 (8)	TP23.721x23.174x0.25	337.48	605.41	0.557	0.00	605.41	0.000
L9	102.33 - 102.08 (9)	TP23.773x23.721x0.388	341.26	937.80	0.364	0.00	937.80	0.000
L10	102.08 - 97.08	TP24.797x23.773x0.375	426.92	991.03	0.431	0.00	991.03	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 $\frac{M_{uy}}{\phi M_{ny}}$
	(10)							
L11	97.08 - 91.75 (11)	TP25.89x24.797x0.375	465.84	1026.20	0.454	0.00	1026.20	0.000
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	546.62	1090.60	0.501	0.00	1090.60	0.000
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	644.43	1181.63	0.545	0.00	1181.63	0.000
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	652.75	1189.45	0.549	0.00	1189.45	0.000
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.563	657.71	1841.60	0.357	0.00	1841.60	0.000
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.563	709.20	1917.53	0.370	0.00	1917.53	0.000
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.313	714.22	1099.66	0.649	0.00	1099.66	0.000
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.55	817.85	2036.38	0.402	0.00	2036.38	0.000
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.55	822.65	2043.45	0.403	0.00	2043.45	0.000
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.538	927.85	2150.88	0.431	0.00	2150.88	0.000
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.525	1037.21	2256.73	0.460	0.00	2256.73	0.000
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.525	1042.76	2264.52	0.460	0.00	2264.52	0.000
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	1048.32	2221.00	0.472	0.00	2221.00	0.000
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	1160.83	2376.38	0.488	0.00	2376.38	0.000
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1193.18	2393.27	0.499	0.00	2393.27	0.000
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	1198.92	2429.35	0.494	0.00	2429.35	0.000
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	1314.85	2591.73	0.507	0.00	2591.73	0.000
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	1403.43	2685.34	0.523	0.00	2685.34	0.000
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	1536.44	2995.33	0.513	0.00	2995.33	0.000
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	1567.12	3041.44	0.515	0.00	3041.44	0.000
L31	44.25 - 44 (31)	TP34.557x34.506x0.675	1573.27	3702.91	0.425	0.00	3702.91	0.000
L32	44 - 39 (32)	TP35.583x34.557x0.663	1697.53	3863.98	0.439	0.00	3863.98	0.000
L33	39 - 34 (33)	TP36.608x35.583x0.65	1824.08	4023.29	0.453	0.00	4023.29	0.000
L34	34 - 29 (34)	TP37.633x36.608x0.638	1952.79	4180.44	0.467	0.00	4180.44	0.000
L35	29 - 27.75 (35)	TP37.89x37.633x0.638	1985.30	4239.07	0.468	0.00	4239.07	0.000
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.638	1991.82	4250.84	0.469	0.00	4250.84	0.000
L37	27.5 - 24.083 (37)	TP38.642x37.941x0.638	2081.46	4413.40	0.472	0.00	4413.40	0.000
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	2088.06	3844.40	0.543	0.00	3844.40	0.000
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	2221.20	3966.99	0.560	0.00	3966.99	0.000
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	2241.36	3998.41	0.561	0.00	3998.41	0.000
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	2248.09	4718.63	0.476	0.00	4718.63	0.000
L42	17.833 - 12.833 (42)	TP40.948x39.923x0.625	2383.93	4877.23	0.489	0.00	4877.23	0.000
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	2521.95	5130.35	0.492	0.00	5130.35	0.000
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	2662.03	5286.75	0.504	0.00	5286.75	0.000
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	2742.29	5433.71	0.505	0.00	5433.71	0.000

Pole Shear Design Data

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	140 - 135 (1)	TP17.025x16x0.25	4.98	459.40	0.011	0.00	632.31	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.33	487.47	0.011	0.00	712.53	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	8.86	515.53	0.017	0.01	797.55	0.000
L4	125 - 120 (4)	TP20.099x19.075x0.25	9.23	543.60	0.017	0.01	887.36	0.000
L5	120 - 115 (5)	TP21.124x20.099x0.25	9.60	571.67	0.017	0.01	981.96	0.000
L6	115 - 110 (6)	TP22.149x21.124x0.25	9.99	599.73	0.017	0.01	1081.34	0.000
L7	110 - 105 (7)	TP23.174x22.149x0.25	14.90	624.67	0.024	0.01	1179.61	0.000
L8	105 - 102.33 (8)	TP23.721x23.174x0.25	15.11	634.76	0.024	0.01	1227.58	0.000
L9	102.33 - 102.08 (9)	TP23.773x23.721x0.388	15.12	992.66	0.015	0.01	1901.56	0.000
L10	102.08 - 97.08 (10)	TP24.797x23.773x0.375	18.63	1003.26	0.019	0.01	2009.51	0.000
L11	97.08 - 91.75 (11)	TP25.89x24.797x0.375	18.80	1020.77	0.018	0.01	2080.82	0.000
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	19.21	1067.03	0.018	0.01	2211.40	0.000
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	19.79	1110.37	0.018	0.01	2395.99	0.000
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	19.82	1114.01	0.018	0.01	2411.83	0.000
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.563	19.84	1748.62	0.011	0.01	3734.18	0.000
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.563	20.08	1783.93	0.011	0.01	3888.13	0.000
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.313	20.09	1002.25	0.020	0.01	2229.77	0.000
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.55	20.55	1816.70	0.011	0.01	4129.13	0.000
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.55	20.57	1819.82	0.011	0.01	4143.48	0.000
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.538	21.58	1844.67	0.012	0.87	4361.31	0.000
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.525	22.20	1866.45	0.012	1.02	4575.95	0.000
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.525	22.22	1869.64	0.012	1.02	4591.74	0.000
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	22.25	1829.00	0.012	1.02	4503.49	0.000
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	22.77	1891.37	0.012	1.02	4818.55	0.000
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	22.92	1886.15	0.012	1.02	4852.79	0.000
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	22.94	1912.17	0.012	1.02	4925.96	0.000
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	23.45	1974.54	0.012	1.02	5255.22	0.000
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	23.82	1997.05	0.012	1.02	5445.04	0.000
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	24.49	2199.60	0.011	0.89	6073.60	0.000
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	24.61	2216.33	0.011	0.89	6167.09	0.000
L31	44.25 - 44 (31)	TP34.557x34.506x0.675	24.62	2714.13	0.009	0.89	7508.35	0.000
L32	44 - 39 (32)	TP35.583x34.557x0.663	25.09	2745.46	0.009	0.89	7834.95	0.000
L33	39 - 34 (33)	TP36.608x35.583x0.65	25.54	2773.71	0.009	0.89	8157.98	0.000
L34	34 - 29 (34)	TP37.633x36.608x0.638	25.96	2798.88	0.009	0.89	8476.67	0.000
L35	29 - 27.75 (35)	TP37.89x37.633x0.638	26.07	2818.28	0.009	0.89	8595.50	0.000
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.638	26.08	2822.15	0.009	0.89	8619.42	0.000
L37	27.5 - 24.083 (37)	TP38.642x37.941x0.638	26.40	2875.16	0.009	0.89	8949.00	0.000
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	26.41	2489.59	0.011	0.89	7795.24	0.000
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	26.86	2499.21	0.011	0.89	8043.82	0.000
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	26.92	2509.02	0.011	0.89	8107.52	0.000
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	26.94	2972.12	0.009	0.89	9567.92	0.000
L42	17.833 - 12.833 (42)	TP40.948x39.923x0.625	27.41	2990.82	0.009	0.89	9889.50	0.000

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 $\frac{T_u}{\phi T_n}$
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	27.82	3066.87	0.009	0.89	10402.75	0.000
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	28.23	3080.96	0.009	0.89	10719.92	0.000
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	28.46	3123.19	0.009	0.89	11017.83	0.000

