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

March 22, 2018

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT2099
56 Norfield Road, Weston, CT 06883
N 41-12-08.50
W 73-22-46.70

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 163-foot level of the existing 190-foot Monopole at 56 Norfield Road, Weston, CT. The tower is owned by Crown Castle. The property is owned by the Town of Weston. AT&T now intends to remove three (3) Powerwave antennas and replace them with three (3) new Kathrein antennas (800-10965). AT&T also intends to install (3) Ericsson RRUS-32 and three (3) RRUS-4478 B14 Remote Radio Units (RRU), also at the 163-foot level.

This facility was approved by the Planning & Zoning Commission of the Town of Weston on July 26, 1999. No conditions of approval were applied that could feasibly apply to this proposed modification.

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 Chris Spaulding, First Selectman of the Town of Weston, and the Weston Land Use Director, as well as the property owner and the tower owner.

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

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

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

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

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

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

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

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

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

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Chris Spaulding - as Elected Official and Property Owner
Tracy Kulikowski – Land Use Director
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*							6.82%
AT&T GSM	2	414	160	0.0126	850	0.5667	0.22%
AT&T UMTS	2	414	160	0.0126	850	0.5667	0.22%
AT&T UMTS	2	656	160	0.0199	1900	1.0000	0.20%
AT&T LTE	2	877	160	0.0266	700	0.4667	0.57%
AT&T LTE	2	1832	160	0.0566	1900	1.0000	0.56%
Site Total							7.24%

*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*							14.12%
AT&T UMTS	1	288	163	0.0042	850	0.5667	0.07%
AT&T LTE	2	2951	163	0.0861	700	0.4667	1.85%
AT&T LTE	2	4842	163	0.1413	1900	1.0000	1.41%
AT&T LTE	1	1285	163	0.0187	2300	1.0000	0.19%
Site Total							8.99%

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

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

PROJECT INFORMATION

SCOPE OF WORK:	TOP – REMOVE (3) EXISITNG GSM ANTENNAS IN POSITION 4 & MOVE (3) EXISTING ANTENNAS IN POSITION 2 TO POSITION 4. INSTALL (3) ANTENNAS IN POSITION 3, (3) WCS RRUS–32, (3) 700–4478 FIRSTNET RADIOS, (1) SQUID, (2) DC CABLES & (1) FIBER CABLE. BOTTOM – REPLACE EXISTING BB WITH RBS 5216.
SITE ADDRESS:	56 NORFIELD ROAD WESTON, CT 06883
LATITUDE:	41° 12' 7.86"N (NAD 83)*
LONGITUDE:	73° 22' 46.19" W (NAD 83)* *PER HANDHELD GPS
JURISDICTION:	CITY OF WESTON
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NAME OF APPLICANT:	AT&T MOBILITY 550 COCHITUATE ROAD SUITES 13 & 14 FRAMINGHAM, MA 01701

DRAWING INDEX

		REV
T01	TITLE SHEET	0
G01	GENERAL NOTES	0
C01	PROPOSED SITE & SHELTER PLAN	0
C02	PROPOSED ELEVATION & CONSTRUCTION DETAILS	0
C03	EQUIPMENT PLUMBING DIAGRAM	0
E01	GROUNDING NOTES & DETAILS	0

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

STRUCTURAL NOTE:

1. AS REQUIRED UNDER TIA/EIA 222H – STANDARD, SAI COMMUNICATIONS SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED CONNECTICUT STRUCTURAL ENGINEER CERTIFYING THAT, THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS AND APPURTENANCES AND COMPLIES WITH THE CURRENT CONNECTICUT STATE BUILDING CODE AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

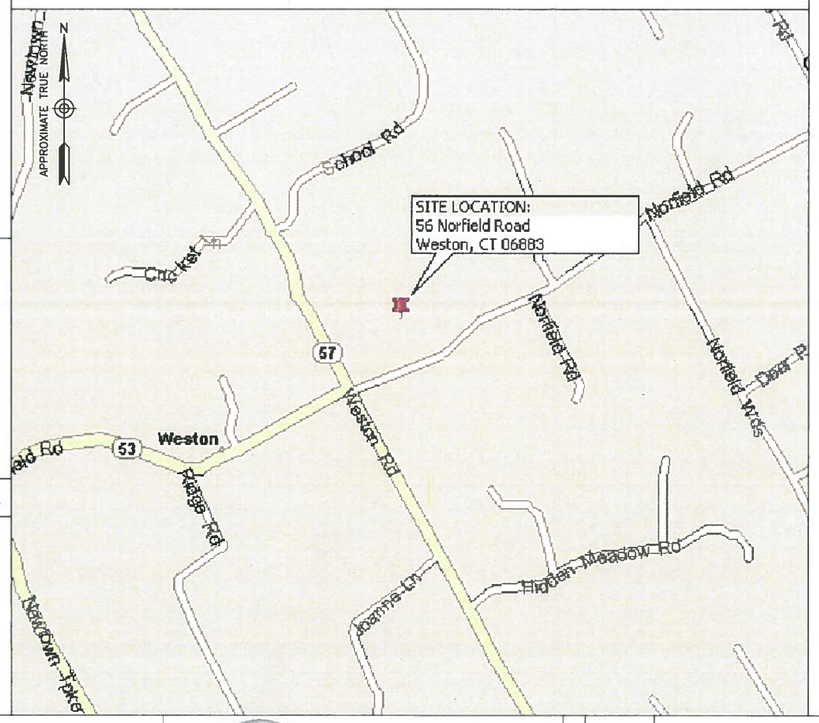
CONTACT & UTILITY INFORMATION

	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	DAMIAN SCHMALZ, P.E.	DEWBERRY	(617) 531–0823
SAC:	TIM BULKS	SAI COMMUNICATIONS	(860) 989–0001
UTILITIES			
POWER:		CONNECTICUT LIGHT & POWER	(860) 286–2000
TELCO:		AT&T	(888) 944–0447

SITE NAME: WESTON DT 3C/4C
SITE NUMBER: CT2099
PACE NO:. MRCTB026834 (3C) / MRCTB026825 (4C)

VICINITY MAP

DIRECTIONS: FROM FRAMINGHAM, MA: TAKE I–90 W. TAKE EXIT 9 TO MERGE ONTO I–84 TOWARD RT–20/HARTFORD. TAKE EXIT 38 FOR US–6W TOWARD BRISTOL. CONTINUE ONTO US–6W. TURN RIGHT ONTO NORTH STREET. TURN LEFT & FOLLOW ACCESS ROAD TO SITE.



APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARD NOTES, SYMBOLS AND DETAILS (SEE DRAWING INDEX FOR STANDARD NOTES AND DETAILS INCLUDED WITH TYPICAL DRAWING PACKAGE). CONTRACTOR 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:
2016 CONNECTICUT STATE BUILDING CODE (INTERNATIONAL BUILDING CODE)

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE (NEC)

CONTRACTOR'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, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–H, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR–1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

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.

Dewberry®
Dewberry Engineers Inc.
280 SUMMER STREET
10TH FLOOR
BOSTON, MA 02210
PHONE: 617.695.3400
FAX: 617.695.3310

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

WESTON DT 3C/4C
SITE NO. CT2099
56 NORFIELD ROAD
WESTON, CT 06883

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/18	ISSUED FOR CONSTRUCTION	KB	DAS	BBR
A	02/08/18	ISSUED FOR REVIEW	KB	DAS	BBR

SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: SK

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
28971
LICENSED
PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	T01	0

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – SAI
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR 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.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR 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 CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING & PROPOSED IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR 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. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR 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.
17. 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.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM–A–36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION & TOPSOIL EXPOSE UNDISTURBED NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM & LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
5. AS AN ALTERNATIVE TO ITEMS 2 AND 3 PROOFROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND–OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL–GRADED GRANULAR FILL, AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/18	ISSUED FOR CONSTRUCTION	KB	DAS	BBR
A	02/08/18	ISSUED FOR REVIEW	KB	DAS	BBR

SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: SK

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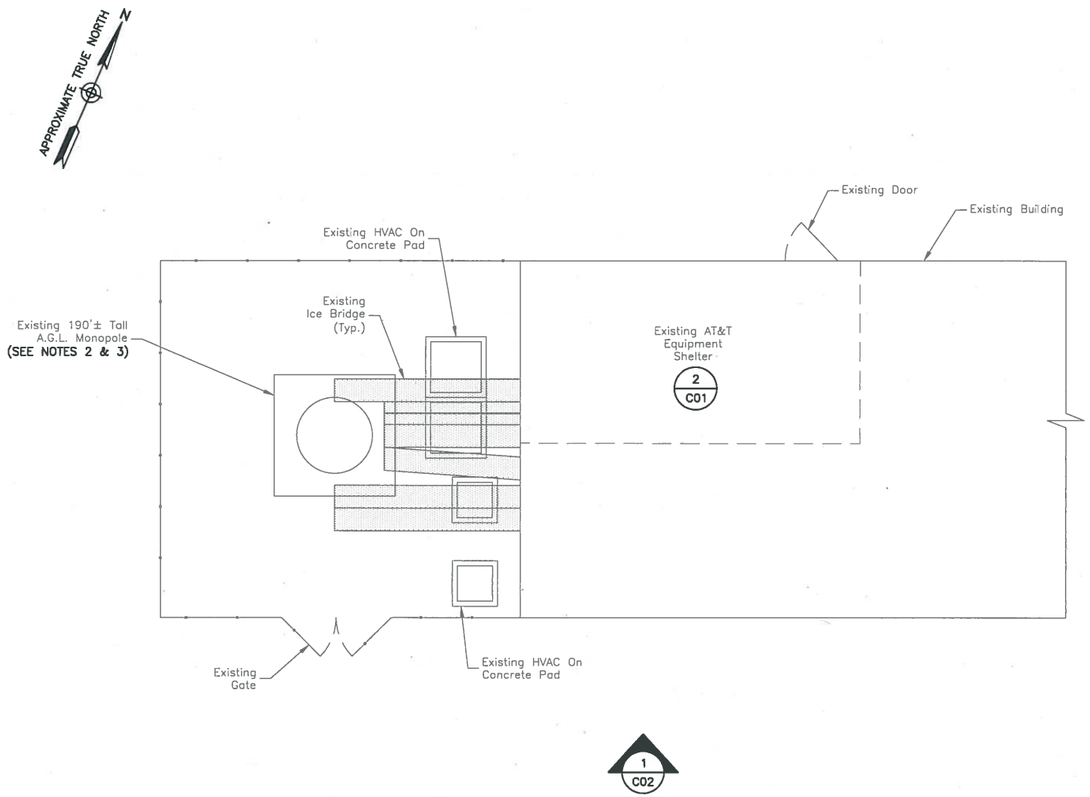
FRAMINGHAM, MA 01701

GENERAL NOTES

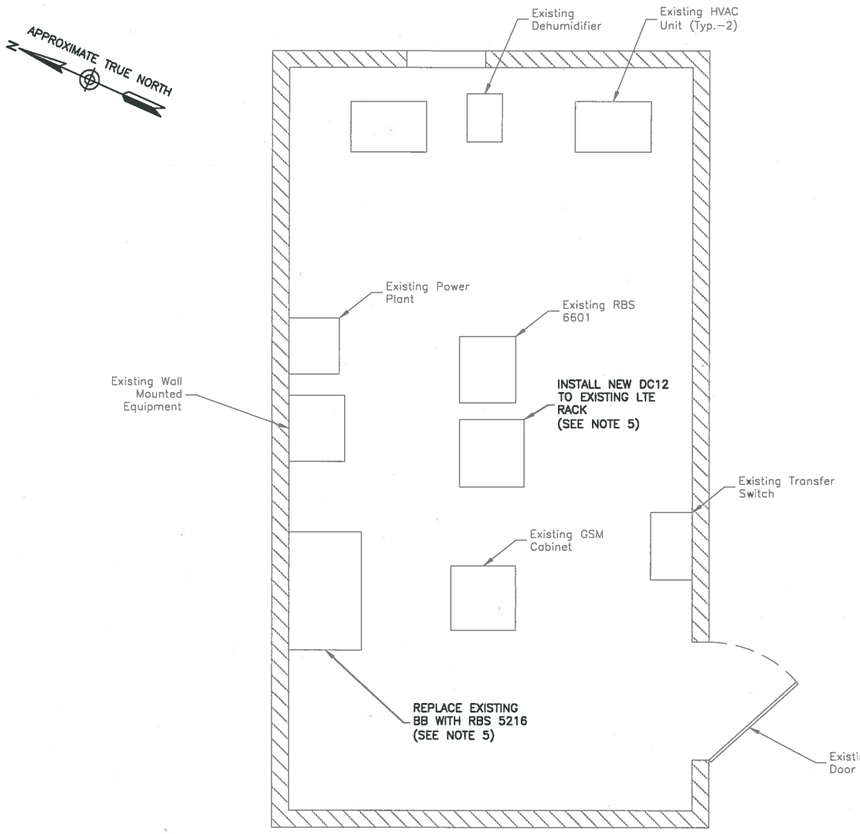
DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	G01	0



PROPOSED SITE PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

0' 5' 10'



PROPOSED SHELTER PLAN 2

SCALE: 1"=4' FOR 11"x17"
1"=2' FOR 22"x34"

2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS (BY OTHERS).
3. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
4. NOT ALL INFORMATION SHOWN FOR CLARITY.
5. EQUIPMENT MODIFICATION SCOPE:

   TOP – REMOVE (3) EXISITNG GSM ANTENNAS IN POSITION 4 & MOVE (3) EXISTING ANTENNAS IN POSITION 2 TO POSITION 4. INSTALL (3) ANTENNAS IN POSITION 3, (3) WCS RRUS-32, (3) 700-447B FIRSTNET RADIOS, (1) SQUID, (2) DC CABLES & (1) FIBER CABLE.

   BOTTOM – REPLACE EXISTING BB WITH RBS 5216.

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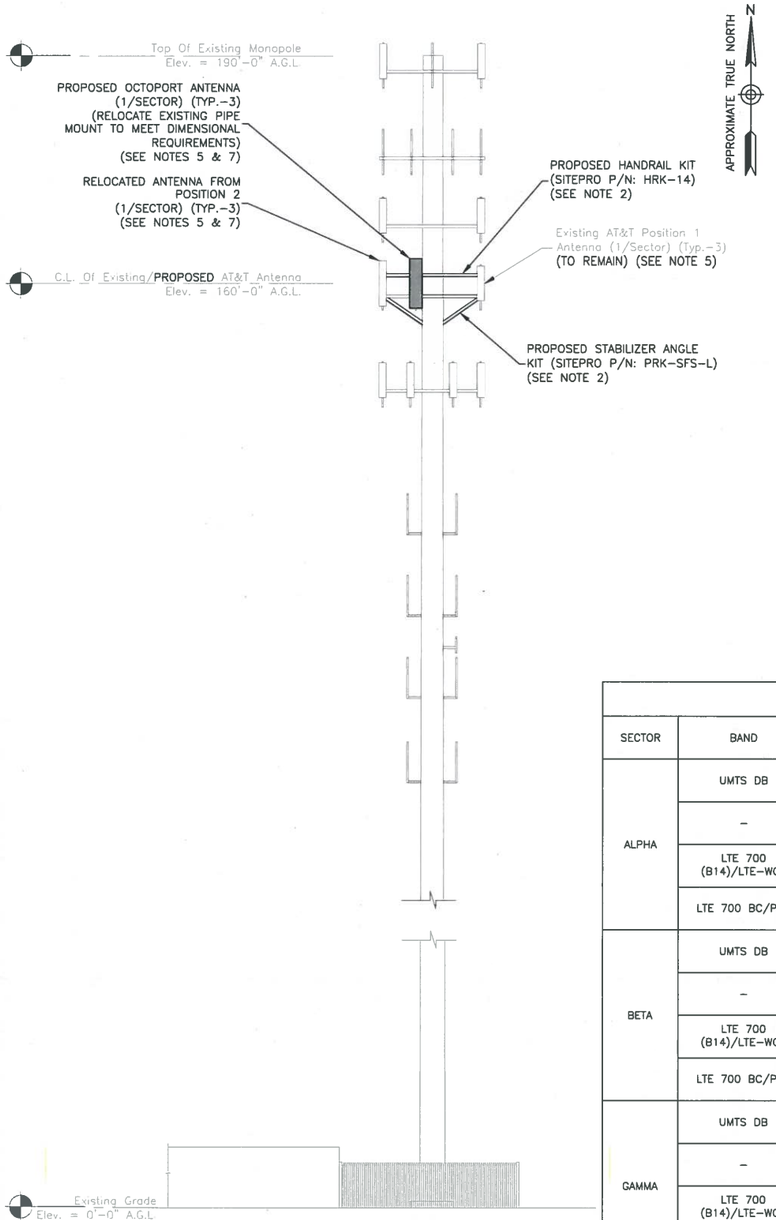
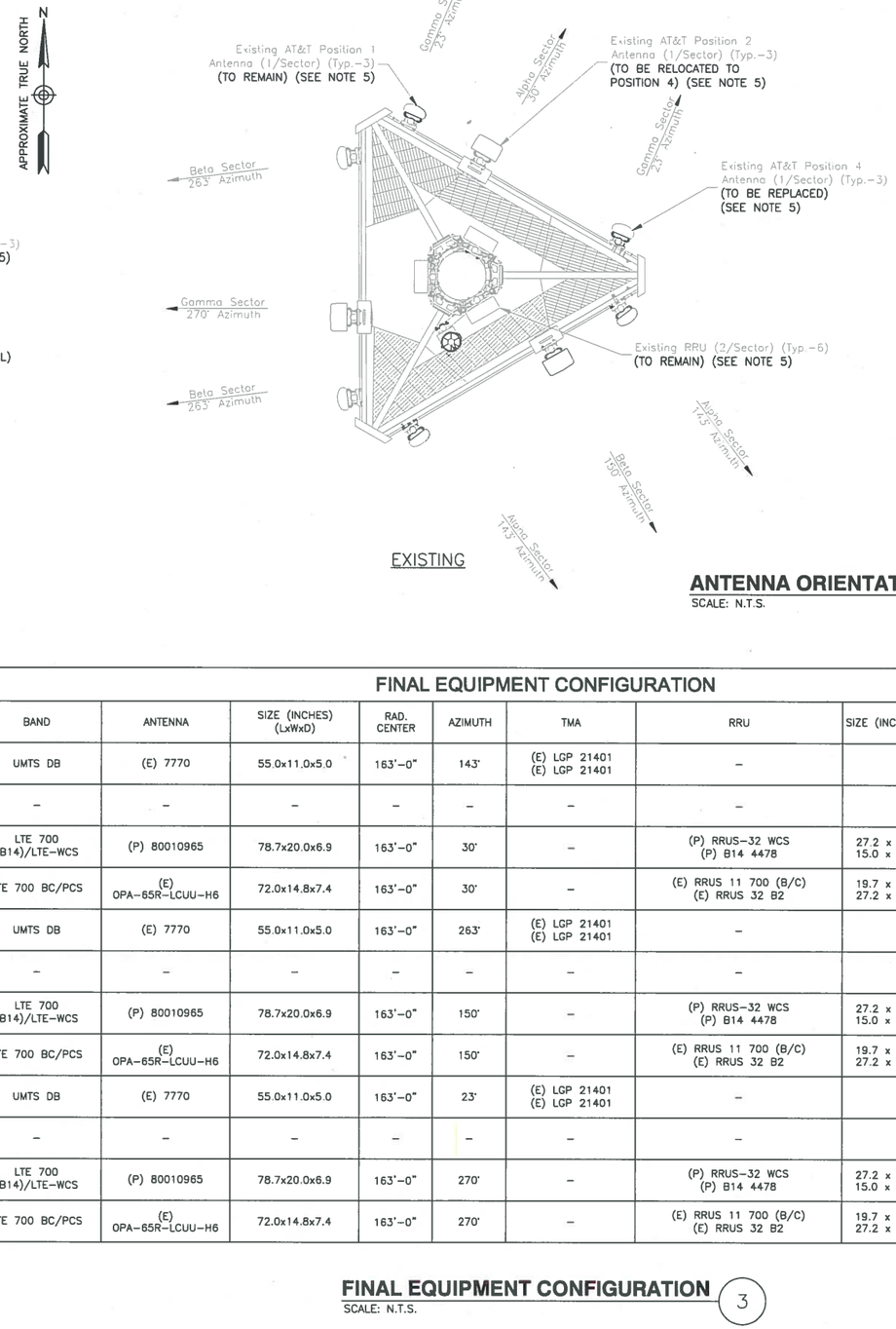
PROPOSED SITE & SHELTER PLAN

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	C01	0



PROPOSED ELEVATION 1

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'



ANTENNA ORIENTATION PLAN 2

SCALE: N.T.S.

FINAL EQUIPMENT CONFIGURATION

SECTOR	BAND	ANTENNA	SIZE (INCHES) (LxWxD)	RAD. CENTER	AZIMUTH	TMA	RRU	SIZE (INCHES) (LxWxD)	FEEDER	FIBER JUMPERS	DC JUMPERS
ALPHA	UMTS DB	(E) 7770	55.0x11.0x5.0	163'-0"	143°	(E) LGP 21401 (E) LGP 21401	-	-	(E) 2	-	-
	-	-	-	-	-	-	-	-	-	-	-
	LTE 700 (B14)/LTE-WCS	(P) 80010965	78.7x20.0x6.9	163'-0"	30°	-	(P) RRUS-32 WCS (P) B14 4478	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	-	(P) 2	(P) 2
	LTE 700 BC/PCS	(E) OPA-65R-LCUU-H6	72.0x14.8x7.4	163'-0"	30°	-	(E) RRUS 11 700 (B/C) (E) RRUS 32 B2	19.7 x 17.0 x 7.2 27.2 x 12.1 x 7.0	-	(E) 3	(E) 2
BETA	UMTS DB	(E) 7770	55.0x11.0x5.0	163'-0"	263°	(E) LGP 21401 (E) LGP 21401	-	-	(E) 2	-	-
	-	-	-	-	-	-	-	-	-	-	-
	LTE 700 (B14)/LTE-WCS	(P) 80010965	78.7x20.0x6.9	163'-0"	150°	-	(P) RRUS-32 WCS (P) B14 4478	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	-	(P) 2	(P) 2
	LTE 700 BC/PCS	(E) OPA-65R-LCUU-H6	72.0x14.8x7.4	163'-0"	150°	-	(E) RRUS 11 700 (B/C) (E) RRUS 32 B2	19.7 x 17.0 x 7.2 27.2 x 12.1 x 7.0	-	(E) 3	(E) 2
GAMMA	UMTS DB	(E) 7770	55.0x11.0x5.0	163'-0"	23°	(E) LGP 21401 (E) LGP 21401	-	-	(E) 2	-	-
	-	-	-	-	-	-	-	-	-	-	-
	LTE 700 (B14)/LTE-WCS	(P) 80010965	78.7x20.0x6.9	163'-0"	270°	-	(P) RRUS-32 WCS (P) B14 4478	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	-	(P) 2	(P) 2
	LTE 700 BC/PCS	(E) OPA-65R-LCUU-H6	72.0x14.8x7.4	163'-0"	270°	-	(E) RRUS 11 700 (B/C) (E) RRUS 32 B2	19.7 x 17.0 x 7.2 27.2 x 12.1 x 7.0	-	(E) 3	(E) 2

FINAL EQUIPMENT CONFIGURATION 3

SCALE: N.T.S.

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH APPURTENANCE MOUNT MODIFICATION REPORT BY B+T GROUP DATED 03-01-18.
3. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
4. NOT ALL INFORMATION SHOWN FOR CLARITY.
5. EQUIPMENT MODIFICATION SCOPE:

   TOP – REMOVE (3) EXISITNG GSM ANTENNAS IN POSITION 4 & MOVE (3) EXISTING ANTENNAS IN POSITION 2 TO POSITION 4. INSTALL (3) ANTENNAS IN POSITION 3, (3) WCS RRUS-32, (3) 700-4478 FIRSTNET RADIOS, (1) SQUID, (2) DC CABLES & (1) FIBER CABLE.

   BOTTOM – REPLACE EXISTING BB WITH RBS 5216.
6. ALL SPACING REQUIREMENTS FOR PROPOSED RRU MOUNTS SHALL BE CONFIRMED & SHALL NOT IMPEDE CLIMBING PEGS, TIE OFF FEATURES, OR OTHER EXISTING SAFETY FEATURES. ALL MOUNTS SHALL MAINTAIN EXISTING/PROPOSED MANUFACTURER REQUIREMENTS & SHALL NOT EXCEED THE TOP OF THE TOWER OR INTERFERE WITH OTHER RAD CENTERS.
7. CONTRACTOR SHALL VERIFY ANTENNA SPACING IN FIELD & RELOCATE PIPE MASTS AS REQUIRED TO MEET ANTENNA SPACING REQUIREMENTS. THE ANTENNA SPACING REQUIREMENTS ARE AS FOLLOWS:

   2'-0" MINIMUM SEPARATION BETWEEN LTE ANTENNAS
   3'-0" MINIMUM SEPARATION BETWEEN 700BC & 700DE

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A	02/08/18	ISSUED FOR REVIEW	KB	DAS	BBR

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STATE OF CONNECTICUT
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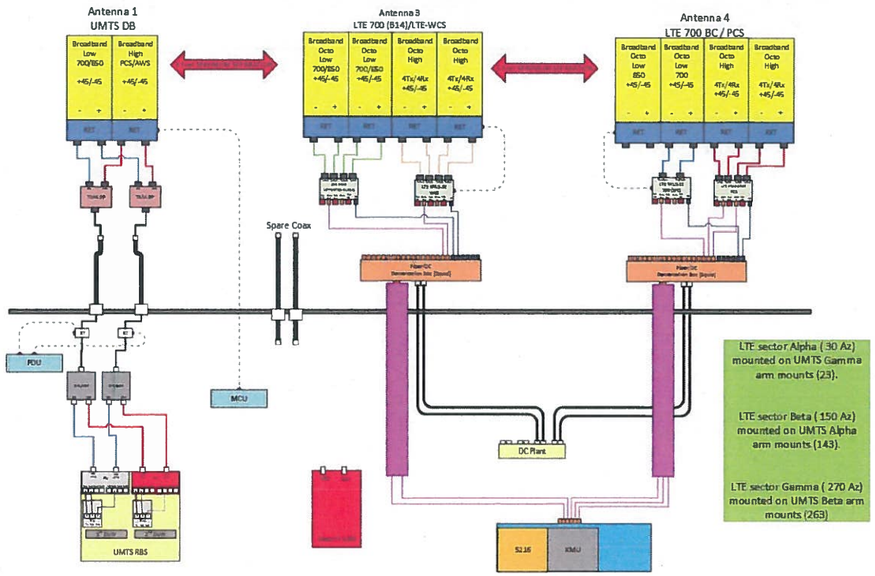
AT&T MOBILITY
FRAMINGHAM, MA 01701

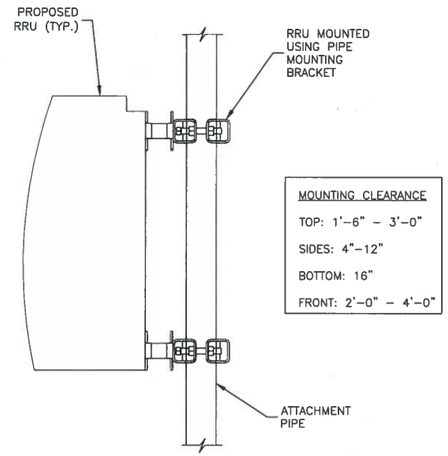
PROPOSED ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	C02	0

DIAGRAM A

Diagram Sector: A	Diagram File Name: CT2099_A_B_C_LTE_BrRRH_Rev.1.vsd
Atoll Site Name: CTL02099	Location Name: WESTON DT
Market: CONNECTICUT	Market Cluster: NEW ENGLAND
Comments: "Important Note: For detailed radio to antenna wiring refer to the latest 4T4R Antenna/ radio Port connections Fiel	





REMOTE ATTACHMENT DETAIL 2
SCALE: N.T.S.

EQUIPMENT PLUMBING DIAGRAM 1
SCALE: N.T.S.

NOTES:

1. EQUIPMENT PLUMBING DIAGRAM PER RFDS VERSION 4 DATED 10/31/17.
2. CONTRACTOR TO VERIFY FINAL EQUIPMENT CONFIGURATION & SEPARATIONS WITH AT&T PRIOR TO CONSTRUCTION.

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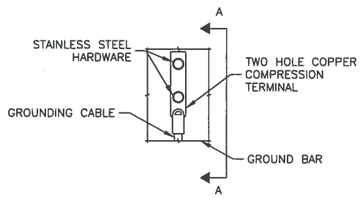
EQUIPMENT PLUMBING DIAGRAM

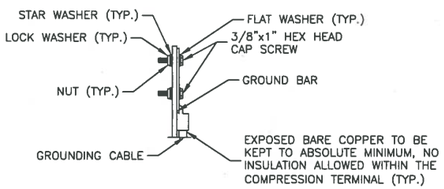
DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	C02	0

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW & INSPECT THE EXISTING FACILITY GROUNDING SYSTEM & LIGHTNING PROTECTION SYSTEM (AS DESIGNED & INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, & GENERAL COMPLIANCE WITH TELCORDIA & TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, & AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 & 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY CONTRACTOR IN WRITING.
4. THE CONTRACTOR SHALL FURNISH & INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES & 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE & ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING & UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT & TRAY SHALL BE GROUNDED & MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE & UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. 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 & INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS & THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM CENTERLINE COMMUNICATIONS COMMUNICATIONS MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT & STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE & THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS & STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION & BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL & NON-ELECTRICAL METAL BOXES, FRAMES & SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND & LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.



ELEVATION

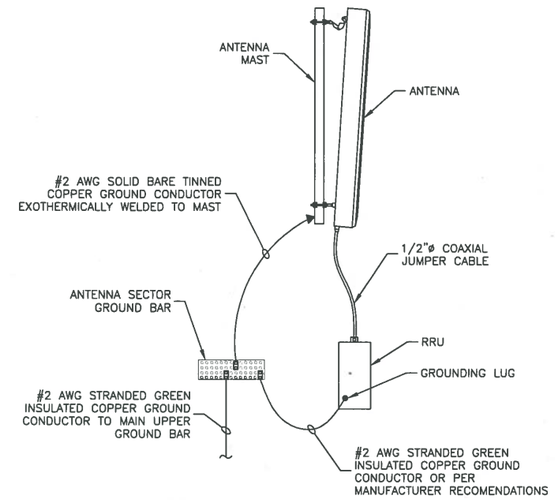


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 1

SCALE: N.T.S.



NOTES:

1. VERIFY EXISTING GROUNDING SYSTEM IS INSTALLED PER AT&T STANDARDS.
2. BOND NEW EQUIPMENT INTO EXISTING GROUND SYSTEM IN ACCORDANCE WITH AT&T STANDARDS & MANUFACTURER RECOMMENDATIONS.

TYPICAL ANTENNA/RRU GROUNDING DETAIL 2

SCALE: N.T.S

Dewberry®
Dewberry Engineers Inc.
280 SUMMER STREET
10TH FLOOR
BOSTON, MA 02210
PHONE: 617.695.3400
FAX: 617.695.3310

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

WESTON DT 3C/4C
SITE NO. CT2099
56 NORFIELD ROAD
WESTON, CT 06883

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/18	ISSUED FOR CONSTRUCTION	KB	DAS	BBR
A	02/08/18	ISSUED FOR REVIEW	KB	DAS	BBR

SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: SK

STATE OF CONNECTICUT · BENJAMIN B. REVETTE · 29477 · LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

GROUNDING NOTES & DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083726	E01	0

Date: **February 14, 2018**

Cheryl Schultz
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:	CT2099
	Carrier Site Name:	WESTON DT
Crown Castle Designation:	**Crown Castle BU Number:**	829046
	Crown Castle Site Name:	Weston/ Rt-57/ Norfield R
	Crown Castle JDE Job Number:	478068
	Crown Castle Work Order Number:	1524908
	Crown Castle Application Number:	421191 Rev. 6
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	194393
Site Data:	**56 Norfield Rd. (Town Hall), Weston, Fairfield County, CT** **Latitude *41° 12' 8.4"*, Longitude *-73° 22' 46.6"*** **190 Foot - Monopole Tower**	

Dear Cheryl Schultz,

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 1140318, in accordance with application 421191, revision 6.

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 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B 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 0.226g and S_1 of 0.067g.

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: Patdanai Chongcharoenkamon / Josh Riley

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 190 ft Monopole tower designed by Pirod, Inc. in January of 2000 and mapped by Tower Engineering Professionals, Inc. in October of 2015. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

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

The tower has been modified per reinforcement drawings prepared by Tower Engineering Professionals and Sabre Tower & Poles, in January of 2012. Reinforcement consists of addition of reinforcement plates at elevation 0.83' – 51' and 57.5' – 112.5' and additional (8) anchor rods. Refer to Post Modification Inspection Report by Sabre Tower & Poles in November 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 April of 2013. Reinforcement consisted of addition of jump plates at elevation 20', 40', 60' and 80', reinforcing plates at 80.25' to 87.25' and additional (4) transition stiffeners. Refer to Modification Inspection Report by Tower Engineering Professionals in November of 2014. 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 93 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B 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 0.226g and S_1 of 0.067g.

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
160.0	163.0	3	ericsson	RRUS 32	2 4	3/8 3/4	1
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 4478 B14			
		3	kathrein	80010965 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8C			

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
188.0	193.0	1	rfs celwave	PD201-7	-	-	1
	190.0	3	alcatel lucent	TD-RRH8x20-25	3	1-1/4	2
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	1 1 1	5/16 5/8 7/8	1
	188.0	1	cci tower mounts	Platform Mount [LP 403-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	187.0	1	radiowaves	SP2-5.8	1	1-1/4	
185.0	188.0	3	alcatel lucent	1900MHz RRH	-	-	1
		3	alcatel lucent	800MHZ RRH			
	185.0	1	cci tower mounts	Side Arm Mount [SO 102-3]			
184.0	184.0	1	cci tower mounts	Side Arm Mount [SO 701-1]	-	-	1
179.0	185.0	2	rfs celwave	458-2D	2	7/8	1
	179.0	1	cci tower mounts	Platform Mount [LP 403-1]			
170.0	174.0	1	rfs celwave	PD201-7	2 13	7/8 1-5/8	1
	170.0	1	cci tower mounts	Platform Mount [LP 405-1]			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		4	ericsson	RRUS 11 B12			
160.0	163.0	3	ericsson	RRUS12/RRUS A2	-	-	3
		6	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2 12 1	5/8 7/8 1-5/8 Conduit	1,4
		3	ericsson	RRUS 11			
		6	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	160.0	1	cci tower mounts	Platform Mount [LP 403-1]			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	TT19-08BP111-001	-	-	3
150.0	150.0	3	alcatel lucent	RRH2X60-1900	1	1-5/8	2
		3	alcatel lucent	RRH2X60-700			
		3	alcatel lucent	RRH4X45-AWS4 B66			
		6	commscope	SBNHH-1D85C w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	antel	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	12	1-5/8	1
		2	antel	LPA-80080/6CF w/ Mount			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
				Pipe			
		1	cci tower mounts	Platform Mount [LP 403-1]			
		4	decibel	DB846F65ZAXY w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
125.0	130.0	1	rfs celwave	PD128-1	1 1	1/2 7/8	1
		1	rfs celwave	PD201-1			
	125.0	2	cci tower mounts	Side Arm Mount [SO 901-1]			
110.0	115.0	2	rfs celwave	PD128-1	2	1/2	1
	110.0	2	cci tower mounts	Side Arm Mount [SO 901-1]			
100.0	101.0	1	gps	GPS_A	1	1/2	1
	100.0	1	cci tower mounts	Side Arm Mount [SO 901-1]			
95.0	100.0	2	rfs celwave	PD128-1	2	1/2	1
	95.0	2	cci tower mounts	Side Arm Mount [SO 901-1]			
80.0	85.0	1	decibel	DB222	2	1/2	1
		1	rfs celwave	PD128-1			
	80.0	2	cci tower mounts	Side Arm Mount [SO 901-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Existing Equipment To Be Removed; Not Considered in This Analysis
4) (1) 5/8" Coax is Routed in Conduit

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)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Arcnet architects, Inc.	3529916	CCISITES
4-POST-MODIFICATION INSPECTION	Sabre Tower & Poles	3673725	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	5392198	CCISITES

Document	Remarks	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, Inc.	3755295	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, Inc. & Tower Engineering Professionals, Inc. (mapped)	7340070	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Sabre Tower & Poles	3667108	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3801440	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Black & Veatch Corp.	7336231	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 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 not considered in this analysis.
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
190 - 185	Pole	TP30x30x0.375	Pole	1.8%	Pass
185 - 180	Pole	TP30x30x0.375	Pole	4.5%	Pass

180 - 175	Pole	TP36x36x0.375	Pole	6.1%	Pass
175 - 170	Pole	TP36x36x0.375	Pole	8.8%	Pass
170 - 165	Pole	TP36x36x0.375	Pole	13.2%	Pass
165 - 160	Pole	TP36x36x0.375	Pole	17.5%	Pass
160 - 155	Pole	TP42x42x0.375	Pole	18.6%	Pass
155 - 150	Pole	TP42x42x0.375	Pole	23.3%	Pass
150 - 145	Pole	TP42x42x0.375	Pole	30.0%	Pass
145 - 140	Pole	TP42x42x0.375	Pole	36.7%	Pass
140 - 135	Pole	TP48x48x0.375	Pole	33.9%	Pass
135 - 130	Pole	TP48x48x0.375	Pole	39.3%	Pass
130 - 125	Pole	TP48x48x0.375	Pole	44.8%	Pass
125 - 120	Pole	TP48x48x0.375	Pole	50.4%	Pass
120 - 115	Pole	TP54x54x0.375	Pole	45.0%	Pass
115 - 112.67	Pole	TP54x54x0.375	Pole	47.2%	Pass
112.67 - 112.42	Pole + Reinf.	TP54x54x0.4875	Pole	36.3%	Pass
112.42 - 107.42	Pole + Reinf.	TP54x54x0.4875	Pole	40.0%	Pass
107.42 - 103.33	Pole + Reinf.	TP54x54x0.4875	Pole	43.0%	Pass
103.33 - 103.08	Pole + Reinf.	TP54x54x0.4875	Pole	43.2%	Pass
103.08 - 100	Pole + Reinf.	TP54x54x0.4875	Pole	45.6%	Pass
100 - 95	Pole + Reinf.	TP60x60x0.475	Pole	41.5%	Pass
95 - 90	Pole + Reinf.	TP60x60x0.475	Pole	44.9%	Pass
90 - 89.5	Pole + Reinf.	TP60x60x0.475	Pole	45.2%	Pass
89.5 - 89.25	Pole + Reinf.	TP60x60x0.5563	Pole	39.1%	Pass
89.25 - 85.5	Pole + Reinf.	TP60x60x0.5563	Pole	41.3%	Pass
85.5 - 85.25	Pole + Reinf.	TP60x60x0.6375	Pole	36.4%	Pass
85.25 - 84	Pole + Reinf.	TP60x60x0.6375	Pole	37.1%	Pass
84 - 83.75	Pole + Reinf.	TP60x60x0.525	Pole	44.4%	Pass
83.75 - 82.5	Pole + Reinf.	TP60x60x0.525	Pole	45.2%	Pass
82.5 - 82.25	Pole + Reinf.	TP60x60x0.45	Pole	53.0%	Pass
82.25 - 80	Pole + Reinf.	TP60x60x0.45	Pole	54.7%	Pass
80 - 75	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	45.3%	Pass
75 - 70	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	48.3%	Pass
70 - 65	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	51.4%	Pass
65 - 60	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	54.4%	Pass
60 - 58.5	Pole + Reinf.	TP60x60x0.7	Reinf. 3 Tension Rupture	45.7%	Pass
58.5 - 58.25	Pole	TP60x60x0.625	Pole	49.6%	Pass
58.25 - 53.25	Pole	TP60x60x0.625	Pole	52.5%	Pass
53.25 - 48.25	Pole	TP60x60x0.625	Pole	55.3%	Pass
48.25 - 48	Pole + Reinf.	TP60x60x0.775	Pole	45.3%	Pass
48 - 43	Pole + Reinf.	TP60x60x0.775	Pole	47.7%	Pass

43 - 40	Pole + Reinf.	TP60x60x0.775	Pole	49.1%	Pass
40 - 35	Pole + Reinf.	TP60x60x0.775	Pole	51.6%	Pass
35 - 32.08	Pole + Reinf.	TP60x60x0.775	Pole	53.1%	Pass
32.08 - 31.83	Pole + Reinf.	TP60x60x0.9625	Pole	42.9%	Pass
31.83 - 28.75	Pole + Reinf.	TP60x60x0.9625	Pole	44.1%	Pass
28.75 - 28.5	Pole + Reinf.	TP60x60x0.8125	Pole	51.9%	Pass
28.5 - 23.5	Pole + Reinf.	TP60x60x0.8125	Pole	54.3%	Pass
23.5 - 20	Pole + Reinf.	TP60x60x0.8125	Pole	56.0%	Pass
20 - 19.75	Pole + Reinf.	TP60x60x0.95	Pole	47.6%	Pass
19.75 - 14.75	Pole + Reinf.	TP60x60x0.95	Pole	49.7%	Pass
14.75 - 9.75	Pole + Reinf.	TP60x60x0.95	Pole	51.9%	Pass
9.75 - 4.75	Pole + Reinf.	TP60x60x0.95	Pole	54.0%	Pass
4.75 - 0	Pole + Reinf.	TP60x60x0.95	Pole	56.0%	Pass
				Summary	
			Pole	56.0%	Pass
			Reinforcement	54.4%	Pass
			Overall	56.0%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Bolts	180	4.0	Pass
	Flange Plate		4.5	Pass
1,2	Flange Bolts	160	16.9	Pass
	Flange Plate		17.5	Pass
1,2	Flange Bolts	140	37.1	Pass
	Flange Plate		37.1	Pass
1,2	Flange Bolts	120	52.5	Pass
	Flange Plate		52.5	Pass
1,2	Flange Bolts	100	52.4	Pass
	Flange Plate		52.4	Pass
1,2	Flange Bolts	80	34.8	Pass
	Flange Plate		54.7	Pass
	Jump Plates		65.2	Pass
1,2	Flange Bolts	60	38.0	Pass
	Flange Plate		53.8	Pass
	Jump Plates		62.4	Pass
1,2	Flange Bolts	40	40.8	Pass
	Flange Plate		49.1	Pass
	Jump Plates		68.3	Pass
1,2	Flange Bolts	20	42.8	Pass
	Flange Plate		56.0	Pass
	Jump Plates		70.1	Pass

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	64.7	Pass
	Base Plate		64.7	Pass
1,3	Base Foundation (Compared w/ Design Loads)	0	73.0	Pass

Structure Rating (max from all components) =	73%

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.
3) Foundation capacity determined by comparing analysis reactions to original design reactions.

