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

February 2, 2018

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)
92 Weston Street, Hartford, CT 06120 – CT5152
N 41-47-12.20
W 72-39-44.24

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 90-foot level of the existing 110-foot Monopole at 92 Weston Street, Hartford, CT. The tower is owned by Crown Castle. The property is owned by Albemarle Weston Street LLC. AT&T now intends to remove three (3) of its existing antennas and replace them with three (3) CCI HPA-65R-BUU-H6 antennas and add three (3) Ericsson RRUS-32 B66 remote radio units. These antennas and RRUs would be installed at the 90-foot level of the tower.

This facility was approved by the City of Hartford on November 26, 1996. Communications Towers were a permitted use as of right in the underlying Industrial Zone and a Building Permit was issued, therefore there were no condition(s) that could feasibly be violated by this modification, including total facility height or mounting restrictions. 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 The Honorable Luke Bronin, Mayor of the City of Hartford, as elected official, and the City of Hartford

Planning Department as well as the tower and property owners.

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.

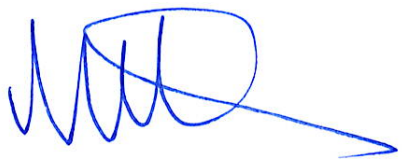
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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: The Honorable Luke Bronin - Elected Official
Caitlin Palmer – Chief of Zoning Administration
Albemarle Weston Street LLC – Property Owner
Crown Castle - 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*							13.08%
AT&T LTE	2	1313	90	0.1388	734	0.4893	2.74%
AT&T LTE	2	3664	90	0.3735	1900	1.0000	3.73%
AT&T LTE	2	1791	90	0.1826	2300	1.0000	1.83%
AT&T UMTS	2	565	90	0.0576	880	0.5867	0.98%
AT&T UMTS	4	525	90	0.1070	1900	1.0000	1.07%
AT&T GSM	1	283	90	0.0144	880	0.5867	0.25%
Site Total							23.68%

*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*							13.08%
AT&T LTE	1	1475	90	0.0752	734	0.4893	1.54%
AT&T LTE	2	4842	90	0.4936	1900	1.0000	4.94%
AT&T LTE	1	5070	90	0.2584	2100	1.0000	2.58%
AT&T LTE	1	1285	90	0.0655	2300	1.0000	0.65%
AT&T UMTS	2	320	90	0.0326	880	0.5867	0.56%
AT&T UMTS	1	379	90	0.0193	1900	1.0000	0.19%
Site Total							23.54%

*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

Note: Proposed Loading may also include corrections to certain Existing Loading values

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:
- INSTALL NEW ANTENNA (HPA-65R-BUU-H6) (TYP. OF 1 PER SECTORS, TOTAL OF 3).
- INSTALL NEW RRUS: RRUS-32 B66 (AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW JUMPER CABLES: COAX JUMPER (1) PER SECTOR FROM EACH RRU (TOTAL OF 3)
- NEW FIBER JUMPERS: FIBER JUMPERS (1) FROM THE SQUID TO EACH RRU (TOTAL OF 3)

ITEMS TO BE MOUNTED INSIDE EXISTING EQUIPMENT SHELTER:
- INSTALL XMU.

ITEMS TO REMAIN:
- (6) ANTENNAS, (9) RRU'S, (1) SURGE ARRESTOR, (12) COAX (2) DC POWER CABLES, & (1) FIBER RUN.

SITE ADDRESS:	92 WESTON STREET HARTFORD, CT 06120
LATITUDE:	41.7863919° N 41° 47' 11.01" N
LONGITUDE:	72.662498° W 72° 39' 44.99" W
TYPE OF SITE:	MONOPOLE / OUTDOOR EQUIPMENT
TOWER HEIGHT:	110'±
RAD CENTER:	90'-0"±
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

at&t

SITE NUMBER: CT5152

SITE NAME: HARTFORD NORTH

PROJECT: LTE 4C 2018 UPGRADE

DRAWING INDEX

CROWN CASTLE SITE ID: 876325

SITE NAME: WESTON SQUARE

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.2 MI. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD. 10.6 MI. TAKE THE JENNINGS ROAD EXIT, EXIT 33. 0.3 MI. TURN RIGHT ONTO JENNINGS RD. 0.1 MI. TURN LEFT TO STAY ON JENNINGS RD. 0.4 MI. TURN LEFT ONTO WESTON ST. 0.1 MI. END AT 92 WESTON ST HARTFORD, CT 06120.

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455

OR CALL 811

UNDERGROUND SERVICE ALERT

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

12 INDUSTRIAL WAY.
SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
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92 WESTON STREET
HARTFORD, CT 06120
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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A	1/23/18	ISSUED FOR REVIEW	RB	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT — DEREK J. PHELPS — 21632 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	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 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 Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY.
SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
CROWN SITE ID: 876325

92 WESTON STREET
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at&t
550 COCHITUATE ROAD
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT
DEREK J. CREASEY
No. 28587
LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	GN-1	1

NOTE:

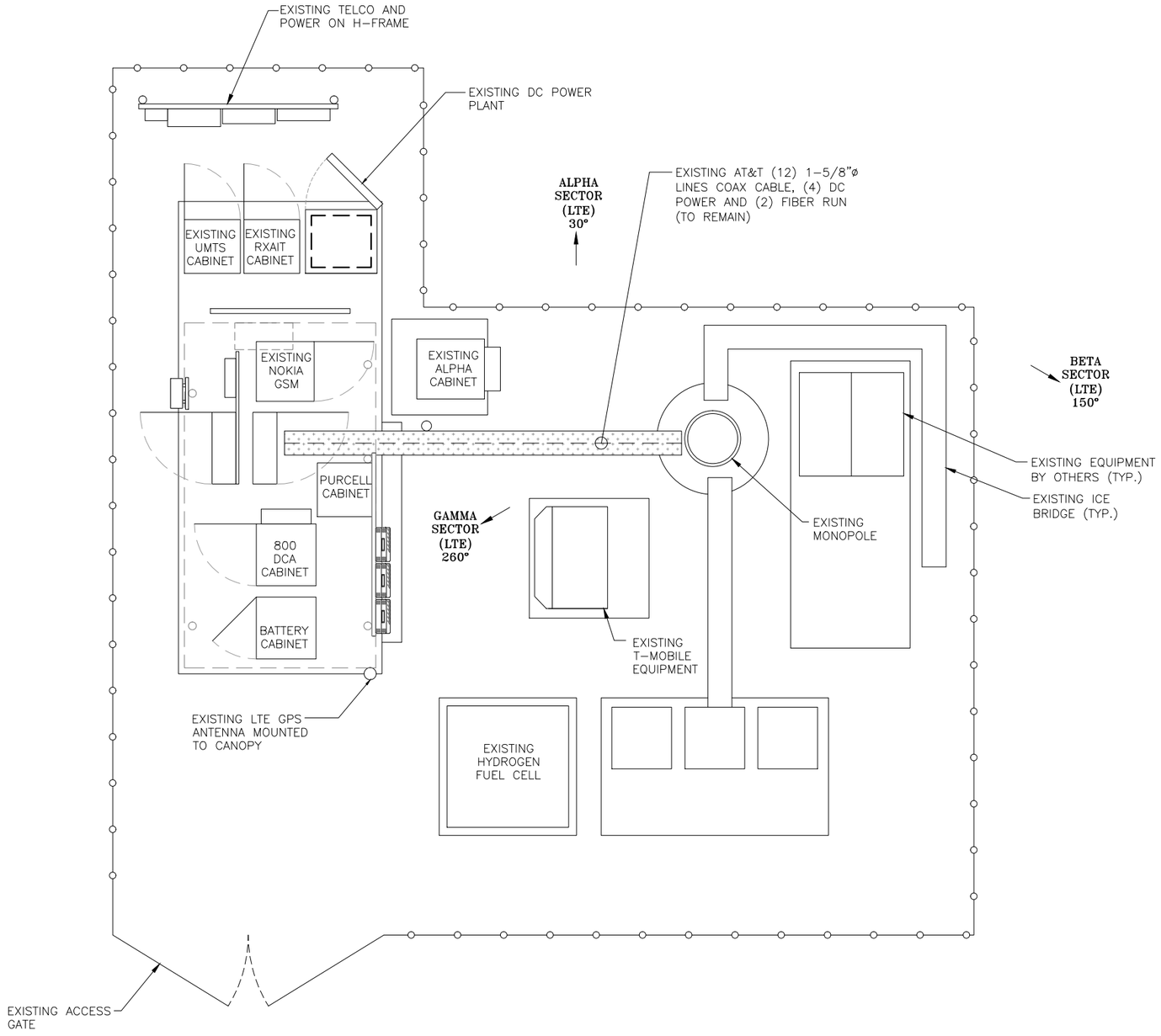
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 24, 2018

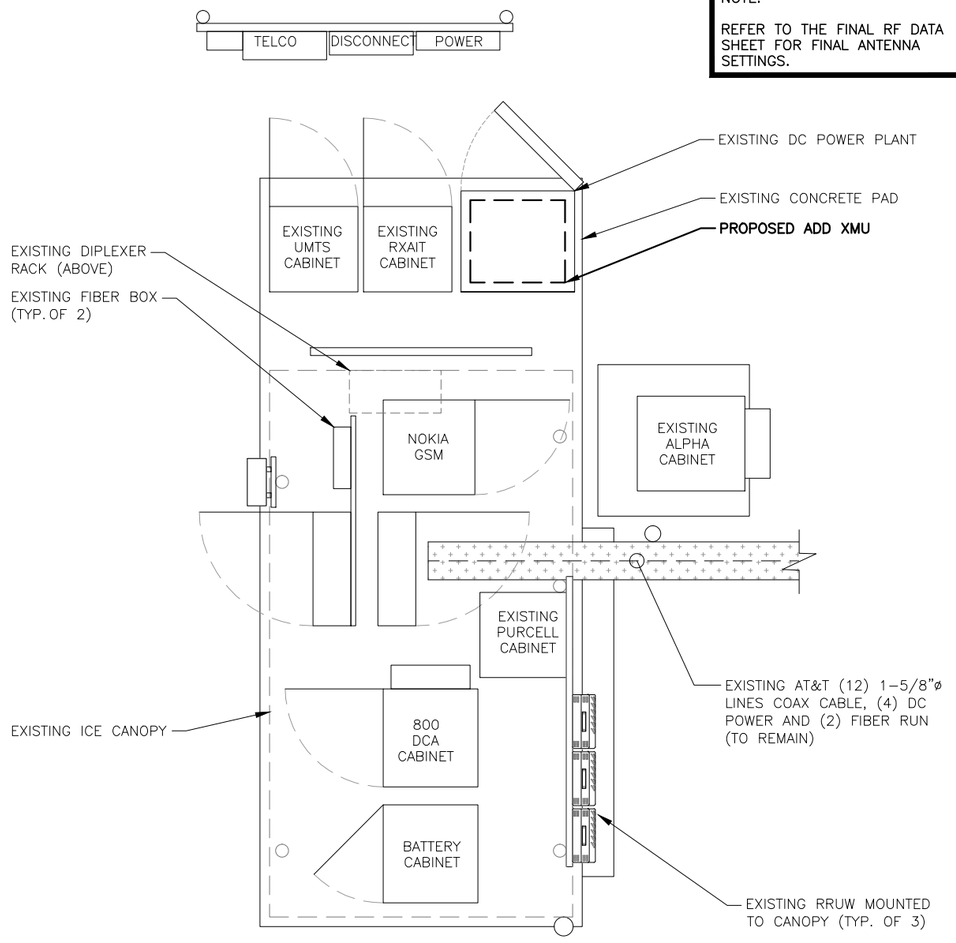
NOTE:

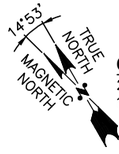
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

NOTE:

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

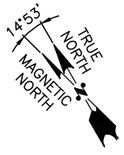






COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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



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

0 1'-0" 2'-0" 4'-0" 6'-0"

POWER PANEL NOTE:

1. ADD (9) 30A, & (3) 25A BREAKER IN EXISTING POWER PLANT

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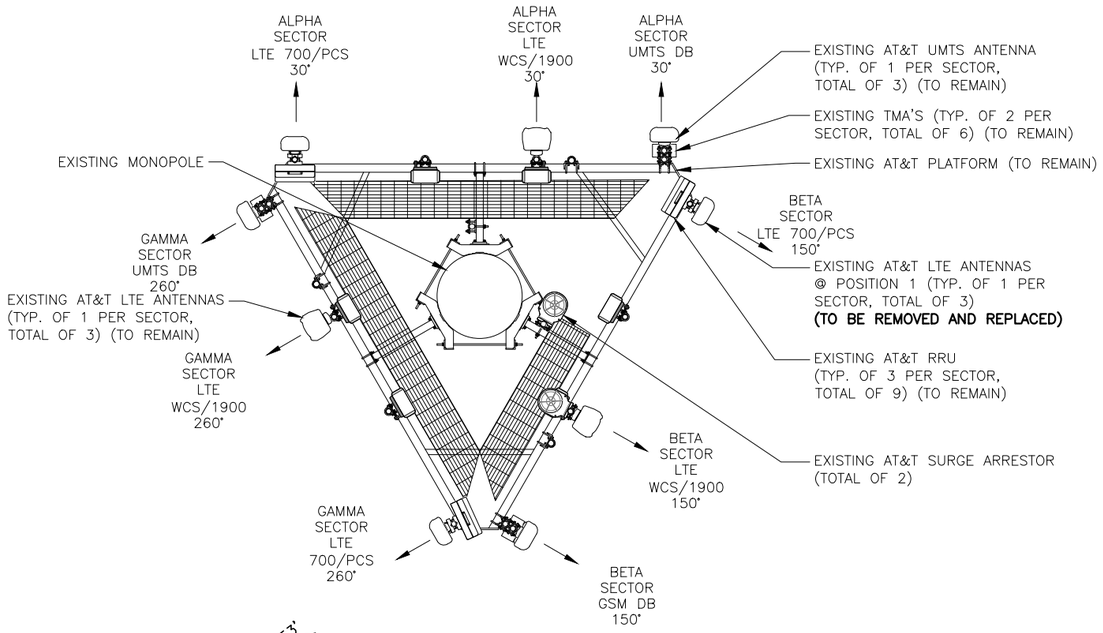
STATE OF CONNECTICUT — DEREK J. CREASEY — No. 23587 — LICENSED PROFESSIONAL ENGINEER

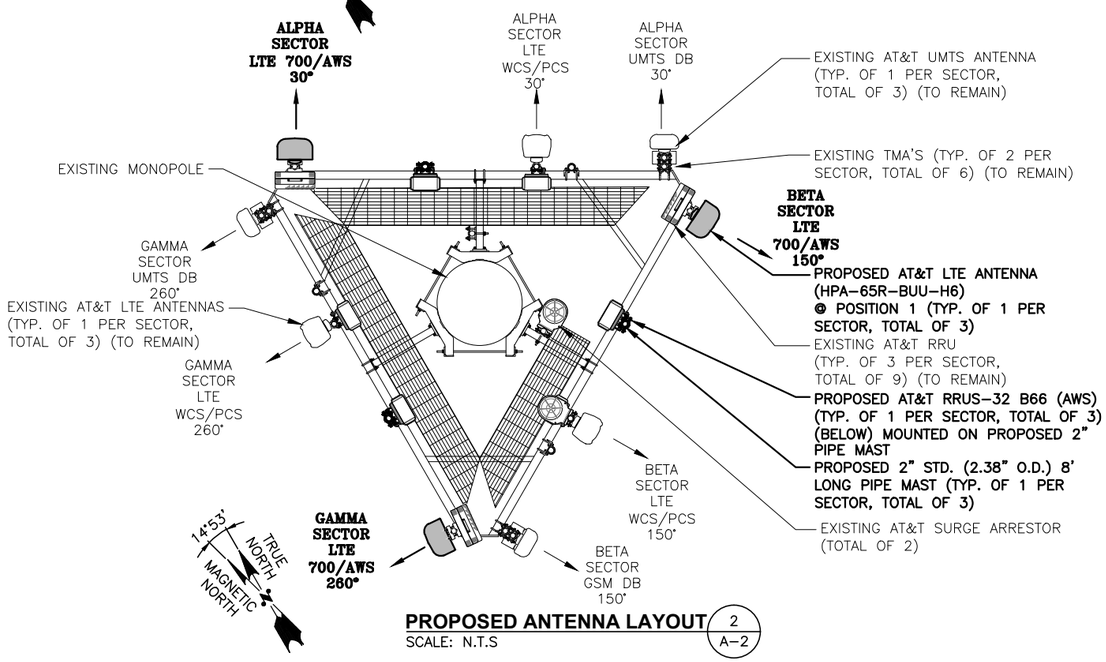
AT&T

COMPOUND & EQUIPMENT PLANS
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	A-1	1



EXISTING ANTENNA LAYOUT (1 / A–2)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A–2)
SCALE: N.T.S

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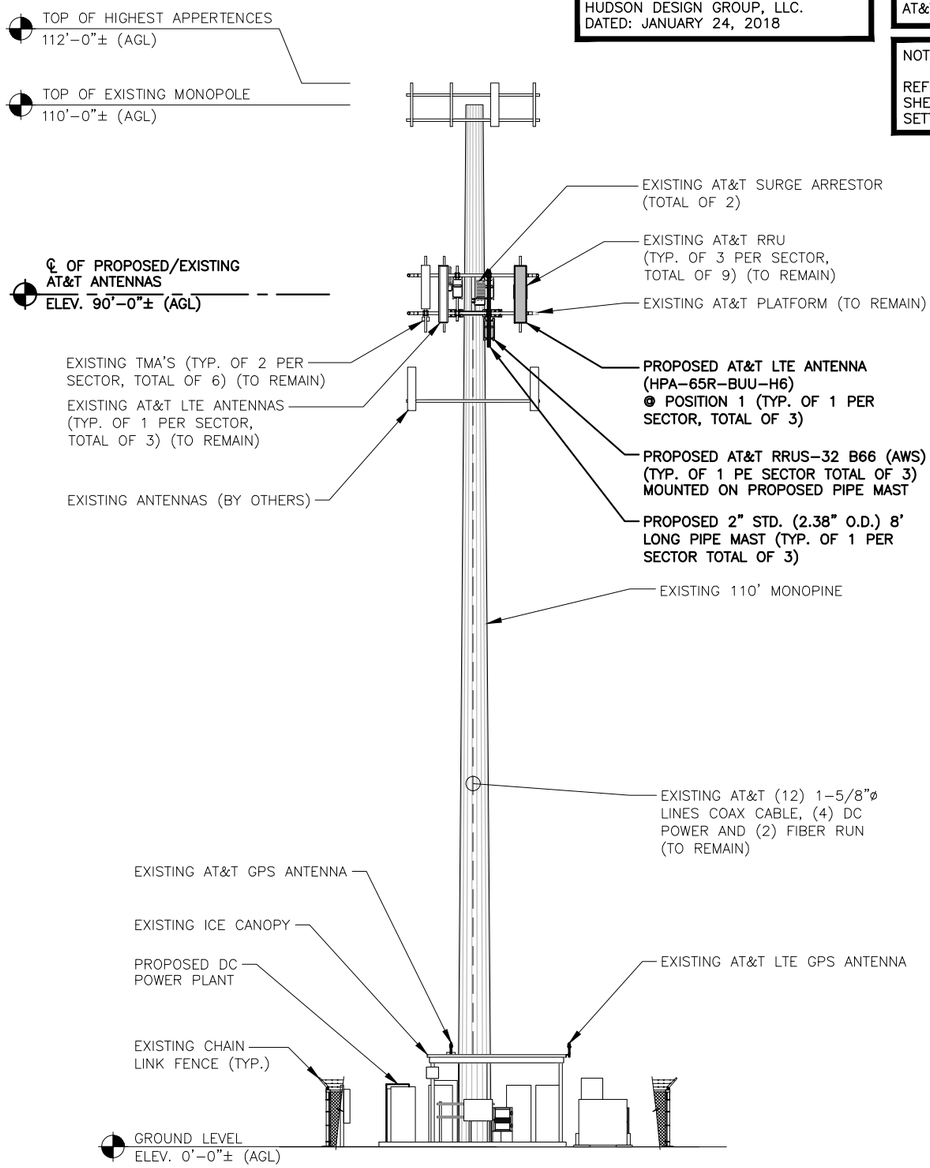
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



ELEVATION (3 / A–2)
22x34 SCALE: 1/8"=1'–0"
11x17 SCALE: 1/16"=1'–0"

0 4'–0" 8'–0" 16'–0" 24'–0"

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

12 INDUSTRIAL WAY.
SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
CROWN SITE ID: 876325

92 WESTON STREET
HARTFORD, CT 06120
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	1/31/18	ISSUED FOR CONSTRUCTION	SG	AT	DJC
A	1/23/18	ISSUED FOR REVIEW	RB	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT — JEREMY J. CRAM — No. 23577 — LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	A–2	1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 24, 2018

NOTE:

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

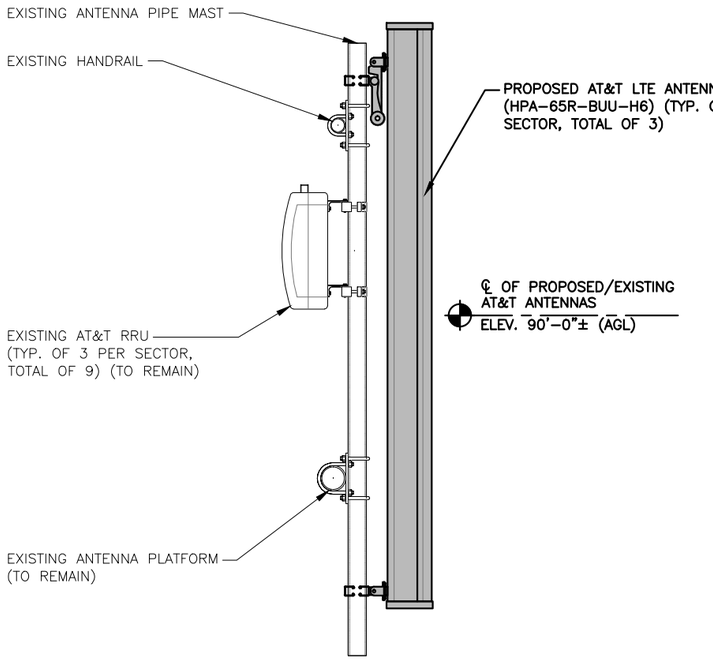
FINAL ANTENNA SCHEDULE

SECTOR	BAND	ANTENNA		SIZE (INCHES) (L X W X D)	RAD CENTER	AZIMUTH	TMA'S		DIPLEXERS		RRU'S		SIZE (INCHES) (L X W X D)	COAX JUMPERS	FIBER JUMPERS
ALPHA	LTE 700/AWS	PROPOSED	HPA-65R-BUU-H6	72X14.8X9	90'-0"±	30°	–	–	–	–	EXISTING PROPOSED	RRUS-11(700) RRUS-32 B66 (AWS)	19.7x17.0x7.2 27.2x12.1x7.0	– 2**	– 1*
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/PCS	EXISTING	QS66512-2	72X12X9.6	90'-0"±	30°	–	–	–	–	EXISTING EXISTING	RRUS-30 RRUS-32 B2	– –	– –	– –
	UMTS DB	EXISTING	7770	55X11X5	91'-0"±	30°	–	–	EXISTING	LGP21901	–	–	–	–	–
BETA	LTE 700/AWS	PROPOSED	HPA-65R-BUU-H6	72X14.8X9	90'-0"±	150°	–	–	–	–	EXISTING PROPOSED	RRUS-11(700) RRUS-32 B66 (AWS)	19.7x17.0x7.2 27.2x12.1x7.0	– 2**	– 1*
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/PCS	EXISTING	QS66512-2	72X12X9.6	90'-0"±	150°	–	–	–	–	EXISTING EXISTING	RRUS-30 RRUS-32 B2	– –	– –	– –
	UMTS DB	EXISTING	7770	55X11X5	91'-0"±	150°	–	–	EXISTING	LGP21901	–	–	–	–	–
GAMMA	LTE 700/AWS	PROPOSED	HPA-65R-BUU-H6	72X14.8X9	90'-0"±	260°	–	–	–	–	EXISTING PROPOSED	RRUS-11(700) RRUS-32 B66 (AWS)	19.7x17.0x7.2 27.2x12.1x7.0	– 2**	– 1*
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/PCS	EXISTING	QS66512-2	72X12X9.6	90'-0"±	260°	–	–	–	–	EXISTING EXISTING	RRUS-30 RRUS-32 B2	– –	– –	– –
	UMTS DB	EXISTING	7770	55X11X5	91'-0"±	260°	–	–	EXISTING	LGP21901	–	–	–	–	–

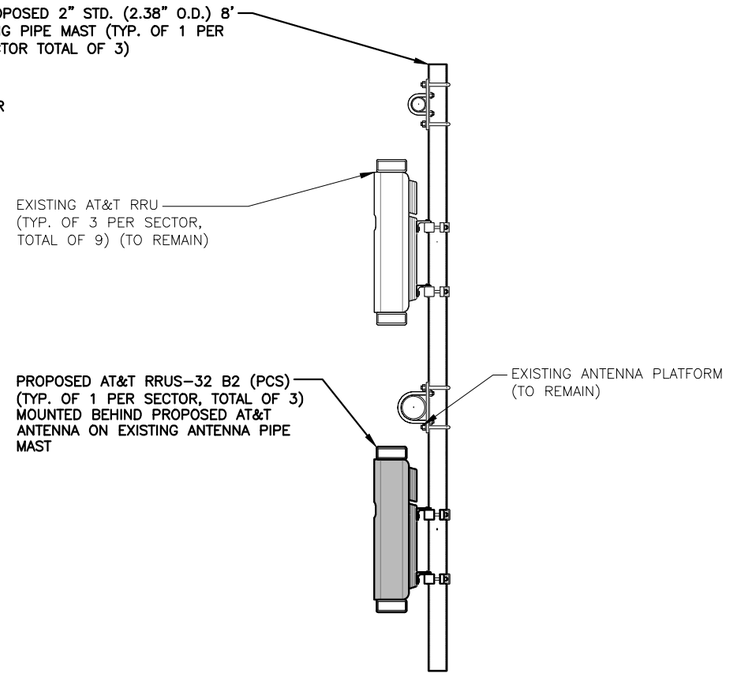
FINAL ANTENNA CONFIGURATION TABLE (4 / A-3)

*COAX JUMPER NOTE:
COAX JUMPERS (1) PER SECTOR, FROM EACH RRU (TOTAL OF 3).