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	140 - 135 (1)	0.005	0.066	0.000	0.011	0.000	0.071 ✔	1.000	4.8.2 ✔
L2	135 - 130 (2)	0.005	0.132	0.000	0.011	0.000	0.137 ✔	1.000	4.8.2 ✔
L3	130 - 125 (3)	0.006	0.223	0.000	0.017	0.000	0.230 ✔	1.000	4.8.2 ✔
L4	125 - 120 (4)	0.006	0.304	0.000	0.017	0.000	0.310 ✔	1.000	4.8.2 ✔
L5	120 - 115 (5)	0.006	0.372	0.000	0.017	0.000	0.378 ✔	1.000	4.8.2 ✔
L6	115 - 110 (6)	0.007	0.429	0.000	0.017	0.000	0.436 ✔	1.000	4.8.2 ✔
L7	110 - 105 (7)	0.009	0.511	0.000	0.024	0.000	0.521 ✔	1.000	4.8.2 ✔
L8	105 - 102.33 (8)	0.009	0.557	0.000	0.024	0.000	0.567 ✔	1.000	4.8.2 ✔
L9	102.33 - 102.08 (9)	0.006	0.364	0.000	0.015	0.000	0.370 ✔	1.000	4.8.2 ✔
L10	102.08 - 97.08 (10)	0.007	0.431	0.000	0.019	0.000	0.438 ✔	1.000	4.8.2 ✔
L11	97.08 - 91.75 (11)	0.007	0.454	0.000	0.018	0.000	0.461 ✔	1.000	4.8.2 ✔
L12	91.75 - 90.75 (12)	0.007	0.501	0.000	0.018	0.000	0.509 ✔	1.000	4.8.2 ✔
L13	90.75 - 85.75 (13)	0.008	0.545	0.000	0.018	0.000	0.553 ✔	1.000	4.8.2 ✔
L14	85.75 - 85.33 (14)	0.008	0.549	0.000	0.018	0.000	0.557 ✔	1.000	4.8.2 ✔
L15	85.33 - 85.08 (15)	0.005	0.357	0.000	0.011	0.000	0.362 ✔	1.000	4.8.2 ✔
L16	85.08 - 82.5 (16)	0.005	0.370	0.000	0.011	0.000	0.375 ✔	1.000	4.8.2 ✔
L17	82.5 - 82.25 (17)	0.009	0.649	0.000	0.020	0.000	0.659 ✔	1.000	4.8.2 ✔
L18	82.25 - 77.15 (18)	0.005	0.402	0.000	0.011	0.000	0.407 ✔	1.000	4.8.2 ✔
L19	77.15 - 76.9167 (19)	0.005	0.403	0.000	0.011	0.000	0.408 ✔	1.000	4.8.2 ✔
L20	76.9167 - 71.9167 (20)	0.005	0.431	0.000	0.012	0.000	0.437 ✔	1.000	4.8.2 ✔
L21	71.9167 - 66.9167 (21)	0.006	0.460	0.000	0.012	0.000	0.466 ✔	1.000	4.8.2 ✔
L22	66.9167 - 66.667 (22)	0.006	0.460	0.000	0.012	0.000	0.466 ✔	1.000	4.8.2 ✔
L23	66.667 - 66.417 (23)	0.006	0.472	0.000	0.012	0.000	0.478 ✔	1.000	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
L24	66.417 - 61.417 (24)	0.006	0.488	0.000	0.012	0.000	0.495 ✔	1.000	4.8.2 ✔
L25	61.417 - 60 (25)	0.006	0.499	0.000	0.012	0.000	0.505 ✔	1.000	4.8.2 ✔
L26	60 - 59.75 (26)	0.006	0.494	0.000	0.012	0.000	0.500 ✔	1.000	4.8.2 ✔
L27	59.75 - 54.75 (27)	0.006	0.507	0.000	0.012	0.000	0.514 ✔	1.000	4.8.2 ✔
L28	54.75 - 46.5 (28)	0.006	0.523	0.000	0.012	0.000	0.529 ✔	1.000	4.8.2 ✔
L29	46.5 - 45.5 (29)	0.007	0.513	0.000	0.011	0.000	0.520 ✔	1.000	4.8.2 ✔
L30	45.5 - 44.25 (30)	0.007	0.515	0.000	0.011	0.000	0.522 ✔	1.000	4.8.2 ✔
L31	44.25 - 44 (31)	0.005	0.425	0.000	0.009	0.000	0.430 ✔	1.000	4.8.2 ✔
L32	44 - 39 (32)	0.006	0.439	0.000	0.009	0.000	0.445 ✔	1.000	4.8.2 ✔
L33	39 - 34 (33)	0.006	0.453	0.000	0.009	0.000	0.459 ✔	1.000	4.8.2 ✔
L34	34 - 29 (34)	0.006	0.467	0.000	0.009	0.000	0.473 ✔	1.000	4.8.2 ✔
L35	29 - 27.75 (35)	0.006	0.468	0.000	0.009	0.000	0.475 ✔	1.000	4.8.2 ✔
L36	27.75 - 27.5 (36)	0.006	0.469	0.000	0.009	0.000	0.475 ✔	1.000	4.8.2 ✔
L37	27.5 - 24.083 (37)	0.006	0.472	0.000	0.009	0.000	0.478 ✔	1.000	4.8.2 ✔
L38	24.083 - 23.833 (38)	0.007	0.543	0.000	0.011	0.000	0.550 ✔	1.000	4.8.2 ✔
L39	23.833 - 18.833 (39)	0.008	0.560	0.000	0.011	0.000	0.568 ✔	1.000	4.8.2 ✔
L40	18.833 - 18.083 (40)	0.008	0.561	0.000	0.011	0.000	0.568 ✔	1.000	4.8.2 ✔
L41	18.083 - 17.833 (41)	0.006	0.476	0.000	0.009	0.000	0.483 ✔	1.000	4.8.2 ✔
L42	17.833 - 12.833 (42)	0.007	0.489	0.000	0.009	0.000	0.496 ✔	1.000	4.8.2 ✔
L43	12.833 - 7.833 (43)	0.007	0.492	0.000	0.009	0.000	0.499 ✔	1.000	4.8.2 ✔
L44	7.833 - 2.833 (44)	0.007	0.504	0.000	0.009	0.000	0.511 ✔	1.000	4.8.2 ✔
L45	2.833 - 0 (45)	0.007	0.505	0.000	0.009	0.000	0.512 ✔	1.000	4.8.2 ✔