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.

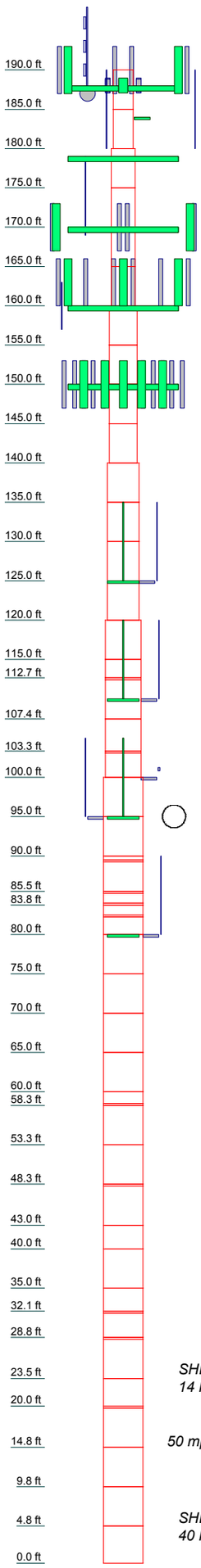
4.3) Recommendations

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

APPENDIX A

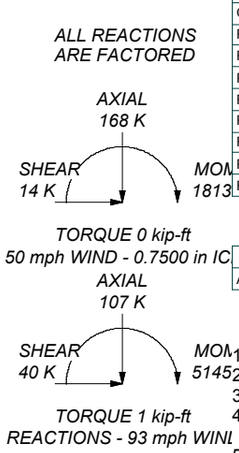
TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P60x0.375	5.00	A53-B-42	0.6
2	P60x0.375	5.00		0.6
3	P60x0.375	5.00		0.7
4	P56x0.375	5.00		0.7
5	P56x0.375	5.00		0.7
6	P56x0.375	5.00		0.7
7	P52x0.375	5.00		0.8
8	P52x0.375	5.00		0.8
9	P52x0.375	5.00		0.8
10	P52x0.375	5.00		0.8
11	P48x0.375	5.00		1.0
12	P48x0.375	5.00		1.0
13	P48x0.375	5.00		1.0
14	P46x0.375	5.00		1.0
15	P46x0.375	5.00		1.1
16	P46x0.375	2.53		0.5
17	P46x0.375	0.47		0.1
18	P46x0.375	5.000		1.4
19	P46x0.375	5.08		1.1
20	P46x0.375	3.00		0.9
21	P46x0.375	0.25		0.1
22	P46x0.375	5.00		1.5
23	P46x0.375	5.00		1.5
24	P46x0.375	0.25		0.1
25	P46x0.375	0.75		0.2
26	P46x0.375	5.00		1.3
27	P46x0.375	0.25		0.1
28	P46x0.375	0.75		0.2
29	P46x0.375	0.25		0.1
30	P46x0.375	0.75		0.2
31	P46x0.375	0.25		0.1
32	P46x0.375	2.00		0.6
33	P46x0.375	5.00		1.8
34	P60x0.500	5.00		1.8
35	P60x0.500	5.00		1.8
36	P60x0.500	5.00		1.8
37	P60x0.500	0.25		0.1
38	P60x0.500	0.75		0.2
39	P60x0.500	5.000		2.0
40	P60x0.500	5.00		2.0
41	P60x0.500	0.25		0.1
42	P60x0.500	5.000		2.4
43	P75x0.750	3.00		1.4
44	P75x0.750	5.00		2.4
45	P75x0.750	2.92		1.4
46	P75x0.750	0.08		0.0
47	P75x0.750	0.25		0.1
48	P75x0.750	0.75		0.3
49	P75x0.750	5.000		2.5
50	P75x0.750	23.50		11.8
51	P75x0.750	0.25		0.1
52	P75x0.750	5.000		2.9
53	P60x0.375	5.00		2.9
54	P60x0.375	5.00		2.9
55	P60x0.375	4.75		2.8
				60.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 403-1]	188	RRUS 32 B2	160
6' x 2" Mount Pipe	188	DC6-48-60-18-8C	160
6' x 2" Mount Pipe	188	DC6-48-60-18-8F	160
6' x 2" Mount Pipe	188	(2) LGP21401	160
APXVTM14-ALU-I20 w/ Mount Pipe	188	(2) LGP21401	160
APXVTM14-ALU-I20 w/ Mount Pipe	188	(2) LGP21401	160
APXVTM14-ALU-I20 w/ Mount Pipe	188	(2) 7020.00	160
PD201-7	188	(2) 7020.00	160
APXVSPP18-C-A20 w/ Mount Pipe	188	(2) 7020.00	160
APXVSPP18-C-A20 w/ Mount Pipe	188	RRUS 11	160
APXVSPP18-C-A20 w/ Mount Pipe	188	RRUS 11	160
TD-RRH8x20-25	188	RRUS 11	160
TD-RRH8x20-25	188	Platform Mount [LP 403-1]	160
TD-RRH8x20-25	188	SBNHH-1D85C w/ Mount Pipe	150
SP2-5.8	188	SBNHH-1D85C w/ Mount Pipe	150
(2) 4' x 2" Pipe Mount	185	SBNHH-1D85C w/ Mount Pipe	150
(2) 4' x 2" Pipe Mount	185	SBNHH-1D85C w/ Mount Pipe	150
(2) 4' x 2" Pipe Mount	185	SBNHH-1D85C w/ Mount Pipe	150
800MHZ RRH	185	SBNHH-1D85C w/ Mount Pipe	150
800MHZ RRH	185	(2) DB846F65ZAXY w/ Mount Pipe	150
800MHZ RRH	185	(2) DB846F65ZAXY w/ Mount Pipe	150
1900MHz RRH	185	(2) LPA-80080/6CF w/ Mount Pipe	150
1900MHz RRH	185	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	150
1900MHz RRH	185		
Side Arm Mount [SO 102-3]	185	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	150
4' x 2" Pipe Mount	184		
Side Arm Mount [SO 701-1]	184	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	150
Side Arm Mount [SO 301-1]	179		
Side Arm Mount [SO 301-1]	179	RRH2X60-700	150
(4) 6' x 2" Mount Pipe	179	RRH2X60-700	150
(4) 6' x 2" Mount Pipe	179	RRH2X60-700	150
(4) 6' x 2" Mount Pipe	179	RRH4X45-AWS4 B66	150
458-2D	179	RRH4X45-AWS4 B66	150
458-2D	179	RRH4X45-AWS4 B66	150
Platform Mount [LP 403-1]	179	RRH2X60-1900	150
4' x 2" Pipe Mount	170	RRH2X60-1900	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	RRH2X60-1900	150
		DB-T1-6Z-8AB-0Z	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	DB-T1-6Z-8AB-0Z	150
		(2) FD9R6004/2C-3L	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	(2) FD9R6004/2C-3L	150
		(2) FD9R6004/2C-3L	150
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	170	Platform Mount [LP 403-1]	150
		Side Arm Mount [SO 901-1]	125
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	170	PD201-1	125
		PD128-1	125
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	170	Side Arm Mount [SO 901-1]	125
		Side Arm Mount [SO 901-1]	110
PD201-7	170	PD128-1	110
KRY 112 144/1	170	PD128-1	110
KRY 112 144/1	170	Side Arm Mount [SO 901-1]	110
KRY 112 144/1	170	GPS_A	100
(2) RRUS 11 B12	170	Side Arm Mount [SO 901-1]	100
RRUS 11 B12	170	Side Arm Mount [SO 901-1]	95
RRUS 11 B12	170	PD128-1	95
Platform Mount [LP 405-1]	170	PD128-1	95
6' x 2" Mount Pipe	160	Side Arm Mount [SO 901-1]	95
80010965 w/ Mount Pipe	160	Side Arm Mount [SO 901-1]	80
80010965 w/ Mount Pipe	160	PD128-1	80
80010965 w/ Mount Pipe	160	DB222	80
7770.00 w/ Mount Pipe	160	Jump Plate 120" x 4.5" x 1"	80
7770.00 w/ Mount Pipe	160	Jump Plate 120" x 4.5" x 1"	80
7770.00 w/ Mount Pipe	160	Jump Plate 120" x 4.5" x 1"	80
OPA-65R-LCUU-H6 w/ Mount Pipe	160	Side Arm Mount [SO 901-1]	80
OPA-65R-LCUU-H6 w/ Mount Pipe	160	Jump Plate 120" x 6.5" x 1.25"	60
OPA-65R-LCUU-H6 w/ Mount Pipe	160	Jump Plate 120" x 6.5" x 1.25"	60
RRUS 32	160	Jump Plate 120" x 6.5" x 1.25"	60
RRUS 32	160	(2) Jump Plate 120" x 6" x 1"	40
RRUS 32	160	(2) Jump Plate 120" x 6" x 1"	40
RRUS 4478 B14	160	(2) Jump Plate 120" x 6" x 1"	40
RRUS 4478 B14	160	(2) Jump Plate 120" x 6.5" x 1.25"	20
RRUS 4478 B14	160	(2) Jump Plate 120" x 6.5" x 1.25"	20
RRUS 32 B2	160	(2) Jump Plate 120" x 6.5" x 1.25"	20
RRUS 32 B2	160		



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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/Rt-57/Norfield (BU# 829046)***			
Project: ***194393 (829046.1524908)***			
Client: Crown Castle	Drawn by: Josh Riley	App'd:	
Code: TIA-222-G	Date: 02/14/18	Scale: NTS	
Path: C:\Users\ril68982\Desktop\829046.1524908 (VER)\mod.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 Fairfield County, Connecticut.
2) Basic wind speed of 93 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 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*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	190.00-185.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L2	185.00-180.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L3	180.00-175.00	5.00	P36x0.375	A53-B-42 (42 ksi)	
L4	175.00-170.00	5.00	P36x0.375	A53-B-42 (42 ksi)	
L5	170.00-165.00	5.00	P36x0.375	A53-B-42 (42 ksi)	
L6	165.00-160.00	5.00	P36x0.375	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L7	160.00-155.00	5.00	P42x0.375	(42 ksi) A53-B-42 (42 ksi)	
L8	155.00-150.00	5.00	P42x0.375	A53-B-42 (42 ksi)	
L9	150.00-145.00	5.00	P42x0.375	A53-B-42 (42 ksi)	
L10	145.00-140.00	5.00	P42x0.375	A53-B-42 (42 ksi)	
L11	140.00-135.00	5.00	P48x0.375	A53-B-42 (42 ksi)	
L12	135.00-130.00	5.00	P48x0.375	A53-B-42 (42 ksi)	
L13	130.00-125.00	5.00	P48x0.375	A53-B-42 (42 ksi)	
L14	125.00-120.00	5.00	P48x0.375	A53-B-42 (42 ksi)	
L15	120.00-115.00	5.00	P54x0.375	A53-B-42 (42 ksi)	
L16	115.00-112.67	2.33	P54x0.375	A53-B-42 (42 ksi)	
L17	112.67-112.42	0.25	P54x0.4875	A53-B-42 (42 ksi)	
L18	112.42-107.42	5.00	P54x0.4875	A53-B-42 (42 ksi)	
L19	107.42-103.33	4.08	P54x0.4875	A53-B-42 (42 ksi)	
L20	103.33-103.08	0.25	P54x0.4875	A53-B-42 (42 ksi)	
L21	103.08-100.00	3.08	P54x0.4875	A53-B-42 (42 ksi)	
L22	100.00-95.00	5.00	P60x0.475	A53-B-42 (42 ksi)	
L23	95.00-90.00	5.00	P60x0.475	A53-B-42 (42 ksi)	
L24	90.00-89.50	0.50	P60x0.475	A53-B-42 (42 ksi)	
L25	89.50-89.25	0.25	P60x0.55625	A53-B-42 (42 ksi)	
L26	89.25-85.50	3.75	P60x0.55625	A53-B-42 (42 ksi)	
L27	85.50-85.25	0.25	P60x0.6375	A53-B-42 (42 ksi)	
L28	85.25-84.00	1.25	P60x0.6375	A53-B-42 (42 ksi)	
L29	84.00-83.75	0.25	P60x0.525	A53-B-42 (42 ksi)	
L30	83.75-82.50	1.25	P60x0.525	A53-B-42 (42 ksi)	
L31	82.50-82.25	0.25	P60x0.45	A53-B-42 (42 ksi)	
L32	82.25-80.00	2.25	P60x0.45	A53-B-42 (42 ksi)	
L33	80.00-75.00	5.00	P60x0.575	A53-B-42 (42 ksi)	
L34	75.00-70.00	5.00	P60x0.575	A53-B-42 (42 ksi)	
L35	70.00-65.00	5.00	P60x0.575	A53-B-42 (42 ksi)	
L36	65.00-60.00	5.00	P60x0.575	A53-B-42 (42 ksi)	
L37	60.00-58.50	1.50	P60x0.7	A53-B-42 (42 ksi)	
L38	58.50-58.25	0.25	P60x0.625	A53-B-42 (42 ksi)	
L39	58.25-53.25	5.00	P60x0.625	A53-B-42 (42 ksi)	
L40	53.25-48.25	5.00	P60x0.625	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L41	48.25-48.00	0.25	P60x0.775	A53-B-42 (42 ksi)	
L42	48.00-43.00	5.00	P60x0.775	A53-B-42 (42 ksi)	
L43	43.00-40.00	3.00	P60x0.775	A53-B-42 (42 ksi)	
L44	40.00-35.00	5.00	P60x0.775	A53-B-42 (42 ksi)	
L45	35.00-32.08	2.92	P60x0.775	A53-B-42 (42 ksi)	
L46	32.08-31.83	0.25	P60x0.9625	A53-B-42 (42 ksi)	
L47	31.83-28.75	3.08	P60x0.9625	A53-B-42 (42 ksi)	
L48	28.75-28.50	0.25	P60x0.8125	A53-B-42 (42 ksi)	
L49	28.50-23.50	5.00	P60x0.8125	A53-B-42 (42 ksi)	
L50	23.50-20.00	3.50	P60x0.8125	A53-B-42 (42 ksi)	
L51	20.00-19.75	0.25	P60x0.95	A53-B-42 (42 ksi)	
L52	19.75-14.75	5.00	P60x0.95	A53-B-42 (42 ksi)	
L53	14.75-9.75	5.00	P60x0.95	A53-B-42 (42 ksi)	
L54	9.75-4.75	5.00	P60x0.95	A53-B-42 (42 ksi)	
L55	4.75-0.00	4.75	P60x0.95	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 190.00-185.00				1	1	1			
L2 185.00-180.00				1	1	1			
L3 180.00-175.00				1	1	1			
L4 175.00-170.00				1	1	1			
L5 170.00-165.00				1	1	1			
L6 165.00-160.00				1	1	1			
L7 160.00-155.00				1	1	1			
L8 155.00-150.00				1	1	1			
L9 150.00-145.00				1	1	1			
L10 145.00-140.00				1	1	1			
L11 140.00-135.00				1	1	1			
L12 135.00-130.00				1	1	1			
L13 130.00-125.00				1	1	1			
L14 125.00-120.00				1	1	1			
L15 120.00-115.00				1	1	1			
L16 115.00-				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
112.67									
L17 112.67-112.42				1	1	0.990478			
L18 112.42-107.42				1	1	0.990478			
L19 107.42-103.33				1	1	0.990478			
L20 103.33-103.08				1	1	0.990478			
L21 103.08-100.00				1	1	0.990478			
L22 100.00-95.00				1	1	0.993442			
L23 95.00-90.00				1	1	0.993442			
L24 90.00-89.50				1	1	0.993442			
L25 89.50-89.25				1	1	0.979451			
L26 89.25-85.50				1	1	0.979451			
L27 85.50-85.25				1	1	0.96934			
L28 85.25-84.00				1	1	0.96934			
L29 84.00-83.75				1	1	0.991333			
L30 83.75-82.50				1	1	0.991333			
L31 82.50-82.25				1	1	0.99474			
L32 82.25-80.00				1	1	0.99474			
L33 80.00-75.00				1	1	0.996424			
L34 75.00-70.00				1	1	0.996424			
L35 70.00-65.00				1	1	0.996424			
L36 65.00-60.00				1	1	0.996424			
L37 60.00-58.50				1	1	0.997508			
L38 58.50-58.25				1	1	1			
L39 58.25-53.25				1	1	1			
L40 53.25-48.25				1	1	1			
L41 48.25-48.00				1	1	0.977534			
L42 48.00-43.00				1	1	0.977534			
L43 43.00-40.00				1	1	0.977534			
L44 40.00-35.00				1	1	0.977534			
L45 35.00-32.08				1	1	0.977534			
L46 32.08-31.83				1	1	0.96816			
L47 31.83-28.75				1	1	0.96816			
L48 28.75-28.50				1	1	0.98265			
L49 28.50-23.50				1	1	0.98265			

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
L50 23.50-20.00				1	1	0.98265			
L51 20.00-19.75				1	1	0.973014			
L52 19.75-14.75				1	1	0.973014			
L53 14.75-9.75				1	1	0.973014			
L54 9.75-4.75				1	1	0.973014			
L55 4.75-0.00				1	1	0.973014			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	190.00 - 10.00	1	1	0.000 0.010	0.3750		0.22
Climbing Rungs	C	Surface Ar (CaAa)	100.00 - 10.00	1	1	0.000 0.000	0.8000		7.90
188									
HB114-21U3M12-XXXF(1-1/4)	A	Surface Ar (CaAa)	188.00 - 6.00	3	3	0.400 0.480	1.5400		1.22
LDF7-50A(1-5/8)	A	Surface Ar (CaAa)	170.00 - 11.00	7	7	0.100 0.370	1.9800		0.82
160									
(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	A	Surface Ar (CaAa)	160.00 - 11.00	6	3	-0.100 -0.060	0.7950		0.58
LDF7-50A(1-5/8)	A	Surface Ar (CaAa)	160.00 - 11.00	12	6	-0.340 -0.100	1.9800		0.82
**********									
***MOD 2012 ***									
8.5" x 1.25" Flat Plate	A	Surface Af (CaAa)	35.83 - 0.83	1	1	0.000 0.000	8.5000	19.5000	0.00
8.5" x 1.25" Flat Plate	B	Surface Af (CaAa)	35.83 - 0.83	1	1	0.000 0.000	8.5000	19.5000	0.00
8.5" x 1.25" Flat Plate *	C	Surface Af (CaAa)	35.83 - 0.83	1	1	0.000 0.000	8.5000	19.5000	0.00
6.5" x 1.25" Flat Plate	A	Surface Af (CaAa)	51.00 - 26.00	1	1	0.000 0.000	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate	B	Surface Af (CaAa)	51.00 - 26.00	1	1	0.000 0.000	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate *	C	Surface Af (CaAa)	51.00 - 26.00	1	1	0.000 0.000	6.5000	15.5000	0.00
4.5" x 1" Flat Plate	A	Surface Af (CaAa)	87.00 - 57.00	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flat Plate	B	Surface Af (CaAa)	87.00 - 57.00	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flat Plate *	C	Surface Af (CaAa)	87.00 - 57.00	1	1	0.000 0.000	4.5000	11.0000	0.00
6" x 1" Flat Plate	A	Surface Af (CaAa)	105.33 - 82.00	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flat Plate	B	Surface Af (CaAa)	105.33 - 82.00	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flat Plate *	C	Surface Af (CaAa)	105.33 - 82.00	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flat Plate	A	Surface Af (CaAa)	114.67 - 101.33	1	1	0.000 0.000	6.0000	14.0000	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
6" x 1" Flat Plate	B	Surface Af (CaAa)	114.67 - 101.33	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flat Plate	C	Surface Af (CaAa)	114.67 - 101.33	1	1	0.000 0.000	6.0000	14.0000	0.00
MOD 2013									
4.5" x 1" Flat Plate	A	Surface Af (CaAa)	91.00 - 81.00	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flat Plate	B	Surface Af (CaAa)	91.00 - 81.00	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flat Plate	C	Surface Af (CaAa)	91.00 - 81.00	1	1	0.000 0.000	4.5000	11.0000	0.00
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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
TYPE I(1-1/4)	A	No	Inside Pole	188.00 - 6.00	1	No Ice	0.00	0.63
						1/2" Ice	0.00	0.63
						1" Ice	0.00	0.63
ATCB-B01(5/16)	A	No	Inside Pole	188.00 - 6.00	1	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
LDF4.5-50(5/8)	A	No	Inside Pole	188.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF5-50A(7/8)	A	No	Inside Pole	188.00 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
179								
LDF5-50A(7/8)	A	No	Inside Pole	179.00 - 6.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
170								
LDF5-50A(7/8)	A	No	Inside Pole	170.00 - 11.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF7-50A(1-5/8)	A	No	Inside Pole	170.00 - 11.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
2" innerduct conduit	A	No	Inside Pole	160.00 - 11.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20
9776(5/8)	A	No	Inside Pole	160.00 - 11.00	1	No Ice	0.00	0.28
						1/2" Ice	0.00	0.28
						1" Ice	0.00	0.28
LDF5-50A(7/8)	A	No	Inside Pole	160.00 - 11.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
150								
HB158-1-08U8-S8J18(1-5/8)	B	No	Inside Pole	150.00 - 6.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
LDF7-50A(1-5/8)	B	No	Inside Pole	150.00 - 6.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
125								
LDF4-50A(1/2)	A	No	Inside Pole	125.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF5-50A(7/8)	A	No	Inside Pole	125.00 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
110								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF4-50A(1/2)	A	No	Inside Pole	110.00 - 6.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
100								
LDF4-50A(1/2)	A	No	Inside Pole	100.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
95								
LDF4-50A(1/2)	A	No	Inside Pole	95.00 - 6.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
80								
LDF4-50A(1/2)	A	No	Inside Pole	80.00 - 6.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
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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	190.00-185.00	A	0.000	0.000	1.386	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L2	185.00-180.00	A	0.000	0.000	2.310	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L3	180.00-175.00	A	0.000	0.000	2.310	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L4	175.00-170.00	A	0.000	0.000	2.310	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L5	170.00-165.00	A	0.000	0.000	9.240	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L6	165.00-160.00	A	0.000	0.000	9.240	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L7	160.00-155.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L8	155.00-150.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L9	150.00-145.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L10	145.00-140.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L11	140.00-135.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L12	135.00-130.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L13	130.00-125.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L14	125.00-120.00	A	0.000	0.000	16.372	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L15	120.00-115.00	A	0.000	0.000	16.372	0.000	0.16

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L16	115.00-112.67	A	0.000	0.000	9.643	0.000	0.07
		B	0.000	0.000	2.000	0.000	0.03
		C	0.000	0.000	2.088	0.000	0.00
L17	112.67-112.42	A	0.000	0.000	1.069	0.000	0.01
		B	0.000	0.000	0.250	0.000	0.00
		C	0.000	0.000	0.259	0.000	0.00
L18	112.42-107.42	A	0.000	0.000	21.372	0.000	0.16
		B	0.000	0.000	5.000	0.000	0.06
		C	0.000	0.000	5.188	0.000	0.00
L19	107.42-103.33	A	0.000	0.000	19.453	0.000	0.13
		B	0.000	0.000	6.083	0.000	0.05
		C	0.000	0.000	6.236	0.000	0.00
L20	103.33-103.08	A	0.000	0.000	1.319	0.000	0.01
		B	0.000	0.000	0.500	0.000	0.00
		C	0.000	0.000	0.509	0.000	0.00
L21	103.08-100.00	A	0.000	0.000	14.928	0.000	0.10
		B	0.000	0.000	4.833	0.000	0.03
		C	0.000	0.000	4.949	0.000	0.00
L22	100.00-95.00	A	0.000	0.000	21.372	0.000	0.16
		B	0.000	0.000	5.000	0.000	0.06
		C	0.000	0.000	5.588	0.000	0.04
L23	95.00-90.00	A	0.000	0.000	22.122	0.000	0.16
		B	0.000	0.000	5.750	0.000	0.06
		C	0.000	0.000	6.338	0.000	0.04
L24	90.00-89.50	A	0.000	0.000	2.512	0.000	0.02
		B	0.000	0.000	0.875	0.000	0.01
		C	0.000	0.000	0.934	0.000	0.00
L25	89.50-89.25	A	0.000	0.000	1.256	0.000	0.01
		B	0.000	0.000	0.438	0.000	0.00
		C	0.000	0.000	0.467	0.000	0.00
L26	89.25-85.50	A	0.000	0.000	19.967	0.000	0.12
		B	0.000	0.000	7.688	0.000	0.04
		C	0.000	0.000	8.128	0.000	0.03
L27	85.50-85.25	A	0.000	0.000	1.444	0.000	0.01
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.654	0.000	0.00
L28	85.25-84.00	A	0.000	0.000	7.218	0.000	0.04
		B	0.000	0.000	3.125	0.000	0.01
		C	0.000	0.000	3.272	0.000	0.01
L29	84.00-83.75	A	0.000	0.000	1.444	0.000	0.01
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.654	0.000	0.00
L30	83.75-82.50	A	0.000	0.000	7.218	0.000	0.04
		B	0.000	0.000	3.125	0.000	0.01
		C	0.000	0.000	3.272	0.000	0.01
L31	82.50-82.25	A	0.000	0.000	1.444	0.000	0.01
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.654	0.000	0.00
L32	82.25-80.00	A	0.000	0.000	10.243	0.000	0.07
		B	0.000	0.000	2.875	0.000	0.03
		C	0.000	0.000	3.139	0.000	0.02
L33	80.00-75.00	A	0.000	0.000	20.122	0.000	0.16
		B	0.000	0.000	3.750	0.000	0.06
		C	0.000	0.000	4.338	0.000	0.04
L34	75.00-70.00	A	0.000	0.000	20.122	0.000	0.16
		B	0.000	0.000	3.750	0.000	0.06
		C	0.000	0.000	4.338	0.000	0.04
L35	70.00-65.00	A	0.000	0.000	20.122	0.000	0.16
		B	0.000	0.000	3.750	0.000	0.06
		C	0.000	0.000	4.338	0.000	0.04
L36	65.00-60.00	A	0.000	0.000	20.122	0.000	0.16
		B	0.000	0.000	3.750	0.000	0.06
		C	0.000	0.000	4.338	0.000	0.04
L37	60.00-58.50	A	0.000	0.000	6.037	0.000	0.05
		B	0.000	0.000	1.125	0.000	0.02
		C	0.000	0.000	1.301	0.000	0.01
L38	58.50-58.25	A	0.000	0.000	1.006	0.000	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.217	0.000	0.00
L39	58.25-53.25	A	0.000	0.000	17.310	0.000	0.16
		B	0.000	0.000	0.938	0.000	0.06
		C	0.000	0.000	1.525	0.000	0.04
L40	53.25-48.25	A	0.000	0.000	19.352	0.000	0.16
		B	0.000	0.000	2.979	0.000	0.06
		C	0.000	0.000	3.567	0.000	0.04
L41	48.25-48.00	A	0.000	0.000	1.089	0.000	0.01
		B	0.000	0.000	0.271	0.000	0.00
		C	0.000	0.000	0.300	0.000	0.00
L42	48.00-43.00	A	0.000	0.000	21.789	0.000	0.16
		B	0.000	0.000	5.417	0.000	0.06
		C	0.000	0.000	6.004	0.000	0.04
L43	43.00-40.00	A	0.000	0.000	13.073	0.000	0.10
		B	0.000	0.000	3.250	0.000	0.03
		C	0.000	0.000	3.603	0.000	0.02
L44	40.00-35.00	A	0.000	0.000	22.969	0.000	0.16
		B	0.000	0.000	6.597	0.000	0.06
		C	0.000	0.000	7.184	0.000	0.04
L45	35.00-32.08	A	0.000	0.000	16.862	0.000	0.10
		B	0.000	0.000	7.300	0.000	0.03
		C	0.000	0.000	7.643	0.000	0.02
L46	32.08-31.83	A	0.000	0.000	1.444	0.000	0.01
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.654	0.000	0.00
L47	31.83-28.75	A	0.000	0.000	17.785	0.000	0.10
		B	0.000	0.000	7.700	0.000	0.03
		C	0.000	0.000	8.062	0.000	0.03
L48	28.75-28.50	A	0.000	0.000	1.444	0.000	0.01
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.654	0.000	0.00
L49	28.50-23.50	A	0.000	0.000	26.164	0.000	0.16
		B	0.000	0.000	9.792	0.000	0.06
		C	0.000	0.000	10.379	0.000	0.04
L50	23.50-20.00	A	0.000	0.000	16.419	0.000	0.11
		B	0.000	0.000	4.958	0.000	0.04
		C	0.000	0.000	5.370	0.000	0.03
L51	20.00-19.75	A	0.000	0.000	1.173	0.000	0.01
		B	0.000	0.000	0.354	0.000	0.00
		C	0.000	0.000	0.384	0.000	0.00
L52	19.75-14.75	A	0.000	0.000	23.456	0.000	0.16
		B	0.000	0.000	7.083	0.000	0.06
		C	0.000	0.000	7.671	0.000	0.04
L53	14.75-9.75	A	0.000	0.000	19.940	0.000	0.13
		B	0.000	0.000	7.083	0.000	0.06
		C	0.000	0.000	7.641	0.000	0.04
L54	9.75-4.75	A	0.000	0.000	8.816	0.000	0.03
		B	0.000	0.000	7.083	0.000	0.04
		C	0.000	0.000	7.083	0.000	0.00
L55	4.75-0.00	A	0.000	0.000	5.549	0.000	0.00
		B	0.000	0.000	5.549	0.000	0.00
		C	0.000	0.000	5.549	0.000	0.00

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	190.00-185.00	A	1.785	0.000	0.000	3.071	0.000	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.972	0.000	0.02
L2	185.00-180.00	A	1.780	0.000	0.000	5.112	0.000	0.08
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.967	0.000	0.02
L3	180.00-175.00	A	1.775	0.000	0.000	5.106	0.000	0.09

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.962	0.000	0.02
L4	175.00-170.00	A	1.770	0.000	0.000	5.100	0.000	0.09
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.957	0.000	0.02
L5	170.00-165.00	A	1.765	0.000	0.000	15.961	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.952	0.000	0.02
L6	165.00-160.00	A	1.759	0.000	0.000	15.948	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.947	0.000	0.02
L7	160.00-155.00	A	1.754	0.000	0.000	29.234	0.000	0.53
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.941	0.000	0.02
L8	155.00-150.00	A	1.748	0.000	0.000	29.206	0.000	0.53
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.936	0.000	0.02
L9	150.00-145.00	A	1.742	0.000	0.000	29.177	0.000	0.53
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.930	0.000	0.02
L10	145.00-140.00	A	1.736	0.000	0.000	29.147	0.000	0.53
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.924	0.000	0.02
L11	140.00-135.00	A	1.730	0.000	0.000	29.116	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.918	0.000	0.02
L12	135.00-130.00	A	1.724	0.000	0.000	29.084	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.911	0.000	0.02
L13	130.00-125.00	A	1.717	0.000	0.000	29.051	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.905	0.000	0.02
L14	125.00-120.00	A	1.710	0.000	0.000	29.017	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.898	0.000	0.02
L15	120.00-115.00	A	1.703	0.000	0.000	28.981	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.891	0.000	0.02
L16	115.00-112.67	A	1.698	0.000	0.000	15.920	0.000	0.27
		B		0.000	0.000	2.405	0.000	0.05
		C		0.000	0.000	3.285	0.000	0.04
L17	112.67-112.42	A	1.696	0.000	0.000	1.748	0.000	0.03
		B		0.000	0.000	0.301	0.000	0.01
		C		0.000	0.000	0.395	0.000	0.00
L18	112.42-107.42	A	1.692	0.000	0.000	34.933	0.000	0.59
		B		0.000	0.000	6.008	0.000	0.12
		C		0.000	0.000	7.888	0.000	0.09
L19	107.42-103.33	A	1.685	0.000	0.000	31.168	0.000	0.50
		B		0.000	0.000	7.577	0.000	0.13
		C		0.000	0.000	9.106	0.000	0.10
L20	103.33-103.08	A	1.681	0.000	0.000	2.078	0.000	0.03
		B		0.000	0.000	0.634	0.000	0.01
		C		0.000	0.000	0.728	0.000	0.01
L21	103.08-100.00	A	1.678	0.000	0.000	24.012	0.000	0.38
		B		0.000	0.000	6.219	0.000	0.10
		C		0.000	0.000	7.369	0.000	0.08
L22	100.00-95.00	A	1.672	0.000	0.000	35.495	0.000	0.58
		B		0.000	0.000	6.672	0.000	0.12
		C		0.000	0.000	10.602	0.000	0.15
L23	95.00-90.00	A	1.663	0.000	0.000	36.383	0.000	0.59
		B		0.000	0.000	7.603	0.000	0.13
		C		0.000	0.000	11.517	0.000	0.16
L24	90.00-89.50	A	1.658	0.000	0.000	4.011	0.000	0.06
		B		0.000	0.000	1.136	0.000	0.02
		C		0.000	0.000	1.526	0.000	0.02
L25	89.50-89.25	A	1.657	0.000	0.000	2.005	0.000	0.03
		B		0.000	0.000	0.568	0.000	0.01
		C		0.000	0.000	0.763	0.000	0.01
L26	89.25-85.50	A	1.653	0.000	0.000	31.684	0.000	0.49