**FIBER JUMPER NOTE:
FIBER JUMPERS (1) PER SECTOR, FROM THE SQUID TO EACH RRU (TOTAL OF 3).



PROPOSED ANTENNA MOUNTING DETAIL (1 / A-3)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"



PROPOSED RRH MOUNTING DETAIL (2 / A-3)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"

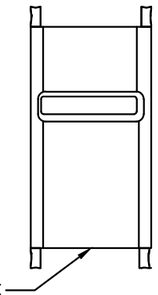
RRU CHART

QUANTITY	MODEL	L	W	D
3(E)	RRUS-11	19.7"	17.0"	7.2"
6(E) 3(P)	RRUS-32	27.2"	12.1"	7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:

SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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

HUDSON Design Group LLC
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at&t
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A	1/23/18	ISSUED FOR REVIEW	RB	AT	DJC

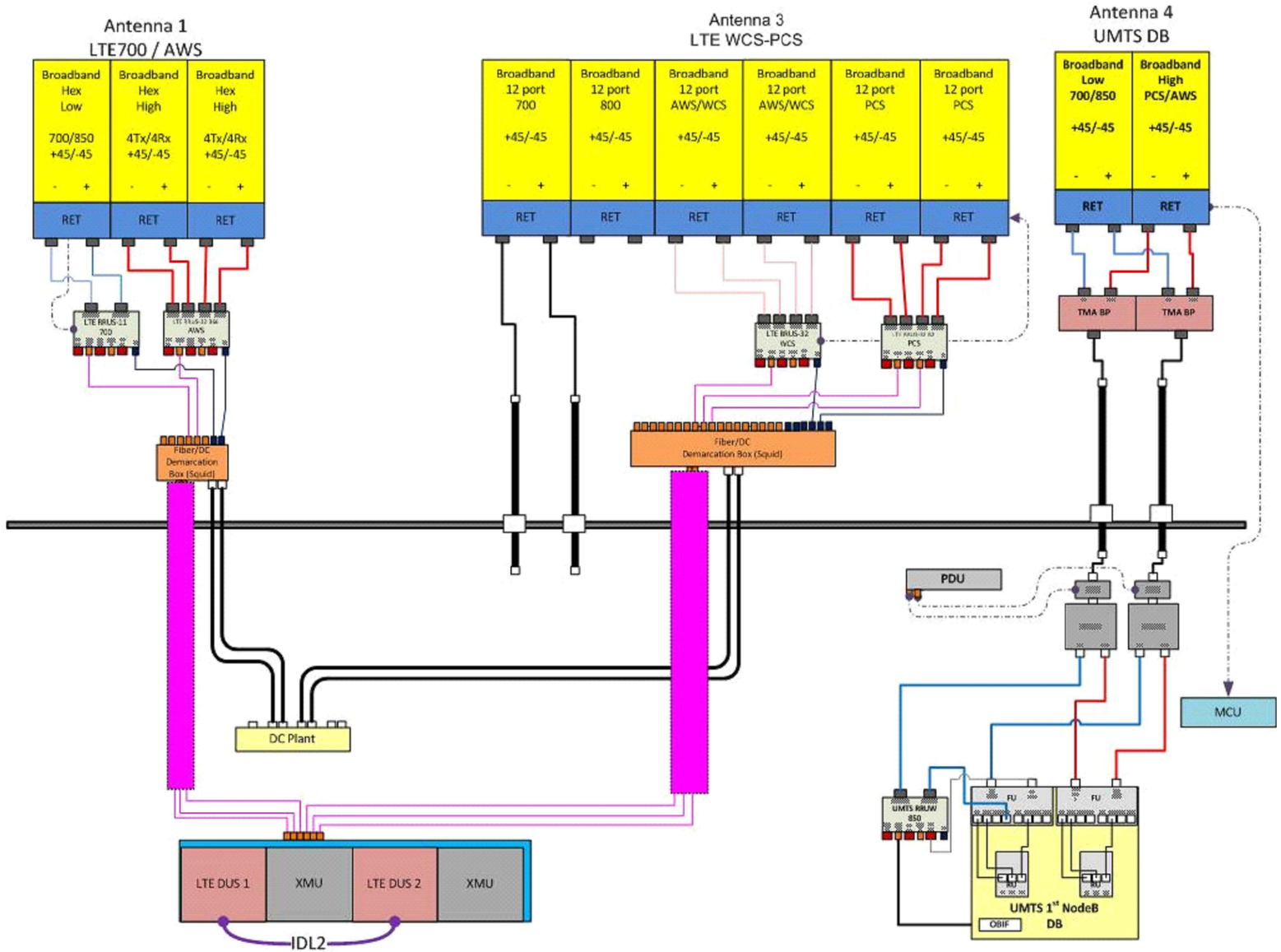
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT
DEREK J. CREASEY
NO. 28551
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	A-3	1



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

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

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

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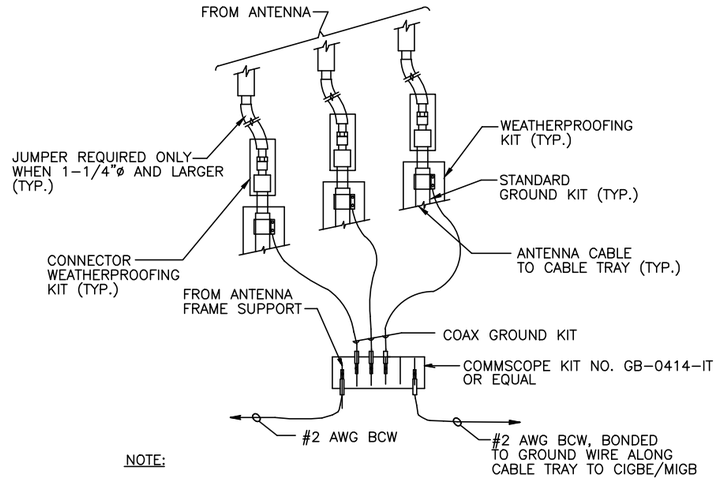
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT · DEREK J. CREASEY · No. 23557 · LICENSED PROFESSIONAL ENGINEER

AT&T

RF PLUMBING DIAGRAM
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	RF–1	1



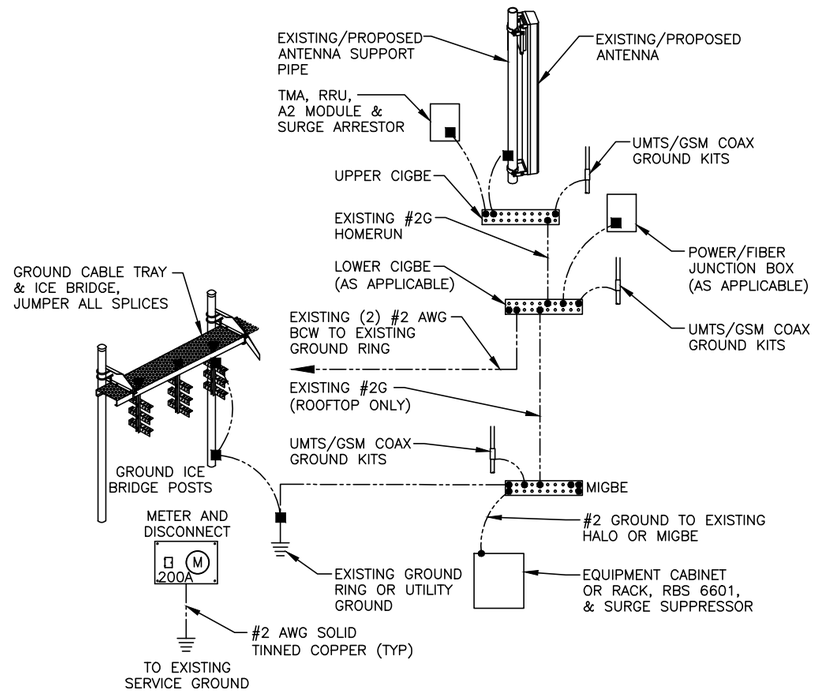
NOTE:

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

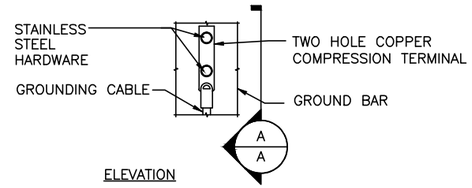
1 / G-1



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

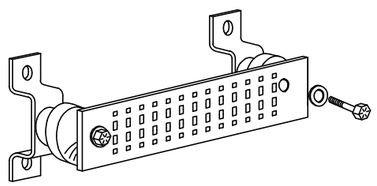
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: RB

STATE OF CONNECTICUT · DEREK J. CREASEY · NO. 27858 · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
(LTE 4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5152	G-1	1

Date: **January 11, 2018**

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

Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-8145

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5152
	Carrier Site Name:	HARTFORD NORTH
Crown Castle Designation:	**Crown Castle BU Number:**	876325
	Crown Castle Site Name:	WESTON SQUARE
	Crown Castle JDE Job Number:	477479
	Crown Castle Work Order Number:	1509095
	Crown Castle Application Number:	420734 Rev. 2
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	194393
Site Data:	**92 Weston Street, Hartford, Hartford County, CT** **Latitude *41° 47' 12.3"*, Longitude *-72° 39' 44.42"*** **110 Foot - Monopole Tower**	

Dear Charles McGuirt,

Black & Veatch Corp. 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 1126070, in accordance with application 420734, revision 2.

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

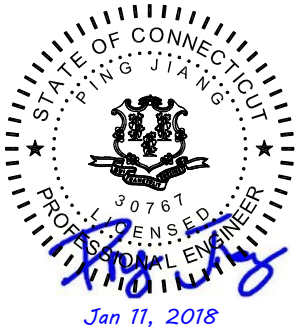
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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 C with a maximum topographic factor, Kzt, of 1.000 and Risk Category II were used in this analysis. Seismic forces have been evaluated based on Site Class D with spectral response factors S_S of 0.181g and S_1 of 0.064g.

We at *Black & Veatch Corp.* 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: Adichon Akkarapunyathorn / Christopher Giannotti

Respectfully submitted by:



Ping Jiang, P.E.
Professional Engineer

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 110 ft Monopole tower designed by Rohn Industries, Inc. in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

The tower has been modified multiple times in the past to accommodate additional loading.

The tower has been modified per reinforcement drawings prepared by B&T Engineering, Inc., in December of 2008. Reinforcement consists of addition of reinforcement plates from 0.5' – 10.5', additional anchor rods, and base plate stiffeners. Refer to Post Modification Inspection Report by B&T Engineering, Inc. in November of 2009. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in May of 2012. Reinforcement consists of addition of reinforcement plates from 30.5' – 40.5', and bridge stiffeners at 30'. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in October of 2012. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2013. Reinforcement consists of addition of reinforcement plates from 6' – 21' and transition stiffeners. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in August of 2013. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2017. Reinforcement consists of addition of reinforcement plates from 4.5' – 26.5', jump plates at 30', and additional foundation reinforcement. Refer to Modification Inspection Report by Engineered Tower Solutions, Pllc. in August of 2017. This modification has been considered effective in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas 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 C with topographic category 1 and crest height of 0 feet. Seismic forces have been evaluated based on Site Class D with spectral response factors S_S of 0.181g and S_1 of 0.064g.

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
89.0	90.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2	2"conduit 3/4	1
		3	ericsson	RRUS 32			
		5	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B66			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Notes:
1) See Appendix B for proposed coax configuration

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
107.0	108.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		3	alcatel lucent	TD-RRH8x20-25	1	5/8	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
	107.0	1	cci tower mounts	T-Arm Mount [TA 702-3]			
105.0	108.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
	107.0	3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
	105.0	1	cci tower mounts	Side Arm Mount [SO 102-3]			
89.0	90.0	5	ericsson	RRUS-11	1	3/8	3
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7750.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	7750.00 w/ Mount Pipe	1 2 12	2"conduit 3/4 1-5/8	1
		1	raycap	DC6-48-60-18-8F			
		1	ericsson	RRUS-11			
	89.0	1	cci tower mounts	Platform Mount [LP 502-1]			
		6	powerwave technologies	LGP21903			
74.0	76.0	3	andrew	LNX-6515DS-A1M w/ Mount Pipe	6 2	7/8 1-5/8	1
		3	ericsson	AIR 32 B2a/B66Aa w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
	74.0	1	cci tower mounts	Platform Mount [LP 304-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Existing Equipment To Be Removed; Not Considered in This 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)
110.0	110.0	12	allgon	ALP 9212	12	1-5/8
92.0	92.0	12	allgon	ALP 9212	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2192540	CCISITES
4-POST-MODIFICATION INSPECTION	B&T Engineering, Inc	2561266	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	3355603	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	4075332	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solutions, Pllc.	6996864	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn Industries, Inc.	1615433	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn Industries, Inc.	1615400	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B&T Engineering, Inc	2356066	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3187227	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3667858	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	6702634	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Paul J. Ford and Company	7010159	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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

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.
4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically and must be replaced if damaged or cracked. Refer to Crown Castle document ENG-PRC-10012, Base Plate Grout Repair.
5) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.
6) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. The existing/proposed loading on the structure is based on CAD level drawings and carrier applications provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

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

4) ANALYSIS RESULTS

4.1) Wind Results

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	2.4%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	8.7%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	14.9%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	21.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	22.8%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	32.2%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	41.9%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	55.6%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	69.0%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	82.7%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	63.8%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	73.2%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	82.8%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	92.5%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	93.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	73.7%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	81.4%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	87.9%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	82.0%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	89.7%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	81.1%	Pass

24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	88.4%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	90.1%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.7	Pole	78.3%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.7	Pole	84.8%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.7	Pole	91.5%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x0.8625	Pole	70.5%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x0.8625	Pole	70.7%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x0.8625	Pole	72.7%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x0.8	Pole	78.0%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x0.8	Pole	82.4%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.525	Reinf. 5 Weldment	71.9%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x1.475	Reinf. 1 Weldment	74.5%	Pass
				Summary	
			Pole	93.8%	Pass
			Reinforcement	81.9%	Pass
			Overall	93.8%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Bolts	90	12.3	Pass
	Flange Plate		21.5	Pass
1,2	Flange Bolts	60	51.3	Pass
	Flange Plate		82.7	Pass
1	Bridge Stiffeners	30	45.8	Pass
	Jump Plates		47.8	Pass
	Flange Bolts		27.2	Pass
	Flange Plate		16.7	Pass
1	Anchor Rods	0	95.7	Pass
	Base Plate		85.9	Pass
1	Base Foundation	0	84.6	Pass

4.2) Seismic Results

Tower and foundation have been analyzed based on the seismic criteria outlined in section 2 of this report. Based on the analysis, seismic loading is not governing the tower and foundation stress. Wind loading is governing the tower and foundation stress.

Structure Rating (max from all components) =	95.7%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Base/Flange plates are assumed to have the same capacity as their respective splice bolts or shaft

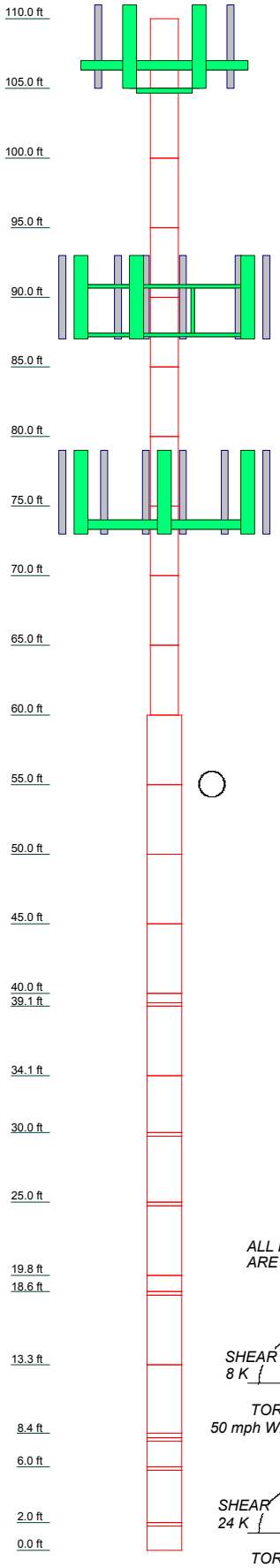
4.3) Recommendations

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

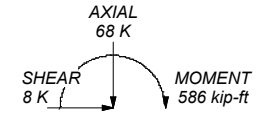
APPENDIX A

TNXTOWER OUTPUT

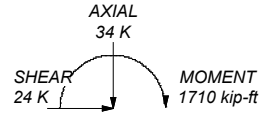
Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.00	A53-B-42	0.3
2	P24x0.25	5.00		0.3
3	P24x0.25	5.00		0.3
4	P24x0.25	5.00		0.3
5	P24x0.375	5.00		0.5
6	P24x0.375	5.00		0.5
7	P24x0.375	5.00		0.5
8	P24x0.375	5.00		0.5
9	P24x0.375	5.00		0.5
10	P24x0.375	5.00		0.5
11	P30x0.375	5.00		0.6
12	P30x0.375	5.00		0.6
13	P30x0.375	5.00		0.6
14	P30x0.375	5.00		0.6
15	P30x0.375	0.67		0.1
16	P30x0.375	0.33		0.0
17	P30x0.4375	5.00		0.7
18	P30x0.4375	4.08		0.6
19	P30x0.4375	0.25		0.0
20	P30x0.5625	4.75		0.7
21	P30x0.5625	0.25		0.1
22	P30x0.5625	5.00		1.1
23	P30x0.5625	0.17		0.0
24	P30x0.7500	0.33		0.1
25	P30x0.7500	5.00		1.4
26	P30x0.7500	4.92		1.4
27	P30x0.7500	0.08		0.0
28	P30x0.7500	0.25		0.1
29	P30x0.7500	0.25		0.1
30	P30x0.7500	0.25		0.1
31	P30x0.7500	3.75		0.9
32	P30x0.7500	0.25		0.1
33	P30x0.7500	1.75		0.6
Total		110.00		15.3



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 0 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
T-Arm Mount [TA 702-3]	107	RRUS 32 B66	89
APXVTM14-C-120 w/ Mount Pipe	107	RRUS 32 B66	89
APXVTM14-C-120 w/ Mount Pipe	107	DC6-48-60-18-8F	89
APXVTM14-C-120 w/ Mount Pipe	107	RRUS 32 B2	89
APXVSPP18-C-A20 w/ Mount Pipe	107	(2) RRUS 32 B2	89
APXVSPP18-C-A20 w/ Mount Pipe	107	(2) RRUS 32 B2	89
APXVSPP18-C-A20 w/ Mount Pipe	107	RRUS 32	89
TD-RRH8x20-25	107	RRUS 32	89
TD-RRH8x20-25	107	RRUS 32	89
TD-RRH8x20-25	107	RRUS-11	89
Side Arm Mount [SO 102-3]	105	DC6-48-60-18-8F	89
(3) 5' x 2" Pipe Mount	105	(2) LGP21903	89
(3) 5' x 2" Pipe Mount	105	(2) LGP21903	89
(3) 5' x 2" Pipe Mount	105	(2) LGP21903	89
IBC1900BB-1	105	Platform Mount [LP 304-1]	74
IBC1900BB-1	105	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	74
IBC1900BB-1	105		
800MHz 2X50W RRH W/FILTER	105	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	74
800MHz 2X50W RRH W/FILTER	105		
800MHz 2X50W RRH W/FILTER	105	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	74
IBC1900HG-2A	105		
IBC1900HG-2A	105	LNX-6515DS-A1M w/ Mount Pipe	74
IBC1900HG-2A	105	LNX-6515DS-A1M w/ Mount Pipe	74
PCS 1900MHz 4x45W-65MHz	105	LNX-6515DS-A1M w/ Mount Pipe	74
PCS 1900MHz 4x45W-65MHz	105	AIR 32 B2a/B66Aa w/ Mount Pipe	74
PCS 1900MHz 4x45W-65MHz	105	AIR 32 B2a/B66Aa w/ Mount Pipe	74
Platform Mount [LP 502-1]	89	AIR 32 B2a/B66Aa w/ Mount Pipe	74
6' x 2" Mount Pipe	89	KRY 112 144/1	74
6' x 2" Mount Pipe	89	KRY 112 144/1	74
6' x 2" Mount Pipe	89	KRY 112 144/1	74
HPA-65R-BUU-H6 w/ Mount Pipe	89	RRUS 11 B12	74
HPA-65R-BUU-H6 w/ Mount Pipe	89	RRUS 11 B12	74
HPA-65R-BUU-H6 w/ Mount Pipe	89	RRUS 11 B12	74
QS66512-2 w/ Mount Pipe	89	Bridge Stiffener 72" x 1.25" x 11"	30
QS66512-2 w/ Mount Pipe	89	Bridge Stiffener 72" x 1.25" x 11"	30
QS66512-2 w/ Mount Pipe	89	Bridge Stiffener 72" x 1.25" x 11"	30
7750.00 w/ Mount Pipe	89	Jump Plate 116" x 6" x 1"	30
7750.00 w/ Mount Pipe	89	Jump Plate 116" x 6" x 1"	30
7750.00 w/ Mount Pipe	89	Jump Plate 116" x 6" x 1"	30
RRUS 32 B66	89		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C 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

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Job:	***WESTON SQUARE (BU# 876325)***		
Project:	***194393 (876325.1509095)***		
Client: Crown Castle	Drawn by: Christopher Giannotti, E.I.T.	App'd:	
Code: TIA-222-G	Date: 01/11/18	Scale: NTS	
Path: C:\Users\CGIA9012\Desktop\CCI SAI\876325_1509095 - TSAI\Structural\876325_1509095 Structural Analysis - Modified.eri		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:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category C.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 1.0000 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) 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		

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	110.00-105.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L2	105.00-100.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L3	100.00-95.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L4	95.00-90.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L5	90.00-85.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L6	85.00-80.00	5.00	P24x0.375	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L7	80.00-75.00	5.00	P24x0.375	(42 ksi) A53-B-42 (42 ksi)	
L8	75.00-70.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	70.00-65.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L10	65.00-60.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L11	60.00-55.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L12	55.00-50.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L13	50.00-45.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L14	45.00-40.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L15	40.00-39.33	0.67	P30x0.375	A53-B-42 (42 ksi)	
L16	39.33-39.08	0.25	P30x0.4875	A53-B-42 (42 ksi)	
L17	39.08-34.08	5.00	P30x0.4875	A53-B-42 (42 ksi)	
L18	34.08-30.00	4.08	P30x0.4875	A53-B-42 (42 ksi)	
L19	30.00-29.75	0.25	P30x0.5	A53-B-42 (42 ksi)	
L20	29.75-25.00	4.75	P30x0.5	A53-B-42 (42 ksi)	
L21	25.00-24.75	0.25	P30x0.55625	A53-B-42 (42 ksi)	
L22	24.75-19.75	5.00	P30x0.55625	A53-B-42 (42 ksi)	
L23	19.75-18.58	1.17	P30x0.55625	A53-B-42 (42 ksi)	
L24	18.58-18.33	0.25	P30x0.7	A53-B-42 (42 ksi)	
L25	18.33-13.33	5.00	P30x0.7	A53-B-42 (42 ksi)	
L26	13.33-8.42	4.92	P30x0.7	A53-B-42 (42 ksi)	
L27	8.42-8.07	0.35	P30x0.8625	A53-B-42 (42 ksi)	
L28	8.07-7.83	0.23	P30x0.8625	A53-B-42 (42 ksi)	
L29	7.83-6.00	1.83	P30x0.8625	A53-B-42 (42 ksi)	
L30	6.00-5.75	0.25	P30x0.8	A53-B-42 (42 ksi)	
L31	5.75-2.00	3.75	P30x0.8	A53-B-42 (42 ksi)	
L32	2.00-1.75	0.25	P30x1.525	A53-B-42 (42 ksi)	
L33	1.75-0.00	1.75	P30x1.475	A53-B-42 (42 ksi)	

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 110.00-105.00				1	1	1			
L2 105.00-100.00				1	1	1			
L3 100.00-95.00				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L4 95.00-90.00				1	1	1			
L5 90.00-85.00				1	1	1			
L6 85.00-80.00				1	1	1			
L7 80.00-75.00				1	1	1			
L8 75.00-70.00				1	1	1			
L9 70.00-65.00				1	1	1			
L10 65.00-60.00				1	1	1			
L11 60.00-55.00				1	1	1			
L12 55.00-50.00				1	1	1			
L13 50.00-45.00				1	1	1			
L14 45.00-40.00				1	1	1			
L15 40.00-39.33				1	1	1			
L16 39.33-39.08				1	1	0.965972			
L17 39.08-34.08				1	1	0.965972			
L18 34.08-30.00				1	1	0.965972			
L19 30.00-29.75				1	1	1			
L20 29.75-25.00				1	1	1			
L21 25.00-24.75				1	1	1.25043			
L22 24.75-19.75				1	1	1.25043			
L23 19.75-18.58				1	1	1.25043			
L24 18.58-18.33				1	1	1.26158			
L25 18.33-13.33				1	1	1.26158			
L26 13.33-8.42				1	1	1.26158			
L27 8.42-8.07				1	1	1.10116			
L28 8.07-7.83				1	1	1.10116			
L29 7.83-6.00				1	1	1.10116			
L30 6.00-5.75				1	1	0.939375			
L31 5.75-2.00				1	1	0.939375			
L32 2.00-1.75				1	1	0.761891			
L33 1.75-0.00				1	1	0.786337			

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 ***	A	Surface Ar (CaAa)	110.00 - 8.00	1	1	0.490 0.500	0.3750		0.22