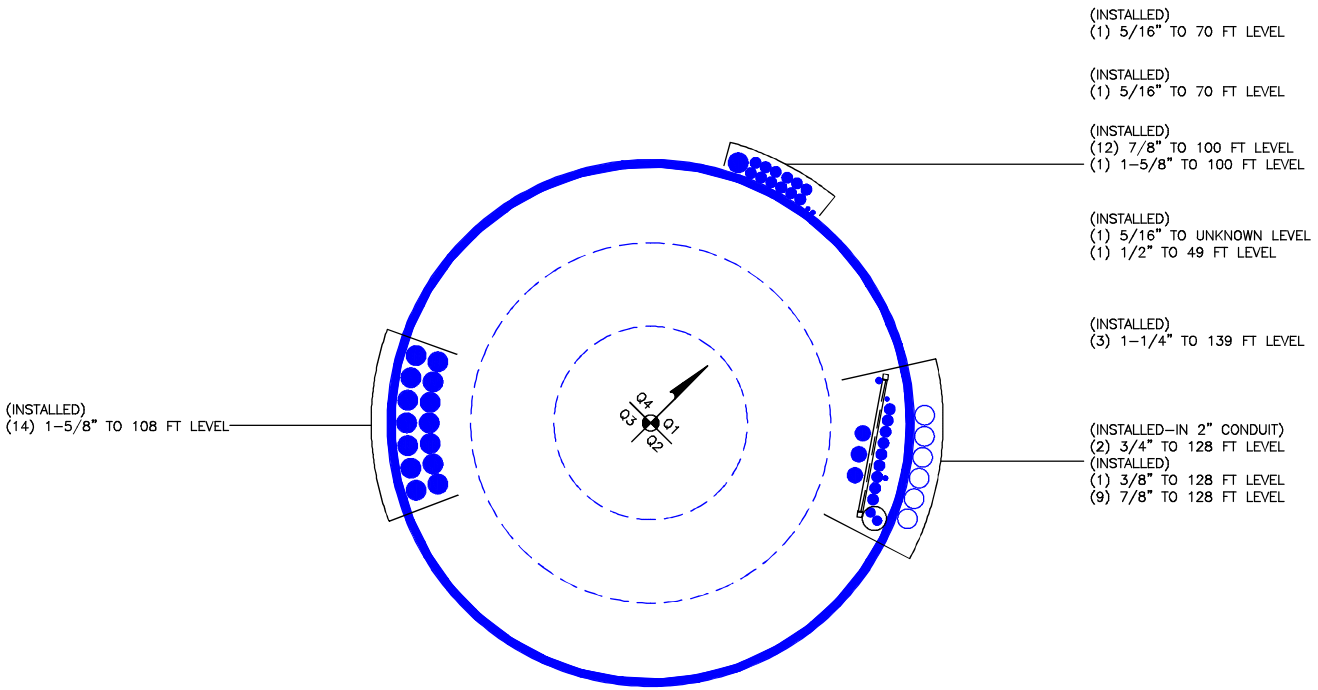
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	140 - 135	Pole	TP17.025x16x0.25	1	-4.16	918.80	7.1	Pass
L2	135 - 130	Pole	TP18.05x17.025x0.25	2	-4.44	974.93	13.7	Pass
L3	130 - 125	Pole	TP19.075x18.05x0.25	3	-6.60	1031.07	23.0	Pass
L4	125 - 120	Pole	TP20.099x19.075x0.25	4	-6.97	1087.20	31.0	Pass
L5	120 - 115	Pole	TP21.124x20.099x0.25	5	-7.37	1143.33	37.8	Pass
L6	115 - 110	Pole	TP22.149x21.124x0.25	6	-7.80	1199.47	43.6	Pass
L7	110 - 105	Pole	TP23.174x22.149x0.25	7	-10.93	1249.34	52.1	Pass
L8	105 - 102.33	Pole	TP23.721x23.174x0.25	8	-11.23	1269.52	56.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L9	102.33 - 102.08	Pole	TP23.773x23.721x0.388	9	-11.28	1985.32	37.0	Pass
L10	102.08 - 97.08	Pole	TP24.797x23.773x0.375	10	-14.10	2006.51	43.8	Pass
L11	97.08 - 91.75	Pole	TP25.89x24.797x0.375	11	-14.43	2041.54	46.1	Pass
L12	91.75 - 90.75	Pole	TP25.595x24.724x0.356	12	-15.63	2134.07	50.9	Pass
L13	90.75 - 85.75	Pole	TP26.62x25.595x0.356	13	-16.87	2220.75	55.3	Pass
L14	85.75 - 85.33	Pole	TP26.706x26.62x0.356	14	-16.96	2228.03	55.7	Pass
L15	85.33 - 85.08	Pole	TP26.758x26.706x0.563	15	-17.02	3497.24	36.2	Pass
L16	85.08 - 82.5	Pole	TP27.287x26.758x0.563	16	-17.63	3567.86	37.5	Pass
L17	82.5 - 82.25	Pole	TP27.338x27.287x0.313	17	-17.68	2004.49	65.9	Pass
L18	82.25 - 77.15	Pole	TP28.383x27.337x0.55	18	-18.96	3633.39	40.7	Pass
L19	77.15 - 76.9167	Pole	TP28.431x28.383x0.55	19	-19.03	3639.64	40.8	Pass
L20	76.9167 - 71.9167	Pole	TP29.457x28.431x0.538	20	-20.26	3689.35	43.7	Pass
L21	71.9167 - 66.9167	Pole	TP30.482x29.457x0.525	21	-21.75	3732.89	46.6	Pass
L22	66.9167 - 66.667	Pole	TP30.534x30.482x0.525	22	-21.82	3739.28	46.6	Pass
L23	66.667 - 66.417	Pole	TP30.585x30.534x0.513	23	-21.88	3658.00	47.8	Pass
L24	66.417 - 61.417	Pole	TP31.61x30.585x0.513	24	-23.10	3782.75	49.5	Pass
L25	61.417 - 60	Pole	TP31.901x31.61x0.506	25	-23.44	3772.29	50.5	Pass
L26	60 - 59.75	Pole	TP31.952x31.901x0.513	26	-23.52	3824.34	50.0	Pass
L27	59.75 - 54.75	Pole	TP32.978x31.952x0.513	27	-24.89	3949.09	51.4	Pass
L28	54.75 - 46.5	Pole	TP34.67x32.978x0.506	28	-25.94	3994.10	52.9	Pass
L29	46.5 - 45.5	Pole	TP34.25x33.122x0.55	29	-28.60	4399.19	52.0	Pass
L30	45.5 - 44.25	Pole	TP34.506x34.25x0.55	30	-28.96	4432.65	52.2	Pass
L31	44.25 - 44	Pole	TP34.557x34.506x0.675	31	-29.06	5428.26	43.0	Pass
L32	44 - 39	Pole	TP35.583x34.557x0.663	32	-30.74	5490.92	44.5	Pass
L33	39 - 34	Pole	TP36.608x35.583x0.65	33	-32.46	5547.42	45.9	Pass
L34	34 - 29	Pole	TP37.633x36.608x0.638	34	-34.21	5597.77	47.3	Pass
L35	29 - 27.75	Pole	TP37.89x37.633x0.638	35	-34.65	5636.55	47.5	Pass
L36	27.75 - 27.5	Pole	TP37.941x37.89x0.638	36	-34.75	5644.31	47.5	Pass
L37	27.5 - 24.083	Pole	TP38.642x37.941x0.638	37	-35.96	5750.33	47.8	Pass
L38	24.083 - 23.833	Pole	TP38.693x38.642x0.55	38	-36.06	4979.18	55.0	Pass
L39	23.833 - 18.833	Pole	TP39.718x38.693x0.538	39	-37.90	4998.41	56.8	Pass
L40	18.833 - 18.083	Pole	TP39.872x39.718x0.538	40	-38.19	5018.03	56.8	Pass
L41	18.083 - 17.833	Pole	TP39.923x39.872x0.638	41	-38.29	5944.25	48.3	Pass
L42	17.833 - 12.833	Pole	TP40.948x39.923x0.625	42	-40.16	5981.64	49.6	Pass
L43	12.833 - 7.833	Pole	TP41.974x40.948x0.625	43	-42.06	6133.73	49.9	Pass
L44	7.833 - 2.833	Pole	TP42.999x41.974x0.613	44	-43.99	6161.93	51.1	Pass
L45	2.833 - 0	Pole	TP43.58x42.999x0.613	45	-45.09	6246.38	51.2	Pass
							Summary	
						Pole (L17)	65.9	Pass
						RATING =	**65.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876335 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 876335

Work Order:

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	140	48.25	3.25	12	16	25.89	0.25	1	A607-60
2	95	17.833	0	12	24.72	28.38	0.3125	1.25	A607-65
3	77.167	30.667	4.5	12	28.38	34.67	0.3125	1.25	A607-65
4	51	51	0	12	33.12	43.58	0.375	1.5	A607-65

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	0	18.083	channel	MP3-05 (1.1875")	4	3				3			3		3		
2	18.083	24.083	channel	MP3-05 (1.1875")	4	3				3				3		3	
3	24.083	44.25	channel	MP3-05 (1.1875")	3	3				3				3			
4	44.25	66.667	channel	MP3-05 (1.1875")	3		3				3				3		
5	66.667	77.1667	channel	MP3-03 (1.1875")	4		3	3			3				3		
6	77.1667	85.33	channel	MP3-03 (1.1875")	3			3				3				3	
7	94.667	102.33	channel	MP3-03 (1.1875")	3				3				3				3
8	0	27.75	plate	CCI-SFP-065125	1						4						
9	24.083	44.25	plate	CCI-SFP-060100	2			4				4					
10	49	60	plate	CCI-SFP-060100	1				4								
11	66.667	82.5	plate	CCI-SFP-060100	2				4				4				
12	82.5	93	plate	CCI-SFP-060100	2					4				4			
13																	