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	10.135	0.000	0.15
		C		0.000	0.000	13.055	0.000	0.17
L27	85.50-85.25	A	1.650	0.000	0.000	2.273	0.000	0.03
		B		0.000	0.000	0.837	0.000	0.01
		C		0.000	0.000	1.032	0.000	0.01
L28	85.25-84.00	A	1.648	0.000	0.000	11.362	0.000	0.17
		B		0.000	0.000	4.185	0.000	0.06
		C		0.000	0.000	5.156	0.000	0.07
L29	84.00-83.75	A	1.647	0.000	0.000	2.272	0.000	0.03
		B		0.000	0.000	0.837	0.000	0.01
		C		0.000	0.000	1.031	0.000	0.01
L30	83.75-82.50	A	1.645	0.000	0.000	11.357	0.000	0.17
		B		0.000	0.000	4.184	0.000	0.06
		C		0.000	0.000	5.153	0.000	0.07
L31	82.50-82.25	A	1.644	0.000	0.000	2.271	0.000	0.03
		B		0.000	0.000	0.837	0.000	0.01
		C		0.000	0.000	1.030	0.000	0.01
L32	82.25-80.00	A	1.641	0.000	0.000	16.833	0.000	0.27
		B		0.000	0.000	3.931	0.000	0.07
		C		0.000	0.000	5.673	0.000	0.08
L33	80.00-75.00	A	1.634	0.000	0.000	34.018	0.000	0.56
		B		0.000	0.000	5.384	0.000	0.11
		C		0.000	0.000	9.239	0.000	0.14
L34	75.00-70.00	A	1.623	0.000	0.000	33.953	0.000	0.56
		B		0.000	0.000	5.373	0.000	0.11
		C		0.000	0.000	9.206	0.000	0.14
L35	70.00-65.00	A	1.611	0.000	0.000	33.883	0.000	0.56
		B		0.000	0.000	5.361	0.000	0.11
		C		0.000	0.000	9.171	0.000	0.14
L36	65.00-60.00	A	1.599	0.000	0.000	33.809	0.000	0.55
		B		0.000	0.000	5.349	0.000	0.11
		C		0.000	0.000	9.134	0.000	0.14
L37	60.00-58.50	A	1.590	0.000	0.000	10.127	0.000	0.17
		B		0.000	0.000	1.602	0.000	0.03
		C		0.000	0.000	2.733	0.000	0.04
L38	58.50-58.25	A	1.588	0.000	0.000	1.687	0.000	0.03
		B		0.000	0.000	0.267	0.000	0.01
		C		0.000	0.000	0.455	0.000	0.01
L39	58.25-53.25	A	1.581	0.000	0.000	29.702	0.000	0.51
		B		0.000	0.000	1.333	0.000	0.07
		C		0.000	0.000	5.082	0.000	0.10
L40	53.25-48.25	A	1.566	0.000	0.000	32.136	0.000	0.53
		B		0.000	0.000	3.840	0.000	0.09
		C		0.000	0.000	7.560	0.000	0.12
L41	48.25-48.00	A	1.558	0.000	0.000	1.761	0.000	0.03
		B		0.000	0.000	0.349	0.000	0.01
		C		0.000	0.000	0.534	0.000	0.01
L42	48.00-43.00	A	1.549	0.000	0.000	35.176	0.000	0.55
		B		0.000	0.000	6.966	0.000	0.12
		C		0.000	0.000	10.651	0.000	0.15
L43	43.00-40.00	A	1.535	0.000	0.000	21.055	0.000	0.33
		B		0.000	0.000	4.171	0.000	0.07
		C		0.000	0.000	6.365	0.000	0.09
L44	40.00-35.00	A	1.519	0.000	0.000	36.431	0.000	0.56
		B		0.000	0.000	8.369	0.000	0.13
		C		0.000	0.000	11.995	0.000	0.15
L45	35.00-32.08	A	1.502	0.000	0.000	25.394	0.000	0.36
		B		0.000	0.000	9.055	0.000	0.11
		C		0.000	0.000	11.153	0.000	0.13
L46	32.08-31.83	A	1.495	0.000	0.000	2.172	0.000	0.03
		B		0.000	0.000	0.775	0.000	0.01
		C		0.000	0.000	0.953	0.000	0.01
L47	31.83-28.75	A	1.487	0.000	0.000	26.720	0.000	0.38
		B		0.000	0.000	9.532	0.000	0.12
		C		0.000	0.000	11.726	0.000	0.13
L48	28.75-28.50	A	1.479	0.000	0.000	2.166	0.000	0.03
		B		0.000	0.000	0.773	0.000	0.01
		C		0.000	0.000	0.950	0.000	0.01
L49	28.50-23.50	A	1.465	0.000	0.000	39.778	0.000	0.57

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	11.989	0.000	0.16
		C		0.000	0.000	15.505	0.000	0.18
L50	23.50-20.00	A	1.439	0.000	0.000	25.327	0.000	0.37
		B		0.000	0.000	5.965	0.000	0.09
		C		0.000	0.000	8.391	0.000	0.10
L51	20.00-19.75	A	1.426	0.000	0.000	1.805	0.000	0.03
		B		0.000	0.000	0.425	0.000	0.01
		C		0.000	0.000	0.597	0.000	0.01
L52	19.75-14.75	A	1.406	0.000	0.000	35.984	0.000	0.53
		B		0.000	0.000	8.489	0.000	0.12
		C		0.000	0.000	11.888	0.000	0.14
L53	14.75-9.75	A	1.358	0.000	0.000	30.032	0.000	0.42
		B		0.000	0.000	8.442	0.000	0.12
		C		0.000	0.000	11.581	0.000	0.13
L54	9.75-4.75	A	1.289	0.000	0.000	11.747	0.000	0.12
		B		0.000	0.000	8.372	0.000	0.10
		C		0.000	0.000	8.372	0.000	0.06
L55	4.75-0.00	A	1.153	0.000	0.000	6.452	0.000	0.04
		B		0.000	0.000	6.452	0.000	0.04
		C		0.000	0.000	6.452	0.000	0.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.00-185.00	-0.0492	-0.3346	-0.0762	-0.2160
L2	185.00-180.00	-0.0766	-0.5550	-0.1074	-0.5166
L3	180.00-175.00	-0.0782	-0.5659	-0.1158	-0.5556
L4	175.00-170.00	-0.0782	-0.5659	-0.1158	-0.5558
L5	170.00-165.00	-0.7657	-1.5500	-0.7386	-1.4316
L6	165.00-160.00	-0.7657	-1.5500	-0.7387	-1.4320
L7	160.00-155.00	-1.8147	-1.4171	-1.7340	-1.2464
L8	155.00-150.00	-1.8147	-1.4171	-1.7343	-1.2469
L9	150.00-145.00	-1.8147	-1.4171	-1.7345	-1.2473
L10	145.00-140.00	-1.8147	-1.4171	-1.7347	-1.2477
L11	140.00-135.00	-1.9161	-1.5004	-1.8914	-1.3636
L12	135.00-130.00	-1.9161	-1.5004	-1.8916	-1.3640
L13	130.00-125.00	-1.9161	-1.5004	-1.8917	-1.3645
L14	125.00-120.00	-1.9161	-1.5004	-1.8919	-1.3650
L15	120.00-115.00	-2.0045	-1.5730	-2.0366	-1.4722
L16	115.00-112.67	-1.5082	-1.1835	-1.6558	-1.1972
L17	112.67-112.42	-1.4483	-1.1365	-1.6056	-1.1610
L18	112.42-107.42	-1.4483	-1.1365	-1.6056	-1.1611
L19	107.42-103.33	-1.2750	-1.0005	-1.4392	-1.0411
L20	103.33-103.08	-1.1337	-0.8897	-1.2990	-0.9398
L21	103.08-100.00	-1.2512	-0.9819	-1.4030	-1.0151
L22	100.00-95.00	-1.5192	-1.1409	-1.6466	-1.0212
L23	95.00-90.00	-1.4615	-1.0976	-1.5974	-0.9915
L24	90.00-89.50	-1.2687	-0.9528	-1.4263	-0.8857
L25	89.50-89.25	-1.2687	-0.9528	-1.4263	-0.8858
L26	89.25-85.50	-1.1902	-0.8938	-1.3435	-0.8347
L27	85.50-85.25	-1.0890	-0.8179	-1.2359	-0.7681
L28	85.25-84.00	-1.0890	-0.8179	-1.2359	-0.7682
L29	84.00-83.75	-1.0890	-0.8179	-1.2359	-0.7683
L30	83.75-82.50	-1.0890	-0.8179	-1.2359	-0.7685
L31	82.50-82.25	-1.0890	-0.8179	-1.2359	-0.7686
L32	82.25-80.00	-1.4157	-1.0632	-1.5405	-0.9582
L33	80.00-75.00	-1.6263	-1.2213	-1.7178	-1.0693
L34	75.00-70.00	-1.6263	-1.2213	-1.7181	-1.0706
L35	70.00-65.00	-1.6263	-1.2213	-1.7183	-1.0720
L36	65.00-60.00	-1.6263	-1.2213	-1.7186	-1.0734
L37	60.00-58.50	-1.6263	-1.2213	-1.7188	-1.0745
L38	58.50-58.25	-1.6263	-1.2213	-1.7188	-1.0748
L39	58.25-53.25	-1.9328	-1.4515	-1.9966	-1.2493

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L40	53.25-48.25	-1.7002	-1.2768	-1.8125	-1.1359
L41	48.25-48.00	-1.4866	-1.1164	-1.6249	-1.0191
L42	48.00-43.00	-1.4866	-1.1164	-1.6249	-1.0200
L43	43.00-40.00	-1.4866	-1.1164	-1.6250	-1.0215
L44	40.00-35.00	-1.4014	-1.0524	-1.5512	-0.9767
L45	35.00-32.08	-1.0890	-0.8179	-1.2636	-0.7969
L46	32.08-31.83	-1.0890	-0.8179	-1.2635	-0.7975
L47	31.83-28.75	-1.0890	-0.8179	-1.2634	-0.7981
L48	28.75-28.50	-1.0890	-0.8179	-1.2632	-0.7987
L49	28.50-23.50	-1.2131	-0.9110	-1.3875	-0.8785
L50	23.50-20.00	-1.3690	-1.0281	-1.5389	-0.9770
L51	20.00-19.75	-1.3690	-1.0281	-1.5388	-0.9782
L52	19.75-14.75	-1.3690	-1.0281	-1.5385	-0.9801
L53	14.75-9.75	-1.0972	-0.8758	-1.2735	-0.8509
L54	9.75-4.75	-0.0348	-0.2756	-0.0576	-0.4558
L55	4.75-0.00	0.0000	0.0000	0.0000	0.0000

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	185.00 - 190.00	1.0000	1.0000
L1	4	HB114-21U3M12-XXXF(1-1/4)	185.00 - 188.00	1.0000	1.0000
L2	1	Safety Line 3/8	180.00 - 185.00	1.0000	1.0000
L2	4	HB114-21U3M12-XXXF(1-1/4)	180.00 - 185.00	1.0000	1.0000
L3	1	Safety Line 3/8	175.00 - 180.00	1.0000	1.0000
L3	4	HB114-21U3M12-XXXF(1-1/4)	175.00 - 180.00	1.0000	1.0000
L4	1	Safety Line 3/8	170.00 - 175.00	1.0000	1.0000
L4	4	HB114-21U3M12-XXXF(1-1/4)	170.00 - 175.00	1.0000	1.0000
L5	1	Safety Line 3/8	165.00 - 170.00	1.0000	1.0000
L5	4	HB114-21U3M12-XXXF(1-1/4)	165.00 - 170.00	1.0000	1.0000
L5	15	LDF7-50A(1-5/8)	165.00 - 170.00	1.0000	1.0000
L6	1	Safety Line 3/8	160.00 - 165.00	1.0000	1.0000
L6	4	HB114-21U3M12-XXXF(1-1/4)	160.00 - 165.00	1.0000	1.0000
L6	15	LDF7-50A(1-5/8)	160.00 - 165.00	1.0000	1.0000
L7	1	Safety Line 3/8	155.00 - 160.00	1.0000	1.0000
L7	4	HB114-21U3M12-XXXF(1-1/4)	155.00 - 160.00	1.0000	1.0000
L7	15	LDF7-50A(1-5/8)	155.00 - 160.00	1.0000	1.0000
L7	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	155.00 - 160.00	1.0000	1.0000
L7	23	LDF7-50A(1-5/8)	155.00 - 160.00	1.0000	1.0000
L8	1	Safety Line 3/8	150.00 - 155.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L8	4	HB114-21U3M12-XXXF(1-1/4)	150.00 - 155.00	1.0000	1.0000
L8	15	LDF7-50A(1-5/8)	150.00 - 155.00	1.0000	1.0000
L8	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	150.00 - 155.00	1.0000	1.0000
L8	23	LDF7-50A(1-5/8)	150.00 - 155.00	1.0000	1.0000
L9	1	Safety Line 3/8	145.00 - 150.00	1.0000	1.0000
L9	4	HB114-21U3M12-XXXF(1-1/4)	145.00 - 150.00	1.0000	1.0000
L9	15	LDF7-50A(1-5/8)	145.00 - 150.00	1.0000	1.0000
L9	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	145.00 - 150.00	1.0000	1.0000
L9	23	LDF7-50A(1-5/8)	145.00 - 150.00	1.0000	1.0000
L10	1	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L10	4	HB114-21U3M12-XXXF(1-1/4)	140.00 - 145.00	1.0000	1.0000
L10	15	LDF7-50A(1-5/8)	140.00 - 145.00	1.0000	1.0000
L10	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	140.00 - 145.00	1.0000	1.0000
L10	23	LDF7-50A(1-5/8)	140.00 - 145.00	1.0000	1.0000
L11	1	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L11	4	HB114-21U3M12-XXXF(1-1/4)	135.00 - 140.00	1.0000	1.0000
L11	15	LDF7-50A(1-5/8)	135.00 - 140.00	1.0000	1.0000
L11	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	135.00 - 140.00	1.0000	1.0000
L11	23	LDF7-50A(1-5/8)	135.00 - 140.00	1.0000	1.0000
L12	1	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000
L12	4	HB114-21U3M12-XXXF(1-1/4)	130.00 - 135.00	1.0000	1.0000
L12	15	LDF7-50A(1-5/8)	130.00 - 135.00	1.0000	1.0000
L12	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	130.00 - 135.00	1.0000	1.0000
L12	23	LDF7-50A(1-5/8)	130.00 - 135.00	1.0000	1.0000
L13	1	Safety Line 3/8	125.00 - 130.00	1.0000	1.0000
L13	4	HB114-21U3M12-XXXF(1-1/4)	125.00 - 130.00	1.0000	1.0000
L13	15	LDF7-50A(1-5/8)	125.00 - 130.00	1.0000	1.0000
L13	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	125.00 - 130.00	1.0000	1.0000
L13	23	LDF7-50A(1-5/8)	125.00 - 130.00	1.0000	1.0000
L14	1	Safety Line 3/8	120.00 - 125.00	1.0000	1.0000
L14	4	HB114-21U3M12-XXXF(1-1/4)	120.00 - 125.00	1.0000	1.0000
L14	15	LDF7-50A(1-5/8)	120.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			125.00		
L14	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	120.00 - 125.00	1.0000	1.0000
L14	23	LDF7-50A(1-5/8)	120.00 - 125.00	1.0000	1.0000
L15	1	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L15	4	HB114-21U3M12-XXXF(1-1/4)	115.00 - 120.00	1.0000	1.0000
L15	15	LDF7-50A(1-5/8)	115.00 - 120.00	1.0000	1.0000
L15	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	115.00 - 120.00	1.0000	1.0000
L15	23	LDF7-50A(1-5/8)	115.00 - 120.00	1.0000	1.0000
L16	1	Safety Line 3/8	112.67 - 115.00	1.0000	1.0000
L16	4	HB114-21U3M12-XXXF(1-1/4)	112.67 - 115.00	1.0000	1.0000
L16	15	LDF7-50A(1-5/8)	112.67 - 115.00	1.0000	1.0000
L16	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	112.67 - 115.00	1.0000	1.0000
L16	23	LDF7-50A(1-5/8)	112.67 - 115.00	1.0000	1.0000
L16	57	6" x 1" Flat Plate	112.67 - 114.67	1.0000	1.0000
L16	58	6" x 1" Flat Plate	112.67 - 114.67	1.0000	1.0000
L16	59	6" x 1" Flat Plate	112.67 - 114.67	1.0000	1.0000
L17	1	Safety Line 3/8	112.42 - 112.67	1.0000	1.0000
L17	4	HB114-21U3M12-XXXF(1-1/4)	112.42 - 112.67	1.0000	1.0000
L17	15	LDF7-50A(1-5/8)	112.42 - 112.67	1.0000	1.0000
L17	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	112.42 - 112.67	1.0000	1.0000
L17	23	LDF7-50A(1-5/8)	112.42 - 112.67	1.0000	1.0000
L17	57	6" x 1" Flat Plate	112.42 - 112.67	1.0000	1.0000
L17	58	6" x 1" Flat Plate	112.42 - 112.67	1.0000	1.0000
L17	59	6" x 1" Flat Plate	112.42 - 112.67	1.0000	1.0000
L18	1	Safety Line 3/8	107.42 - 112.42	1.0000	1.0000
L18	4	HB114-21U3M12-XXXF(1-1/4)	107.42 - 112.42	1.0000	1.0000
L18	15	LDF7-50A(1-5/8)	107.42 - 112.42	1.0000	1.0000
L18	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	107.42 - 112.42	1.0000	1.0000
L18	23	LDF7-50A(1-5/8)	107.42 - 112.42	1.0000	1.0000
L18	57	6" x 1" Flat Plate	107.42 - 112.42	1.0000	1.0000
L18	58	6" x 1" Flat Plate	107.42 - 112.42	1.0000	1.0000
L18	59	6" x 1" Flat Plate	107.42 - 112.42	1.0000	1.0000
L19	1	Safety Line 3/8	103.33 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	4	HB114-21U3M12-XXXF(1-1/4)	107.42 103.33 - 107.42	1.0000	1.0000
L19	15	LDF7-50A(1-5/8)	103.33 - 107.42	1.0000	1.0000
L19	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	103.33 - 107.42	1.0000	1.0000
L19	23	LDF7-50A(1-5/8)	103.33 - 107.42	1.0000	1.0000
L19	53	6" x 1" Flat Plate	103.33 - 105.33	1.0000	1.0000
L19	54	6" x 1" Flat Plate	103.33 - 105.33	1.0000	1.0000
L19	55	6" x 1" Flat Plate	103.33 - 105.33	1.0000	1.0000
L19	57	6" x 1" Flat Plate	103.33 - 107.42	1.0000	1.0000
L19	58	6" x 1" Flat Plate	103.33 - 107.42	1.0000	1.0000
L19	59	6" x 1" Flat Plate	103.33 - 107.42	1.0000	1.0000
L20	1	Safety Line 3/8	103.08 - 103.33	1.0000	1.0000
L20	4	HB114-21U3M12-XXXF(1-1/4)	103.08 - 103.33	1.0000	1.0000
L20	15	LDF7-50A(1-5/8)	103.08 - 103.33	1.0000	1.0000
L20	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	103.08 - 103.33	1.0000	1.0000
L20	23	LDF7-50A(1-5/8)	103.08 - 103.33	1.0000	1.0000
L20	53	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L20	54	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L20	55	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L20	57	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L20	58	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L20	59	6" x 1" Flat Plate	103.08 - 103.33	1.0000	1.0000
L21	1	Safety Line 3/8	100.00 - 103.08	1.0000	1.0000
L21	4	HB114-21U3M12-XXXF(1-1/4)	100.00 - 103.08	1.0000	1.0000
L21	15	LDF7-50A(1-5/8)	100.00 - 103.08	1.0000	1.0000
L21	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	100.00 - 103.08	1.0000	1.0000
L21	23	LDF7-50A(1-5/8)	100.00 - 103.08	1.0000	1.0000
L21	53	6" x 1" Flat Plate	100.00 - 103.08	1.0000	1.0000
L21	54	6" x 1" Flat Plate	100.00 - 103.08	1.0000	1.0000
L21	55	6" x 1" Flat Plate	100.00 - 103.08	1.0000	1.0000
L21	57	6" x 1" Flat Plate	101.33 - 103.08	1.0000	1.0000
L21	58	6" x 1" Flat Plate	101.33 - 103.08	1.0000	1.0000
L21	59	6" x 1" Flat Plate	101.33 - 103.08	1.0000	1.0000
L22	1	Safety Line 3/8	95.00 -	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
			100.00		
L22	2	Climbing Rungs	95.00 - 100.00	1.0000	1.0000
L22	4	HB114-21U3M12-XXXF(1-1/4)	95.00 - 100.00	1.0000	1.0000
L22	15	LDF7-50A(1-5/8)	95.00 - 100.00	1.0000	1.0000
L22	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	95.00 - 100.00	1.0000	1.0000
L22	23	LDF7-50A(1-5/8)	95.00 - 100.00	1.0000	1.0000
L22	53	6" x 1" Flat Plate	95.00 - 100.00	1.0000	1.0000
L22	54	6" x 1" Flat Plate	95.00 - 100.00	1.0000	1.0000
L22	55	6" x 1" Flat Plate	95.00 - 100.00	1.0000	1.0000
L23	1	Safety Line 3/8	90.00 - 95.00	1.0000	1.0000
L23	2	Climbing Rungs	90.00 - 95.00	1.0000	1.0000
L23	4	HB114-21U3M12-XXXF(1-1/4)	90.00 - 95.00	1.0000	1.0000
L23	15	LDF7-50A(1-5/8)	90.00 - 95.00	1.0000	1.0000
L23	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	90.00 - 95.00	1.0000	1.0000
L23	23	LDF7-50A(1-5/8)	90.00 - 95.00	1.0000	1.0000
L23	53	6" x 1" Flat Plate	90.00 - 95.00	1.0000	1.0000
L23	54	6" x 1" Flat Plate	90.00 - 95.00	1.0000	1.0000
L23	55	6" x 1" Flat Plate	90.00 - 95.00	1.0000	1.0000
L23	61	4.5" x 1" Flat Plate	90.00 - 91.00	1.0000	1.0000
L23	62	4.5" x 1" Flat Plate	90.00 - 91.00	1.0000	1.0000
L23	63	4.5" x 1" Flat Plate	90.00 - 91.00	1.0000	1.0000
L24	1	Safety Line 3/8	89.50 - 90.00	1.0000	1.0000
L24	2	Climbing Rungs	89.50 - 90.00	1.0000	1.0000
L24	4	HB114-21U3M12-XXXF(1-1/4)	89.50 - 90.00	1.0000	1.0000
L24	15	LDF7-50A(1-5/8)	89.50 - 90.00	1.0000	1.0000
L24	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	89.50 - 90.00	1.0000	1.0000
L24	23	LDF7-50A(1-5/8)	89.50 - 90.00	1.0000	1.0000
L24	53	6" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L24	54	6" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L24	55	6" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L24	61	4.5" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L24	62	4.5" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L24	63	4.5" x 1" Flat Plate	89.50 - 90.00	1.0000	1.0000
L25	1	Safety Line 3/8	89.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			89.50		
L25	2	Climbing Rungs	89.25 - 89.50	1.0000	1.0000
L25	4	HB114-21U3M12-XXXF(1-1/4)	89.25 - 89.50	1.0000	1.0000
L25	15	LDF7-50A(1-5/8)	89.25 - 89.50	1.0000	1.0000
L25	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	89.25 - 89.50	1.0000	1.0000
L25	23	LDF7-50A(1-5/8)	89.25 - 89.50	1.0000	1.0000
L25	53	6" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L25	54	6" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L25	55	6" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L25	61	4.5" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L25	62	4.5" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L25	63	4.5" x 1" Flat Plate	89.25 - 89.50	1.0000	1.0000
L26	1	Safety Line 3/8	85.50 - 89.25	1.0000	1.0000
L26	2	Climbing Rungs	85.50 - 89.25	1.0000	1.0000
L26	4	HB114-21U3M12-XXXF(1-1/4)	85.50 - 89.25	1.0000	1.0000
L26	15	LDF7-50A(1-5/8)	85.50 - 89.25	1.0000	1.0000
L26	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	85.50 - 89.25	1.0000	1.0000
L26	23	LDF7-50A(1-5/8)	85.50 - 89.25	1.0000	1.0000
L26	49	4.5" x 1" Flat Plate	85.50 - 87.00	1.0000	1.0000
L26	50	4.5" x 1" Flat Plate	85.50 - 87.00	1.0000	1.0000
L26	51	4.5" x 1" Flat Plate	85.50 - 87.00	1.0000	1.0000
L26	53	6" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L26	54	6" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L26	55	6" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L26	61	4.5" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L26	62	4.5" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L26	63	4.5" x 1" Flat Plate	85.50 - 89.25	1.0000	1.0000
L27	1	Safety Line 3/8	85.25 - 85.50	1.0000	1.0000
L27	2	Climbing Rungs	85.25 - 85.50	1.0000	1.0000
L27	4	HB114-21U3M12-XXXF(1-1/4)	85.25 - 85.50	1.0000	1.0000
L27	15	LDF7-50A(1-5/8)	85.25 - 85.50	1.0000	1.0000
L27	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	85.25 - 85.50	1.0000	1.0000
L27	23	LDF7-50A(1-5/8)	85.25 - 85.50	1.0000	1.0000
L27	49	4.5" x 1" Flat Plate	85.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			85.50		
L27	50	4.5" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	51	4.5" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	53	6" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	54	6" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	55	6" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	61	4.5" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	62	4.5" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L27	63	4.5" x 1" Flat Plate	85.25 - 85.50	1.0000	1.0000
L28	1	Safety Line 3/8	84.00 - 85.25	1.0000	1.0000
L28	2	Climbing Rungs	84.00 - 85.25	1.0000	1.0000
L28	4	HB114-21U3M12-XXXF(1-1/4)	84.00 - 85.25	1.0000	1.0000
L28	15	LDF7-50A(1-5/8)	84.00 - 85.25	1.0000	1.0000
L28	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	84.00 - 85.25	1.0000	1.0000
L28	23	LDF7-50A(1-5/8)	84.00 - 85.25	1.0000	1.0000
L28	49	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	50	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	51	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	53	6" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	54	6" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	55	6" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	61	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	62	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L28	63	4.5" x 1" Flat Plate	84.00 - 85.25	1.0000	1.0000
L29	1	Safety Line 3/8	83.75 - 84.00	1.0000	1.0000
L29	2	Climbing Rungs	83.75 - 84.00	1.0000	1.0000
L29	4	HB114-21U3M12-XXXF(1-1/4)	83.75 - 84.00	1.0000	1.0000
L29	15	LDF7-50A(1-5/8)	83.75 - 84.00	1.0000	1.0000
L29	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	83.75 - 84.00	1.0000	1.0000
L29	23	LDF7-50A(1-5/8)	83.75 - 84.00	1.0000	1.0000
L29	49	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	50	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	51	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	53	6" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L29	54	6" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	55	6" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	61	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	62	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L29	63	4.5" x 1" Flat Plate	83.75 - 84.00	1.0000	1.0000
L30	1	Safety Line 3/8	82.50 - 83.75	1.0000	1.0000
L30	2	Climbing Rungs	82.50 - 83.75	1.0000	1.0000
L30	4	HB114-21U3M12-XXXF(1-1/4)	82.50 - 83.75	1.0000	1.0000
L30	15	LDF7-50A(1-5/8)	82.50 - 83.75	1.0000	1.0000
L30	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	82.50 - 83.75	1.0000	1.0000
L30	23	LDF7-50A(1-5/8)	82.50 - 83.75	1.0000	1.0000
L30	49	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	50	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	51	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	53	6" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	54	6" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	55	6" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	61	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	62	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L30	63	4.5" x 1" Flat Plate	82.50 - 83.75	1.0000	1.0000
L31	1	Safety Line 3/8	82.25 - 82.50	1.0000	1.0000
L31	2	Climbing Rungs	82.25 - 82.50	1.0000	1.0000
L31	4	HB114-21U3M12-XXXF(1-1/4)	82.25 - 82.50	1.0000	1.0000
L31	15	LDF7-50A(1-5/8)	82.25 - 82.50	1.0000	1.0000
L31	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	82.25 - 82.50	1.0000	1.0000
L31	23	LDF7-50A(1-5/8)	82.25 - 82.50	1.0000	1.0000
L31	49	4.5" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	50	4.5" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	51	4.5" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	53	6" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	54	6" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	55	6" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	61	4.5" x 1" Flat Plate	82.25 - 82.50	1.0000	1.0000
L31	62	4.5" x 1" Flat Plate	82.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L31	63	4.5" x 1" Flat Plate	82.50 82.25 - 82.50	1.0000	1.0000
L32	1	Safety Line 3/8	80.00 - 82.25	1.0000	1.0000
L32	2	Climbing Rungs	80.00 - 82.25	1.0000	1.0000
L32	4	HB114-21U3M12-XXXF(1-1/4)	80.00 - 82.25	1.0000	1.0000
L32	15	LDF7-50A(1-5/8)	80.00 - 82.25	1.0000	1.0000
L32	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	80.00 - 82.25	1.0000	1.0000
L32	23	LDF7-50A(1-5/8)	80.00 - 82.25	1.0000	1.0000
L32	49	4.5" x 1" Flat Plate	80.00 - 82.25	1.0000	1.0000
L32	50	4.5" x 1" Flat Plate	80.00 - 82.25	1.0000	1.0000
L32	51	4.5" x 1" Flat Plate	80.00 - 82.25	1.0000	1.0000
L32	53	6" x 1" Flat Plate	82.00 - 82.25	1.0000	1.0000
L32	54	6" x 1" Flat Plate	82.00 - 82.25	1.0000	1.0000
L32	55	6" x 1" Flat Plate	82.00 - 82.25	1.0000	1.0000
L32	61	4.5" x 1" Flat Plate	81.00 - 82.25	1.0000	1.0000
L32	62	4.5" x 1" Flat Plate	81.00 - 82.25	1.0000	1.0000
L32	63	4.5" x 1" Flat Plate	81.00 - 82.25	1.0000	1.0000
L33	1	Safety Line 3/8	75.00 - 80.00	1.0000	1.0000
L33	2	Climbing Rungs	75.00 - 80.00	1.0000	1.0000
L33	4	HB114-21U3M12-XXXF(1-1/4)	75.00 - 80.00	1.0000	1.0000
L33	15	LDF7-50A(1-5/8)	75.00 - 80.00	1.0000	1.0000
L33	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	75.00 - 80.00	1.0000	1.0000
L33	23	LDF7-50A(1-5/8)	75.00 - 80.00	1.0000	1.0000
L33	49	4.5" x 1" Flat Plate	75.00 - 80.00	1.0000	1.0000
L33	50	4.5" x 1" Flat Plate	75.00 - 80.00	1.0000	1.0000
L33	51	4.5" x 1" Flat Plate	75.00 - 80.00	1.0000	1.0000
L34	1	Safety Line 3/8	70.00 - 75.00	1.0000	1.0000
L34	2	Climbing Rungs	70.00 - 75.00	1.0000	1.0000
L34	4	HB114-21U3M12-XXXF(1-1/4)	70.00 - 75.00	1.0000	1.0000
L34	15	LDF7-50A(1-5/8)	70.00 - 75.00	1.0000	1.0000
L34	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	70.00 - 75.00	1.0000	1.0000
L34	23	LDF7-50A(1-5/8)	70.00 - 75.00	1.0000	1.0000
L34	49	4.5" x 1" Flat Plate	70.00 - 75.00	1.0000	1.0000
L34	50	4.5" x 1" Flat Plate	70.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			75.00		
L34	51	4.5" x 1" Flat Plate	70.00 - 75.00	1.0000	1.0000
L35	1	Safety Line 3/8	65.00 - 70.00	1.0000	1.0000
L35	2	Climbing Rungs	65.00 - 70.00	1.0000	1.0000
L35	4	HB114-21U3M12-XXXF(1-1/4)	65.00 - 70.00	1.0000	1.0000
L35	15	LDF7-50A(1-5/8)	65.00 - 70.00	1.0000	1.0000
L35	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	65.00 - 70.00	1.0000	1.0000
L35	23	LDF7-50A(1-5/8)	65.00 - 70.00	1.0000	1.0000
L35	49	4.5" x 1" Flat Plate	65.00 - 70.00	1.0000	1.0000
L35	50	4.5" x 1" Flat Plate	65.00 - 70.00	1.0000	1.0000
L35	51	4.5" x 1" Flat Plate	65.00 - 70.00	1.0000	1.0000
L36	1	Safety Line 3/8	60.00 - 65.00	1.0000	1.0000
L36	2	Climbing Rungs	60.00 - 65.00	1.0000	1.0000
L36	4	HB114-21U3M12-XXXF(1-1/4)	60.00 - 65.00	1.0000	1.0000
L36	15	LDF7-50A(1-5/8)	60.00 - 65.00	1.0000	1.0000
L36	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	60.00 - 65.00	1.0000	1.0000
L36	23	LDF7-50A(1-5/8)	60.00 - 65.00	1.0000	1.0000
L36	49	4.5" x 1" Flat Plate	60.00 - 65.00	1.0000	1.0000
L36	50	4.5" x 1" Flat Plate	60.00 - 65.00	1.0000	1.0000
L36	51	4.5" x 1" Flat Plate	60.00 - 65.00	1.0000	1.0000
L37	1	Safety Line 3/8	58.50 - 60.00	1.0000	1.0000
L37	2	Climbing Rungs	58.50 - 60.00	1.0000	1.0000
L37	4	HB114-21U3M12-XXXF(1-1/4)	58.50 - 60.00	1.0000	1.0000
L37	15	LDF7-50A(1-5/8)	58.50 - 60.00	1.0000	1.0000
L37	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	58.50 - 60.00	1.0000	1.0000
L37	23	LDF7-50A(1-5/8)	58.50 - 60.00	1.0000	1.0000
L37	49	4.5" x 1" Flat Plate	58.50 - 60.00	1.0000	1.0000
L37	50	4.5" x 1" Flat Plate	58.50 - 60.00	1.0000	1.0000
L37	51	4.5" x 1" Flat Plate	58.50 - 60.00	1.0000	1.0000
L38	1	Safety Line 3/8	58.25 - 58.50	1.0000	1.0000
L38	2	Climbing Rungs	58.25 - 58.50	1.0000	1.0000
L38	4	HB114-21U3M12-XXXF(1-1/4)	58.25 - 58.50	1.0000	1.0000
L38	15	LDF7-50A(1-5/8)	58.25 - 58.50	1.0000	1.0000
L38	19	(4) WR-VG86ST-BRD(3/4)	58.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		+ (2) FB-L98B-034-XXX(3/8)	58.50		
L38	23	LDF7-50A(1-5/8)	58.25 - 58.50	1.0000	1.0000
L38	49	4.5" x 1" Flat Plate	58.25 - 58.50	1.0000	1.0000
L38	50	4.5" x 1" Flat Plate	58.25 - 58.50	1.0000	1.0000
L38	51	4.5" x 1" Flat Plate	58.25 - 58.50	1.0000	1.0000
L39	1	Safety Line 3/8	53.25 - 58.25	1.0000	1.0000
L39	2	Climbing Rungs	53.25 - 58.25	1.0000	1.0000
L39	4	HB114-21U3M12-XXXF(1-1/4)	53.25 - 58.25	1.0000	1.0000
L39	15	LDF7-50A(1-5/8)	53.25 - 58.25	1.0000	1.0000
L39	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	53.25 - 58.25	1.0000	1.0000
L39	23	LDF7-50A(1-5/8)	53.25 - 58.25	1.0000	1.0000
L39	49	4.5" x 1" Flat Plate	57.00 - 58.25	1.0000	1.0000
L39	50	4.5" x 1" Flat Plate	57.00 - 58.25	1.0000	1.0000
L39	51	4.5" x 1" Flat Plate	57.00 - 58.25	1.0000	1.0000
L40	1	Safety Line 3/8	48.25 - 53.25	1.0000	1.0000
L40	2	Climbing Rungs	48.25 - 53.25	1.0000	1.0000
L40	4	HB114-21U3M12-XXXF(1-1/4)	48.25 - 53.25	1.0000	1.0000
L40	15	LDF7-50A(1-5/8)	48.25 - 53.25	1.0000	1.0000
L40	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	48.25 - 53.25	1.0000	1.0000
L40	23	LDF7-50A(1-5/8)	48.25 - 53.25	1.0000	1.0000
L40	45	6.5" x 1.25" Flat Plate	48.25 - 51.00	1.0000	1.0000
L40	46	6.5" x 1.25" Flat Plate	48.25 - 51.00	1.0000	1.0000
L40	47	6.5" x 1.25" Flat Plate	48.25 - 51.00	1.0000	1.0000
L41	1	Safety Line 3/8	48.00 - 48.25	1.0000	1.0000
L41	2	Climbing Rungs	48.00 - 48.25	1.0000	1.0000
L41	4	HB114-21U3M12-XXXF(1-1/4)	48.00 - 48.25	1.0000	1.0000
L41	15	LDF7-50A(1-5/8)	48.00 - 48.25	1.0000	1.0000
L41	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	48.00 - 48.25	1.0000	1.0000
L41	23	LDF7-50A(1-5/8)	48.00 - 48.25	1.0000	1.0000
L41	45	6.5" x 1.25" Flat Plate	48.00 - 48.25	1.0000	1.0000
L41	46	6.5" x 1.25" Flat Plate	48.00 - 48.25	1.0000	1.0000
L41	47	6.5" x 1.25" Flat Plate	48.00 - 48.25	1.0000	1.0000
L42	1	Safety Line 3/8	43.00 - 48.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L42	2	Climbing Rungs	43.00 - 48.00	1.0000	1.0000
L42	4	HB114-21U3M12-XXXF(1-1/4)	43.00 - 48.00	1.0000	1.0000
L42	15	LDF7-50A(1-5/8)	43.00 - 48.00	1.0000	1.0000
L42	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	43.00 - 48.00	1.0000	1.0000
L42	23	LDF7-50A(1-5/8)	43.00 - 48.00	1.0000	1.0000
L42	45	6.5" x 1.25" Flat Plate	43.00 - 48.00	1.0000	1.0000
L42	46	6.5" x 1.25" Flat Plate	43.00 - 48.00	1.0000	1.0000
L42	47	6.5" x 1.25" Flat Plate	43.00 - 48.00	1.0000	1.0000
L43	1	Safety Line 3/8	40.00 - 43.00	1.0000	1.0000
L43	2	Climbing Rungs	40.00 - 43.00	1.0000	1.0000
L43	4	HB114-21U3M12-XXXF(1-1/4)	40.00 - 43.00	1.0000	1.0000
L43	15	LDF7-50A(1-5/8)	40.00 - 43.00	1.0000	1.0000
L43	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	40.00 - 43.00	1.0000	1.0000
L43	23	LDF7-50A(1-5/8)	40.00 - 43.00	1.0000	1.0000
L43	45	6.5" x 1.25" Flat Plate	40.00 - 43.00	1.0000	1.0000
L43	46	6.5" x 1.25" Flat Plate	40.00 - 43.00	1.0000	1.0000
L43	47	6.5" x 1.25" Flat Plate	40.00 - 43.00	1.0000	1.0000
L44	1	Safety Line 3/8	35.00 - 40.00	1.0000	1.0000
L44	2	Climbing Rungs	35.00 - 40.00	1.0000	1.0000
L44	4	HB114-21U3M12-XXXF(1-1/4)	35.00 - 40.00	1.0000	1.0000
L44	15	LDF7-50A(1-5/8)	35.00 - 40.00	1.0000	1.0000
L44	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	35.00 - 40.00	1.0000	1.0000
L44	23	LDF7-50A(1-5/8)	35.00 - 40.00	1.0000	1.0000
L44	41	8.5" x 1.25" Flat Plate	35.00 - 35.83	1.0000	1.0000
L44	42	8.5" x 1.25" Flat Plate	35.00 - 35.83	1.0000	1.0000
L44	43	8.5" x 1.25" Flat Plate	35.00 - 35.83	1.0000	1.0000
L44	45	6.5" x 1.25" Flat Plate	35.00 - 40.00	1.0000	1.0000
L44	46	6.5" x 1.25" Flat Plate	35.00 - 40.00	1.0000	1.0000
L44	47	6.5" x 1.25" Flat Plate	35.00 - 40.00	1.0000	1.0000
L45	1	Safety Line 3/8	32.08 - 35.00	1.0000	1.0000
L45	2	Climbing Rungs	32.08 - 35.00	1.0000	1.0000
L45	4	HB114-21U3M12-XXXF(1-1/4)	32.08 - 35.00	1.0000	1.0000
L45	15	LDF7-50A(1-5/8)	32.08 - 35.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L45	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	32.08 - 35.00	1.0000	1.0000
L45	23	LDF7-50A(1-5/8)	32.08 - 35.00	1.0000	1.0000
L45	41	8.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L45	42	8.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L45	43	8.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L45	45	6.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L45	46	6.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L45	47	6.5" x 1.25" Flat Plate	32.08 - 35.00	1.0000	1.0000
L46	1	Safety Line 3/8	31.83 - 32.08	1.0000	1.0000
L46	2	Climbing Rungs	31.83 - 32.08	1.0000	1.0000
L46	4	HB114-21U3M12-XXXF(1-1/4)	31.83 - 32.08	1.0000	1.0000
L46	15	LDF7-50A(1-5/8)	31.83 - 32.08	1.0000	1.0000
L46	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	31.83 - 32.08	1.0000	1.0000
L46	23	LDF7-50A(1-5/8)	31.83 - 32.08	1.0000	1.0000
L46	41	8.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L46	42	8.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L46	43	8.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L46	45	6.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L46	46	6.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L46	47	6.5" x 1.25" Flat Plate	31.83 - 32.08	1.0000	1.0000
L47	1	Safety Line 3/8	28.75 - 31.83	1.0000	1.0000
L47	2	Climbing Rungs	28.75 - 31.83	1.0000	1.0000
L47	4	HB114-21U3M12-XXXF(1-1/4)	28.75 - 31.83	1.0000	1.0000
L47	15	LDF7-50A(1-5/8)	28.75 - 31.83	1.0000	1.0000
L47	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	28.75 - 31.83	1.0000	1.0000
L47	23	LDF7-50A(1-5/8)	28.75 - 31.83	1.0000	1.0000
L47	41	8.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L47	42	8.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L47	43	8.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L47	45	6.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L47	46	6.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L47	47	6.5" x 1.25" Flat Plate	28.75 - 31.83	1.0000	1.0000
L48	1	Safety Line 3/8	28.50 - 28.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L48	2	Climbing Rungs	28.50 - 28.75	1.0000	1.0000
L48	4	HB114-21U3M12-XXXF(1-1/4)	28.50 - 28.75	1.0000	1.0000
L48	15	LDF7-50A(1-5/8)	28.50 - 28.75	1.0000	1.0000
L48	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	28.50 - 28.75	1.0000	1.0000
L48	23	LDF7-50A(1-5/8)	28.50 - 28.75	1.0000	1.0000
L48	41	8.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L48	42	8.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L48	43	8.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L48	45	6.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L48	46	6.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L48	47	6.5" x 1.25" Flat Plate	28.50 - 28.75	1.0000	1.0000
L49	1	Safety Line 3/8	23.50 - 28.50	1.0000	1.0000
L49	2	Climbing Rungs	23.50 - 28.50	1.0000	1.0000
L49	4	HB114-21U3M12-XXXF(1-1/4)	23.50 - 28.50	1.0000	1.0000
L49	15	LDF7-50A(1-5/8)	23.50 - 28.50	1.0000	1.0000
L49	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	23.50 - 28.50	1.0000	1.0000
L49	23	LDF7-50A(1-5/8)	23.50 - 28.50	1.0000	1.0000
L49	41	8.5" x 1.25" Flat Plate	23.50 - 28.50	1.0000	1.0000
L49	42	8.5" x 1.25" Flat Plate	23.50 - 28.50	1.0000	1.0000
L49	43	8.5" x 1.25" Flat Plate	23.50 - 28.50	1.0000	1.0000
L49	45	6.5" x 1.25" Flat Plate	26.00 - 28.50	1.0000	1.0000
L49	46	6.5" x 1.25" Flat Plate	26.00 - 28.50	1.0000	1.0000
L49	47	6.5" x 1.25" Flat Plate	26.00 - 28.50	1.0000	1.0000
L50	1	Safety Line 3/8	20.00 - 23.50	1.0000	1.0000
L50	2	Climbing Rungs	20.00 - 23.50	1.0000	1.0000
L50	4	HB114-21U3M12-XXXF(1-1/4)	20.00 - 23.50	1.0000	1.0000
L50	15	LDF7-50A(1-5/8)	20.00 - 23.50	1.0000	1.0000
L50	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	20.00 - 23.50	1.0000	1.0000
L50	23	LDF7-50A(1-5/8)	20.00 - 23.50	1.0000	1.0000
L50	41	8.5" x 1.25" Flat Plate	20.00 - 23.50	1.0000	1.0000
L50	42	8.5" x 1.25" Flat Plate	20.00 - 23.50	1.0000	1.0000
L50	43	8.5" x 1.25" Flat Plate	20.00 - 23.50	1.0000	1.0000
L51	1	Safety Line 3/8	19.75 - 20.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L51	2	Climbing Rungs	19.75 - 20.00	1.0000	1.0000
L51	4	HB114-21U3M12-XXXF(1-1/4)	19.75 - 20.00	1.0000	1.0000
L51	15	LDF7-50A(1-5/8)	19.75 - 20.00	1.0000	1.0000
L51	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	19.75 - 20.00	1.0000	1.0000
L51	23	LDF7-50A(1-5/8)	19.75 - 20.00	1.0000	1.0000
L51	41	8.5" x 1.25" Flat Plate	19.75 - 20.00	1.0000	1.0000
L51	42	8.5" x 1.25" Flat Plate	19.75 - 20.00	1.0000	1.0000
L51	43	8.5" x 1.25" Flat Plate	19.75 - 20.00	1.0000	1.0000
L52	1	Safety Line 3/8	14.75 - 19.75	1.0000	1.0000
L52	2	Climbing Rungs	14.75 - 19.75	1.0000	1.0000
L52	4	HB114-21U3M12-XXXF(1-1/4)	14.75 - 19.75	1.0000	1.0000
L52	15	LDF7-50A(1-5/8)	14.75 - 19.75	1.0000	1.0000
L52	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	14.75 - 19.75	1.0000	1.0000
L52	23	LDF7-50A(1-5/8)	14.75 - 19.75	1.0000	1.0000
L52	41	8.5" x 1.25" Flat Plate	14.75 - 19.75	1.0000	1.0000
L52	42	8.5" x 1.25" Flat Plate	14.75 - 19.75	1.0000	1.0000
L52	43	8.5" x 1.25" Flat Plate	14.75 - 19.75	1.0000	1.0000
L53	1	Safety Line 3/8	10.00 - 14.75	1.0000	1.0000
L53	2	Climbing Rungs	10.00 - 14.75	1.0000	1.0000
L53	4	HB114-21U3M12-XXXF(1-1/4)	9.75 - 14.75	1.0000	1.0000
L53	15	LDF7-50A(1-5/8)	11.00 - 14.75	1.0000	1.0000
L53	19	(4) WR-VG86ST-BRD(3/4) + (2) FB-L98B-034-XXX(3/8)	11.00 - 14.75	1.0000	1.0000
L53	23	LDF7-50A(1-5/8)	11.00 - 14.75	1.0000	1.0000
L53	41	8.5" x 1.25" Flat Plate	9.75 - 14.75	1.0000	1.0000
L53	42	8.5" x 1.25" Flat Plate	9.75 - 14.75	1.0000	1.0000
L53	43	8.5" x 1.25" Flat Plate	9.75 - 14.75	1.0000	1.0000
L54	4	HB114-21U3M12-XXXF(1-1/4)	6.00 - 9.75	1.0000	1.0000
L54	41	8.5" x 1.25" Flat Plate	4.75 - 9.75	1.0000	1.0000
L54	42	8.5" x 1.25" Flat Plate	4.75 - 9.75	1.0000	1.0000
L54	43	8.5" x 1.25" Flat Plate	4.75 - 9.75	1.0000	1.0000
L55	41	8.5" x 1.25" Flat Plate	0.83 - 4.75	1.0000	1.0000
L55	42	8.5" x 1.25" Flat Plate	0.83 - 4.75	1.0000	1.0000
L55	43	8.5" x 1.25" Flat Plate	0.83 - 4.75	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
188									
Platform Mount [LP 403-1]	C	None		0.0000	188.00	No Ice	18.85	18.85	1.50
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
6' x 2" Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Face	4.00 -7.00 2.00	70.0000	188.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Face	4.00 -7.00 2.00	45.0000	188.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Face	4.00 -7.00 2.00	60.0000	188.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
PD201-7	A	From Face	4.00 0.00 5.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.02 1.81 2.62	1.02 1.81 2.62	0.00 0.01 0.03
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.00 7.00 2.00	70.0000	188.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00 7.00 2.00	45.0000	188.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00 7.00 2.00	60.0000	188.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
TD-RRH8x20-25	A	From Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Face	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
185									
Side Arm Mount [SO 102-3]	C	None		0.0000	185.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
(2) 4' x 2" Pipe Mount	A	From Face	0.50 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 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			
(2) 4' x 2" Pipe Mount	B	From Face	0.50	0.0000	185.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice			
(2) 4' x 2" Pipe Mount	C	From Face	0.50	0.0000	185.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice			
800MHZ RRH	A	From Face	1.00	0.0000	185.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			3.00			Ice	2.51	2.13	0.10
						1" Ice			
800MHZ RRH	B	From Face	1.00	0.0000	185.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			3.00			Ice	2.51	2.13	0.10
						1" Ice			
800MHZ RRH	C	From Face	1.00	0.0000	185.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			3.00			Ice	2.51	2.13	0.10
						1" Ice			
1900MHz RRH	A	From Face	1.00	0.0000	185.00	No Ice	2.49	3.26	0.04
			0.00			1/2"	2.70	3.48	0.08
			3.00			Ice	2.91	3.72	0.11
						1" Ice			
1900MHz RRH	B	From Face	1.00	0.0000	185.00	No Ice	2.49	3.26	0.04
			0.00			1/2"	2.70	3.48	0.08
			3.00			Ice	2.91	3.72	0.11
						1" Ice			
1900MHz RRH	C	From Face	1.00	0.0000	185.00	No Ice	2.49	3.26	0.04
			0.00			1/2"	2.70	3.48	0.08
			3.00			Ice	2.91	3.72	0.11
						1" Ice			
184									
Side Arm Mount [SO 701-1]	B	From Leg	1.50	0.0000	184.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
						1" Ice			
4' x 2" Pipe Mount	B	From Leg	3.00	0.0000	184.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice			
179									
Platform Mount [LP 403-1]	C	None		0.0000	179.00	No Ice	18.85	18.85	1.50
						1/2"	24.30	24.30	1.80
						Ice	29.75	29.75	2.09
						1" Ice			
Side Arm Mount [SO 301-1]	A	From Face	4.00	0.0000	179.00	No Ice	1.00	0.90	0.02
			7.00			1/2"	1.39	1.42	0.03
			0.00			Ice	1.78	1.94	0.04
						1" Ice			
Side Arm Mount [SO 301-1]	B	From Face	4.00	0.0000	179.00	No Ice	1.00	0.90	0.02
			7.00			1/2"	1.39	1.42	0.03
			0.00			Ice	1.78	1.94	0.04
						1" Ice			
(4) 6' x 2" Mount Pipe	A	From Face	4.00	0.0000	179.00	No Ice	1.43	1.43	0.02
			-7.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
(4) 6' x 2" Mount Pipe	B	From Face	4.00	0.0000	179.00	No Ice	1.43	1.43	0.02
			-7.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
(4) 6' x 2" Mount Pipe	C	From Face	4.00	0.0000	179.00	No Ice	1.43	1.43	0.02
			-7.00			1/2"	1.92	1.92	0.03

