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

August 27, 2015

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

RE: **T-Mobile - Exempt Modification - Crown Site BU: 876335**
T-Mobile Site ID: CTHA233B
Located at: 3A Birdseye Road, Farmington, CT 06030

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mrs. Kathleen A. Eagen, Manager for Town of Farmington.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **3A Birdseye Road, Farmington, CT**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the 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 tower. T-Mobile's additional antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Kimberly Myl.

Sincerely,

Kimberly Myl
Real Estate Specialist

Enclosures

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mrs. Kathleen A. Eagen, Manager
Town of Farmington
1 Monteith Drive
Farmington, CT 06032

5677

CROWN CASTLE - ETA PROPERTY
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

32-61-1110

DATE 8/27/15

PAY TO THE ORDER OF Connecticut Siting Council $ 625.00

Six hundred twenty-five & 00/100 DOLLARS

Security Features Included. Details on Back.

CHASE
JPMorgan Chase Bank, N.A.
www.Chase.com

VALID FOR 180 DAYS

TMO 700 zon.

FOR CTHA_876335_340888_303995

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T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CTHA233B
CROWN CASTLE BU #: 876335
SITE NAME: EAST FARMINGTON

3 A BIRDSEYE ROAD
FARMINGTON, CT 06030
HARTFORD COUNTY

VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART FROM 4 SYLVAN WAY. TAKE A RIGHT ONTO SYLVAN WAY TOWARDS US-202. TURN RIGHT ONTO US-202. USE RIGHT LANE TO TAKE EXIT ONTO I-80 E. TAKE EXIT 43 AND GET ONTO I-287N. KEEP LEFT TO STAY ON I-287 N. USE RIGHT TWO LANES TO MERGE ONTO I-287 E/I-87S. FOLLOW SIGNS TO STAY ON I-287 E/I-87 S. KEEP RIGHT AT A FORK TO CONTINUE ONTO I-87 S AND FOLLOW SIGNS FOR SAW MILL PKWY S/NEW YORK CITY. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD. FOLLOW SIGNS FOR SAWMILL RIVER PWKY N. KEEP LEFT AND MERGE ONTO 1-684N. TAKE EXIT 9E FOR INTERSTATE 84 E TOWARD DANBURY. MERGE ONTO I-84 E AND FOLLOW SIGNS TO STAY ON I-84 E. TAKE EXIT 37 FOR FIENEMANN RD TOWARD US-6 W. USE LEFT TWO LANES TO TURN LEFT ONTO FIENEMANN RD. FIENEMANN RD TURNS RIGHT AND BECOMES STATE HWY 549. DESTINATION WILL BE ON THE RIGHT.

ENGINEER
DEWBERRY ENGINEERS INC.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054

CONTACT: BRYAN HUFF
PHONE #: (973) 576-0147

CONSTRUCTION
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CONTACT: PATRICIA PELON
PHONE #: (518) 373-3507

CONSULTANT TEAM

SITE NAME:
EAST FARMINGTON

SITE NUMBER:
CTHA233B

TOWER OWNER:
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

COORDINATES:
LATITUDE: 41°-42'-56.94" N (NAD83)
LONGITUDE: -72°-48'-37.42" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
3 A BIRDSEYE ROAD
FARMINGTON, CT 06030
HARTFORD COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- REMOVE EXISTING ANTENNAS, COAX CABLES & ANTENNA MOUNT @ 120'-0" A.G.L. RAD CENTER.

SCOPE OF WORK

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.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

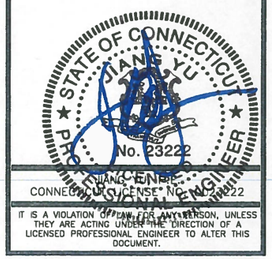
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CTHA233B
EAST FARMINGTON

CONSTRUCTION DRAWINGS

0	08/17/15	ISSUED AS FINAL
A	08/05/15	ISSUED FOR REVIEW

Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



JIANG YU, PE
CONNECTICUT LICENSE NO. 23222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074599
SITE ADDRESS:	

3 A BIRDSEYE ROAD
FARMINGTON, CT 06030
HARTFORD COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CROWN CASTLE
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   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 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.

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 T–MOBILE 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.

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 AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
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.

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.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE 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.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.

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CTHA233B
EAST FARMINGTON

CONSTRUCTION DRAWINGS

0	08/17/15	ISSUED AS FINAL
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Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
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PHONE: 973.739.9400
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STATE OF CONNECTICUT
JIANE YU
No. 23222
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 23222

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DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074599
SITE ADDRESS:	

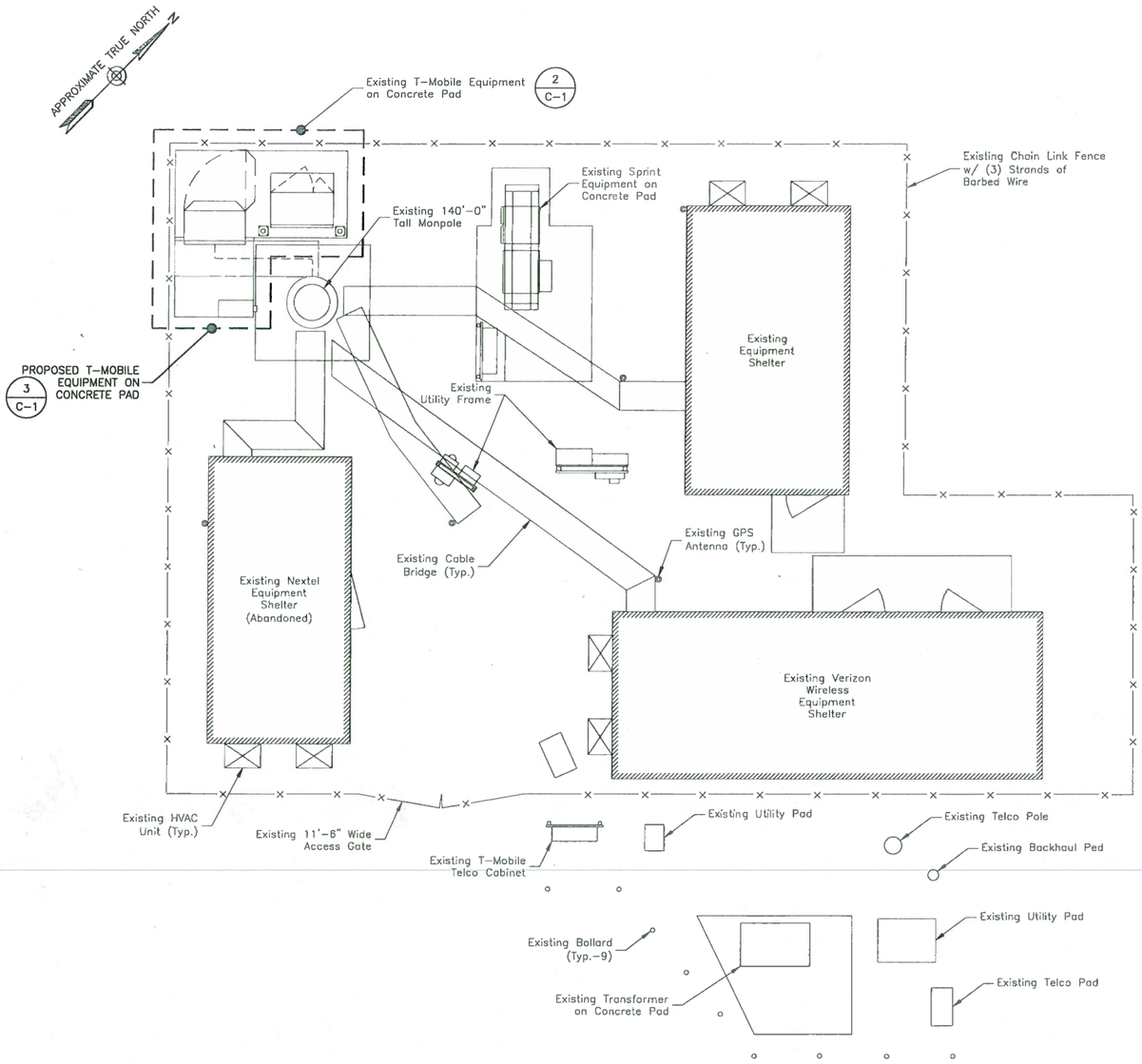
3 A BIRDSEYE ROAD
FARMINGTON, CT 06030
HARTFORD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1

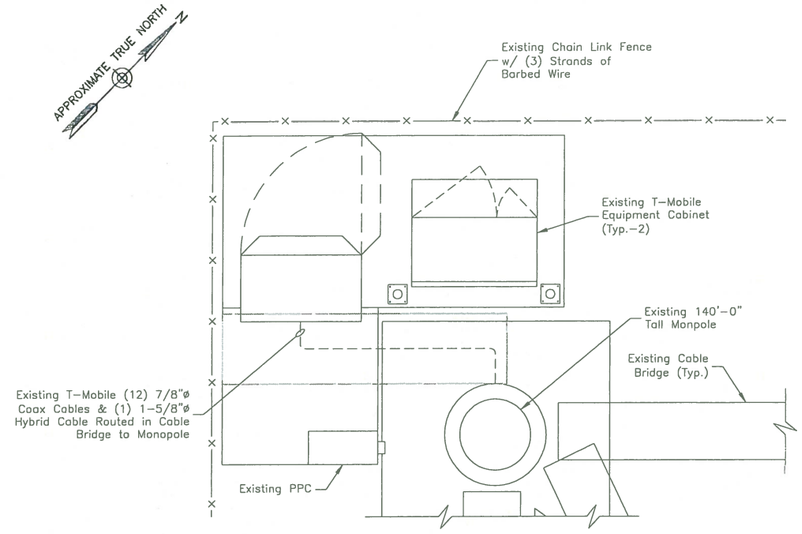


COMPOUND PLAN

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

1

0' 5' 10'

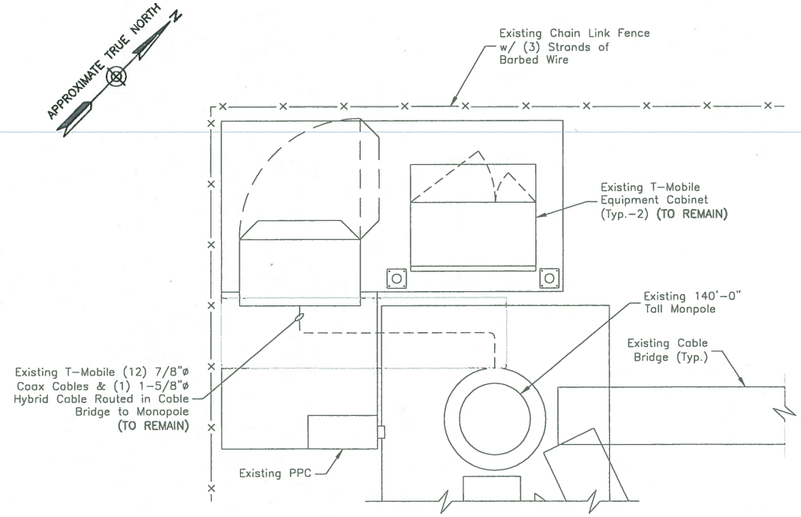


EXISTING EQUIPMENT PLAN

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

2

0' 2' 4' 6'



NOTE:

1. NO EQUIPMENT IS PROPOSED AT GRADE.

PROPOSED EQUIPMENT PLAN

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

3

0' 2' 4' 6'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY FDH VELOCITEL DATED JULY 24, 2015.

T-Mobile
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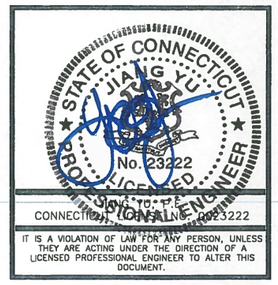

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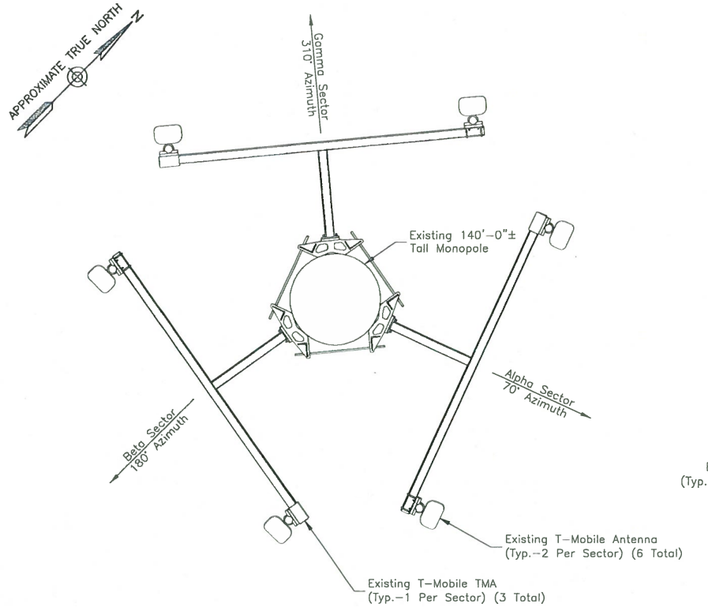
SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

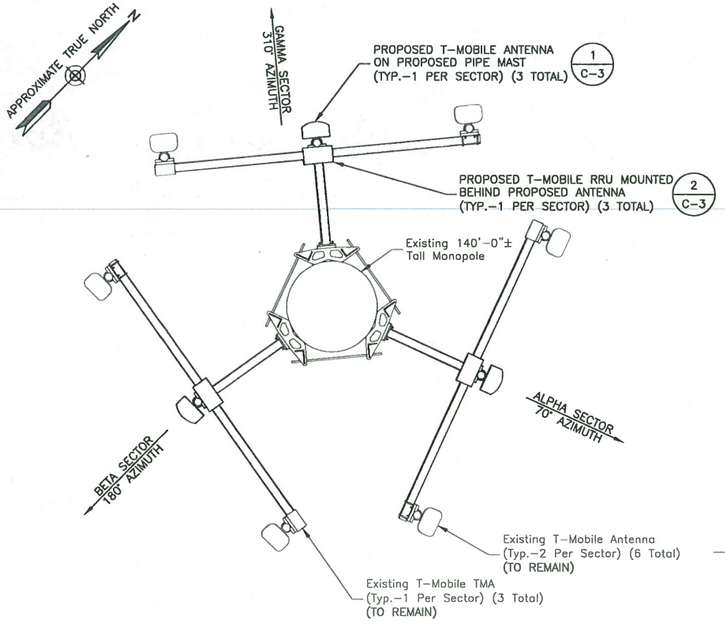
SHEET NUMBER

C-1



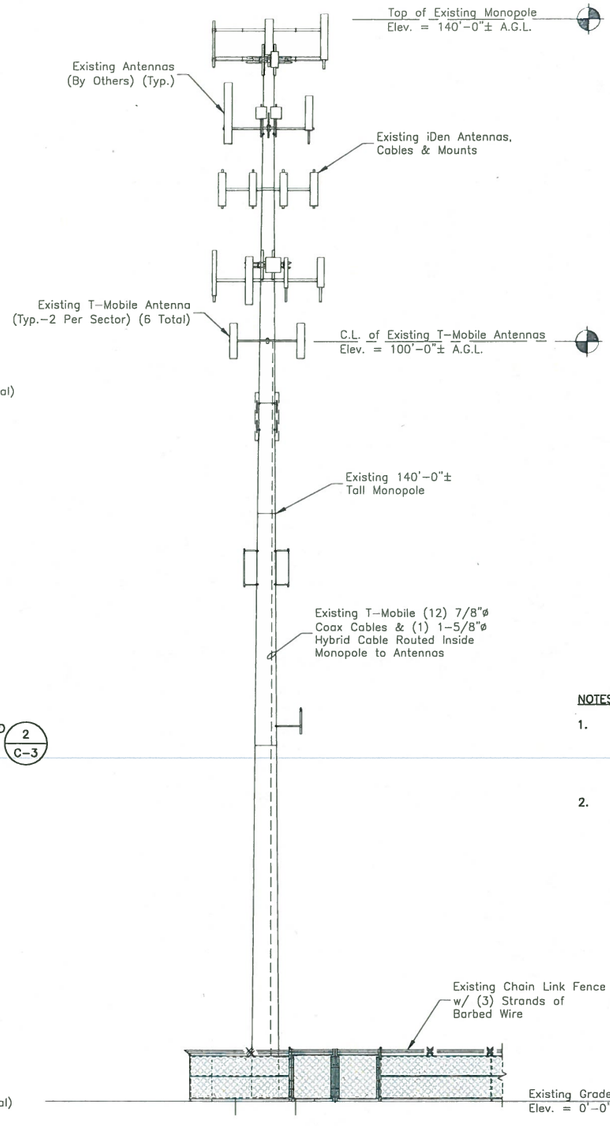
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



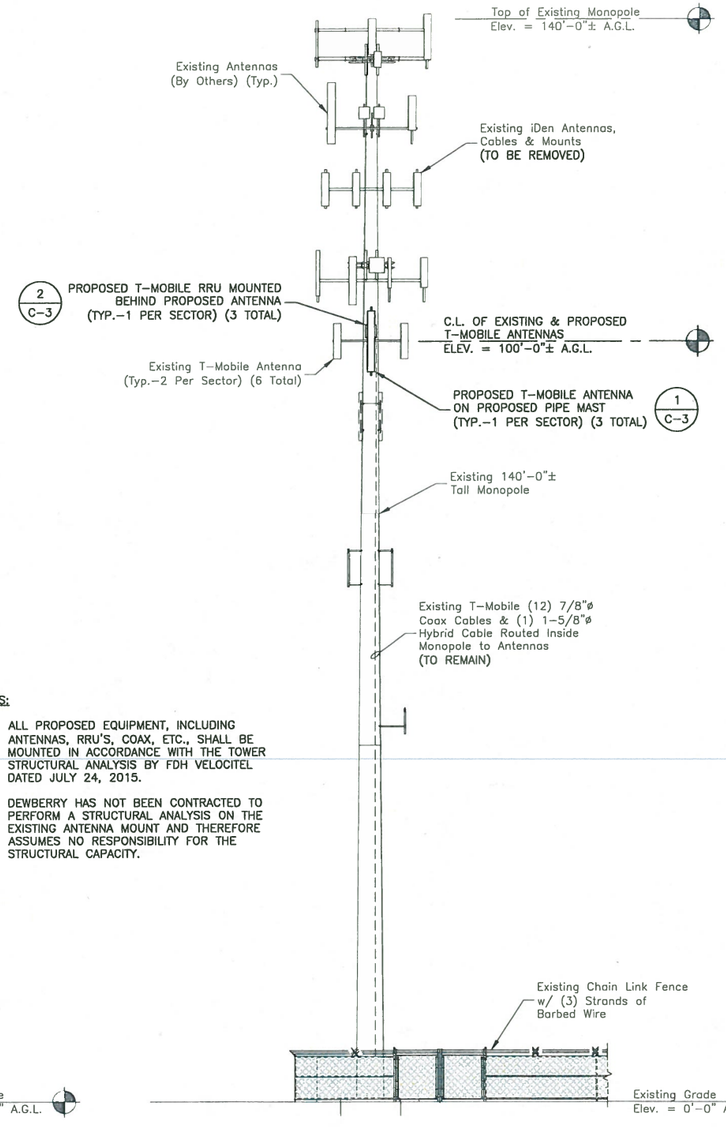
PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.