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
2" innerduct conduit	C	Surface Ar (CaAa)	89.00 - 6.00	1	1	-0.400 -0.330	2.0000		0.20
WR-VG86ST-BRD(3/4)	C	Surface Ar (CaAa)	89.00 - 6.00	2	2	-0.400 -0.330	0.0000		0.58
LDF7-50A(1-5/8)	C	Surface Ar (CaAa)	89.00 - 6.00	4	4	-0.330 -0.060	1.9800		0.82
***									
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	C	Surface Ar (CaAa)	74.00 - 0.00	2	2	0.100 0.210	1.6250		1.07
810921-001(7/8)	C	Surface Ar (CaAa)	74.00 - 0.00	6	6	0.210 0.440	1.1120		0.40
MOD 2008									
MP-305	A	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3300	14.8400	0.00
MP-305	B	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3300	14.8400	0.00
MP-305	C	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3300	14.8400	0.00
MP-305	C	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3300	14.8400	0.00
MOD 2012									
MP-303	A	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0600	11.2600	0.00
MP-303	B	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0600	11.2600	0.00
MP-303	C	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0600	11.2600	0.00
MOD 2013									
MP-305	A	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3300	14.8400	0.00
MP-305	B	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3300	14.8400	0.00
MP-305	C	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3300	14.8400	0.00
MOD 2017									
CCI-SFP-045100	A	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	B	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	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	107.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.08 1.08 1.08
HB058-M12-XXXF(5/8)	B	No	Inside Pole	107.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.24 0.24 0.24
2" innerduct conduit	C	No	Inside Pole	89.00 - 6.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.20 0.20 0.20
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	89.00 - 6.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
LDF7-50A(1-5/8)	C	No	Inside Pole	89.00 - 6.00	8	No Ice 1/2" Ice	0.00 0.00	0.82 0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.82

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	110.00-105.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L2	105.00-100.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L3	100.00-95.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L4	95.00-90.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L5	90.00-85.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	3.968	0.000	0.05
L6	85.00-80.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	4.960	0.000	0.06
L7	80.00-75.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	4.960	0.000	0.06
L8	75.00-70.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	8.929	0.000	0.08
L9	70.00-65.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	9.921	0.000	0.09
L10	65.00-60.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	9.921	0.000	0.09
L11	60.00-55.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	9.921	0.000	0.09
L12	55.00-50.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	9.921	0.000	0.09
L13	50.00-45.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	9.921	0.000	0.09
L14	45.00-40.00	A	0.000	0.000	0.526	0.000	0.00
		B	0.000	0.000	0.338	0.000	0.02
		C	0.000	0.000	10.259	0.000	0.09
L15	40.00-39.33	A	0.000	0.000	0.476	0.000	0.00
		B	0.000	0.000	0.451	0.000	0.00
		C	0.000	0.000	1.774	0.000	0.01
L16	39.33-39.08	A	0.000	0.000	0.179	0.000	0.00
		B	0.000	0.000	0.169	0.000	0.00
		C	0.000	0.000	0.665	0.000	0.00
L17	39.08-34.08	A	0.000	0.000	3.571	0.000	0.00
		B	0.000	0.000	3.383	0.000	0.02
		C	0.000	0.000	13.304	0.000	0.09
L18	34.08-30.00	A	0.000	0.000	2.578	0.000	0.00
		B	0.000	0.000	2.425	0.000	0.01
		C	0.000	0.000	10.527	0.000	0.07
L19	30.00-29.75	A	0.000	0.000	0.009	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.496	0.000	0.00
L20	29.75-25.00	A	0.000	0.000	1.303	0.000	0.00
		B	0.000	0.000	1.125	0.000	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	11.675	0.000	0.08
L21	25.00-24.75	A	0.000	0.000	0.197	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.871	0.000	0.00
L22	24.75-19.75	A	0.000	0.000	5.048	0.000	0.00
		B	0.000	0.000	4.860	0.000	0.02
		C	0.000	0.000	18.531	0.000	0.09
L23	19.75-18.58	A	0.000	0.000	1.955	0.000	0.00
		B	0.000	0.000	1.911	0.000	0.00
		C	0.000	0.000	5.101	0.000	0.02
L24	18.58-18.33	A	0.000	0.000	0.419	0.000	0.00
		B	0.000	0.000	0.410	0.000	0.00
		C	0.000	0.000	1.093	0.000	0.00
L25	18.33-13.33	A	0.000	0.000	8.379	0.000	0.00
		B	0.000	0.000	8.192	0.000	0.02
		C	0.000	0.000	21.863	0.000	0.09
L26	13.33-8.42	A	0.000	0.000	10.090	0.000	0.00
		B	0.000	0.000	9.906	0.000	0.02
		C	0.000	0.000	25.200	0.000	0.08
L27	8.42-8.07	A	0.000	0.000	0.897	0.000	0.00
		B	0.000	0.000	0.884	0.000	0.00
		C	0.000	0.000	2.152	0.000	0.01
L28	8.07-7.83	A	0.000	0.000	0.592	0.000	0.00
		B	0.000	0.000	0.590	0.000	0.00
		C	0.000	0.000	1.435	0.000	0.00
L29	7.83-6.00	A	0.000	0.000	4.632	0.000	0.00
		B	0.000	0.000	4.632	0.000	0.01
		C	0.000	0.000	11.274	0.000	0.03
L30	6.00-5.75	A	0.000	0.000	0.410	0.000	0.00
		B	0.000	0.000	0.410	0.000	0.00
		C	0.000	0.000	1.067	0.000	0.00
L31	5.75-2.00	A	0.000	0.000	4.269	0.000	0.00
		B	0.000	0.000	4.269	0.000	0.01
		C	0.000	0.000	12.258	0.000	0.02
L32	2.00-1.75	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.692	0.000	0.00
L33	1.75-0.00	A	0.000	0.000	1.110	0.000	0.00
		B	0.000	0.000	1.110	0.000	0.01
		C	0.000	0.000	3.957	0.000	0.01

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	110.00-105.00	A	2.251	0.000	0.000	2.438	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L2	105.00-100.00	A	2.240	0.000	0.000	2.428	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L3	100.00-95.00	A	2.229	0.000	0.000	2.416	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L4	95.00-90.00	A	2.217	0.000	0.000	2.405	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L5	90.00-85.00	A	2.205	0.000	0.000	2.392	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	10.934	0.000	0.21
L6	85.00-80.00	A	2.192	0.000	0.000	2.379	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	13.622	0.000	0.26
L7	80.00-75.00	A	2.178	0.000	0.000	2.366	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02

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	13.574	0.000	0.26
L8	75.00-70.00	A	2.164	0.000	0.000	2.351	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	22.812	0.000	0.40
L9	70.00-65.00	A	2.148	0.000	0.000	2.336	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	25.041	0.000	0.43
L10	65.00-60.00	A	2.132	0.000	0.000	2.319	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	24.943	0.000	0.43
L11	60.00-55.00	A	2.114	0.000	0.000	2.302	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	24.836	0.000	0.43
L12	55.00-50.00	A	2.095	0.000	0.000	2.283	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	24.722	0.000	0.42
L13	50.00-45.00	A	2.074	0.000	0.000	2.262	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	24.596	0.000	0.42
L14	45.00-40.00	A	2.051	0.000	0.000	2.706	0.000	0.04
		B		0.000	0.000	0.467	0.000	0.02
		C		0.000	0.000	24.926	0.000	0.42
L15	40.00-39.33	A	2.037	0.000	0.000	0.919	0.000	0.01
		B		0.000	0.000	0.622	0.000	0.01
		C		0.000	0.000	3.872	0.000	0.06
L16	39.33-39.08	A	2.035	0.000	0.000	0.344	0.000	0.01
		B		0.000	0.000	0.233	0.000	0.00
		C		0.000	0.000	1.451	0.000	0.02
L17	39.08-34.08	A	2.021	0.000	0.000	6.864	0.000	0.10
		B		0.000	0.000	4.656	0.000	0.09
		C		0.000	0.000	28.932	0.000	0.48
L18	34.08-30.00	A	1.994	0.000	0.000	5.109	0.000	0.08
		B		0.000	0.000	3.327	0.000	0.07
		C		0.000	0.000	23.022	0.000	0.38
L19	30.00-29.75	A	1.980	0.000	0.000	0.108	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.202	0.000	0.02
L20	29.75-25.00	A	1.963	0.000	0.000	3.757	0.000	0.05
		B		0.000	0.000	1.714	0.000	0.04
		C		0.000	0.000	26.160	0.000	0.42
L21	25.00-24.75	A	1.944	0.000	0.000	0.391	0.000	0.00
		B		0.000	0.000	0.285	0.000	0.00
		C		0.000	0.000	1.760	0.000	0.03
L22	24.75-19.75	A	1.923	0.000	0.000	9.295	0.000	0.12
		B		0.000	0.000	7.185	0.000	0.11
		C		0.000	0.000	36.545	0.000	0.54
L23	19.75-18.58	A	1.894	0.000	0.000	3.211	0.000	0.04
		B		0.000	0.000	2.725	0.000	0.04
		C		0.000	0.000	9.529	0.000	0.14
L24	18.58-18.33	A	1.887	0.000	0.000	0.687	0.000	0.01
		B		0.000	0.000	0.583	0.000	0.01
		C		0.000	0.000	2.039	0.000	0.03
L25	18.33-13.33	A	1.858	0.000	0.000	13.672	0.000	0.17
		B		0.000	0.000	11.626	0.000	0.16
		C		0.000	0.000	40.536	0.000	0.58
L26	13.33-8.42	A	1.790	0.000	0.000	15.438	0.000	0.19
		B		0.000	0.000	13.494	0.000	0.18
		C		0.000	0.000	43.611	0.000	0.61
L27	8.42-8.07	A	1.741	0.000	0.000	1.298	0.000	0.02
		B		0.000	0.000	1.163	0.000	0.02
		C		0.000	0.000	3.490	0.000	0.05
L28	8.07-7.83	A	1.735	0.000	0.000	0.800	0.000	0.01
		B		0.000	0.000	0.775	0.000	0.01
		C		0.000	0.000	2.324	0.000	0.03
L29	7.83-6.00	A	1.711	0.000	0.000	6.069	0.000	0.07
		B		0.000	0.000	6.069	0.000	0.08
		C		0.000	0.000	18.177	0.000	0.25
L30	6.00-5.75	A	1.683	0.000	0.000	0.528	0.000	0.01
		B		0.000	0.000	0.528	0.000	0.01

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	1.577	0.000	0.02
L31	5.75-2.00	A	1.614	0.000	0.000	5.164	0.000	0.06
		B		0.000	0.000	5.164	0.000	0.08
		C		0.000	0.000	18.005	0.000	0.22
L32	2.00-1.75	A	1.501	0.000	0.000	0.252	0.000	0.00
		B		0.000	0.000	0.252	0.000	0.00
		C		0.000	0.000	1.002	0.000	0.01
L33	1.75-0.00	A	1.391	0.000	0.000	1.246	0.000	0.01
		B		0.000	0.000	1.246	0.000	0.02
		C		0.000	0.000	5.879	0.000	0.07

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	110.00-105.00	-0.0006	-0.0561	-0.0054	-0.5190
L2	105.00-100.00	-0.0006	-0.0561	-0.0054	-0.5174
L3	100.00-95.00	-0.0006	-0.0561	-0.0054	-0.5158
L4	95.00-90.00	-0.0006	-0.0561	-0.0054	-0.5140
L5	90.00-85.00	0.4153	0.7592	0.5962	0.7157
L6	85.00-80.00	0.4853	0.8963	0.6574	0.8421
L7	80.00-75.00	0.4853	0.8963	0.6569	0.8424
L8	75.00-70.00	0.0393	1.2572	0.1581	1.0920
L9	70.00-65.00	-0.0447	1.3252	0.0770	1.1329
L10	65.00-60.00	-0.0447	1.3252	0.0765	1.1335
L11	60.00-55.00	-0.0516	1.4541	0.0888	1.3358
L12	55.00-50.00	-0.0516	1.4541	0.0880	1.3364
L13	50.00-45.00	-0.0516	1.4541	0.0872	1.3370
L14	45.00-40.00	-0.0493	1.3916	0.0841	1.3040
L15	40.00-39.33	-0.0356	1.0035	0.0680	1.0625
L16	39.33-39.08	-0.0356	1.0035	0.0679	1.0625
L17	39.08-34.08	-0.0356	1.0035	0.0675	1.0624
L18	34.08-30.00	-0.0370	1.0431	0.0683	1.0899
L19	30.00-29.75	-0.0516	1.4541	0.0833	1.3399
L20	29.75-25.00	-0.0426	1.3700	0.0727	1.2959
L21	25.00-24.75	-0.0310	1.2605	0.0571	1.2288
L22	24.75-19.75	-0.0285	1.1579	0.0532	1.1592
L23	19.75-18.58	-0.0229	0.9307	0.0447	0.9897
L24	18.58-18.33	-0.0229	0.9307	0.0445	0.9896
L25	18.33-13.33	-0.0229	0.9307	0.0437	0.9892
L26	13.33-8.42	-0.0199	0.9400	0.0381	0.9895
L27	8.42-8.07	-0.0170	0.9494	0.0329	0.9903
L28	8.07-7.83	-0.0169	0.9586	0.0336	1.0505
L29	7.83-6.00	-0.0169	0.9624	0.0334	1.0740
L30	6.00-5.75	-0.2033	0.9660	-0.2837	1.0497
L31	5.75-2.00	-0.2539	0.9653	-0.3530	1.0676
L32	2.00-1.75	-0.2899	0.9648	-0.3999	1.0771
L33	1.75-0.00	-0.3387	0.9584	-0.4493	1.0818

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	105.00 - 110.00	1.0000	1.0000
L2	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L3	1	Safety Line 3/8	95.00 - 100.00	1.0000	1.0000
L4	1	Safety Line 3/8	90.00 - 95.00	1.0000	1.0000
L5	1	Safety Line 3/8	85.00 - 90.00	1.0000	1.0000
L5	6	2" innerduct conduit	85.00 - 89.00	1.0000	1.0000
L5	7	WR-VG86ST-BRD(3/4)	85.00 - 89.00	1.0000	1.0000
L5	11	LDF7-50A(1-5/8)	85.00 - 89.00	1.0000	1.0000
L6	1	Safety Line 3/8	80.00 - 85.00	1.0000	1.0000
L6	6	2" innerduct conduit	80.00 - 85.00	1.0000	1.0000
L6	7	WR-VG86ST-BRD(3/4)	80.00 - 85.00	1.0000	1.0000
L6	11	LDF7-50A(1-5/8)	80.00 - 85.00	1.0000	1.0000
L7	1	Safety Line 3/8	75.00 - 80.00	1.0000	1.0000
L7	6	2" innerduct conduit	75.00 - 80.00	1.0000	1.0000
L7	7	WR-VG86ST-BRD(3/4)	75.00 - 80.00	1.0000	1.0000
L7	11	LDF7-50A(1-5/8)	75.00 - 80.00	1.0000	1.0000
L8	1	Safety Line 3/8	70.00 - 75.00	1.0000	1.0000
L8	6	2" innerduct conduit	70.00 - 75.00	1.0000	1.0000
L8	7	WR-VG86ST-BRD(3/4)	70.00 - 75.00	1.0000	1.0000
L8	11	LDF7-50A(1-5/8)	70.00 - 75.00	1.0000	1.0000
L8	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	70.00 - 74.00	1.0000	1.0000
L8	15	810921-001(7/8)	70.00 - 74.00	1.0000	1.0000
L9	1	Safety Line 3/8	65.00 - 70.00	1.0000	1.0000
L9	6	2" innerduct conduit	65.00 - 70.00	1.0000	1.0000
L9	7	WR-VG86ST-BRD(3/4)	65.00 - 70.00	1.0000	1.0000
L9	11	LDF7-50A(1-5/8)	65.00 - 70.00	1.0000	1.0000
L9	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	65.00 - 70.00	1.0000	1.0000
L9	15	810921-001(7/8)	65.00 - 70.00	1.0000	1.0000
L10	1	Safety Line 3/8	60.00 - 65.00	1.0000	1.0000
L10	6	2" innerduct conduit	60.00 - 65.00	1.0000	1.0000
L10	7	WR-VG86ST-BRD(3/4)	60.00 - 65.00	1.0000	1.0000
L10	11	LDF7-50A(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	15	810921-001(7/8)	60.00 - 65.00	1.0000	1.0000
L11	1	Safety Line 3/8	55.00 - 60.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L11	6	2" innerduct conduit	55.00 - 60.00	1.0000	1.0000
L11	7	WR-VG86ST-BRD(3/4)	55.00 - 60.00	1.0000	1.0000
L11	11	LDF7-50A(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	15	810921-001(7/8)	55.00 - 60.00	1.0000	1.0000
L12	1	Safety Line 3/8	50.00 - 55.00	1.0000	1.0000
L12	6	2" innerduct conduit	50.00 - 55.00	1.0000	1.0000
L12	7	WR-VG86ST-BRD(3/4)	50.00 - 55.00	1.0000	1.0000
L12	11	LDF7-50A(1-5/8)	50.00 - 55.00	1.0000	1.0000
L12	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	50.00 - 55.00	1.0000	1.0000
L12	15	810921-001(7/8)	50.00 - 55.00	1.0000	1.0000
L13	1	Safety Line 3/8	45.00 - 50.00	1.0000	1.0000
L13	6	2" innerduct conduit	45.00 - 50.00	1.0000	1.0000
L13	7	WR-VG86ST-BRD(3/4)	45.00 - 50.00	1.0000	1.0000
L13	11	LDF7-50A(1-5/8)	45.00 - 50.00	1.0000	1.0000
L13	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	45.00 - 50.00	1.0000	1.0000
L13	15	810921-001(7/8)	45.00 - 50.00	1.0000	1.0000
L14	1	Safety Line 3/8	40.00 - 45.00	1.0000	1.0000
L14	6	2" innerduct conduit	40.00 - 45.00	1.0000	1.0000
L14	7	WR-VG86ST-BRD(3/4)	40.00 - 45.00	1.0000	1.0000
L14	11	LDF7-50A(1-5/8)	40.00 - 45.00	1.0000	1.0000
L14	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	40.00 - 45.00	1.0000	1.0000
L14	15	810921-001(7/8)	40.00 - 45.00	1.0000	1.0000
L14	22	MP-303	40.00 - 40.50	1.0000	1.0000
L14	23	MP-303	40.00 - 40.50	1.0000	1.0000
L14	24	MP-303	40.00 - 40.50	1.0000	1.0000
L15	1	Safety Line 3/8	39.33 - 40.00	1.0000	1.0000
L15	6	2" innerduct conduit	39.33 - 40.00	1.0000	1.0000
L15	7	WR-VG86ST-BRD(3/4)	39.33 - 40.00	1.0000	1.0000
L15	11	LDF7-50A(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	15	810921-001(7/8)	39.33 - 40.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L15	22	MP-303	39.33 - 40.00	1.0000	1.0000
L15	23	MP-303	39.33 - 40.00	1.0000	1.0000
L15	24	MP-303	39.33 - 40.00	1.0000	1.0000
L16	1	Safety Line 3/8	39.08 - 39.33	1.0000	1.0000
L16	6	2" innerduct conduit	39.08 - 39.33	1.0000	1.0000
L16	7	WR-VG86ST-BRD(3/4)	39.08 - 39.33	1.0000	1.0000
L16	11	LDF7-50A(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	15	810921-001(7/8)	39.08 - 39.33	1.0000	1.0000
L16	22	MP-303	39.08 - 39.33	1.0000	1.0000
L16	23	MP-303	39.08 - 39.33	1.0000	1.0000
L16	24	MP-303	39.08 - 39.33	1.0000	1.0000
L17	1	Safety Line 3/8	34.08 - 39.08	1.0000	1.0000
L17	6	2" innerduct conduit	34.08 - 39.08	1.0000	1.0000
L17	7	WR-VG86ST-BRD(3/4)	34.08 - 39.08	1.0000	1.0000
L17	11	LDF7-50A(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	15	810921-001(7/8)	34.08 - 39.08	1.0000	1.0000
L17	22	MP-303	34.08 - 39.08	1.0000	1.0000
L17	23	MP-303	34.08 - 39.08	1.0000	1.0000
L17	24	MP-303	34.08 - 39.08	1.0000	1.0000
L18	1	Safety Line 3/8	30.00 - 34.08	1.0000	1.0000
L18	6	2" innerduct conduit	30.00 - 34.08	1.0000	1.0000
L18	7	WR-VG86ST-BRD(3/4)	30.00 - 34.08	1.0000	1.0000
L18	11	LDF7-50A(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	15	810921-001(7/8)	30.00 - 34.08	1.0000	1.0000
L18	22	MP-303	30.50 - 34.08	1.0000	1.0000
L18	23	MP-303	30.50 - 34.08	1.0000	1.0000
L18	24	MP-303	30.50 - 34.08	1.0000	1.0000
L19	1	Safety Line 3/8	29.75 - 30.00	1.0000	1.0000
L19	6	2" innerduct conduit	29.75 - 30.00	1.0000	1.0000
L19	7	WR-VG86ST-BRD(3/4)	29.75 - 30.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L19	11	LDF7-50A(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	15	810921-001(7/8)	29.75 - 30.00	1.0000	1.0000
L20	1	Safety Line 3/8	25.00 - 29.75	1.0000	1.0000
L20	6	2" innerduct conduit	25.00 - 29.75	1.0000	1.0000
L20	7	WR-VG86ST-BRD(3/4)	25.00 - 29.75	1.0000	1.0000
L20	11	LDF7-50A(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	15	810921-001(7/8)	25.00 - 29.75	1.0000	1.0000
L20	30	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	31	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	32	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	33	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L21	1	Safety Line 3/8	24.75 - 25.00	1.0000	1.0000
L21	6	2" innerduct conduit	24.75 - 25.00	1.0000	1.0000
L21	7	WR-VG86ST-BRD(3/4)	24.75 - 25.00	1.0000	1.0000
L21	11	LDF7-50A(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	15	810921-001(7/8)	24.75 - 25.00	1.0000	1.0000
L21	30	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	31	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	32	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	33	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L22	1	Safety Line 3/8	19.75 - 24.75	1.0000	1.0000
L22	6	2" innerduct conduit	19.75 - 24.75	1.0000	1.0000
L22	7	WR-VG86ST-BRD(3/4)	19.75 - 24.75	1.0000	1.0000
L22	11	LDF7-50A(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	15	810921-001(7/8)	19.75 - 24.75	1.0000	1.0000
L22	26	MP-305	19.75 - 21.00	1.0000	1.0000
L22	27	MP-305	19.75 - 21.00	1.0000	1.0000
L22	28	MP-305	19.75 - 21.00	1.0000	1.0000
L22	30	CCI-SFP-045100	19.75 -	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L22	31	CCI-SFP-045100	24.75 19.75 -	1.0000	1.0000
L22	32	CCI-SFP-045100	24.75 19.75 -	1.0000	1.0000
L22	33	CCI-SFP-045100	24.75 19.75 -	1.0000	1.0000
L23	1	Safety Line 3/8	24.75 18.58 -	1.0000	1.0000
L23	6	2" innerduct conduit	19.75 18.58 -	1.0000	1.0000
L23	7	WR-VG86ST-BRD(3/4)	19.75 18.58 -	1.0000	1.0000
L23	11	LDF7-50A(1-5/8)	19.75 18.58 -	1.0000	1.0000
L23	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	19.75 18.58 - 19.75	1.0000	1.0000
L23	15	810921-001(7/8)	18.58 -	1.0000	1.0000
L23	26	MP-305	19.75 18.58 -	1.0000	1.0000
L23	27	MP-305	19.75 18.58 -	1.0000	1.0000
L23	28	MP-305	19.75 18.58 -	1.0000	1.0000
L23	30	CCI-SFP-045100	19.75 18.58 -	1.0000	1.0000
L23	31	CCI-SFP-045100	19.75 18.58 -	1.0000	1.0000
L23	32	CCI-SFP-045100	19.75 18.58 -	1.0000	1.0000
L23	33	CCI-SFP-045100	19.75 18.58 -	1.0000	1.0000
L24	1	Safety Line 3/8	19.75 18.33 -	1.0000	1.0000
L24	6	2" innerduct conduit	18.58 18.33 -	1.0000	1.0000
L24	7	WR-VG86ST-BRD(3/4)	18.58 18.33 -	1.0000	1.0000
L24	11	LDF7-50A(1-5/8)	18.58 18.33 -	1.0000	1.0000
L24	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	18.58 18.33 - 18.58	1.0000	1.0000
L24	15	810921-001(7/8)	18.33 -	1.0000	1.0000
L24	26	MP-305	18.58 18.33 -	1.0000	1.0000
L24	27	MP-305	18.58 18.33 -	1.0000	1.0000
L24	28	MP-305	18.58 18.33 -	1.0000	1.0000
L24	30	CCI-SFP-045100	18.58 18.33 -	1.0000	1.0000
L24	31	CCI-SFP-045100	18.58 18.33 -	1.0000	1.0000
L24	32	CCI-SFP-045100	18.58 18.33 -	1.0000	1.0000
L24	33	CCI-SFP-045100	18.58 18.33 -	1.0000	1.0000
L25	1	Safety Line 3/8	18.58 13.33 -	1.0000	1.0000
L25	6	2" innerduct conduit	18.33 13.33 -	1.0000	1.0000
L25	7	WR-VG86ST-BRD(3/4)	18.33 13.33 -	1.0000	1.0000
L25	11	LDF7-50A(1-5/8)	18.33 13.33 -	1.0000	1.0000
			18.33		