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
458-2D	A	From Face	5.00	0.0000	179.00	No Ice	3.67	3.67	0.02
			7.00			1/2"	5.03	5.03	0.05
			6.00			Ice	6.41	6.41	0.08
						1" Ice			
458-2D	B	From Face	5.00	0.0000	179.00	No Ice	3.67	3.67	0.02
			7.00			1/2"	5.03	5.03	0.05
			6.00			Ice	6.41	6.41	0.08
						1" Ice			
170									
Platform Mount [LP 405-1]	C	None		0.0000	170.00	No Ice	20.80	20.80	1.80
						1/2"	28.10	28.10	2.07
						Ice	35.40	35.40	2.33
						1" Ice			
4' x 2" Pipe Mount	A	From Face	4.00	0.0000	170.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00	30.0000	170.00	No Ice	6.33	5.64	0.11
			-8.50			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00	30.0000	170.00	No Ice	6.33	5.64	0.11
			-8.50			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00	30.0000	170.00	No Ice	6.33	5.64	0.11
			-8.50			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	A	From Face	4.00	30.0000	170.00	No Ice	11.78	11.04	0.16
			8.50			1/2"	12.50	12.56	0.25
			0.00			Ice	13.23	14.12	0.36
						1" Ice			
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	B	From Face	4.00	30.0000	170.00	No Ice	11.78	11.04	0.16
			8.50			1/2"	12.50	12.56	0.25
			0.00			Ice	13.23	14.12	0.36
						1" Ice			
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	C	From Face	4.00	30.0000	170.00	No Ice	11.78	11.04	0.16
			8.50			1/2"	12.50	12.56	0.25
			0.00			Ice	13.23	14.12	0.36
						1" Ice			
PD201-7	A	From Face	4.00	0.0000	170.00	No Ice	1.02	1.02	0.00
			0.00			1/2"	1.81	1.81	0.01
			4.00			Ice	2.62	2.62	0.03
						1" Ice			
KRY 112 144/1	A	From Face	4.00	0.0000	170.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
KRY 112 144/1	B	From Face	4.00	0.0000	170.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
KRY 112 144/1	C	From Face	4.00	0.0000	170.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
(2) RRUS 11 B12	A	From Face	4.00	0.0000	170.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			0.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	B	From Face	4.00	0.0000	170.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
			0.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	C	From Face	4.00	0.0000	170.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			0.00			Ice	3.26	1.48	0.10
						1" Ice			
160									
Platform Mount [LP 403-1]	C	None		0.0000	160.00	No Ice	18.85	18.85	1.50
						1/2"	24.30	24.30	1.80
						Ice	29.75	29.75	2.09
						1" Ice			
6' x 2" Mount Pipe	A	From Face	4.00	0.0000	160.00	No Ice	1.43	1.43	0.02
			-6.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
80010965 w/ Mount Pipe	A	From Face	4.00	30.0000	160.00	No Ice	14.05	7.63	0.13
			0.00			1/2"	14.69	8.90	0.22
			3.00			Ice	15.30	9.96	0.33
						1" Ice			
80010965 w/ Mount Pipe	B	From Face	4.00	30.0000	160.00	No Ice	14.05	7.63	0.13
			0.00			1/2"	14.69	8.90	0.22
			3.00			Ice	15.30	9.96	0.33
						1" Ice			
80010965 w/ Mount Pipe	C	From Face	4.00	30.0000	160.00	No Ice	14.05	7.63	0.13
			0.00			1/2"	14.69	8.90	0.22
			3.00			Ice	15.30	9.96	0.33
						1" Ice			
7770.00 w/ Mount Pipe	A	From Face	4.00	23.0000	160.00	No Ice	5.75	4.25	0.06
			-7.00			1/2"	6.18	5.01	0.10
			3.00			Ice	6.61	5.71	0.16
						1" Ice			
7770.00 w/ Mount Pipe	B	From Face	4.00	23.0000	160.00	No Ice	5.75	4.25	0.06
			-7.00			1/2"	6.18	5.01	0.10
			3.00			Ice	6.61	5.71	0.16
						1" Ice			
7770.00 w/ Mount Pipe	C	From Face	4.00	23.0000	160.00	No Ice	5.75	4.25	0.06
			-7.00			1/2"	6.18	5.01	0.10
			3.00			Ice	6.61	5.71	0.16
						1" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Face	4.00	30.0000	160.00	No Ice	9.90	7.18	0.10
			7.00			1/2"	10.47	8.36	0.18
			3.00			Ice	11.01	9.26	0.26
						1" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Face	4.00	30.0000	160.00	No Ice	9.90	7.18	0.10
			7.00			1/2"	10.47	8.36	0.18
			3.00			Ice	11.01	9.26	0.26
						1" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Face	4.00	30.0000	160.00	No Ice	9.90	7.18	0.10
			7.00			1/2"	10.47	8.36	0.18
			3.00			Ice	11.01	9.26	0.26
						1" Ice			
RRUS 32	A	From Face	4.00	0.0000	160.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	B	From Face	4.00	0.0000	160.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	C	From Face	4.00	0.0000	160.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 4478 B14	A	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08

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*
			3.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 4478 B14	B	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			3.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 4478 B14	C	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			3.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 32 B2	A	From Face	4.00	0.0000	160.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	B	From Face	4.00	0.0000	160.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	C	From Face	4.00	0.0000	160.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice			
DC6-48-60-18-8C	A	From Face	1.00	0.0000	160.00	No Ice	2.74	2.74	0.03
			0.00			1/2"	2.96	2.96	0.05
			3.00			Ice	3.20	3.20	0.08
						1" Ice			
DC6-48-60-18-8F	A	From Face	1.00	0.0000	160.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice			
(2) LGP21401	A	From Face	4.00	0.0000	160.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice			
(2) LGP21401	B	From Face	4.00	0.0000	160.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice			
(2) LGP21401	C	From Face	4.00	0.0000	160.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice			
(2) 7020.00	A	From Face	4.00	0.0000	160.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	B	From Face	4.00	0.0000	160.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	C	From Face	4.00	0.0000	160.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice			
RRUS 11	A	From Face	4.00	0.0000	160.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			3.00			Ice	3.21	1.49	0.10
						1" Ice			
RRUS 11	B	From Face	4.00	0.0000	160.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			3.00			Ice	3.21	1.49	0.10
						1" Ice			
RRUS 11	C	From Face	4.00	0.0000	160.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			3.00			Ice	3.21	1.49	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
						1" Ice			
150									
Platform Mount [LP 403-1]	C	None		0.0000	150.00	No Ice	18.85	18.85	1.50
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
SBNHH-1D85C w/ Mount Pipe	A	From Face	4.00 -2.33 0.00	5.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
SBNHH-1D85C w/ Mount Pipe	B	From Face	4.00 -2.33 0.00	15.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
SBNHH-1D85C w/ Mount Pipe	C	From Face	4.00 -2.33 0.00	15.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
SBNHH-1D85C w/ Mount Pipe	A	From Face	4.00 0.00 0.00	4.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
SBNHH-1D85C w/ Mount Pipe	B	From Face	4.00 0.00 0.00	15.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
SBNHH-1D85C w/ Mount Pipe	C	From Face	4.00 0.00 0.00	15.0000	150.00	No Ice	11.63	9.79	0.08
						1/2" Ice	12.35	11.31	0.17
						1" Ice	13.07	12.85	0.27
(2) DB846F65ZAXY w/ Mount Pipe	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice	7.27	7.82	0.05
						1/2" Ice	7.83	9.01	0.11
						1" Ice	8.35	9.91	0.19
(2) DB846F65ZAXY w/ Mount Pipe	B	From Face	4.00 0.00 0.00	15.0000	150.00	No Ice	7.27	7.82	0.05
						1/2" Ice	7.83	9.01	0.11
						1" Ice	8.35	9.91	0.19
(2) LPA-80080/6CF w/ Mount Pipe	C	From Face	4.00 0.00 0.00	15.0000	150.00	No Ice	4.56	10.26	0.05
						1/2" Ice	5.11	11.43	0.11
						1" Ice	5.61	12.31	0.19
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	A	From Face	4.00 2.33 0.00	5.0000	150.00	No Ice	5.03	5.29	0.04
						1/2" Ice	5.58	6.46	0.09
						1" Ice	6.10	7.35	0.14
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	B	From Face	4.00 2.33 0.00	15.0000	150.00	No Ice	5.03	5.29	0.04
						1/2" Ice	5.58	6.46	0.09
						1" Ice	6.10	7.35	0.14
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	C	From Face	4.00 2.33 0.00	15.0000	150.00	No Ice	5.03	5.29	0.04
						1/2" Ice	5.58	6.46	0.09
						1" Ice	6.10	7.35	0.14
RRH2X60-700	A	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice	3.50	1.82	0.06
						1/2" Ice	3.76	2.05	0.08
						1" Ice	4.03	2.29	0.11
RRH2X60-700	B	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice	3.50	1.82	0.06
						1/2" Ice	3.76	2.05	0.08
						1" Ice	4.03	2.29	0.11
RRH2X60-700	C	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice	3.50	1.82	0.06
						1/2" Ice	3.76	2.05	0.08
						1" Ice	4.03	2.29	0.11

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			
RRH4X45-AWS4 B66	A	From Face	4.00	0.0000	150.00	No Ice	2.66	1.59	0.06
			0.00			1/2"	2.88	1.77	0.08
			0.00			Ice	3.10	1.96	0.11
						1" Ice			
RRH4X45-AWS4 B66	B	From Face	4.00	0.0000	150.00	No Ice	2.66	1.59	0.06
			0.00			1/2"	2.88	1.77	0.08
			0.00			Ice	3.10	1.96	0.11
						1" Ice			
RRH4X45-AWS4 B66	C	From Face	4.00	0.0000	150.00	No Ice	2.66	1.59	0.06
			0.00			1/2"	2.88	1.77	0.08
			0.00			Ice	3.10	1.96	0.11
						1" Ice			
RRH2X60-1900	A	From Face	4.00	0.0000	150.00	No Ice	1.87	1.22	0.04
			0.00			1/2"	2.05	1.37	0.06
			0.00			Ice	2.24	1.52	0.08
						1" Ice			
RRH2X60-1900	B	From Face	4.00	0.0000	150.00	No Ice	1.87	1.22	0.04
			0.00			1/2"	2.05	1.37	0.06
			0.00			Ice	2.24	1.52	0.08
						1" Ice			
RRH2X60-1900	C	From Face	4.00	0.0000	150.00	No Ice	1.87	1.22	0.04
			0.00			1/2"	2.05	1.37	0.06
			0.00			Ice	2.24	1.52	0.08
						1" Ice			
DB-T1-6Z-8AB-0Z	C	From Face	4.00	0.0000	150.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			0.00			Ice	5.35	2.39	0.12
						1" Ice			
DB-T1-6Z-8AB-0Z	C	From Face	4.00	0.0000	150.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			0.00			Ice	5.35	2.39	0.12
						1" Ice			
(2) FD9R6004/2C-3L	A	From Face	4.00	0.0000	150.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			0.00			Ice	0.47	0.17	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Face	4.00	0.0000	150.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			0.00			Ice	0.47	0.17	0.01
						1" Ice			
(2) FD9R6004/2C-3L	C	From Face	4.00	0.0000	150.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			0.00			Ice	0.47	0.17	0.01
						1" Ice			
125									
Side Arm Mount [SO 901-1]	B	From Face	1.50	0.0000	125.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
Side Arm Mount [SO 901-1]	C	From Face	1.50	0.0000	125.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
PD201-1	B	From Face	3.00	0.0000	125.00	No Ice	1.18	1.18	0.00
			0.00			1/2"	2.09	2.09	0.01
			5.00			Ice	3.02	3.02	0.02
						1" Ice			
PD128-1	C	From Face	3.00	0.0000	125.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
110									
Side Arm Mount [SO 901-1]	B	From Face	1.50	0.0000	110.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
Side Arm Mount [SO 901-1]	C	From Face	1.50	0.0000	110.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
PD128-1	B	From Face	3.00	0.0000	110.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
PD128-1	C	From Face	3.00	0.0000	110.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
100									
Side Arm Mount [SO 901-1]	B	From Face	1.50	0.0000	100.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
GPS_A	B	From Face	3.00	0.0000	100.00	No Ice	0.26	0.26	0.00
			0.00			1/2"	0.32	0.32	0.00
			1.00			Ice	0.39	0.39	0.01
						1" Ice			
95									
Side Arm Mount [SO 901-1]	A	From Face	1.50	0.0000	95.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
Side Arm Mount [SO 901-1]	C	From Face	1.50	0.0000	95.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
PD128-1	A	From Face	3.00	0.0000	95.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
PD128-1	C	From Face	3.00	0.0000	95.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
80									
Side Arm Mount [SO 901-1]	B	From Face	1.50	0.0000	80.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
Side Arm Mount [SO 901-1]	C	From Face	1.50	0.0000	80.00	No Ice	0.50	0.88	0.11
			0.00			1/2"	0.68	1.13	0.11
			0.00			Ice	0.86	1.38	0.11
						1" Ice			
PD128-1	B	From Face	3.00	0.0000	80.00	No Ice	1.28	1.28	0.01
			0.00			1/2"	2.27	2.27	0.02
			5.00			Ice	3.28	3.28	0.04
						1" Ice			
DB222	C	From Face	3.00	0.0000	80.00	No Ice	1.60	1.60	0.02
			0.00			1/2"	2.88	2.88	0.02
			5.00			Ice	4.16	4.16	0.03
						1" Ice			
MOD 2013									
Jump Plate 120" x 4.5" x 1"	A	From Face	0.00	0.0000	80.00	No Ice	7.50	2.21	0.21
			0.00			1/2"	9.24	3.09	0.25
			0.00			Ice	11.01	3.99	0.28
						1" Ice			
Jump Plate 120" x 4.5" x 1"	B	From Face	0.00	0.0000	80.00	No Ice	7.50	2.21	0.21
			0.00			1/2"	9.24	3.09	0.25
			0.00			Ice	11.01	3.99	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Jump Plate 120" x 4.5" x 1"	C	From Face	0.00	0.00	0.0000	80.00	1" Ice			
			0.00	0.00			No Ice	7.50	2.21	0.21
			0.00	0.00			1/2" Ice	9.24	3.09	0.25
							1" Ice	11.01	3.99	0.28
***										
Jump Plate 120" x 6.5" x 1.25"	A	From Face	0.00	0.00	0.0000	60.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
Jump Plate 120" x 6.5" x 1.25"	B	From Face	0.00	0.00	0.0000	60.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
Jump Plate 120" x 6.5" x 1.25"	C	From Face	0.00	0.00	0.0000	60.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
***										
(2) Jump Plate 120" x 6" x 1"	A	From Face	0.00	0.00	0.0000	40.00	No Ice	9.17	2.42	0.30
			0.00	0.00			1/2" Ice	10.78	3.30	0.35
							1" Ice	12.43	4.19	0.38
(2) Jump Plate 120" x 6" x 1"	B	From Face	0.00	0.00	0.0000	40.00	No Ice	9.17	2.42	0.30
			0.00	0.00			1/2" Ice	10.78	3.30	0.35
							1" Ice	12.43	4.19	0.38
(2) Jump Plate 120" x 6" x 1"	C	From Face	0.00	0.00	0.0000	40.00	No Ice	9.17	2.42	0.30
			0.00	0.00			1/2" Ice	10.78	3.30	0.35
							1" Ice	12.43	4.19	0.38
***										
(2) Jump Plate 120" x 6.5" x 1.25"	A	From Face	0.00	0.00	0.0000	20.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
(2) Jump Plate 120" x 6.5" x 1.25"	B	From Face	0.00	0.00	0.0000	20.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
(2) Jump Plate 120" x 6.5" x 1.25"	C	From Face	0.00	0.00	0.0000	20.00	No Ice	9.65	3.08	0.41
			0.00	0.00			1/2" Ice	11.23	3.97	0.47
							1" Ice	12.83	4.87	0.51
***										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
SP2-5.8	A	Paraboloid w/Radome	From Face	4.00	0.00	15.0000		188.00	2.00	No Ice	3.14	0.02
				0.00	-1.00					1/2" Ice	3.41	0.04
										1" Ice	3.68	0.06
***												

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	190 - 185	Pole	Max Tension	48	0.00	-0.00	-0.00
			Max. Compression	26	-7.12	0.69	0.43
			Max. Mx	20	-3.31	14.58	-0.12
			Max. My	2	-3.31	-0.08	14.28
			Max. Vy	8	3.57	-14.38	0.27
			Max. Vx	14	3.52	0.29	-14.18
			Max. Torque	14			-0.84

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	185 - 180	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.13	0.15	0.18
			Max. Mx	8	-4.75	-39.45	0.34
			Max. My	14	-4.75	0.22	-38.90
			Max. Vy	8	4.84	-39.45	0.34
			Max. Vx	14	4.81	0.22	-38.90
			Max. Torque	14			-0.84
L3	180 - 175	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.84	-1.40	1.69
			Max. Mx	8	-7.74	-73.92	0.89
			Max. My	2	-7.75	-1.22	72.53
			Max. Vy	8	7.09	-73.92	0.89
			Max. Vx	14	7.05	0.13	-72.47
			Max. Torque	22			-1.45
L4	175 - 170	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.22	-1.36	1.79
			Max. Mx	8	-8.62	-110.42	1.16
			Max. My	14	-8.62	0.37	-108.75
			Max. Vy	8	7.51	-110.42	1.16
			Max. Vx	14	7.47	0.37	-108.75
			Max. Torque	22			-1.45
L5	170 - 165	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.57	0.17	2.90
			Max. Mx	8	-12.88	-164.58	1.61
			Max. My	2	-12.88	-1.12	163.13
			Max. Vy	8	11.11	-164.58	1.61
			Max. Vx	14	11.05	0.98	-162.73
			Max. Torque	8			1.56
L6	165 - 160	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.15	0.35	3.23
			Max. Mx	8	-13.83	-221.13	1.81
			Max. My	2	-13.83	-1.22	219.24
			Max. Vy	8	11.52	-221.13	1.81
			Max. Vx	14	11.46	1.13	-218.91
			Max. Torque	8			1.56
L7	160 - 155	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.31	2.24	3.78
			Max. Mx	8	-18.63	-312.45	2.05
			Max. My	2	-18.64	-0.88	310.62
			Max. Vy	8	16.55	-312.45	2.05
			Max. Vx	14	16.48	1.73	-310.25
			Max. Torque	8			1.60
L8	155 - 150	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.36	2.95	4.23
			Max. Mx	8	-19.81	-396.19	2.27
			Max. My	2	-19.82	-0.82	394.09
			Max. Vy	8	17.02	-396.19	2.27
			Max. Vx	14	16.95	2.03	-393.73
			Max. Torque	8			1.60
L9	150 - 145	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.65	3.68	2.46
			Max. Mx	8	-24.41	-512.07	1.59
			Max. My	14	-24.42	1.91	-509.21
			Max. Vy	8	23.44	-512.07	1.59
			Max. Vx	14	23.24	1.91	-509.21
			Max. Torque	8			1.60
L10	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.76	4.40	2.92
			Max. Mx	20	-25.68	630.29	-0.30
			Max. My	14	-25.69	1.80	-626.38
			Max. Vy	8	23.88	-630.19	1.40
			Max. Vx	14	23.68	1.80	-626.38
			Max. Torque	14			-0.94
L11	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.08	5.22	3.43
			Max. Mx	20	-27.09	750.96	0.10
			Max. My	14	-27.10	1.72	-745.89
			Max. Vy	8	24.39	-750.66	1.23
			Max. Vx	14	24.18	1.72	-745.89

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	14			-0.94
L12	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.39	6.03	3.94
			Max. Mx	20	-28.50	874.12	0.50
			Max. My	14	-28.51	1.64	-867.90
			Max. Vy	8	24.88	-873.61	1.06
			Max. Vx	14	24.68	1.64	-867.90
			Max. Torque	14			-0.94
L13	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.70	6.83	4.45
			Max. Mx	20	-29.92	999.70	0.90
			Max. My	14	-29.93	1.55	-992.32
			Max. Vy	8	25.36	-998.98	0.88
			Max. Vx	14	25.15	1.55	-992.32
			Max. Torque	14			-0.94
L14	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.43	6.97	4.44
			Max. Mx	20	-31.62	1128.52	1.05
			Max. My	14	-31.63	1.04	-1120.65
			Max. Vy	8	25.99	-1128.41	0.39
			Max. Vx	14	25.77	1.04	-1120.65
			Max. Torque	14			-0.94
L15	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.94	7.86	5.00
			Max. Mx	20	-33.19	1259.76	1.50
			Max. My	14	-33.20	0.95	-1250.65
			Max. Vy	8	26.51	-1259.39	0.20
			Max. Vx	14	26.29	0.95	-1250.65
			Max. Torque	15			-0.62
L16	115 - 112.666	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.19	8.27	5.26
			Max. Mx	20	-33.92	1321.91	1.71
			Max. My	14	-33.93	0.91	-1312.22
			Max. Vy	8	26.75	-1321.42	0.11
			Max. Vx	14	26.54	0.91	-1312.22
			Max. Torque	15			-0.62
L17	112.666 - 112.416	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.35	8.32	5.29
			Max. Mx	20	-34.02	1328.60	1.73
			Max. My	14	-34.03	0.91	-1318.85
			Max. Vy	8	26.77	-1328.10	0.10
			Max. Vx	14	26.56	0.91	-1318.85
			Max. Torque	15			-0.62
L18	112.416 - 107.416	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.87	8.37	5.37
			Max. Mx	8	-36.23	-1464.41	-0.38
			Max. My	14	-36.24	0.33	-1453.97
			Max. Vy	8	27.46	-1464.41	-0.38
			Max. Vx	14	27.24	0.33	-1453.97
			Max. Torque	15			-0.62
L19	107.416 - 103.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.45	9.09	5.82
			Max. Mx	20	-37.81	1577.18	2.32
			Max. My	14	-37.82	0.23	-1565.90
			Max. Vy	8	27.88	-1577.17	-0.56
			Max. Vx	14	27.66	0.23	-1565.90
			Max. Torque	12			-0.43
L20	103.333 - 103.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.61	9.14	5.85
			Max. Mx	20	-37.91	1584.15	2.35
			Max. My	14	-37.92	0.22	-1572.81
			Max. Vy	8	27.90	-1584.13	-0.57
			Max. Vx	14	27.68	0.22	-1572.81
			Max. Torque	12			-0.43

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L21	103.083 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.57	9.68	6.19
			Max. Mx	20	-39.10	1670.64	2.64
			Max. My	14	-39.11	0.14	-1658.52
			Max. Vy	8	28.21	-1670.46	-0.71
			Max. Vx	14	27.99	0.14	-1658.52
			Max. Torque	12			-0.43
L22	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.07	10.09	6.94
			Max. Mx	8	-41.36	-1813.21	-0.83
			Max. My	14	-41.37	-0.40	-1799.76
			Max. Vy	8	28.80	-1813.21	-0.83
			Max. Vx	14	28.59	-0.40	-1799.76
			Max. Torque	12			-0.43
L23	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.88	11.92	6.86
			Max. Mx	20	-43.77	1960.00	3.37
			Max. My	14	-43.78	0.01	-1945.49
			Max. Vy	8	29.50	-1959.01	-1.45
			Max. Vx	14	29.27	0.01	-1945.49
			Max. Torque	12			-0.65
L24	90 - 89.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.23	12.01	6.90
			Max. Mx	20	-43.98	1974.77	3.41
			Max. My	14	-43.99	-0.00	-1960.13
			Max. Vy	8	29.55	-1973.74	-1.49
			Max. Vx	14	29.33	-0.00	-1960.13
			Max. Torque	12			-0.65
L25	89.5 - 89.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.42	12.06	6.92
			Max. Mx	20	-44.11	1982.16	3.43
			Max. My	14	-44.11	-0.01	-1967.46
			Max. Vy	8	29.57	-1981.12	-1.50
			Max. Vx	14	29.35	-0.01	-1967.46
			Max. Torque	12			-0.65
L26	89.25 - 85.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.30	12.78	7.23
			Max. Mx	20	-45.91	2093.84	3.71
			Max. My	14	-45.92	-0.08	-2078.25
			Max. Vy	8	29.98	-2092.57	-1.75
			Max. Vx	14	29.76	-0.08	-2078.25
			Max. Torque	12			-0.65
L27	85.5 - 85.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.51	12.83	7.26
			Max. Mx	20	-46.04	2101.34	3.73
			Max. My	14	-46.05	-0.08	-2085.69
			Max. Vy	8	30.00	-2100.05	-1.77
			Max. Vx	14	29.78	-0.08	-2085.69
			Max. Torque	12			-0.65
L28	85.25 - 84	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.56	13.06	7.36
			Max. Mx	20	-46.71	2138.94	3.83
			Max. My	14	-46.72	-0.11	-2122.99
			Max. Vy	8	30.15	-2137.58	-1.85
			Max. Vx	14	29.92	-0.11	-2122.99
			Max. Torque	12			-0.65
L29	84 - 83.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.75	13.11	7.38
			Max. Mx	20	-46.83	2146.48	3.85
			Max. My	14	-46.84	-0.11	-2130.47
			Max. Vy	8	30.17	-2145.10	-1.87
			Max. Vx	14	29.94	-0.11	-2130.47
			Max. Torque	12			-0.65
L30	83.75 - 82.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.71	13.35	7.49
			Max. Mx	20	-47.41	2184.28	3.94
			Max. My	14	-47.42	-0.14	-2167.97
			Max. Vy	8	30.31	-2182.83	-1.95