EXISTING ELEVATION (3)

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



PROPOSED ELEVATION (4)

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

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY FDH VELOCITEL DATED JULY 24, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

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JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU
CONNECTICUT LICENSE NO. 0023222

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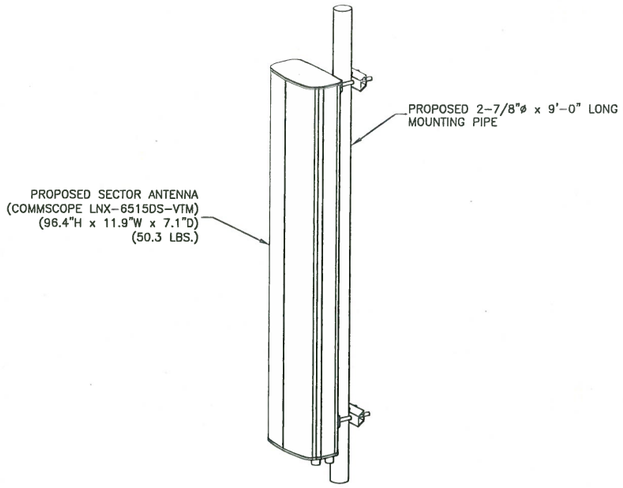
HARTFORD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

C-2

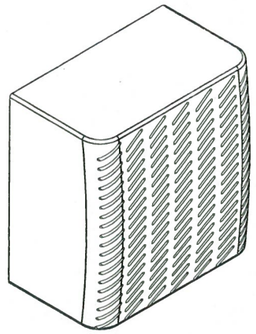


NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL 1

SCALE: N.T.S.



SPECIFICATIONS:

HEIGHT:	20.0"
WIDTH:	17.0"
DEPTH:	7.0"
WEIGHT:	50.7 LBS

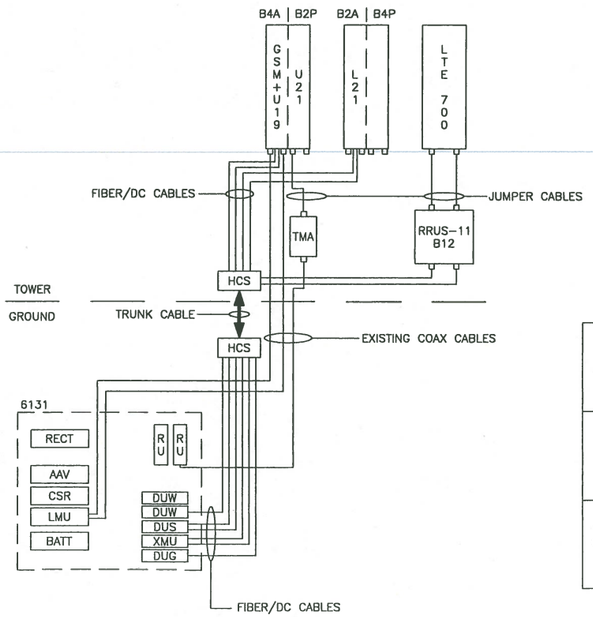
ERICSSON RRUS-11 B12

RRU NOTES:

1. MOUNT EQUIPMENT WITH MANUFACTURER PROVIDED MOUNTING BRACKETS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT 2

SCALE: N.T.S.



SITE CONFIGURATION 702Cu 3

SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH	EXISTING HCS
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	150'-0"	(1) 1-5/8"ø @ 150'-0"
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	150'-0"	
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	150'-0"	
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				

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FARMINGTON, CT 06030
HARTFORD COUNTY

SHEET TITLE

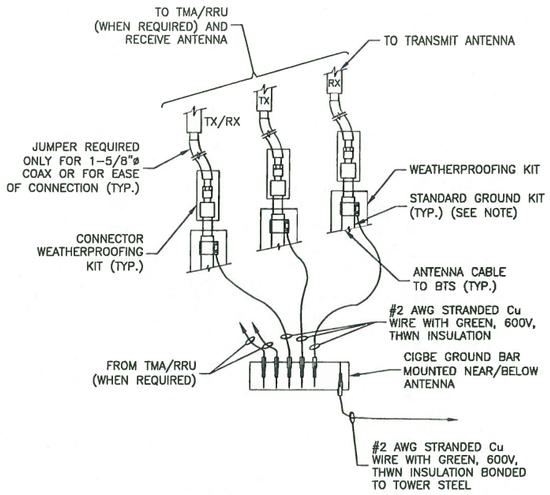
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. 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 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND 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 AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND 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 AND 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 AND 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 T-MOBILE 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 AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND 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 AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

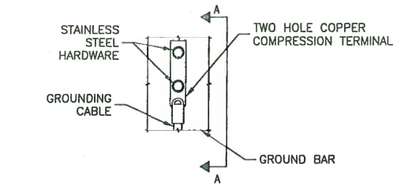


NOTE:

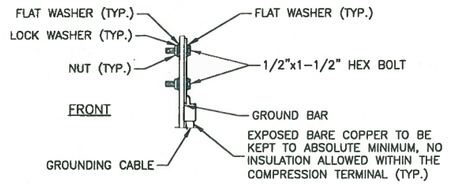
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

SCALE: N.T.S.



ELEVATION



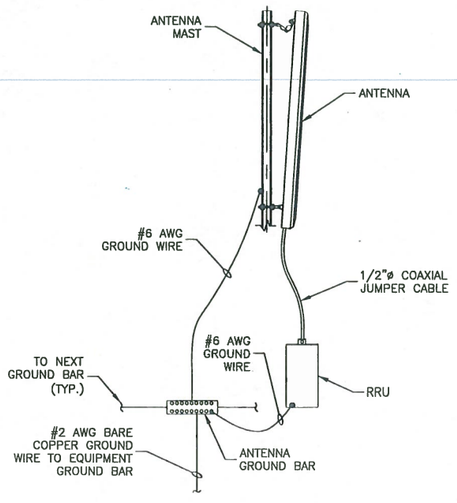
SECTION 'A-A'

NOTES:

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

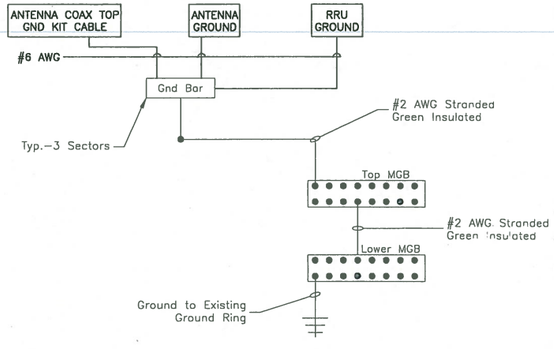
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 3

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
4. VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM — 4

SCALE: N.T.S.

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HARTFORD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **July 24, 2015**

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6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
(919) 755-1012

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTHA233B
	Carrier Site Name:	CT233/Global Signal

MP

Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	EAST FARMINGTON
	Crown Castle JDE Job Number:	340888
	Crown Castle Work Order Number:	1092759
	Crown Castle Application Number:	303995 Rev. 0

Engineering Firm Designation: **Velocitel, Inc., d.b.a. FDH Velocitel Project Number:** 15BWIZ1400

Site Data: **3 A Birdseye Road, Farmington, Hartford County, CT**
Latitude *41° 42' 56.94"*, Longitude *-72° 48' 37.42"*
140 Foot - Monopole Tower

Dear Sean Dempsey,

Velocitel, Inc., d.b.a. FDH Velocitel is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 808500, in accordance with application 303995, revision 0.

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

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

The structure has sufficient capacity once the loading changes described in the **Recommendations** section of this report are completed

The analysis has been performed in accordance with the TIA/EIA-222-F 2005 CT State Building Code based upon a wind speed of 80 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Tyler Ferguson
Project Engineer I

Reviewed by:

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

07-24-2015

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by SUMMIT in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been reinforced in 2008 & modified in 2012 by B&T Engineering. These modifications are incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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
100.0	100.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	-	-	-
		3	ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

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

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	4	swedcom	ALP 9212-N w/ Mount Pipe	2 12	1/2 7/8	2
		1	crown mounts	Platform Mount [LP 1201-1]			
110.0	110.0	1	raycap	TME-DB-T16Z-8AB-0Z w/mount pipe	-	-	1
		1	crown mounts	Side Arm Mount [SO 102-1]			
108.0	109.0	3	antel	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	13	1-5/8	1
		3	antel	BXA-185060/8CFx2 w/ Mount Pipe			
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		2	antel	BXA-70063-6CF-EDIN-4 w/Mount Pipe			
		1	kathrein	800 10735V01 w/ Mount Pipe			
		1	rfs celwave	FD9R6004/2C-3L			
	108.0	3	alcatel lucent	RRH2x40-AWS			
		5	rfs celwave	FD9R6004/2C-3L			
		1	crown mounts	Platform Mount [LP 303-1]			
100.0	100.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12 1	7/8 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	crown mounts	T-Arm Mount [TA 702-3]			
90.0	90.0	1	crown mounts	Pipe Mount [PM 601-3]	-	-	1
70.0	72.0	2	lucent	KS24019-L112A	2	5/16	1
	70.0	2	crown mounts	Side Arm Mount [SO 701-1]			
49.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	49.0	1	crown mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed, Not Considered

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

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

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Velocitel, Inc., d.b.a. FDH Velocitel should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 135	Pole	TP17.025x16x0.25	1	-3.31	648.02	10.1	Pass
L2	135 - 130	Pole	TP18.05x17.025x0.25	2	-3.54	687.61	19.9	Pass
L3	130 - 125	Pole	TP19.075x18.05x0.25	3	-5.23	727.20	33.9	Pass
L4	125 - 120	Pole	TP20.099x19.075x0.25	4	-5.54	766.79	46.1	Pass
L5	120 - 115	Pole	TP21.124x20.099x0.25	5	-5.87	806.38	56.2	Pass
L6	115 - 110	Pole	TP22.149x21.124x0.25	6	-6.22	845.98	64.9	Pass
L7	110 - 105	Pole	TP23.174x22.149x0.25	7	-8.23	885.57	75.7	Pass
L8	105 - 102.333	Pole	TP23.721x23.174x0.25	8	-8.48	906.68	81.3	Pass
L9	102.333 - 102.083	Pole + Reinf.	TP23.772x23.721x0.388	9	-8.52	1400.20	59.6	Pass
L10	102.083 - 97.083	Pole + Reinf.	TP24.797x23.772x0.375	10	-10.66	1415.14	69.0	Pass
L11	97.083 - 91.75	Pole + Reinf.	TP25.89x24.797x0.375	11	-10.93	1439.88	73.1	Pass
L12	91.75 - 90.75	Pole + Reinf.	TP25.595x24.724x0.356	12	-11.90	1505.14	80.0	Pass
L13	90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.356	13	-12.92	1566.27	87.4	Pass
L14	85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.356	14	-13.00	1571.41	88.0	Pass
L15	85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.488	15	-13.05	2143.82	65.5	Pass
L16	85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.488	16	-13.54	2186.99	68.4	Pass
L17	82.5 - 82.25	Pole + Reinf.	TP27.338x27.287x0.494	17	-13.60	2218.74	78.0	Pass
L18	82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.475	18	-14.65	2219.12	74.2	Pass
L19	77.15 - 76.9167	Pole + Reinf.	TP28.431x28.383x0.475	19	-14.71	2222.92	74.4	Pass
L20	76.9167 - 71.9167	Pole + Reinf.	TP29.457x28.431x0.475	20	-15.77	2304.46	79.2	Pass
L21	71.9167 - 66.9167	Pole + Reinf.	TP30.482x29.457x0.463	21	-17.01	2324.19	83.7	Pass
L22	66.9167 - 66.667	Pole + Reinf.	TP30.534x30.482x0.463	22	-17.07	2328.15	83.9	Pass
L23	66.667 - 66.417	Pole + Reinf.	TP30.585x30.534x0.513	23	-17.12	2579.95	80.1	Pass
L24	66.417 - 61.417	Pole + Reinf.	TP31.61x30.585x0.513	24	-18.13	2667.93	84.3	Pass
L25	61.417 - 60	Pole + Reinf.	TP31.901x31.61x0.506	25	-18.42	2660.56	85.4	Pass
L26	60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.513	26	-18.49	2697.27	78.9	Pass
L27	59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.513	27	-19.63	2785.25	82.5	Pass
L28	54.75 - 46.5	Pole + Reinf.	TP34.67x32.978x0.506	28	-20.51	2817.00	85.0	Pass
L29	46.5 - 45.5	Pole + Reinf.	TP34.25x33.122x0.55	29	-22.72	3102.70	87.7	Pass
L30	45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.55	30	-23.02	3126.31	88.4	Pass
L31	44.25 - 44	Pole + Reinf.	TP34.557x34.506x0.6	31	-23.10	3410.64	76.3	Pass
L32	44 - 39	Pole + Reinf.	TP35.583x34.557x0.6	32	-24.51	3513.63	78.7	Pass
L33	39 - 34	Pole + Reinf.	TP36.608x35.583x0.588	33	-25.97	3542.49	80.9	Pass
L34	34 - 29	Pole + Reinf.	TP37.633x36.608x0.588	34	-27.44	3643.32	82.9	Pass
L35	29 - 27.75	Pole + Reinf.	TP37.89x37.633x0.575	35	-27.81	3591.68	83.4	Pass
L36	27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x0.65	36	-27.91	4057.57	83.4	Pass
L37	27.5 - 24.083	Pole + Reinf.	TP38.642x37.941x0.638	37	-29.01	4055.65	84.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L38	24.083 - 23.833	Pole + Reinf.	TP38.693x38.642x0.55	38	-29.10	3511.78	90.4	Pass
L39	23.833 - 18.833	Pole + Reinf.	TP39.718x38.693x0.538	39	-30.66	3525.33	92.4	Pass
L40	18.833 - 18.083	Pole + Reinf.	TP39.872x39.718x0.538	40	-30.90	3539.17	92.6	Pass
L41	18.083 - 17.833	Pole + Reinf.	TP39.923x39.872x0.638	41	-30.99	4192.42	90.6	Pass
L42	17.833 - 12.833	Pole + Reinf.	TP40.948x39.923x0.625	42	-32.56	4218.80	92.3	Pass
L43	12.833 - 7.833	Pole + Reinf.	TP41.974x40.948x0.625	43	-34.17	4326.06	94.0	Pass
L44	7.833 - 2.833	Pole + Reinf.	TP42.999x41.974x0.613	44	-35.80	4345.95	95.6	Pass
L45	2.833 - 0	Pole + Reinf.	TP43.58x42.999x0.613	45	-36.74	4405.51	96.5	Pass
							Summary	
						Pole (L8)	88.0	Pass
						Reinforcement =	96.5	Pass
						Rating	96.5	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.7	Pass
1	Base Plate	0	89.0	Pass
1	Base Foundation	0	81.1	Pass
1	Base Foundation Soil Interaction	0	34.5	Pass

Structure Rating (max from all components) =	96.5%

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

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. In order for the results of this analysis to be considered valid, the loading modification listed below must be completed.

Loading Changes:

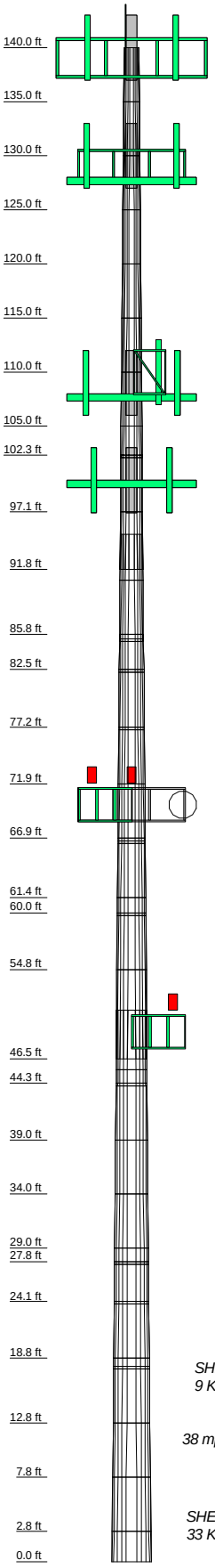
1) Removal of the abandoned antennas, cables, and mounts at the 120 ft level.

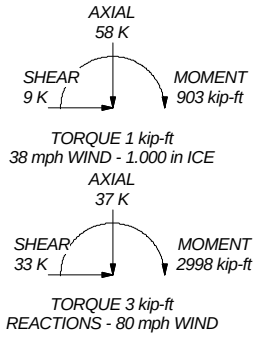
No structural modifications are required at this time, provided that the above listed changes are implemented.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.250		16.000	17.025		0.2
2	5.00	12	0.250		17.025	18.050		0.2
3	5.00	12	0.250		18.050	19.075		0.3
4	5.00	12	0.250		19.075	20.099		0.3
5	5.00	12	0.250		20.099	21.124		0.3
6	5.00	12	0.250		21.124	22.149		0.3
7	5.00	12	0.250		22.149	23.174		0.3
8	5.67	12	0.250		23.174	23.721		0.2
9	0.25	12	0.250		23.721	23.772		0.0
10	5.00	12	0.375		23.772	24.797		0.5
11	4.25	12	0.375	3.25	24.797	25.890	A607-60	0.5
12	0.33	12	0.356		25.890	26.025		0.1
13	5.00	12	0.356		26.025	26.620		0.6
14	0.25	12	0.356		26.620	26.739		0.0
15	0.25	12	0.356		26.739	26.858		0.0
16	0.50	12	0.356		26.858	27.096		0.1
17	0.25	12	0.356		27.096	27.215		0.0
18	5.10	12	0.4750		27.215	27.332		0.9
19	0.23	12	0.4750		27.332	27.383		0.0
20	5.00	12	0.4750		27.383	28.432		0.9
21	5.00	12	0.463		28.432	29.457		0.9
22	0.25	12	0.463		29.457	29.514		0.0
23	0.25	12	0.463		29.514	29.571		0.0
24	5.00	12	0.512		29.571	30.585		0.8
25	0.42	12	0.512		30.585	30.681		0.1
26	0.25	12	0.512		30.681	30.738		0.0
27	5.00	12	0.512		30.738	31.952		0.9
28	5.50	12	0.506	4.50	31.952	32.978	A607-65	1.6
29	0.25	12	0.506		32.978	33.035		0.1
30	0.25	12	0.506		33.035	33.092		0.1
31	0.25	12	0.506		33.092	33.149		0.0
32	5.00	12	0.600		33.149	34.552		1.2
33	5.00	12	0.588		34.552	35.583		1.2
34	5.00	12	0.588		35.583	36.608		1.2
35	0.25	12	0.588		36.608	36.665		0.1
36	0.25	12	0.588		36.665	36.722		0.1
37	0.42	12	0.637		36.722	36.842		0.1
38	0.25	12	0.550		36.842	36.899		0.1
39	5.00	12	0.537		36.899	38.693		1.3
40	0.25	12	0.537		38.693	38.750		0.1
41	0.25	12	0.537		38.750	38.807		0.1
42	5.00	12	0.625		38.807	40.948		1.3
43	5.00	12	0.625		40.948	41.974		1.4
44	5.00	12	0.613		41.974	42.999		1.4
45	2.83	12	0.613		42.999	43.580		0.8