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	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
2	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
3	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
4	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
5	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
6	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
7	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
8	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
9	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
10	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
11	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
12	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	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	140 - 135	5		12	16.000	17.025	0.25	A607-60	1.000
2	135 - 130	5		12	17.025	18.050	0.25	A607-60	1.000
3	130 - 125	5		12	18.050	19.075	0.25	A607-60	1.000
4	125 - 120	5		12	19.075	20.099	0.25	A607-60	1.000
5	120 - 115	5		12	20.099	21.124	0.25	A607-60	1.000
6	115 - 110	5		12	21.124	22.149	0.25	A607-60	1.000
7	110 - 105	5		12	22.149	23.174	0.25	A607-60	1.000
8	105 - 102.33	2.67		12	23.174	23.721	0.25	A607-60	1.000
9	102.33 - 102.08	0.25		12	23.721	23.773	0.3875	A607-60	0.950
10	102.08 - 97.08	5		12	23.773	24.797	0.375	A607-60	0.968
11	97.08 - 95	5.33	3.25	12	24.797	25.890	0.375	A607-60	0.962
12	95 - 90.75	4.25		12	24.724	25.595	0.35625	A607-65	1.294
13	90.75 - 85.75	5		12	25.595	26.620	0.35625	A607-65	1.278
14	85.75 - 85.33	0.42		12	26.620	26.706	0.35625	A607-65	1.276
15	85.33 - 85.08	0.25		12	26.706	26.758	0.5625	A607-65	0.999
16	85.08 - 82.5	2.58		12	26.758	27.287	0.5625	A607-65	0.990
17	82.5 - 82.25	0.25	0	12	27.287	27.338	0.3125	A607-65	1.000
18	82.25 - 77.15	5.1		12	27.337	28.383	0.55	A607-65	1.054
19	77.15 - 76.9167	0.2333		12	28.383	28.431	0.55	A607-65	1.053
20	76.9167 - 71.9167	5		12	28.431	29.457	0.5375	A607-65	1.060
21	71.9167 - 66.9167	5		12	29.457	30.482	0.525	A607-65	1.068
22	66.9167 - 66.667	0.2497		12	30.482	30.534	0.525	A607-65	1.067
23	66.667 - 66.417	0.25		12	30.534	30.585	0.5125	A607-65	0.956
24	66.417 - 61.417	5		12	30.585	31.610	0.5125	A607-65	0.944
25	61.417 - 60	1.417		12	31.610	31.901	0.50625	A607-65	0.953
26	60 - 59.75	0.25		12	31.901	31.952	0.5125	A607-65	1.057
27	59.75 - 54.75	5		12	31.952	32.978	0.5125	A607-65	1.042
28	54.75 - 51	8.25	4.5	12	32.978	34.670	0.50625	A607-65	1.045
29	51 - 45.5	5.5		12	33.122	34.250	0.55	A607-65	0.970
30	45.5 - 44.25	1.25		12	34.250	34.506	0.55	A607-65	0.968
31	44.25 - 44	0.25		12	34.506	34.557	0.675	A607-65	0.954
32	44 - 39	5		12	34.557	35.583	0.6625	A607-65	0.960
33	39 - 34	5		12	35.583	36.608	0.65	A607-65	0.967
34	34 - 29	5		12	36.608	37.633	0.6375	A607-65	0.974
35	29 - 27.75	1.25		12	37.633	37.890	0.6375	A607-65	0.972
36	27.75 - 27.5	0.25		12	37.890	37.941	0.6375	A607-65	0.971
37	27.5 - 24.083	3.417		12	37.941	38.642	0.6375	A607-65	0.964
38	24.083 - 23.833	0.25		12	38.642	38.693	0.55	A607-65	1.140
39	23.833 - 18.833	5		12	38.693	39.718	0.5375	A607-65	1.154
40	18.833 - 18.083	0.75		12	39.718	39.872	0.5375	A607-65	1.153
41	18.083 - 17.833	0.25		12	39.872	39.923	0.6375	A607-65	0.974
42	17.833 - 12.833	5		12	39.923	40.948	0.625	A607-65	0.983
43	12.833 - 7.833	5		12	40.948	41.974	0.625	A607-65	0.973
44	7.833 - 2.833	5		12	41.974	42.999	0.6125	A607-65	0.984
45	2.833 - 0	2.833		12	42.999	43.580	0.6125	A607-65	0.979

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	140 - 135	4.162	20.559	4.9801
2	135 - 130	4.4376	46.326	5.3311
3	130 - 125	6.5989	87.716	8.8588
4	125 - 120	6.9734	132.91	9.2279
5	120 - 115	7.3739	179.97	9.6041
6	115 - 110	7.7993	228.93	9.9874
7	110 - 105	10.929	297.44	14.903
8	105 - 102.33	11.232	337.48	15.109
9	102.33 - 102.08	11.28	341.26	15.122
10	102.08 - 97.08	14.098	426.92	18.626
11	97.08 - 95	14.433	465.84	18.797
12	95 - 90.75	15.626	546.62	19.206
13	90.75 - 85.75	16.868	644.43	19.793
14	85.75 - 85.33	16.962	652.75	19.821
15	85.33 - 85.08	17.024	657.71	19.841
16	85.08 - 82.5	17.627	709.2	20.077
17	82.5 - 82.25	17.676	714.22	20.091
18	82.25 - 77.15	18.959	817.85	20.549
19	77.15 - 76.9167	19.025	822.65	20.566
20	76.9167 - 71.9167	20.261	927.85	21.578
21	71.9167 - 66.9167	21.746	1037.2	22.2
22	66.9167 - 66.667	21.821	1042.8	22.224
23	66.667 - 66.417	21.882	1048.3	22.25
24	66.417 - 61.417	23.096	1160.8	22.769
25	61.417 - 60	23.443	1193.2	22.919
26	60 - 59.75	23.524	1198.9	22.936
27	59.75 - 54.75	24.894	1314.8	23.45
28	54.75 - 51	25.944	1403.4	23.816
29	51 - 45.5	28.602	1536.4	24.488
30	45.5 - 44.25	28.962	1567.1	24.608
31	44.25 - 44	29.057	1573.3	24.621
32	44 - 39	30.739	1697.5	25.095
33	39 - 34	32.459	1824.1	25.54
34	34 - 29	34.208	1952.8	25.964
35	29 - 27.75	34.648	1985.3	26.072
36	27.75 - 27.5	34.746	1991.8	26.081
37	27.5 - 24.083	35.956	2081.5	26.396
38	24.083 - 23.833	36.057	2088.1	26.407
39	23.833 - 18.833	37.9	2221.2	26.9
40	18.833 - 18.083	38.2	2241.4	26.9
41	18.083 - 17.833	38.3	2248.1	26.9
42	17.833 - 12.833	40.2	2383.9	27.4
43	12.833 - 7.833	42.1	2522.0	27.8
44	7.833 - 2.833	44.0	2662.0	28.2
45	2.833 - 0	45.1	2742.3	28.5