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	30.08	-0.14	-2167.97
			Max. Torque	12			-0.65
L31	82.5 - 82.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.89	13.40	7.51
			Max. Mx	20	-47.51	2191.87	3.96
			Max. My	14	-47.52	-0.14	-2175.49
			Max. Vy	8	30.33	-2190.39	-1.96
			Max. Vx	14	30.10	-0.14	-2175.49
			Max. Torque	12			-0.65
L32	82.25 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.37	13.82	7.69
			Max. Mx	20	-48.43	2260.37	4.13
			Max. My	14	-48.44	-0.19	-2243.44
			Max. Vy	8	30.56	-2258.76	-2.11
			Max. Vx	14	30.33	-0.19	-2243.44
			Max. Torque	12			-0.65
L33	80 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.55	13.91	7.85
			Max. Mx	20	-51.97	2417.28	4.22
			Max. My	14	-51.98	-0.82	-2399.91
			Max. Vy	8	31.63	-2416.38	-2.78
			Max. Vx	14	31.40	-0.82	-2399.91
			Max. Torque	20			0.74
L34	75 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-100.21	14.85	8.26
			Max. Mx	20	-54.50	2576.67	4.63
			Max. My	14	-54.51	-0.95	-2558.03
			Max. Vy	8	32.12	-2575.47	-3.14
			Max. Vx	14	31.88	-0.95	-2558.03
			Max. Torque	20			0.74
L35	70 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-103.85	15.78	8.67
			Max. Mx	20	-57.03	2738.42	5.04
			Max. My	14	-57.04	-1.08	-2718.52
			Max. Vy	8	32.58	-2736.91	-3.50
			Max. Vx	14	32.34	-1.08	-2718.52
			Max. Torque	20			0.74
L36	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-107.49	16.70	9.08
			Max. Mx	20	-59.57	2902.43	5.44
			Max. My	14	-59.57	-1.20	-2881.27
			Max. Vy	8	33.02	-2900.61	-3.86
			Max. Vx	14	32.78	-1.20	-2881.27
			Max. Torque	20			0.74
L37	60 - 58.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-110.64	16.98	9.20
			Max. Mx	20	-61.93	2952.83	5.56
			Max. My	14	-61.94	-1.24	-2931.29
			Max. Vy	8	33.67	-2950.92	-3.96
			Max. Vx	14	33.43	-1.24	-2931.29
			Max. Torque	20			0.74
L38	58.5 - 58.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-110.83	17.03	9.22
			Max. Mx	20	-62.07	2961.25	5.58
			Max. My	14	-62.08	-1.25	-2939.64
			Max. Vy	8	33.68	-2959.32	-3.98
			Max. Vx	14	33.44	-1.25	-2939.64
			Max. Torque	20			0.74
L39	58.25 - 53.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-114.53	17.92	9.61
			Max. Mx	20	-64.80	3130.72	5.99
			Max. My	14	-64.81	-1.38	-3107.85
			Max. Vy	8	34.10	-3128.48	-4.34
			Max. Vx	14	33.87	-1.38	-3107.85
			Max. Torque	20			0.74
L40	53.25 - 48.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-118.29	18.78	9.98

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-67.54	3302.20	6.40
			Max. My	14	-67.55	-1.50	-3278.07
			Max. Vy	8	34.49	-3299.66	-4.70
			Max. Vx	14	34.26	-1.50	-3278.07
			Max. Torque	20			0.74
L41	48.25 - 48	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-118.50	18.83	10.00
			Max. Mx	20	-67.71	3310.83	6.42
			Max. My	14	-67.71	-1.51	-3286.63
			Max. Vy	8	34.50	-3308.27	-4.71
			Max. Vx	14	34.27	-1.51	-3286.63
			Max. Torque	20			0.74
L42	48 - 43	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-122.84	19.68	10.36
			Max. Mx	20	-70.93	3484.35	6.82
			Max. My	14	-70.94	-1.64	-3458.90
			Max. Vy	8	34.90	-3481.49	-5.07
			Max. Vx	14	34.66	-1.64	-3458.90
			Max. Torque	20			0.74
L43	43 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-125.43	20.19	10.58
			Max. Mx	20	-72.87	3589.38	7.06
			Max. My	14	-72.88	-1.71	-3563.18
			Max. Vy	8	35.12	-3586.33	-5.29
			Max. Vx	14	34.89	-1.71	-3563.18
			Max. Torque	20			0.74
L44	40 - 35	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-132.70	21.03	10.94
			Max. Mx	20	-78.23	3769.87	7.47
			Max. My	14	-78.24	-1.84	-3742.41
			Max. Vy	8	36.27	-3766.51	-5.64
			Max. Vx	14	36.03	-1.84	-3742.41
			Max. Torque	20			0.74
L45	35 - 32.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-135.33	21.51	11.15
			Max. Mx	20	-80.12	3876.04	7.70
			Max. My	14	-80.13	-1.91	-3847.85
			Max. Vy	8	36.46	-3872.50	-5.85
			Max. Vx	14	36.23	-1.91	-3847.85
			Max. Torque	20			0.74
L46	32.08 - 31.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-135.59	21.56	11.17
			Max. Mx	20	-80.32	3885.16	7.72
			Max. My	14	-80.33	-1.92	-3856.90
			Max. Vy	8	36.46	-3881.60	-5.87
			Max. Vx	14	36.23	-1.92	-3856.90
			Max. Torque	20			0.74
L47	31.83 - 28.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-138.76	22.06	11.39
			Max. Mx	20	-82.71	3997.79	7.97
			Max. My	14	-82.72	-2.00	-3968.76
			Max. Vy	8	36.67	-3994.04	-6.09
			Max. Vx	14	36.43	-2.00	-3968.76
			Max. Torque	20			0.74
L48	28.75 - 28.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-139.00	22.11	11.41
			Max. Mx	20	-82.89	4006.95	7.99
			Max. My	14	-82.89	-2.00	-3977.86
			Max. Vy	8	36.68	-4003.19	-6.10
			Max. Vx	14	36.44	-2.00	-3977.86
			Max. Torque	20			0.74
L49	28.5 - 23.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-143.54	22.92	11.76
			Max. Mx	20	-86.28	4191.08	8.39
			Max. My	14	-86.28	-2.13	-4160.74
			Max. Vy	8	36.97	-4187.01	-6.46
			Max. Vx	14	36.74	-2.13	-4160.74

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	20			0.74
L50	23.5 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-146.64	23.49	12.00
			Max. Mx	20	-88.66	4320.80	8.68
			Max. My	14	-88.66	-2.22	-4289.58
			Max. Vy	8	37.16	-4316.51	-6.71
			Max. Vx	14	36.93	-2.22	-4289.58
			Max. Torque	20			0.74
L51	20 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-150.63	23.53	12.02
			Max. Mx	20	-91.80	4330.29	8.70
			Max. My	14	-91.80	-2.23	-4299.02
			Max. Vy	8	37.98	-4325.99	-6.73
			Max. Vx	14	37.74	-2.23	-4299.02
			Max. Torque	20			0.74
L52	19.75 - 14.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-155.50	24.32	12.36
			Max. Mx	20	-95.66	4520.89	9.10
			Max. My	14	-95.66	-2.35	-4488.37
			Max. Vy	8	38.26	-4516.28	-7.08
			Max. Vx	14	38.03	-2.35	-4488.37
			Max. Torque	20			0.74
L53	14.75 - 9.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-160.23	24.91	12.60
			Max. Mx	20	-99.49	4712.75	9.48
			Max. My	14	-99.49	-2.54	-4679.08
			Max. Vy	8	38.52	-4707.97	-7.45
			Max. Vx	14	38.29	-2.54	-4679.08
			Max. Torque	20			0.74
L54	9.75 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-164.51	24.93	12.72
			Max. Mx	20	-103.13	4905.67	9.88
			Max. My	14	-103.13	-2.92	-4871.01
			Max. Vy	8	38.76	-4901.09	-7.80
			Max. Vx	14	38.53	-2.92	-4871.01
			Max. Torque	20			0.74
L55	4.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-168.37	24.93	12.72
			Max. Mx	20	-106.51	5090.00	10.22
			Max. My	14	-106.51	-3.29	-5054.46
			Max. Vy	8	38.98	-5085.63	-8.16
			Max. Vx	14	38.75	-3.29	-5054.46
			Max. Torque	20			0.74

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	168.37	0.00	0.00
	Max. H_x	20	106.52	38.91	0.07
	Max. H_z	2	106.52	0.07	38.68
	Max. M_x	2	5049.08	0.07	38.68
	Max. M_z	8	5085.63	-38.95	-0.08
	Max. Torsion	20	0.74	38.91	0.07
	Min. Vert	19	79.89	33.64	-19.29
	Min. H_x	8	106.52	-38.95	-0.08
	Min. H_z	14	106.52	-0.08	-38.73
	Min. M_x	14	-5054.46	-0.08	-38.73
	Min. M_z	20	-5090.00	38.91	0.07
	Min. Torsion	8	-0.69	-38.95	-0.08

Tower Mast Reaction Summary

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 Only	88.77	0.00	0.00	-1.24	5.19	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	106.52	-0.07	-38.68	-5049.08	15.09	-0.01
0.9 Dead+1.6 Wind 0 deg - No Ice	79.89	-0.07	-38.68	-5008.56	13.39	-0.02
1.2 Dead+1.6 Wind 30 deg - No Ice	106.52	19.87	-34.27	-4446.25	-2575.32	0.40
0.9 Dead+1.6 Wind 30 deg - No Ice	79.89	19.87	-34.27	-4410.64	-2556.50	0.40
1.2 Dead+1.6 Wind 60 deg - No Ice	106.52	33.67	-19.27	-2515.58	-4394.20	0.66
0.9 Dead+1.6 Wind 60 deg - No Ice	79.89	33.67	-19.27	-2495.19	-4360.85	0.65
1.2 Dead+1.6 Wind 90 deg - No Ice	106.52	38.95	0.08	8.16	-5085.63	0.69
0.9 Dead+1.6 Wind 90 deg - No Ice	79.89	38.95	0.08	8.50	-5046.79	0.68
1.2 Dead+1.6 Wind 120 deg - No Ice	106.52	33.77	19.43	2534.42	-4408.59	0.67
0.9 Dead+1.6 Wind 120 deg - No Ice	79.89	33.77	19.43	2514.68	-4375.14	0.67
1.2 Dead+1.6 Wind 150 deg - No Ice	106.52	19.54	33.58	4382.86	-2547.23	0.49
0.9 Dead+1.6 Wind 150 deg - No Ice	79.89	19.54	33.58	4348.41	-2528.59	0.49
1.2 Dead+1.6 Wind 180 deg - No Ice	106.52	0.08	38.73	5054.46	-3.29	0.16
0.9 Dead+1.6 Wind 180 deg - No Ice	79.89	0.08	38.73	5014.67	-4.88	0.16
1.2 Dead+1.6 Wind 210 deg - No Ice	106.52	-19.85	34.30	4449.16	2584.73	-0.33
0.9 Dead+1.6 Wind 210 deg - No Ice	79.89	-19.85	34.30	4414.30	2562.64	-0.33
1.2 Dead+1.6 Wind 240 deg - No Ice	106.52	-33.64	19.29	2515.92	4401.04	-0.64
0.9 Dead+1.6 Wind 240 deg - No Ice	79.89	-33.64	19.29	2496.30	4364.45	-0.63
1.2 Dead+1.6 Wind 270 deg - No Ice	106.52	-38.91	-0.07	-10.22	5090.00	-0.74
0.9 Dead+1.6 Wind 270 deg - No Ice	79.89	-38.91	-0.07	-9.76	5047.94	-0.73
1.2 Dead+1.6 Wind 300 deg - No Ice	106.52	-33.75	-19.41	-2534.23	4416.82	-0.63
0.9 Dead+1.6 Wind 300 deg - No Ice	79.89	-33.75	-19.41	-2513.71	4380.11	-0.63
1.2 Dead+1.6 Wind 330 deg - No Ice	106.52	-19.52	-33.56	-4381.34	2556.79	-0.45
0.9 Dead+1.6 Wind 330 deg - No Ice	79.89	-19.52	-33.56	-4346.13	2534.87	-0.45
1.2 Dead+1.0 Ice+1.0 Temp	168.37	-0.00	-0.00	-12.72	24.93	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	168.37	-0.02	-12.94	-1699.14	27.97	0.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	168.37	7.12	-12.33	-1580.85	-879.20	0.32
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	168.37	11.20	-6.45	-853.12	-1434.55	0.29
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	168.37	13.44	0.02	-9.92	-1704.20	0.17
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	168.37	11.23	6.49	833.74	-1438.67	0.03
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	168.37	6.49	11.23	1450.95	-821.42	-0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	168.37	0.02	12.95	1675.43	22.29	-0.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	168.37	-7.11	12.34	1556.54	928.87	-0.31

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	168.37	-11.20	6.45	828.18	1483.59	-0.28
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	168.37	-13.43	-0.02	-15.60	1752.64	-0.18
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	168.37	-11.23	-6.49	-858.71	1488.05	-0.02
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	168.37	-6.49	-11.22	-1475.60	871.12	0.12
Dead+Wind 0 deg - Service	88.77	-0.02	-9.00	-1170.24	7.34	-0.00
Dead+Wind 30 deg - Service	88.77	4.62	-7.98	-1030.66	-592.58	0.09
Dead+Wind 60 deg - Service	88.77	7.84	-4.48	-583.51	-1013.80	0.15
Dead+Wind 90 deg - Service	88.77	9.07	0.02	0.96	-1173.93	0.16
Dead+Wind 120 deg - Service	88.77	7.86	4.52	586.02	-1017.14	0.16
Dead+Wind 150 deg - Service	88.77	4.55	7.82	1014.09	-586.07	0.11
Dead+Wind 180 deg - Service	88.77	0.02	9.01	1169.63	3.08	0.04
Dead+Wind 210 deg - Service	88.77	-4.62	7.98	1029.47	602.45	-0.08
Dead+Wind 240 deg - Service	88.77	-7.83	4.49	581.73	1023.08	-0.15
Dead+Wind 270 deg - Service	88.77	-9.06	-0.02	-3.30	1182.63	-0.17
Dead+Wind 300 deg - Service	88.77	-7.86	-4.52	-587.83	1026.73	-0.15
Dead+Wind 330 deg - Service	88.77	-4.54	-7.81	-1015.60	595.97	-0.11

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX	PY	PZ	PX	PY	PZ	
	K	K	K	K	K	K	
1	0.00	-88.77	0.00	0.00	88.77	0.00	0.000%
2	-0.07	-106.52	-38.68	0.07	106.52	38.68	0.000%
3	-0.07	-79.89	-38.68	0.07	79.89	38.68	0.000%
4	19.87	-106.52	-34.27	-19.87	106.52	34.27	0.000%
5	19.87	-79.89	-34.27	-19.87	79.89	34.27	0.000%
6	33.67	-106.52	-19.27	-33.67	106.52	19.27	0.000%
7	33.67	-79.89	-19.27	-33.67	79.89	19.27	0.000%
8	38.95	-106.52	0.08	-38.95	106.52	-0.08	0.000%
9	38.95	-79.89	0.08	-38.95	79.89	-0.08	0.000%
10	33.77	-106.52	19.43	-33.77	106.52	-19.43	0.000%
11	33.77	-79.89	19.43	-33.77	79.89	-19.43	0.000%
12	19.54	-106.52	33.58	-19.54	106.52	-33.58	0.000%
13	19.54	-79.89	33.58	-19.54	79.89	-33.58	0.000%
14	0.08	-106.52	38.73	-0.08	106.52	-38.73	0.000%
15	0.08	-79.89	38.73	-0.08	79.89	-38.73	0.000%
16	-19.85	-106.52	34.30	19.85	106.52	-34.30	0.000%
17	-19.85	-79.89	34.30	19.85	79.89	-34.30	0.000%
18	-33.64	-106.52	19.29	33.64	106.52	-19.29	0.000%
19	-33.64	-79.89	19.29	33.64	79.89	-19.29	0.000%
20	-38.91	-106.52	-0.07	38.91	106.52	0.07	0.000%
21	-38.91	-79.89	-0.07	38.91	79.89	0.07	0.000%
22	-33.75	-106.52	-19.41	33.75	106.52	19.41	0.000%
23	-33.75	-79.89	-19.41	33.75	79.89	19.41	0.000%
24	-19.52	-106.52	-33.56	19.52	106.52	33.56	0.000%
25	-19.52	-79.89	-33.56	19.52	79.89	33.56	0.000%
26	0.00	-168.37	0.00	0.00	168.37	0.00	0.000%
27	-0.02	-168.37	-12.94	0.02	168.37	12.94	0.000%
28	7.12	-168.37	-12.33	-7.12	168.37	12.33	0.000%
29	11.20	-168.37	-6.45	-11.20	168.37	6.45	0.000%
30	13.44	-168.37	0.02	-13.44	168.37	-0.02	0.000%
31	11.23	-168.37	6.49	-11.23	168.37	-6.49	0.000%
32	6.49	-168.37	11.23	-6.49	168.37	-11.23	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.02	-168.37	12.95	-0.02	168.37	-12.95	0.000%
34	-7.11	-168.37	12.34	7.11	168.37	-12.34	0.000%
35	-11.20	-168.37	6.45	11.20	168.37	-6.45	0.000%
36	-13.43	-168.37	-0.02	13.43	168.37	0.02	0.000%
37	-11.23	-168.37	-6.49	11.23	168.37	6.49	0.000%
38	-6.49	-168.37	-11.22	6.49	168.37	11.22	0.000%
39	-0.02	-88.77	-9.00	0.02	88.77	9.00	0.000%
40	4.62	-88.77	-7.98	-4.62	88.77	7.98	0.000%
41	7.84	-88.77	-4.48	-7.84	88.77	4.48	0.000%
42	9.07	-88.77	0.02	-9.07	88.77	-0.02	0.000%
43	7.86	-88.77	4.52	-7.86	88.77	-4.52	0.000%
44	4.55	-88.77	7.82	-4.55	88.77	-7.82	0.000%
45	0.02	-88.77	9.01	-0.02	88.77	-9.01	0.000%
46	-4.62	-88.77	7.98	4.62	88.77	-7.98	0.000%
47	-7.83	-88.77	4.49	7.83	88.77	-4.49	0.000%
48	-9.06	-88.77	-0.02	9.06	88.77	0.02	0.000%
49	-7.86	-88.77	-4.52	7.86	88.77	4.52	0.000%
50	-4.54	-88.77	-7.81	4.54	88.77	7.81	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	0.00010644
3	Yes	5	0.00000001	0.00004161
4	Yes	6	0.00000001	0.00006874
5	Yes	5	0.00000001	0.00092322
6	Yes	6	0.00000001	0.00006557
7	Yes	5	0.00000001	0.00088124
8	Yes	5	0.00000001	0.00011496
9	Yes	5	0.00000001	0.00004732
10	Yes	6	0.00000001	0.00006775
11	Yes	5	0.00000001	0.00091125
12	Yes	6	0.00000001	0.00006622
13	Yes	5	0.00000001	0.00089044
14	Yes	5	0.00000001	0.00010588
15	Yes	5	0.00000001	0.00004128
16	Yes	6	0.00000001	0.00006845
17	Yes	5	0.00000001	0.00091816
18	Yes	6	0.00000001	0.00006701
19	Yes	5	0.00000001	0.00090056
20	Yes	5	0.00000001	0.00011133
21	Yes	5	0.00000001	0.00004491
22	Yes	6	0.00000001	0.00006651
23	Yes	5	0.00000001	0.00089267
24	Yes	6	0.00000001	0.00006762
25	Yes	5	0.00000001	0.00090815
26	Yes	4	0.00000001	0.00099069
27	Yes	6	0.00000001	0.00026020
28	Yes	6	0.00000001	0.00028994
29	Yes	6	0.00000001	0.00027116
30	Yes	6	0.00000001	0.00025757
31	Yes	6	0.00000001	0.00026888
32	Yes	6	0.00000001	0.00026940
33	Yes	6	0.00000001	0.00025549
34	Yes	6	0.00000001	0.00029162
35	Yes	6	0.00000001	0.00027605
36	Yes	6	0.00000001	0.00026606
37	Yes	6	0.00000001	0.00028073
38	Yes	6	0.00000001	0.00028030
39	Yes	4	0.00000001	0.00052264
40	Yes	5	0.00000001	0.00003304
41	Yes	4	0.00000001	0.00098636
42	Yes	4	0.00000001	0.00052661

43	Yes	5	0.00000001	0.00003271
44	Yes	4	0.00000001	0.00098902
45	Yes	4	0.00000001	0.00052209
46	Yes	5	0.00000001	0.00003304
47	Yes	5	0.00000001	0.00003268
48	Yes	4	0.00000001	0.00053059
49	Yes	5	0.00000001	0.00003226
50	Yes	5	0.00000001	0.00003303

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 185	13.723	46	0.5890	0.0004
L2	185 - 180	13.106	46	0.5885	0.0004
L3	180 - 175	12.491	46	0.5862	0.0003
L4	175 - 170	11.878	46	0.5835	0.0003
L5	170 - 165	11.269	46	0.5791	0.0003
L6	165 - 160	10.666	46	0.5725	0.0003
L7	160 - 155	10.071	46	0.5631	0.0003
L8	155 - 150	9.486	46	0.5548	0.0002
L9	150 - 145	8.910	46	0.5439	0.0003
L10	145 - 140	8.348	46	0.5298	0.0002
L11	140 - 135	7.802	46	0.5122	0.0002
L12	135 - 130	7.273	46	0.4979	0.0002
L13	130 - 125	6.760	46	0.4812	0.0002
L14	125 - 120	6.266	46	0.4618	0.0001
L15	120 - 115	5.794	46	0.4398	0.0001
L16	115 - 112.666	5.342	46	0.4225	0.0001
L17	112.666 - 112.416	5.138	46	0.4138	0.0001
L18	112.416 - 107.416	5.116	46	0.4131	0.0001
L19	107.416 - 103.333	4.691	46	0.3974	0.0001
L20	103.333 - 103.083	4.357	46	0.3834	0.0001
L21	103.083 - 100	4.337	46	0.3826	0.0001
L22	100 - 95	4.094	46	0.3713	0.0001
L23	95 - 90	3.713	46	0.3567	0.0001
L24	90 - 89.5	3.347	46	0.3409	0.0001
L25	89.5 - 89.25	3.312	46	0.3392	0.0001
L26	89.25 - 85.5	3.294	46	0.3385	0.0001
L27	85.5 - 85.25	3.032	46	0.3275	0.0001
L28	85.25 - 84	3.015	46	0.3269	0.0001
L29	84 - 83.75	2.930	46	0.3235	0.0001
L30	83.75 - 82.5	2.913	46	0.3227	0.0001
L31	82.5 - 82.25	2.829	46	0.3186	0.0001
L32	82.25 - 80	2.813	46	0.3176	0.0001
L33	80 - 75	2.665	46	0.3087	0.0001
L34	75 - 70	2.350	46	0.2924	0.0001
L35	70 - 65	2.053	46	0.2750	0.0001
L36	65 - 60	1.775	46	0.2564	0.0001
L37	60 - 58.5	1.516	46	0.2367	0.0001
L38	58.5 - 58.25	1.443	46	0.2316	0.0001
L39	58.25 - 53.25	1.431	46	0.2307	0.0001
L40	53.25 - 48.25	1.199	46	0.2110	0.0000
L41	48.25 - 48	0.989	46	0.1902	0.0000
L42	48 - 43	0.979	46	0.1894	0.0000
L43	43 - 40	0.790	46	0.1715	0.0000
L44	40 - 35	0.686	46	0.1604	0.0000
L45	35 - 32.08	0.528	46	0.1411	0.0000
L46	32.08 - 31.83	0.445	46	0.1293	0.0000
L47	31.83 - 28.75	0.439	46	0.1285	0.0000
L48	28.75 - 28.5	0.359	46	0.1181	0.0000
L49	28.5 - 23.5	0.353	46	0.1171	0.0000
L50	23.5 - 20	0.241	46	0.0965	0.0000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L51	20 - 19.75	0.176	46	0.0816	0.0000
L52	19.75 - 14.75	0.171	46	0.0806	0.0000
L53	14.75 - 9.75	0.097	46	0.0615	0.0000
L54	9.75 - 4.75	0.043	46	0.0414	0.0000
L55	4.75 - 0	0.010	46	0.0206	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Platform Mount [LP 403-1]	46	13.476	0.5890	0.0004	207318
187.00	SP2-5.8	46	13.352	0.5889	0.0004	207318
185.00	Side Arm Mount [SO 102-3]	46	13.106	0.5885	0.0004	207318
184.00	Side Arm Mount [SO 701-1]	46	12.983	0.5882	0.0004	173389
179.00	Platform Mount [LP 403-1]	46	12.368	0.5857	0.0004	100276
170.00	Platform Mount [LP 405-1]	46	11.269	0.5791	0.0003	50637
160.00	Platform Mount [LP 403-1]	46	10.071	0.5631	0.0003	31774
150.00	Platform Mount [LP 403-1]	46	8.910	0.5439	0.0003	22972
125.00	Side Arm Mount [SO 901-1]	46	6.266	0.4618	0.0001	13800
110.00	Side Arm Mount [SO 901-1]	46	4.909	0.4057	0.0001	17748
100.00	Side Arm Mount [SO 901-1]	46	4.094	0.3713	0.0001	17532
95.00	Side Arm Mount [SO 901-1]	46	3.713	0.3567	0.0001	18823
80.00	Side Arm Mount [SO 901-1]	46	2.665	0.3087	0.0001	16407
60.00	Jump Plate 120" x 6.5" x 1.25"	46	1.516	0.2367	0.0001	15083
40.00	(2) Jump Plate 120" x 6" x 1"	46	0.686	0.1604	0.0000	15192
20.00	(2) Jump Plate 120" x 6.5" x 1.25"	46	0.176	0.0816	0.0000	14188

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 185	59.272	16	2.5473	0.0019
L2	185 - 180	56.606	16	2.5452	0.0017
L3	180 - 175	53.947	16	2.5351	0.0015
L4	175 - 170	51.300	16	2.5233	0.0013
L5	170 - 165	48.668	16	2.5039	0.0011
L6	165 - 160	46.062	16	2.4749	0.0011
L7	160 - 155	43.492	16	2.4340	0.0011
L8	155 - 150	40.962	16	2.3978	0.0010
L9	150 - 145	38.476	16	2.3505	0.0011
L10	145 - 140	36.047	16	2.2897	0.0010
L11	140 - 135	33.689	16	2.2133	0.0008
L12	135 - 130	31.403	16	2.1517	0.0007
L13	130 - 125	29.188	16	2.0791	0.0007
L14	125 - 120	27.054	16	1.9954	0.0006
L15	120 - 115	25.014	16	1.9002	0.0006
L16	115 - 112.666	23.063	16	1.8254	0.0005
L17	112.666 - 112.416	22.181	16	1.7876	0.0005
L18	112.416 - 107.416	22.087	16	1.7844	0.0005
L19	107.416 - 103.333	20.254	16	1.7166	0.0005
L20	103.333 - 103.083	18.812	16	1.6563	0.0005
L21	103.083 - 100	18.725	16	1.6525	0.0005
L22	100 - 95	17.674	16	1.6037	0.0004
L23	95 - 90	16.028	16	1.5406	0.0004

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	90 - 89.5	14.450	16	1.4722	0.0004
L25	89.5 - 89.25	14.296	16	1.4651	0.0004
L26	89.25 - 85.5	14.220	16	1.4620	0.0004
L27	85.5 - 85.25	13.090	16	1.4144	0.0004
L28	85.25 - 84	13.016	16	1.4116	0.0004
L29	84 - 83.75	12.649	16	1.3971	0.0004
L30	83.75 - 82.5	12.576	16	1.3936	0.0004
L31	82.5 - 82.25	12.213	16	1.3758	0.0004
L32	82.25 - 80	12.141	16	1.3716	0.0004
L33	80 - 75	11.504	16	1.3332	0.0003
L34	75 - 70	10.145	16	1.2627	0.0003
L35	70 - 65	8.861	16	1.1873	0.0003
L36	65 - 60	7.660	16	1.1071	0.0003
L37	60 - 58.5	6.545	16	1.0219	0.0002
L38	58.5 - 58.25	6.227	16	1.0000	0.0002
L39	58.25 - 53.25	6.175	16	0.9958	0.0002
L40	53.25 - 48.25	5.176	16	0.9109	0.0002
L41	48.25 - 48	4.269	16	0.8212	0.0002
L42	48 - 43	4.226	16	0.8175	0.0002
L43	43 - 40	3.410	16	0.7405	0.0002
L44	40 - 35	2.960	16	0.6923	0.0001
L45	35 - 32.08	2.278	16	0.6089	0.0001
L46	32.08 - 31.83	1.921	16	0.5582	0.0001
L47	31.83 - 28.75	1.892	16	0.5546	0.0001
L48	28.75 - 28.5	1.549	16	0.5098	0.0001
L49	28.5 - 23.5	1.522	16	0.5055	0.0001
L50	23.5 - 20	1.039	16	0.4166	0.0001
L51	20 - 19.75	0.757	16	0.3519	0.0001
L52	19.75 - 14.75	0.739	16	0.3479	0.0001
L53	14.75 - 9.75	0.418	16	0.2652	0.0000
L54	9.75 - 4.75	0.185	16	0.1788	0.0000
L55	4.75 - 0	0.044	16	0.0888	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Platform Mount [LP 403-1]	16	58.205	2.5472	0.0018	48213
187.00	SP2-5.8	16	57.672	2.5469	0.0018	48213
185.00	Side Arm Mount [SO 102-3]	16	56.606	2.5452	0.0017	48213
184.00	Side Arm Mount [SO 701-1]	16	56.074	2.5437	0.0017	40443
179.00	Platform Mount [LP 403-1]	16	53.417	2.5329	0.0015	23734
170.00	Platform Mount [LP 405-1]	16	48.668	2.5039	0.0011	11887
160.00	Platform Mount [LP 403-1]	16	43.492	2.4340	0.0011	7397
150.00	Platform Mount [LP 403-1]	16	38.476	2.3505	0.0011	5347
125.00	Side Arm Mount [SO 901-1]	16	27.054	1.9954	0.0006	3211
110.00	Side Arm Mount [SO 901-1]	16	21.193	1.7526	0.0005	4123
100.00	Side Arm Mount [SO 901-1]	16	17.674	1.6037	0.0004	4067
95.00	Side Arm Mount [SO 901-1]	16	16.028	1.5406	0.0004	4364
80.00	Side Arm Mount [SO 901-1]	16	11.504	1.3332	0.0004	3800
60.00	Jump Plate 120" x 6.5" x 1.25"	16	6.545	1.0219	0.0002	3494
40.00	(2) Jump Plate 120" x 6" x 1"	16	2.960	0.6923	0.0002	3519
20.00	(2) Jump Plate 120" x 6.5" x 1.25"	16	0.757	0.3519	0.0001	3287

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	190 - 185 (1)	P30x0.375	5.00	0.00	0.0	34.9011	-3.31	1311.06	0.003
L2	185 - 180 (2)	P30x0.375	5.00	0.00	0.0	34.9011	-4.75	1311.06	0.004
L3	180 - 175 (3)	P36x0.375	5.00	0.00	0.0	41.9697	-7.74	1490.10	0.005
L4	175 - 170 (4)	P36x0.375	5.00	0.00	0.0	41.9697	-8.62	1490.10	0.006
L5	170 - 165 (5)	P36x0.375	5.00	0.00	0.0	41.9697	-12.88	1490.10	0.009
L6	165 - 160 (6)	P36x0.375	5.00	0.00	0.0	41.9697	-13.83	1490.10	0.009
L7	160 - 155 (7)	P42x0.375	5.00	0.00	0.0	49.0383	-18.63	1668.87	0.011
L8	155 - 150 (8)	P42x0.375	5.00	0.00	0.0	49.0383	-19.81	1668.87	0.012
L9	150 - 145 (9)	P42x0.375	5.00	0.00	0.0	49.0383	-24.41	1668.87	0.015
L10	145 - 140 (10)	P42x0.375	5.00	0.00	0.0	49.0383	-25.68	1668.87	0.015
L11	140 - 135 (11)	P48x0.375	5.00	0.00	0.0	56.1069	-27.09	1847.49	0.015
L12	135 - 130 (12)	P48x0.375	5.00	0.00	0.0	56.1069	-28.50	1847.49	0.015
L13	130 - 125 (13)	P48x0.375	5.00	0.00	0.0	56.1069	-29.92	1847.49	0.016
L14	125 - 120 (14)	P48x0.375	5.00	0.00	0.0	56.1069	-31.61	1847.49	0.017
L15	120 - 115 (15)	P54x0.375	5.00	0.00	0.0	63.1755	-33.18	2026.00	0.016
L16	115 - 112.666 (16)	P54x0.375	2.33	0.00	0.0	63.1755	-33.91	2026.00	0.017
L17	112.666 - 112.416 (17)	P54x0.4875	0.25	0.00	0.0	81.9558	-34.01	2797.17	0.012
L18	112.416 - 107.416 (18)	P54x0.4875	5.00	0.00	0.0	81.9558	-36.22	2797.17	0.013
L19	107.416 - 103.333 (19)	P54x0.4875	4.08	0.00	0.0	81.9558	-37.80	2797.17	0.014
L20	103.333 - 103.083 (20)	P54x0.4875	0.25	0.00	0.0	81.9558	-37.90	2797.17	0.014
L21	103.083 - 100 (21)	P54x0.4875	3.08	0.00	0.0	81.9558	-39.09	2797.17	0.014
L22	100 - 95 (22)	P60x0.475	5.00	0.00	0.0	88.8266	-41.34	2934.04	0.014
L23	95 - 90 (23)	P60x0.475	5.00	0.00	0.0	88.8266	-43.75	2934.04	0.015
L24	90 - 89.5 (24)	P60x0.475	0.50	0.00	0.0	88.8266	-43.97	2934.04	0.015
L25	89.5 - 89.25 (25)	P60x0.55625	0.25	0.00	0.0	103.8790	-44.09	3570.37	0.012
L26	89.25 - 85.5 (26)	P60x0.55625	3.75	0.00	0.0	103.8790	-45.89	3570.37	0.013
L27	85.5 - 85.25 (27)	P60x0.6375	0.25	0.00	0.0	118.8890	-46.03	4245.55	0.011
L28	85.25 - 84 (28)	P60x0.6375	1.25	0.00	0.0	118.8890	-46.70	4245.55	0.011
L29	84 - 83.75 (29)	P60x0.525	0.25	0.00	0.0	98.0943	-46.81	3321.02	0.014
L30	83.75 - 82.5 (30)	P60x0.525	1.25	0.00	0.0	98.0943	-47.39	3321.02	0.014
L31	82.5 - 82.25 (31)	P60x0.45	0.25	0.00	0.0	84.1868	-47.50	2746.08	0.017
L32	82.25 - 80 (32)	P60x0.45	2.25	0.00	0.0	84.1868	-48.42	2746.08	0.018
L33	80 - 75 (33)	P60x0.575	5.00	0.00	0.0	107.3460	-51.96	3722.74	0.014
L34	75 - 70 (34)	P60x0.575	5.00	0.00	0.0	107.3460	-54.49	3722.74	0.015

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L35	70 - 65 (35)	P60x0.575	5.00	0.00	0.0	107.3460	-57.02	3722.74	0.015
L36	65 - 60 (36)	P60x0.575	5.00	0.00	0.0	107.3460	-59.55	3722.74	0.016
L37	60 - 58.5 (37)	P60x0.7	1.50	0.00	0.0	130.4080	-61.92	4791.24	0.013
L38	58.5 - 58.25 (38)	P60x0.625	0.25	0.00	0.0	116.5830	-62.06	4139.15	0.015
L39	58.25 - 53.25 (39)	P60x0.625	5.00	0.00	0.0	116.5830	-64.79	4139.15	0.016
L40	53.25 - 48.25 (40)	P60x0.625	5.00	0.00	0.0	116.5830	-67.53	4139.15	0.016
L41	48.25 - 48 (41)	P60x0.775	0.25	0.00	0.0	144.1970	-67.70	5450.65	0.012
L42	48 - 43 (42)	P60x0.775	5.00	0.00	0.0	144.1970	-70.92	5450.65	0.013
L43	43 - 40 (43)	P60x0.775	3.00	0.00	0.0	144.1970	-72.86	5450.65	0.013
L44	40 - 35 (44)	P60x0.775	5.00	0.00	0.0	144.1970	-78.22	5450.65	0.014
L45	35 - 32.08 (45)	P60x0.775	2.92	0.00	0.0	144.1970	-80.11	5450.65	0.015
L46	32.08 - 31.83 (46)	P60x0.9625	0.25	0.00	0.0	178.5170	-80.32	6747.93	0.012
L47	31.83 - 28.75 (47)	P60x0.9625	3.08	0.00	0.0	178.5170	-82.70	6747.93	0.012
L48	28.75 - 28.5 (48)	P60x0.8125	0.25	0.00	0.0	151.0790	-82.88	5710.78	0.015
L49	28.5 - 23.5 (49)	P60x0.8125	5.00	0.00	0.0	151.0790	-86.27	5710.78	0.015
L50	23.5 - 20 (50)	P60x0.8125	3.50	0.00	0.0	151.0790	-88.65	5710.78	0.016
L51	20 - 19.75 (51)	P60x0.95	0.25	0.00	0.0	176.2350	-91.79	6661.70	0.014
L52	19.75 - 14.75 (52)	P60x0.95	5.00	0.00	0.0	176.2350	-95.65	6661.70	0.014
L53	14.75 - 9.75 (53)	P60x0.95	5.00	0.00	0.0	176.2350	-99.48	6661.70	0.015
L54	9.75 - 4.75 (54)	P60x0.95	5.00	0.00	0.0	176.2350	-103.13	6661.70	0.015
L55	4.75 - 0 (55)	P60x0.95	4.75	0.00	0.0	176.2350	-106.51	6661.70	0.016