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	140	BXA-185060/8CFx2 w/ Mount Pipe	108
APXV9ERR18-C-A20	139	BXA-185060/8CFx2 w/ Mount Pipe	108
APXV9ERR18-C-A20	139	800 10735V01 w/ Mount Pipe	108
APXV9ERR18-C-A20	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe	108
APXVTM14-C-120	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe	108
APXVTM14-C-120	139	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	108
APXVTM14-C-120	139	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	108
TD-RRH8x20-25	139	BXA-171063-12CF-EDIN-2 w/ Mount Pipe	108
TD-RRH8x20-25	139	RRH2x40-AWS	108
TD-RRH8x20-25	139	RRH2x40-AWS	108
Platform Mount [LP 1201-1]	139	RRH2x40-AWS	108
Miscellaneous [NA 510-3]	139	FD9R6004/2C-3L	108
PCS 1900MHz 4x45W-65MHz	137	(2) FD9R6004/2C-3L	108
PCS 1900MHz 4x45W-65MHz	137	(2) FD9R6004/2C-3L	108
PCS 1900MHz 4x45W-65MHz	137	FD9R6004/2C-3L	108
800MHz 2X50W RRH W/FILTER	137	Platform Mount [LP 303-1]	108
800MHz 2X50W RRH W/FILTER	137	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137		
Side Arm Mount [SO 102-3]	137	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
RRUS-11	129		
RRUS-11	129	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
RRUS-11	129		
Side Arm Mount [SO 102-3]	129	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128		
7770.00 w/ Mount Pipe	128	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
7770.00 w/ Mount Pipe	128		
SBNH-1D6565C w/ Mount Pipe	128	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	128	LNX-6515DS-VTM w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	128	LNX-6515DS-VTM w/ Mount Pipe	100
RRUS-11	128	LNX-6515DS-VTM w/ Mount Pipe	100
RRUS-11	128	RRUS 11 B12	100
RRUS-11	128	RRUS 11 B12	100
(2) LGP21401	128	RRUS 11 B12	100
(2) LGP21401	128	KRY 112 144/1	100
(2) LGP21401	128	KRY 112 144/1	100
DC6-48-60-18-8F	128	KRY 112 144/1	100
Empty Mount Pipe	128	T-Arm Mount [TA 602-3]	100
Empty Mount Pipe	128	Pipe Mount [PM 601-3]	90
Empty Mount Pipe	128	KS24019-L112A	70
T-Arm Mount [TA 602-3]	128	Side Arm Mount [SO 701-1]	70
TME-DB-T16Z-8AB-0Z w/mount pipe	110	KS24019-L112A	70
Side Arm Mount [SO 102-1]	110	Side Arm Mount [SO 701-1]	70
BXA-70063-4CF-EDIN-X w/ Mount Pipe	108	KS24019-L112A	49
BXA-70063-4CF-EDIN-X w/ Mount Pipe	108	Side Arm Mount [SO 701-1]	49
BXA-70063-4CF-EDIN-X w/ Mount Pipe	108		
BXA-185060/8CFx2 w/ Mount Pipe	108		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: 9197551012
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Tower Analysis

Job: East Farmington, BU# 876335
Project: 15BWIZ1400
Client: Crown Castle | Drawn by: Tyler Ferguson | App'd:
Code: TIA/EIA-222-F | Date: 07/24/15 | Scale: NTS
Path: | Dwg No. E-1

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	140.00-135.00	5.00	0.00	12	16.000	17.025	0.250	1.000	A607-60 (60 ksi)
L2	135.00-130.00	5.00	0.00	12	17.025	18.050	0.250	1.000	A607-60 (60 ksi)
L3	130.00-125.00	5.00	0.00	12	18.050	19.075	0.250	1.000	A607-60 (60 ksi)
L4	125.00-120.00	5.00	0.00	12	19.075	20.099	0.250	1.000	A607-60 (60 ksi)
L5	120.00-115.00	5.00	0.00	12	20.099	21.124	0.250	1.000	A607-60

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	115.00-110.00	5.00	0.00	12	21.124	22.149	0.250	1.000	(60 ksi) A607-60 (60 ksi)
L7	110.00-105.00	5.00	0.00	12	22.149	23.174	0.250	1.000	A607-60 (60 ksi)
L8	105.00-102.33	2.67	0.00	12	23.174	23.721	0.250	1.000	A607-60 (60 ksi)
L9	102.33-102.08	0.25	0.00	12	23.721	23.772	0.388	1.550	A607-60 (60 ksi)
L10	102.08-97.08	5.00	0.00	12	23.772	24.797	0.375	1.500	A607-60 (60 ksi)
L11	97.08-91.75	5.33	3.25	12	24.797	25.890	0.375	1.500	A607-60 (60 ksi)
L12	91.75-90.75	4.25	0.00	12	24.724	25.595	0.356	1.425	A607-65 (65 ksi)
L13	90.75-85.75	5.00	0.00	12	25.595	26.620	0.356	1.425	A607-65 (65 ksi)
L14	85.75-85.33	0.42	0.00	12	26.620	26.706	0.356	1.425	A607-65 (65 ksi)
L15	85.33-85.08	0.25	0.00	12	26.706	26.758	0.487	1.950	A607-65 (65 ksi)
L16	85.08-82.50	2.58	0.00	12	26.758	27.287	0.487	1.950	A607-65 (65 ksi)
L17	82.50-82.25	0.25	0.00	12	27.287	27.338	0.494	1.975	A607-65 (65 ksi)
L18	82.25-77.15	5.10	0.00	12	27.337	28.383	0.475	1.900	A607-65 (65 ksi)
L19	77.15-76.92	0.23	0.00	12	28.383	28.431	0.475	1.900	A607-65 (65 ksi)
L20	76.92-71.92	5.00	0.00	12	28.431	29.457	0.475	1.900	A607-65 (65 ksi)
L21	71.92-66.92	5.00	0.00	12	29.457	30.482	0.463	1.850	A607-65 (65 ksi)
L22	66.92-66.67	0.25	0.00	12	30.482	30.534	0.463	1.850	A607-65 (65 ksi)
L23	66.67-66.42	0.25	0.00	12	30.534	30.585	0.512	2.050	A607-65 (65 ksi)
L24	66.42-61.42	5.00	0.00	12	30.585	31.610	0.512	2.050	A607-65 (65 ksi)
L25	61.42-60.00	1.42	0.00	12	31.610	31.901	0.506	2.025	A607-65 (65 ksi)
L26	60.00-59.75	0.25	0.00	12	31.901	31.952	0.512	2.050	A607-65 (65 ksi)
L27	59.75-54.75	5.00	0.00	12	31.952	32.978	0.512	2.050	A607-65 (65 ksi)
L28	54.75-46.50	8.25	4.50	12	32.978	34.670	0.506	2.025	A607-65 (65 ksi)
L29	46.50-45.50	5.50	0.00	12	33.122	34.250	0.550	2.200	A607-65 (65 ksi)
L30	45.50-44.25	1.25	0.00	12	34.250	34.506	0.550	2.200	A607-65 (65 ksi)
L31	44.25-44.00	0.25	0.00	12	34.506	34.557	0.600	2.400	A607-65 (65 ksi)
L32	44.00-39.00	5.00	0.00	12	34.557	35.583	0.600	2.400	A607-65 (65 ksi)
L33	39.00-34.00	5.00	0.00	12	35.583	36.608	0.588	2.350	A607-65 (65 ksi)
L34	34.00-29.00	5.00	0.00	12	36.608	37.633	0.588	2.350	A607-65 (65 ksi)
L35	29.00-27.75	1.25	0.00	12	37.633	37.890	0.575	2.300	A607-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L36	27.75-27.50	0.25	0.00	12	37.890	37.941	0.650	2.600	A607-65 (65 ksi)
L37	27.50-24.08	3.42	0.00	12	37.941	38.642	0.637	2.550	A607-65 (65 ksi)
L38	24.08-23.83	0.25	0.00	12	38.642	38.693	0.550	2.200	A607-65 (65 ksi)
L39	23.83-18.83	5.00	0.00	12	38.693	39.718	0.537	2.150	A607-65 (65 ksi)
L40	18.83-18.08	0.75	0.00	12	39.718	39.872	0.537	2.150	A607-65 (65 ksi)
L41	18.08-17.83	0.25	0.00	12	39.872	39.923	0.637	2.550	A607-65 (65 ksi)
L42	17.83-12.83	5.00	0.00	12	39.923	40.948	0.625	2.500	A607-65 (65 ksi)
L43	12.83-7.83	5.00	0.00	12	40.948	41.974	0.625	2.500	A607-65 (65 ksi)
L44	7.83-2.83	5.00	0.00	12	41.974	42.999	0.613	2.450	A607-65 (65 ksi)
L45	2.83-0.00	2.83		12	42.999	43.580	0.613	2.450	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
L2	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
L3	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
L4	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
L5	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
	21.870	16.804	934.589	7.473	10.942	85.410	1893.731	8.270	4.991	19.965
L6	21.870	16.804	934.589	7.473	10.942	85.410	1893.731	8.270	4.991	19.965
	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
L7	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
L8	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
	24.558	18.894	1328.505	8.403	12.287	108.120	2691.912	9.299	5.687	22.749
L9	24.558	29.114	2023.204	8.353	12.287	164.657	4099.560	14.329	5.319	13.726
	24.611	29.178	2036.564	8.372	12.314	165.387	4126.630	14.361	5.332	13.761
L10	24.611	28.252	1974.030	8.376	12.314	160.309	3999.920	13.905	5.366	14.309
	25.672	29.489	2244.967	8.743	12.845	174.777	4548.912	14.514	5.641	15.041
L11	25.672	29.489	2244.967	8.743	12.845	174.777	4548.912	14.514	5.641	15.041
	26.803	30.809	2560.117	9.134	13.411	190.897	5187.491	15.163	5.934	15.823
L12	26.286	27.953	2118.528	8.724	12.807	165.420	4292.711	13.757	5.671	15.919
	26.498	28.952	2354.017	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
L13	26.498	28.952	2354.017	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
L14	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
	27.649	30.227	2678.835	9.433	13.834	193.643	5428.047	14.877	6.203	17.411
L15	27.649	41.157	3611.269	9.386	13.834	261.045	7317.411	20.256	5.851	12.002
	27.702	41.238	3632.490	9.405	13.860	262.076	7360.410	20.296	5.865	12.03
L16	27.702	41.238	3632.490	9.405	13.860	262.076	7360.410	20.296	5.865	12.03

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	28.249	42.068	3856.362	9.594	14.134	272.834	7814.035	20.705	6.006	12.321
L17	28.249	42.597	3903.071	9.592	14.134	276.139	7908.679	20.965	5.990	12.131
	28.302	42.679	3925.514	9.610	14.161	277.206	7954.155	21.005	6.003	12.159
L18	28.302	41.086	3784.182	9.617	14.161	267.229	7667.778	20.221	6.053	12.744
	29.385	42.686	4243.696	9.991	14.703	288.635	8598.879	21.009	6.334	13.334
L19	29.385	42.686	4243.696	9.991	14.703	288.635	8598.879	21.009	6.334	13.334
	29.434	42.759	4265.562	10.008	14.727	289.634	8643.185	21.045	6.347	13.361
L20	29.434	42.759	4265.562	10.008	14.727	289.634	8643.185	21.045	6.347	13.361
	30.496	44.328	4752.419	10.376	15.259	311.457	9629.689	21.817	6.621	13.94
L21	30.496	43.180	4633.345	10.380	15.259	303.653	9388.413	21.252	6.655	14.389
	31.558	44.707	5142.584	10.747	15.790	325.689	10420.270	22.003	6.930	14.983
L22	31.558	44.707	5142.584	10.747	15.790	325.689	10420.270	22.003	6.930	14.983
	31.611	44.783	5168.949	10.765	15.816	326.809	10473.693	22.041	6.944	15.013
L23	31.611	49.542	5699.231	10.748	15.816	360.336	11548.188	24.383	6.810	13.287
	31.664	49.627	5728.485	10.766	15.843	361.579	11607.463	24.425	6.823	13.314
L24	31.664	49.627	5728.485	10.766	15.843	361.579	11607.463	24.425	6.823	13.314
	32.726	51.319	6334.758	11.133	16.374	386.874	12835.937	25.258	7.098	13.85
L25	32.726	50.704	6261.278	11.135	16.374	382.387	12687.047	24.955	7.115	14.054
	33.026	51.177	6438.439	11.239	16.525	389.624	13046.022	25.188	7.193	14.208
L26	33.026	51.799	6514.034	11.237	16.525	394.199	13199.198	25.494	7.176	14.002
	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
L27	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
	34.141	53.576	7207.702	11.623	17.083	421.934	14604.759	26.368	7.465	14.565
L28	34.141	52.933	7123.916	11.625	17.083	417.029	14434.986	26.052	7.481	14.778
	35.893	55.691	8296.663	12.231	17.959	461.976	16811.289	27.410	7.935	15.674
L29	35.246	57.685	7811.575	11.661	17.157	455.294	15828.370	28.391	7.403	13.459
	35.458	59.682	8651.434	12.065	17.741	487.641	17530.151	29.374	7.705	14.009
L30	35.458	59.682	8651.434	12.065	17.741	487.641	17530.151	29.374	7.705	14.009
	35.723	60.136	8850.349	12.156	17.874	495.147	17933.207	29.597	7.774	14.134
L31	35.723	65.507	9612.339	12.138	17.874	537.778	19477.205	32.240	7.640	12.733
	35.776	65.606	9656.006	12.157	17.901	539.419	19565.685	32.289	7.653	12.756
L32	35.776	65.606	9656.006	12.157	17.901	539.419	19565.685	32.289	7.653	12.756
	36.838	67.587	10557.324	12.524	18.432	572.776	21392.002	33.264	7.928	13.214
L33	36.838	66.202	10348.465	12.528	18.432	561.445	20968.796	32.583	7.962	13.552
	37.899	68.142	11284.944	12.895	18.963	595.105	22866.356	33.537	8.236	14.019
L34	37.899	68.142	11284.944	12.895	18.963	595.105	22866.356	33.537	8.236	14.019
	38.961	70.081	12276.281	13.262	19.494	629.745	24875.075	34.492	8.511	14.487
L35	38.961	68.613	12027.250	13.267	19.494	616.970	24370.470	33.769	8.545	14.86
	39.226	69.088	12278.549	13.359	19.627	625.600	24879.669	34.003	8.613	14.98
L36	39.226	77.943	13796.573	13.332	19.627	702.945	27955.597	38.361	8.412	12.942
	39.279	78.050	13853.629	13.350	19.653	704.898	28071.209	38.414	8.426	12.963
L37	39.279	76.575	13600.881	13.355	19.653	692.038	27559.073	37.688	8.460	13.27
	40.005	78.013	14381.779	13.605	20.016	718.502	29141.384	38.396	8.647	13.565
L38	40.005	67.460	12493.710	13.637	20.016	624.176	25315.643	33.202	8.882	16.149
	40.058	67.551	12544.221	13.655	20.043	625.869	25417.992	33.247	8.896	16.174
L39	40.058	66.037	12271.181	13.660	20.043	612.246	24864.740	32.502	8.929	16.612
	41.119	67.812	13287.238	14.027	20.574	645.827	26923.546	33.375	9.204	17.124
L40	41.119	67.812	13287.238	14.027	20.574	645.827	26923.546	33.375	9.204	17.124
	41.278	68.078	13444.320	14.082	20.654	650.941	27241.837	33.506	9.245	17.2
L41	41.278	80.538	15824.282	14.046	20.654	766.173	32064.286	39.639	8.977	14.082
	41.332	80.644	15886.392	14.064	20.680	768.193	32190.137	39.690	8.991	14.103
L42	41.332	79.088	15589.766	14.069	20.680	753.849	31589.092	38.925	9.024	14.439
	42.393	81.151	16842.091	14.436	21.211	794.014	34126.643	39.940	9.299	14.879
L43	42.393	81.151	16842.091	14.436	21.211	794.014	34126.643	39.940	9.299	14.879
	43.454	83.214	18159.749	14.803	21.742	835.222	36796.575	40.956	9.574	15.318
L44	43.454	81.575	17812.699	14.807	21.742	819.260	36093.358	40.149	9.607	15.686
	44.516	83.597	19170.468	15.174	22.274	860.684	38844.565	41.144	9.882	16.134
L45	44.516	83.597	19170.468	15.174	22.274	860.684	38844.565	41.144	9.882	16.134
	45.117	84.743	19969.545	15.382	22.574	884.609	40463.712	41.708	10.038	16.388

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 140.00-135.00				1	1	1		
L2 135.00-130.00				1	1	1		
L3 130.00-125.00				1	1	1		
L4 125.00-120.00				1	1	1		
L5 120.00-115.00				1	1	1		
L6 115.00-110.00				1	1	1		
L7 110.00-105.00				1	1	1		
L8 105.00-102.33				1	1	1		
L9 102.33-102.08				1	1	0.949611		
L10 102.08-97.08				1	1	0.967561		
L11 97.08-91.75				1	1	0.96239		
L12 91.75-90.75				1	1	1.29378		
L13 90.75-85.75				1	1	1.27752		
L14 85.75-85.33				1	1	1.27622		
L15 85.33-85.08				1	1	1.14944		
L16 85.08-82.50				1	1	1.13941		
L17 82.50-82.25				1	1	1.12431		
L18 82.25-77.15				1	1	1.21727		
L19 77.15-76.92				1	1	1.21631		
L20 76.92-71.92				1	1	1.19655		
L21 71.92-66.92				1	1	1.20948		
L22 66.92-66.67				1	1	1.20857		
L23 66.67-66.42				1	1	0.955849		
L24 66.42-61.42				1	1	0.944436		
L25 61.42-60.00				1	1	0.952769		
L26 60.00-59.75				1	1	1.05661		
L27 59.75-54.75				1	1	1.04249		
L28 54.75-46.50				1	1	1.04503		
L29 46.50-45.50				1	1	0.969769		
L30				1	1	0.967596		

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
45.50-44.25								
L31				1	1	1.07105		
44.25-44.00								
L32				1	1	1.05797		
44.00-39.00								
L33				1	1	1.06752		
39.00-34.00								
L34				1	1	1.05564		
34.00-29.00								
L35				1	1	1.0753		
29.00-27.75								
L36				1	1	1.05688		
27.75-27.50								
L37				1	1	1.06822		
27.50-24.08								
L38				1	1	1.14044		
24.08-23.83								
L39				1	1	1.15431		
23.83-18.83								
L40				1	1	1.15252		
18.83-18.08								
L41				1	1	0.973709		
18.08-17.83								
L42				1	1	0.982878		
17.83-12.83								
L43 12.83-7.83				1	1	0.973384		
L44 7.83-2.83				1	1	0.98374		
L45 2.83-0.00				1	1	0.978717		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.000 0.000	0.375		0.22
HB158-1-08U8-S8J18(1-5/8) ***	C	Surface Ar (CaAa)	108.00 - 0.00	1	1	-0.100 -0.100	1.980		1.30
LDF5-50A(7/8")	B	Surface Ar (CaAa)	100.00 - 0.00	12	2	-0.400 -0.300	1.090		0.33
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) ***	B	Surface Ar (CaAa)	100.00 - 0.00	1	1	-0.410 -0.410	1.625		1.07
9207(5/16") ***	C	Surface Ar (CaAa)	70.00 - 0.00	2	1	-0.290 -0.280	0.330		0.60
Aero MP305	A	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	46.70 - 11.70	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	0.400 0.500	2.090	14.840	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	-0.500 -0.400	2.090	14.840	0.00
*									
Aero MP305	A	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
*									
Aero MP305	A	Surface Af (CaAa)	49.00 - 45.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	49.00 - 46.70	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	49.00 - 46.50	1	1	-0.100 0.100	2.090	14.840	0.00
*									
Aero MP303	A	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
***									
Aero MP305	A	Surface Af (CaAa)	26.50 - 16.50	1	1	-0.100 0.100	2.090	14.840	0.00
*									
Aero MP303	A	Surface Af (CaAa)	86.50 - 64.50	1	1	-0.100 0.100	1.570	11.260	0.00
*									
Aero MP303	B	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	1.570	11.260	0.00
*									
Aero MP303	A	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
*									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	30.50 - 0.00	1	1	-0.100 0.100	1.250	14.500	0.00
*									
6" x 1.25" Flat Plate (F)	B	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	1.250	14.500	0.00
*									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	62.00 - 47.00	1	1	-0.500 -0.400	1.250	14.500	0.00
*									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	84.50 - 64.50	1	1	-0.500 -0.400	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	84.50 - 64.50	1	1	-0.500 -0.400	1.250	14.500	0.00
*									
6" x 1.25" Flat Plate (F)	C	Surface Af (CaAa)	95.00 - 80.00	1	1	-0.400 -0.300	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	C	Surface Af	95.00 - 80.00	1	1	-0.500	1.250	14.500	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				-0.400			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	139.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
HB114-21U3M12-XXX F(1-1/4")	C	No	Inside Pole	139.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22
						4" Ice	0.00	1.22
***								
LDF5-50A(7/8")	C	No	Inside Pole	128.00 - 0.00	9	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
FB-L98B-002-75000(3/8")	C	No	Inside Pole	128.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	128.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58
***								
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	108.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
LDF4-50A(1/2")	C	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.188	0.000	0.02
L2	135.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.02
L3	130.00-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.04
L4	125.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.04
L5	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.04
L6	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.04
L7	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.781	0.000	0.08
L8	105.00-102.33	A	0.000	0.000	0.305	0.000	0.00
		B	0.000	0.000	0.305	0.000	0.00
		C	0.000	0.000	0.933	0.000	0.05
L9	102.33-102.08	A	0.000	0.000	0.065	0.000	0.00
		B	0.000	0.000	0.065	0.000	0.00
		C	0.000	0.000	0.124	0.000	0.01
L10	102.08-97.08	A	0.000	0.000	1.308	0.000	0.00
		B	0.000	0.000	2.418	0.000	0.01
		C	0.000	0.000	2.486	0.000	0.10
L11	97.08-91.75	A	0.000	0.000	0.938	0.000	0.00
		B	0.000	0.000	2.967	0.000	0.03
		C	0.000	0.000	3.548	0.000	0.11
L12	91.75-90.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.381	0.000	0.01
		C	0.000	0.000	0.652	0.000	0.02
L13	90.75-85.75	A	0.000	0.000	0.196	0.000	0.00
		B	0.000	0.000	2.099	0.000	0.03
		C	0.000	0.000	3.457	0.000	0.10
L14	85.75-85.33	A	0.000	0.000	0.110	0.000	0.00
		B	0.000	0.000	0.270	0.000	0.00
		C	0.000	0.000	0.384	0.000	0.01
L15	85.33-85.08	A	0.000	0.000	0.065	0.000	0.00
		B	0.000	0.000	0.161	0.000	0.00
		C	0.000	0.000	0.228	0.000	0.01
L16	85.08-82.50	A	0.000	0.000	1.508	0.000	0.00
		B	0.000	0.000	1.657	0.000	0.01
		C	0.000	0.000	2.358	0.000	0.05
L17	82.50-82.25	A	0.000	0.000	0.170	0.000	0.00
		B	0.000	0.000	0.161	0.000	0.00
		C	0.000	0.000	0.228	0.000	0.01
L18	82.25-77.15	A	0.000	0.000	3.944	0.000	0.00
		B	0.000	0.000	3.759	0.000	0.03
		C	0.000	0.000	3.957	0.000	0.10
L19	77.15-76.92	A	0.000	0.000	0.219	0.000	0.00
		B	0.000	0.000	0.211	0.000	0.00
		C	0.000	0.000	0.177	0.000	0.00
L20	76.92-71.92	A	0.000	0.000	4.700	0.000	0.00
		B	0.000	0.000	3.320	0.000	0.03
		C	0.000	0.000	2.595	0.000	0.10
L21	71.92-66.92	A	0.000	0.000	4.881	0.000	0.00
		B	0.000	0.000	3.391	0.000	0.03
		C	0.000	0.000	2.768	0.000	0.10