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP17.025x16x0.25	Pole	7.0%	Pass
135 - 130	Pole	TP18.05x17.025x0.25	Pole	13.6%	Pass
130 - 125	Pole	TP19.075x18.05x0.25	Pole	22.9%	Pass
125 - 120	Pole	TP20.099x19.075x0.25	Pole	31.0%	Pass
120 - 115	Pole	TP21.124x20.099x0.25	Pole	37.7%	Pass
115 - 110	Pole	TP22.149x21.124x0.25	Pole	43.5%	Pass
110 - 105	Pole	TP23.174x22.149x0.25	Pole	51.9%	Pass
105 - 102.33	Pole	TP23.721x23.174x0.25	Pole	56.5%	Pass
102.33 - 102.08	Pole + Reinf.	TP23.773x23.721x0.3875	Reinf. 7 Tension Rupture	51.5%	Pass
102.08 - 97.08	Pole + Reinf.	TP24.797x23.773x0.375	Reinf. 7 Tension Rupture	60.0%	Pass
97.08 - 95	Pole + Reinf.	TP25.89x24.797x0.375	Reinf. 7 Tension Rupture	63.5%	Pass
95 - 90.75	Pole + Reinf.	TP25.595x24.724x0.3563	Pole	55.2%	Pass
90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.3563	Pole	60.2%	Pass
85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.3563	Pole	60.5%	Pass
85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.5625	Reinf. 6 Tension Rupture	55.0%	Pass
85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.5625	Reinf. 6 Tension Rupture	57.4%	Pass
82.5 - 82.25	Pole	TP27.338x27.287x0.3125	Pole	67.6%	Pass
82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.55	Reinf. 5 Tension Rupture	61.7%	Pass
77.15 - 76.92	Pole + Reinf.	TP28.431x28.383x0.55	Reinf. 5 Tension Rupture	61.9%	Pass
76.92 - 71.92	Pole + Reinf.	TP29.457x28.431x0.5375	Reinf. 5 Tension Rupture	65.8%	Pass
71.92 - 66.92	Pole + Reinf.	TP30.482x29.457x0.525	Reinf. 5 Tension Rupture	69.4%	Pass
66.92 - 66.67	Pole + Reinf.	TP30.534x30.482x0.525	Reinf. 5 Tension Rupture	69.5%	Pass
66.67 - 66.42	Pole + Reinf.	TP30.585x30.534x0.5125	Reinf. 4 Tension Rupture	68.4%	Pass
66.42 - 61.42	Pole + Reinf.	TP31.61x30.585x0.5125	Reinf. 4 Tension Rupture	71.7%	Pass
61.42 - 60	Pole + Reinf.	TP31.901x31.61x0.5063	Reinf. 4 Tension Rupture	72.6%	Pass
60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.5125	Reinf. 4 Tension Rupture	67.1%	Pass
59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.5125	Reinf. 4 Tension Rupture	69.9%	Pass
54.75 - 51	Pole + Reinf.	TP34.67x32.978x0.5063	Reinf. 4 Tension Rupture	71.8%	Pass
51 - 45.5	Pole + Reinf.	TP34.25x33.122x0.55	Reinf. 4 Tension Rupture	73.8%	Pass
45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.55	Reinf. 4 Tension Rupture	74.3%	Pass
44.25 - 44	Pole + Reinf.	TP34.557x34.506x0.675	Reinf. 3 Tension Rupture	63.3%	Pass
44 - 39	Pole + Reinf.	TP35.583x34.557x0.6625	Reinf. 3 Tension Rupture	65.1%	Pass
39 - 34	Pole + Reinf.	TP36.608x35.583x0.65	Reinf. 3 Tension Rupture	66.8%	Pass
34 - 29	Pole + Reinf.	TP37.633x36.608x0.6375	Reinf. 3 Tension Rupture	68.3%	Pass
29 - 27.75	Pole + Reinf.	TP37.89x37.633x0.6375	Reinf. 3 Tension Rupture	68.7%	Pass
27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x0.6375	Reinf. 3 Tension Rupture	67.4%	Pass
27.5 - 24.08	Pole + Reinf.	TP38.642x37.941x0.6375	Reinf. 3 Tension Rupture	68.3%	Pass
24.08 - 23.83	Pole + Reinf.	TP38.693x38.642x0.55	Reinf. 2 Tension Rupture	75.0%	Pass
23.83 - 18.83	Pole + Reinf.	TP39.718x38.693x0.5375	Reinf. 2 Tension Rupture	76.3%	Pass
18.83 - 18.08	Pole + Reinf.	TP39.872x39.718x0.5375	Reinf. 2 Tension Rupture	76.5%	Pass
18.08 - 17.83	Pole + Reinf.	TP39.923x39.872x0.6375	Reinf. 1 Tension Rupture	74.8%	Pass
17.83 - 12.83	Pole + Reinf.	TP40.948x39.923x0.625	Reinf. 1 Tension Rupture	76.0%	Pass
12.83 - 7.83	Pole + Reinf.	TP41.974x40.948x0.625	Reinf. 1 Tension Rupture	77.1%	Pass
7.83 - 2.83	Pole + Reinf.	TP42.999x41.974x0.6125	Reinf. 1 Tension Rupture	78.1%	Pass
2.83 - 0	Pole + Reinf.	TP43.58x42.999x0.6125	Reinf. 1 Tension Rupture	78.6%	Pass
				Summary	
			Pole	67.6%	Pass
			Reinforcement	78.6%	Pass
			Overall	78.6%	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	R10	R11	R12
140 - 135	486	n/a	486	13.48	n/a	13.48	7.0%												
135 - 130	580	n/a	580	14.31	n/a	14.31	13.6%												
130 - 125	686	n/a	686	15.13	n/a	15.13	22.9%												
125 - 120	805	n/a	805	15.96	n/a	15.96	31.0%												
120 - 115	936	n/a	936	16.78	n/a	16.78	37.7%												
115 - 110	1081	n/a	1081	17.60	n/a	17.60	43.5%												
110 - 105	1240	n/a	1240	18.43	n/a	18.43	51.9%												
105 - 102.33	1330	n/a	1330	18.87	n/a	18.87	56.5%												
102.33 - 102.08	1339	685	2024	18.91	8.76	27.67	36.5%							51.5%					
102.08 - 97.08	1522	742	2264	19.73	8.76	28.49	43.2%							60.0%					
97.08 - 95	1603	766	2369	20.08	8.76	28.84	46.1%							63.5%					
95 - 90.75	2193	282	2475	25.40	12.00	37.40	55.2%												51.6%
90.75 - 85.75	2464	309	2772	26.43	12.00	38.43	60.2%												57.0%
85.75 - 85.33	2487	311	2798	26.52	12.00	38.52	60.5%												57.5%
85.33 - 85.08	2427	1799	4225	26.57	20.76	47.33	38.9%						55.0%						47.4%
85.08 - 82.5	2574	1868	4442	27.10	20.76	47.86	40.7%						57.4%						49.6%
82.5 - 82.25	2544	n/a	2544	27.16	n/a	27.16	67.6%												
82.25 - 77.15	2943	1986	4930	28.21	23.68	51.89	45.2%					61.7%						52.4%	
77.15 - 76.92	2958	1993	4951	28.25	23.68	51.93	45.3%					61.9%						52.5%	
76.92 - 71.92	3289	2136	5425	29.28	23.68	52.96	48.8%					65.8%						56.2%	
71.92 - 66.92	3644	2284	5928	30.32	23.68	54.00	52.1%					69.4%						59.6%	
66.92 - 66.67	3662	2292	5954	30.37	23.68	54.05	52.3%					69.5%						59.8%	
66.67 - 66.42	3568	2203	5771	30.42	16.95	47.37	47.6%				68.4%								
66.42 - 61.42	3943	2345	6288	31.45	16.95	48.40	50.6%				71.7%								
61.42 - 60	4054	2386	6440	31.74	16.95	48.69	51.4%				72.6%								
60 - 59.75	4081	2500	6581	31.79	22.95	54.74	53.8%				67.1%						56.8%		
59.75 - 54.75	4496	2725	7221	32.82	22.95	55.77	56.4%				69.9%						59.5%		
54.75 - 51	4820	2847	7667	33.60	22.95	56.55	58.6%				71.8%						61.4%		
51 - 45.5	5999	2731	8730	40.85	16.95	57.80	50.4%				73.8%								
45.5 - 44.25	6136	2770	8906	41.15	16.95	58.10	50.9%				74.3%								
44.25 - 44	6212	4564	10776	41.22	28.95	70.17	46.4%			63.3%						60.8%			
44 - 39	6786	4828	11614	42.45	28.95	71.40	48.2%			65.1%						62.7%			
39 - 34	7394	5100	12494	43.69	28.95	72.64	50.0%			66.8%						64.5%			
34 - 29	8038	5380	13417	44.92	28.95	73.87	51.7%			68.3%						66.2%			
29 - 27.75	8204	5451	13655	45.23	28.95	74.18	52.2%			68.7%						66.6%			
27.75 - 27.5	8205	5509	13714	45.30	28.95	74.25	51.2%			64.2%						66.7%			
27.5 - 24.08	8672	5707	14380	46.14	28.95	75.09	52.3%			65.2%						67.7%			
24.08 - 23.83	8713	3834	12547	46.20	30.73	76.93	59.5%		75.0%						59.2%				
23.83 - 18.83	9430	4030	13461	47.44	30.73	78.16	61.2%		76.3%						60.6%				
18.83 - 18.08	9541	4060	13601	47.62	30.73	78.35	61.4%		76.5%						60.8%				
18.08 - 17.83	9807	6225	16031	47.69	30.73	78.41	56.8%	74.8%							59.5%				
17.83 - 12.83	10580	6544	17124	48.92	30.73	79.65	58.3%	76.0%							60.7%				
12.83 - 7.83	11393	6871	18265	50.16	30.73	80.88	59.9%	77.1%							61.9%				
7.83 - 2.83	12247	7207	19454	51.39	30.73	82.12	61.3%	78.1%							63.0%				
2.83 - 0	12749	7401	20150	52.10	30.73	82.82	62.2%	78.6%							63.6%				

Note: Section capacity checked in 5 degree increments.