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L25	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	15	810921-001(7/8)	13.33 - 18.33	1.0000	1.0000
L25	26	MP-305	13.33 - 18.33	1.0000	1.0000
L25	27	MP-305	13.33 - 18.33	1.0000	1.0000
L25	28	MP-305	13.33 - 18.33	1.0000	1.0000
L25	30	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	31	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	32	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	33	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L26	1	Safety Line 3/8	8.42 - 13.33	1.0000	1.0000
L26	6	2" innerduct conduit	8.42 - 13.33	1.0000	1.0000
L26	7	WR-VG86ST-BRD(3/4)	8.42 - 13.33	1.0000	1.0000
L26	11	LDF7-50A(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	15	810921-001(7/8)	8.42 - 13.33	1.0000	1.0000
L26	17	MP-305	8.42 - 10.50	1.0000	1.0000
L26	18	MP-305	8.42 - 10.50	1.0000	1.0000
L26	19	MP-305	8.42 - 10.50	1.0000	1.0000
L26	20	MP-305	8.42 - 10.50	1.0000	1.0000
L26	26	MP-305	8.42 - 13.33	1.0000	1.0000
L26	27	MP-305	8.42 - 13.33	1.0000	1.0000
L26	28	MP-305	8.42 - 13.33	1.0000	1.0000
L26	30	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	31	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	32	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	33	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L27	1	Safety Line 3/8	8.07 - 8.42	1.0000	1.0000
L27	6	2" innerduct conduit	8.07 - 8.42	1.0000	1.0000
L27	7	WR-VG86ST-BRD(3/4)	8.07 - 8.42	1.0000	1.0000
L27	11	LDF7-50A(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	15	810921-001(7/8)	8.07 - 8.42	1.0000	1.0000
L27	17	MP-305	8.07 - 8.42	1.0000	1.0000
L27	18	MP-305	8.07 - 8.42	1.0000	1.0000
L27	19	MP-305	8.07 - 8.42	1.0000	1.0000
L27	20	MP-305	8.07 - 8.42	1.0000	1.0000
L27	26	MP-305	8.07 - 8.42	1.0000	1.0000
L27	27	MP-305	8.07 - 8.42	1.0000	1.0000
L27	28	MP-305	8.07 - 8.42	1.0000	1.0000
L27	30	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	31	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	32	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	33	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L28	1	Safety Line 3/8	8.00 - 8.07	1.0000	1.0000
L28	6	2" innerduct conduit	7.83 - 8.07	1.0000	1.0000
L28	7	WR-VG86ST-BRD(3/4)	7.83 - 8.07	1.0000	1.0000
L28	11	LDF7-50A(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	15	810921-001(7/8)	7.83 - 8.07	1.0000	1.0000
L28	17	MP-305	7.83 - 8.07	1.0000	1.0000
L28	18	MP-305	7.83 - 8.07	1.0000	1.0000
L28	19	MP-305	7.83 - 8.07	1.0000	1.0000
L28	20	MP-305	7.83 - 8.07	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L28	26	MP-305	7.83 - 8.07	1.0000	1.0000
L28	27	MP-305	7.83 - 8.07	1.0000	1.0000
L28	28	MP-305	7.83 - 8.07	1.0000	1.0000
L28	30	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	31	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	32	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	33	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L29	6	2" innerduct conduit	6.00 - 7.83	1.0000	1.0000
L29	7	WR-VG86ST-BRD(3/4)	6.00 - 7.83	1.0000	1.0000
L29	11	LDF7-50A(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	15	810921-001(7/8)	6.00 - 7.83	1.0000	1.0000
L29	17	MP-305	6.00 - 7.83	1.0000	1.0000
L29	18	MP-305	6.00 - 7.83	1.0000	1.0000
L29	19	MP-305	6.00 - 7.83	1.0000	1.0000
L29	20	MP-305	6.00 - 7.83	1.0000	1.0000
L29	26	MP-305	6.00 - 7.83	1.0000	1.0000
L29	27	MP-305	6.00 - 7.83	1.0000	1.0000
L29	28	MP-305	6.00 - 7.83	1.0000	1.0000
L29	30	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	31	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	32	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	33	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L30	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	15	810921-001(7/8)	5.75 - 6.00	1.0000	1.0000
L30	17	MP-305	5.75 - 6.00	1.0000	1.0000
L30	18	MP-305	5.75 - 6.00	1.0000	1.0000
L30	19	MP-305	5.75 - 6.00	1.0000	1.0000
L30	20	MP-305	5.75 - 6.00	1.0000	1.0000
L30	30	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	31	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	32	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	33	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L31	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	15	810921-001(7/8)	2.00 - 5.75	1.0000	1.0000
L31	17	MP-305	2.00 - 5.75	1.0000	1.0000
L31	18	MP-305	2.00 - 5.75	1.0000	1.0000
L31	19	MP-305	2.00 - 5.75	1.0000	1.0000
L31	20	MP-305	2.00 - 5.75	1.0000	1.0000
L31	30	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	31	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	32	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	33	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L32	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	15	810921-001(7/8)	1.75 - 2.00	1.0000	1.0000
L32	17	MP-305	1.75 - 2.00	1.0000	1.0000
L32	18	MP-305	1.75 - 2.00	1.0000	1.0000
L32	19	MP-305	1.75 - 2.00	1.0000	1.0000
L32	20	MP-305	1.75 - 2.00	1.0000	1.0000
L33	14	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	0.00 - 1.75	1.0000	1.0000
L33	15	810921-001(7/8)	0.00 - 1.75	1.0000	1.0000
L33	17	MP-305	0.50 - 1.75	1.0000	1.0000
L33	18	MP-305	0.50 - 1.75	1.0000	1.0000
L33	19	MP-305	0.50 - 1.75	1.0000	1.0000
L33	20	MP-305	0.50 - 1.75	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
T-Arm Mount [TA 702-3]	C	None		0.0000	107.00	No Ice	5.64	5.64	0.34
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
APXVTM14-C-120 w/ Mount Pipe	A	From Face	3.00 -2.50 1.00	20.0000	107.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Face	3.00 -2.50 1.00	40.0000	107.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Face	3.00 -2.50 1.00	50.0000	107.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	3.00 2.50 1.00	20.0000	107.00	No Ice	8.26	6.95	0.08
						1/2" Ice	8.82	8.13	0.15
						1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	3.00 2.50 1.00	40.0000	107.00	No Ice	8.26	6.95	0.08
						1/2" Ice	8.82	8.13	0.15
						1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	3.00 2.50 1.00	50.0000	107.00	No Ice	8.26	6.95	0.08
						1/2" Ice	8.82	8.13	0.15
						1" Ice	9.35	9.02	0.23
TD-RRH8x20-25	A	From Face	3.00 0.00 1.00	0.0000	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Face	3.00 0.00 1.00	0.0000	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Face	3.00 0.00 1.00	0.0000	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
***									
Side Arm Mount [SO 102-3]	C	None		0.0000	105.00	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
(3) 5' x 2" Pipe Mount	A	From Face	1.00 0.00 0.00	0.0000	105.00	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04
						1" Ice	1.70	1.70	0.05
(3) 5' x 2" Pipe Mount	B	From Face	1.00 0.00 0.00	0.0000	105.00	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04
						1" Ice	1.70	1.70	0.05
(3) 5' x 2" Pipe Mount	C	From Face	1.00 0.00 0.00	0.0000	105.00	No Ice	1.00	1.00	0.03
						1/2" Ice	1.39	1.39	0.04
						1" Ice	1.70	1.70	0.05
IBC1900BB-1	A	From Face	2.00 0.00 2.00	0.0000	105.00	No Ice	1.13	0.53	0.02
						1/2" Ice	1.27	0.65	0.03
						Ice	1.43	0.77	0.04

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						1" Ice			
IBC1900BB-1	B	From Face	2.00	0.0000	105.00	No Ice	1.13	0.53	0.02
			0.00			1/2"	1.27	0.65	0.03
			2.00			Ice	1.43	0.77	0.04
						1" Ice			
IBC1900BB-1	C	From Face	2.00	0.0000	105.00	No Ice	1.13	0.53	0.02
			0.00			1/2"	1.27	0.65	0.03
			2.00			Ice	1.43	0.77	0.04
						1" Ice			
800MHz 2X50W RRH W/FILTER	A	From Face	2.00	0.0000	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			3.00			Ice	2.43	2.29	0.11
						1" Ice			
800MHz 2X50W RRH W/FILTER	B	From Face	2.00	0.0000	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			3.00			Ice	2.43	2.29	0.11
						1" Ice			
800MHz 2X50W RRH W/FILTER	C	From Face	2.00	0.0000	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			3.00			Ice	2.43	2.29	0.11
						1" Ice			
IBC1900HG-2A	A	From Face	2.00	0.0000	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900HG-2A	B	From Face	2.00	0.0000	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900HG-2A	C	From Face	2.00	0.0000	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
PCS 1900MHz 4x45W-65MHz	A	From Face	2.00	0.0000	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			3.00			Ice	2.74	2.65	0.11
						1" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Face	2.00	0.0000	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			3.00			Ice	2.74	2.65	0.11
						1" Ice			
PCS 1900MHz 4x45W-65MHz	C	From Face	2.00	0.0000	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			3.00			Ice	2.74	2.65	0.11
						1" Ice			
***									
Platform Mount [LP 502-1]	C	None		0.0000	89.00	No Ice	32.35	32.35	0.93
						1/2"	45.67	45.67	1.19
						Ice	58.99	58.99	1.46
						1" Ice			
6' x 2" Mount Pipe	A	From Face	4.00	0.0000	89.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	B	From Face	4.00	0.0000	89.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	C	From Face	4.00	0.0000	89.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Face	4.00	30.0000	89.00	No Ice	9.90	8.11	0.08
			-6.00			1/2"	10.47	9.30	0.16
			1.00			Ice	11.01	10.21	0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Face	4.00 -6.00 1.00	30.0000	89.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Face	4.00 -6.00 1.00	20.0000	89.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
QS66512-2 w/ Mount Pipe	A	From Face	4.00 2.00 1.00	30.0000	89.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
QS66512-2 w/ Mount Pipe	B	From Face	4.00 2.00 1.00	30.0000	89.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
QS66512-2 w/ Mount Pipe	C	From Face	4.00 2.00 1.00	20.0000	89.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
7750.00 w/ Mount Pipe	A	From Face	4.00 6.00 1.00	30.0000	89.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7750.00 w/ Mount Pipe	B	From Face	4.00 6.00 1.00	30.0000	89.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7750.00 w/ Mount Pipe	C	From Face	4.00 6.00 1.00	20.0000	89.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
RRUS 32 B66	A	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	B	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	C	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
DC6-48-60-18-8F	A	From Face	1.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
RRUS 32 B2	A	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) RRUS 32 B2	B	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) RRUS 32 B2	C	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32	A	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10

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
RRUS 32	B	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32	C	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS-11	A	From Face	4.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
DC6-48-60-18-8F	A	From Face	1.00 0.00 1.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
(2) LGP21903	A	From Face	4.00 0.00 0.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
(2) LGP21903	B	From Face	4.00 0.00 0.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
(2) LGP21903	C	From Face	4.00 0.00 0.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
***									
Platform Mount [LP 304-1]	C	None		0.0000	74.00	No Ice 1/2" Ice 1" Ice	17.46 22.44 27.42	17.46 22.44 27.42	1.35 1.62 1.90
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00 -6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00 -6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00 -6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Face	4.00 6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Face	4.00 6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28

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
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Face	4.00 6.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
KRY 112 144/1	A	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	B	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	C	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
RRUS 11 B12	A	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Face	4.00 0.00 2.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
* ***MOD 2012*** Bridge Stiffener 72" x 1.25" x 11"	A	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	1.25 2.28 3.34	7.91 8.49 9.09	0.27 0.32 0.36
Bridge Stiffener 72" x 1.25" x 11"	B	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	1.25 2.28 3.34	7.91 8.49 9.09	0.27 0.32 0.36
Bridge Stiffener 72" x 1.25" x 11"	C	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	1.25 2.28 3.34	7.91 8.49 9.09	0.27 0.32 0.36
MOD 2017 Jump Plate 116" x 6" x 1"	A	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	8.75 10.30 11.87	7.79 8.74 9.70	1.24 1.31 1.36
Jump Plate 116" x 6" x 1"	B	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	8.75 10.30 11.87	7.79 8.74 9.70	1.24 1.31 1.36
Jump Plate 116" x 6" x 1"	C	From Face	0.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice 1" Ice	8.75 10.30 11.87	7.79 8.74 9.70	1.24 1.31 1.36

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
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	110 - 105	Pole	Max Tension	21	0.00	-0.00	-0.00
			Max. Compression	26	-4.99	0.00	0.04
			Max. Mx	20	-1.39	8.46	0.08
			Max. My	2	-1.40	0.09	8.08
			Max. Vy	20	-3.01	8.46	0.08
			Max. Vx	14	2.88	-0.06	-8.07
			Max. Torque	4			-0.21
L2	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.64	0.00	0.06
			Max. Mx	20	-2.66	32.95	0.20
			Max. My	2	-2.67	0.21	31.90

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-4.67	32.95	0.20
			Max. Vx	14	4.54	-0.18	-31.90
			Max. Torque	4			-0.21
L3	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.43	0.00	0.09
			Max. Mx	20	-3.04	57.13	0.32
			Max. My	2	-3.06	0.33	55.42
			Max. Vy	20	-5.00	57.13	0.32
			Max. Vx	14	4.87	-0.30	-55.42
			Max. Torque	4			-0.21
L4	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.23	0.00	0.12
			Max. Mx	20	-3.42	82.96	0.45
			Max. My	2	-3.44	0.45	80.59
			Max. Vy	20	-5.33	82.96	0.45
			Max. Vx	14	5.20	-0.42	-80.59
			Max. Torque	4			-0.21
L5	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.07	0.29	0.20
			Max. Mx	20	-6.68	137.74	0.71
			Max. My	2	-6.70	0.75	134.77
			Max. Vy	20	-11.52	137.74	0.71
			Max. Vx	14	11.41	-0.60	-134.71
			Max. Torque	4			-0.21
L6	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.31	0.17	0.01
			Max. Mx	20	-7.34	196.16	0.93
			Max. My	2	-7.37	0.98	192.60
			Max. Vy	20	-11.85	196.16	0.93
			Max. Vx	14	11.74	-0.86	-192.59
			Max. Torque	15			0.07
L7	80 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.56	0.04	-0.18
			Max. Mx	20	-8.02	256.18	1.14
			Max. My	14	-8.04	-1.12	-252.08
			Max. Vy	20	-12.17	256.18	1.14
			Max. Vx	14	12.05	-1.12	-252.08
			Max. Torque	15			0.07
L8	75 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.97	-0.00	-0.51
			Max. Mx	20	-11.52	339.62	1.35
			Max. My	14	-11.55	-1.37	-334.90
			Max. Vy	20	-16.47	339.62	1.35
			Max. Vx	14	16.33	-1.37	-334.90
			Max. Torque	15			0.07
L9	70 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.39	-0.03	-0.87
			Max. Mx	20	-12.27	422.73	1.54
			Max. My	14	-12.30	-1.62	-417.23
			Max. Vy	20	-16.78	422.73	1.54
			Max. Vx	14	16.60	-1.62	-417.23
			Max. Torque	15			0.07
L10	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.80	-0.06	-1.23
			Max. Mx	20	-13.04	507.31	1.74
			Max. My	14	-13.07	-1.86	-500.84
			Max. Vy	20	-17.06	507.31	1.74
			Max. Vx	14	16.84	-1.86	-500.84
			Max. Torque	15			0.07
L11	60 - 55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.42	-0.09	-1.66
			Max. Mx	20	-13.92	593.48	1.92
			Max. My	14	-13.95	-2.11	-585.91
			Max. Vy	20	-17.42	593.48	1.92
			Max. Vx	14	17.18	-2.11	-585.91
			Max. Torque	15			0.07
L12	55 - 50	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.04	-0.12	-2.09
			Max. Mx	20	-14.81	681.37	2.11

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-14.84	-2.36	-672.62
			Max. Vy	20	-17.75	681.37	2.11
			Max. Vx	14	17.49	-2.36	-672.62
			Max. Torque	15			0.07
L13	50 - 45	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.65	-0.15	-2.51
			Max. Mx	20	-15.72	770.87	2.29
			Max. My	14	-15.74	-2.60	-760.87
			Max. Vy	20	-18.06	770.87	2.29
			Max. Vx	14	17.79	-2.60	-760.87
			Max. Torque	15			0.07
L14	45 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.26	-0.18	-2.92
			Max. Mx	20	-16.63	861.87	2.47
			Max. My	14	-16.66	-2.85	-850.52
			Max. Vy	20	-18.35	861.87	2.47
			Max. Vx	14	18.06	-2.85	-850.52
			Max. Torque	15			0.07
L15	40 - 39.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.51	-0.18	-2.98
			Max. Mx	20	-16.76	874.11	2.50
			Max. My	14	-16.78	-2.88	-862.57
			Max. Vy	20	-18.39	874.11	2.50
			Max. Vx	14	18.09	-2.88	-862.57
			Max. Torque	15			0.07
L16	39.3333 - 39.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.60	-0.18	-3.00
			Max. Mx	20	-16.82	878.71	2.51
			Max. My	14	-16.84	-2.90	-867.10
			Max. Vy	20	-18.40	878.71	2.51
			Max. Vx	14	18.10	-2.90	-867.10
			Max. Torque	15			0.07
L17	39.0833 - 34.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.59	-0.21	-3.40
			Max. Mx	20	-17.90	971.55	2.69
			Max. My	14	-17.93	-3.14	-958.33
			Max. Vy	20	-18.74	971.55	2.69
			Max. Vx	14	18.37	-3.14	-958.33
			Max. Torque	15			0.07
L18	34.0833 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.17	-0.23	-3.72
			Max. Mx	20	-18.80	1048.53	2.83
			Max. My	14	-18.82	-3.34	-1033.77
			Max. Vy	20	-18.98	1048.53	2.83
			Max. Vx	14	18.57	-3.34	-1033.77
			Max. Torque	15			0.07
L19	30 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.96	-0.24	-3.75
			Max. Mx	20	-24.25	1053.70	2.84
			Max. My	14	-24.28	-3.35	-1038.84
			Max. Vy	20	-20.68	1053.70	2.84
			Max. Vx	14	20.26	-3.35	-1038.84
			Max. Torque	15			0.07
L20	29.75 - 25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.75	-0.26	-4.13
			Max. Mx	20	-25.36	1152.39	3.02
			Max. My	14	-25.38	-3.58	-1135.55
			Max. Vy	20	-20.90	1152.39	3.02
			Max. Vx	14	20.45	-3.58	-1135.55
			Max. Torque	15			0.07
L21	25 - 24.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.87	-0.26	-4.15
			Max. Mx	20	-25.45	1157.62	3.03
			Max. My	14	-25.47	-3.60	-1140.66
			Max. Vy	20	-20.90	1157.62	3.03
			Max. Vx	14	20.45	-3.60	-1140.66
			Max. Torque	15			0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	24.75 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.34	-0.29	-4.60
			Max. Mx	20	-26.97	1263.55	3.21
			Max. My	14	-27.00	-3.84	-1243.37
			Max. Vy	20	-21.49	1263.55	3.21
			Max. Vx	14	20.63	-3.84	-1243.37
			Max. Torque	15			0.07
L23	19.75 - 18.5833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.96	-0.29	-4.70
			Max. Mx	20	-27.33	1288.69	3.25
			Max. My	14	-27.36	-3.89	-1267.46
			Max. Vy	20	-21.63	1288.69	3.25
			Max. Vx	14	20.67	-3.89	-1267.46
			Max. Torque	9			-0.08
L24	18.5833 - 18.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.11	-0.29	-4.72
			Max. Mx	20	-27.44	1294.10	3.26
			Max. My	14	-27.46	-3.91	-1272.62
			Max. Vy	20	-21.65	1294.10	3.26
			Max. Vx	14	20.66	-3.91	-1272.62
			Max. Torque	9			-0.08
L25	18.3333 - 13.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.06	-0.31	-5.15
			Max. Mx	20	-29.31	1403.77	3.44
			Max. My	14	-29.34	-4.15	-1376.35
			Max. Vy	20	-22.23	1403.77	3.44
			Max. Vx	14	20.82	-4.15	-1376.35
			Max. Torque	9			-0.15
L26	13.3333 - 8.41667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.04	-0.34	-5.60
			Max. Mx	20	-31.17	1514.40	3.61
			Max. My	14	-31.19	-4.38	-1479.01
			Max. Vy	20	-22.80	1514.40	3.61
			Max. Vx	14	20.94	-4.38	-1479.01
			Max. Torque	9			-0.23
L27	8.41667 - 8.06667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.27	-0.34	-5.63
			Max. Mx	20	-31.32	1522.38	3.63
			Max. My	14	-31.34	-4.40	-1486.34
			Max. Vy	20	-22.83	1522.38	3.63
			Max. Vx	14	20.94	-4.40	-1486.34
			Max. Torque	9			-0.24
L28	8.06667 - 7.83333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.42	-0.34	-5.65
			Max. Mx	20	-31.42	1527.71	3.63
			Max. My	14	-31.43	-4.41	-1491.23
			Max. Vy	20	-22.86	1527.71	3.63
			Max. Vx	14	20.94	-4.41	-1491.23
			Max. Torque	9			-0.24
L29	7.83333 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.60	-0.35	-5.84
			Max. Mx	20	-32.13	1569.82	3.70
			Max. My	14	-32.15	-4.50	-1529.68
			Max. Vy	20	-23.11	1569.82	3.70
			Max. Vx	14	21.01	-4.50	-1529.68
			Max. Torque	9			-0.28
L30	6 - 5.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.72	-0.34	-5.86
			Max. Mx	20	-32.23	1575.59	3.71
			Max. My	14	-32.24	-4.51	-1534.93
			Max. Vy	20	-23.11	1575.59	3.71
			Max. Vx	14	20.99	-4.51	-1534.93

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	9			-0.28
L31	5.75 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.37	-0.27	-6.05
			Max. Mx	20	-33.39	1662.94	3.86
			Max. My	14	-33.40	-4.67	-1613.81
			Max. Vy	20	-23.49	1662.94	3.86
			Max. Vx	14	21.09	-4.67	-1613.81
			Max. Torque	9			-0.32
L32	2 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.51	-0.27	-6.07
			Max. Mx	20	-33.52	1668.81	3.87
			Max. My	14	-33.52	-4.68	-1619.08
			Max. Vy	20	-23.48	1668.81	3.87
			Max. Vx	14	21.07	-4.68	-1619.08
			Max. Torque	9			-0.32
L33	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.45	-0.24	-6.13
			Max. Mx	20	-34.29	1709.97	3.94
			Max. My	14	-34.29	-4.76	-1656.01
			Max. Vy	20	-23.56	1709.97	3.94
			Max. Vx	14	21.14	-4.76	-1656.01
			Max. Torque	9			-0.32

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	68.45	7.63	0.00
	Max. H_x	21	25.73	23.54	0.05
	Max. H_z	3	25.73	0.05	21.13
	Max. M_x	2	1654.27	0.05	21.13
	Max. M_z	8	1709.85	-23.54	-0.05
	Max. Torsion	21	0.32	23.54	0.05
	Min. Vert	11	25.73	-18.43	-10.61
	Min. H_x	9	25.73	-23.54	-0.05
	Min. H_z	15	25.73	-0.05	-21.13
	Min. M_x	14	-1656.01	-0.05	-21.13
	Min. M_z	20	-1709.97	23.54	0.05
	Min. Torsion	9	-0.32	-23.54	-0.05

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	28.59	0.00	0.00	0.70	0.05	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	34.31	-0.05	-21.13	-1654.27	4.88	0.07
0.9 Dead+1.6 Wind 0 deg - No Ice	25.73	-0.05	-21.13	-1639.52	4.81	0.07
1.2 Dead+1.6 Wind 30 deg - No Ice	34.31	10.98	-18.97	-1440.58	-835.54	0.09
0.9 Dead+1.6 Wind 30 deg - No Ice	25.73	10.98	-18.97	-1427.83	-828.03	0.10
1.2 Dead+1.6 Wind 60 deg - No Ice	34.31	18.80	-10.77	-836.68	-1466.11	0.02
0.9 Dead+1.6 Wind 60 deg - No Ice	25.73	18.80	-10.77	-829.36	-1452.89	0.02
1.2 Dead+1.6 Wind 90 deg - No Ice	34.31	23.54	0.05	5.69	-1709.85	0.32

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 90 deg - No Ice	25.73	23.54	0.05	5.42	-1694.61	0.32
1.2 Dead+1.6 Wind 120 deg - No Ice	34.31	18.43	10.61	833.25	-1447.50	-0.05
0.9 Dead+1.6 Wind 120 deg - No Ice	25.73	18.43	10.61	825.49	-1434.40	-0.05
1.2 Dead+1.6 Wind 150 deg - No Ice	34.31	10.80	18.56	1438.86	-839.10	-0.05
0.9 Dead+1.6 Wind 150 deg - No Ice	25.73	10.80	18.56	1425.64	-831.52	-0.06
1.2 Dead+1.6 Wind 180 deg - No Ice	34.31	0.05	21.13	1656.01	-4.76	-0.07
0.9 Dead+1.6 Wind 180 deg - No Ice	25.73	0.05	21.13	1640.81	-4.73	-0.07
1.2 Dead+1.6 Wind 210 deg - No Ice	34.31	-10.98	18.97	1442.33	835.66	-0.10
0.9 Dead+1.6 Wind 210 deg - No Ice	25.73	-10.98	18.97	1429.13	828.11	-0.10
1.2 Dead+1.6 Wind 240 deg - No Ice	34.31	-18.80	10.77	838.43	1466.23	-0.02
0.9 Dead+1.6 Wind 240 deg - No Ice	25.73	-18.80	10.77	830.66	1452.98	-0.02
1.2 Dead+1.6 Wind 270 deg - No Ice	34.31	-23.54	-0.05	-3.94	1709.97	-0.32
0.9 Dead+1.6 Wind 270 deg - No Ice	25.73	-23.54	-0.05	-4.12	1694.70	-0.32
1.2 Dead+1.6 Wind 300 deg - No Ice	34.31	-18.43	-10.61	-831.50	1447.62	0.05
0.9 Dead+1.6 Wind 300 deg - No Ice	25.73	-18.43	-10.61	-824.19	1434.49	0.05
1.2 Dead+1.6 Wind 330 deg - No Ice	34.31	-10.80	-18.56	-1437.11	839.22	0.06
0.9 Dead+1.6 Wind 330 deg - No Ice	25.73	-10.80	-18.56	-1424.34	831.61	0.06
1.2 Dead+1.0 Ice+1.0 Temp	68.45	0.00	0.00	6.13	-0.24	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.45	-0.00	-6.65	-534.63	-0.26	-0.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.45	3.67	-6.35	-490.92	-287.39	-0.02
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.45	6.47	-3.73	-285.14	-505.09	-0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.45	7.63	0.00	6.20	-583.05	0.12
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.45	6.22	3.59	286.76	-486.40	0.01
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.45	3.42	5.93	477.55	-272.49	0.03
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.45	0.00	6.65	547.04	-0.24	0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.45	-3.67	6.35	503.33	286.89	0.02
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.45	-6.47	3.73	297.56	504.59	0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.45	-7.63	-0.00	6.22	582.55	-0.12
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.45	-6.22	-3.59	-274.35	485.91	-0.01
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.45	-3.42	-5.93	-465.13	272.00	-0.03
Dead+Wind 0 deg - Service	28.59	-0.01	-4.52	-351.64	1.07	0.02
Dead+Wind 30 deg - Service	28.59	2.35	-4.06	-306.15	-177.85	0.01
Dead+Wind 60 deg - Service	28.59	4.02	-2.31	-177.59	-312.10	0.00
Dead+Wind 90 deg - Service	28.59	5.04	0.01	1.75	-364.01	-0.00
Dead+Wind 120 deg - Service	28.59	3.94	2.27	177.93	-308.13	-0.01
Dead+Wind 150 deg - Service	28.59	2.31	3.97	306.86	-178.60	-0.01
Dead+Wind 180 deg - Service	28.59	0.01	4.52	353.09	-0.98	-0.02