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L22	66.92-66.67	A	0.000	0.000	0.256	0.000	0.00
		B	0.000	0.000	0.182	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L23	66.67-66.42	A	0.000	0.000	0.257	0.000	0.00
		B	0.000	0.000	0.182	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L24	66.42-61.42	A	0.000	0.000	3.163	0.000	0.00
		B	0.000	0.000	3.644	0.000	0.03
		C	0.000	0.000	3.084	0.000	0.11
L25	61.42-60.00	A	0.000	0.000	0.789	0.000	0.00
		B	0.000	0.000	1.033	0.000	0.01
		C	0.000	0.000	0.874	0.000	0.03
L26	60.00-59.75	A	0.000	0.000	0.139	0.000	0.00
		B	0.000	0.000	0.182	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L27	59.75-54.75	A	0.000	0.000	2.783	0.000	0.00
		B	0.000	0.000	3.644	0.000	0.03
		C	0.000	0.000	3.084	0.000	0.11
L28	54.75-46.50	A	0.000	0.000	4.488	0.000	0.00
		B	0.000	0.000	5.943	0.000	0.04
		C	0.000	0.000	5.159	0.000	0.18
L29	46.50-45.50	A	0.000	0.000	0.557	0.000	0.00
		B	0.000	0.000	0.589	0.000	0.01
		C	0.000	0.000	0.617	0.000	0.02
L30	45.50-44.25	A	0.000	0.000	0.870	0.000	0.00
		B	0.000	0.000	1.171	0.000	0.01
		C	0.000	0.000	0.771	0.000	0.03
L31	44.25-44.00	A	0.000	0.000	0.139	0.000	0.00
		B	0.000	0.000	0.234	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L32	44.00-39.00	A	0.000	0.000	2.783	0.000	0.00
		B	0.000	0.000	4.686	0.000	0.03
		C	0.000	0.000	3.084	0.000	0.11
L33	39.00-34.00	A	0.000	0.000	2.783	0.000	0.00
		B	0.000	0.000	4.686	0.000	0.03
		C	0.000	0.000	3.084	0.000	0.11
L34	34.00-29.00	A	0.000	0.000	3.096	0.000	0.00
		B	0.000	0.000	4.686	0.000	0.03
		C	0.000	0.000	3.084	0.000	0.11
L35	29.00-27.75	A	0.000	0.000	0.956	0.000	0.00
		B	0.000	0.000	1.171	0.000	0.01
		C	0.000	0.000	0.771	0.000	0.03
L36	27.75-27.50	A	0.000	0.000	0.191	0.000	0.00
		B	0.000	0.000	0.234	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L37	27.50-24.08	A	0.000	0.000	3.456	0.000	0.00
		B	0.000	0.000	3.202	0.000	0.02
		C	0.000	0.000	2.108	0.000	0.07
L38	24.08-23.83	A	0.000	0.000	0.278	0.000	0.00
		B	0.000	0.000	0.234	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.01
L39	23.83-18.83	A	0.000	0.000	5.011	0.000	0.00
		B	0.000	0.000	4.130	0.000	0.03
		C	0.000	0.000	4.246	0.000	0.11
L40	18.83-18.08	A	0.000	0.000	0.679	0.000	0.00
		B	0.000	0.000	0.547	0.000	0.00
		C	0.000	0.000	0.985	0.000	0.02
L41	18.08-17.83	A	0.000	0.000	0.226	0.000	0.00
		B	0.000	0.000	0.182	0.000	0.00
		C	0.000	0.000	0.328	0.000	0.01
L42	17.83-12.83	A	0.000	0.000	3.248	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	3.644	0.000	0.03
		C	0.000	0.000	6.567	0.000	0.11
L43	12.83-7.83	A	0.000	0.000	2.783	0.000	0.00
		B	0.000	0.000	3.644	0.000	0.03
		C	0.000	0.000	5.220	0.000	0.11
L44	7.83-2.83	A	0.000	0.000	2.783	0.000	0.00
		B	0.000	0.000	3.644	0.000	0.03
		C	0.000	0.000	4.826	0.000	0.11
L45	2.83-0.00	A	0.000	0.000	1.577	0.000	0.00
		B	0.000	0.000	2.065	0.000	0.01
		C	0.000	0.000	2.734	0.000	0.06

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.00-135.00	A	1.187	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.374	0.000	0.03
L2	135.00-130.00	A	1.182	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.369	0.000	0.03
L3	130.00-125.00	A	1.176	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.364	0.000	0.05
L4	125.00-120.00	A	1.170	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.358	0.000	0.06
L5	120.00-115.00	A	1.165	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.352	0.000	0.06
L6	115.00-110.00	A	1.159	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.346	0.000	0.06
L7	110.00-105.00	A	1.152	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	2.625	0.000	0.10
L8	105.00-102.33	A	1.147	0.000	0.000	0.752	0.000	0.01
		B		0.000	0.000	0.752	0.000	0.01
		C		0.000	0.000	2.604	0.000	0.08
L9	102.33-102.08	A	1.145	0.000	0.000	0.161	0.000	0.00
		B		0.000	0.000	0.161	0.000	0.00
		C		0.000	0.000	0.334	0.000	0.01
L10	102.08-97.08	A	1.142	0.000	0.000	3.211	0.000	0.03
		B		0.000	0.000	7.505	0.000	0.09
		C		0.000	0.000	6.672	0.000	0.17
L11	97.08-91.75	A	1.134	0.000	0.000	2.292	0.000	0.02
		B		0.000	0.000	10.115	0.000	0.12
		C		0.000	0.000	9.780	0.000	0.22
L12	91.75-90.75	A	1.130	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.467	0.000	0.02
		C		0.000	0.000	1.862	0.000	0.04
L13	90.75-85.75	A	1.125	0.000	0.000	0.478	0.000	0.01
		B		0.000	0.000	7.778	0.000	0.10
		C		0.000	0.000	9.740	0.000	0.22
L14	85.75-85.33	A	1.121	0.000	0.000	0.267	0.000	0.00
		B		0.000	0.000	0.879	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	1.043	0.000	0.02
L15	85.33-85.08	A	1.121	0.000	0.000	0.159	0.000	0.00
		B		0.000	0.000	0.523	0.000	0.01
		C		0.000	0.000	0.621	0.000	0.01
L16	85.08-82.50	A	1.118	0.000	0.000	3.961	0.000	0.05
		B		0.000	0.000	5.391	0.000	0.07
		C		0.000	0.000	6.397	0.000	0.13
L17	82.50-82.25	A	1.116	0.000	0.000	0.449	0.000	0.01
		B		0.000	0.000	0.522	0.000	0.01
		C		0.000	0.000	0.619	0.000	0.01
L18	82.25-77.15	A	1.112	0.000	0.000	10.298	0.000	0.13
		B		0.000	0.000	11.789	0.000	0.14
		C		0.000	0.000	10.467	0.000	0.22
L19	77.15-76.92	A	1.107	0.000	0.000	0.564	0.000	0.01
		B		0.000	0.000	0.632	0.000	0.01
		C		0.000	0.000	0.453	0.000	0.01
L20	76.92-71.92	A	1.102	0.000	0.000	12.050	0.000	0.15
		B		0.000	0.000	10.625	0.000	0.13
		C		0.000	0.000	6.790	0.000	0.17
L21	71.92-66.92	A	1.093	0.000	0.000	12.169	0.000	0.15
		B		0.000	0.000	10.494	0.000	0.13
		C		0.000	0.000	7.451	0.000	0.18
L22	66.92-66.67	A	1.088	0.000	0.000	0.619	0.000	0.01
		B		0.000	0.000	0.535	0.000	0.01
		C		0.000	0.000	0.408	0.000	0.01
L23	66.67-66.42	A	1.088	0.000	0.000	0.619	0.000	0.01
		B		0.000	0.000	0.536	0.000	0.01
		C		0.000	0.000	0.408	0.000	0.01
L24	66.42-61.42	A	1.083	0.000	0.000	7.253	0.000	0.09
		B		0.000	0.000	10.689	0.000	0.13
		C		0.000	0.000	8.136	0.000	0.19
L25	61.42-60.00	A	1.076	0.000	0.000	1.805	0.000	0.02
		B		0.000	0.000	3.019	0.000	0.04
		C		0.000	0.000	2.297	0.000	0.05
L26	60.00-59.75	A	1.074	0.000	0.000	0.318	0.000	0.00
		B		0.000	0.000	0.532	0.000	0.01
		C		0.000	0.000	0.405	0.000	0.01
L27	59.75-54.75	A	1.068	0.000	0.000	6.344	0.000	0.08
		B		0.000	0.000	10.614	0.000	0.13
		C		0.000	0.000	8.070	0.000	0.19
L28	54.75-46.50	A	1.053	0.000	0.000	10.102	0.000	0.12
		B		0.000	0.000	17.234	0.000	0.21
		C		0.000	0.000	13.334	0.000	0.32
L29	46.50-45.50	A	1.041	0.000	0.000	1.258	0.000	0.02
		B		0.000	0.000	1.966	0.000	0.03
		C		0.000	0.000	1.599	0.000	0.04
L30	45.50-44.25	A	1.038	0.000	0.000	1.908	0.000	0.02
		B		0.000	0.000	3.305	0.000	0.04
		C		0.000	0.000	1.982	0.000	0.05
L31	44.25-44.00	A	1.035	0.000	0.000	0.312	0.000	0.00
		B		0.000	0.000	0.660	0.000	0.01
		C		0.000	0.000	0.396	0.000	0.01
L32	44.00-39.00	A	1.028	0.000	0.000	6.209	0.000	0.07
		B		0.000	0.000	13.152	0.000	0.16
		C		0.000	0.000	7.881	0.000	0.19
L33	39.00-34.00	A	1.012	0.000	0.000	6.157	0.000	0.07
		B		0.000	0.000	13.042	0.000	0.16
		C		0.000	0.000	7.807	0.000	0.19
L34	34.00-29.00	A	1.000	0.000	0.000	6.929	0.000	0.08
		B		0.000	0.000	12.958	0.000	0.16
		C		0.000	0.000	7.751	0.000	0.19

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
L35	29.00-27.75	A	1.000	0.000	0.000	2.206	0.000	0.03
		B		0.000	0.000	3.239	0.000	0.04
		C		0.000	0.000	1.938	0.000	0.05
L36	27.75-27.50	A	1.000	0.000	0.000	0.441	0.000	0.01
		B		0.000	0.000	0.648	0.000	0.01
		C		0.000	0.000	0.388	0.000	0.01
L37	27.50-24.08	A	1.000	0.000	0.000	7.679	0.000	0.09
		B		0.000	0.000	8.855	0.000	0.11
		C		0.000	0.000	5.297	0.000	0.13
L38	24.08-23.83	A	1.000	0.000	0.000	0.612	0.000	0.01
		B		0.000	0.000	0.648	0.000	0.01
		C		0.000	0.000	0.388	0.000	0.01
L39	23.83-18.83	A	1.000	0.000	0.000	10.789	0.000	0.12
		B		0.000	0.000	11.513	0.000	0.14
		C		0.000	0.000	10.024	0.000	0.21
L40	18.83-18.08	A	1.000	0.000	0.000	1.429	0.000	0.02
		B		0.000	0.000	1.537	0.000	0.02
		C		0.000	0.000	2.185	0.000	0.04
L41	18.08-17.83	A	1.000	0.000	0.000	0.476	0.000	0.01
		B		0.000	0.000	0.512	0.000	0.01
		C		0.000	0.000	0.728	0.000	0.01
L42	17.83-12.83	A	1.000	0.000	0.000	7.025	0.000	0.08
		B		0.000	0.000	10.249	0.000	0.12
		C		0.000	0.000	14.567	0.000	0.26
L43	12.83-7.83	A	1.000	0.000	0.000	6.117	0.000	0.07
		B		0.000	0.000	10.249	0.000	0.12
		C		0.000	0.000	11.931	0.000	0.23
L44	7.83-2.83	A	1.000	0.000	0.000	6.117	0.000	0.07
		B		0.000	0.000	10.249	0.000	0.12
		C		0.000	0.000	11.159	0.000	0.22
L45	2.83-0.00	A	1.000	0.000	0.000	3.466	0.000	0.04
		B		0.000	0.000	5.807	0.000	0.07
		C		0.000	0.000	6.323	0.000	0.13

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.00-135.00	0.000	0.056	0.000	0.314
L2	135.00-130.00	0.000	0.056	0.000	0.317
L3	130.00-125.00	0.000	0.056	0.000	0.320
L4	125.00-120.00	0.000	0.056	0.000	0.323
L5	120.00-115.00	0.000	0.056	0.000	0.325
L6	115.00-110.00	0.000	0.056	0.000	0.327
L7	110.00-105.00	0.038	0.229	0.064	0.596
L8	105.00-102.33	0.052	0.287	0.077	0.576
L9	102.33-102.08	0.044	0.245	0.060	0.448
L10	102.08-97.08	0.106	-0.007	0.167	-0.025
L11	97.08-91.75	0.478	-0.114	0.734	-0.204
L12	91.75-90.75	0.768	-0.091	1.213	-0.177
L13	90.75-85.75	0.744	-0.089	1.166	-0.172
L14	85.75-85.33	0.624	-0.075	0.927	-0.137
L15	85.33-85.08	0.624	-0.075	0.928	-0.138
L16	85.08-82.50	0.394	0.258	0.568	0.347
L17	82.50-82.25	0.335	0.347	0.480	0.471
L18	82.25-77.15	0.082	0.308	0.121	0.420

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L19	77.15-76.92	-0.107	0.264	-0.150	0.356
L20	76.92-71.92	-0.308	0.185	-0.415	0.270
L21	71.92-66.92	-0.312	0.190	-0.396	0.316
L22	66.92-66.67	-0.297	0.193	-0.365	0.345
L23	66.67-66.42	-0.297	0.194	-0.365	0.345
L24	66.42-61.42	-0.046	0.030	-0.006	0.094
L25	61.42-60.00	0.023	0.110	0.085	0.211
L26	60.00-59.75	0.023	0.110	0.086	0.211
L27	59.75-54.75	0.023	0.111	0.087	0.214
L28	54.75-46.50	0.025	0.112	0.094	0.212
L29	46.50-45.50	-0.414	-0.025	-0.471	-0.074
L30	45.50-44.25	-0.071	-0.239	-0.068	-0.318
L31	44.25-44.00	0.047	-0.177	0.070	-0.248
L32	44.00-39.00	0.047	-0.177	0.071	-0.250
L33	39.00-34.00	0.048	-0.178	0.072	-0.252
L34	34.00-29.00	-0.008	-0.208	-0.015	-0.300
L35	29.00-27.75	-0.134	-0.276	-0.208	-0.402
L36	27.75-27.50	-0.134	-0.276	-0.209	-0.402
L37	27.50-24.08	-0.331	-0.382	-0.433	-0.519
L38	24.08-23.83	-0.409	-0.424	-0.522	-0.565
L39	23.83-18.83	-0.291	-0.401	-0.346	-0.534
L40	18.83-18.08	-0.180	-0.378	-0.180	-0.497
L41	18.08-17.83	-0.181	-0.378	-0.180	-0.498
L42	17.83-12.83	0.021	-0.276	0.061	-0.383
L43	12.83-7.83	0.103	-0.523	0.165	-0.694
L44	7.83-2.83	0.105	-0.615	0.171	-0.815
L45	2.83-0.00	0.106	-0.619	0.173	-0.823