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	190 - 185 (1)	P30x0.375	14.60	947.86	0.015	0.00	947.86	0.000
L2	185 - 180 (2)	P30x0.375	39.45	947.86	0.042	0.00	947.86	0.000
L3	180 - 175 (3)	P36x0.375	74.02	1338.81	0.055	0.00	1338.81	0.000
L4	175 - 170 (4)	P36x0.375	110.54	1338.81	0.083	0.00	1338.81	0.000
L5	170 - 165 (5)	P36x0.375	164.79	1338.81	0.123	0.00	1338.81	0.000
L6	165 - 160 (6)	P36x0.375	221.25	1338.81	0.165	0.00	1338.81	0.000
L7	160 - 155 (7)	P42x0.375	312.54	1796.56	0.174	0.00	1796.56	0.000
L8	155 - 150 (8)	P42x0.375	396.21	1796.56	0.221	0.00	1796.56	0.000
L9	150 - 145 (9)	P42x0.375	512.07	1796.56	0.285	0.00	1796.56	0.000
L10	145 - 140 (10)	P42x0.375	630.29	1796.56	0.351	0.00	1796.56	0.000
L11	140 - 135 (11)	P48x0.375	750.96	2321.11	0.324	0.00	2321.11	0.000
L12	135 - 130 (12)	P48x0.375	874.12	2321.11	0.377	0.00	2321.11	0.000
L13	130 - 125 (13)	P48x0.375	999.70	2321.11	0.431	0.00	2321.11	0.000
L14	125 - 120 (14)	P48x0.375	1128.97	2321.11	0.486	0.00	2321.11	0.000
L15	120 - 115 (15)	P54x0.375	1260.66	2912.46	0.433	0.00	2912.46	0.000
L16	115 - 112.666 (16)	P54x0.375	1323.06	2912.46	0.454	0.00	2912.46	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L17	112.666 - 112.416 (17)	P54x0.4875	1329.78	3864.47	0.344	0.00	3864.47	0.000
L18	112.416 - 107.416 (18)	P54x0.4875	1466.53	3864.47	0.379	0.00	3864.47	0.000
L19	107.416 - 103.333 (19)	P54x0.4875	1580.18	3864.47	0.409	0.00	3864.47	0.000
L20	103.333 - 103.083 (20)	P54x0.4875	1587.21	3864.47	0.411	0.00	3864.47	0.000
L21	103.083 - 100 (21)	P54x0.4875	1674.35	3864.47	0.433	0.00	3864.47	0.000
L22	100 - 95 (22)	P60x0.475	1817.86	4598.57	0.395	0.00	4598.57	0.000
L23	95 - 90 (23)	P60x0.475	1966.40	4598.57	0.428	0.00	4598.57	0.000
L24	90 - 89.5 (24)	P60x0.475	1981.31	4598.57	0.431	0.00	4598.57	0.000
L25	89.5 - 89.25 (25)	P60x0.55625	1988.78	5456.53	0.364	0.00	5456.53	0.000
L26	89.25 - 85.5 (26)	P60x0.55625	2101.68	5456.53	0.385	0.00	5456.53	0.000
L27	85.5 - 85.25 (27)	P60x0.6375	2109.27	6334.56	0.333	0.00	6334.56	0.000
L28	85.25 - 84 (28)	P60x0.6375	2147.32	6334.56	0.339	0.00	6334.56	0.000
L29	84 - 83.75 (29)	P60x0.525	2154.95	5124.16	0.421	0.00	5124.16	0.000
L30	83.75 - 82.5 (30)	P60x0.525	2193.22	5124.16	0.428	0.00	5124.16	0.000
L31	82.5 - 82.25 (31)	P60x0.45	2200.90	4338.67	0.507	0.00	4338.67	0.000
L32	82.25 - 80 (32)	P60x0.45	2270.29	4338.67	0.523	0.00	4338.67	0.000
L33	80 - 75 (33)	P60x0.575	2429.77	5657.38	0.429	0.00	5657.38	0.000
L34	75 - 70 (34)	P60x0.575	2591.29	5657.38	0.458	0.00	5657.38	0.000
L35	70 - 65 (35)	P60x0.575	2755.29	5657.38	0.487	0.00	5657.38	0.000
L36	65 - 60 (36)	P60x0.575	2921.65	5657.38	0.516	0.00	5657.38	0.000
L37	60 - 58.5 (37)	P60x0.7	2972.77	7023.43	0.423	0.00	7023.43	0.000
L38	58.5 - 58.25 (38)	P60x0.625	2981.31	6198.18	0.481	0.00	6198.18	0.000
L39	58.25 - 53.25 (39)	P60x0.625	3153.22	6198.18	0.509	0.00	6198.18	0.000
L40	53.25 - 48.25 (40)	P60x0.625	3327.17	6198.18	0.537	0.00	6198.18	0.000
L41	48.25 - 48 (41)	P60x0.775	3335.92	7865.35	0.424	0.00	7865.35	0.000
L42	48 - 43 (42)	P60x0.775	3512.01	7865.35	0.447	0.00	7865.35	0.000
L43	43 - 40 (43)	P60x0.775	3618.63	7865.35	0.460	0.00	7865.35	0.000
L44	40 - 35 (44)	P60x0.775	3801.88	7865.35	0.483	0.00	7865.35	0.000
L45	35 - 32.08 (45)	P60x0.775	3909.73	7865.35	0.497	0.00	7865.35	0.000
L46	32.08 - 31.83 (46)	P60x0.9625	3919.00	10041.58	0.390	0.00	10041.58	0.000
L47	31.83 - 28.75 (47)	P60x0.9625	4033.50	10041.58	0.402	0.00	10041.58	0.000
L48	28.75 - 28.5 (48)	P60x0.8125	4042.82	8292.48	0.488	0.00	8292.48	0.000
L49	28.5 - 23.5 (49)	P60x0.8125	4230.15	8292.48	0.510	0.00	8292.48	0.000
L50	23.5 - 20 (50)	P60x0.8125	4362.19	8292.48	0.526	0.00	8292.48	0.000
L51	20 - 19.75 (51)	P60x0.95	4371.85	9893.33	0.442	0.00	9893.33	0.000
L52	19.75 - 14.75 (52)	P60x0.95	4565.86	9893.33	0.462	0.00	9893.33	0.000
L53	14.75 - 9.75 (53)	P60x0.95	4761.23	9893.33	0.481	0.00	9893.33	0.000
L54	9.75 - 4.75 (54)	P60x0.95	4957.71	9893.33	0.501	0.00	9893.33	0.000
L55	4.75 - 0 (55)	P60x0.95	5145.47	9893.33	0.520	0.00	9893.33	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	190 - 185 (1)	P30x0.375	3.53	655.53	0.005	0.68	1598.37	0.000
L2	185 - 180 (2)	P30x0.375	4.84	655.53	0.007	0.25	1598.37	0.000
L3	180 - 175 (3)	P36x0.375	7.09	745.05	0.010	0.65	2189.07	0.000
L4	175 - 170 (4)	P36x0.375	7.51	745.05	0.010	0.65	2189.07	0.000
L5	170 - 165 (5)	P36x0.375	11.08	745.05	0.015	1.15	2189.07	0.001
L6	165 - 160 (6)	P36x0.375	11.49	745.05	0.015	1.15	2189.07	0.001
L7	160 - 155 (7)	P42x0.375	16.52	834.44	0.020	1.51	2868.84	0.001
L8	155 - 150 (8)	P42x0.375	16.99	834.44	0.020	1.51	2868.84	0.001
L9	150 - 145 (9)	P42x0.375	23.44	834.44	0.028	0.06	2868.84	0.000
L10	145 - 140 (10)	P42x0.375	23.84	834.44	0.029	0.01	2868.84	0.000
L11	140 - 135 (11)	P48x0.375	24.35	923.75	0.026	0.01	3637.70	0.000
L12	135 - 130 (12)	P48x0.375	24.84	923.75	0.027	0.01	3637.70	0.000
L13	130 - 125 (13)	P48x0.375	25.32	923.75	0.027	0.01	3637.70	0.000
L14	125 - 120 (14)	P48x0.375	26.07	923.75	0.028	0.34	3637.70	0.000
L15	120 - 115 (15)	P54x0.375	26.61	1013.00	0.026	0.34	4495.63	0.000
L16	115 - 112.666 (16)	P54x0.375	26.87	1013.00	0.027	0.34	4495.63	0.000
L17	112.666 - 112.416 (17)	P54x0.4875	26.89	1398.58	0.019	0.34	6181.02	0.000
L18	112.416 - 107.416 (18)	P54x0.4875	27.61	1398.58	0.020	0.03	6181.02	0.000
L19	107.416 - 103.333 (19)	P54x0.4875	28.07	1398.58	0.020	0.03	6181.02	0.000
L20	103.333 - 103.083 (20)	P54x0.4875	28.10	1398.58	0.020	0.03	6181.02	0.000
L21	103.083 - 100 (21)	P54x0.4875	28.44	1398.58	0.020	0.03	6181.02	0.000
L22	100 - 95 (22)	P60x0.475	29.06	1467.02	0.020	0.12	7219.87	0.000
L23	95 - 90 (23)	P60x0.475	29.78	1467.02	0.020	0.08	7219.87	0.000
L24	90 - 89.5 (24)	P60x0.475	29.84	1467.02	0.020	0.08	7219.87	0.000
L25	89.5 - 89.25 (25)	P60x0.55625	29.87	1785.19	0.017	0.08	8762.00	0.000
L26	89.25 - 85.5 (26)	P60x0.55625	30.32	1785.19	0.017	0.08	8762.00	0.000
L27	85.5 - 85.25 (27)	P60x0.6375	30.34	2122.77	0.014	0.08	10390.75	0.000
L28	85.25 - 84 (28)	P60x0.6375	30.50	2122.77	0.014	0.08	10390.75	0.000
L29	84 - 83.75 (29)	P60x0.525	30.53	1660.51	0.018	0.08	8158.53	0.000
L30	83.75 - 82.5 (30)	P60x0.525	30.68	1660.51	0.018	0.08	8158.53	0.000
L31	82.5 - 82.25 (31)	P60x0.45	30.70	1373.04	0.022	0.08	6763.00	0.000
L32	82.25 - 80 (32)	P60x0.45	30.95	1373.04	0.023	0.08	6763.00	0.000
L33	80 - 75 (33)	P60x0.575	32.04	1861.37	0.017	0.33	9130.17	0.000
L34	75 - 70 (34)	P60x0.575	32.54	1861.37	0.017	0.33	9130.17	0.000
L35	70 - 65 (35)	P60x0.575	33.03	1861.37	0.018	0.33	9130.17	0.000
L36	65 - 60 (36)	P60x0.575	33.49	1861.37	0.018	0.33	9130.17	0.000
L37	60 - 58.5 (37)	P60x0.7	34.14	2395.62	0.014	0.33	11701.92	0.000
L38	58.5 - 58.25 (38)	P60x0.625	34.15	2069.58	0.017	0.33	10134.58	0.000
L39	58.25 - 53.25 (39)	P60x0.625	34.58	2069.58	0.017	0.33	10134.58	0.000
L40	53.25 - 48.25 (40)	P60x0.625	34.98	2069.58	0.017	0.33	10134.58	0.000
L41	48.25 - 48 (41)	P60x0.775	34.99	2725.33	0.013	0.33	13279.17	0.000
L42	48 - 43 (42)	P60x0.775	35.41	2725.33	0.013	0.33	13279.17	0.000
L43	43 - 40 (43)	P60x0.775	35.65	2725.33	0.013	0.33	13279.17	0.000
L44	40 - 35 (44)	P60x0.775	36.82	2725.33	0.014	0.33	13279.17	0.000
L45	35 - 32.08 (45)	P60x0.775	37.04	2725.33	0.014	0.33	13279.17	0.000
L46	32.08 - 31.83 (46)	P60x0.9625	37.04	3373.96	0.011	0.33	16337.25	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 $\frac{T_u}{\phi T_n}$
L47	31.83 - 28.75 (47)	P60x0.9625	37.28	3373.96	0.011	0.33	16337.25	0.000
L48	28.75 - 28.5 (48)	P60x0.8125	37.29	2855.39	0.013	0.33	13895.50	0.000
L49	28.5 - 23.5 (49)	P60x0.8125	37.62	2855.39	0.013	0.33	13895.50	0.000
L50	23.5 - 20 (50)	P60x0.8125	37.82	2855.39	0.013	0.33	13895.50	0.000
L51	20 - 19.75 (51)	P60x0.95	38.64	3330.85	0.012	0.33	16135.25	0.000
L52	19.75 - 14.75 (52)	P60x0.95	38.94	3330.85	0.012	0.33	16135.25	0.000
L53	14.75 - 9.75 (53)	P60x0.95	39.20	3330.85	0.012	0.33	16135.25	0.000
L54	9.75 - 4.75 (54)	P60x0.95	39.44	3330.85	0.012	0.33	16135.25	0.000
L55	4.75 - 0 (55)	P60x0.95	39.65	3330.85	0.012	0.33	16135.25	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	190 - 185 (1)	0.003	0.015	0.000	0.005	0.000	0.018	1.000	4.8.2
L2	185 - 180 (2)	0.004	0.042	0.000	0.007	0.000	0.045	1.000	4.8.2
L3	180 - 175 (3)	0.005	0.055	0.000	0.010	0.000	0.061	1.000	4.8.2
L4	175 - 170 (4)	0.006	0.083	0.000	0.010	0.000	0.088	1.000	4.8.2
L5	170 - 165 (5)	0.009	0.123	0.000	0.015	0.001	0.132	1.000	4.8.2
L6	165 - 160 (6)	0.009	0.165	0.000	0.015	0.001	0.175	1.000	4.8.2
L7	160 - 155 (7)	0.011	0.174	0.000	0.020	0.001	0.186	1.000	4.8.2
L8	155 - 150 (8)	0.012	0.221	0.000	0.020	0.001	0.233	1.000	4.8.2
L9	150 - 145 (9)	0.015	0.285	0.000	0.028	0.000	0.300	1.000	4.8.2
L10	145 - 140 (10)	0.015	0.351	0.000	0.029	0.000	0.367	1.000	4.8.2
L11	140 - 135 (11)	0.015	0.324	0.000	0.026	0.000	0.339	1.000	4.8.2
L12	135 - 130 (12)	0.015	0.377	0.000	0.027	0.000	0.393	1.000	4.8.2
L13	130 - 125 (13)	0.016	0.431	0.000	0.027	0.000	0.448	1.000	4.8.2
L14	125 - 120 (14)	0.017	0.486	0.000	0.028	0.000	0.504	1.000	4.8.2
L15	120 - 115 (15)	0.016	0.433	0.000	0.026	0.000	0.450	1.000	4.8.2
L16	115 - 112.666 (16)	0.017	0.454	0.000	0.027	0.000	0.472	1.000	4.8.2
L17	112.666 - 112.416 (17)	0.012	0.344	0.000	0.019	0.000	0.357	1.000	4.8.2
L18	112.416 - 107.416 (18)	0.013	0.379	0.000	0.020	0.000	0.393	1.000	4.8.2
L19	107.416 - 103.333 (19)	0.014	0.409	0.000	0.020	0.000	0.423	1.000	4.8.2
L20	103.333 - 103.083 (20)	0.014	0.411	0.000	0.020	0.000	0.425	1.000	4.8.2
L21	103.083 - 100 (21)	0.014	0.433	0.000	0.020	0.000	0.448	1.000	4.8.2
L22	100 - 95 (22)	0.014	0.395	0.000	0.020	0.000	0.410	1.000	4.8.2
L23	95 - 90 (23)	0.015	0.428	0.000	0.020	0.000	0.443	1.000	4.8.2
L24	90 - 89.5 (24)	0.015	0.431	0.000	0.020	0.000	0.446	1.000	4.8.2
L25	89.5 - 89.25 (25)	0.012	0.364	0.000	0.017	0.000	0.377	1.000	4.8.2
L26	89.25 - 85.5 (26)	0.013	0.385	0.000	0.017	0.000	0.398	1.000	4.8.2
L27	85.5 - 85.25 (27)	0.011	0.333	0.000	0.014	0.000	0.344	1.000	4.8.2
L28	85.25 - 84 (28)	0.011	0.339	0.000	0.014	0.000	0.350	1.000	4.8.2
L29	84 - 83.75 (29)	0.014	0.421	0.000	0.018	0.000	0.435	1.000	4.8.2
L30	83.75 - 82.5	0.014	0.428	0.000	0.018	0.000	0.443	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
	(30)								
L31	82.5 - 82.25	0.017	0.507	0.000	0.022	0.000	0.525	1.000	4.8.2
	(31)								
L32	82.25 - 80	0.018	0.523	0.000	0.023	0.000	0.541	1.000	4.8.2
	(32)								
L33	80 - 75 (33)	0.014	0.429	0.000	0.017	0.000	0.444	1.000	4.8.2
L34	75 - 70 (34)	0.015	0.458	0.000	0.017	0.000	0.473	1.000	4.8.2
L35	70 - 65 (35)	0.015	0.487	0.000	0.018	0.000	0.503	1.000	4.8.2
L36	65 - 60 (36)	0.016	0.516	0.000	0.018	0.000	0.533	1.000	4.8.2
L37	60 - 58.5 (37)	0.013	0.423	0.000	0.014	0.000	0.436	1.000	4.8.2
L38	58.5 - 58.25	0.015	0.481	0.000	0.017	0.000	0.496	1.000	4.8.2
	(38)								
L39	58.25 - 53.25	0.016	0.509	0.000	0.017	0.000	0.525	1.000	4.8.2
	(39)								
L40	53.25 - 48.25	0.016	0.537	0.000	0.017	0.000	0.553	1.000	4.8.2
	(40)								
L41	48.25 - 48	0.012	0.424	0.000	0.013	0.000	0.437	1.000	4.8.2
	(41)								
L42	48 - 43 (42)	0.013	0.447	0.000	0.013	0.000	0.460	1.000	4.8.2
L43	43 - 40 (43)	0.013	0.460	0.000	0.013	0.000	0.474	1.000	4.8.2
L44	40 - 35 (44)	0.014	0.483	0.000	0.014	0.000	0.498	1.000	4.8.2
L45	35 - 32.08	0.015	0.497	0.000	0.014	0.000	0.512	1.000	4.8.2
	(45)								
L46	32.08 - 31.83	0.012	0.390	0.000	0.011	0.000	0.402	1.000	4.8.2
	(46)								
L47	31.83 - 28.75	0.012	0.402	0.000	0.011	0.000	0.414	1.000	4.8.2
	(47)								
L48	28.75 - 28.5	0.015	0.488	0.000	0.013	0.000	0.502	1.000	4.8.2
	(48)								
L49	28.5 - 23.5	0.015	0.510	0.000	0.013	0.000	0.525	1.000	4.8.2
	(49)								
L50	23.5 - 20 (50)	0.016	0.526	0.000	0.013	0.000	0.542	1.000	4.8.2
L51	20 - 19.75	0.014	0.442	0.000	0.012	0.000	0.456	1.000	4.8.2
	(51)								
L52	19.75 - 14.75	0.014	0.462	0.000	0.012	0.000	0.476	1.000	4.8.2
	(52)								
L53	14.75 - 9.75	0.015	0.481	0.000	0.012	0.000	0.496	1.000	4.8.2
	(53)								
L54	9.75 - 4.75	0.015	0.501	0.000	0.012	0.000	0.517	1.000	4.8.2
	(54)								
L55	4.75 - 0 (55)	0.016	0.520	0.000	0.012	0.000	0.536	1.000	4.8.2

Section Capacity Table

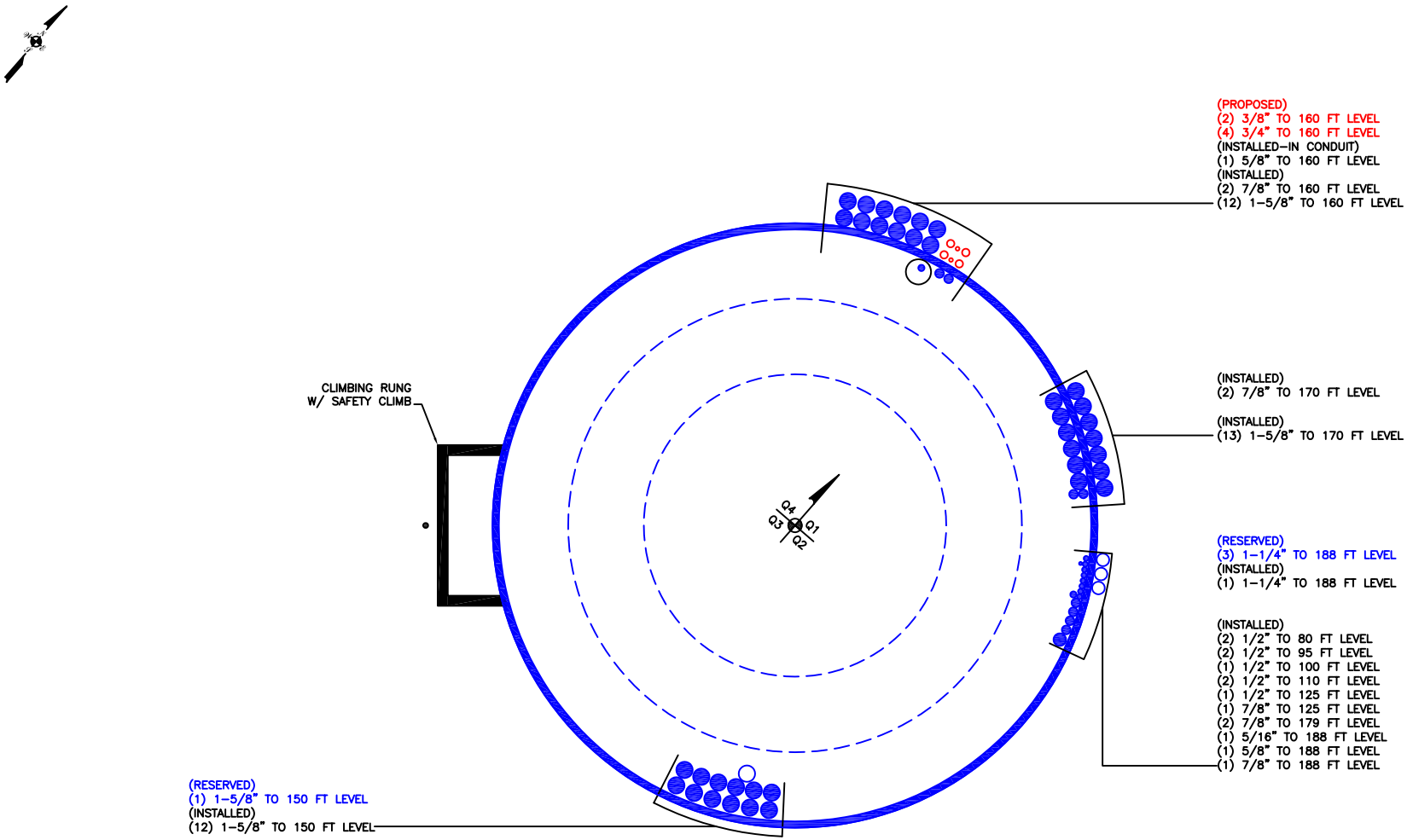
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	190 - 185	Pole	P30x0.375	1	-3.31	1311.06	1.8	Pass
L2	185 - 180	Pole	P30x0.375	2	-4.75	1311.06	4.5	Pass
L3	180 - 175	Pole	P36x0.375	3	-7.74	1490.10	6.1	Pass
L4	175 - 170	Pole	P36x0.375	4	-8.62	1490.10	8.8	Pass
L5	170 - 165	Pole	P36x0.375	5	-12.88	1490.10	13.2	Pass
L6	165 - 160	Pole	P36x0.375	6	-13.83	1490.10	17.5	Pass
L7	160 - 155	Pole	P42x0.375	7	-18.63	1668.87	18.6	Pass
L8	155 - 150	Pole	P42x0.375	8	-19.81	1668.87	23.3	Pass
L9	150 - 145	Pole	P42x0.375	9	-24.41	1668.87	30.0	Pass
L10	145 - 140	Pole	P42x0.375	10	-25.68	1668.87	36.7	Pass
L11	140 - 135	Pole	P48x0.375	11	-27.09	1847.49	33.9	Pass
L12	135 - 130	Pole	P48x0.375	12	-28.50	1847.49	39.3	Pass
L13	130 - 125	Pole	P48x0.375	13	-29.92	1847.49	44.8	Pass
L14	125 - 120	Pole	P48x0.375	14	-31.61	1847.49	50.4	Pass
L15	120 - 115	Pole	P54x0.375	15	-33.18	2026.00	45.0	Pass
L16	115 - 112.666	Pole	P54x0.375	16	-33.91	2026.00	47.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L17	112.666 - 112.416	Pole	P54x0.4875	17	-34.01	2797.17	35.7	Pass
L18	112.416 - 107.416	Pole	P54x0.4875	18	-36.22	2797.17	39.3	Pass
L19	107.416 - 103.333	Pole	P54x0.4875	19	-37.80	2797.17	42.3	Pass
L20	103.333 - 103.083	Pole	P54x0.4875	20	-37.90	2797.17	42.5	Pass
L21	103.083 - 100	Pole	P54x0.4875	21	-39.09	2797.17	44.8	Pass
L22	100 - 95	Pole	P60x0.475	22	-41.34	2934.04	41.0	Pass
L23	95 - 90	Pole	P60x0.475	23	-43.75	2934.04	44.3	Pass
L24	90 - 89.5	Pole	P60x0.475	24	-43.97	2934.04	44.6	Pass
L25	89.5 - 89.25	Pole	P60x0.55625	25	-44.09	3570.37	37.7	Pass
L26	89.25 - 85.5	Pole	P60x0.55625	26	-45.89	3570.37	39.8	Pass
L27	85.5 - 85.25	Pole	P60x0.6375	27	-46.03	4245.55	34.4	Pass
L28	85.25 - 84	Pole	P60x0.6375	28	-46.70	4245.55	35.0	Pass
L29	84 - 83.75	Pole	P60x0.525	29	-46.81	3321.02	43.5	Pass
L30	83.75 - 82.5	Pole	P60x0.525	30	-47.39	3321.02	44.3	Pass
L31	82.5 - 82.25	Pole	P60x0.45	31	-47.50	2746.08	52.5	Pass
L32	82.25 - 80	Pole	P60x0.45	32	-48.42	2746.08	54.1	Pass
L33	80 - 75	Pole	P60x0.575	33	-51.96	3722.74	44.4	Pass
L34	75 - 70	Pole	P60x0.575	34	-54.49	3722.74	47.3	Pass
L35	70 - 65	Pole	P60x0.575	35	-57.02	3722.74	50.3	Pass
L36	65 - 60	Pole	P60x0.575	36	-59.55	3722.74	53.3	Pass
L37	60 - 58.5	Pole	P60x0.7	37	-61.92	4791.24	43.6	Pass
L38	58.5 - 58.25	Pole	P60x0.625	38	-62.06	4139.15	49.6	Pass
L39	58.25 - 53.25	Pole	P60x0.625	39	-64.79	4139.15	52.5	Pass
L40	53.25 - 48.25	Pole	P60x0.625	40	-67.53	4139.15	55.3	Pass
L41	48.25 - 48	Pole	P60x0.775	41	-67.70	5450.65	43.7	Pass
L42	48 - 43	Pole	P60x0.775	42	-70.92	5450.65	46.0	Pass
L43	43 - 40	Pole	P60x0.775	43	-72.86	5450.65	47.4	Pass
L44	40 - 35	Pole	P60x0.775	44	-78.22	5450.65	49.8	Pass
L45	35 - 32.08	Pole	P60x0.775	45	-80.11	5450.65	51.2	Pass
L46	32.08 - 31.83	Pole	P60x0.9625	46	-80.32	6747.93	40.2	Pass
L47	31.83 - 28.75	Pole	P60x0.9625	47	-82.70	6747.93	41.4	Pass
L48	28.75 - 28.5	Pole	P60x0.8125	48	-82.88	5710.78	50.2	Pass
L49	28.5 - 23.5	Pole	P60x0.8125	49	-86.27	5710.78	52.5	Pass
L50	23.5 - 20	Pole	P60x0.8125	50	-88.65	5710.78	54.2	Pass
L51	20 - 19.75	Pole	P60x0.95	51	-91.79	6661.70	45.6	Pass
L52	19.75 - 14.75	Pole	P60x0.95	52	-95.65	6661.70	47.6	Pass
L53	14.75 - 9.75	Pole	P60x0.95	53	-99.48	6661.70	49.6	Pass
L54	9.75 - 4.75	Pole	P60x0.95	54	-103.13	6661.70	51.7	Pass
L55	4.75 - 0	Pole	P60x0.95	55	-106.51	6661.70	53.6	Pass
							Summary	
						Pole (L40)	55.3	Pass
						RATING =	**55.3**	**Pass**

Note: Above stress ratio for reinforced sections are approximate. More exact calculation are presented in Appendix C.

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 829046 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 829046

Work Order: 1524908

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	190	10		0	30	30	0.375	n/a	A53-B-42
2	180	20		0	36.00	36	0.375	n/a	A53-B-42
3	160	20		0	42.00	42	0.375	n/a	A53-B-42
4	140	20		0	48.00	48	0.375	n/a	A53-B-42
5	120	20		0	54.00	54	0.375	n/a	A53-B-42
6	100	20		0	60.00	60	0.375	n/a	A53-B-42
7	80	20		0	60.00	60	0.5	n/a	A53-B-42
8	60	20		0	60.00	60	0.625	n/a	A53-B-42
9	40	20		0	60.00	60	0.625	n/a	A53-B-42
10	20	20		0	60.00	60	0.75	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	32.08	plate	MS-850 (1.1875")	3	0	120	240															
2	28.75	48.25	plate	MS-650 (1.1875")	3	24	144	264															
3	58.5	85.5	plate	MS-450 (1.25")	3	0	120	240															
4	84	103.333	plate	MS-600 (1.1875")	3	21	141	261															
5	103.333	112.666	plate	MS-600 (1.1875")	3				0	120	240												
6	82.5	89.5	plate	MS-450 (1.1875")	3							90	210	330									
7																							
8																							
9		20																					
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	8.5	1.25	10.625	0.625	45.000	45.000	17.250	9.063	1.1875	A572-65
2	6.5	1.25	8.125	0.625	33.000	33.000	19.250	6.563	1.1875	A572-65
3	4.5	1	4.5	0.5	18.000	18.000	20.625	3.188	1.2500	A572-65
4	6	1	6	0.5	24.000	24.000	16.375	4.750	1.1875	A572-65
5	6	1	6	0.5	24.000	24.000	16.375	4.750	1.1875	A572-65
6	4.5	1	4.5	0.5	18.000	18.000	20.625	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	190 - 185	5		0	30.000	30.000	0.375	A53-B-42	1.000
2	185 - 180	5	0	0	30.000	30.000	0.375	A53-B-42	1.000
3	180 - 175	5		0	36.000	36.000	0.375	A53-B-42	1.000
4	175 - 170	5		0	36.000	36.000	0.375	A53-B-42	1.000
5	170 - 165	5		0	36.000	36.000	0.375	A53-B-42	1.000
6	165 - 160	5	0	0	36.000	36.000	0.375	A53-B-42	1.000
7	160 - 155	5		0	42.000	42.000	0.375	A53-B-42	1.000
8	155 - 150	5		0	42.000	42.000	0.375	A53-B-42	1.000
9	150 - 145	5		0	42.000	42.000	0.375	A53-B-42	1.000
10	145 - 140	5	0	0	42.000	42.000	0.375	A53-B-42	1.000
11	140 - 135	5		0	48.000	48.000	0.375	A53-B-42	1.000
12	135 - 130	5		0	48.000	48.000	0.375	A53-B-42	1.000
13	130 - 125	5		0	48.000	48.000	0.375	A53-B-42	1.000
14	125 - 120	5	0	0	48.000	48.000	0.375	A53-B-42	1.000
15	120 - 115	5		0	54.000	54.000	0.375	A53-B-42	1.000
16	115 - 112.666	2.334		0	54.000	54.000	0.375	A53-B-42	1.000
17	112.666 - 112.416	0.25		0	54.000	54.000	0.4875	A53-B-42	0.990
18	112.416 - 107.416	5		0	54.000	54.000	0.4875	A53-B-42	0.990
19	107.416 - 103.333	4.083		0	54.000	54.000	0.4875	A53-B-42	0.990
20	103.333 - 103.083	0.25		0	54.000	54.000	0.4875	A53-B-42	0.990
21	103.083 - 100	3.083	0	0	54.000	54.000	0.4875	A53-B-42	0.990
22	100 - 95	5		0	60.000	60.000	0.475	A53-B-42	0.993
23	95 - 90	5		0	60.000	60.000	0.475	A53-B-42	0.993
24	90 - 89.5	0.5		0	60.000	60.000	0.475	A53-B-42	0.993
25	89.5 - 89.25	0.25		0	60.000	60.000	0.55625	A53-B-42	0.979
26	89.25 - 85.5	3.75		0	60.000	60.000	0.55625	A53-B-42	0.979
27	85.5 - 85.25	0.25		0	60.000	60.000	0.6375	A53-B-42	0.969
28	85.25 - 84	1.25		0	60.000	60.000	0.6375	A53-B-42	0.969
29	84 - 83.75	0.25		0	60.000	60.000	0.525	A53-B-42	0.991
30	83.75 - 82.5	1.25		0	60.000	60.000	0.525	A53-B-42	0.991
31	82.5 - 82.25	0.25		0	60.000	60.000	0.45	A53-B-42	0.995
32	82.25 - 80	2.25	0	0	60.000	60.000	0.45	A53-B-42	0.995
33	80 - 75	5		0	60.000	60.000	0.575	A53-B-42	0.996
34	75 - 70	5		0	60.000	60.000	0.575	A53-B-42	0.996
35	70 - 65	5		0	60.000	60.000	0.575	A53-B-42	0.996
36	65 - 60	5	0	0	60.000	60.000	0.575	A53-B-42	0.996
37	60 - 58.5	1.5		0	60.000	60.000	0.7	A53-B-42	0.998
38	58.5 - 58.25	0.25		0	60.000	60.000	0.625	A53-B-42	1.000
39	58.25 - 53.25	5		0	60.000	60.000	0.625	A53-B-42	1.000
40	53.25 - 48.25	5		0	60.000	60.000	0.625	A53-B-42	1.000
41	48.25 - 48	0.25		0	60.000	60.000	0.775	A53-B-42	0.978
42	48 - 43	5		0	60.000	60.000	0.775	A53-B-42	0.978
43	43 - 40	3	0	0	60.000	60.000	0.775	A53-B-42	0.978
44	40 - 35	5		0	60.000	60.000	0.775	A53-B-42	0.978
45	35 - 32.08	2.92		0	60.000	60.000	0.775	A53-B-42	0.978
46	32.08 - 31.83	0.25		0	60.000	60.000	0.9625	A53-B-42	0.968
47	31.83 - 28.75	3.08		0	60.000	60.000	0.9625	A53-B-42	0.968
48	28.75 - 28.5	0.25		0	60.000	60.000	0.8125	A53-B-42	0.983
49	28.5 - 23.5	5		0	60.000	60.000	0.8125	A53-B-42	0.983
50	23.5 - 20	3.5	0	0	60.000	60.000	0.8125	A53-B-42	0.983
51	20 - 19.75	0.25		0	60.000	60.000	0.95	A53-B-42	0.973
52	19.75 - 14.75	5		0	60.000	60.000	0.95	A53-B-42	0.973
53	14.75 - 9.75	5		0	60.000	60.000	0.95	A53-B-42	0.973
54	9.75 - 4.75	5		0	60.000	60.000	0.95	A53-B-42	0.973
55	4.75 - 0	4.75		0	60.000	60.000	0.95	A53-B-42	0.973

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	190 - 185	3.31	14.60	3.53
2	185 - 180	4.75	39.45	4.84
3	180 - 175	7.74	74.02	7.09
4	175 - 170	8.62	110.54	7.51
5	170 - 165	12.88	164.79	11.08
6	165 - 160	13.83	221.25	11.49
7	160 - 155	18.63	312.54	16.52
8	155 - 150	19.81	396.21	16.99
9	150 - 145	24.41	512.07	23.44
10	145 - 140	25.68	630.29	23.84
11	140 - 135	27.09	750.96	24.35
12	135 - 130	28.50	874.12	24.84
13	130 - 125	29.92	999.70	25.32
14	125 - 120	31.61	######	26.07
15	120 - 115	33.18	######	26.61
16	115 - 112.666	33.91	######	26.87
17	112.666 - 112.416	34.01	######	26.89
18	112.416 - 107.416	36.22	######	27.61
19	107.416 - 103.333	37.80	######	28.07
20	103.333 - 103.083	37.90	######	28.10
21	103.083 - 100	39.09	######	28.44
22	100 - 95	41.34	######	29.06
23	95 - 90	43.75	######	29.78
24	90 - 89.5	43.97	######	29.84
25	89.5 - 89.25	44.09	######	29.87
26	89.25 - 85.5	45.89	######	30.32
27	85.5 - 85.25	46.03	######	30.34
28	85.25 - 84	46.70	######	30.50
29	84 - 83.75	46.81	######	30.53
30	83.75 - 82.5	47.39	######	30.68
31	82.5 - 82.25	47.50	######	30.70
32	82.25 - 80	48.42	######	30.95
33	80 - 75	51.96	######	32.04
34	75 - 70	54.49	######	32.54
35	70 - 65	57.02	######	33.03
36	65 - 60	59.55	######	33.49
37	60 - 58.5	61.92	######	34.14
38	58.5 - 58.25	62.06	######	34.15
39	58.25 - 53.25	64.79	######	34.58
40	53.25 - 48.25	67.53	######	34.98
41	48.25 - 48	67.70	######	34.99
42	48 - 43	70.92	######	35.41
43	43 - 40	72.86	######	35.65
44	40 - 35	78.22	######	36.82
45	35 - 32.08	80.11	######	37.04
46	32.08 - 31.83	80.32	######	37.04
47	31.83 - 28.75	82.70	######	37.28
48	28.75 - 28.5	82.88	######	37.29
49	28.5 - 23.5	86.27	######	37.62
50	23.5 - 20	88.65	######	37.82
51	20 - 19.75	91.79	######	38.64
52	19.75 - 14.75	95.65	######	38.94
53	14.75 - 9.75	99.48	######	39.20
54	9.75 - 4.75	103.13	######	39.44
55	4.75 - 0	106.51	######	39.65