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
Dead+Wind 210 deg - Service	28.59	-2.35	4.06	307.60	177.94	-0.01
Dead+Wind 240 deg - Service	28.59	-4.02	2.31	179.04	312.19	-0.01
Dead+Wind 270 deg - Service	28.59	-5.04	-0.01	-0.30	364.11	0.00
Dead+Wind 300 deg - Service	28.59	-3.94	-2.27	-176.48	308.22	0.01
Dead+Wind 330 deg - Service	28.59	-2.31	-3.97	-305.41	178.70	0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-28.59	0.00	0.00	28.59	0.00	0.000%
2	-0.05	-34.31	-21.13	0.05	34.31	21.13	0.000%
3	-0.05	-25.73	-21.13	0.05	25.73	21.13	0.000%
4	10.98	-34.31	-18.97	-10.98	34.31	18.97	0.000%
5	10.98	-25.73	-18.97	-10.98	25.73	18.97	0.000%
6	18.80	-34.31	-10.77	-18.80	34.31	10.77	0.000%
7	18.80	-25.73	-10.77	-18.80	25.73	10.77	0.000%
8	23.54	-34.31	0.05	-23.54	34.31	-0.05	0.000%
9	23.54	-25.73	0.05	-23.54	25.73	-0.05	0.000%
10	18.43	-34.31	10.61	-18.43	34.31	-10.61	0.000%
11	18.43	-25.73	10.61	-18.43	25.73	-10.61	0.000%
12	10.80	-34.31	18.56	-10.80	34.31	-18.56	0.000%
13	10.80	-25.73	18.56	-10.80	25.73	-18.56	0.000%
14	0.05	-34.31	21.13	-0.05	34.31	-21.13	0.000%
15	0.05	-25.73	21.13	-0.05	25.73	-21.13	0.000%
16	-10.98	-34.31	18.97	10.98	34.31	-18.97	0.000%
17	-10.98	-25.73	18.97	10.98	25.73	-18.97	0.000%
18	-18.80	-34.31	10.77	18.80	34.31	-10.77	0.000%
19	-18.80	-25.73	10.77	18.80	25.73	-10.77	0.000%
20	-23.54	-34.31	-0.05	23.54	34.31	0.05	0.000%
21	-23.54	-25.73	-0.05	23.54	25.73	0.05	0.000%
22	-18.43	-34.31	-10.61	18.43	34.31	10.61	0.000%
23	-18.43	-25.73	-10.61	18.43	25.73	10.61	0.000%
24	-10.80	-34.31	-18.56	10.80	34.31	18.56	0.000%
25	-10.80	-25.73	-18.56	10.80	25.73	18.56	0.000%
26	0.00	-68.45	0.00	-0.00	68.45	-0.00	0.000%
27	-0.00	-68.45	-6.65	0.00	68.45	6.65	0.000%
28	3.67	-68.45	-6.35	-3.67	68.45	6.35	0.000%
29	6.47	-68.45	-3.73	-6.47	68.45	3.73	0.000%
30	7.63	-68.45	0.00	-7.63	68.45	-0.00	0.000%
31	6.22	-68.45	3.59	-6.22	68.45	-3.59	0.000%
32	3.42	-68.45	5.93	-3.42	68.45	-5.93	0.000%
33	0.00	-68.45	6.65	-0.00	68.45	-6.65	0.000%
34	-3.67	-68.45	6.35	3.67	68.45	-6.35	0.000%
35	-6.47	-68.45	3.73	6.47	68.45	-3.73	0.000%
36	-7.63	-68.45	-0.00	7.63	68.45	0.00	0.000%
37	-6.22	-68.45	-3.59	6.22	68.45	3.59	0.000%
38	-3.42	-68.45	-5.93	3.42	68.45	5.93	0.000%
39	-0.01	-28.59	-4.52	0.01	28.59	4.52	0.000%
40	2.35	-28.59	-4.06	-2.35	28.59	4.06	0.000%
41	4.02	-28.59	-2.31	-4.02	28.59	2.31	0.000%
42	5.04	-28.59	0.01	-5.04	28.59	-0.01	0.000%
43	3.94	-28.59	2.27	-3.94	28.59	-2.27	0.000%
44	2.31	-28.59	3.97	-2.31	28.59	-3.97	0.000%
45	0.01	-28.59	4.52	-0.01	28.59	-4.52	0.000%
46	-2.35	-28.59	4.06	2.35	28.59	-4.06	0.000%
47	-4.02	-28.59	2.31	4.02	28.59	-2.31	0.000%
48	-5.04	-28.59	-0.01	5.04	28.59	0.01	0.000%
49	-3.94	-28.59	-2.27	3.94	28.59	2.27	0.000%
50	-2.31	-28.59	-3.97	2.31	28.59	3.97	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	0.00004527
3	Yes	4	0.00000001	0.00053123
4	Yes	6	0.00000001	0.00007440
5	Yes	5	0.00000001	0.00083752
6	Yes	6	0.00000001	0.00007589
7	Yes	5	0.00000001	0.00085331
8	Yes	5	0.00000001	0.00005124
9	Yes	4	0.00000001	0.00064329
10	Yes	6	0.00000001	0.00007534
11	Yes	5	0.00000001	0.00084803
12	Yes	6	0.00000001	0.00007536
13	Yes	5	0.00000001	0.00084849
14	Yes	5	0.00000001	0.00005127
15	Yes	4	0.00000001	0.00065159
16	Yes	6	0.00000001	0.00007413
17	Yes	5	0.00000001	0.00083393
18	Yes	6	0.00000001	0.00007624
19	Yes	5	0.00000001	0.00085693
20	Yes	5	0.00000001	0.00004553
21	Yes	4	0.00000001	0.00053776
22	Yes	6	0.00000001	0.00007549
23	Yes	5	0.00000001	0.00085009
24	Yes	6	0.00000001	0.00007486
25	Yes	5	0.00000001	0.00084300
26	Yes	4	0.00000001	0.00034866
27	Yes	6	0.00000001	0.00039680
28	Yes	6	0.00000001	0.00047708
29	Yes	6	0.00000001	0.00048513
30	Yes	6	0.00000001	0.00042039
31	Yes	6	0.00000001	0.00047364
32	Yes	6	0.00000001	0.00046209
33	Yes	6	0.00000001	0.00040468
34	Yes	6	0.00000001	0.00048590
35	Yes	6	0.00000001	0.00049284
36	Yes	6	0.00000001	0.00042002
37	Yes	6	0.00000001	0.00046497
38	Yes	6	0.00000001	0.00045321
39	Yes	4	0.00000001	0.00023197
40	Yes	4	0.00000001	0.00071028
41	Yes	4	0.00000001	0.00072496
42	Yes	4	0.00000001	0.00023591
43	Yes	4	0.00000001	0.00072025
44	Yes	4	0.00000001	0.00072395
45	Yes	4	0.00000001	0.00023328
46	Yes	4	0.00000001	0.00070658
47	Yes	4	0.00000001	0.00073586
48	Yes	4	0.00000001	0.00023591
49	Yes	4	0.00000001	0.00072121
50	Yes	4	0.00000001	0.00071067

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	14.078	48	0.9910	0.0004
L2	105 - 100	13.040	48	0.9904	0.0003
L3	100 - 95	12.005	48	0.9855	0.0003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	95 - 90	10.979	47	0.9751	0.0002
L5	90 - 85	9.966	47	0.9590	0.0002
L6	85 - 80	8.970	47	0.9420	0.0001
L7	80 - 75	7.996	47	0.9162	0.0001
L8	75 - 70	7.054	47	0.8812	0.0001
L9	70 - 65	6.155	48	0.8349	0.0001
L10	65 - 60	5.311	48	0.7757	0.0001
L11	60 - 55	4.536	48	0.7032	0.0001
L12	55 - 50	3.823	48	0.6597	0.0001
L13	50 - 45	3.158	48	0.6093	0.0001
L14	45 - 40	2.550	48	0.5518	0.0000
L15	40 - 39.3333	2.006	48	0.4871	0.0000
L16	39.3333 - 39.0833	1.939	48	0.4780	0.0000
L17	39.0833 - 34.0833	1.914	48	0.4753	0.0000
L18	34.0833 - 30	1.445	48	0.4183	0.0000
L19	30 - 29.75	1.109	48	0.3676	0.0000
L20	29.75 - 25	1.090	48	0.3644	0.0000
L21	25 - 24.75	0.758	48	0.3016	0.0000
L22	24.75 - 19.75	0.743	48	0.2984	0.0000
L23	19.75 - 18.5833	0.464	48	0.2328	0.0000
L24	18.5833 - 18.3333	0.409	48	0.2166	0.0000
L25	18.3333 - 13.3333	0.398	48	0.2138	0.0000
L26	13.3333 - 8.41667	0.204	48	0.1548	0.0000
L27	8.41667 - 8.06667	0.077	48	0.0920	0.0000
L28	8.06667 - 7.83333	0.070	48	0.0882	0.0000
L29	7.83333 - 6	0.066	48	0.0856	0.0000
L30	6 - 5.75	0.037	48	0.0651	0.0000
L31	5.75 - 2	0.034	48	0.0621	0.0000
L32	2 - 1.75	0.003	48	0.0151	0.0000
L33	1.75 - 0	0.002	48	0.0133	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	T-Arm Mount [TA 702-3]	48	13.455	0.9910	0.0003	115315
105.00	Side Arm Mount [SO 102-3]	48	13.040	0.9904	0.0003	115315
89.00	Platform Mount [LP 502-1]	47	9.765	0.9559	0.0002	16830
74.00	Platform Mount [LP 304-1]	47	6.871	0.8728	0.0001	6721
30.00	Bridge Stiffener 72" x 1.25" x 11"	48	1.109	0.3676	0.0000	4478

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	66.133	20	4.6583	0.0017
L2	105 - 100	61.260	20	4.6559	0.0016
L3	100 - 95	56.400	20	4.6325	0.0014
L4	95 - 90	51.577	20	4.5840	0.0012
L5	90 - 85	46.819	20	4.5084	0.0010
L6	85 - 80	42.141	20	4.4285	0.0009
L7	80 - 75	37.568	20	4.3064	0.0008

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	75 - 70	33.145	20	4.1408	0.0007
L9	70 - 65	28.921	20	3.9228	0.0006
L10	65 - 60	24.957	20	3.6442	0.0005
L11	60 - 55	21.317	20	3.3039	0.0004
L12	55 - 50	17.964	20	3.0994	0.0003
L13	50 - 45	14.842	20	2.8624	0.0003
L14	45 - 40	11.984	20	2.5922	0.0002
L15	40 - 39.3333	9.426	20	2.2890	0.0002
L16	39.3333 - 39.0833	9.110	20	2.2460	0.0002
L17	39.0833 - 34.0833	8.993	20	2.2334	0.0002
L18	34.0833 - 30	6.792	20	1.9660	0.0002
L19	30 - 29.75	5.212	20	1.7277	0.0002
L20	29.75 - 25	5.122	20	1.7128	0.0002
L21	25 - 24.75	3.563	20	1.4172	0.0002
L22	24.75 - 19.75	3.489	20	1.4025	0.0002
L23	19.75 - 18.5833	2.179	20	1.0938	0.0002
L24	18.5833 - 18.3333	1.921	20	1.0179	0.0002
L25	18.3333 - 13.3333	1.869	20	1.0046	0.0002
L26	13.3333 - 8.41667	0.960	20	0.7273	0.0002
L27	8.41667 - 8.06667	0.361	20	0.4324	0.0001
L28	8.06667 - 7.83333	0.330	20	0.4143	0.0001
L29	7.83333 - 6	0.310	20	0.4022	0.0001
L30	6 - 5.75	0.174	20	0.3059	0.0001
L31	5.75 - 2	0.158	20	0.2916	0.0001
L32	2 - 1.75	0.015	20	0.0709	0.0000
L33	1.75 - 0	0.011	20	0.0624	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	T-Arm Mount [TA 702-3]	20	63.209	4.6585	0.0018	24887
105.00	Side Arm Mount [SO 102-3]	20	61.260	4.6559	0.0018	24887
89.00	Platform Mount [LP 502-1]	20	45.876	4.4934	0.0010	3626
74.00	Platform Mount [LP 304-1]	20	32.283	4.1013	0.0006	1444
30.00	Bridge Stiffener 72" x 1.25" x 11"	20	5.212	1.7277	0.0002	955

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	110 - 105 (1)	P24x0.25	5.00	0.00	0.0	18.6532	-1.39	662.26	0.002
L2	105 - 100 (2)	P24x0.25	5.00	0.00	0.0	18.6532	-2.66	662.26	0.004
L3	100 - 95 (3)	P24x0.25	5.00	0.00	0.0	18.6532	-3.04	662.26	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L4	95 - 90 (4)	P24x0.25	5.00	0.00	0.0	18.6532	-3.42	662.26	0.005
L5	90 - 85 (5)	P24x0.375	5.00	0.00	0.0	27.8325	-6.68	1052.07	0.006
L6	85 - 80 (6)	P24x0.375	5.00	0.00	0.0	27.8325	-7.34	1052.07	0.007
L7	80 - 75 (7)	P24x0.375	5.00	0.00	0.0	27.8325	-8.02	1052.07	0.008
L8	75 - 70 (8)	P24x0.375	5.00	0.00	0.0	27.8325	-11.52	1052.07	0.011
L9	70 - 65 (9)	P24x0.375	5.00	0.00	0.0	27.8325	-12.27	1052.07	0.012
L10	65 - 60 (10)	P24x0.375	5.00	0.00	0.0	27.8325	-13.04	1052.07	0.012
L11	60 - 55 (11)	P30x0.375	5.00	0.00	0.0	34.9011	-13.92	1311.06	0.011
L12	55 - 50 (12)	P30x0.375	5.00	0.00	0.0	34.9011	-14.81	1311.06	0.011
L13	50 - 45 (13)	P30x0.375	5.00	0.00	0.0	34.9011	-15.71	1311.06	0.012
L14	45 - 40 (14)	P30x0.375	5.00	0.00	0.0	34.9011	-16.63	1311.06	0.013
L15	40 - 39.3333 (15)	P30x0.375	0.67	0.00	0.0	34.9011	-16.76	1311.06	0.013
L16	39.3333 - 39.0833 (16)	P30x0.4875	0.25	0.00	0.0	45.1992	-16.82	1708.53	0.010
L17	39.0833 - 34.0833 (17)	P30x0.4875	5.00	0.00	0.0	45.1992	-17.90	1708.53	0.010
L18	34.0833 - 30 (18)	P30x0.4875	4.08	0.00	0.0	45.1992	-18.80	1708.53	0.011
L19	30 - 29.75 (19)	P30x0.5	0.25	0.00	0.0	46.3385	-24.25	1751.60	0.014
L20	29.75 - 25 (20)	P30x0.5	4.75	0.00	0.0	46.3385	-25.36	1751.60	0.014
L21	25 - 24.75 (21)	P30x0.55625	0.25	0.00	0.0	51.4533	-25.45	1944.93	0.013
L22	24.75 - 19.75 (22)	P30x0.55625	5.00	0.00	0.0	51.4533	-26.98	1944.93	0.014
L23	19.75 - 18.5833 (23)	P30x0.55625	1.17	0.00	0.0	51.4533	-27.34	1944.93	0.014
L24	18.5833 - 18.3333 (24)	P30x0.7	0.25	0.00	0.0	64.4341	-27.45	2435.61	0.011
L25	18.3333 - 13.3333 (25)	P30x0.7	5.00	0.00	0.0	64.4341	-29.31	2435.61	0.012
L26	13.3333 - 8.41667 (26)	P30x0.7	4.92	0.00	0.0	64.4341	-31.17	2435.61	0.013
L27	8.41667 - 8.06667 (27)	P30x0.8625	0.35	0.00	0.0	78.9517	-31.32	2984.37	0.010
L28	8.06667 - 7.83333 (28)	P30x0.8625	0.23	0.00	0.0	78.9517	-31.42	2984.37	0.011
L29	7.83333 - 6 (29)	P30x0.8625	1.83	0.00	0.0	78.9517	-32.13	2984.37	0.011
L30	6 - 5.75 (30)	P30x0.8	0.25	0.00	0.0	73.3876	-32.23	2774.05	0.012
L31	5.75 - 2 (31)	P30x0.8	3.75	0.00	0.0	73.3876	-33.39	2774.05	0.012
L32	2 - 1.75 (32)	P30x1.525	0.25	0.00	0.0	136.4220	-33.52	5156.74	0.007
L33	1.75 - 0 (33)	P30x1.475	1.75	0.00	0.0	132.1810	-34.29	4996.42	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	110 - 105 (1)	P24x0.25	8.47	396.68	0.021	0.00	396.68	0.000
L2	105 - 100 (2)	P24x0.25	32.95	396.68	0.083	0.00	396.68	0.000
L3	100 - 95 (3)	P24x0.25	57.13	396.68	0.144	0.00	396.68	0.000
L4	95 - 90 (4)	P24x0.25	82.96	396.68	0.209	0.00	396.68	0.000
L5	90 - 85 (5)	P24x0.375	137.75	623.72	0.221	0.00	623.72	0.000
L6	85 - 80 (6)	P24x0.375	196.16	623.72	0.315	0.00	623.72	0.000
L7	80 - 75 (7)	P24x0.375	256.19	623.72	0.411	0.00	623.72	0.000
L8	75 - 70 (8)	P24x0.375	339.62	623.72	0.545	0.00	623.72	0.000
L9	70 - 65 (9)	P24x0.375	422.73	623.72	0.678	0.00	623.72	0.000
L10	65 - 60 (10)	P24x0.375	507.32	623.72	0.813	0.00	623.72	0.000
L11	60 - 55 (11)	P30x0.375	593.99	947.86	0.627	0.00	947.86	0.000
L12	55 - 50 (12)	P30x0.375	682.42	947.86	0.720	0.00	947.86	0.000
L13	50 - 45 (13)	P30x0.375	772.51	947.86	0.815	0.00	947.86	0.000
L14	45 - 40 (14)	P30x0.375	864.13	947.86	0.912	0.00	947.86	0.000
L15	40 - 39.3333 (15)	P30x0.375	876.44	947.86	0.925	0.00	947.86	0.000
L16	39.3333 - 39.0833 (16)	P30x0.4875	881.08	1273.78	0.692	0.00	1273.78	0.000
L17	39.0833 - 34.0833 (17)	P30x0.4875	974.40	1273.78	0.765	0.00	1273.78	0.000
L18	34.0833 - 30 (18)	P30x0.4875	1051.63	1273.78	0.826	0.00	1273.78	0.000
L19	30 - 29.75 (19)	P30x0.5	1056.82	1311.10	0.806	0.00	1311.10	0.000
L20	29.75 - 25 (20)	P30x0.5	1155.71	1311.10	0.881	0.00	1311.10	0.000
L21	25 - 24.75 (21)	P30x0.55625	1160.94	1481.77	0.783	0.00	1481.77	0.000
L22	24.75 - 19.75 (22)	P30x0.55625	1266.07	1481.77	0.854	0.00	1481.77	0.000
L23	19.75 - 18.5833 (23)	P30x0.55625	1290.72	1481.77	0.871	0.00	1481.77	0.000
L24	18.5833 - 18.3333 (24)	P30x0.7	1296.01	1893.33	0.685	0.00	1893.33	0.000
L25	18.3333 - 13.3333 (25)	P30x0.7	1403.77	1893.33	0.741	0.00	1893.33	0.000
L26	13.3333 - 8.41667 (26)	P30x0.7	1514.40	1893.33	0.800	0.00	1893.33	0.000
L27	8.41667 - 8.06667 (27)	P30x0.8625	1522.38	2307.28	0.660	0.00	2307.28	0.000
L28	8.06667 - 7.83333 (28)	P30x0.8625	1527.71	2307.28	0.662	0.00	2307.28	0.000
L29	7.83333 - 6 (29)	P30x0.8625	1569.83	2307.28	0.680	0.00	2307.28	0.000
L30	6 - 5.75 (30)	P30x0.8	1575.60	2149.19	0.733	0.00	2149.19	0.000
L31	5.75 - 2 (31)	P30x0.8	1662.95	2149.19	0.774	0.00	2149.19	0.000
L32	2 - 1.75 (32)	P30x1.525	1668.82	3898.72	0.428	0.00	3898.72	0.000
L33	1.75 - 0 (33)	P30x1.475	1709.97	3783.91	0.452	0.00	3783.91	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	110 - 105 (1)	P24x0.25	3.01	331.13	0.009	0.11	648.61	0.000
L2	105 - 100 (2)	P24x0.25	4.67	331.13	0.014	0.11	648.61	0.000
L3	100 - 95 (3)	P24x0.25	5.00	331.13	0.015	0.11	648.61	0.000
L4	95 - 90 (4)	P24x0.25	5.33	331.13	0.016	0.11	648.61	0.000
L5	90 - 85 (5)	P24x0.375	11.52	526.03	0.022	0.02	1019.71	0.000
L6	85 - 80 (6)	P24x0.375	11.85	526.03	0.023	0.02	1019.71	0.000
L7	80 - 75 (7)	P24x0.375	12.17	526.03	0.023	0.02	1019.71	0.000
L8	75 - 70 (8)	P24x0.375	16.47	526.03	0.031	0.02	1019.71	0.000
L9	70 - 65 (9)	P24x0.375	16.78	526.03	0.032	0.02	1019.71	0.000
L10	65 - 60 (10)	P24x0.375	17.15	526.03	0.033	0.02	1019.71	0.000
L11	60 - 55 (11)	P30x0.375	17.51	655.53	0.027	0.02	1598.37	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 $\frac{T_u}{\phi T_n}$
L12	55 - 50 (12)	P30x0.375	17.86	655.53	0.027	0.02	1598.37	0.000
L13	50 - 45 (13)	P30x0.375	18.18	655.53	0.028	0.02	1598.37	0.000
L14	45 - 40 (14)	P30x0.375	18.47	655.53	0.028	0.02	1598.37	0.000
L15	40 - 39.3333 (15)	P30x0.375	18.50	655.53	0.028	0.02	1598.37	0.000
L16	39.3333 - 39.0833 (16)	P30x0.4875	18.52	854.26	0.022	0.02	2067.38	0.000
L17	39.0833 - 34.0833 (17)	P30x0.4875	18.81	854.26	0.022	0.02	2067.38	0.000
L18	34.0833 - 30 (18)	P30x0.4875	19.03	854.26	0.022	0.02	2067.38	0.000
L19	30 - 29.75 (19)	P30x0.5	20.72	875.80	0.024	0.02	2117.72	0.000
L20	29.75 - 25 (20)	P30x0.5	20.93	875.80	0.024	0.02	2117.72	0.000
L21	25 - 24.75 (21)	P30x0.55625	20.92	972.47	0.022	0.02	2342.68	0.000
L22	24.75 - 19.75 (22)	P30x0.55625	21.13	972.47	0.022	0.02	2342.68	0.000
L23	19.75 - 18.5833 (23)	P30x0.55625	21.17	972.47	0.022	0.02	2342.68	0.000
L24	18.5833 - 18.3333 (24)	P30x0.7	21.16	1217.80	0.017	0.02	2905.75	0.000
L25	18.3333 - 13.3333 (25)	P30x0.7	22.23	1217.80	0.018	0.15	2905.75	0.000
L26	13.3333 - 8.41667 (26)	P30x0.7	22.80	1217.80	0.019	0.23	2905.75	0.000
L27	8.41667 - 8.06667 (27)	P30x0.8625	22.83	1492.19	0.015	0.23	3522.13	0.000
L28	8.06667 - 7.83333 (28)	P30x0.8625	22.86	1492.19	0.015	0.24	3522.13	0.000
L29	7.83333 - 6 (29)	P30x0.8625	23.11	1492.19	0.015	0.27	3522.13	0.000
L30	6 - 5.75 (30)	P30x0.8	23.11	1387.03	0.017	0.28	3287.56	0.000
L31	5.75 - 2 (31)	P30x0.8	23.49	1387.03	0.017	0.32	3287.56	0.000
L32	2 - 1.75 (32)	P30x1.525	23.48	2578.37	0.009	0.32	5823.90	0.000
L33	1.75 - 0 (33)	P30x1.475	23.56	2498.21	0.009	0.32	5661.58	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	110 - 105 (1)	0.002	0.021	0.000	0.009	0.000	0.024	1.000	4.8.2
L2	105 - 100 (2)	0.004	0.083	0.000	0.014	0.000	0.087	1.000	4.8.2
L3	100 - 95 (3)	0.005	0.144	0.000	0.015	0.000	0.149	1.000	4.8.2
L4	95 - 90 (4)	0.005	0.209	0.000	0.016	0.000	0.215	1.000	4.8.2
L5	90 - 85 (5)	0.006	0.221	0.000	0.022	0.000	0.228	1.000	4.8.2
L6	85 - 80 (6)	0.007	0.315	0.000	0.023	0.000	0.322	1.000	4.8.2
L7	80 - 75 (7)	0.008	0.411	0.000	0.023	0.000	0.419	1.000	4.8.2
L8	75 - 70 (8)	0.011	0.545	0.000	0.031	0.000	0.556	1.000	4.8.2
L9	70 - 65 (9)	0.012	0.678	0.000	0.032	0.000	0.690	1.000	4.8.2
L10	65 - 60 (10)	0.012	0.813	0.000	0.033	0.000	0.827	1.000	4.8.2
L11	60 - 55 (11)	0.011	0.627	0.000	0.027	0.000	0.638	1.000	4.8.2
L12	55 - 50 (12)	0.011	0.720	0.000	0.027	0.000	0.732	1.000	4.8.2
L13	50 - 45 (13)	0.012	0.815	0.000	0.028	0.000	0.828	1.000	4.8.2
L14	45 - 40 (14)	0.013	0.912	0.000	0.028	0.000	0.925	1.000	4.8.2
L15	40 - 39.3333 (15)	0.013	0.925	0.000	0.028	0.000	0.938	1.000	4.8.2
L16	39.3333 - 39.0833 (16)	0.010	0.692	0.000	0.022	0.000	0.702	1.000	4.8.2
L17	39.0833 - 34.0833 (17)	0.010	0.765	0.000	0.022	0.000	0.776	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
L18	34.0833 - 30 (18)	0.011	0.826	0.000	0.022	0.000	0.837	1.000	4.8.2
L19	30 - 29.75 (19)	0.014	0.806	0.000	0.024	0.000	0.820	1.000	4.8.2
L20	29.75 - 25 (20)	0.014	0.881	0.000	0.024	0.000	0.897	1.000	4.8.2
L21	25 - 24.75 (21)	0.013	0.783	0.000	0.022	0.000	0.797	1.000	4.8.2
L22	24.75 - 19.75 (22)	0.014	0.854	0.000	0.022	0.000	0.869	1.000	4.8.2
L23	19.75 - 18.5833 (23)	0.014	0.871	0.000	0.022	0.000	0.886	1.000	4.8.2
L24	18.5833 - 18.3333 (24)	0.011	0.685	0.000	0.017	0.000	0.696	1.000	4.8.2
L25	18.3333 - 13.3333 (25)	0.012	0.741	0.000	0.018	0.000	0.754	1.000	4.8.2
L26	13.3333 - 8.41667 (26)	0.013	0.800	0.000	0.019	0.000	0.813	1.000	4.8.2
L27	8.41667 - 8.06667 (27)	0.010	0.660	0.000	0.015	0.000	0.671	1.000	4.8.2
L28	8.06667 - 7.83333 (28)	0.011	0.662	0.000	0.015	0.000	0.673	1.000	4.8.2
L29	7.83333 - 6 (29)	0.011	0.680	0.000	0.015	0.000	0.691	1.000	4.8.2
L30	6 - 5.75 (30)	0.012	0.733	0.000	0.017	0.000	0.745	1.000	4.8.2
L31	5.75 - 2 (31)	0.012	0.774	0.000	0.017	0.000	0.786	1.000	4.8.2
L32	2 - 1.75 (32)	0.007	0.428	0.000	0.009	0.000	0.435	1.000	4.8.2
L33	1.75 - 0 (33)	0.007	0.452	0.000	0.009	0.000	0.459	1.000	4.8.2