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod	C	From Leg	0.00	0.0000	140.00	No Ice	0.25	0.25	0.03
			0.00			1/2" Ice	0.66	0.66	0.03
			2.00			1" Ice	0.97	0.97	0.04
						2" Ice	1.49	1.49	0.06
						4" Ice	2.68	2.68	0.14
***									
APXV9ERR18-C-A20	A	From Leg	4.00	0.0000	139.00	No Ice	8.26	5.81	0.06
			0.00			1/2" Ice	8.81	6.27	0.11
			1.00			1" Ice	9.36	6.73	0.17
						2" Ice	10.50	7.68	0.31
						4" Ice	12.88	9.95	0.66
APXV9ERR18-C-A20	B	From Leg	4.00	0.0000	139.00	No Ice	8.26	5.81	0.06
			0.00			1/2" Ice	8.81	6.27	0.11
			1.00			1" Ice	9.36	6.73	0.17
						2" Ice	10.50	7.68	0.31
						4" Ice	12.88	9.95	0.66
APXV9ERR18-C-A20	C	From Leg	4.00	0.0000	139.00	No Ice	8.26	5.81	0.06
			0.00			1/2" Ice	8.81	6.27	0.11
			1.00			1" Ice	9.36	6.73	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	10.50	7.68	0.31
						4" Ice	12.88	9.95	0.66
APXVTM14-C-120	A	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-120	B	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-120	C	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Platform Mount [LP 1201-1]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
Miscellaneous [NA 510-3]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.70 28.20 36.70 53.70 87.70	19.70 28.20 36.70 53.70 87.70	0.52 0.72 0.92 1.33 2.14
*									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.71 2.95 3.20 3.72	2.61 2.85 3.09 3.61	0.06 0.08 0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.86	4.74	0.35
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
Side Arm Mount [SO 102-3]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
***									
RRUS-11	A	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
Side Arm Mount [SO 102-3]	C	None		0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
*									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.12 6.63 7.13 8.16	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	10.36	10.41	0.66
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.10 0.19 0.29 0.52 1.17
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
RRUS-11	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
Empty Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	1.40	1.40	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
Empty Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
T-Arm Mount [TA 602-3]	C	None		0.0000	128.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
						2" Ice	26.99	26.99	1.64
						4" Ice	42.39	42.39	2.50
***									
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TME-DB-T16Z-8AB-0Z w/mount pipe	B	From Leg	2.00	0.0000	110.00	No Ice	5.66	2.75	0.05
			0.00			1/2" Ice	6.00	3.13	0.09
			0.00			1" Ice	6.34	3.52	0.14
						2" Ice	7.08	4.42	0.25
						4" Ice	8.66	6.45	0.56
Side Arm Mount [SO 102-1]	B	From Leg	1.00	0.0000	110.00	No Ice	1.50	1.50	0.03
			0.00			1/2" Ice	1.74	1.75	0.04
			0.00			1" Ice	1.98	2.00	0.04
						2" Ice	2.46	2.50	0.07
						4" Ice	3.42	3.50	0.11
*									
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27
						4" Ice	10.91	10.98	0.65
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27
						4" Ice	10.91	10.98	0.65
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27
						4" Ice	10.91	10.98	0.65
BXA-185060/8CFx2 w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	3.20	3.02	0.03
			0.00			1/2" Ice	3.58	3.64	0.06
			1.00			1" Ice	3.99	4.26	0.10
						2" Ice	4.88	5.56	0.19
						4" Ice	6.80	8.46	0.47
BXA-185060/8CFx2 w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	3.20	3.02	0.03
			0.00			1/2" Ice	3.58	3.64	0.06
			1.00			1" Ice	3.99	4.26	0.10
						2" Ice	4.88	5.56	0.19
						4" Ice	6.80	8.46	0.47
BXA-185060/8CFx2 w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	3.20	3.02	0.03
			0.00			1/2" Ice	3.58	3.64	0.06
			1.00			1" Ice	3.99	4.26	0.10
						2" Ice	4.88	5.56	0.19
						4" Ice	6.80	8.46	0.47

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
800 10735V01 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.96 9.60 10.23 11.50 14.17	5.41 6.60 7.50 9.33 13.20	0.06 0.12 0.19 0.36 0.84
BXA-70063-6CF-EDIN-4 w/Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.75 8.29 8.85 9.97 12.34	5.18 6.11 6.92 8.59 12.13	0.04 0.10 0.16 0.31 0.75
BXA-70063-6CF-EDIN-4 w/Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.75 8.29 8.85 9.97 12.34	5.18 6.11 6.92 8.59 12.13	0.04 0.10 0.16 0.31 0.75
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
RRH2x40-AWS	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
FD9R6004/2C-3L	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00	0.0000	108.00	No Ice 1/2" Ice	0.37 0.45	0.08 0.14	0.00 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
FD9R6004/2C-3L	A	From Leg	4.00	0.0000	108.00	No Ice	0.37	0.08	0.00
			0.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
Platform Mount [LP 303-1]	C	None		0.0000	108.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
						4" Ice	48.34	48.34	3.10
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	3.00	0.0000	100.00	No Ice	6.83	5.64	0.11
			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
RRUS 11 B12	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	0.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
KRY 112 144/1	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
T-Arm Mount [TA 602-3]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.59 15.44 19.29 26.99 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50
***									
Pipe Mount [PM 601-3]	C	None		0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
***									
KS24019-L112A	A	From Leg	3.00 0.00 2.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
KS24019-L112A	C	From Leg	3.00 0.00 2.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	0.16 0.22 0.30	0.16 0.22 0.30	0.01 0.01 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.48	0.48	0.02
						4" Ice	0.95	0.95	0.06
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
***									
KS24019-L112A	B	From Leg	3.00 0.00 2.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	B	From Leg	1.50 0.00 0.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

Load Combinations

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

Comb. No.	Description
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140 - 135	Pole	Max Tension	27	0.00	0.00	-0.00
			Max. Compression	14	-6.86	0.02	-0.01
			Max. Mx	11	-3.31	21.25	0.01
			Max. My	8	-3.32	0.01	-21.24
			Max. Vy	5	5.22	-21.22	-0.00
			Max. Vx	2	-5.22	0.02	21.22
			Max. Torque	7			-0.01
L2	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.27	0.01	-0.01
			Max. Mx	11	-3.54	48.18	0.03
			Max. My	8	-3.54	-0.01	-48.17
			Max. Vy	5	5.56	-48.15	0.01
			Max. Vx	2	-5.56	0.02	48.15
			Max. Torque	7			-0.01
L3	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.65	0.00	0.96
			Max. Mx	11	-5.23	92.32	0.18
			Max. My	2	-5.24	0.02	92.15
			Max. Vy	5	9.43	-92.29	0.13
			Max. Vx	2	-9.35	0.02	92.15
			Max. Torque	5			1.55
L4	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.12	-0.01	0.97
			Max. Mx	11	-5.54	140.36	0.21
			Max. My	2	-5.55	0.02	139.76
			Max. Vy	5	9.79	-140.33	0.15
			Max. Vx	2	-9.70	0.02	139.76
			Max. Torque	5			1.55
L5	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.62	-0.02	0.97
			Max. Mx	11	-5.87	190.20	0.24
			Max. My	2	-5.87	0.02	189.17
			Max. Vy	5	10.16	-190.18	0.16
			Max. Vx	2	-10.07	0.02	189.17
			Max. Torque	5			1.55
L6	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.13	-0.03	0.98
			Max. Mx	11	-6.22	241.89	0.28
			Max. My	2	-6.23	0.02	240.43
			Max. Vy	5	10.53	-241.87	0.17
			Max. Vx	2	-10.44	0.02	240.43
			Max. Torque	5			1.54
L7	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-17.89	-1.32	2.20
			Max. Mx	5	-8.23	-309.43	-0.08
			Max. My	2	-8.23	0.22	307.98
			Max. Vy	5	14.46	-309.43	-0.08
			Max. Vx	2	-14.50	0.22	307.98
			Max. Torque	12			-3.12
L8	105 - 102.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.25	-1.33	2.19
			Max. Mx	5	-8.48	-348.32	-0.33
			Max. My	2	-8.47	0.47	346.98
			Max. Vy	5	14.72	-348.32	-0.33
			Max. Vx	2	-14.76	0.47	346.98
			Max. Torque	12			-3.12
L9	102.333 - 102.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.30	-1.33	2.19
			Max. Mx	5	-8.52	-352.00	-0.35
			Max. My	2	-8.51	0.49	350.67
			Max. Vy	5	14.74	-352.00	-0.35
			Max. Vx	2	-14.79	0.49	350.67
			Max. Torque	12			-3.11
L10	102.083 - 97.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.33	-1.64	2.39
			Max. Mx	5	-10.67	-437.74	-0.73
			Max. My	2	-10.67	0.83	436.59
			Max. Vy	5	18.92	-437.74	-0.73
			Max. Vx	2	-18.96	0.83	436.59
			Max. Torque	12			-3.25
L11	97.083 - 91.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.75	-1.70	2.42
			Max. Mx	5	-10.94	-477.43	-0.91
			Max. My	2	-10.94	1.03	476.38
			Max. Vy	5	19.19	-477.43	-0.91
			Max. Vx	2	-19.24	1.03	476.38
			Max. Torque	12			-3.26
L12	91.75 - 90.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.18	-1.82	2.49
			Max. Mx	5	-11.91	-560.31	-1.28
			Max. My	2	-11.91	1.42	559.46
			Max. Vy	5	19.79	-560.31	-1.28
			Max. Vx	2	-19.84	1.42	559.46
			Max. Torque	12			-3.28
L13	90.75 - 85.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.62	-2.00	2.56
			Max. Mx	5	-12.93	-661.51	-1.72
			Max. My	2	-12.93	1.88	660.90
			Max. Vy	5	20.58	-661.51	-1.72
			Max. Vx	2	-20.62	1.88	660.90
			Max. Torque	12			-3.30
L14	85.75 - 85.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.73	-2.02	2.57
			Max. Mx	5	-13.01	-670.16	-1.76
			Max. My	2	-13.01	1.92	669.57
			Max. Vy	5	20.63	-670.16	-1.76
			Max. Vx	2	-20.68	1.92	669.57
			Max. Torque	12			-3.30
L15	85.33 - 85.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.80	-2.03	2.57
			Max. Mx	5	-13.06	-675.32	-1.78
			Max. My	2	-13.06	1.94	674.74

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	20.67	-675.32	-1.78
			Max. Vx	2	-20.72	1.94	674.74
			Max. Torque	12			-3.30
L16	85.08 - 82.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.56	-2.10	2.56
			Max. Mx	5	-13.55	-729.18	-2.01
			Max. My	2	-13.55	2.18	728.73
			Max. Vy	5	21.09	-729.18	-2.01
			Max. Vx	2	-21.14	2.18	728.73
			Max. Torque	12			-3.30
L17	82.5 - 82.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.64	-2.10	2.56
			Max. Mx	5	-13.61	-734.46	-2.03
			Max. My	2	-13.61	2.21	734.02
			Max. Vy	5	21.13	-734.46	-2.03
			Max. Vx	2	-21.17	2.21	734.02
			Max. Torque	12			-3.30
L18	82.25 - 77.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.21	-2.15	2.52
			Max. Mx	5	-14.66	-844.33	-2.48
			Max. My	2	-14.66	2.68	844.14
			Max. Vy	5	21.97	-844.33	-2.48
			Max. Vx	2	-22.02	2.68	844.14
			Max. Torque	12			-3.30
L19	77.15 - 76.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.29	-2.15	2.52
			Max. Mx	5	-14.72	-849.46	-2.50
			Max. My	2	-14.72	2.70	849.28
			Max. Vy	5	22.01	-849.46	-2.50
			Max. Vx	2	-22.05	2.70	849.28
			Max. Torque	12			-3.28
L20	76.9167 - 71.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.82	-2.10	2.50
			Max. Mx	5	-15.78	-961.46	-2.94
			Max. My	2	-15.78	3.16	961.51
			Max. Vy	5	22.80	-961.46	-2.94
			Max. Vx	2	-22.85	3.16	961.51
			Max. Torque	12			-3.28
L21	71.9167 - 66.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.61	-1.79	2.62
			Max. Mx	5	-17.02	-1077.60	-3.33
			Max. My	2	-17.02	3.82	1078.12
			Max. Vy	5	23.71	-1077.60	-3.33
			Max. Vx	2	-23.74	3.82	1078.12
			Max. Torque	12			-3.26
L22	66.9167 - 66.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.69	-1.78	2.62
			Max. Mx	5	-17.08	-1083.53	-3.36
			Max. My	2	-17.08	3.85	1084.06
			Max. Vy	5	23.74	-1083.53	-3.36
			Max. Vx	2	-23.78	3.85	1084.06
			Max. Torque	12			-3.23
L23	66.667 - 66.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.76	-1.78	2.62
			Max. Mx	5	-17.13	-1089.47	-3.38
			Max. My	2	-17.13	3.87	1090.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	23.78	-1089.47	-3.38
			Max. Vx	2	-23.82	3.87	1090.00
			Max. Torque	12			-3.23
L24	66.417 - 61.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.20	-1.80	2.63
			Max. Mx	5	-18.14	-1210.22	-3.90
			Max. My	2	-18.14	4.40	1210.92
			Max. Vy	5	24.53	-1210.22	-3.90
			Max. Vx	2	-24.56	4.40	1210.92
			Max. Torque	12			-3.23
L25	61.417 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.61	-1.81	2.62
			Max. Mx	5	-18.43	-1245.12	-4.04
			Max. My	2	-18.43	4.54	1245.86
			Max. Vy	5	24.74	-1245.12	-4.04
			Max. Vx	2	-24.77	4.54	1245.86
			Max. Torque	12			-3.23
L26	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.69	-1.81	2.63
			Max. Mx	5	-18.50	-1251.31	-4.07
			Max. My	2	-18.50	4.57	1252.06
			Max. Vy	5	24.76	-1251.31	-4.07
			Max. Vx	2	-24.80	4.57	1252.06
			Max. Torque	12			-3.22
L27	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.25	-1.84	2.61
			Max. Mx	5	-19.64	-1376.92	-4.58
			Max. My	2	-19.64	5.09	1377.83
			Max. Vy	5	25.49	-1376.92	-4.58
			Max. Vx	2	-25.52	5.09	1377.83
			Max. Torque	12			-3.22
L28	54.75 - 46.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.43	-1.86	2.60
			Max. Mx	5	-20.52	-1473.44	-4.96
			Max. My	2	-20.52	5.47	1474.48
			Max. Vy	5	26.01	-1473.44	-4.96
			Max. Vx	2	-26.04	5.47	1474.48
			Max. Torque	12			-3.22
L29	46.5 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.37	-2.15	2.44
			Max. Mx	5	-22.73	-1619.14	-5.59
			Max. My	2	-22.72	5.83	1620.10
			Max. Vy	5	26.88	-1619.14	-5.59
			Max. Vx	2	-26.93	5.83	1620.10
			Max. Torque	12			-3.21
L30	45.5 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.78	-2.15	2.46
			Max. Mx	5	-23.03	-1652.85	-5.70
			Max. My	2	-23.02	5.94	1653.87
			Max. Vy	5	27.07	-1652.85	-5.70
			Max. Vx	2	-27.11	5.94	1653.87
			Max. Torque	12			-3.21
L31	44.25 - 44	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.88	-2.15	2.47
			Max. Mx	5	-23.11	-1659.62	-5.72
			Max. My	2	-23.11	5.96	1660.65
			Max. Vy	5	27.09	-1659.62	-5.72
			Max. Vx	2	-27.14	5.96	1660.65
			Max. Torque	12			-3.21
L32	44 - 39	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-42.73	-2.17	2.54
			Max. Mx	5	-24.52	-1796.83	-6.18
			Max. My	2	-24.52	6.43	1798.09
			Max. Vy	5	27.80	-1796.83	-6.18
			Max. Vx	2	-27.85	6.43	1798.09
			Max. Torque	12			-3.22
L33	39 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.61	-2.20	2.62
			Max. Mx	5	-25.97	-1937.48	-6.64
			Max. My	2	-25.97	6.89	1938.96
			Max. Vy	5	28.47	-1937.48	-6.64
			Max. Vx	2	-28.52	6.89	1938.96
			Max. Torque	12			-3.23
L34	34 - 29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.51	-2.20	2.71
			Max. Mx	5	-27.45	-2081.47	-7.09
			Max. My	2	-27.45	7.35	2083.17
			Max. Vy	5	29.14	-2081.47	-7.09
			Max. Vx	2	-29.18	7.35	2083.17
			Max. Torque	12			-3.24
L35	29 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.00	-2.19	2.74
			Max. Mx	5	-27.82	-2117.99	-7.21
			Max. My	2	-27.82	7.46	2119.75
			Max. Vy	5	29.31	-2117.99	-7.21
			Max. Vx	2	-29.36	7.46	2119.75
			Max. Torque	12			-3.24
L36	27.75 - 27.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.10	-2.19	2.74
			Max. Mx	5	-27.91	-2125.32	-7.23
			Max. My	2	-27.91	7.48	2127.09
			Max. Vy	5	29.34	-2125.32	-7.23
			Max. Vx	2	-29.38	7.48	2127.09
			Max. Torque	12			-3.24
L37	27.5 - 24.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.56	-2.14	2.83
			Max. Mx	5	-29.02	-2226.41	-7.54
			Max. My	2	-29.02	7.80	2228.34
			Max. Vy	5	29.84	-2226.41	-7.54
			Max. Vx	2	-29.89	7.80	2228.34
			Max. Torque	12			-3.25
L38	24.083 - 23.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.66	-2.14	2.84
			Max. Mx	5	-29.11	-2233.88	-7.56
			Max. My	2	-29.11	7.82	2235.81
			Max. Vy	5	29.87	-2233.88	-7.56
			Max. Vx	2	-29.92	7.82	2235.81
			Max. Torque	12			-3.25
L39	23.833 - 18.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.70	-2.08	2.98
			Max. Mx	5	-30.66	-2385.05	-8.02
			Max. My	2	-30.66	8.28	2387.21
			Max. Vy	5	30.61	-2385.05	-8.02
			Max. Vx	2	-30.65	8.28	2387.21
			Max. Torque	12			-3.26
L40	18.833 - 18.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.01	-2.08	3.00
			Max. Mx	5	-30.91	-2408.04	-8.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-30.91	8.34	2410.23
			Max. Vy	5	30.72	-2408.04	-8.08
			Max. Vx	2	-30.76	8.34	2410.23
			Max. Torque	12			-3.26
L41	18.083 - 17.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.11	-2.08	3.01
			Max. Mx	5	-30.99	-2415.72	-8.11
			Max. My	2	-30.99	8.37	2417.93
			Max. Vy	5	30.75	-2415.72	-8.11
			Max. Vx	2	-30.80	8.37	2417.93
			Max. Torque	12			-3.27
L42	17.833 - 12.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.17	-2.11	3.12
			Max. Mx	5	-32.56	-2571.35	-8.56
			Max. My	2	-32.56	8.82	2573.78
			Max. Vy	5	31.51	-2571.35	-8.56
			Max. Vx	8	31.55	-10.39	-2571.68
			Max. Torque	12			-3.28
L43	12.833 - 7.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-55.22	-2.15	3.28
			Max. Mx	5	-34.17	-2730.61	-9.01
			Max. My	2	-34.17	9.27	2733.26
			Max. Vy	5	32.21	-2730.61	-9.01
			Max. Vx	8	32.26	-10.89	-2731.11
			Max. Torque	12			-3.32
L44	7.833 - 2.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-57.29	-2.19	3.45
			Max. Mx	5	-35.80	-2893.35	-9.46
			Max. My	2	-35.80	9.72	2896.22
			Max. Vy	5	32.90	-2893.35	-9.46
			Max. Vx	8	32.95	-11.38	-2894.02
			Max. Torque	12			-3.36
L45	2.833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-58.48	-2.22	3.56
			Max. Mx	5	-36.74	-2987.09	-9.71
			Max. My	2	-36.74	9.97	2990.08
			Max. Vy	5	33.30	-2987.09	-9.71
			Max. Vx	8	33.34	-11.66	-2987.86
			Max. Torque	12			-3.38

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	58.48	0.00	-0.00
	Max. H_x	11	36.75	33.28	0.09
	Max. H_z	2	36.75	0.09	33.32
	Max. M_x	2	2990.08	0.09	33.32
	Max. M_z	5	2987.09	-33.28	-0.09
	Max. Torsion	6	3.38	-28.87	-16.74
	Min. Vert	2	36.75	0.09	33.32
	Min. H_x	5	36.75	-33.28	-0.09
	Min. H_z	8	36.75	-0.09	-33.32
	Min. M_x	8	-2987.86	-0.09	-33.32

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M_z	11	-2985.38	33.28	0.09
	Min. Torsion	12	-3.38	28.87	16.74