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
190 - 185	Pole	TP30x30x0.375	Pole	1.8%	Pass
185 - 180	Pole	TP30x30x0.375	Pole	4.5%	Pass
180 - 175	Pole	TP36x36x0.375	Pole	6.1%	Pass
175 - 170	Pole	TP36x36x0.375	Pole	8.8%	Pass
170 - 165	Pole	TP36x36x0.375	Pole	13.2%	Pass
165 - 160	Pole	TP36x36x0.375	Pole	17.5%	Pass
160 - 155	Pole	TP42x42x0.375	Pole	18.6%	Pass
155 - 150	Pole	TP42x42x0.375	Pole	23.3%	Pass
150 - 145	Pole	TP42x42x0.375	Pole	30.0%	Pass
145 - 140	Pole	TP42x42x0.375	Pole	36.7%	Pass
140 - 135	Pole	TP48x48x0.375	Pole	33.9%	Pass
135 - 130	Pole	TP48x48x0.375	Pole	39.3%	Pass
130 - 125	Pole	TP48x48x0.375	Pole	44.8%	Pass
125 - 120	Pole	TP48x48x0.375	Pole	50.4%	Pass
120 - 115	Pole	TP54x54x0.375	Pole	45.0%	Pass
115 - 112.67	Pole	TP54x54x0.375	Pole	47.2%	Pass
112.67 - 112.42	Pole + Reinf.	TP54x54x0.4875	Pole	36.3%	Pass
112.42 - 107.42	Pole + Reinf.	TP54x54x0.4875	Pole	40.0%	Pass
107.42 - 103.33	Pole + Reinf.	TP54x54x0.4875	Pole	43.0%	Pass
103.33 - 103.08	Pole + Reinf.	TP54x54x0.4875	Pole	43.2%	Pass
103.08 - 100	Pole + Reinf.	TP54x54x0.4875	Pole	45.6%	Pass
100 - 95	Pole + Reinf.	TP60x60x0.475	Pole	41.5%	Pass
95 - 90	Pole + Reinf.	TP60x60x0.475	Pole	44.9%	Pass
90 - 89.5	Pole + Reinf.	TP60x60x0.475	Pole	45.2%	Pass
89.5 - 89.25	Pole + Reinf.	TP60x60x0.5563	Pole	39.1%	Pass
89.25 - 85.5	Pole + Reinf.	TP60x60x0.5563	Pole	41.3%	Pass
85.5 - 85.25	Pole + Reinf.	TP60x60x0.6375	Pole	36.4%	Pass
85.25 - 84	Pole + Reinf.	TP60x60x0.6375	Pole	37.1%	Pass
84 - 83.75	Pole + Reinf.	TP60x60x0.525	Pole	44.4%	Pass
83.75 - 82.5	Pole + Reinf.	TP60x60x0.525	Pole	45.2%	Pass
82.5 - 82.25	Pole + Reinf.	TP60x60x0.45	Pole	53.0%	Pass
82.25 - 80	Pole + Reinf.	TP60x60x0.45	Pole	54.7%	Pass
80 - 75	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	45.3%	Pass
75 - 70	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	48.3%	Pass
70 - 65	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	51.4%	Pass
65 - 60	Pole + Reinf.	TP60x60x0.575	Reinf. 3 Tension Rupture	54.4%	Pass
60 - 58.5	Pole + Reinf.	TP60x60x0.7	Reinf. 3 Tension Rupture	45.7%	Pass
58.5 - 58.25	Pole	TP60x60x0.625	Pole	49.6%	Pass
58.25 - 53.25	Pole	TP60x60x0.625	Pole	52.5%	Pass
53.25 - 48.25	Pole	TP60x60x0.625	Pole	55.3%	Pass
48.25 - 48	Pole + Reinf.	TP60x60x0.775	Pole	45.3%	Pass
48 - 43	Pole + Reinf.	TP60x60x0.775	Pole	47.7%	Pass
43 - 40	Pole + Reinf.	TP60x60x0.775	Pole	49.1%	Pass
40 - 35	Pole + Reinf.	TP60x60x0.775	Pole	51.6%	Pass
35 - 32.08	Pole + Reinf.	TP60x60x0.775	Pole	53.1%	Pass
32.08 - 31.83	Pole + Reinf.	TP60x60x0.9625	Pole	42.9%	Pass
31.83 - 28.75	Pole + Reinf.	TP60x60x0.9625	Pole	44.1%	Pass
28.75 - 28.5	Pole + Reinf.	TP60x60x0.8125	Pole	51.9%	Pass
28.5 - 23.5	Pole + Reinf.	TP60x60x0.8125	Pole	54.3%	Pass
23.5 - 20	Pole + Reinf.	TP60x60x0.8125	Pole	56.0%	Pass
20 - 19.75	Pole + Reinf.	TP60x60x0.95	Pole	47.6%	Pass
19.75 - 14.75	Pole + Reinf.	TP60x60x0.95	Pole	49.7%	Pass
14.75 - 9.75	Pole + Reinf.	TP60x60x0.95	Pole	51.9%	Pass
9.75 - 4.75	Pole + Reinf.	TP60x60x0.95	Pole	54.0%	Pass
4.75 - 0	Pole + Reinf.	TP60x60x0.95	Pole	56.0%	Pass
				Summary	
			Pole	56.0%	Pass
			Reinforcement	54.4%	Pass
			Overall	56.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity						
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6
190 - 185	3829	n/a	3829	34.90	n/a	34.90	1.8%						
185 - 180	3829	n/a	3829	34.90	n/a	34.90	4.5%						
180 - 175	6659	n/a	6659	41.97	n/a	41.97	6.1%						
175 - 170	6659	n/a	6659	41.97	n/a	41.97	8.8%						
170 - 165	6659	n/a	6659	41.97	n/a	41.97	13.2%						
165 - 160	6659	n/a	6659	41.97	n/a	41.97	17.5%						
160 - 155	10622	n/a	10622	49.04	n/a	49.04	18.6%						
155 - 150	10622	n/a	10622	49.04	n/a	49.04	23.3%						
150 - 145	10622	n/a	10622	49.04	n/a	49.04	30.0%						
145 - 140	10622	n/a	10622	49.04	n/a	49.04	36.7%						
140 - 135	15908	n/a	15908	56.11	n/a	56.11	33.9%						
135 - 130	15908	n/a	15908	56.11	n/a	56.11	39.3%						
130 - 125	15908	n/a	15908	56.11	n/a	56.11	44.8%						
125 - 120	15908	n/a	15908	56.11	n/a	56.11	50.4%						
120 - 115	22710	n/a	22710	63.18	n/a	63.18	45.0%						
115 - 112.67	22710	n/a	22710	63.18	n/a	63.18	47.2%						
112.67 - 112.42	22710	6834	29544	63.18	18.00	81.18	36.3%					32.5%	
112.42 - 107.42	22710	6834	29544	63.18	18.00	81.18	40.0%					35.8%	
107.42 - 103.33	22710	6834	29544	63.18	18.00	81.18	43.0%					38.5%	
103.33 - 103.08	22710	6834	29544	63.18	18.00	81.18	43.2%				38.7%		
103.08 - 100	22710	6834	29544	63.18	18.00	81.18	45.6%				40.8%		
100 - 95	31217	8400	39617	70.24	18.00	88.24	41.5%				36.7%		
95 - 90	31217	8400	39617	70.24	18.00	88.24	44.9%				39.7%		
90 - 89.5	31217	8400	39617	70.24	18.00	88.24	45.2%				40.0%		
89.5 - 89.25	31217	14691	45908	70.24	31.50	101.74	39.1%				34.6%		38.2%
89.25 - 85.5	31217	14691	45908	70.24	31.50	101.74	41.3%				36.5%		40.4%
85.5 - 85.25	31217	20982	52199	70.24	45.00	115.24	36.4%			35.9%	32.2%		35.6%
85.25 - 84	31217	20982	52199	70.24	45.00	115.24	37.1%			36.5%	32.8%		36.2%
84 - 83.75	31217	12582	43799	70.24	27.00	97.24	44.4%			43.8%			43.4%
83.75 - 82.5	31217	12582	43799	70.24	27.00	97.24	45.2%			44.6%			44.2%
82.5 - 82.25	31217	6291	37508	70.24	13.50	83.74	53.0%			52.3%			
82.25 - 80	31217	6291	37508	70.24	13.50	83.74	54.7%			53.9%			
80 - 75	41363	6291	47654	93.46	13.50	106.96	44.8%			45.3%			
75 - 70	41363	6291	47654	93.46	13.50	106.96	47.8%			48.3%			
70 - 65	41363	6291	47654	93.46	13.50	106.96	50.8%			51.4%			
65 - 60	41363	6291	47654	93.46	13.50	106.96	53.8%			54.4%			
60 - 58.5	51381	6291	57672	116.58	13.50	130.08	44.1%			45.7%			
58.5 - 58.25	51381	n/a	51381	116.58	n/a	116.58	49.6%						
58.25 - 53.25	51381	n/a	51381	116.58	n/a	116.58	52.5%						
53.25 - 48.25	51381	n/a	51381	116.58	n/a	116.58	55.3%						
48.25 - 48	51381	11475	62856	116.58	24.38	140.96	45.3%		41.5%				
48 - 43	51381	11475	62856	116.58	24.38	140.96	47.7%		43.7%				
43 - 40	51381	11475	62856	116.58	24.38	140.96	49.1%		45.0%				
40 - 35	51381	11475	62856	116.58	24.38	140.96	51.6%		47.3%				
35 - 32.08	51381	11475	62856	116.58	24.38	140.96	53.1%		48.7%				
32.08 - 31.83	51381	26521	77901	116.58	56.25	172.83	42.9%	37.5%	39.3%				
31.83 - 28.75	51381	26521	77901	116.58	56.25	172.83	44.1%	38.6%	40.5%				
28.75 - 28.5	51381	15046	66426	116.58	31.88	148.46	51.9%	45.4%					
28.5 - 23.5	51381	15046	66426	116.58	31.88	148.46	54.3%	47.5%					
23.5 - 20	51381	15046	66426	116.58	31.88	148.46	56.0%	49.0%					
20 - 19.75	61271	15046	76317	139.60	31.88	171.48	47.6%	42.7%					
19.75 - 14.75	61271	15046	76317	139.60	31.88	171.48	49.7%	44.6%					
14.75 - 9.75	61271	15046	76317	139.60	31.88	171.48	51.9%	46.5%					
9.75 - 4.75	61271	15046	76317	139.60	31.88	171.48	54.0%	48.4%					
4.75 - 0	61271	15046	76317	139.60	31.88	171.48	56.0%	50.2%					

Note: Section capacity checked in 5 degree increments.

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

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Reactions		
Mu	39.45	ft-kips
Axial, Pu:	4.75	kips
Shear, Vu:	4.84	kips
Elevation:	180	feet

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

Pole Manufacturer:	Pirod

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

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	33		

Plate Data		
Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	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**:	54.54	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	
Max Bolt directly applied Tu:	2.19	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.031	in	
Min PL "treq" for actual **T w/ Pry**:	0.157	in	
Min PL "t1" for actual **T w/o Pry**:	0.207	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	2.19	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	4.0%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

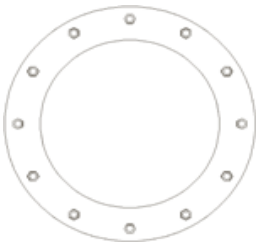
Exterior Flange Plate Results

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

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
13.75

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, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Manufacturer:	Pirod

Bolt Data

Qty:	24		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	33	in	

Plate Data

Plate Outer Diam:	35.25	in
Plate Inner Diam:	30	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.61	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

Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Reactions

Moment:	39.45	ft-kips
Axial:	4.75	kips
Shear:	4.84	kips
Exterior Flange Run, T+q:	2.19	kips

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

Elevation: 180 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	2.2	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty	54.5	Kips
Bolt Stress Ratio:	4.0%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	2.6	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Piroc	OK

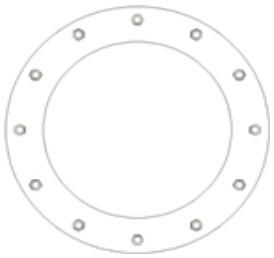
n/a

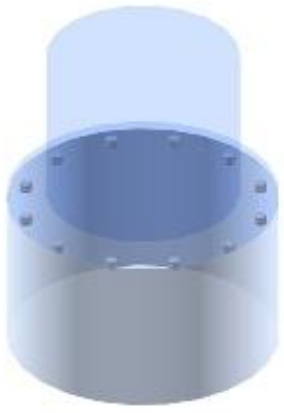
Stiffener Results N/A for Rohn / Pirod

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#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Reactions		
Mu	221.25	ft-kips
Axial, Pu:	13.83	kips
Shear, Vu:	11.49	kips
Elevation:	160	feet

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

Pole Manufacturer: Pirod

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

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	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:	36	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:	9.23	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.017	in	
Min PL "treq" for actual **T w/ Pry**:	0.317	in	
Min PL "t1" for actual **T w/o Pry**:	0.418	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	9.23	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	16.9%	**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:
15.00

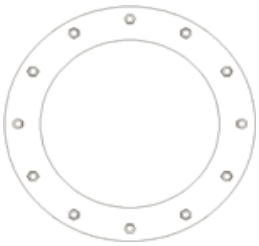
n/a

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, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Manufacturer:	Pirod

Bolt Data

Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	39	in	

Plate Data

Plate Outer Diam:	41.25	in
Plate Inner Diam:	36	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	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

Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Reactions

Moment:	221.25	ft-kips
Axial:	13.83	kips
Shear:	11.49	kips
Exterior Flange Run, T+q:	9.23	kips

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

Elevation: 160 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	9.2	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty	54.5	Kips
Bolt Stress Ratio:	16.9%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	10.2	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Piroc	OK

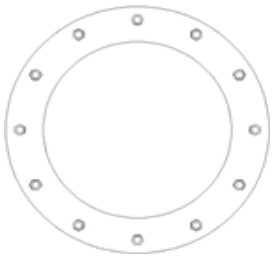
n/a

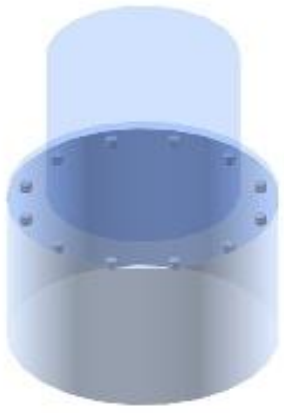
Stiffener Results N/A for Rohn / Pirod

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#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Reactions		
Mu	630.29	ft-kips
Axial, Pu:	25.68	kips
Shear, Vu:	23.84	kips
Elevation:	140	feet

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

Pole Manufacturer:	Pirod

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

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	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:	42	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**:	54.53	kips	
Max Bolt directly applied Tu:	20.21	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.006	in	
Min PL "treq" for actual **T w/ Pry**:	0.464	in	
Min PL "t1" for actual **T w/o Pry**:	0.612	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	20.21	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	37.1%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

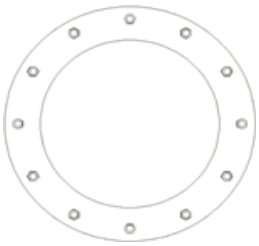
Exterior Flange Plate Results

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

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
16.16

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, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Manufacturer:	Pirod

Reactions		
Moment:	630.29	ft-kips
Axial:	25.68	kips
Shear:	23.84	kips
Exterior Flange Run, T+q:	20.21	kips

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

Elevation: 140 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	45	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	20.2	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty	54.5	Kips
Bolt Stress Ratio:	37.1%	**Pass**

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	42	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.8	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Piroc	OK

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

n/a

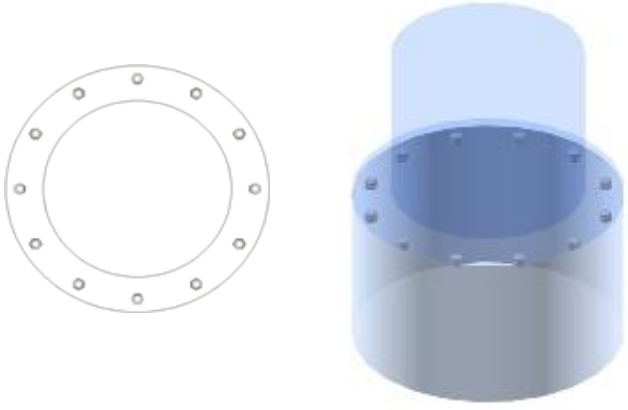
Stiffener Results N/A for Rohn / Pirod

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

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi



* 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#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Reactions		
Mu	1128.97	ft-kips
Axial, Pu:	31.61	kips
Shear, Vu:	26.07	kips
Elevation:	120	feet

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

Pole Manufacturer:	Pirod

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

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	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:	48	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**:	54.53	kips	
Max Bolt directly applied Tu:	28.64	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.998	in	
Min PL "treq" for actual **T w/ Pry**:	0.547	in	
Min PL "t1" for actual **T w/o Pry**:	0.723	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	28.64	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	52.5%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

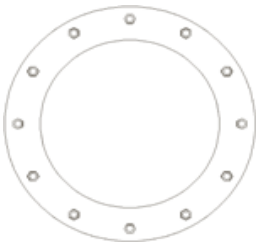
Exterior Flange Plate Results

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

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
17.23

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, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Manufacturer:	Pirod

Bolt Data

Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	51	in	

Plate Data

Plate Outer Diam:	53.25	in
Plate Inner Diam:	48	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.65	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

Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Reactions

Moment:	1128.97	ft-kips
Axial:	31.61	kips
Shear:	26.07	kips
Exterior Flange Run, T+q:	28.64	kips

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

Elevation: 120 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	28.6	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty	54.5	Kips
Bolt Stress Ratio:	52.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	30.4	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Piroc	OK

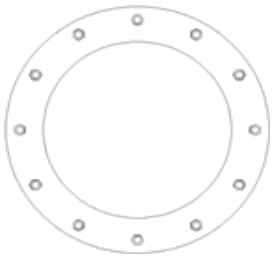
n/a

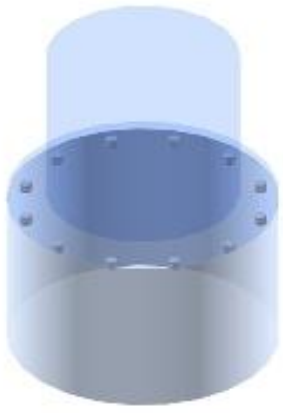
Stiffener Results N/A for Rohn / Pirod

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#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Reactions		
Mu	1674.35	ft-kips
Axial, Pu:	39.09	kips
Shear, Vu:	28.44	kips
Elevation:	100	feet

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

Pole Manufacturer:	Pirod

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

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	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

			Stiffened
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	28.56	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened	in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened	in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened	in	
T allowable	54.54	kips	<-- B, Stiffened
Prying Force, q:	0.00	kips	Stiffened
Total Bolt Tension=Tu+q:	28.56	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	52.4%	**Pass**	

Exterior Flange Plate Results — Shear Check Only

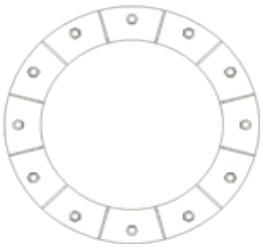
			Stiffened
Compression Side Plate Stress:	Rohn/Piroc	OK	TIA G
Allowable Plate Stress:	19.4	ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc	OK	Comp. Y.L. Length:
Stiffened			N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod	OK	

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, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *829046*
Site Name: *Weston/ Rt-57/ Norfield R*
App #: *421191 Rev. 6*

Manufacturer:	Pirod

Bolt Data

Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	57	in	

Plate Data

Plate Outer Diam:	59.25	in
Plate Inner Diam:	54	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.88	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

Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Reactions

Moment:	1674.35	ft-kips
Axial:	39.09	kips
Shear:	28.44	kips
Exterior Flange Run, T+q:	28.56	kips

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

Elevation: 100 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	28.6	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty	54.5	Kips
Bolt Stress Ratio:	52.4%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	30.2	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Piroc	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Piroc	OK

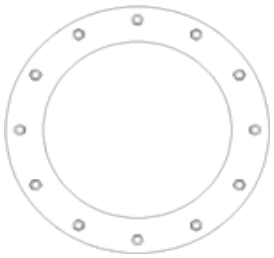
n/a

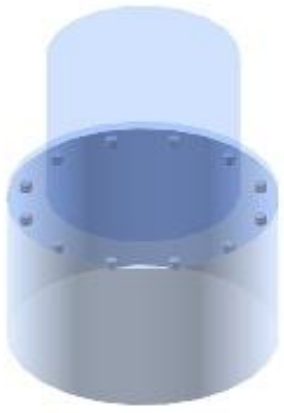
Stiffener Results N/A for Rohn / Pirod

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

BU: 829046
WO: 1524908

Done By: PCN
Checked By: JR
Date: 2/13/2018

Jump Plate Reinforcement Check

Elevation: 80ft

DETERMINE MAXIMUM FORCES ON JUMP PLATE

Jump Plate Properties

$N := 3$

$BC := 63in$

$Ag := 4.5in^2$

$r_x := 0.2887in$

Flange Bolt Poperties

$N_{fb} := 64$

$Dia_{fb} := 1.25in$

$BC_{fb} := 50in$

$Ag_{fb} := 1.23in^2$

Reactions

$M := 2270.3kip \cdot ft$

$P := 48.42kip$

$V := 30.95kip$

Combined Section Properties

$$I_{fb} := \frac{N_{fb} \cdot BC_{fb}^2 \cdot Ag_{fb}}{8} = 24600 \cdot in^4$$

$$I_{bs} := \frac{N \cdot BC^2 \cdot Ag}{8} = 6697.69 \cdot in^4$$

$$I_{tot} := I_{fb} + I_{bs} = 31297.69 \cdot in^4$$

$$Ag_{tot} := N \cdot Ag + N_{fb} \cdot Ag_{fb} = 92.22 \cdot in^2$$

Division of Forces

Jump Plates

$$M_s := M \cdot \left(\frac{I_{bs}}{I_{tot}} \right) = 485.84 \cdot kip \cdot ft$$

$$P_s := P \cdot \left(\frac{N \cdot Ag}{Ag_{tot}} \right) = 7.09 \cdot kip$$

$$V_s := 0kip$$

Flange Bolts

$$M_b := M \cdot \left(\frac{I_{fb}}{I_{tot}} \right) = 1784.46 \cdot kip \cdot ft$$

$$P_b := P \cdot \left(\frac{N_{fb} \cdot Ag_{fb}}{Ag_{tot}} \right) = 41.33 \cdot kip$$

$$V_b := V = 30.95 \cdot kip$$

Flange bolts to take full shear load

Maximum Axial Forces in Single Jump Plate

$$C := \frac{BC}{2} = 31.5 \cdot in$$

$$P_{Comp} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag + \frac{P_s}{N} = 125.75 \cdot kip$$

$$P_{Tens} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag - \frac{P_s}{N} = 121.03 \cdot kip$$

CHECK BOLT CONNECTION TO TOWER

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

$N_b := 6$ $Dia := 0.7874in$ $Fu_{bolt} := 120ksi$ $Ag_b := 0.4869in^2$ $\phi := 0.75$

$t_{shaft} := 0.375in$ $F_{yshaft} := 42ksi$ $F_{ushaft} := 60ksi$

Bolt Shear Capacity

$$V_{max} := \frac{P_{Comp}}{N_b} = 20.96 \cdot kip$$

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

$$\text{\% Capacity} = \frac{V_{max}}{\phi R_{nv}} = 56.64 \cdot \%$$

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

$ecc := 1.5in$

BoltType :=

$n' := 3$ number of bolts above neutral axis

$d_m := 9in$ moment arm between resultant tensile and resultant compressive force

$$r_{ut} := \frac{P_{Comp} \cdot ecc}{n' \cdot d_m} = 6.99 \cdot kip$$ Tension force due to eccentric load

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

$$\phi R_{nt} = 32.9\cdot kip$$

% Capacity = $\dfrac{r_{ut}}{\phi R_{nt}} = 21.23\cdot\%$

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

$$\left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 = 0.37$$

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

check = "OK"

% Capacity = $\dfrac{Combined}{1} = 36.6\cdot\%$

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

$$0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} = 43.4\cdot kip$$

$$2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} = 42.52\cdot kip$$

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

$\phi R_{nshaft} = 42.52 \cdot kip$

% Capacity = $\frac{V_{max}}{\phi R_{nshaft}} = 49.29 \cdot \%$

CHECK JUMP PLATE CAPACITY

Compression Check — AISC, part 16, ch. E

$L := 20.625in$ $K := 0.8$ $F_y := 65ksi$ $F_u := 80ksi$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{K \cdot L}{r_x}\right)^2} = 87.62 \cdot ksi$$

$$\frac{K \cdot L}{r_x} = 57.15 < 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_y}} = 99.49 \quad \therefore \quad F_{cr} := 0.658^{\frac{F_y}{F_e}} \cdot F_y = 47.65 \cdot ksi$$

$\phi P_n := 0.9 \cdot F_{cr} \cdot Ag = 192.99 \cdot kip$

% Capacity = $\frac{P_{Comp}}{\phi P_n} = 65.16 \cdot \%$

Tension Check — AISC, part 16, ch. D

Gross Section Yield

$\phi P_t := 0.90 \cdot F_y \cdot Ag = 263.25 \cdot kip$

% Capacity = $\frac{P_{Tens}}{\phi P_t} = 45.97 \cdot \%$

Net Section Fracture

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

$$A_n := Ag - \left(BH + \frac{1}{16}in\right) \cdot T = 3.25 \cdot in^2$$

$$A_e := \min\left(A_n, 0.85 \cdot Ag\right) = 3.25 \cdot in^2$$

$$\phi F_n := 0.75 \cdot F_u \cdot A_e = 195 \cdot kip$$

% Capacity = $\frac{P_{Tens}}{\phi F_n} = 62.06 \cdot \%$

ANCHOR ROD ANALYSIS

Anchor Rod Information

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

Reactions

Moment	1784.46	kip-ft
Axial	41.33	kip
Shear	30.95	kip

	1st BC	2nd BC	
Anchor Rod Quantity	32	32	
Anchor Rod Diameter	1.25	1.25	in
Anchor Rod Material	A325	A325	ksi
Bolt Circle Diameter	47	53	in
Base Plate or Bracketed Connection?		Base Plate	

The tower shaft and flange plate bolts are passing, thus the flange plate is passing because the tower is PiRod.

Bolt #	Orientation of Anchor Bolts (Degrees)	
1	0.0	0
2	11.3	11.3
3	22.5	22.5
4	33.8	33.8
5	45.0	45
6	56.3	56.3
7	67.5	67.5
8	78.8	78.8
9	90.0	90.0
10	101.3	101.3
11	112.5	112.5
12	123.8	123.8
13	135.0	135.0
14	146.3	146.3
15	157.5	157.5
16	168.8	168.8
17	180.0	180.0
18	191.3	191.3
19	202.5	202.5
20	213.8	213.8
21	225.0	225.0
22	236.3	236.3
23	**247.5**	247.5
24	*258.8*	258.8
25	270.0	270.0
26	281.3	281.3
27	**292.5**	292.5
28	*303.8*	303.8
29	315.0	315.0
30	326.3	326.3
31	337.5	337.5
32	348.8	348.8

Anchor Rod Results

	1st BC	2nd BC	
Moment on Bolt Group	785.5	998.9	kip-ft
Axial on Bolt Group	41.3	0.0	kip
Shear on Bolt Group	31.0	0.0	kip
Combined Load per Anchor Rod	28.3	28.3	kip
Anchor Rod Capacity	81.4	81.4	kip
Max Stress Ratio	**34.8%**	**34.7%**	

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

BU: 829046
WO: 1524908

Done By: PCN
Checked By: JR
Date: 2/13/2018

Jump Plate Reinforcement Check

Elevation: 60ft

DETERMINE MAXIMUM FORCES ON JUMP PLATE

Jump Plate Properties

$N := 3$

$BC := 63.25in$

$Ag := 8.125in^2$

$r_x := 0.3608in$

Flange Bolt Poperties

$N_{fb} := 64$

$Dia_{fb} := 1.25in$

$BC_{fb} := 50in$

$Ag_{fb} := 1.23in^2$

Reactions

$M := 2921.65kip \cdot ft$

$P := 59.55kip$

$V := 33.49kip$

Combined Section Properties

$$I_{fb} := \frac{N_{fb} \cdot BC_{fb}^2 \cdot Ag_{fb}}{8} = 24600 \cdot in^4$$

$$I_{bs} := \frac{N \cdot BC^2 \cdot Ag}{8} = 12189.21 \cdot in^4$$

$$I_{tot} := I_{fb} + I_{bs} = 36789.21 \cdot in^4$$

$$Ag_{tot} := N \cdot Ag + N_{fb} \cdot Ag_{fb} = 103.09 \cdot in^2$$

Division of Forces

Jump Plates

$$M_s := M \cdot \left(\frac{I_{bs}}{I_{tot}} \right) = 968.02 \cdot kip \cdot ft$$

$$P_s := P \cdot \left(\frac{N \cdot Ag}{Ag_{tot}} \right) = 14.08 \cdot kip$$

$$V_s := 0kip$$

Flange Bolts

$$M_b := M \cdot \left(\frac{I_{fb}}{I_{tot}} \right) = 1953.63 \cdot kip \cdot ft$$

$$P_b := P \cdot \left(\frac{N_{fb} \cdot Ag_{fb}}{Ag_{tot}} \right) = 45.47 \cdot kip$$

$$V_b := V = 33.49 \cdot kip$$

Flange bolts to take full shear load

Maximum Axial Forces in Single Jump Plate

$$C := \frac{BC}{2} = 31.63 \cdot in$$

$$P_{Comp} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag + \frac{P_s}{N} = 249.57 \cdot kip$$

$$P_{Tens} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag - \frac{P_s}{N} = 240.18 \cdot kip$$

CHECK BOLT CONNECTION TO TOWER

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

$N_b := 11$ $Dia := 0.7874in$ $Fu_{bolt} := 120ksi$ $Ag_b := 0.4869in^2$ $\phi := 0.75$

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

Bolt Shear Capacity

$$V_{max} := \frac{P_{Comp}}{N_b} = 22.69 \cdot kip$$

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

$$\text{\% Capacity} = \frac{V_{max}}{\phi R_{nv}} = 61.32 \cdot \%$$

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

$ecc := 1.625in$

BoltType :=

$n' := 5$ number of bolts above neutral axis

$d_m := 15in$ moment arm between resultant tensile and resultant compressive force

$$r_{ut} := \frac{P_{Comp} \cdot ecc}{n' \cdot d_m} = 5.41 \cdot kip$$ Tension force due to eccentric load

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

$$\phi R_{nt} = 32.9\cdot kip$$

% Capacity = $\dfrac{r_{ut}}{\phi R_{nt}} = 16.44\cdot\%$

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

$$\left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 = 0.4$$

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

check = "OK" % Capacity = $\dfrac{\text{Combined}}{1} = 40.3\cdot\%$

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 = $\frac{V_{max}}{\phi R_{nshaft}} = 40.02 \cdot \%$

CHECK JUMP PLATE CAPACITY

Compression Check — AISC, part 16, ch. E

$L := 19.25in$ $K := 0.8$ $F_y := 65ksi$ $F_u := 80ksi$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{K \cdot L}{r_x}\right)^2} = 157.1 \cdot ksi$$

$$\frac{K \cdot L}{r_x} = 42.68 < 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_y}} = 99.49 \quad \therefore \quad F_{cr} := 0.658^{\frac{F_y}{F_e}} \cdot F_y = 54.66 \cdot ksi$$

$\phi P_n := 0.9 \cdot F_{cr} \cdot Ag = 399.74 \cdot kip$

% Capacity = $\frac{P_{Comp}}{\phi P_n} = 62.43 \cdot \%$

Tension Check — AISC, part 16, ch. D

Gross Section Yield

$\phi P_t := 0.90 \cdot F_y \cdot Ag = 475.31 \cdot kip$

% Capacity = $\frac{P_{Tens}}{\phi P_t} = 50.53 \cdot \%$

Net Section Fracture

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

$$A_n := Ag - \left(BH + \frac{1}{16}in\right) \cdot T = 6.875 \cdot in^2$$

$$A_e := \min\left(A_n, 0.85 \cdot Ag\right) = 6.87 \cdot in^2$$

$$\phi F_n := 0.75 \cdot F_u \cdot A_e = 412.5 \cdot kip$$

% Capacity = $\frac{P_{Tens}}{\phi F_n} = 58.23 \cdot \%$

ANCHOR ROD ANALYSIS

Anchor Rod Information

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

Reactions

Moment	1953.63	kip-ft
Axial	45.47	kip
Shear	33.49	kip

	1st BC	2nd BC	
Anchor Rod Quantity	32	32	
Anchor Rod Diameter	1.25	1.25	in
Anchor Rod Material	A325	A325	ksi
Bolt Circle Diameter	47	53	in
Base Plate or Bracketed Connection?		Base Plate	

The tower shaft and flange plate bolts are passing, thus the flange plate is passing because the tower is PiRod.

Bolt #	Orientation of Anchor Bolts (Degrees)	
1	0.0	0
2	11.3	11.3
3	22.5	22.5
4	33.8	33.8
5	45.0	45
6	56.3	56.3
7	67.5	67.5
8	78.8	78.8
9	90.0	90.0
10	101.3	101.3
11	112.5	112.5
12	123.8	123.8
13	135.0	135.0
14	146.3	146.3
15	157.5	157.5
16	168.8	168.8
17	180.0	180.0
18	191.3	191.3
19	202.5	202.5
20	213.8	213.8
21	225.0	225.0
22	236.3	236.3
23	**247.5**	247.5
24	*258.8*	258.8
25	270.0	270.0
26	281.3	281.3
27	**292.5**	292.5
28	*303.8*	303.8
29	315.0	315.0
30	326.3	326.3
31	337.5	337.5
32	348.8	348.8

Anchor Rod Results

	1st BC	2nd BC	
Moment on Bolt Group	860.0	1093.6	kip-ft
Axial on Bolt Group	45.5	0.0	kip
Shear on Bolt Group	33.5	0.0	kip
Combined Load per Anchor Rod	31.0	31.0	kip
Anchor Rod Capacity	81.4	81.4	kip
Max Stress Ratio	**38.0%**	**38.0%**	

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

BU: 829046
WO: 1524908

Done By: PCN
Checked By: JR
Date: 2/13/2018

Jump Plate Reinforcement Check

Elevation: 40ft

DETERMINE MAXIMUM FORCES ON JUMP PLATE

Jump Plate Properties

$N := 6$

$BC := 63in$

$Ag := 6in^2$

$r_x := 0.2887in$

Flange Bolt Poperties

$N_{fb} := 64$

$Dia_{fb} := 1.25in$

$BC_{fb} := 50in$

$Ag_{fb} := 1.23in^2$

Reactions

$M := 3618.63kip \cdot ft$

$P := 72.86kip$

$V := 35.65kip$

Combined Section Properties

$$I_{fb} := \frac{N_{fb} \cdot BC_{fb}^2 \cdot Ag_{fb}}{8} = 24600 \cdot in^4$$

$$I_{bs} := \frac{N \cdot BC^2 \cdot Ag}{8} = 17860.5 \cdot in^4$$

$$I_{tot} := I_{fb} + I_{bs} = 42460.5 \cdot in^4$$

$$Ag_{tot} := N \cdot Ag + N_{fb} \cdot Ag_{fb} = 114.72 \cdot in^2$$

Division of Forces

Jump Plates

$$M_s := M \cdot \left(\frac{I_{bs}}{I_{tot}} \right) = 1522.13 \cdot kip \cdot ft$$

$$P_s := P \cdot \left(\frac{N \cdot Ag}{Ag_{tot}} \right) = 22.86 \cdot kip$$

$$V_s := 0kip$$

Flange Bolts

$$M_b := M \cdot \left(\frac{I_{fb}}{I_{tot}} \right) = 2096.5 \cdot kip \cdot ft$$

$$P_b := P \cdot \left(\frac{N_{fb} \cdot Ag_{fb}}{Ag_{tot}} \right) = 50 \cdot kip$$

$$V_b := V = 35.65 \cdot kip$$

Flange bolts to take full shear load

Maximum Axial Forces in Single Jump Plate

$$C := \frac{BC}{2} = 31.5 \cdot in$$

$$P_{Comp} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag + \frac{P_s}{N} = 197.1 \cdot kip$$

$$P_{Tens} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag - \frac{P_s}{N} = 189.48 \cdot kip$$

CHECK BOLT CONNECTION TO TOWER

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

$N_b := 8$ $Dia := 0.7874in$ $Fu_{bolt} := 120ksi$ $Ag_b := 0.4869in^2$ $\phi := 0.75$

$t_{shaft} := 0.625in$ $F_{yshaft} := 42ksi$ $F_{ushaft} := 60ksi$

Bolt Shear Capacity

$$V_{max} := \frac{P_{Comp}}{N_b} = 24.64 \cdot kip$$

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

$$\text{\% Capacity} = \frac{V_{max}}{\phi R_{nv}} = 66.59 \cdot \%$$

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

$ecc := 1.5in$

BoltType :=

$n' := 4$ number of bolts above neutral axis

$d_m := 12in$ moment arm between resultant tensile and resultant compressive force

$$r_{ut} := \frac{P_{Comp} \cdot ecc}{n' \cdot d_m} = 6.16 \cdot kip$$ Tension force due to eccentric load

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

$$\phi R_{nt} = 32.9\cdot kip$$

% Capacity = $\dfrac{r_{ut}}{\phi R_{nt}} = 18.72\cdot\%$

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

$$\left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 = 0.48$$

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

check = "OK" % Capacity = $\dfrac{\text{Combined}}{1} = 47.84\cdot\%$

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

$$0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} = 72.34\cdot kip$$

$$2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} = 70.87\cdot kip$$

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

$\phi R_{nshaft} = 70.87 \cdot kip$

% Capacity = $\frac{V_{max}}{\phi R_{nshaft}} = 34.77 \cdot \%$

CHECK JUMP PLATE CAPACITY

Compression Check — AISC, part 16, ch. E

$L := 16.375in$ $K := 0.8$ $F_y := 65ksi$ $F_u := 80ksi$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{K \cdot L}{r_x}\right)^2} = 139.01 \cdot ksi$$

$$\frac{K \cdot L}{r_x} = 45.38 < 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_y}} = 99.49 \quad \therefore \quad F_{cr} := 0.658^{\frac{F_y}{F_e}} \cdot F_y = 53.45 \cdot ksi$$

$\phi P_n := 0.9 \cdot F_{cr} \cdot Ag = 288.61 \cdot kip$

% Capacity = $\frac{P_{Comp}}{\phi P_n} = 68.29 \cdot \%$

Tension Check — AISC, part 16, ch. D

Gross Section Yield

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

% Capacity = $\frac{P_{Tens}}{\phi P_t} = 53.98 \cdot \%$

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 = $\frac{P_{Tens}}{\phi F_n} = 66.48 \cdot \%$

ANCHOR ROD ANALYSIS

Anchor Rod Information

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

Reactions

Moment	2096.5	kip-ft
Axial	50	kip
Shear	35.65	kip

	1st BC	2nd BC	
Anchor Rod Quantity	32	32	
Anchor Rod Diameter	1.25	1.25	in
Anchor Rod Material	A325	A325	ksi
Bolt Circle Diameter	47	53	in
Base Plate or Bracketed Connection?		Base Plate	

The tower shaft and flange plate bolts are passing, thus the flange plate is passing because the tower is PiRod.