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876335*
Site Name: *East Farmington*
App #:

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	49.5	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	6	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	43.58	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	2158	ft-kips
Factored Axial, Pu:	45	kips
Factored Shear, Vu:	28	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	177.7 Kips
Axial Design Strength, Φ*Fu*Anet:	260.0 Kips
Anchor Rod Stress Ratio:	68.3% **Pass**

Base Plate Results	Flexural Check
Base Plate Stress:	27.8 ksi
PL Design Bending Strength, Φ*Fy:	45.0 ksi
Base Plate Stress Ratio:	61.8% **Pass**

PL Ref. Data
Yield Line (in): 26.42
Max PL Length: 26.42

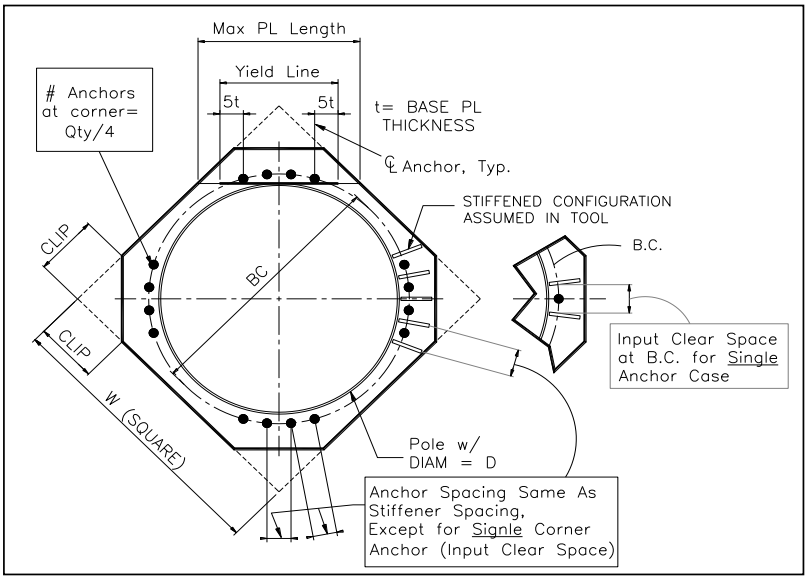
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A



** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

FDH VELOCITEL
ENGINEERING INNOVATION

Version: 1.4
Version Date: 9/21/2016

FDH Velocitel -- 6521 Meridien Drive, Raleigh, NC 27616 -- Ph. 919.755.1012 -- Fax 919.755.1031

Monopole Anchor Rod Modifications

Project & Site Details	
Project No.	16PYKA1400
Project Name	East Farmington
Site ID	876335
Date	December 30, 2016
Code	ANSI/TIA-222-G
Maximum Stress Ratio	105%

Tower Reactions		
Moment	2742	k-ft
Axial	45	k
Shear	28	k

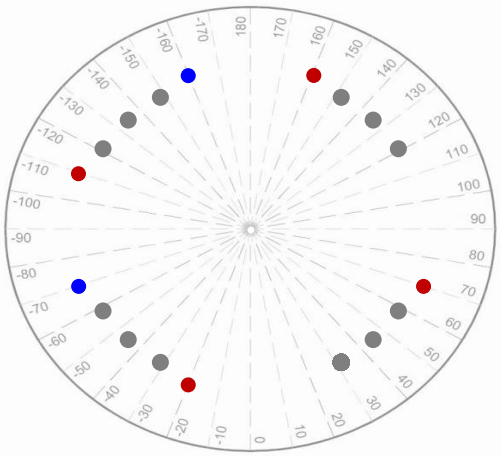
Optional Inputs	
Axis Angle to 0° (°)	149
Additional Inertia (in^4)	0

Centroid		
x	-1.3394	in
y	0.6246	in

Existing Anchor Rod Input		
Anchor Rods	Y	(Y/N)
Base Plate Type	Square	
Quantity	12	Rods
Grade	A615-75	
Thread Form	Non-Upset	
Diameter	2.25	in
Bolt Circle	51	in
Angle to 0° of First Rod		
Spacing	6	in
Detail Type	c	
l_{ar}		
η	0.55	

Foundation Input		
Pier Diameter	8	ft
f'c, Pier Concrete Strength	3000	psi
fy, Rebar Yield Strength	60	psi
Vertical Rebar Size	#11	
Vertical Rebar Quantity		Bars
Horizontal Rebar Size	#5	
Side Cover	3	in
Top Cover	3	in
τ, Ultimate Bond Resistance	1.8	ksi
Vertical Bar Diameter	1.41	in
Horizontal Bar Diameter	0.625	in
Rebar Cage Circle	87.34	in

Moment of Inertia		
	I (in^4)	Angle (°)
Min.	20665.5	155
Max.	20801.3	65
Current	**20667.0**	**149**



Post-Installed Anchor Rods		
Quantity	6	Rods
Any Symmetric Rods?		(Y/N)

Individual Post-Installed Anchor Rod Input

Name	Angle	Axis Angle of Max (°)	Axial Force (kips)	Allow. Axial (kips)	Controlling	Percentage	Pass/Fail
AR1	70	159.5	110.9	176.0	Eccentric Weld to Sleeve	63.0%	Pass
AR1	160	67.0	104.3	176.0	Eccentric Weld to Sleeve	59.2%	Pass
AR1	-110	160.0	99.7	176.0	Eccentric Weld to Sleeve	56.6%	Pass
AR1	-20	73.0	105.3	176.0	Eccentric Weld to Sleeve	59.8%	Pass
AR2	-160	108.0	100.9	168.0	Eccentric Weld to Sleeve	60.0%	Pass
AR2	-70	22.0	100.9	168.0	Eccentric Weld to Sleeve	60.0%	Pass
Existing Rods		149.0	177.7	260.0	Shear-Tension Interaction	68.4%	Pass

Overall	68.4%	Pass

Post-Installed Anchor Rod Summary

Post-Installed Anchor Rods						Anchor Rod Sleeve		Transfer Plate	
Assembly Name	Diameter (in)	Grade	Bolt Circle (in)	Target Tension (kips)	Required Embedment (ft)	Member	Grade	Dimensions (H" x W" x T")	Grade
AR1	1.75	A193 B7	54.08	111	3.20	P3x.600 (3.5 OD)	A572-65	24 x 3 1/2 x 1 1/4	A572-65
AR2	1.75	A193 B7	54	111	3.20	P4x.674 (4.5 OD)	A53-B-35	36 x 3 x 1 1/4	A572-65

Anchor Rod Colors	
Apply New Rod Colors	
AR1	
AR2	

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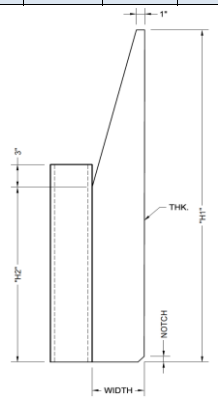
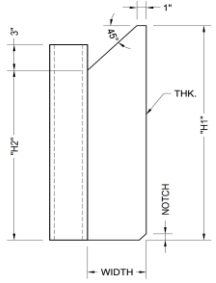
Anchor Rod Assembly Database

Anchor Rod								Anchor Rod Sleeve					Transfer Plate									
Assembly Name	Grade	Thread Form	Diameter (in)	Bolt Circle (in)	Unbraced Length (in)	Installed Through Base Plate? (Y/N)	Breaker Bond Tape Length (in)	Sleeve Member Type	Sleeve Member	Sleeve Grade	Analysis/ Design	AISC Sleeve Comp. Equation (13th Ed.)	Detail	Width (in)	Thickness (in)	Overall Height "H1" (in)	Term Height "H2" (in)	Notch (in)	Plate Grade	Weld Electrode (ksi)	Vert. Weld to Pole Size (in)	Vert. Weld to Sleeve Size (in)
AR1	A193 B7	Non-Upset	1.75	54.08	0	Y	0	Pipe	P3x.600 (3.5 OD)	A572-65	Analysis	J4-6	1	3.5	1.25	24	10.5	0.75	A572-65	80	3/8	3/8
AR2	A193 B7	Non-Upset	1.75	54	0	Y	0	Pipe	P4x.674 (4.5 OD)	A53-B-35	Analysis	J4-6	1	3	1.25	36	10.5	0.75	A572-65	80	3/8	3/8



Detail 1



Detail 2

FDH VELOCITEL
ENGINEERING INNOVATION

Version:	2.4
Version Date:	10/31/2016

FDH Velocitel -- 6521 Meridien Drive, Raleigh, NC 27616 -- Ph. 919.755.1012 -- Fax 919.755.1031

Base Transfer Stiffener

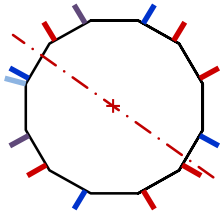
Project & Site Details	
Project No.	16PYKA1400
Project Name	East Farmington
Site ID	876335
Date	December 30, 2016
Code	ANSI/TIA-222-G
Maximum Stress Ratio	105%

Tower Reactions		
Moment	2742	k-ft
Axial	45	kips
Shear	28	kips

Optional Inputs	
Axis Angle to 0° (°)	54
Additional Inertia (in^4)	