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	36.75	-0.00	0.00	-1.07	-0.81	-0.00
Dead+Wind 0 deg - No Ice	36.75	-0.09	-33.32	-2990.08	9.97	1.41
Dead+Wind 30 deg - No Ice	36.75	16.56	-28.81	-2584.33	-1484.63	-0.33
Dead+Wind 60 deg - No Ice	36.75	28.78	-16.58	-1486.28	-2581.65	-1.97
Dead+Wind 90 deg - No Ice	36.75	33.28	0.09	9.71	-2987.09	-3.09
Dead+Wind 120 deg - No Ice	36.75	28.87	16.74	1502.76	-2592.40	-3.38
Dead+Wind 150 deg - No Ice	36.75	16.72	28.91	2592.84	-1503.32	-2.76
Dead+Wind 180 deg - No Ice	36.75	0.09	33.32	2987.86	-11.66	-1.41
Dead+Wind 210 deg - No Ice	36.75	-16.56	28.81	2582.06	1482.92	0.32
Dead+Wind 240 deg - No Ice	36.75	-28.78	16.58	1484.04	2579.93	1.97
Dead+Wind 270 deg - No Ice	36.75	-33.28	-0.09	-11.93	2985.38	3.09
Dead+Wind 300 deg - No Ice	36.75	-28.87	-16.74	-1504.98	2590.72	3.38
Dead+Wind 330 deg - No Ice	36.75	-16.72	-28.91	-2595.08	1501.65	2.76
Dead+Ice+Temp	58.48	-0.00	0.00	-3.56	-2.22	-0.00
Dead+Wind 0 deg+Ice+Temp	58.48	-0.02	-9.46	-902.18	-0.13	0.47
Dead+Wind 30 deg+Ice+Temp	58.48	4.72	-8.19	-780.71	-450.66	-0.07
Dead+Wind 60 deg+Ice+Temp	58.48	8.20	-4.72	-451.04	-781.04	-0.59
Dead+Wind 90 deg+Ice+Temp	58.48	9.47	0.02	-1.50	-902.77	-0.96
Dead+Wind 120 deg+Ice+Temp	58.48	8.21	4.75	447.47	-783.21	-1.07
Dead+Wind 150 deg+Ice+Temp	58.48	4.75	8.21	775.55	-454.41	-0.89
Dead+Wind 180 deg+Ice+Temp	58.48	0.02	9.46	894.84	-4.47	-0.47
Dead+Wind 210 deg+Ice+Temp	58.48	-4.72	8.19	773.38	446.05	0.07
Dead+Wind 240 deg+Ice+Temp	58.48	-8.20	4.72	443.71	776.44	0.59
Dead+Wind 270 deg+Ice+Temp	58.48	-9.47	-0.02	-5.83	898.16	0.96
Dead+Wind 300 deg+Ice+Temp	58.48	-8.21	-4.75	-454.80	778.61	1.07
Dead+Wind 330 deg+Ice+Temp	58.48	-4.75	-8.21	-782.88	449.81	0.89
Dead+Wind 0 deg - Service	36.75	-0.04	-13.02	-1170.17	3.37	0.56
Dead+Wind 30 deg - Service	36.75	6.47	-11.26	-1011.55	-581.23	-0.13
Dead+Wind 60 deg - Service	36.75	11.24	-6.48	-582.05	-1010.33	-0.78
Dead+Wind 90 deg - Service	36.75	13.00	0.04	3.09	-1168.91	-1.22
Dead+Wind 120 deg - Service	36.75	11.28	6.54	587.11	-1014.55	-1.33
Dead+Wind 150 deg - Service	36.75	6.53	11.29	1013.50	-588.56	-1.09
Dead+Wind 180 deg - Service	36.75	0.04	13.02	1167.96	-5.09	-0.56
Dead+Wind 210 deg - Service	36.75	-6.47	11.26	1009.27	579.52	0.13
Dead+Wind 240 deg - Service	36.75	-11.24	6.48	579.78	1008.61	0.78
Dead+Wind 270 deg - Service	36.75	-13.00	-0.04	-5.37	1167.19	1.22
Dead+Wind 300 deg - Service	36.75	-11.28	-6.54	-589.38	1012.84	1.34
Dead+Wind 330 deg - Service	36.75	-6.53	-11.29	-1015.77	586.85	1.09

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-36.75	0.00	0.00	36.75	-0.00	0.001%
2	-0.09	-36.75	-33.33	0.09	36.75	33.32	0.001%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
3	16.56	-36.75	-28.81	-16.56	36.75	28.81	0.000%
4	28.78	-36.75	-16.58	-28.78	36.75	16.58	0.000%
5	33.28	-36.75	0.09	-33.28	36.75	-0.09	0.000%
6	28.87	-36.75	16.74	-28.87	36.75	-16.74	0.000%
7	16.72	-36.75	28.91	-16.72	36.75	-28.91	0.000%
8	0.09	-36.75	33.33	-0.09	36.75	-33.32	0.001%
9	-16.56	-36.75	28.81	16.56	36.75	-28.81	0.000%
10	-28.78	-36.75	16.58	28.78	36.75	-16.58	0.000%
11	-33.28	-36.75	-0.09	33.28	36.75	0.09	0.000%
12	-28.87	-36.75	-16.74	28.87	36.75	16.74	0.000%
13	-16.72	-36.75	-28.91	16.72	36.75	28.91	0.000%
14	0.00	-58.48	0.00	0.00	58.48	-0.00	0.000%
15	-0.02	-58.48	-9.46	0.02	58.48	9.46	0.000%
16	4.72	-58.48	-8.19	-4.72	58.48	8.19	0.000%
17	8.20	-58.48	-4.72	-8.20	58.48	4.72	0.000%
18	9.47	-58.48	0.02	-9.47	58.48	-0.02	0.000%
19	8.21	-58.48	4.75	-8.21	58.48	-4.75	0.000%
20	4.75	-58.48	8.21	-4.75	58.48	-8.21	0.000%
21	0.02	-58.48	9.46	-0.02	58.48	-9.46	0.000%
22	-4.72	-58.48	8.19	4.72	58.48	-8.19	0.000%
23	-8.20	-58.48	4.72	8.20	58.48	-4.72	0.000%
24	-9.47	-58.48	-0.02	9.47	58.48	0.02	0.000%
25	-8.21	-58.48	-4.75	8.21	58.48	4.75	0.000%
26	-4.75	-58.48	-8.21	4.75	58.48	8.21	0.000%
27	-0.04	-36.75	-13.02	0.04	36.75	13.02	0.003%
28	6.47	-36.75	-11.26	-6.47	36.75	11.26	0.000%
29	11.24	-36.75	-6.48	-11.24	36.75	6.48	0.000%
30	13.00	-36.75	0.04	-13.00	36.75	-0.04	0.001%
31	11.28	-36.75	6.54	-11.28	36.75	-6.54	0.000%
32	6.53	-36.75	11.29	-6.53	36.75	-11.29	0.000%
33	0.04	-36.75	13.02	-0.04	36.75	-13.02	0.002%
34	-6.47	-36.75	11.26	6.47	36.75	-11.26	0.000%
35	-11.24	-36.75	6.48	11.24	36.75	-6.48	0.000%
36	-13.00	-36.75	-0.04	13.00	36.75	0.04	0.001%
37	-11.28	-36.75	-6.54	11.28	36.75	6.54	0.000%
38	-6.53	-36.75	-11.29	6.53	36.75	11.29	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000295
2	Yes	19	0.00000001	0.00014532
3	Yes	24	0.00000001	0.00014367
4	Yes	24	0.00000001	0.00014893
5	Yes	21	0.00000001	0.00009255
6	Yes	24	0.00000001	0.00013991
7	Yes	25	0.00000001	0.00007663
8	Yes	20	0.00000001	0.00011449
9	Yes	24	0.00000001	0.00014431
10	Yes	24	0.00000001	0.00013967
11	Yes	21	0.00000001	0.00011273
12	Yes	25	0.00000001	0.00007752
13	Yes	24	0.00000001	0.00014106
14	Yes	13	0.00000001	0.00011512
15	Yes	22	0.00000001	0.00009845

16	Yes	22	0.00000001	0.00013165
17	Yes	22	0.00000001	0.00013327
18	Yes	22	0.00000001	0.00009909
19	Yes	22	0.00000001	0.00012934
20	Yes	22	0.00000001	0.00013293
21	Yes	22	0.00000001	0.00009708
22	Yes	22	0.00000001	0.00012850
23	Yes	22	0.00000001	0.00012757
24	Yes	22	0.00000001	0.00009820
25	Yes	22	0.00000001	0.00013421
26	Yes	22	0.00000001	0.00012996
27	Yes	17	0.00006025	0.00014128
28	Yes	21	0.00000001	0.00010061
29	Yes	21	0.00000001	0.00010934
30	Yes	19	0.00000001	0.00008291
31	Yes	21	0.00000001	0.00009369
32	Yes	21	0.00000001	0.00011447
33	Yes	18	0.00000001	0.00008735
34	Yes	21	0.00000001	0.00010146
35	Yes	21	0.00000001	0.00009435
36	Yes	19	0.00000001	0.00008906
37	Yes	21	0.00000001	0.00011758
38	Yes	21	0.00000001	0.00009520

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	39.8233	38	2.6522	0.0146
L2	135 - 130	37.0508	38	2.6416	0.0146
L3	130 - 125	34.3032	38	2.6055	0.0146
L4	125 - 120	31.6052	38	2.5451	0.0137
L5	120 - 115	28.9851	38	2.4580	0.0125
L6	115 - 110	26.4665	38	2.3520	0.0113
L7	110 - 105	24.0662	38	2.2325	0.0104
L8	105 - 102.333	21.7968	38	2.1009	0.0089
L9	102.333 - 102.083	20.6448	38	2.0247	0.0080
L10	102.083 - 97.083	20.5389	38	2.0199	0.0079
L11	97.083 - 91.75	18.4780	38	1.9160	0.0068
L12	95 - 90.75	17.6524	38	1.8698	0.0064
L13	90.75 - 85.75	16.0128	38	1.8037	0.0059
L14	85.75 - 85.33	14.1953	38	1.6673	0.0050
L15	85.33 - 85.08	14.0492	38	1.6556	0.0049
L16	85.08 - 82.5	13.9627	38	1.6504	0.0049
L17	82.5 - 82.25	13.0856	38	1.5963	0.0045
L18	82.25 - 77.15	13.0022	38	1.5911	0.0045
L19	77.15 - 76.9167	11.3627	38	1.4788	0.0039
L20	76.9167 - 71.9167	11.2906	38	1.4736	0.0039
L21	71.9167 - 66.9167	9.8064	38	1.3613	0.0034
L22	66.9167 - 66.667	8.4421	38	1.2445	0.0029
L23	66.667 - 66.417	8.3771	38	1.2387	0.0029
L24	66.417 - 61.417	8.3124	38	1.2334	0.0028
L25	61.417 - 60	7.0768	38	1.1266	0.0025
L26	60 - 59.75	6.7470	38	1.0964	0.0024
L27	59.75 - 54.75	6.6897	38	1.0910	0.0023
L28	54.75 - 46.5	5.6033	38	0.9841	0.0020
L29	51 - 45.5	4.8623	38	0.9030	0.0018
L30	45.5 - 44.25	3.8566	38	0.8342	0.0016
L31	44.25 - 44	3.6416	38	0.8084	0.0015

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L32	44 - 39	3.5994	38	0.8036	0.0015
L33	39 - 34	2.8081	38	0.7079	0.0013
L34	34 - 29	2.1175	38	0.6114	0.0011
L35	29 - 27.75	1.5273	38	0.5160	0.0009
L36	27.75 - 27.5	1.3953	38	0.4921	0.0008
L37	27.5 - 24.083	1.3697	38	0.4878	0.0008
L38	24.083 - 23.833	1.0419	38	0.4284	0.0007
L39	23.833 - 18.833	1.0196	38	0.4234	0.0007
L40	18.833 - 18.083	0.6292	38	0.3224	0.0005
L41	18.083 - 17.833	0.5797	38	0.3074	0.0005
L42	17.833 - 12.833	0.5637	38	0.3032	0.0005
L43	12.833 - 7.833	0.2914	38	0.2172	0.0003
L44	7.833 - 2.833	0.1083	38	0.1325	0.0002
L45	2.833 - 0	0.0141	38	0.0476	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	38	39.8233	2.6522	0.0146	12079
139.00	APXV9ERR18-C-A20	38	39.2680	2.6511	0.0146	12079
137.00	PCS 1900MHz 4x45W-65MHz	38	38.1582	2.6479	0.0146	12079
129.00	RRUS-11	38	33.7588	2.5954	0.0145	5460
128.00	7770.00 w/ Mount Pipe	38	33.2165	2.5844	0.0144	4944
110.00	TME-DB-T16Z-8AB-0Z w/mount pipe	38	24.0662	2.2325	0.0104	2287
108.00	BXA-70063-4CF-EDIN-X w/ Mount Pipe	38	23.1419	2.1836	0.0099	2192
100.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	38	19.6670	1.9792	0.0075	2604
90.00	Pipe Mount [PM 601-3]	38	15.7315	1.7878	0.0058	2416
70.00	KS24019-L112A	38	9.2690	1.3172	0.0032	2487
49.00	KS24019-L112A	38	4.4861	0.8782	0.0017	3857

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	101.4172	13	6.7623	0.0374
L2	135 - 130	94.3740	13	6.7351	0.0374
L3	130 - 125	87.3933	13	6.6434	0.0374
L4	125 - 120	80.5375	13	6.4899	0.0352
L5	120 - 115	73.8776	13	6.2683	0.0319
L6	115 - 110	67.4732	13	5.9984	0.0290
L7	110 - 105	61.3669	13	5.6944	0.0265
L8	105 - 102.333	55.5911	13	5.3597	0.0227
L9	102.333 - 102.083	52.6582	13	5.1656	0.0203
L10	102.083 - 97.083	52.3887	13	5.1534	0.0202
L11	97.083 - 91.75	47.1401	13	4.8890	0.0174
L12	95 - 90.75	45.0370	13	4.7713	0.0163

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L13	90.75 - 85.75	40.8600	13	4.6031	0.0150
L14	85.75 - 85.33	36.2282	13	4.2555	0.0126
L15	85.33 - 85.08	35.8558	13	4.2257	0.0124
L16	85.08 - 82.5	35.6352	13	4.2125	0.0123
L17	82.5 - 82.25	33.3995	13	4.0746	0.0115
L18	82.25 - 77.15	33.1868	13	4.0613	0.0114
L19	77.15 - 76.9167	29.0066	13	3.7752	0.0099
L20	76.9167 - 71.9167	28.8227	13	3.7620	0.0098
L21	71.9167 - 66.9167	25.0371	13	3.4755	0.0085
L22	66.9167 - 66.667	21.5566	13	3.1777	0.0073
L23	66.667 - 66.417	21.3909	13	3.1628	0.0073
L24	66.417 - 61.417	21.2258	13	3.1493	0.0072
L25	61.417 - 60	18.0728	13	2.8771	0.0062
L26	60 - 59.75	17.2310	13	2.7999	0.0060
L27	59.75 - 54.75	17.0848	13	2.7863	0.0059
L28	54.75 - 46.5	14.3116	13	2.5134	0.0051
L29	51 - 45.5	12.4197	13	2.3066	0.0045
L30	45.5 - 44.25	9.8519	13	2.1310	0.0040
L31	44.25 - 44	9.3028	13	2.0650	0.0039
L32	44 - 39	9.1951	13	2.0527	0.0038
L33	39 - 34	7.1742	13	1.8085	0.0033
L34	34 - 29	5.4100	13	1.5620	0.0027
L35	29 - 27.75	3.9024	13	1.3183	0.0022
L36	27.75 - 27.5	3.5653	13	1.2573	0.0021
L37	27.5 - 24.083	3.4998	13	1.2463	0.0021
L38	24.083 - 23.833	2.6623	13	1.0946	0.0018
L39	23.833 - 18.833	2.6053	13	1.0819	0.0018
L40	18.833 - 18.083	1.6079	13	0.8237	0.0013
L41	18.083 - 17.833	1.4815	13	0.7856	0.0012
L42	17.833 - 12.833	1.4406	13	0.7747	0.0012
L43	12.833 - 7.833	0.7446	13	0.5551	0.0008
L44	7.833 - 2.833	0.2768	13	0.3387	0.0005
L45	2.833 - 0	0.0361	13	0.1216	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	13	101.4172	6.7623	0.0374	4859
139.00	APXV9ERR18-C-A20	13	100.0065	6.7595	0.0374	4859
137.00	PCS 1900MHz 4x45W-65MHz	13	97.1872	6.7514	0.0373	4859
129.00	RRUS-11	13	86.0100	6.6177	0.0372	2195
128.00	7770.00 w/ Mount Pipe	13	84.6321	6.5897	0.0368	1989
110.00	TME-DB-T16Z-8AB-0Z w/mount pipe	13	61.3669	5.6944	0.0265	914
108.00	BXA-70063-4CF-EDIN-X w/ Mount Pipe	13	59.0149	5.5700	0.0252	875
100.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	50.1683	5.0500	0.0190	1037
90.00	Pipe Mount [PM 601-3]	13	40.1432	4.5626	0.0147	959
70.00	KS24019-L112A	13	23.6662	3.3630	0.0080	982
49.00	KS24019-L112A	13	11.4591	2.2433	0.0043	1516