Section Capacity Table

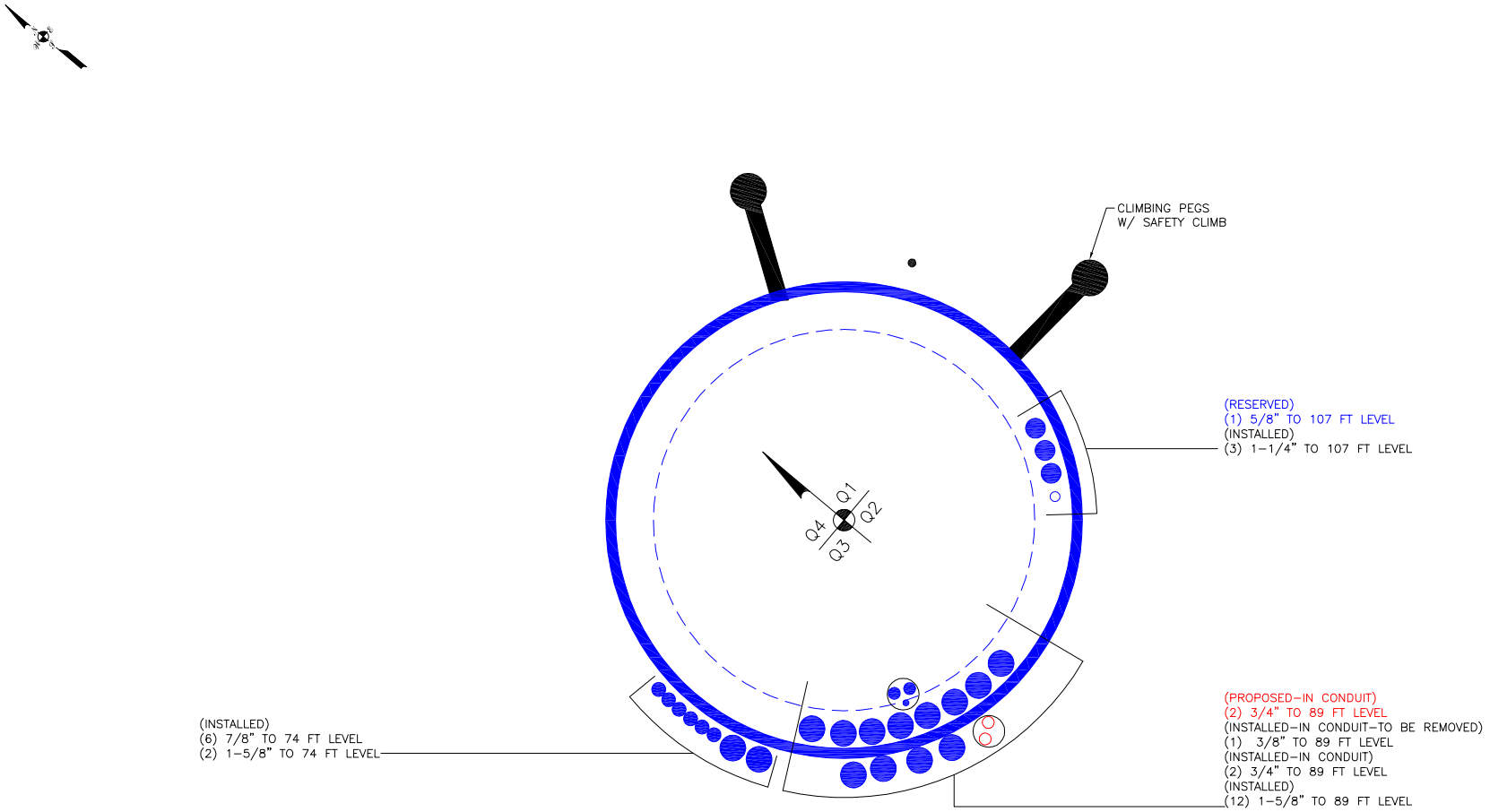
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	110 - 105	Pole	P24x0.25	1	-1.39	662.26	2.4	Pass
L2	105 - 100	Pole	P24x0.25	2	-2.66	662.26	8.7	Pass
L3	100 - 95	Pole	P24x0.25	3	-3.04	662.26	14.9	Pass
L4	95 - 90	Pole	P24x0.25	4	-3.42	662.26	21.5	Pass
L5	90 - 85	Pole	P24x0.375	5	-6.68	1052.07	22.8	Pass
L6	85 - 80	Pole	P24x0.375	6	-7.34	1052.07	32.2	Pass
L7	80 - 75	Pole	P24x0.375	7	-8.02	1052.07	41.9	Pass
L8	75 - 70	Pole	P24x0.375	8	-11.52	1052.07	55.6	Pass
L9	70 - 65	Pole	P24x0.375	9	-12.27	1052.07	69.0	Pass
L10	65 - 60	Pole	P24x0.375	10	-13.04	1052.07	82.7	Pass
L11	60 - 55	Pole	P30x0.375	11	-13.92	1311.06	63.8	Pass
L12	55 - 50	Pole	P30x0.375	12	-14.81	1311.06	73.2	Pass
L13	50 - 45	Pole	P30x0.375	13	-15.71	1311.06	82.8	Pass
L14	45 - 40	Pole	P30x0.375	14	-16.63	1311.06	92.5	Pass
L15	40 - 39.3333	Pole	P30x0.375	15	-16.76	1311.06	93.8	Pass
L16	39.3333 - 39.0833	Pole	P30x0.4875	16	-16.82	1708.53	70.2	Pass
L17	39.0833 - 34.0833	Pole	P30x0.4875	17	-17.90	1708.53	77.6	Pass
L18	34.0833 - 30	Pole	P30x0.4875	18	-18.80	1708.53	83.7	Pass
L19	30 - 29.75	Pole	P30x0.5	19	-24.25	1751.60	82.0	Pass
L20	29.75 - 25	Pole	P30x0.5	20	-25.36	1751.60	89.7	Pass
L21	25 - 24.75	Pole	P30x0.55625	21	-25.45	1944.93	79.7	Pass
L22	24.75 - 19.75	Pole	P30x0.55625	22	-26.98	1944.93	86.9	Pass
L23	19.75 - 18.5833	Pole	P30x0.55625	23	-27.34	1944.93	88.6	Pass
L24	18.5833 - 18.3333	Pole	P30x0.7	24	-27.45	2435.61	69.6	Pass
L25	18.3333 - 13.3333	Pole	P30x0.7	25	-29.31	2435.61	75.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
L26	13.3333 - 8.41667	Pole	P30x0.7	26	-31.17	2435.61	81.3	Pass
L27	8.41667 - 8.06667	Pole	P30x0.8625	27	-31.32	2984.37	67.1	Pass
L28	8.06667 - 7.83333	Pole	P30x0.8625	28	-31.42	2984.37	67.3	Pass
L29	7.83333 - 6	Pole	P30x0.8625	29	-32.13	2984.37	69.1	Pass
L30	6 - 5.75	Pole	P30x0.8	30	-32.23	2774.05	74.5	Pass
L31	5.75 - 2	Pole	P30x0.8	31	-33.39	2774.05	78.6	Pass
L32	2 - 1.75	Pole	P30x1.525	32	-33.52	5156.74	43.5	Pass
L33	1.75 - 0	Pole	P30x1.475	33	-34.29	4996.42	45.9	Pass
							Summary	
						Pole (L15)	93.8	Pass
						RATING =	**93.8**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876325 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 876325

Work Order: 1509095

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	110	20		0	24	24	0.25	n/a	A53-B-42
2	90	30		0	24.00	24	0.375	n/a	A53-B-42
3	60	30		0	30.00	30	0.375	n/a	A53-B-42
4	30	30		0	30.00	30	0.5	n/a	A53-B-42

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	13	14	15	16	17	18
1	0	8.083333333	channel	MP3-05 (Bottom Weld	4	45	135	225	315														
2	6	25	plate	CCI-SFP-045100	4	70	110	250	290														
3	8.416666667	18.58333333	channel	MP3-05 (1.1875")	3	0	90	270															
4	30	39.33333333	channel	MP3-03 (1.1875")	3	0	120	240															
5	0	2	plate	TS 7"x1.25"	4	15	105	255	345														
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	n/a	29.000	18.000	5.025	1.1875	A572-65
2	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	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	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
5	1.25	7	8.75	3.5	n/a	n/a	0.000	8.750	0.0000	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	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	100 - 95	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	95 - 90	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
5	90 - 85	5		0	24.000	24.000	0.375	A53-B-42	1.000
6	85 - 80	5		0	24.000	24.000	0.375	A53-B-42	1.000
7	80 - 75	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	75 - 70	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	70 - 65	5		0	24.000	24.000	0.375	A53-B-42	1.000
10	65 - 60	5	0	0	24.000	24.000	0.375	A53-B-42	1.000
11	60 - 55	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	55 - 50	5		0	30.000	30.000	0.375	A53-B-42	1.000
13	50 - 45	5		0	30.000	30.000	0.375	A53-B-42	1.000
14	45 - 40	5		0	30.000	30.000	0.375	A53-B-42	1.000
15	40 - 39.33333	0.666666667		0	30.000	30.000	0.375	A53-B-42	1.000
16	39.33333 - 39.08333	0.25		0	30.000	30.000	0.4875	A53-B-42	0.966
17	39.08333 - 34.08333	5		0	30.000	30.000	0.4875	A53-B-42	0.966
18	34.08333 - 30	4.083333333	0	0	30.000	30.000	0.4875	A53-B-42	0.966
19	30 - 29.75	0.25		0	30.000	30.000	0.5	A53-B-42	1.000
20	29.75 - 25	4.75		0	30.000	30.000	0.5	A53-B-42	1.000
21	25 - 24.75	0.25		0	30.000	30.000	0.55625	A53-B-42	1.250
22	24.75 - 19.75	5		0	30.000	30.000	0.55625	A53-B-42	1.250
23	19.75 - 18.58333	1.166666667		0	30.000	30.000	0.55625	A53-B-42	1.250
24	18.58333 - 18.33333	0.25		0	30.000	30.000	0.7	A53-B-42	1.262
25	18.33333 - 13.33333	5		0	30.000	30.000	0.7	A53-B-42	1.262
26	13.33333 - 8.416667	4.916666667		0	30.000	30.000	0.7	A53-B-42	1.262
27	8.416667 - 8.066667	0.35		0	30.000	30.000	0.8625	A53-B-42	1.101
28	8.066667 - 7.833333	0.233333333		0	30.000	30.000	0.8625	A53-B-42	1.101
29	7.833333 - 6	1.833333333		0	30.000	30.000	0.8625	A53-B-42	1.101
30	6 - 5.75	0.25		0	30.000	30.000	0.8	A53-B-42	0.939
31	5.75 - 2	3.75		0	30.000	30.000	0.8	A53-B-42	0.939
32	2 - 1.75	0.25		0	30.000	30.000	1.525	A53-B-42	0.762
33	1.75 - 0	1.75		0	30.000	30.000	1.475	A53-B-42	0.786

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	110 - 105	1.39	8.47	3.01
2	105 - 100	2.66	32.95	4.67
3	100 - 95	3.04	57.13	5.00
4	95 - 90	3.42	82.96	5.33
5	90 - 85	6.68	137.75	11.52
6	85 - 80	7.34	196.16	11.85
7	80 - 75	8.02	256.19	12.17
8	75 - 70	11.52	339.62	16.47
9	70 - 65	12.27	422.73	16.78
10	65 - 60	13.04	507.32	17.15
11	60 - 55	13.92	593.99	17.51
12	55 - 50	14.81	682.42	17.86
13	50 - 45	15.71	772.51	18.18
14	45 - 40	16.63	864.12	18.47
15	40 - 39.33333	16.76	876.45	18.50
16	39.33333 - 39.08333	16.82	881.07	18.52
17	39.08333 - 34.08333	17.90	974.40	18.81
18	34.08333 - 30	18.80	1051.64	19.03
19	30 - 29.75	24.25	1056.81	20.72
20	29.75 - 25	25.36	1155.71	20.93
21	25 - 24.75	25.45	1160.94	20.92
22	24.75 - 19.75	26.98	1266.06	21.13
23	19.75 - 18.58333	27.34	1290.72	21.17
24	18.58333 - 18.33333	27.45	1296.01	21.16
25	18.33333 - 13.33333	29.31	1403.77	22.23
26	13.33333 - 8.416667	31.17	1514.40	22.80
27	8.416667 - 8.066667	31.32	1522.38	22.83
28	8.066667 - 7.833333	31.42	1527.71	22.86
29	7.833333 - 6	32.13	1569.82	23.11
30	6 - 5.75	32.23	1575.60	23.11
31	5.75 - 2	33.39	1662.95	23.49
32	2 - 1.75	33.52	1668.82	23.48
33	1.75 - 0	34.29	1709.97	23.56

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	2.4%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	8.7%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	14.9%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	21.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	22.8%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	32.2%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	41.9%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	55.6%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	69.0%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	82.7%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	63.8%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	73.2%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	82.8%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	92.5%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	93.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	73.7%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	81.4%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	87.9%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	82.0%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	89.7%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	81.1%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	88.4%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	90.1%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.7	Pole	78.3%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.7	Pole	84.8%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.7	Pole	91.5%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x0.8625	Pole	70.5%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x0.8625	Pole	70.7%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x0.8625	Pole	72.7%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x0.8	Pole	78.0%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x0.8	Pole	82.4%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.525	Reinf. 5 Weldment	71.9%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x1.475	Reinf. 1 Weldment	74.5%	Pass
				Summary	
			Pole	93.8%	Pass
			Reinforcement	81.9%	Pass
			Overall	93.8%	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
110 - 105	1315	n/a	1315	18.65	n/a	18.65	2.4%					
105 - 100	1315	n/a	1315	18.65	n/a	18.65	8.7%					
100 - 95	1315	n/a	1315	18.65	n/a	18.65	14.9%					
95 - 90	1315	n/a	1315	18.65	n/a	18.65	21.5%					
90 - 85	1942	n/a	1942	27.83	n/a	27.83	22.8%					
85 - 80	1942	n/a	1942	27.83	n/a	27.83	32.2%					
80 - 75	1942	n/a	1942	27.83	n/a	27.83	41.9%					
75 - 70	1942	n/a	1942	27.83	n/a	27.83	55.6%					
70 - 65	1942	n/a	1942	27.83	n/a	27.83	69.0%					
65 - 60	1942	n/a	1942	27.83	n/a	27.83	82.7%					
60 - 55	3829	n/a	3829	34.90	n/a	34.90	63.8%					
55 - 50	3829	n/a	3829	34.90	n/a	34.90	73.2%					
50 - 45	3829	n/a	3829	34.90	n/a	34.90	82.8%					
45 - 40	3829	n/a	3829	34.90	n/a	34.90	92.5%					
40 - 39.33	3829	n/a	3829	34.90	n/a	34.90	93.8%					
39.33 - 39.08	3829	1067	4897	34.90	8.76	43.66	73.7%				68.7%	
39.08 - 34.08	3829	1067	4897	34.90	8.76	43.66	81.4%				75.9%	
34.08 - 30	3829	1067	4897	34.90	8.76	43.66	87.9%				81.9%	
30 - 29.75	5042	n/a	5042	46.34	n/a	46.34	82.0%					
29.75 - 25	5042	n/a	5042	46.34	n/a	46.34	89.7%					
25 - 24.75	5042	533	5575	46.34	18.00	64.34	81.1%		63.6%			
24.75 - 19.75	5042	533	5575	46.34	18.00	64.34	88.4%		69.3%			
19.75 - 18.58	5042	533	5575	46.34	18.00	64.34	90.1%		70.6%			
18.58 - 18.33	5098	1832	6930	46.34	34.95	81.29	78.0%		58.3%	64.5%		
18.33 - 13.33	5098	1832	6930	46.34	34.95	81.29	84.5%		63.1%	69.8%		
13.33 - 8.42	5098	1832	6930	46.34	34.95	81.29	91.1%		68.1%	75.3%		
8.42 - 8.07	5042	3365	8407	46.34	40.60	86.94	70.5%	59.1%	60.3%			
8.07 - 7.83	5042	3365	8407	46.34	40.60	86.94	70.7%	59.3%	60.5%			
7.83 - 6	5042	3365	8407	46.34	40.60	86.94	72.7%	61.0%	62.2%			
6 - 5.75	5042	2832	7874	46.34	22.60	68.94	78.0%	74.3%				
5.75 - 2	5042	2832	7874	46.34	22.60	68.94	82.4%	78.4%				
2 - 1.75	5082	8765	13847	46.34	57.60	103.94	49.9%	50.0%				71.9%
1.75 - 0	5174	8467	13641	46.34	57.60	103.94	54.3%	74.5%				66.1%

Note: Section capacity checked in 5 degree increments.

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Reactions		
Mu	82.96	ft-kips
Axial, Pu:	3.42	kips
Shear, Vu:	5.33	kips
Elevation:	90	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
31.81

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Pole Manufacturer:	Rohn

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	29		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	Rigid	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φ*Tn	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	6.69	Kips		
Min. PL "tc" for **B** cap. **w/o** Pry:	1.488	in		
Min PL "treq" for actual **T w/ Pry**:	0.398	in		
Min PL "t1" for actual **T w/o Pry**:	0.521	in		
T allowable w/o Prying:	54.54	kips	α'<0 case	
Prying Force, q:	0.00	kips		
Total Bolt Tension=Tu+q:	6.69	kips		
Non-Prying Bolt Stress Ratio, Tu/B:	12.3%	**Pass**		

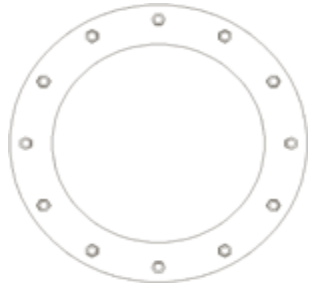
Exterior Flange Plate Results	Flexural Check	Rigid
Compression Side Plate Stress:	Rohn/Piroc OK	TIA G
Allowable Plate Stress:	32.4 ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc OK	Comp. Y.L. Length:
No Prying		16.28
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod OK	

n/a

Stiffener Results	N/A for Rohn / Pirod
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



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Reactions		
Mu	82.96	ft-kips
Axial, Pu:	3.42	kips
Shear, Vu:	5.33	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Rohn

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	29		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	
Max Bolt directly applied Tu:	6.69	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.488	in	
Min PL "treq" for actual **T w/ Pry**:	0.398	in	
Min PL "t1" for actual **T w/o Pry**:	0.521	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	6.69	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	12.3%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results

	Flexural Check	
Compression Side Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress:	32.4	ksi
Compression Plate Stress Ratio:	Rohn/Piroc	OK
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod	OK

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
16.28

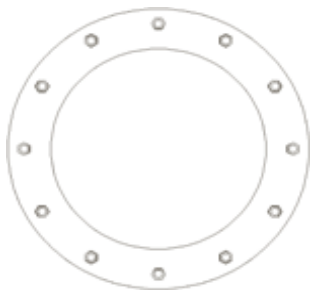
n/a

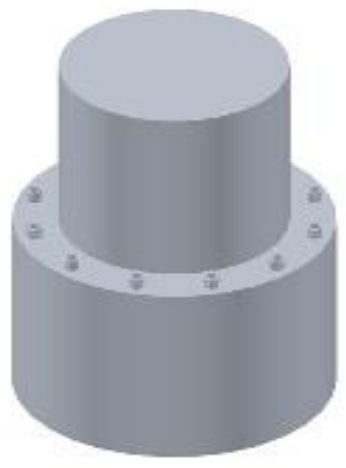
Stiffener Results N/A for Rohn / Pirod

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





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Reactions		
Mu	507.32	ft-kips
Axial, Pu:	13.04	kips
Shear, Vu:	17.15	kips
Elevation:	60	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
62.62

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Pole Manufacturer:	Rohn

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	35		

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.28	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.01	kips	
Max Bolt directly applied Tu:	56.89	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.535	in	
Min PL "treq" for actual **T w/ Pry**:	1.371	in	
Min PL "t1" for actual **T w/o Pry**:	1.815	in	
T allowable with Prying:	87.60	kips	0≤α'≤1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	56.89	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	51.3%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress:	32.4	ksi
Compression Plate Stress Ratio:	Rohn/Piroc	OK
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod	OK

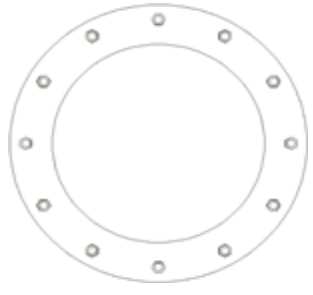
Rigid
TIA G
φ*Fy
Comp. Y.L. Length: 25.48

n/a

Stiffener Results	N/A for Rohn / Pirod
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



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Reactions		
Mu	507.32	ft-kips
Axial, Pu:	13.04	kips
Shear, Vu:	17.15	kips
Elevation:	60	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Rohn

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	35		

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.85	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.02	kips	
Max Bolt directly applied Tu:	56.89	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.376	in	
Min PL "treq" for actual **T w/ Pry**:	0.734	in	
Min PL "t1" for actual **T w/o Pry**:	0.985	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	56.89	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	51.2%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results

	Flexural Check	
Compression Side Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress:	32.4	ksi
Compression Plate Stress Ratio:	Rohn/Piroc	OK
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod	OK

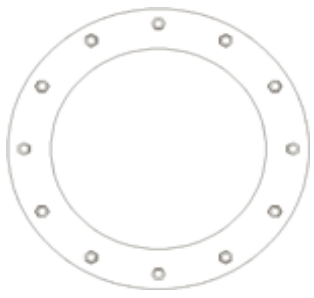
Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
18.03

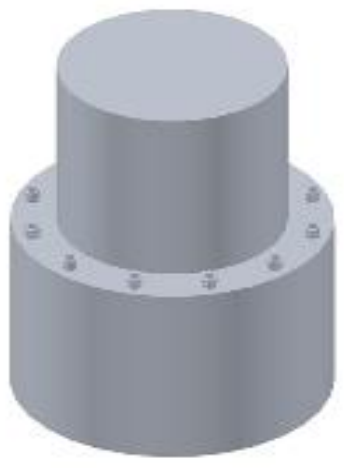
n/a

Stiffener Results	N/A for Rohn / Pirod
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





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

BLACK & VEATCH Building a world of difference.	Client:	Crown Castle	Design:	Adichon
6800 W 115th St. Suite 2292 Overland Park, KS 66211 Phone: (913) 458-8145	Project:	194393	Date:	1/11/2018
	Site:	876325.1509095	Verify:	CG
	Title:	Determination Reactions for Flange Connection	Date:	1/11/2018
			Code:	TIA-222-G

Reactions from TNX at **30** **ft**

Moment	1051.64	kip-ft
Axial	18.8	kips
Shear	19.03	kips

Flange Bolt Information:

N_{fb}	12	
Dia_{fb}	1.5	in
BC_{fb}	35	in
Ag_{fb}	1.7671	in^2
Group Area	21.21	in^2
Group Moment of Intertia	3247.13	in^4

Note: Flange bolts are assumed to take Moment, Axial, and full shear.