Pole Properties		
Pole Diameter	43.58	in
Pole Thickness	0.375	in
Pole Grade	A607-65	
Number of Sides	12	Sided

Centroid		
x	-0.3073	in
y	0.2177	in



Moment of Inertia		
	I (in^4)	Angle (°)
Min.	31017.1	75
Max.	35432.3	165
Current	**31587.8**	**54**

Stiffener Properties		
Stiffener Quantity	13	Stiffeners
Any Symmetric Plates?		(Y/N)

Individual Stiffener Input

Stiffener Name	Angle to 0° (°)	Axis Angle of Max (°)	Controlling Case	Percentage	Pass/Fail
1. PL 6x1.25	20	104	Horizontal Weld	91.2%	Pass
1. PL 6x1.25	50	134	Horizontal Weld	85.5%	Pass
1. PL 6x1.25	110	27	Horizontal Weld	86.7%	Pass
1. PL 6x1.25	140	54	Horizontal Weld	91.8%	Pass
1. PL 6x1.25	-140	122	Horizontal Weld	85.0%	Pass
2. PL 6x1.25	-105	165	Horizontal Weld	71.7%	Pass
1. PL 6x1.25	-50	47	Horizontal Weld	90.0%	Pass
3. PL 3.5x1.25	70	158	Horizontal Weld	69.2%	Pass
3. PL 3.5x1.25	160	70	Horizontal Weld	77.5%	Pass
3. PL 3.5x1.25	-110	159	Horizontal Weld	67.1%	Pass
3. PL 3.5x1.25	-20	72	Horizontal Weld	78.2%	Pass
4. PL 3x1.25	-160	103	Horizontal Weld	73.2%	Pass
4. PL 3x1.25	-70	28	Horizontal Weld	70.3%	Pass
Pole		75	Stress	36.7%	Pass
			Overall	**91.8%**	**Pass**

Stiffener Input

Stiffener Name	Width (in)	Thickness (in)	Considering Plate Capacity (Y/N)	Height (in)	Notch (in)	Offset from Pole (in)	Grade	Weld Electrode (ksi)	Vertical Weld Size (in)	Horizontal Weld Type	Groove Angle (°)	Horizontal Groove Size (in)	Horizontal Fillet Size (in)
1. PL 6x1.25	6	1.25	Y	36	0.75	0	A572-65	70	3/8	Double Sided	0	0	0.5
2. PL 6x1.25	6	1.25	Y	36	0.75	0	A572-65	80	3/8	Double Sided	0	0	0.5
3. PL 3.5x1.25	3.5	1.25	Y	24	0.75	0	A572-65	80	3/8	Double Sided	0	0	0.5
4. PL 3x1.25	3	1.25	Y	36	0.75	0	A572-65	80	3/8	Double Sided	0	0	0.5

FDH VELOCITEL

ENGINEERING INNOVATION

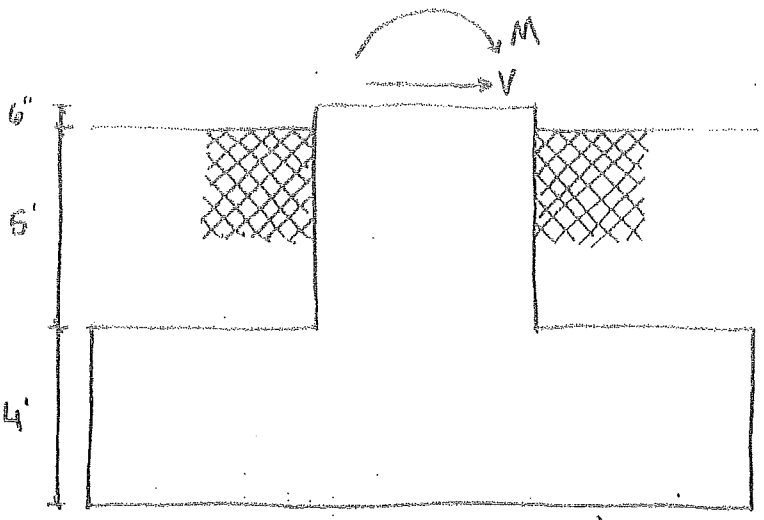
Project: East Farmington

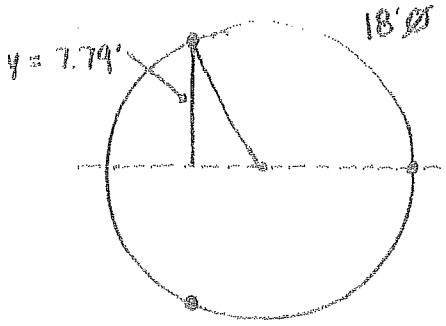
Sheet: 1 of 1 Date:

By: Project #:

Checked By: Drawing #:

Overturn Check





Allowable Uplift = 262 kips

TNX Reactions: M = 2742 k-ft

(Iterate Mpiles until = soil capacity)

$M_{piles} = 1180$ k-ft

$I = \Sigma y^2$
$= 2(7.79^2)$
$= 121.5 ft^2$

$T_u = \frac{M_T y}{I}$

$= \frac{1180 \text{ k-ft}(7.79 \text{ ft})}{121.5 ft^2} = 75.65 k$

$\frac{T_u}{\phi T_n} = \frac{75.65}{262} = 28.9\ \%$

SEE SOIL CHECK (BSPSQP)

$M_u = M_{tnx} - M_{piles}$
$= 2742 - 1180$
$= 1562$ k-ft

$\% = 28.7\%$

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

Site ID: *BU# 876335*
Site Name: *East Farmington*
Job No.: *16PYKA1400*

Loads Already Factored		
For P (DL)	1.2	<----Disregard
For P,V, and M (WL)	1.35	<----Disregard

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	9	ft
Pad Thickness, T:	4	ft
Pad Width=Length, L:	20	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	5.50	ft
Soil (above pad) Height:	5.00	ft

Soil Parameters		
Unit Weight, γ:	130.0	pcf
Ultimate Bearing Capacity, qn:	31.11	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	38.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	23.33	ksf
Passive Pres. Coeff., Kp	4.20	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	28.0	kips
Pad Force Location Above D:	1.81	ft
ϕ(Passive Pressure Moment):	50.67	ft-kips
Factored O.T. M(WL), "1.6W":	1835.0	ft-kips
Factored OT (MW-Msoil), M1	1784.33	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	3.91	ft
Sum of Soil Wedges Wt:	45.03	kips
Soil Wedges ecc, K1:	10.21	ft
Ftg+Soil above Pad wt:	511.2	kips
Unfactored (Total ftg-soil Wt):	556.23	kips
1.2D. **No Soil Wedges**.	658.44	kips
0.9D. **With Soil Wedges**	534.36	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	G	<--Pull Down
Factored DL Axial, PDu:	45	kips
Factored WL Axial, PWu:		kips
Factored WL Shear, Vu:	28	kips
Factored WL Moment, Mu:	1562	ft-kips

Load Factor	Shaft Factored Loads		
1.00	1.2D+1.6W, Pu:	45	kips
0.90	0.9D+1.6W, Pu:	33.75	kips
1.00	Vu:	28	kips
	Mu:	1562	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	658.44	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	1784.33	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	2.71	ft
Orthogonal qu=	2.54	ksf
qu/ϕ*qn Ratio=	**10.88%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	1.92	ft
Diagonal qu=	2.52	ksf
qu/ϕ*qn Ratio=	**10.80%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	534.36	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	1370.65	ft-kips

Orthogonal ecc3 = M2/P2 =	2.57	ft
Ortho Non Bearing Length,NBL=	5.13	ft
Orthogonal qu=	2.02	ksf
Diagonal qu=	1.99	ksf

Max Reaction Moment (ft-kips) so that qu=ϕ*qn = 100% Capacity Rating

Actual M:	1562.00	
M Orthogonal:	5443.17	**28.70%**
M Diagonal:	5443.17	**28.70%**

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876335*
Site Name: *East Farmington*
App #:

Loads Already Factored		
For M (WL)	1.3	<----Disregard
For P (DL)	1.3	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	9.02	ft
Concrete Area =	9201.6	in^2

Reinforcement:

Clear Cover to **Tie**=	3	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	8.30	ft
Vert. Cage Diameter =	99.58	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	24	
As Total=	37.44	in^2
A s/ Aconc, Rho:	0.0041	0.41%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.41%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	13319.86	kips
at Mu=(ϕ=0.65)Mn=	10552.30	ft-kips
Max Tu, (φ=0.9) Tn =	2021.76	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	2896	ft-kips **(* Note)**
Max. Factored Shaft Pu:	45	kips
Max Axial Force Type:	Tension	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	**Shaft Factored Loads**		
1.00	Mu:	2896	ft-kips
1.00	Pu:	45	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2008

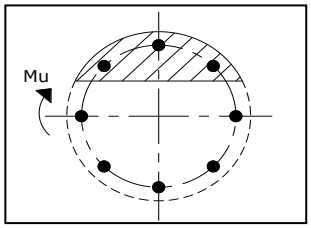
Seismic Properties

Seismic Design Category =	B
Seismic Risk =	**Low**

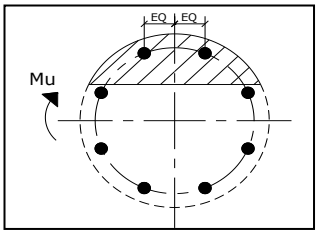
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **1**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**13.73**	in
Extreme Steel Strain, ϵt:	**0.0197**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

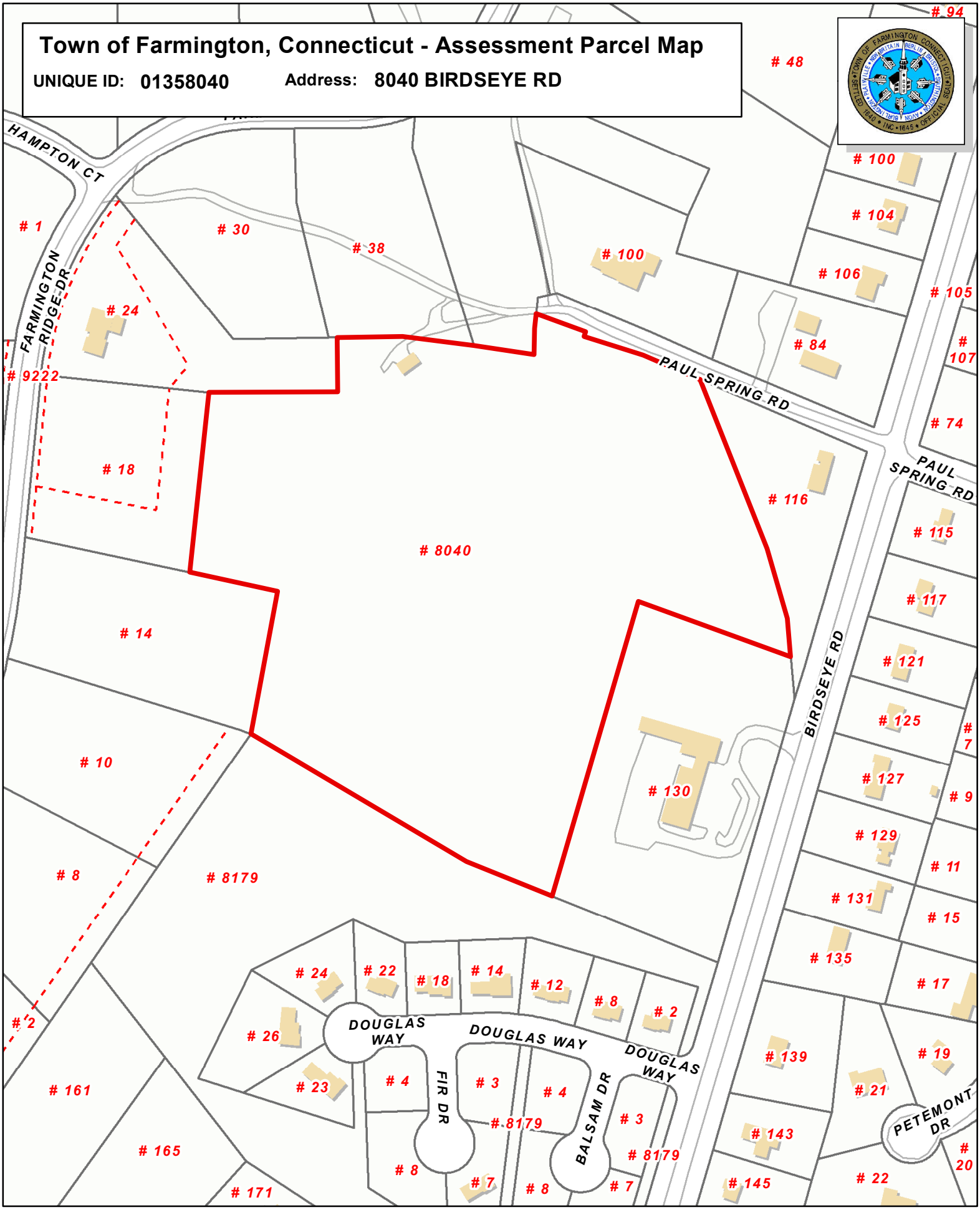
Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	-45.00	kips
Drilled Shaft Moment Capacity, φMn:	**7681.38**	ft-kips
Drilled Shaft Superimposed Mu:	**2896.00**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**37.7%**

Town of Farmington, Connecticut - Assessment Parcel Map

UNIQUE ID: 01358040 **Address:** 8040 BIRDSEYE RD



Map Produced Sept 2016

Approximate Scale: 1 inch = 200 feet

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2012.

Information on the Property Records for the Municipality of Farmington was last updated on 3/2/2017.

Parcel Information

Location:	8040 BIRDSEYE RD	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	01358040	Map Block Lot:	0119 3A	Acres:	13.53
490 Acres:	0.00	Zone:	R80	Volume / Page:	0928/0470
Developers Map / Lot:		Census:	4602-02		

Value Information

	Appraised Value	70% Assessed Value
Land	369,900	258,930

	Appraised Value	70% Assessed Value
Buildings	0	0
Detached Outbuildings	0	0
Total	369,900	258,930

Owner's Information

Owner's Data
GOIS HOLDINGS OF CONNECTICUT LLC%P GOIS,GOIS BROADCASTING 135 BURNSIDE AVE EAST HARTFORD, CT 06108

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
GOIS HOLDINGS OF CONNECTICUT	0928	0470	04/09/2008		No	$518,000
CELL TOWER LEASE	0862	0083	12/07/2005		No	$0
UNISON SITE MANAGEMENT LLC	0862	0062	12/07/2005		No	$385,000
FREEDON COMMUNICATIONS OF	0809	0324	06/15/2004		No	$280,000
MEGA BROADCASTING	0530	0225	12/17/1996		No	$75,000
MEGA COMMUNICATIONS OC NB LL	0585	0272			No	$0
AMERICAN RADIO SYSTEMS INC	0484	0674			No	$0

Mark Roberts

From: Sandra Michaud <michauds@farmington-ct.org>
Sent: Monday, February 27, 2017 4:16 PM
To: Mark Roberts
Subject: 130 Birdseye Road

Hi Mark

I was able to go through documents for this address and it appears on November 4, 1997 a federal judge ordered the Town (within 20 days) to issue a zoning permit so that Sprint Spectrum could install a 140 foot high communications tower. I do not have an approval letter from the Plan & Zoning Commission as it appears they did not formally make a decision in support of the Court's Order but a zoning permit was issued on November 26, 1997.

The Town did appeal this Order but did later withdraw in March 1998.

Sandy

Sandra Michaud
Land Use Coordinator
Town of Farmington
Planning Division
Department of Public Works
1 Monteith Drive
Farmington, CT 06032
860.675.2325 Office
860.675.2319 Fax

DIV. SITE ACQUISITION, LLC
27 NORTHWESTERN DRIVE
SALEM, NH 03079

BANK OF AMERICA 54-49/114

56662

Pay: ****************************Six hundred twenty-five dollars and no cents

DATE	CHECK NO.	AMOUNT
January 20, 2017	56662	$********625.00

PAY TO THE ORDER OF
Connecticut Siting Council
10 Franklin Sq
New Britain, CT 06051

⑈056662⑈ ⑆011400495⑆ 000089877441⑈

SAI
DIV. SITE ACQUISITION, LLC

56662

CONN03 Connecticut Siting Council

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DEDUCTION	BALANCE
1-20-17	CR012017H	CT5255-CSC Filing Fe	625.00		625.00
CHECK DATE 1-20-17	CHECK NUMBER 56662	TOTALS	625.00		625.00