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	140 - 135 (1)	TP17.025x16x0.25	5.00	0.00	0.0	36.000	13.504	-3.31	486.14	0.007
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.00	0.00	0.0	36.000	14.329	-3.54	515.84	0.007
L3	130 - 125 (3)	TP19.075x18.05x0.25	5.00	0.00	0.0	36.000	15.154	-5.23	545.54	0.010
L4	125 - 120 (4)	TP20.099x19.075x0.25	5.00	0.00	0.0	36.000	15.979	-5.54	575.24	0.010
L5	120 - 115 (5)	TP21.124x20.099x0.25	5.00	0.00	0.0	36.000	16.804	-5.87	604.94	0.010
L6	115 - 110 (6)	TP22.149x21.124x0.25	5.00	0.00	0.0	36.000	17.629	-6.22	634.64	0.010
L7	110 - 105 (7)	TP23.174x22.149x0.25	5.00	0.00	0.0	36.000	18.454	-8.23	664.34	0.012
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	2.67	0.00	0.0	36.000	18.894	-8.48	680.18	0.012
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	0.25	0.00	0.0	36.000	29.178	-8.52	1050.41	0.008
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	5.00	0.00	0.0	36.000	29.489	-10.66	1061.62	0.010
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	5.33	0.00	0.0	36.000	30.005	-10.93	1080.18	0.010
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	4.25	0.00	0.0	39.000	28.952	-11.90	1129.14	0.011
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	5.00	0.00	0.0	39.000	30.128	-12.92	1175.00	0.011
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	0.42	0.00	0.0	39.000	30.227	-13.00	1178.85	0.011
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	0.25	0.00	0.0	39.000	41.238	-13.05	1608.27	0.008
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	2.58	0.00	0.0	39.000	42.068	-13.54	1640.65	0.008
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	0.25	0.00	0.0	39.000	42.679	-13.60	1664.47	0.008
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	5.10	0.00	0.0	39.000	42.686	-14.65	1664.76	0.009
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	0.23	0.00	0.0	39.000	42.759	-14.71	1667.61	0.009
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	5.00	0.00	0.0	39.000	44.328	-15.77	1728.78	0.009
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.463	5.00	0.00	0.0	39.000	44.707	-17.01	1743.58	0.010
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	0.25	0.00	0.0	39.000	44.783	-17.07	1746.55	0.010
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	0.25	0.00	0.0	39.000	49.627	-17.12	1935.45	0.009
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	5.00	0.00	0.0	39.000	51.319	-18.13	2001.45	0.009
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1.42	0.00	0.0	39.000	51.178	-18.42	1995.92	0.009
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	0.25	0.00	0.0	39.000	51.884	-18.49	2023.46	0.009
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	5.00	0.00	0.0	39.000	53.576	-19.63	2089.46	0.009
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	8.25	0.00	0.0	39.000	54.187	-20.51	2113.28	0.010
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	5.50	0.00	0.0	39.000	59.682	-22.72	2327.61	0.010
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	1.25	0.00	0.0	39.000	60.136	-23.02	2345.32	0.010
L31	44.25 - 44 (31)	TP34.557x34.506x0.6	0.25	0.00	0.0	39.000	65.606	-23.10	2558.62	0.009
L32	44 - 39 (32)	TP35.583x34.557x0.6	5.00	0.00	0.0	39.000	67.587	-24.51	2635.88	0.009
L33	39 - 34 (33)	TP36.608x35.583x0.588	5.00	0.00	0.0	39.000	68.142	-25.97	2657.53	0.010
L34	34 - 29 (34)	TP37.633x36.608x0.588	5.00	0.00	0.0	39.000	70.081	-27.44	2733.17	0.010
L35	29 - 27.75 (35)	TP37.89x37.633x0.575	1.25	0.00	0.0	39.000	69.088	-27.81	2694.43	0.010
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.65	0.25	0.00	0.0	39.000	78.050	-27.91	3043.94	0.009
L37	27.5 - 24.083	TP38.642x37.941x0.638	3.42	0.00	0.0	39.000	78.013	-29.01	3042.50	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	(37)									
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	0.25	0.00	0.0	39.000	67.551	-29.10	2634.49	0.011
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	5.00	0.00	0.0	39.000	67.812	-30.66	2644.66	0.012
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	0.75	0.00	0.0	39.000	68.078	-30.90	2655.04	0.012
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	0.25	0.00	0.0	39.000	80.644	-30.99	3145.10	0.010
L42	17.833 - 12.833 (42)	TP40.948x39.923x0.625	5.00	0.00	0.0	39.000	81.151	-32.56	3164.89	0.010
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	5.00	0.00	0.0	39.000	83.214	-34.17	3245.36	0.011
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	5.00	0.00	0.0	39.000	83.597	-35.80	3260.28	0.011
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	2.83	0.00	0.0	39.000	84.743	-36.74	3304.96	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	140 - 135 (1)	TP17.025x16x0.25	21.25	4.637	36.000	0.129	0.00	0.000	36.000	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	48.18	9.329	36.000	0.259	0.00	0.000	36.000	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	92.37	15.978	36.000	0.444	0.00	0.000	36.000	0.000
L4	125 - 120 (4)	TP20.099x19.075x0.25	140.36	21.823	36.000	0.606	0.00	0.000	36.000	0.000
L5	120 - 115 (5)	TP21.124x20.099x0.25	190.21	26.724	36.000	0.742	0.00	0.000	36.000	0.000
L6	115 - 110 (6)	TP22.149x21.124x0.25	241.89	30.862	36.000	0.857	0.00	0.000	36.000	0.000
L7	110 - 105 (7)	TP23.174x22.149x0.25	309.43	36.009	36.000	1.000	0.00	0.000	36.000	0.000
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	348.32	38.659	36.000	1.074	0.00	0.000	36.000	0.000
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	352.00	25.540	36.000	0.709	0.00	0.000	36.000	0.000
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	438.09	30.079	36.000	0.836	0.00	0.000	36.000	0.000
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	477.96	31.690	36.000	0.880	0.00	0.000	36.000	0.000
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	561.23	37.932	39.000	0.973	0.00	0.000	39.000	0.000
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	662.89	41.351	39.000	1.060	0.00	0.000	39.000	0.000
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	671.58	41.618	39.000	1.067	0.00	0.000	39.000	0.000
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	676.77	30.988	39.000	0.795	0.00	0.000	39.000	0.000
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	730.86	32.145	39.000	0.824	0.00	0.000	39.000	0.000
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	736.16	31.868	39.000	0.817	0.00	0.000	39.000	0.000
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	846.63	35.198	39.000	0.903	0.00	0.000	39.000	0.000
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	851.78	35.291	39.000	0.905	0.00	0.000	39.000	0.000
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	964.37	37.156	39.000	0.953	0.00	0.000	39.000	0.000
L21	71.9167 -	TP30.482x29.457x0.463	1081.44	39.846	39.000	1.022	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	66.9167 (21)									
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	1087.40	39.928	39.000	1.024	0.00	0.000	39.000	0.000
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	1093.37	36.286	39.000	0.930	0.00	0.000	39.000	0.000
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	1214.70	37.677	39.000	0.966	0.00	0.000	39.000	0.000
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1249.76	38.491	39.000	0.987	0.00	0.000	39.000	0.000
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	1255.97	38.108	39.000	0.977	0.00	0.000	39.000	0.000
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	1382.17	39.310	39.000	1.008	0.00	0.000	39.000	0.000
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	1479.13	40.601	39.000	1.041	0.00	0.000	39.000	0.000
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	1625.09	39.991	39.000	1.025	0.00	0.000	39.000	0.000
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	1658.94	40.205	39.000	1.031	0.00	0.000	39.000	0.000
L31	44.25 - 44 (31)	TP34.557x34.506x0.6	1665.74	37.056	39.000	0.950	0.00	0.000	39.000	0.000
L32	44 - 39 (32)	TP35.583x34.557x0.6	1803.53	37.785	39.000	0.969	0.00	0.000	39.000	0.000
L33	39 - 34 (33)	TP36.608x35.583x0.588	1944.76	39.215	39.000	1.006	0.00	0.000	39.000	0.000
L34	34 - 29 (34)	TP37.633x36.608x0.588	2089.32	39.813	39.000	1.021	0.00	0.000	39.000	0.000
L35	29 - 27.75 (35)	TP37.89x37.633x0.575	2125.98	40.780	39.000	1.046	0.00	0.000	39.000	0.000
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.65	2133.34	36.318	39.000	0.931	0.00	0.000	39.000	0.000
L37	27.5 - 24.083 (37)	TP38.642x37.941x0.638	2234.83	37.325	39.000	0.957	0.00	0.000	39.000	0.000
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	2242.32	42.993	39.000	1.102	0.00	0.000	39.000	0.000
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	2394.07	44.484	39.000	1.141	0.00	0.000	39.000	0.000
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	2417.14	44.560	39.000	1.143	0.00	0.000	39.000	0.000
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	2424.85	37.879	39.000	0.971	0.00	0.000	39.000	0.000
L42	17.833 - 12.833 (42)	TP40.948x39.923x0.625	2581.05	39.008	39.000	1.000	0.00	0.000	39.000	0.000
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	2740.88	39.379	39.000	1.010	0.00	0.000	39.000	0.000
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	2904.18	40.491	39.000	1.038	0.00	0.000	39.000	0.000
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	2998.23	40.672	39.000	1.043	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	140 - 135 (1)	TP17.025x16x0.25	5.22	0.386	24.000	0.033	0.01	0.001	24.000	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.56	0.388	24.000	0.033	0.01	0.001	24.000	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	9.41	0.621	24.000	0.053	1.33	0.108	24.000	0.004
L4	125 - 120 (4)	TP20.099x19.075x0.25	9.79	0.613	24.000	0.052	1.54	0.113	24.000	0.005
L5	120 - 115 (5)	TP21.124x20.099x0.25	10.16	0.604	24.000	0.051	1.54	0.102	24.000	0.004
L6	115 - 110 (6)	TP22.149x21.124x0.25	10.53	0.597	24.000	0.051	1.54	0.092	24.000	0.004
L7	110 - 105 (7)	TP23.174x22.149x0.25	14.46	0.784	24.000	0.066	2.88	0.158	24.000	0.007
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	14.72	0.779	24.000	0.066	2.87	0.150	24.000	0.006

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	14.74	0.505	24.000	0.043	2.87	0.098	24.000	0.004
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	19.01	0.645	24.000	0.055	3.25	0.105	24.000	0.004
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	19.29	0.643	24.000	0.054	3.26	0.101	24.000	0.004
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	19.89	0.687	26.000	0.054	3.28	0.104	26.000	0.004
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	20.67	0.686	26.000	0.054	3.30	0.097	26.000	0.004
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	20.73	0.686	26.000	0.054	3.30	0.096	26.000	0.004
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	20.78	0.504	26.000	0.039	3.30	0.071	26.000	0.003
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	21.19	0.504	26.000	0.039	3.30	0.068	26.000	0.003
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	21.24	0.498	26.000	0.039	3.30	0.067	26.000	0.003
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	22.09	0.517	26.000	0.040	2.76	0.054	26.000	0.002
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	22.14	0.518	26.000	0.040	2.76	0.053	26.000	0.002
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	22.92	0.517	26.000	0.040	2.73	0.049	26.000	0.002
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.463	23.82	0.533	26.000	0.042	2.62	0.045	26.000	0.002
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	23.87	0.533	26.000	0.042	2.61	0.045	26.000	0.002
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	23.91	0.482	26.000	0.038	2.61	0.041	26.000	0.002
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	24.65	0.480	26.000	0.038	2.60	0.038	26.000	0.001
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	24.86	0.486	26.000	0.038	2.60	0.038	26.000	0.001
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	24.89	0.480	26.000	0.037	2.60	0.037	26.000	0.001
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	25.61	0.478	26.000	0.037	2.60	0.035	26.000	0.001
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	26.12	0.482	26.000	0.038	2.60	0.033	26.000	0.001
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.55	27.00	0.452	26.000	0.035	2.68	0.031	26.000	0.001
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.55	27.19	0.452	26.000	0.035	2.67	0.030	26.000	0.001
L31	44.25 - 44 (31)	TP34.557x34.506x0.6	27.22	0.415	26.000	0.032	2.67	0.028	26.000	0.001
L32	44 - 39 (32)	TP35.583x34.557x0.6	27.92	0.413	26.000	0.032	2.68	0.026	26.000	0.001
L33	39 - 34 (33)	TP36.608x35.583x0.588	28.59	0.420	26.000	0.033	2.69	0.025	26.000	0.001
L34	34 - 29 (34)	TP37.633x36.608x0.588	29.25	0.417	26.000	0.033	2.69	0.024	26.000	0.001
L35	29 - 27.75 (35)	TP37.89x37.633x0.575	29.43	0.426	26.000	0.033	2.70	0.024	26.000	0.001
L36	27.75 - 27.5 (36)	TP37.941x37.89x0.65	29.45	0.377	26.000	0.029	2.70	0.021	26.000	0.001
L37	27.5 - 24.083 (37)	TP38.642x37.941x0.638	29.96	0.384	26.000	0.030	2.69	0.021	26.000	0.001
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.55	29.99	0.444	26.000	0.035	2.69	0.024	26.000	0.001
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.538	30.72	0.453	26.000	0.035	2.69	0.023	26.000	0.001
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.538	30.84	0.453	26.000	0.035	2.69	0.023	26.000	0.001
L41	18.083 - 17.833 (41)	TP39.923x39.872x0.638	30.87	0.383	26.000	0.030	2.69	0.020	26.000	0.001
L42	17.833 -	TP40.948x39.923x0.625	31.63	0.390	26.000	0.030	2.70	0.019	26.000	0.001

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	12.833 (42)									
L43	12.833 - 7.833 (43)	TP41.974x40.948x0.625	32.33	0.388	26.000	0.030	2.72	0.018	26.000	0.001
L44	7.833 - 2.833 (44)	TP42.999x41.974x0.613	33.02	0.395	26.000	0.031	2.75	0.018	26.000	0.001
L45	2.833 - 0 (45)	TP43.58x42.999x0.613	33.41	0.394	26.000	0.031	2.76	0.018	26.000	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 135 (1)	0.007	0.129	0.000	0.033	0.000	0.136 ✔	1.333	H1-3+VT ✔
L2	135 - 130 (2)	0.007	0.259	0.000	0.033	0.000	0.266 ✔	1.333	H1-3+VT ✔
L3	130 - 125 (3)	0.010	0.444	0.000	0.053	0.004	0.454 ✔	1.333	H1-3+VT ✔
L4	125 - 120 (4)	0.010	0.606	0.000	0.052	0.005	0.617 ✔	1.333	H1-3+VT ✔
L5	120 - 115 (5)	0.010	0.742	0.000	0.051	0.004	0.753 ✔	1.333	H1-3+VT ✔
L6	115 - 110 (6)	0.010	0.857	0.000	0.051	0.004	0.868 ✔	1.333	H1-3+VT ✔
L7	110 - 105 (7)	0.012	1.000	0.000	0.066	0.007	1.014 ✔	1.333	H1-3+VT ✔
L8	105 - 102.333 (8)	0.012	1.074	0.000	0.066	0.006	1.088 ✔	1.333	H1-3+VT ✔
L9	102.333 - 102.083 (9)	0.008	0.709	0.000	0.043	0.004	0.718 ✔	1.333	H1-3+VT ✔
L10	102.083 - 97.083 (10)	0.010	0.836	0.000	0.055	0.004	0.847 ✔	1.333	H1-3+VT ✔
L11	97.083 - 91.75 (11)	0.010	0.880	0.000	0.054	0.004	0.891 ✔	1.333	H1-3+VT ✔
L12	91.75 - 90.75 (12)	0.011	0.973	0.000	0.054	0.004	0.984 ✔	1.333	H1-3+VT ✔
L13	90.75 - 85.75 (13)	0.011	1.060	0.000	0.054	0.004	1.072 ✔	1.333	H1-3+VT ✔
L14	85.75 - 85.33 (14)	0.011	1.067	0.000	0.054	0.004	1.079 ✔	1.333	H1-3+VT ✔
L15	85.33 - 85.08 (15)	0.008	0.795	0.000	0.039	0.003	0.803 ✔	1.333	H1-3+VT ✔
L16	85.08 - 82.5 (16)	0.008	0.824	0.000	0.039	0.003	0.833 ✔	1.333	H1-3+VT ✔
L17	82.5 - 82.25 (17)	0.008	0.817	0.000	0.039	0.003	0.826 ✔	1.333	H1-3+VT ✔
L18	82.25 - 77.15 (18)	0.009	0.903	0.000	0.040	0.002	0.912 ✔	1.333	H1-3+VT ✔
L19	77.15 -	0.009	0.905	0.000	0.040	0.002	0.914	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	76.9167 (19)						✔		
L20	76.9167 - 71.9167 (20)	0.009	0.953	0.000	0.040	0.002	0.962 ✔	1.333	H1-3+VT ✔
L21	71.9167 - 66.9167 (21)	0.010	1.022	0.000	0.042	0.002	1.032 ✔	1.333	H1-3+VT ✔
L22	66.9167 - 66.667 (22)	0.010	1.024	0.000	0.042	0.002	1.034 ✔	1.333	H1-3+VT ✔
L23	66.667 - 66.417 (23)	0.009	0.930	0.000	0.038	0.002	0.940 ✔	1.333	H1-3+VT ✔
L24	66.417 - 61.417 (24)	0.009	0.966	0.000	0.038	0.001	0.976 ✔	1.333	H1-3+VT ✔
L25	61.417 - 60 (25)	0.009	0.987	0.000	0.038	0.001	0.997 ✔	1.333	H1-3+VT ✔
L26	60 - 59.75 (26)	0.009	0.977	0.000	0.037	0.001	0.987 ✔	1.333	H1-3+VT ✔
L27	59.75 - 54.75 (27)	0.009	1.008	0.000	0.037	0.001	1.018 ✔	1.333	H1-3+VT ✔
L28	54.75 - 46.5 (28)	0.010	1.041	0.000	0.038	0.001	1.051 ✔	1.333	H1-3+VT ✔
L29	46.5 - 45.5 (29)	0.010	1.025	0.000	0.035	0.001	1.036 ✔	1.333	H1-3+VT ✔
L30	45.5 - 44.25 (30)	0.010	1.031	0.000	0.035	0.001	1.041 ✔	1.333	H1-3+VT ✔
L31	44.25 - 44 (31)	0.009	0.950	0.000	0.032	0.001	0.959 ✔	1.333	H1-3+VT ✔
L32	44 - 39 (32)	0.009	0.969	0.000	0.032	0.001	0.978 ✔	1.333	H1-3+VT ✔
L33	39 - 34 (33)	0.010	1.006	0.000	0.033	0.001	1.016 ✔	1.333	H1-3+VT ✔
L34	34 - 29 (34)	0.010	1.021	0.000	0.033	0.001	1.031 ✔	1.333	H1-3+VT ✔
L35	29 - 27.75 (35)	0.010	1.046	0.000	0.033	0.001	1.056 ✔	1.333	H1-3+VT ✔
L36	27.75 - 27.5 (36)	0.009	0.931	0.000	0.029	0.001	0.941 ✔	1.333	H1-3+VT ✔
L37	27.5 - 24.083 (37)	0.010	0.957	0.000	0.030	0.001	0.967 ✔	1.333	H1-3+VT ✔
L38	24.083 - 23.833 (38)	0.011	1.102	0.000	0.035	0.001	1.114 ✔	1.333	H1-3+VT ✔
L39	23.833 - 18.833 (39)	0.012	1.141	0.000	0.035	0.001	1.153 ✔	1.333	H1-3+VT ✔
L40	18.833 - 18.083 (40)	0.012	1.143	0.000	0.035	0.001	1.155 ✔	1.333	H1-3+VT ✔
L41	18.083 - 17.833 (41)	0.010	0.971	0.000	0.030	0.001	0.981 ✔	1.333	H1-3+VT ✔
L42	17.833 - 12.833 (42)	0.010	1.000	0.000	0.030	0.001	1.011 ✔	1.333	H1-3+VT ✔
L43	12.833 - 7.833 (43)	0.011	1.010	0.000	0.030	0.001	1.020 ✔	1.333	H1-3+VT ✔
L44	7.833 - 2.833 (44)	0.011	1.038	0.000	0.031	0.001	1.049 ✔	1.333	H1-3+VT ✔
L45	2.833 - 0 (45)	0.011	1.043	0.000	0.031	0.001	1.054	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
							✔		