Bridge Stiffener Information:

N_{bs}	3	
BC_{bs}	47	in
A_{bs}	6.25	in^2
Group Area	18.75	in^2
Group Moment of Intertia	5177.34	in^4

Note: Bridge stiffeners are assumed to take Moment only.

Jump Plate Information:

N_{jp}	3	
BC_{jp}	43	in
A_{jp}	6	in^2
Group Area	18.00	in^2
Group Moment of Intertia	4160.25	in^4

Note: Jump plates are assumed to take Moment ans Axial only.

		Bolt	Bridge Stiffener	Jump Plate	Total	
Properties	Group Area, A	21.21	18.75	18.00	57.96	in^2
	Moment of Intertia, I	3247.13	5177.34	4160.25	12584.72	in^4
Reactions	Moment	271.35	432.64	347.65	1051.64	kip-ft
	Axial	10.17		8.63	18.80	kips
	Shear	19.03			19.03	kips

See attached additional calculations for capacities of connections

Welded-Plate Monopole Bridge Stiffeners
per TIA-222-G

Site Data

BU#: *876325*
Site Name: *Weston Square*
App #: *420734 Rev. 2*

Factored Loads at Splice Elevation		
Moment:	703.99	ft-kips
Axial:	10.17	kips
Shear:	19.03	kips

Elevation:	30	ft

Splice Bolt Data		
Quantity:	12	
Bolt Diameter:	1.5	in
Bolt Circle:	35	in

Pole Data		
Upper Diam:	30	in
Upper Thickness	0.375	in
Lower Diam:	30	in
Lower Thickness	0.5	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data		
Quantity:	3	
Total Length:	72.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	80	ksi
Upper Weld Length:	34	in
Upper Plate Width:	11	in
Lower Weld Length:	32.4	in
Lower Plate Width:	11	in
Gap PL Length:	5.6	in
Gap PL Width:	6	in

Stress Increase Factor		
ASIF:	1.000	

Stiffener Results	37.0%	
Maximum Compression:	158.4	kips
Allowable Compression:	428.7	kips
Compression Stress Ratio:	37.0%	
Maximum Tension:	158.4	kips
Allowable Tension:	438.8	kips
Tension Stress Ratio:	36.1%	
Maximum Flexure:	1267.4	in.kips
Allowable Flexure:	12774.2	in.kips
Bending&Shear Stress Ratio:	11.2%	

Weld Results	45.8%	
Upper Weld Stress:	4.03	kip/in
Allowable Weld Stress:	9.55	kip/in
Upper Weld Stress Ratio:	42.2%	
Lower Weld Stress:	4.38	kip/in
Allowable Weld Stress:	9.55	kip/in
Lower Weld Stress Ratio:	45.8%	

Pole Results	19.2%	
Punching Shear Stress:	7.26	kip/in
Allowable Punching Stress:	37.80	kip/in
Punching Shear Stress Ratio:	19.2%	

Loads to Use to Check Flange and Bolts w / CCIPlate		
Moment:	249	ft.kips
Axial:	10.2	kips
Shear:	19.0	kips

Analysis Date: 1/11/2018

BU: 876325
WO: 1509095

Done By: NCM
Checked By: CG
Date: 1/11/2018
}

Jump Plate Reinforcement Check

Elevation: 30ft

DETERMINE MAXIMUM FORCES ON JUMP PLATE

Jump Plate Properties

$N := 3$

$BC := 43in$

$Ag := 6in^2$

$r_x := 0.2887in$

Flange Bolt Poperties

$N_{fb} := 12$

$Dia_{fb} := 1.5in$

$BC_{fb} := 35in$

$Ag_{fb} := 1.76in^2$

Reactions

$M := 619kip \cdot ft$

$P := 18.8kip$

$V := 19.03kip$

Combined Section Properties

$$I_{fb} := \frac{N_{fb} \cdot BC_{fb}^2 \cdot Ag_{fb}}{8} = 3234 \cdot in^4$$

$$I_{bs} := \frac{N \cdot BC^2 \cdot Ag}{8} = 4160.25 \cdot in^4$$

$$I_{tot} := I_{fb} + I_{bs} = 7394.25 \cdot in^4$$

$$Ag_{tot} := N \cdot Ag + N_{fb} \cdot Ag_{fb} = 39.12 \cdot in^2$$

Division of Forces

Jump Plates

$$M_s := M \cdot \left(\frac{I_{bs}}{I_{tot}} \right) = 348.27 \cdot kip \cdot ft$$

$$P_s := P \cdot \left(\frac{N \cdot Ag}{Ag_{tot}} \right) = 8.65 \cdot kip$$

$V_s := 0kip$

Flange Bolts

$$M_b := M \cdot \left(\frac{I_{fb}}{I_{tot}} \right) = 270.73 \cdot kip \cdot ft$$

$$P_b := P \cdot \left(\frac{N_{fb} \cdot Ag_{fb}}{Ag_{tot}} \right) = 10.15 \cdot kip$$

$V_b := V = 19.03 \cdot kip$

Flange bolts to take full shear load

Maximum Axial Forces in Single Jump Plate

$$C := \frac{BC}{2} = 21.5 \cdot in$$

$$P_{Comp} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag + \frac{P_s}{N} = 132.47 \cdot kip$$

$$P_{Tens} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag - \frac{P_s}{N} = 126.71 \cdot kip$$

CHECK BOLT CONNECTION TO TOWER

AJAX Bolt Properties per ENG-STD-10148 (M20 Bolt with Aero-HS Sleeve)

$N_b := 14$ $Dia := 0.7874in$ $Fu_{bolt} := 120ksi$ $Ag_b := 0.4869in^2$ $\phi := 0.75$

$t_{shaft} := 0.5in$ $F_{yshaft} := 42ksi$ $F_{ushaft} := 60ksi$

Bolt Shear Capacity

$$V_{max} := \frac{P_{Comp}}{N_b} = 9.46 \cdot kip$$

$\phi R_{nv} := 37kip$

$$\text{\% Capacity} = \frac{V_{max}}{\phi R_{nv}} = 25.57 \cdot \%$$

Tension Check (bolts above neutral axis) AISC 13th Edition, pg 7-12

$ecc := 6.5in$

BoltType := ◉ "FORGBolt" ○ "Other"

$n' := 7$ number of bolts above neutral axis

$d_m := 21in$ moment arm between resultant tensile and resultant compressive force

$$r_{ut} := \frac{P_{Comp} \cdot ecc}{n' \cdot d_m} = 5.86 \cdot kip$$ Tension force due to eccentric load

$$\phi R_{nt} := \begin{cases} \phi R_{ntFB} & \text{if BoltType} = \text{"FORGBolt"} \\ 32.9\,kip & \text{otherwise} \end{cases}$$

$$\phi R_{nt} = 18\cdot kip$$

% Capacity = $\dfrac{r_{ut}}{\phi R_{nt}} = 32.54\cdot\%$

Combined Shear and Tension Check — TIA-222-G, 4.9.6.4

$$\left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 = 0.17$$

$$check := \begin{cases} \text{"OK"} & \text{if } \left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 \le 1 \\ \text{"Not Good"} & \text{otherwise} \end{cases}$$

check = "OK" % Capacity = $\dfrac{\text{Combined}}{1} = 17.13\cdot\%$

Shaft Bearing Capacity — TIA-222-G, 4.9.6.2

$L_c := 1.8125in$ clear distance from edge of hole to edge of adjacent hole

$$0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} = 57.87\cdot kip$$

$$2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} = 56.69\cdot kip$$

$$\phi R_{nshaft} := \begin{cases} 2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} & \text{if } 2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} \le 0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} \\ 0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} & \text{otherwise} \end{cases}$$

$\phi R_{nshaft} = 56.69 \cdot kip$

% Capacity = $\frac{V_{max}}{\phi R_{nshaft}} = 16.69 \cdot \%$

CHECK JUMP PLATE CAPACITY

Compression Check — AISC, part 16, ch. E

$L := 18in$ $K := 0.8$ $F_y := 65ksi$ $F_u := 80ksi$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{K \cdot L}{r_x}\right)^2} = 115.04 \cdot ksi$$

$$\frac{K \cdot L}{r_x} = 49.88 < 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_y}} = 99.49 \quad \therefore \quad F_{cr} := 0.658^{\frac{F_y}{F_e}} \cdot F_y = 51.31 \cdot ksi$$

$\phi P_n := 0.9 \cdot F_{cr} \cdot Ag = 277.08 \cdot kip$

% Capacity = $\frac{P_{Comp}}{\phi P_n} = 47.81 \cdot \%$

Tension Check — AISC, part 16, ch. D

Gross Section Yield

$\phi P_t := 0.90 \cdot F_y \cdot Ag = 351 \cdot kip$

% Capacity = $\frac{P_{Tens}}{\phi P_t} = 36.1 \cdot \%$

Net Section Fracture

$BH := 1.1875in$ $T := 1in$

$$A_n := Ag - \left(BH + \frac{1}{16}in\right) \cdot T = 4.75 \cdot in^2$$

$$A_e := \min\left(A_n, 0.85 \cdot Ag\right) = 4.75 \cdot in^2$$

$$\phi F_n := 0.75 \cdot F_u \cdot A_e = 285 \cdot kip$$

% Capacity = $\frac{P_{Tens}}{\phi F_n} = 44.46 \cdot \%$

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Reactions		
Mu	271.35	ft-kips
Axial, Pu:	10.17	kips
Shear, Vu:	19.03	kips
Elevation:	30	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
62.62

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data				
Qty:	12			
Diameter (in.):	1.5	Bolt Fu:	105	
Bolt Material:	A325	Bolt Fy:	81	
N/A:	100	<-- Disregard		
N/A:	75	<-- Disregard		
Circle (in.):	35			

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.85	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	Rigid	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.00	kips	φ*Tn	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	30.16	Kips		
Min. PL "tc" for **B** cap. **w/o** Pry:	1.376	in		
Min PL "treq" for actual **T w/ Pry**:	0.534	in		
Min PL "t1" for actual **T w/o Pry**:	0.717	in		
T allowable w/o Prying:	111.04	kips	α'<0 case	
Prying Force, q:	0.00	kips		
Total Bolt Tension=Tu+q:	30.16	kips		
Non-Prying Bolt Stress Ratio, Tu/B:	27.2%	**Pass**		

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	5.4	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	TIA G
Compression Plate Stress Ratio:	16.7%	**Pass**	φ*Fy
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	7.1%	**Pass**	18.03

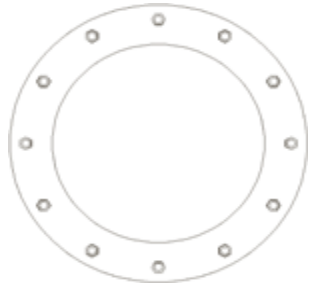
n/a

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



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Reactions		
Mu	271.35	ft-kips
Axial, Pu:	10.17	kips
Shear, Vu:	19.03	kips
Elevation:	30	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	35		

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.85	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
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:	30	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.01	kips	
Max Bolt directly applied Tu:	30.16	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.376	in	
Min PL "treq" for actual **T w/ Pry**:	0.534	in	
Min PL "t1" for actual **T w/o Pry**:	0.717	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	30.16	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	27.2%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	5.4	ksi	
Allowable Plate Stress:	32.4	ksi	
Compression Plate Stress Ratio:	16.7%	**Pass**	
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	7.1%	**Pass**	

Rigid
TIA G
φ*Fy
Comp. Y.L. Length: 18.03

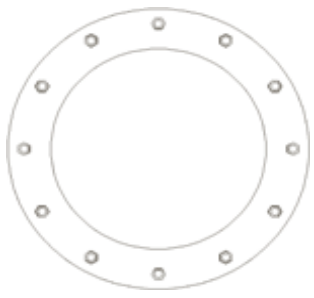
n/a

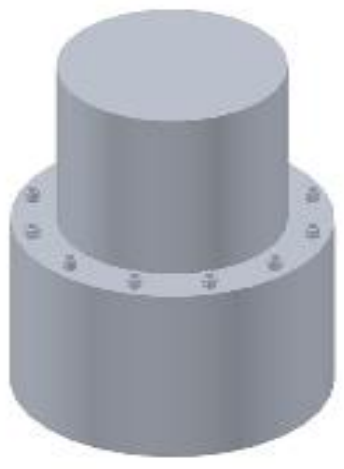
Stiffener Results

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





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BLACK & VEATCH

Owner:	CROWN CASTLE	Prepared By:	AA
Project Name:	WESTON SQUARE	Date:	1/11/2018
Project No.:	194393 (876325.1509095)	Verified By:	CG
Title:	ANCHOR ROD CALCULATIONS	Date:	1/11/2018
		Page:	1 of 1

BV Template v2.0

ANCHOR ROD ANALYSIS

Anchor Rod Information

TIA Code	G
eta Factor	0.5
Number of Bolt Circles	2
Base Plate Type	Circular

Reactions

Moment	1709.97	kip-ft
Axial	34.29	kip
Shear	23.56	kip

	1st BC	2nd BC	
Anchor Rod Quantity	12	3	
Anchor Rod Diameter	1.5	1.75	in
Anchor Rod Material	A354 GR BC	Dywidag	ksi
Bolt Circle Diameter	35	44.5	in
Base Plate or Bracketed Connection?		Bracket*	

Bolt #	Orientation of Anchor Bolts (Degrees)	
1	0.0	15
2	30.0	135
3	60.0	255
4	90.0	
5	120.0	
6	150.0	
7	180.0	
8	210.0	
9	240.0	
10	270.0	
11	300.0	
12	330.0	

Anchor Rod Results

	1st BC	2nd BC	
Moment on Bolt Group	1103.2	606.8	kip-ft
Axial on Bolt Group	34.3	0.0	kip
Shear on Bolt Group	23.6	0.0	kip
Combined Load per Anchor Rod	132.9	218.2	kip
Anchor Rod Capacity	140.5	227.9	kip
Max Stress Ratio	**94.5%**	**95.7%**	

(it is assumed that all Axial and Shear loads will go to the original anchor rods)

*Bracket Calculations & Results are on the following pages.

ANCHOR ROD BRACKET CALCULATIONS

TIA-222-G Reference

Tower & Foundation Properties		
Monopole Thickness at Base	0.5	in
Monopole Material	A500 Gr.B (Rnd)	
Yield Stress, Fy	42	ksi
Ultimate Stress, Fu	58	ksi
Base Plate Material	A36	
Yield Stress, Fy	36	ksi
Ultimate Stress, Fu	58	ksi
Pier Foundation Diameter	5	ft
Rebar Yield Stress	60	ksi
Concrete Strength	3000	psi
Clear Cover	3	in
Rebar Size	9	
Tie Size	4	
Vertical Rebar Quantity	19	
	2nd BC	
Analysis or Design of Bracket?	Analysis	
Bracket Loading Information		
Moment on Bolt Group	606.8	kip-ft
Axial Load on Anchor Rod	218.2	kip
Anchor Rod Capacity	227.9	kip
Tube Properties		
Tube Section	Pipe 3 XXS	
Length	10.625	in
Gap Between Base Plate and Tube	0	in
Outside Width/Diameter	3.5	in
Thickness	0.6	in
Area	5.16	in^2
Moment of Inertia	5.79	in^4
Radius of Gyration	1.06	in
Material	A572 Gr.50	
Yield Stress	50	ksi
Ultimate Stress	65	ksi
Gusset Plate Properties		
Width	5.5	in
Thickness	1	in
Height of Plate at Pole, L_{plate1}	36	in
Height of Plate at Tube, L_{plate2}	10.625	in
Notch Size	0.75	in
Material	A572 Gr. 65	
Yield Stress	65	ksi
Ultimate Stress	80	ksi
Weld Properties		
Plate to Monopole Weld Size	0.375	in
Plate to Tube Weld Size	0.75	in
Plate to Base Plate Weld Size	CJP	in
Electrode	E70	
Material Grade, F_{EXX}	70	ksi
Anchor Rod Embedment Properties		
Embedment Depth	8	ft
Epoxy Material	Hilti RE 500 SD	
Bond Strength	1.575	ksi

AISCM Table 1-12

ANCHOR ROD BRACKET CALCULATIONS

TIA-222-G Reference

Tube Analysis

Bearing Check

ϕ_b =	0.75		
$\phi P_n = \phi_b 1.8 F_y A_g$ =	348.30	kip	AISCM Eq (J7-1)
Stress Ratio	**62.6%**		

Compression Check

ϕ_c =	0.90		
K =	1		
KL/r =	10.02		
$4.71\sqrt{(E/F_y)}$ =	113.43		
$F_e = \pi^2 E/(KL/r)^2$ =	2848.73	ksi	AISCM Eq (E3-4)
$F_{cr} = 0.658^{(Fy/Fe)} F_y$ =	49.63	ksi	AISCM Eq (E3-2)
$\phi P_n = \phi_c F_y A_g$ =	232.20	kip	AISCM Eq (J4-6)
Stress Ratio	**94.0%**		

Gusset Plate Analysis

Plate Shear Yielding Check

ϕ_v =	1		
$A_{nv} = A_g = t_{plate} * L_{tube}$ =	11	in^2	
$\phi V_n = \phi_v 0.6 A_g F_y$ =	414	kip	AISCM Eq (J4-3)
Stress Ratio	**52.7%**		

Plate Shear Rupture Check

ϕ_v =	0.75		
$\phi V_n = \phi_v 0.6 A_{nv} F_u$ =	382.50	kip	AISCM Eq (J4-4)
Stress Ratio	**57.1%**		

Plate to Monopole Punching Shear Check

ϕ_v =	0.90		
$e = w_{plate} + d_{tube} - t_{tube} - D_b/2$ =	7.53	in	
M = P * e =	1641.80	kip-in	
$f_v = 6M/L_{plate1}^2$ =	7.60	kip/in	
$\phi F_v = \phi_v 0.6 F_{ymp} (2t_{mp})$ =	22.68	kip/in	
Stress Ratio	**33.5%**		

Plate to Tube Punching Shear Check

$e = d_{tube} - t_{tube} - D_b/2$ =	2.03	in	
M = P * e =	441.81	kip-in	
$f_v = 6M/L_{plate2}^2$ =	23.48	kip/in	
$\phi F_v = \phi_v 0.6 F_{ytube} (2t_{tube})$ =	32.40	kip/in	
Stress Ratio	**73.4%**		

Gusset Plate to Monopole Weld Analysis

ϕ_{wg} =	0.75		
$\phi R_{nweld} = \phi_{wg} 0.6 F_{EXX}$ =	31.5	ksi	
$\phi R_{nplate} = \phi_{wg} 0.6 F_{uplate}$ =	26.1	ksi	
$\phi R_{npole} = \phi_{wg} 0.6 F_{upole}$ =	26.1	ksi	
Stress Ratio	**50.5%**		

Gusset Plate to Tube Weld Analysis

ϕ_w =	0.75		
$a = (d_{tube} - t_{tube} - D_b/2)/L_{plate2}$ =	0.19		
C =	1.00		
C_1 =	3.67		
$\phi R_n = \phi_w C C_1 D L_{plate2}$ =	350.94	kip	
Stress Ratio	**62.2%**		

ANCHOR ROD BRACKET CALCULATIONS

TIA-222-G Reference

Embedment Depth Analysis

Development Length Calculation — ACI 318-08 Chapter 12

Transverse Reinforcement Index, k_{rt} =	0	
Rebar Location Factor, ψ_t =	1	
Rebar Coating Factor, ψ_e =	1	
Rebar Size Factor, ψs =	1	
Concrete Weight Factor, λ =	1	
Diameter of Rebar, d_b =	1.13	in
Diameter of Tie, d_{tie} =	0.50	in
$BC_{rebar} = D_{pier} - 2c_c - 2d_{tie} - d_b$ =	51.88	in
$S_{rebar} = \pi BC_{rebar} / n$ =	8.58	in
$c_b = S_{rebar}/2$ =	4.06	in
$l_d = [3/40 (f_y/\lambda\sqrt{f'_c}) \psi_t\psi_e\psi_s/2.5]d_b$ =	36.97	in

Development Length Check

$A = S_{rebar} / 2$ =	4.29	in
$B = BC_{rebar}/2 - BC_{bracket}/2$ =	3.69	in
$G = \sqrt{(A^2 + B^2)}$ =	5.66	in
$l'_d = l_d + G/1.5 + 3in$ =	43.74	in
S_b =	1.58	ksi
ϕ_{bond} =	0.55	
$L_{be} = P_n / (\pi D_b S_b \phi_{bond})$ =	45.81	in
$L_{min1} = L_{be} + 6in$ =	51.81	in
$L_{min2} = l'_d + 0.25L_{be}$ =	55.20	in
Stress Ratio	**57.5%**	

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876325*
Site Name: *WESTON SQUARE*
App #: *420734 Rev.2*

Pole Manufacturer:	*Other*

Reactions		
Mu:	1103	ft-kips
Axial, Pu:	34	kips
Shear, Vu:	24	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	12	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	35	in

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ń):	132.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	141.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	94.2% **Pass**	

Plate Data		
Diam:	41	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.85	in

Base Plate Results

	Flexural Check	Stiffened
Base Plate Stress:	24.6 ksi	AISC LRFD
Allowable Plate Stress:	32.4 ksi	φ*Fy
Base Plate Stress Ratio:	75.8% **Pass**	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.5	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	5	in
Height:	10	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	65	ksi
Weld str.:	70	ksi

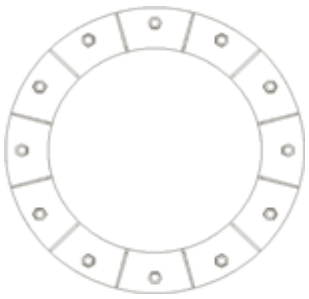
Stiffener Results

Horizontal Weld :	85.9% **Pass**
Vertical Weld:	46.4% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	28.5% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	55.5% **Pass**
Plate Comp. (AISC Bracket):	66.5% **Pass**

Pole Results

Pole Punching Shear Check:	21.3% **Pass**

Pole Data		
Diam:	30	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

LPile for Windows, Version 2016-09.007

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This copy of LPile is being used by:

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Files Used for Analysis

Path to file locations:
\Users\GIA90126\Desktop\CCI SA\876325.1509095 - TSA\Structural\FDN\

Name of input data file:
876325.1509095 Foundation Analysis.lp9d

Name of output report file:
876325.1509095 Foundation Analysis.lp9o

Name of plot output file:
876325.1509095 Foundation Analysis.lp9p

Name of runtime message file:
876325.1509095 Foundation Analysis.lp9r

Date and Time of Analysis

Date: January 11, 2018 Time: 17:29:46

Problem Title

Project Name: WESTON SQUARE(BU# 876325)

Job Number: 194393 (876325.1509095)

Client: Crown Castle

Engineer: Adichon Akkarapunyathron

Description: 876325.1509095 Foundation Analysis

Program Options and Settings

Computational Options:
 - Use unfactored loads in computations (conventional analysis)
Engineering Units Used for Data Input and Computations:
 - US Customary System Units (pounds, feet, inches)

Analysis Control Options:
 - Maximum number of iterations allowed = 500
 - Deflection tolerance for convergence = 1.0000E-05 in
 - Maximum allowable deflection = 100.0000 in
 - Number of pile increments = 100

Loading Type and Number of Cycles of Loading:
 - Static loading specified

 - Use of p-y modification factors for p-y curves not selected
 - No distributed lateral loads are entered
 - Loading by lateral soil movements acting on pile not selected
 - Analysis includes tip shear resistance for short pile or shaft
 - Computation of pile-head foundation stiffness matrix not selected
 - Push-over analysis of pile not selected
 - Buckling analysis of pile not selected

Output Options:
 - Output files use decimal points to denote decimal symbols.
 - Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
 - No p-y curves to be computed and reported for user-specified depths
 - Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined = 2
Total length of pile = 37.500 ft
Depth of ground surface below top of pile = 0.5000 ft

Pile diameters used for p-y curve computations are defined using 4 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	60.0000
2	20.000	60.0000
3	20.000	60.0000
4	37.500	60.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

   Section 1 is a round drilled shaft, bored pile, or CIDH pile
   Length of section = 20.000000 ft
   Shaft Diameter = 60.000000 in
   Shear capacity of section = 0.0000 lbs

Pile Section No. 2:

   Section 2 is a round drilled shaft, bored pile, or CIDH pile
   Length of section = 17.500000 ft
   Shaft Diameter = 60.000000 in
   Shear capacity of section = 0.0000 lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees
= 0.000 radians

Pile Batter Angle = 0.000 degrees
= 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 8 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	0.500000 ft
Distance from top of pile to bottom of layer	=	2.500000 ft
Effective unit weight at top of layer	=	120.000000 pcf
Effective unit weight at bottom of layer	=	120.000000 pcf
Undrained cohesion at top of layer	=	0.0001000 psf
Undrained cohesion at bottom of layer	=	0.0001000 psf
Epsilon-50 at top of layer	=	0.0000
Epsilon-50 at bottom of layer	=	0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

Layer 2 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	2.500000 ft
Distance from top of pile to bottom of layer	=	3.830000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
Undrained cohesion at top of layer	=	0.0001000 psf
Undrained cohesion at bottom of layer	=	0.0001000 psf
Epsilon-50 at top of layer	=	0.0000
Epsilon-50 at bottom of layer	=	0.0000

NOTE: Default values for Epsilon-50 will be computed for this layer.

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	3.830000 ft
Distance from top of pile to bottom of layer	=	6.500000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
Friction angle at top of layer	=	30.000000 deg.
Friction angle at bottom of layer	=	30.000000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Default values for subgrade k will be computed for this layer.