Bolt #	Orientation of Anchor Bolts (Degrees)	
1	0.0	0
2	11.3	11.3
3	22.5	22.5
4	33.8	33.8
5	45.0	45
6	56.3	56.3
7	67.5	67.5
8	78.8	78.8
9	90.0	90.0
10	101.3	101.3
11	112.5	112.5
12	123.8	123.8
13	135.0	135.0
14	146.3	146.3
15	157.5	157.5
16	168.8	168.8
17	180.0	180.0
18	191.3	191.3
19	202.5	202.5
20	213.8	213.8
21	225.0	225.0
22	236.3	236.3
23	**247.5**	247.5
24	*258.8*	258.8
25	270.0	270.0
26	281.3	281.3
27	**292.5**	292.5
28	*303.8*	303.8
29	315.0	315.0
30	326.3	326.3
31	337.5	337.5
32	348.8	348.8

Anchor Rod Results

	1st BC	2nd BC	
Moment on Bolt Group	922.9	1173.6	kip-ft
Axial on Bolt Group	50.0	0.0	kip
Shear on Bolt Group	35.7	0.0	kip
Combined Load per Anchor Rod	33.2	33.2	kip
Anchor Rod Capacity	81.4	81.4	kip
Max Stress Ratio	**40.8%**	**40.8%**	

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

BU: 829046
WO: 1524908

Done By: PCN
Checked By: JR
Date: 2/13/2018

Jump Plate Reinforcement Check

Elevation: 20ft

DETERMINE MAXIMUM FORCES ON JUMP PLATE

Jump Plate Properties

$N := 6$

$BC := 63.25in$

$Ag := 8.125in^2$

$r_x := .3608in$

Flange Bolt Poperties

$N_{fb} := 64$

$Dia_{fb} := 1.25in$

$BC_{fb} := 50in$

$Ag_{fb} := 1.23in^2$

Reactions

$M := 4362.19kip \cdot ft$

$P := 88.65kip$

$V := 37.82kip$

Combined Section Properties

$$I_{fb} := \frac{N_{fb} \cdot BC_{fb}^2 \cdot Ag_{fb}}{8} = 24600 \cdot in^4$$

$$I_{bs} := \frac{N \cdot BC^2 \cdot Ag}{8} = 24378.43 \cdot in^4$$

$$I_{tot} := I_{fb} + I_{bs} = 48978.43 \cdot in^4$$

$$Ag_{tot} := N \cdot Ag + N_{fb} \cdot Ag_{fb} = 127.47 \cdot in^2$$

Division of Forces

Jump Plates

$$M_s := M \cdot \left(\frac{I_{bs}}{I_{tot}} \right) = 2171.23 \cdot kip \cdot ft$$

$$P_s := P \cdot \left(\frac{N \cdot Ag}{Ag_{tot}} \right) = 33.9 \cdot kip$$

$$V_s := 0kip$$

Flange Bolts

$$M_b := M \cdot \left(\frac{I_{fb}}{I_{tot}} \right) = 2190.96 \cdot kip \cdot ft$$

$$P_b := P \cdot \left(\frac{N_{fb} \cdot Ag_{fb}}{Ag_{tot}} \right) = 54.75 \cdot kip$$

$$V_b := V = 37.82 \cdot kip$$

Flange bolts to take full shear load

Maximum Axial Forces in Single Jump Plate

$$C := \frac{BC}{2} = 31.63 \cdot in$$

$$P_{Comp} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag + \frac{P_s}{N} = 280.27 \cdot kip$$

$$P_{Tens} := \frac{M_s \cdot C}{I_{bs}} \cdot Ag - \frac{P_s}{N} = 268.97 \cdot kip$$

CHECK BOLT CONNECTION TO TOWER

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

$N_b := 11$ $Dia := 0.7874in$ $Fu_{bolt} := 120ksi$ $Ag_b := 0.4869in^2$ $\phi := 0.75$

$t_{shaft} := 0.625in$ $F_{yshaft} := 42ksi$ $F_{ushaft} := 60ksi$

Bolt Shear Capacity

$$V_{max} := \frac{P_{Comp}}{N_b} = 25.48 \cdot kip$$

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

$$\text{\% Capacity} = \frac{V_{max}}{\phi R_{nv}} = 68.86 \cdot \%$$

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

$ecc := 1.625in$

BoltType :=

$n' := 5$ number of bolts above neutral axis

$d_m := 15in$ moment arm between resultant tensile and resultant compressive force

$$r_{ut} := \frac{P_{Comp} \cdot ecc}{n' \cdot d_m} = 6.07 \cdot kip$$ Tension force due to eccentric load

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

$$\phi R_{nt} = 32.9\cdot kip$$

% Capacity = $\dfrac{r_{ut}}{\phi R_{nt}} = 18.46\cdot\%$

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

$$\left(\frac{V_{max}}{\phi R_{nv}}\right)^2 + \left(\frac{r_{ut}}{\phi R_{nt}}\right)^2 = 0.51$$

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

check = "OK" % Capacity = $\dfrac{\text{Combined}}{1} = 50.83\cdot\%$

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

$$0.80\cdot 1.2\cdot\left(L_c + \frac{Dia}{4}\right)\cdot t_{shaft}\cdot F_{ushaft} = 72.34\cdot kip$$

$$2.4\cdot Dia\cdot t_{shaft}\cdot F_{ushaft} = 70.87\cdot kip$$

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

$\phi R_{nshaft} = 70.87 \cdot kip$

% Capacity = $\frac{V_{max}}{\phi R_{nshaft}} = 35.95 \cdot \%$

CHECK JUMP PLATE CAPACITY

Compression Check — AISC, part 16, ch. E

$L := 19.25in$ $K := 0.8$ $F_y := 65ksi$ $F_u := 80ksi$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{K \cdot L}{r_x}\right)^2} = 157.1 \cdot ksi$$

$$\frac{K \cdot L}{r_x} = 42.68 < 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_y}} = 99.49 \quad \therefore \quad F_{cr} := 0.658^{\frac{F_y}{F_e}} \cdot F_y = 54.66 \cdot ksi$$

$\phi P_n := 0.9 \cdot F_{cr} \cdot Ag = 399.74 \cdot kip$

% Capacity = $\frac{P_{Comp}}{\phi P_n} = 70.11 \cdot \%$

Tension Check — AISC, part 16, ch. D

Gross Section Yield

$\phi P_t := 0.90 \cdot F_y \cdot Ag = 475.31 \cdot kip$

% Capacity = $\frac{P_{Tens}}{\phi P_t} = 56.59 \cdot \%$

Net Section Fracture

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

$$A_n := Ag - \left(BH + \frac{1}{16}in\right) \cdot T = 6.875 \cdot in^2$$

$$A_e := \min\left(A_n, 0.85 \cdot Ag\right) = 6.87 \cdot in^2$$

$$\phi F_n := 0.75 \cdot F_u \cdot A_e = 412.5 \cdot kip$$

% Capacity = $\frac{P_{Tens}}{\phi F_n} = 65.21 \cdot \%$

ANCHOR ROD ANALYSIS

Anchor Rod Information

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

Reactions		
Moment	2190.96	kip-ft
Axial	54.75	kip
Shear	37.82	kip

	1st BC	2nd BC	
Anchor Rod Quantity	32	32	
Anchor Rod Diameter	1.25	1.25	in
Anchor Rod Material	A325	A325	ksi
Bolt Circle Diameter	47	53	in
Base Plate or Bracketed Connection?		Base Plate	

The tower shaft and flange plate bolts are passing, thus the flange plate is passing because the tower is PiRod.

Bolt #	Orientation of Anchor Bolts (Degrees)	
1	0.0	0
2	11.3	11.3
3	22.5	22.5
4	33.8	33.8
5	45.0	45
6	56.3	56.3
7	67.5	67.5
8	78.8	78.8
9	90.0	90.0
10	101.3	101.3
11	112.5	112.5
12	123.8	123.8
13	135.0	135.0
14	146.3	146.3
15	157.5	157.5
16	168.8	168.8
17	180.0	180.0
18	191.3	191.3
19	202.5	202.5
20	213.8	213.8
21	225.0	225.0
22	236.3	236.3
23	**247.5**	247.5
24	*258.8*	258.8
25	270.0	270.0
26	281.3	281.3
27	**292.5**	292.5
28	*303.8*	303.8
29	315.0	315.0
30	326.3	326.3
31	337.5	337.5
32	348.8	348.8

Anchor Rod Results

	1st BC	2nd BC	
Moment on Bolt Group	964.5	1226.5	kip-ft
Axial on Bolt Group	54.8	0.0	kip
Shear on Bolt Group	37.8	0.0	kip
Combined Load per Anchor Rod	34.9	34.7	kip
Anchor Rod Capacity	81.4	81.4	kip
Max Stress Ratio	**42.8%**	**42.6%**	

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

BLACK & VEATCH

Owner:	CROWN CASTLE	Prepared By:	PCN
Project Name:	Weston/ Rt-57/ Norfield R	Date:	2/14/2018
Project No.:	194393 (829046.1524908)	Verified By:	J. Riley
Title:	ANCHOR ROD CALCULATIONS	Date:	2/14/2018
		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	3
Base Plate Type	Circular

Reactions

Moment	5145	kip-ft
Axial	107	kip
Shear	40	kip

	1st BC	2nd BC	3rd BC	
Anchor Rod Quantity	26	8	26	
Anchor Rod Diameter	1.25	2.25	1.25	in
Anchor Rod Material	F1554 GR 105	F1554 GR 105	F1554 GR 105	ksi
Bolt Circle Diameter	67	76	67	in
Base Plate or Bracketed Connection?		Bracket*	Base Plate	

The tower shaft and base plate bolts are passing, thus the base plate is passing because the tower is PiRod.

Bolt #	Orientation of Anchor Bolts (Degrees)		
1	0.0	10.35	6.9
2	13.8	45	20.75
3	27.7	93.5	34.6
4	41.5	135	48.45
5	55.4	183.5	62.3
6	69.2	225	76.15
7	83.1	273.5	90
8	96.9	315	103.85
9	110.8		117.7
10	124.6		131.6
11	138.5		145.4
12	152.3		159.3
13	166.2		173.1
14	180.0		186.9
15	193.8		200.8
16	207.7		214.6
17	221.5		228.5
18	235.4		242.3
19	249.2		256.2
20	263.1		270.0
21	276.9		283.9
22	290.8		297.7
23	304.6		311.6
24	318.5		325.4
25	332.3		339.3
26	346.2		353.1

Anchor Rod Results

	1st BC	2nd BC	3rd BC	
Moment on Bolt Group	1585.7	1973.6	1585.7	kip-ft
Axial on Bolt Group	107.0	0.0	0.0	kip
Shear on Bolt Group	40.0	0.0	0.0	kip
Combined Load per Anchor Rod	51.1	161.2	43.9	kip
Anchor Rod Capacity	96.9	324.8	96.9	kip
Max Stress Ratio	**52.7%**	**49.6%**	**45.3%**	

(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	0.75	in
Monopole Material	A500 Gr.B (Rnd)	
Yield Stress, Fy	46	ksi
Ultimate Stress, Fu	58	ksi
Base Plate Material	A36	
Yield Stress, Fy	36	ksi
Ultimate Stress, Fu	58	ksi
Pier Foundation Diameter	7.5	ft
Rebar Yield Stress	60	ksi
Concrete Strength	5000	psi
Clear Cover	3	in
Rebar Size	9	
Tie Size	4	
Vertical Rebar Quantity	47	

	2nd BC	
Analysis or Design of Bracket?	Analysis	

Bracket Loading Information

Moment on Bolt Group	1973.6	kip-ft
Axial Load on Anchor Rod	161.2	kip
Anchor Rod Capacity	324.8	kip

Tube Properties

Tube Section	HSS4x4x0.5		
Length	24	in	AISCM Table 1-12
Gap Between Base Plate and Tube	0	in	
Outside Width/Diameter	4	in	
Thickness	0.5	in	
Area	6.02	in^2	
Moment of Inertia	11.9	in^4	
Radius of Gyration	1.41	in	
Material	A500 Gr.C		
Yield Stress	46	ksi	
Ultimate Stress	62	ksi	

Gusset Plate Properties

Width	6.25	in
Thickness	1.25	in
Height of Plate at Pole, L_{plate1}	30	in
Height of Plate at Tube, L_{plate2}	24	in
Notch Size	0.75	in
Material	A572 Gr. 50	
Yield Stress	50	ksi
Ultimate Stress	80	ksi

Weld Properties

Plate to Monopole Weld Size	0.3125	in
Plate to Tube Weld Size	0.625	in
Plate to Base Plate Weld Size	0.625	in
Electrode	E80	
Material Grade, F_{EXX}	80	ksi

Anchor Rod Embedment Properties

Embedment Depth	6	ft
Epoxy Material	Hilti RE 500 V3	
Bond Strength	1.11	ksi

ANCHOR ROD BRACKET CALCULATIONS

TIA-222-G Reference

Tube Analysis

Bearing Check

ϕ_b =	0.75		
$\phi P_n = \phi_b 1.8 F_y A_g$ =	373.84	kip	AISCM Eq (J7-1)
Stress Ratio	**43.1%**		

Compression Check

ϕ_c =	0.90		
K =	1		
KL/r =	17.02		
$4.71\sqrt{(E/F_y)}$ =	118.26		
$F_e = \pi^2 E/(KL/r)^2$ =	987.90	ksi	AISCM Eq (E3-4)
$F_{cr} = 0.658^{(Fy/Fe)} F_y$ =	45.11	ksi	AISCM Eq (E3-2)
$\phi P_n = \phi_c F_y A_g$ =	249.23	kip	AISCM Eq (J4-6)
Stress Ratio	**64.7%**		

Gusset Plate Analysis

Plate Shear Yielding Check

ϕ_v =	1		
$A_{nv} = A_g = t_{plate} * L_{tube}$ =	30	in^2	
$\phi V_n = \phi_v 0.6 A_g F_y$ =	900	kip	AISCM Eq (J4-3)
Stress Ratio	**17.9%**		

Plate Shear Rupture Check

ϕ_v =	0.75		
$\phi V_n = \phi_v 0.6 A_{nv} F_u$ =	1080.00	kip	AISCM Eq (J4-4)
Stress Ratio	**14.9%**		

Plate to Monopole Punching Shear Check

ϕ_v =	0.90		
$e = w_{plate} + d_{tube} - t_{tube} - D_b/2$ =	8.63	in	
M = P * e =	1390.07	kip-in	
$f_v = 6M/L_{plate1}^2$ =	9.27	kip/in	
$\phi F_v = \phi_v 0.6 F_{ymp}(2t_{mp})$ =	34.02	kip/in	
Stress Ratio	**27.2%**		

Plate to Tube Punching Shear Check

$e = d_{tube} - t_{tube} - D_b/2$ =	2.38	in	
M = P * e =	382.77	kip-in	
$f_v = 6M/L_{plate2}^2$ =	3.99	kip/in	
$\phi F_v = \phi_v 0.6 F_{ytube}(2t_{tube})$ =	24.84	kip/in	
Stress Ratio	**15.9%**		

Gusset Plate to Monopole Weld Analysis

ϕ_{wg} =	0.75		
$\phi R_{nweld} = \phi_{wg} 0.6 F_{EXX}$ =	36.0	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	**55.3%**		

Gusset Plate to Tube Weld Analysis

ϕ_w =	0.75		
$a = (d_{tube} - t_{tube} - D_b/2)/L_{plate2}$ =	0.09		
C =	1.03		
C_1 =	3.71		
$\phi R_n = \phi_w C C_1 D L_{plate2}$ =	687.83	kip	
Stress Ratio	**23.4%**		

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
$BC_{rebar} = D_{pier} - 2c_c - 2d_{tie} - d_b$ =	81.88	in
$S_{rebar} = \pi BC_{rebar} / n$ =	5.47	in
$c_b = c_c + d_{tie} + d_b/2$ =	2.74	in
$l_d = [3/40\ (f_y/\lambda\sqrt{f'_c})\ \psi_t\psi_e\psi_s/(c_b+k_{rt}/d_b)]d_b$ =	29.43	in

Development Length Check

$A = S_{rebar} / 2$ =	2.74	in
$B = BC_{rebar}/2 - BC_{bracket}/2$ =	2.94	in
$G = \sqrt{(A^2 + B^2)}$ =	4.01	in
$l'_d = l_d + G/1.5 + 3in$ =	35.11	in
S_b =	1.11	ksi
ϕ_{bond} =	0.55	
$L_{be} = P_n / (\pi D_b S_b \phi_{bond})$ =	37.35	in
$L_{min1} = L_{be} + 6in$ =	43.35	in
$L_{min2} = l'_d + 0.25L_{be}$ =	44.45	in
Stress Ratio	61.7%	

BLACK & VEATCH
Building a world of difference.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
Phone: (913) 458-2000

Client:	Crown Castle	*Design:*	PCN
Project:	194393 (829046.1524908)	*Date:*	2/14/2018
Site:	Weston/ Rt-57/ Norfield R	*Verify:*	J. Riley
Title:	**Monopole Tower Foundation Capacity Comparison**	*Date:*	2/14/2018
		Code:	TIA-222-G

Template Version 1.5

FOUNDATION ANALYSIS:

Original Tower Design Reactions:

Foundation:

Shear:	52.8	Kip*
Overturning moment:	7052.7	Kip-ft*

*Design loads were multiplied by 1.35 for comparison as allowed by TIA-222-G, Section 15.5.1.

TnxTower Reactions:

Foundation:

Shear:	40.0	Kip
Overturning moment:	5145.0	Kip-ft

Stress Ratio:

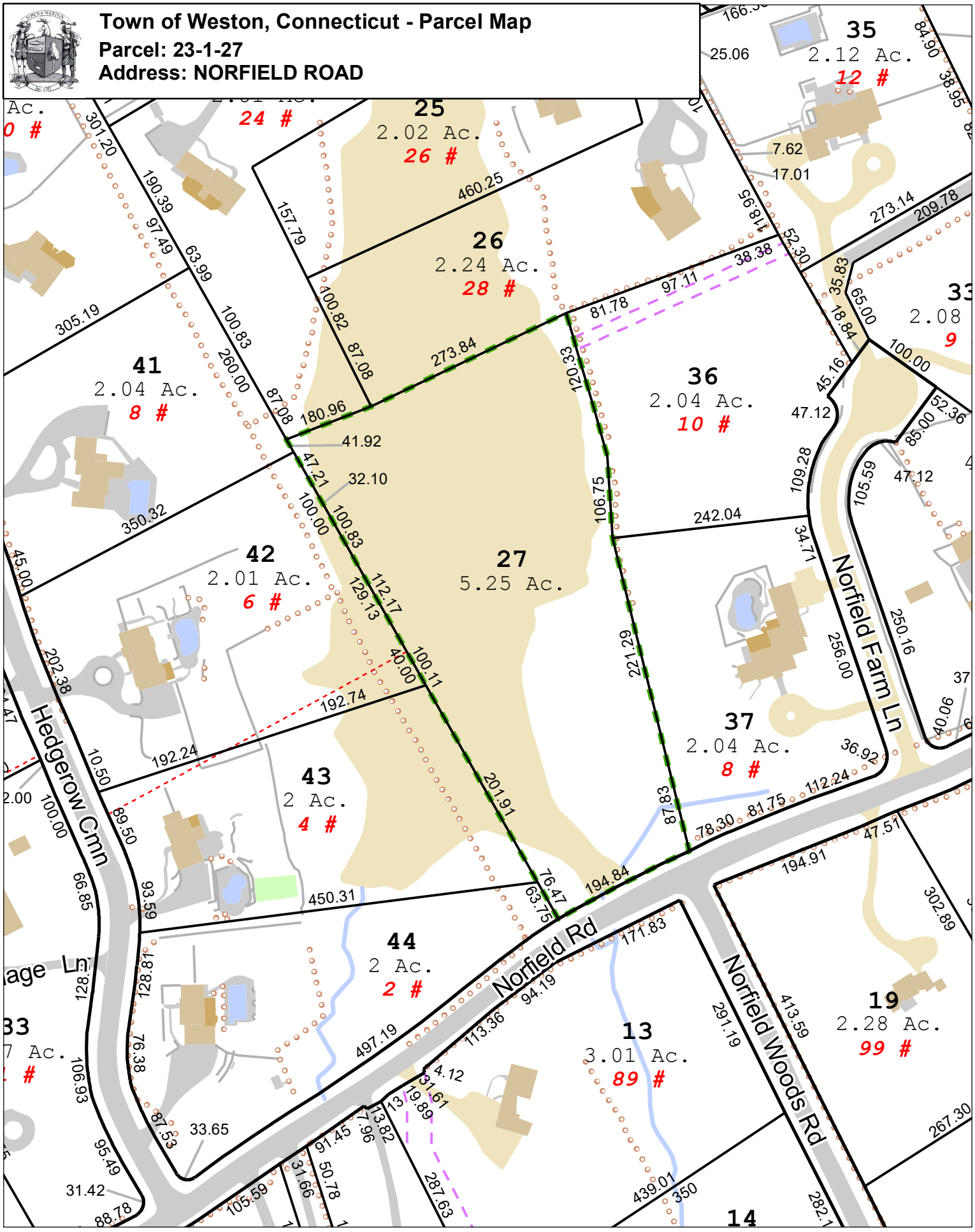
Foundation:

Shear:	**75.8%**
Overturning moment:	**73.0%**

Conclusion: **When the calculated reactions are compared to the original design reactions, the existing foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.**

Controlling Foundation Stress Ratio: **73.0%**

NOTE: Although the shear capacity is at 75.8%, the moment reaction is the governing criteria for a monopole drilled shaft foundation. Therefore, the overall capacity for this foundation is 73.0%.


Town of Weston, Connecticut - Parcel Map
Parcel: 23-1-27
Address: NORFIELD ROAD
25
2.02 Ac.
26 #
26
2.24 Ac.
28 #
35
2.12 Ac.
12 #
41
2.04 Ac.
8 #
36
2.04 Ac.
10 #
42
2.01 Ac.
6 #
27
5.25 Ac.
43
2 Ac.
4 #
37
2.04 Ac.
8 #
44
2 Ac.
2 #
13
3.01 Ac.
89 #
19
2.28 Ac.
99 #
Norfield Rd
Norfield Farm Ln
Norfield Woods Rd
Hedgerow Cmn
Approximate Scale:
0 30 60 90 120
Feet
Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Weston and its mapping contractors
assume no legal responsibility for the information contained herein.
Map Produced November 2017

Town of Weston, CT

Incorporated 1787

Owner and Parcel Information

Owner Name	TOWN OF WESTON TOWN HALL & FIRE STATION	**Today's Date**	March 13, 2018
Mailing Address	56 NORFIELD RRD	**Parcel ID**	13093 (Account #: E00116)
	WESTON, CT 06883	**Map/Block/Lot**	22/6/28+31
Location Address	56 NORFIELD ROAD		
Subdivision Map / Lot	/	**Acreage**	0.00
Use Class / Description	901 Municipal	**Subdivision**	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
$ 4,449,600	$ 0	$ 175,800	$ 0		$ 4,625,400	$ 4,625,400	$ 3,237,800

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
2017	$ 3,114,700	$ 123,100	0	$ 3,237,800
2016	$ 3,114,700	$ 123,100	0	$ 3,237,800
2015	$ 3,114,700	$ 123,100	0	$ 3,237,800

Land Information

Use	Class	Area	Value
Municipal	E	0 AC	
Municipal	E	0 AC	
Municipal	E	0 AC	

Commercial Building Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Town Hall	1956	2000	13,686	1	C	Brick/Masonry	Drywall	10	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Slate	Gable	Carpet	Gas	Hot Water	Heat/AC Pkg	%	Wood Frame	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area
BAS	First Floor	7,615	7,615
BSM	Basement Area	0	5,474
FOP	Framed Open Porch	0	77
PTB	Patio - Brick	0	400
PTS	Patio - Stone	0	120
	Totals	**7,615**	**13,686**

Building Sketch

NA

Building Photo Enlarge

Commercial Building 2 Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Town Hall	1956	1993	5,883	1	C	Brick/Masonry	Drywall	8	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Slate	Gable	Linoleum	Gas	Forced Air	Heat/AC Pkg	%	Wood Frame	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area
BAS	First Floor	1,854	1,854
FEP	Framed Enclosed Porch	0	168
FGR	Garage	0	1,444
FOP	Framed Open Porch	0	49
FRB	Raised Bsmt. Fin	0	2,368
	Totals	**1,854**	**5,883**

Building Sketch
NA

Building Photo
NA

Commercial Building 3 Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Fire Station	1956	1986	11,238	2	C	Brick/Masonry	Minimum	8	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Asphalt Shingl	Hip	Linoleum Carpet	Gas	Hot Water	Heat/AC Split	%	Wood Frame	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area
BAS	First Floor	448	448
FGR	Garage	0	5,428
FST	Finished Storage	0	1,156
FUS	Finished Upper Story	4,206	4,206
	Totals	**4,654**	**11,238**

Building Sketch
NA

Building Photo Enlarge

Out Buildings / Extra Features				
Description	**Sub Description**	**Area**	**Year Built**	**Value**
Paving Asph.		25,600 S.F.	2008	$ 62,200
Paving Asph.		9,600 S.F.	2008	$ 23,300
Light (1)		7 UNITS	2008	$ 13,800
Work Shop		240 S.F.	2008	$ 4,500
Light (2)		1 UNITS	2008	$ 2,900
Studio/Office		768 S.F.	2008	$ 69,100

Sale Information						
Sale Date	**Sale Price**	**Deed Book/Page**	**Sale Qualification**	**Reason**	**Vacant or Improved**	**Owner**
00/00/0000						TOWN OF WESTON TOWN HALL & FIRE STATION

Permit Information								
Permit ID	**Issue Date**	**Type**	**Description**	**Amount**	**Inspection Date**	**% Complete**	**Date Complete**	**Comments**
7970	09/28/2017			$ 20,000		0		SPRINT ADDING EQUIPMENT
7857	01/12/2017			$ 8,000		0		SEE PERMIT
7832	10/27/2016			$ 15,000		100		SEE PERMIT
7790	07/12/2016				07/26/2016	100	09/26/2016	INTERIOR RENOVATIONS TO LIBRARY
7702	12/17/2015			$ 20,000	07/26/2016	100	02/01/2016	AT&T REMOVE AND REPLCE ANTENNAS
7502	01/13/2015			$ 20,000	04/15/2015	100	04/15/2015	SEE PERMIT
7429	08/20/2014			$ 15,000	12/24/2014	100	10/01/2014	ANTENNAS
7346	03/19/2014			$ 10,000	12/24/2014	100	06/01/2014	SEE PERMIT
7291	11/05/2013			$ 25,000	12/24/2014	100	01/15/2014	ELECTRICAL
6512	11/05/2008				08/05/2009	100	01/22/2009	FOOD PANTRY
6490	09/19/2008				04/01/2009	100	04/01/2009	REPLACE ROOF
5362	10/06/2003			$ 80,000		100		CELL TOWER

The Town of Weston Assessor's Office makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. Website Updated: March 4, 2018

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TOWN of WESTON, CONNECTICUT

Incorporated 1787

Planning & Zoning Commission

8-24 Report

Town of Weston
Omnipoint Communications
Monopole Tower

At a regularly scheduled meeting of the Planning & Zoning Commission held on July 26, 1999, the Commission unanimously approved the plan presented by the First Selectman George Guidera and Town Administrator Roy Hill to service six communication companies plus the Town of Weston antennas for public safety and radio emergency equipment on a monopole tower, in accordance with letter dated July 1, 1999 and the standard lease agreement dated May 24, 1999, which will be modified to include maintenance of the building.

RECEIVED FOR RECORD Aug 23 19 99
at 10:14A M. ATTEST [illegible]

56 Norfield Road, P.O. Box 1007, Weston CT 06883 Tel. (203) 222-2618 FAX (203) 222-8871

8-24 REPORT: TOWN OF WESTON OMNIPOINT COMMUNICATION MONOPOLE TOWER

First Selectman George Guidera presented an 8-24 Report for a communication monopole tower. Roy Hill, Town Administrator was also present. Mr. Guidera stated that the Town has been working on this project for almost 4 years to replace the existing emergency services radio tower located at the rear of the Town Hall complex. The existing tower is 20 plus years old and in need of replacement. There is noticeable deterioration of the cement base and several companies have described the tower as having lasted its useful life expectancy. The Town determined that the emergency services radio tower needed to be replaced and upgrading the need for better cellular phone service in Weston. The recommendation of the Communications Tower and Antenna Advisory Committee, it was decided to replace the existing emergency services radio tower with a 190 foot monopole tower in essentially the same as the current tower.

The Omnipoint Communications, Inc. will build this 190 foot monopole tower for the Town of Weston and pay $72,000. rent per year. After construction the tower will be leased back to Omnipoint Communications. Besides the antennas for all radio's of the Weston Fire, EMS, Highway, and Police Departments, it will also have 6 cellular/PCS (personal communications services) carriers on board. In the agreement with Omnipoint, the Town of Weston has the top of the tower allocated for the emergency services radios as appropriate by radio frequency.

An equipment building will also have to built next to the monopole tower to house the radio equipment for the police, fire and EMS, along with equipment for the six cellular/PCS carriers. The proposed building is a white brick, single story structure, approximately 77' by 23' in size.

Due to the placement of the existing underground utilities the most effective location for the new antenna is where the Police/Fire/EMS Fitness Center currently is. It is proposed that the fitness center be moved from its current location on the northeast corner of the of the firehouse to the northwest corner of the firehouse. This proposed tower will eliminate the tower planned at Timber Mill.

Mark Finely of Omnipoint introduced his staff and went over the tower in detail. He also stated that this 8-24 report if only for the tower at Town Hall and showed the coverage this tower would have for the Town.

8-24 REPORT: TOWER CONTINUED:
Questions from the Commission:
1. Will the tower need guy wires? The tower does not need quy wires.
The architect from Omnipoint stated it is extremely safe and has to sustain winds of 100 miles per hour and is designed to crumple down into itself.
2. Address land use issues such as the parking at Town Hall and the possible loss of parking spaces for the utility building. Also the increased traffic for maintenance of the tower.
3. Questioned the use of the land on the other side of the Fire House for the location of the tower. The Town Engineer explained that this area contains a new drainage system and could not withstand the weight of a tower.
4. Omnipoint will install the utility building and the Town will pay for the equipment.
5. Questioned the construction details of the tower and concerned about icing on the platforms. Omnipoint stated that they had not had this problem.

The Commission requested that the utility building be staked for this site walk on July 17.

PUBLIC HEARING CONT: 2 LOT RESUB. 35 SALEM ROAD MITCHELL (BARR)
Mel Barr was present, representing the owner R. Mitchell. The Commissioners walked the site and expressed concern about saving the trees and also a better site line for the driveway as the vegetation is on Town land and needs to be removed. Also discussed possible conditions for the approval including horses on Salem Road during construction, and an updated letter from the Fire Marshal.

Don Saltzman moved that the Commission close the public hearing. Seconded by Michael Widland. Vote in favor (7-0).

PUBLIC HEARING CONT: OLIVE PHILLIPS CALVIN ROAD 4 LOT SUB. (ROMANO)
Peter Romano of Richard Bennett Associates was present for the applicant. Mr. Romano and the Commission discussed the site walk and that the parcel they saw with the foundation is not a lot that is included in the subdivision. Also a discussion followed about the access to this lot which is off the subdivision road "Quail Road". The question arose as to why this lot is not part of the subdivision. Mr. Romano stated that they received a site specific approval from Conservation for this lot. Michael Widland was concerned about two curb cuts onto Georgetown Road and a discussion about the site lines and safety of the access to Georgetown Road. The Chairman requested that the applicant incorporate the adjacent 2 acre lot into the subdivision. Peter Romano agreed to submit a new map and also walk this thru with the Conservation officer as it was included in the subdivision when it was approved by Conservation.

8-24 REPORT CONT: TOWN OF WESTON OMNIPOINT COMMUNICATIONS MONOPOLE TOWER

First Selectman George Guidera, Town Administrator Roy Hill and members of Omnipoint Communications were present. The Commissioners walked the site and had the following concerns:

Don Saltzman looked at other potential locations and feels that the proposed location is the best location. Also concerned about ice buildup on 6 platforms and asked if there was a way to heat the platforms? The Omnipoint representative stated they have no technology for this and to his knowledge they have never had a problem. He felt the ground space around the tower is enough are to catch any ice. A discussion then followed regarding insurance and if the Town is covered. George Guidera stated that the Town has its own insurance and feels the Town is adequately protected. Mr. Saltzman was also concerned about having it in writing that the towers will be at Town Hall and possibly at the Landfill and not at Timbermill. A discussion followed regarding the 6 carriers on one pole.

Michael Widland clarified that the Commission is only dealing with this tower at Town Hall. Marguerite Terzian is concerned about service trucks regarding safety in the Town Hall parking lot and had considered some other location. Ms. Terzian then read the following letter from the Fire Chief, dated 7/20/99:

"I was chairman of the original tower fact-finding committee comprised of representatives from the police department, communications center, fire department, EMS, and the town engineer. When Selectman Guidera appointed a Town Tower Committee I forwarded our findings and became a member of that committee. Many hours have been spent examining in detail all feasible options for a tower location. The area behind the Communications Center is best for a number of short and long term reasons. The further away the tower is from the Communications Center, the greater the potential for problems. The Town Hall building will help screen the tower. When the Communications center expands it will have room to do so back toward the school. Locating the tower and radio building to the west side of the firehouse will make future expansion of Norfield Station impossible. At a minimum I anticipate the need for an aerial ladder truck which will require an additional bay. Parking for volunteers responding during the week is becoming very scarce. Taking space from Station 1's west side will only compound a growing problem. When a firefighter dormitory is added it will have to be at ground level, With no room on the west side the only option would be to build north into the school playing fields. It's highly unlikely the Board of Ed would approve. Marguerite, I cannot emphasize too strongly that the tower will help save lives and property by providing the emergency services the required antenna height for uninterrupted communications. It will also give residents access to emergency services while on the roads, in the woods, or at their homes when conventional telephones are

8-24 REPORT TOWER CONTINUED:

unavailable or out of service. The increasing portability of cellular phones will make 24 hour a day, anywhere in Weston emergency help a reality, particularly for the elderly, infirm and handicapped. Finally, we anticipate mobile computer data exchange in our emergency vehicles for transferring vital statistics to and from the field. We have been working on this very important project for years and are available to you for help and to answer any questions". Ms. Terzian stated that this letter convinced me that the other side of the Fire House was important to the Fire Department.

Town Engineer John Conte showed a map and went over in detail the drainage implications on the other side of the Fire House.

Don Saltzman suggested Omnipoint coordinate their installation with the trench wiring for the Technology Plan for Town Hall.

Michael Widland asked if the lease been amended? The Town Administrator stated it covers at least four and Mr. Widland wants to make sure there are six carriers.

There was a discussion regarding the block house and maintenance and that it is part of Omnipoint's responsibility. The Commission expressed concern about traffic involved for the maintenance and the Town Hall parking and to consider proper signage for same. It was noted by the Town Engineer that there will no loss of parking spaces for the construction of the block house.

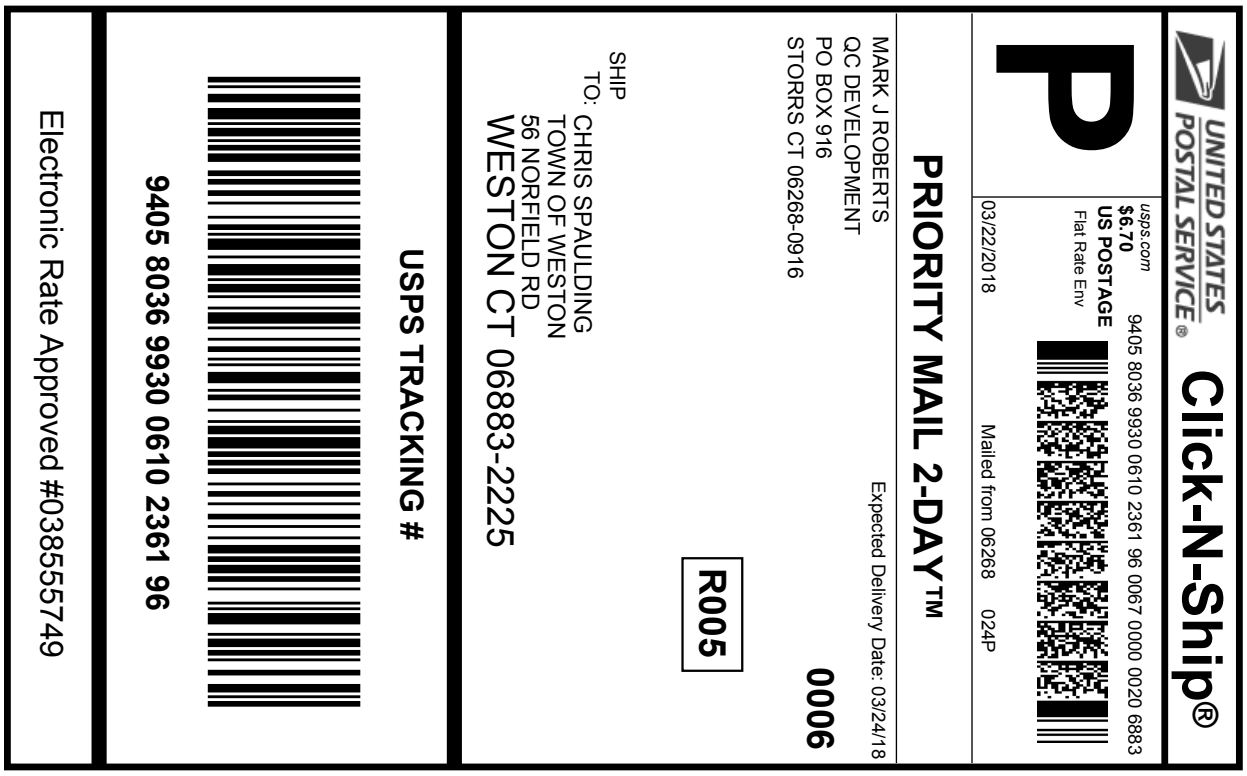
Don Saltzman moved that the Commission approve the plan presented by the First Selectman George Guidera and Town Administrator Roy Hill to service six communication companies plus the Town of Weston antennas for public safety and radio emergency equipment on a monopole tower, in accordance with letter dated July l, l999 and the standard lease agreement dated May 24, 1999, which will be modified to include maintenance of the building. Seconded by Michael Widland. Vote in favor (6-0). Paul Schultz absent.

PUBLIC HEARING CONT: OLIVE PHILLIPS CALVIN ROAD 4 LOT SUB. (ROMANO)

This application was withdrawn.

PUBLIC HEARING CONT: SPECIAL PERMIT APARTMENT 7 NIMROD FARM (MATTERA)

This application was withdrawn



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