Layer 4 is stiff clay with water-induced erosion

Distance from top of pile to top of layer	=	6.500000 ft
Distance from top of pile to bottom of layer	=	13.500000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
Undrained cohesion at top of layer	=	750.000000 psf
Undrained cohesion at bottom of layer	=	750.000000 psf
Epsilon-50 at top of layer	=	0.0000
Epsilon-50 at bottom of layer	=	0.0000
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Default values for Epsilon-50 will be computed for this layer.

NOTE: Default values for subgrade k will be computed for this layer.

Layer 5 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	13.500000 ft
Distance from top of pile to bottom of layer	=	15.500000 ft
Effective unit weight at top of layer	=	105.000000 pcf
Effective unit weight at bottom of layer	=	105.000000 pcf
Friction angle at top of layer	=	30.000000 deg.

```
   Friction angle at bottom of layer                  =    30.000000 deg.
   Subgrade k at top of layer                         =       0.0000 pci
   Subgrade k at bottom of layer                      =       0.0000 pci

   NOTE: Default values for subgrade k will be computed for this layer.

Layer 6 is sand, p-y criteria by Reese et al., 1974

   Distance from top of pile to top of layer          =    15.500000 ft
   Distance from top of pile to bottom of layer       =    28.500000 ft
   Effective unit weight at top of layer              =    52.600000 pcf
   Effective unit weight at bottom of layer           =    52.600000 pcf
   Friction angle at top of layer                     =    32.000000 deg.
   Friction angle at bottom of layer                  =    32.000000 deg.
   Subgrade k at top of layer                         =       0.0000 pci
   Subgrade k at bottom of layer                      =       0.0000 pci

   NOTE: Default values for subgrade k will be computed for this layer.

Layer 7 is stiff clay with water-induced erosion

   Distance from top of pile to top of layer          =    28.500000 ft
   Distance from top of pile to bottom of layer       =    33.500000 ft
   Effective unit weight at top of layer              =    47.600000 pcf
   Effective unit weight at bottom of layer           =    47.600000 pcf
   Undrained cohesion at top of layer                 =   750.000000 psf
   Undrained cohesion at bottom of layer              =   750.000000 psf
   Epsilon-50 at top of layer                         =       0.0000
   Epsilon-50 at bottom of layer                      =       0.0000
   Subgrade k at top of layer                         =       0.0000 pci
   Subgrade k at bottom of layer                      =       0.0000 pci

   NOTE: Default values for Epsilon-50 will be computed for this layer.

   NOTE: Default values for subgrade k will be computed for this layer.

Layer 8 is stiff clay with water-induced erosion

   Distance from top of pile to top of layer          =    33.500000 ft
   Distance from top of pile to bottom of layer       =    37.500000 ft
   Effective unit weight at top of layer              =    57.600000 pcf
   Effective unit weight at bottom of layer           =    57.600000 pcf
   Undrained cohesion at top of layer                 =        1500. psf
   Undrained cohesion at bottom of layer              =        1500. psf
   Epsilon-50 at top of layer                         =       0.0000
   Epsilon-50 at bottom of layer                      =       0.0000
   Subgrade k at top of layer                         =       0.0000 pci
   Subgrade k at bottom of layer                      =       0.0000 pci

   NOTE: Default values for Epsilon-50 will be computed for this layer.

   NOTE: Default values for subgrade k will be computed for this layer.

 (Depth of the lowest soil layer extends 0.000 ft below the pile tip)
```

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Undrained Cohesion psf	Angle of Friction deg.	E50 or krm	kpy pci
1	Soft Clay	0.5000 2.5000	120.0000 120.0000	1.00E-04 1.00E-04	-- --	default default	-- --
2	Soft Clay	2.5000 3.8300	110.0000 110.0000	1.00E-04 1.00E-04	-- --	default default	-- --
3	Sand	3.8300	110.0000	--	30.0000	--	default

	(Reese, et al.)	6.5000	110.0000	--	30.0000	--	default
4	Stiff Clay	6.5000	110.0000	750.0000	--	default	default
	with Free Water	13.5000	110.0000	750.0000	--	default	default
5	Sand	13.5000	105.0000	--	30.0000	--	default
	(Reese, et al.)	15.5000	105.0000	--	30.0000	--	default
6	Sand	15.5000	52.6000	--	32.0000	--	default
	(Reese, et al.)	28.5000	52.6000	--	32.0000	--	default
7	Stiff Clay	28.5000	47.6000	750.0000	--	default	default
	with Free Water	33.5000	47.6000	750.0000	--	default	default
8	Stiff Clay	33.5000	57.6000	1500.	--	default	default
	with Free Water	37.5000	57.6000	1500.	--	default	default

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load No.	Load Type	Condition 1		Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 24000. lbs	M =	20520000. in-lbs	34000.	No
2	1	V = 24000. lbs	M =	20520000. in-lbs	25500.	No

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with
specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Shear Resistance Curve at Pile Tip

Point No.	Displacement in	Tip Shear Force lbs
1	0.000	0.000
2	0.120	16190.625
3	10.000	16190.625

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 2

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	20.000000 ft
Shaft Diameter	=	60.000000 in
Number of Reinforcing Bars	=	19 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	2827. sq. in.
Total Area of Reinforcing Steel	=	19.810000 sq. in.
Area Ratio of Steel Reinforcement	=	0.70 percent
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As	=	8348.040 kips
Tensile Load for Cracking of Concrete	=	-1083.038 kips
Nominal Axial Tensile Capacity	=	-1188.600 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.128000	1.000000	26.436000	0.00000
2	1.128000	1.000000	24.423679	10.116619
3	1.128000	1.000000	18.693075	18.693075
4	1.128000	1.000000	10.116619	24.423679
5	1.128000	1.000000	0.00000	26.436000
6	1.128000	1.000000	-10.116619	24.423679
7	1.128000	1.000000	-18.693075	18.693075
8	1.128000	1.000000	-24.423679	10.116619
9	1.128000	1.000000	-26.436000	0.00000
10	1.128000	1.000000	-24.423679	-10.116619
11	1.128000	1.000000	-18.693075	-18.693075
12	1.128000	1.000000	-10.116619	-24.423679
13	1.128000	1.000000	0.00000	-26.436000
14	1.128000	1.000000	10.116619	-24.423679
15	1.128000	1.000000	18.693075	-18.693075
16	1.128000	1.000000	24.423679	-10.116619
17	1.270000	1.270000	-17.040000	14.300000
18	1.270000	1.270000	19.280000	-11.420000
19	1.270000	1.270000	-19.280000	-11.420000

NOTE: The positions of the above rebars were input by the user

Minimum spacing between any two bars not equal to zero = 3.495 inches
between bars 7 and 17.

Ratio of bar spacing to maximum aggregate size = 4.66

Concrete Properties:

Compressive Strength of Concrete	=	3000. psi
Modulus of Elasticity of Concrete	=	3122019. psi
Modulus of Rupture of Concrete	=	-410.791918 psi
Compression Strain at Peak Stress	=	0.001634
Tensile Strain at Fracture of Concrete	=	-0.0001160
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	25.500
2	34.000

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	25.500	29736.619	0.00300000
2	34.000	29907.318	0.00300000

Note that the values of moment capacity in the table above are not
factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction
factor to compute ultimate moment capacity according to ACI 318, Section
9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding
bending stiffnesses computed for common resistance factor values used for
reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	29737.	16.575000	19329.	417992472.
2	0.65	29907.	22.100000	19440.	420822168.
1	0.70	29737.	17.850000	20816.	414859839.
2	0.70	29907.	23.800000	20935.	417612658.
1	0.75	29737.	19.125000	22302.	401527814.
2	0.75	29907.	25.500000	22430.	404263853.

Pile Section No. 2:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	17.500000 ft
Shaft Diameter	=	60.000000 in
Concrete Cover Thickness	=	3.500000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	2827. sq. in.
Total Area of Reinforcing Steel	=	16.000000 sq. in.
Area Ratio of Steel Reinforcement	=	0.57 percent
Edge-to-Edge Bar Spacing	=	8.991725 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	11.99
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As	=	8129.155 kips
Tensile Load for Cracking of Concrete	=	-1071.606 kips
Nominal Axial Tensile Capacity	=	-960.000 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.128000	1.000000	25.936000	0.00000
2	1.128000	1.000000	23.961740	9.925278
3	1.128000	1.000000	18.339521	18.339521
4	1.128000	1.000000	9.925278	23.961740
5	1.128000	1.000000	0.00000	25.936000
6	1.128000	1.000000	-9.925278	23.961740
7	1.128000	1.000000	-18.339521	18.339521
8	1.128000	1.000000	-23.961740	9.925278

9	1.128000	1.000000	-25.936000	0.00000
10	1.128000	1.000000	-23.961740	-9.925278
11	1.128000	1.000000	-18.339521	-18.339521
12	1.128000	1.000000	-9.925278	-23.961740
13	1.128000	1.000000	0.00000	-25.936000
14	1.128000	1.000000	9.925278	-23.961740
15	1.128000	1.000000	18.339521	-18.339521
16	1.128000	1.000000	23.961740	-9.925278

NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero = 8.992 inches
between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 11.99

Concrete Properties:

Compressive Strength of Concrete	=	3000. psi
Modulus of Elasticity of Concrete	=	3122019. psi
Modulus of Rupture of Concrete	=	-410.791918 psi
Compression Strain at Peak Stress	=	0.001634
Tensile Strain at Fracture of Concrete	=	-0.0001160
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	25.500
2	34.000

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 2

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	25.500	24195.816	0.00300000
2	34.000	24379.047	0.00300000

Note that the values of moment capacity in the table above are not
factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction
factor to compute ultimate moment capacity according to ACI 318, Section
9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding
bending stiffnesses computed for common resistance factor values used for
reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	24196.	16.575000	15727.	357587805.
2	0.65	24379.	22.100000	15846.	360797935.
1	0.70	24196.	17.850000	16937.	356143646.
2	0.70	24379.	23.800000	17065.	359086550.
1	0.75	24196.	19.125000	18147.	347976878.
2	0.75	24379.	25.500000	18284.	351073758.

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.5000	0.00	N.A.	No	0.00	0.00898
2	2.5000	2.0000	Yes	No	0.00898	0.00599
3	3.8300	Not-a-Nu	No	No	0.01497	Not-a-Nu
4	6.5000	Not-a-Nu	No	No	Not-a-Nu	Not-a-Nu
5	13.5000	Not-a-Nu	No	No	Not-a-Nu	Not-a-Nu
6	15.5000	Not-a-Nu	Yes	No	Not-a-Nu	Not-a-Nu
7	28.5000	Not-a-Nu	No	No	Not-a-Nu	Not-a-Nu
8	33.5000	Not-a-Nu	Yes	No	Not-a-Nu	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Pile-head Load 1	Load Type 2	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	24000.	M, in-lb	2.05E+07	34000.	1.0564	-0.01028	-103076.	2.19E+07
2	V, lb	24000.	M, in-lb	2.05E+07	25500.	1.0629	-0.01036	-103323.	2.19E+07

Maximum pile-head deflection = 1.0628543444 inches
Maximum pile-head rotation = -0.0103553066 radians = -0.593315 deg.

The analysis ended normally.

$M_u = 2.19 \times 10^7 / 12000 = 1825$ ft-kip
$\phi M_n = .87 \times (29736.619/12) = 2156$ ft-kip
$SR = 1825 / 2156 = 84.6\%$

Unofficial Property Record Card - City of Hartford, CT

General Property Data

Parcel Identification 286-173-007

Property Owner ALBEMARLE WESTON STREET LLC

Property Location 0092 WESTON ST HARTFORD

Property Use WAREHOUSE

Mailing Address 942 MAIN ST STE 300

Most Recent Sale Date 2/4/2005

Legal Reference 05252-0168

City HARTFORD

Grantor WESTON SQUARE ASSOCIATES LLC,

Mailing State CT **Zip** 06103-1217

Sale Price 2,795,000

ParcelZoning ID-1

Land Area 4.301 acres

Current Property Assessment

Fiscal Year 2015

Total Value 1,330,000

Land Value 835,310

Building Value 459,410

Building Description

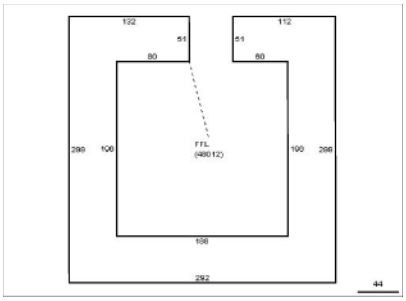
Building Style OFFICE/WHS	**Foundation Type** Concrete	**Flooring Type** COMBINATION
# of Living Units 0	**Frame Type** Steel	**Basement Floor** N/A
Year Built 1978	**Roof Structure** FLAT	**Heating Type** Warm Air
Building Grade Average	**Roof Cover** Metal	**Heating Fuel** Gas
Building Condition Average	**Siding** Brick	**Air Conditioning** 30%
Finished Area (SF) 48012	**Interior Walls** DRYWALL	**# of Bsmt Garages** 0
Number Rooms 0	**Number Beds** 0	**# of Full Baths** 0
# of 3/4 Baths 0	**# of 1/2 Baths** 0	**# of Other Fixtures** 0

Legal Description

Narrative Description of Property

This property contains 4.301 acres of land mainly classified as WAREHOUSE with a(n) OFFICE/WHS style building, built about 1978 , having Brick exterior and Metal roof cover, with 0 unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

1022500

1024250

848500

847100

BOCE BARLOW WAY

JENNINGS RD

WESTON ST

WEST SERVICE ROAD CONNECTOR

UNAPPROVED LOT

286074004
1.172 Ac

286074003
309046 sf

286074002
20.83 Ac

286074001
2.21 Ac

286129005
2.492 Ac

286129006
1.123 Ac

286173007
187334.4531 sf

286173008
10608 sf

286173009
2.74 Ac

111

125

100

98

93

92

89

85

81H

80

City of Hartford Assessor Map

Legend

- Parcel ID
- Duplicate Parcel ID
- Exempt ID
- Building ID
- Air Right ID
- Parcels
- Tax Map Grid
- City Boundary Line
- Building
- Building Under Construction
- House Trailer
- Foundation
- Greenhouse
- Cement Pad
- Deck
- Patio
- Pool
- Swamp
- Water
- River or Stream
- Tree
- Hedge
- Vegetation
- 161507165 Parcel ID
- *7500 sf or Ac* Parcel Area
- 88 Street Address
- *11-19* Condo Lot Range
- *11D* Condo Unit
- Road Edge Paved
- Road Edge Unpaved
- Driveway and Parking Lot Paved
- Driveway and Parking Lot Unpaved
- Sidewalk
- Private Sidewalk and Steps
- Runway
- Bridge
- Wharf and Pier
- Fuel Tank
- Water Tank
- Tunnel
- Trail
- Railroad
- Abandoned Railroad
- Fence
- Ruins

262	285	306
263	286	307
264	287	308

Key Map

DISCLAIMER:

The planimetric and topographic information depicted on this map was compiled by The James Sewell Company and is based on an aerial flight performed in April 2006. In addition, the City's GIS staff has been updating limited planimetric features based on information on file in various City departments. The parcel and property information depicted on this map has been compiled from recorded deeds, maps, assessor records, and other public records on file in the City of Hartford. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose. The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data.

THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.

Horizontal Datum: Connecticut State Plane Coordinates (NAD 83 feet)
Vertical Datum: North American Vertical Datum (NAVD 88 feet)

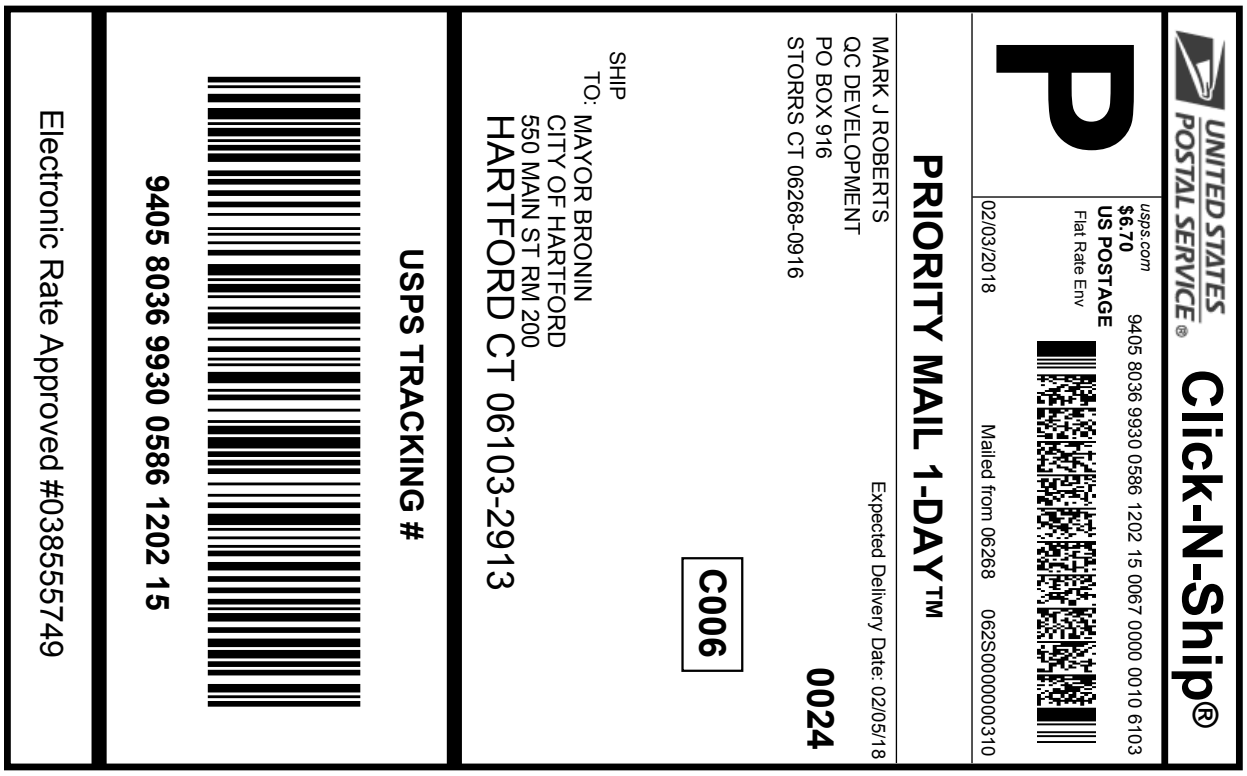
N W E S

Date: September 7, 2012

0 25 50 100 150 200 Feet

1 inch = 50 feet

Map Sheet 286



Cut on dotted line.

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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # / Insurance Number:
9405 8036 9930 0586 1202 15

Trans. #:	426572281
Print Date:	02/02/2018
Ship Date:	02/03/2018
Expected Delivery Date:	02/05/2018
Insured Value:	$50.00

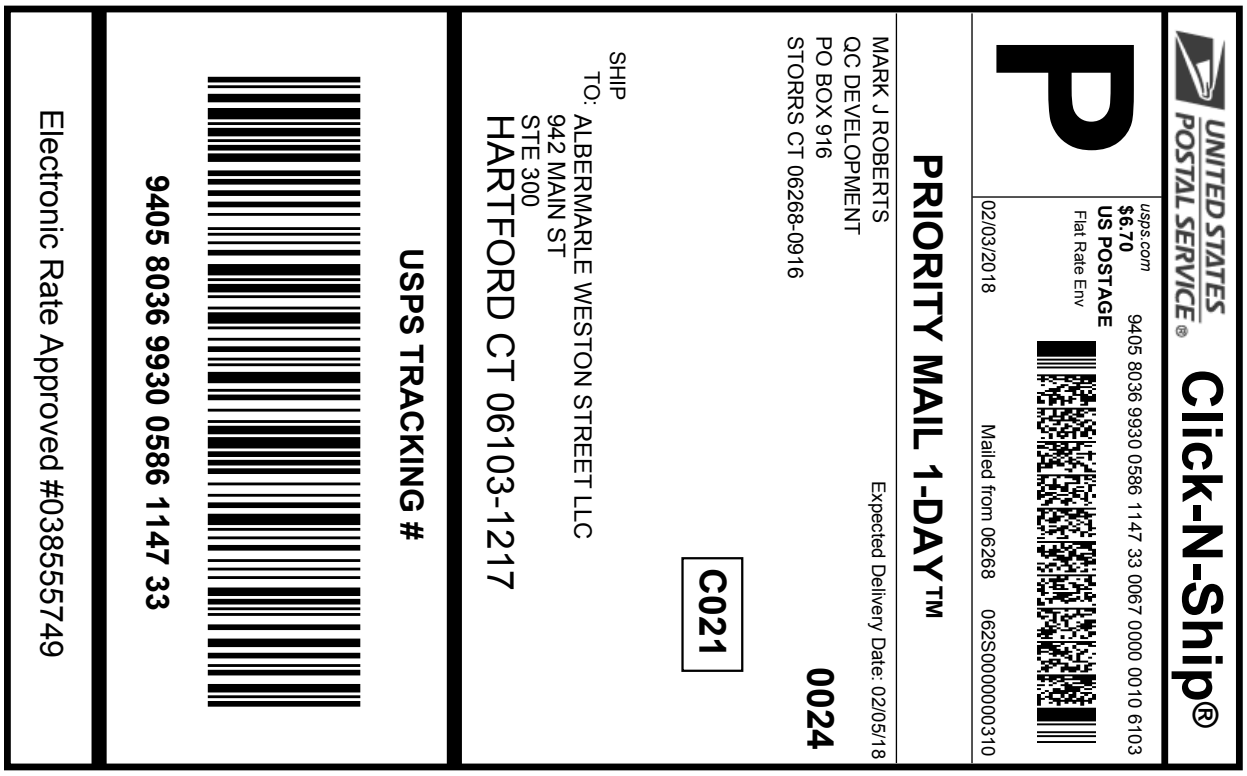
Priority Mail® Postage:	**$6.70**
Insurance Fee	**$0.00**
Total	**$6.70**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MAYOR BRONIN
CITY OF HARTFORD
550 MAIN ST RM 200
HARTFORD CT 06103-2913

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



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Click-N-Ship® Label Record

USPS TRACKING # / Insurance Number:
9405 8036 9930 0586 1147 33

Trans. #:	426571416
Print Date:	02/02/2018
Ship Date:	02/03/2018
Expected Delivery Date:	02/05/2018
Insured Value:	$50.00

Priority Mail® Postage:	**$6.70**
Insurance Fee	**$0.00**
Total	**$6.70**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: ALBERMARLE WESTON STREET LLC
942 MAIN ST
STE 300
HARTFORD CT 06103-1217

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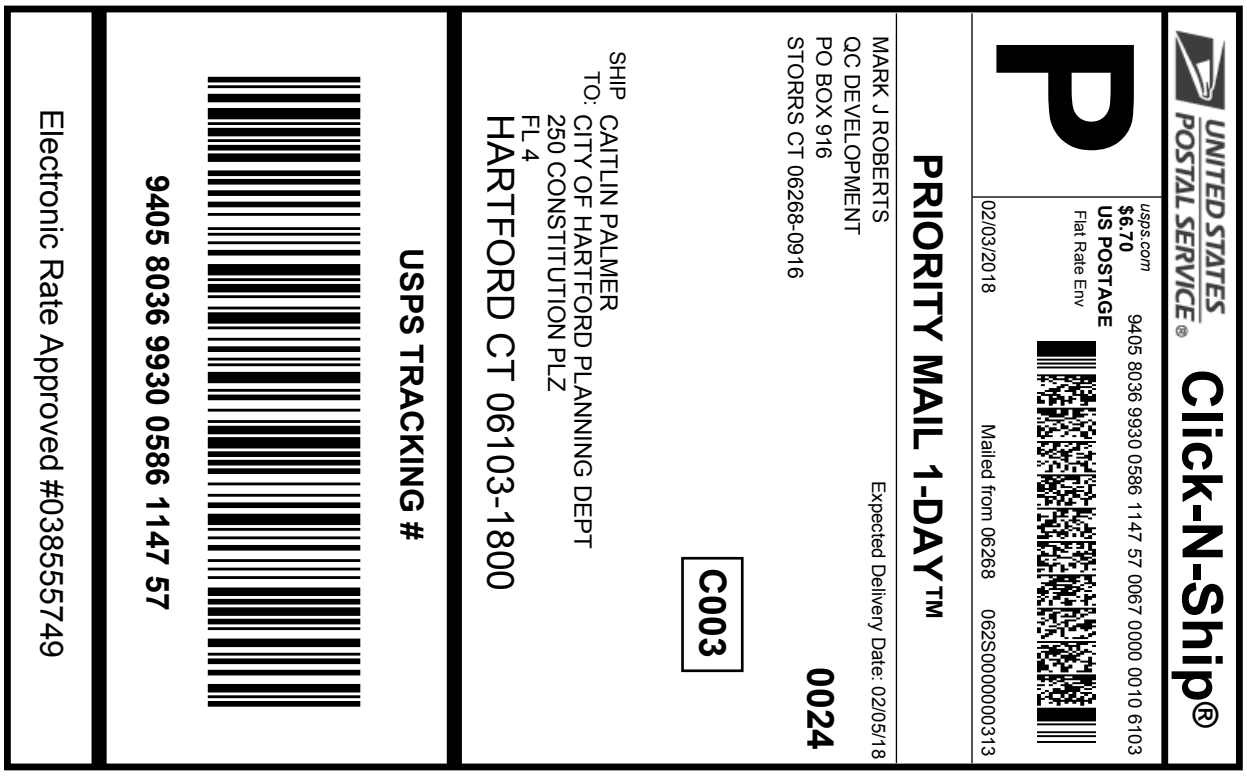

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Click-N-Ship® Label Record

USPS TRACKING # / Insurance Number:
9405 8036 9930 0586 1147 57

Trans. #:	426571416
Print Date:	02/02/2018
Ship Date:	02/03/2018
Expected Delivery Date:	02/05/2018
Insured Value:	$50.00

Priority Mail® Postage:	**$6.70**
Insurance Fee	**$0.00**
Total	**$6.70**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: CAITLIN PALMER
CITY OF HARTFORD PLANNING DEPT
250 CONSTITUTION PLZ
FL 4
HARTFORD CT 06103-1800

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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