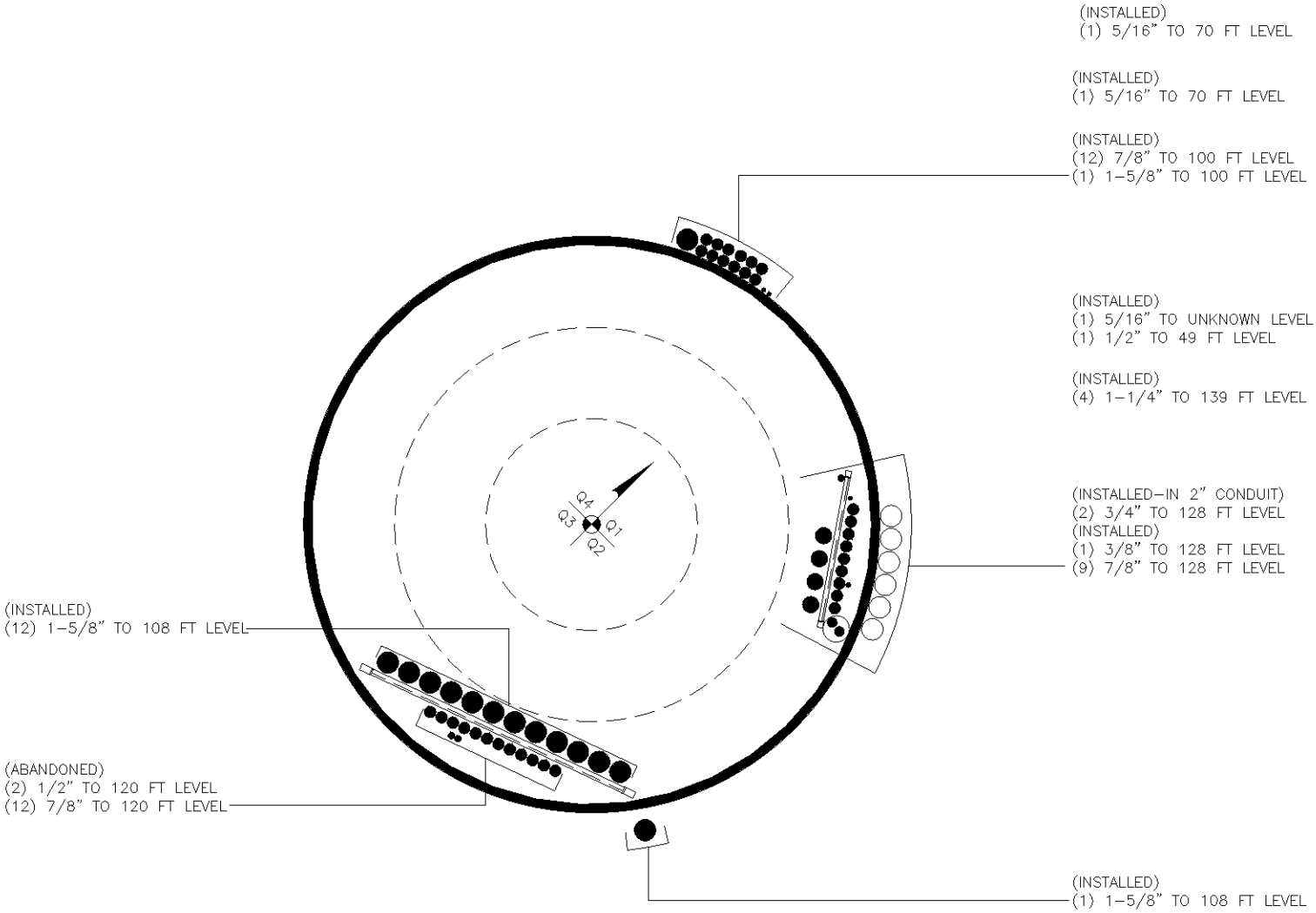
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	140 - 135	Pole	TP17.025x16x0.25	1	-3.31	648.02	10.2	Pass
L2	135 - 130	Pole	TP18.05x17.025x0.25	2	-3.54	687.61	20.0	Pass
L3	130 - 125	Pole	TP19.075x18.05x0.25	3	-5.23	727.20	34.1	Pass
L4	125 - 120	Pole	TP20.099x19.075x0.25	4	-5.54	766.79	46.3	Pass
L5	120 - 115	Pole	TP21.124x20.099x0.25	5	-5.87	806.38	56.5	Pass
L6	115 - 110	Pole	TP22.149x21.124x0.25	6	-6.22	845.98	65.1	Pass
L7	110 - 105	Pole	TP23.174x22.149x0.25	7	-8.23	885.57	76.1	Pass
L8	105 - 102.333	Pole	TP23.721x23.174x0.25	8	-8.48	906.68	81.6	Pass
L9	102.333 - 102.083	Pole	TP23.772x23.721x0.388	9	-8.52	1400.20	53.9	Pass
L10	102.083 - 97.083	Pole	TP24.797x23.772x0.375	10	-10.66	1415.14	63.5	Pass
L11	97.083 - 91.75	Pole	TP25.89x24.797x0.375	11	-10.93	1439.88	66.9	Pass
L12	91.75 - 90.75	Pole	TP25.595x24.724x0.356	12	-11.90	1505.14	73.8	Pass
L13	90.75 - 85.75	Pole	TP26.62x25.595x0.356	13	-12.92	1566.27	80.4	Pass
L14	85.75 - 85.33	Pole	TP26.706x26.62x0.356	14	-13.00	1571.41	80.9	Pass
L15	85.33 - 85.08	Pole	TP26.758x26.706x0.488	15	-13.05	2143.82	60.3	Pass
L16	85.08 - 82.5	Pole	TP27.287x26.758x0.488	16	-13.54	2186.99	62.5	Pass
L17	82.5 - 82.25	Pole	TP27.338x27.287x0.494	17	-13.60	2218.74	61.9	Pass
L18	82.25 - 77.15	Pole	TP28.383x27.337x0.475	18	-14.65	2219.12	68.4	Pass
L19	77.15 - 76.9167	Pole	TP28.431x28.383x0.475	19	-14.71	2222.92	68.6	Pass
L20	76.9167 - 71.9167	Pole	TP29.457x28.431x0.475	20	-15.77	2304.46	72.2	Pass
L21	71.9167 - 66.9167	Pole	TP30.482x29.457x0.463	21	-17.01	2324.19	77.4	Pass
L22	66.9167 - 66.667	Pole	TP30.534x30.482x0.463	22	-17.07	2328.15	77.6	Pass
L23	66.667 - 66.417	Pole	TP30.585x30.534x0.513	23	-17.12	2579.95	70.5	Pass
L24	66.417 - 61.417	Pole	TP31.61x30.585x0.513	24	-18.13	2667.93	73.2	Pass
L25	61.417 - 60	Pole	TP31.901x31.61x0.506	25	-18.42	2660.56	74.8	Pass
L26	60 - 59.75	Pole	TP31.952x31.901x0.513	26	-18.49	2697.27	74.0	Pass
L27	59.75 - 54.75	Pole	TP32.978x31.952x0.513	27	-19.63	2785.25	76.3	Pass
L28	54.75 - 46.5	Pole	TP34.67x32.978x0.506	28	-20.51	2817.00	78.9	Pass
L29	46.5 - 45.5	Pole	TP34.25x33.122x0.55	29	-22.72	3102.70	77.7	Pass
L30	45.5 - 44.25	Pole	TP34.506x34.25x0.55	30	-23.02	3126.31	78.1	Pass
L31	44.25 - 44	Pole	TP34.557x34.506x0.6	31	-23.10	3410.64	72.0	Pass
L32	44 - 39	Pole	TP35.583x34.557x0.6	32	-24.51	3513.63	73.4	Pass
L33	39 - 34	Pole	TP36.608x35.583x0.588	33	-25.97	3542.49	76.2	Pass
L34	34 - 29	Pole	TP37.633x36.608x0.588	34	-27.44	3643.32	77.4	Pass
L35	29 - 27.75	Pole	TP37.89x37.633x0.575	35	-27.81	3591.68	79.2	Pass
L36	27.75 - 27.5	Pole	TP37.941x37.89x0.65	36	-27.91	4057.57	70.6	Pass
L37	27.5 - 24.083	Pole	TP38.642x37.941x0.638	37	-29.01	4055.65	72.5	Pass
L38	24.083 - 23.833	Pole	TP38.693x38.642x0.55	38	-29.10	3511.78	83.6	Pass
L39	23.833 - 18.833	Pole	TP39.718x38.693x0.538	39	-30.66	3525.33	86.5	Pass
L40	18.833 - 18.083	Pole	TP39.872x39.718x0.538	40	-30.90	3539.17	86.6	Pass
L41	18.083 - 17.833	Pole	TP39.923x39.872x0.638	41	-30.99	4192.42	73.6	Pass
L42	17.833 - 12.833	Pole	TP40.948x39.923x0.625	42	-32.56	4218.80	75.8	Pass
L43	12.833 - 7.833	Pole	TP41.974x40.948x0.625	43	-34.17	4326.06	76.6	Pass
L44	7.833 - 2.833	Pole	TP42.999x41.974x0.613	44	-35.80	4345.95	78.7	Pass
L45	2.833 - 0	Pole	TP43.58x42.999x0.613	45	-36.74	4405.51	79.1	Pass
							Summary	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Pole (L40)	86.6	Pass
						RATING =	**86.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(1) 5/16" TO 70 FT LEVEL
(INSTALLED)
(1) 5/16" TO 70 FT LEVEL
(INSTALLED)
(12) 7/8" TO 100 FT LEVEL
(1) 1-5/8" TO 100 FT LEVEL
(INSTALLED)
(1) 5/16" TO UNKNOWN LEVEL
(1) 1/2" TO 49 FT LEVEL
(INSTALLED)
(4) 1-1/4" TO 139 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(2) 3/4" TO 128 FT LEVEL
(INSTALLED)
(1) 3/8" TO 128 FT LEVEL
(9) 7/8" TO 128 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 108 FT LEVEL
(ABANDONED)
(2) 1/2" TO 120 FT LEVEL
(12) 7/8" TO 120 FT LEVEL
(INSTALLED)
(1) 1-5/8" TO 108 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

CCIpole

per TIA-222- F

Site BU: 876335

Work Order: 1092759

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	140	48.25	3.25	12	16	25.89	0.25	1	A607-60
2	95	17.833	0	12	24.72	28.38	0.3125	1.25	A607-65
3	77.167	30.667	4.5	12	28.38	34.67	0.3125	1.25	A607-65
4	51	51	0	12	33.12	43.58	0.375	1.5	A607-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	18.083	channel	MP3-05 (1.1875")	4	3				3			3		3		
2	18.083	24.083	channel	MP3-05 (1.1875")	4	3				3				3		3	
3	24.083	44.25	channel	MP3-05 (1.1875")	3	3				3				3			
4	44.25	66.667	channel	MP3-05 (1.1875")	3		3				3				3		
5	66.667	77.1667	channel	MP3-03 (1.1875")	4		3	3			3				3		
6	77.1667	85.33	channel	MP3-03 (1.1875")	3			3				3				3	
7	94.667	102.333	channel	MP3-03 (1.1875")	3				3				3				3
8	0	27.75	plate	CCI-SFP-065125	1						4						
9	24.083	44.25	plate	CCI-SFP-060100	2			4				4					
10	49	60	plate	CCI-SFP-060100	1				4								
11	66.667	82.5	plate	CCI-SFP-060100	2				4				4				
12	82.5	93	plate	CCI-SFP-060100	2					4				4			
13																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
2	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
3	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
4	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
5	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
6	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
7	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
8	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
9	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
10	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
11	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
12	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	140 - 135	5		12	16.000	17.025	0.25	A607-60	1.000
2	135 - 130	5		12	17.025	18.050	0.25	A607-60	1.000
3	130 - 125	5		12	18.050	19.075	0.25	A607-60	1.000
4	125 - 120	5		12	19.075	20.099	0.25	A607-60	1.000
5	120 - 115	5		12	20.099	21.124	0.25	A607-60	1.000
6	115 - 110	5		12	21.124	22.149	0.25	A607-60	1.000
7	110 - 105	5		12	22.149	23.174	0.25	A607-60	1.000
8	105 - 102.333	2.667		12	23.174	23.721	0.25	A607-60	1.000
9	102.333 - 102.083	0.25		12	23.721	23.772	0.3875	A607-60	0.950
10	102.083 - 97.083	5		12	23.772	24.797	0.375	A607-60	0.968
11	97.083 - 95	5.333	3.25	12	24.797	25.890	0.375	A607-60	0.962
12	95 - 90.75	4.25		12	24.724	25.595	0.35625	A607-65	1.294
13	90.75 - 85.75	5		12	25.595	26.620	0.35625	A607-65	1.278
14	85.75 - 85.33	0.42		12	26.620	26.706	0.35625	A607-65	1.276
15	85.33 - 85.08	0.25		12	26.706	26.758	0.4875	A607-65	1.149
16	85.08 - 82.5	2.58		12	26.758	27.287	0.4875	A607-65	1.139
17	82.5 - 82.25	0.25	0	12	27.287	27.338	0.49375	A607-65	1.124
18	82.25 - 77.15	5.1		12	27.337	28.383	0.475	A607-65	1.217
19	77.15 - 76.9167	0.2333		12	28.383	28.431	0.475	A607-65	1.216
20	76.9167 - 71.9167	5		12	28.431	29.457	0.475	A607-65	1.197
21	71.9167 - 66.9167	5		12	29.457	30.482	0.4625	A607-65	1.209
22	66.9167 - 66.667	0.2497		12	30.482	30.534	0.4625	A607-65	1.209
23	66.667 - 66.417	0.25		12	30.534	30.585	0.5125	A607-65	0.956
24	66.417 - 61.417	5		12	30.585	31.610	0.5125	A607-65	0.944
25	61.417 - 60	1.417		12	31.610	31.901	0.50625	A607-65	0.953
26	60 - 59.75	0.25		12	31.901	31.952	0.5125	A607-65	1.057
27	59.75 - 54.75	5		12	31.952	32.978	0.5125	A607-65	1.042
28	54.75 - 51	8.25	4.5	12	32.978	34.670	0.50625	A607-65	1.045
29	51 - 45.5	5.5		12	33.122	34.250	0.55	A607-65	0.970
30	45.5 - 44.25	1.25		12	34.250	34.506	0.55	A607-65	0.968
31	44.25 - 44	0.25		12	34.506	34.557	0.6	A607-65	1.071
32	44 - 39	5		12	34.557	35.583	0.6	A607-65	1.058
33	39 - 34	5		12	35.583	36.608	0.5875	A607-65	1.068
34	34 - 29	5		12	36.608	37.633	0.5875	A607-65	1.056
35	29 - 27.75	1.25		12	37.633	37.890	0.575	A607-65	1.075
36	27.75 - 27.5	0.25		12	37.890	37.941	0.65	A607-65	1.057
37	27.5 - 24.083	3.417		12	37.941	38.642	0.6375	A607-65	1.068
38	24.083 - 23.833	0.25		12	38.642	38.693	0.55	A607-65	1.140
39	23.833 - 18.833	5		12	38.693	39.718	0.5375	A607-65	1.154
40	18.833 - 18.083	0.75		12	39.718	39.872	0.5375	A607-65	1.153
41	18.083 - 17.833	0.25		12	39.872	39.923	0.6375	A607-65	0.974
42	17.833 - 12.833	5		12	39.923	40.948	0.625	A607-65	0.983
43	12.833 - 7.833	5		12	40.948	41.974	0.625	A607-65	0.973
44	7.833 - 2.833	5		12	41.974	42.999	0.6125	A607-65	0.984
45	2.833 - 0	2.833		12	42.999	43.580	0.6125	A607-65	0.979

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	140 - 135	3.3139	21.251	5.2175
2	135 - 130	3.5416	48.182	5.5597
3	130 - 125	5.231	92.369	9.4123
4	125 - 120	5.5366	140.36	9.7895
5	120 - 115	5.8658	190.2	10.155
6	115 - 110	6.2179	241.89	10.528
7	110 - 105	8.2338	309.43	14.459
8	105 - 102.333	8.4772	348.32	14.717
9	102.333 - 102.083	8.5173	352	14.741
10	102.083 - 97.083	10.659	438.09	19.015
11	97.083 - 95	10.929	477.96	19.288
12	95 - 90.75	11.898	561.23	19.889
13	90.75 - 85.75	12.919	662.89	20.671
14	85.75 - 85.33	12.998	671.58	20.731
15	85.33 - 85.08	13.05	676.77	20.781
16	85.08 - 82.5	13.54	730.86	21.186
17	82.5 - 82.25	13.599	736.16	21.239
18	82.25 - 77.15	14.649	846.62	22.09
19	77.15 - 76.9167	14.707	851.78	22.141
20	76.9167 - 71.9167	15.769	964.36	22.92
21	71.9167 - 66.9167	17.007	1081.4	23.825
22	66.9167 - 66.667	17.073	1087.4	23.87
23	66.667 - 66.417	17.123	1093.4	23.911
24	66.417 - 61.417	18.13	1214.7	24.647
25	61.417 - 60	18.418	1249.8	24.856
26	60 - 59.75	18.489	1256	24.891
27	59.75 - 54.75	19.631	1382.2	25.606
28	54.75 - 51	20.509	1479.1	26.125
29	51 - 45.5	22.718	1625.1	27.003
30	45.5 - 44.25	23.018	1658.9	27.186
31	44.25 - 44	23.101	1665.7	27.216
32	44 - 39	24.514	1803.5	27.918
33	39 - 34	25.965	1944.8	28.592
34	34 - 29	27.442	2089.3	29.255
35	29 - 27.75	27.814	2126	29.429
36	27.75 - 27.5	27.908	2133.3	29.453
37	27.5 - 24.083	29.015	2234.8	29.961
38	24.083 - 23.833	29.103	2242.3	29.989
39	23.833 - 18.833	30.7	2394.1	30.7
40	18.833 - 18.083	30.9	2417.1	30.8
41	18.083 - 17.833	31.0	2424.9	30.9
42	17.833 - 12.833	32.6	2581.1	31.6
43	12.833 - 7.833	34.2	2740.9	32.3
44	7.833 - 2.833	35.8	2904.2	33.0
45	2.833 - 0	36.7	2998.2	33.4

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP17.025x16x0.25	Pole	10.1%	Pass
135 - 130	Pole	TP18.05x17.025x0.25	Pole	19.9%	Pass
130 - 125	Pole	TP19.075x18.05x0.25	Pole	33.9%	Pass
125 - 120	Pole	TP20.099x19.075x0.25	Pole	46.1%	Pass
120 - 115	Pole	TP21.124x20.099x0.25	Pole	56.2%	Pass
115 - 110	Pole	TP22.149x21.124x0.25	Pole	64.9%	Pass
110 - 105	Pole	TP23.174x22.149x0.25	Pole	75.7%	Pass
105 - 102.33	Pole	TP23.721x23.174x0.25	Pole	81.3%	Pass
102.33 - 102.08	Pole + Reinf.	TP23.772x23.721x0.3875	Reinf. 7 Tension Rupture	59.6%	Pass
102.08 - 97.08	Pole + Reinf.	TP24.797x23.772x0.375	Reinf. 7 Tension Rupture	69.0%	Pass
97.08 - 95	Pole + Reinf.	TP25.89x24.797x0.375	Reinf. 7 Tension Rupture	73.1%	Pass
95 - 90.75	Pole + Reinf.	TP25.595x24.724x0.3563	Pole	80.0%	Pass
90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.3563	Pole	87.4%	Pass
85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.3563	Pole	88.0%	Pass
85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.4875	Pole	65.5%	Pass
85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.4875	Pole	68.4%	Pass
82.5 - 82.25	Pole + Reinf.	TP27.338x27.287x0.4938	Reinf. 6 Tension Rupture	78.0%	Pass
82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.475	Pole	74.2%	Pass
77.15 - 76.92	Pole + Reinf.	TP28.431x28.383x0.475	Pole	74.4%	Pass
76.92 - 71.92	Pole + Reinf.	TP29.457x28.431x0.475	Pole	79.2%	Pass
71.92 - 66.92	Pole + Reinf.	TP30.482x29.457x0.4625	Pole	83.7%	Pass
66.92 - 66.67	Pole + Reinf.	TP30.534x30.482x0.4625	Pole	83.9%	Pass
66.67 - 66.42	Pole + Reinf.	TP30.585x30.534x0.5125	Reinf. 4 Tension Rupture	80.1%	Pass
66.42 - 61.42	Pole + Reinf.	TP31.61x30.585x0.5125	Reinf. 4 Tension Rupture	84.3%	Pass
61.42 - 60	Pole + Reinf.	TP31.901x31.61x0.5063	Reinf. 4 Tension Rupture	85.4%	Pass
60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.5125	Reinf. 4 Tension Rupture	78.9%	Pass
59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.5125	Reinf. 4 Tension Rupture	82.5%	Pass
54.75 - 51	Pole + Reinf.	TP34.67x32.978x0.5063	Reinf. 4 Tension Rupture	85.0%	Pass
51 - 45.5	Pole + Reinf.	TP34.25x33.122x0.55	Reinf. 4 Tension Rupture	87.7%	Pass
45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.55	Reinf. 4 Tension Rupture	88.4%	Pass
44.25 - 44	Pole + Reinf.	TP34.557x34.506x0.6	Pole	76.3%	Pass
44 - 39	Pole + Reinf.	TP35.583x34.557x0.6	Pole	78.7%	Pass
39 - 34	Pole + Reinf.	TP36.608x35.583x0.5875	Pole	80.9%	Pass
34 - 29	Pole + Reinf.	TP37.633x36.608x0.5875	Pole	82.9%	Pass
29 - 27.75	Pole + Reinf.	TP37.89x37.633x0.575	Pole	83.4%	Pass
27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x0.65	Reinf. 3 Tension Rupture	83.4%	Pass
27.5 - 24.08	Pole + Reinf.	TP38.642x37.941x0.6375	Reinf. 3 Tension Rupture	84.7%	Pass
24.08 - 23.83	Pole + Reinf.	TP38.693x38.642x0.55	Reinf. 2 Tension Rupture	90.4%	Pass
23.83 - 18.83	Pole + Reinf.	TP39.718x38.693x0.5375	Reinf. 2 Tension Rupture	92.4%	Pass
18.83 - 18.08	Pole + Reinf.	TP39.872x39.718x0.5375	Reinf. 2 Tension Rupture	92.6%	Pass
18.08 - 17.83	Pole + Reinf.	TP39.923x39.872x0.6375	Reinf. 1 Tension Rupture	90.6%	Pass
17.83 - 12.83	Pole + Reinf.	TP40.948x39.923x0.625	Reinf. 1 Tension Rupture	92.3%	Pass
12.83 - 7.83	Pole + Reinf.	TP41.974x40.948x0.625	Reinf. 1 Tension Rupture	94.0%	Pass
7.83 - 2.83	Pole + Reinf.	TP42.999x41.974x0.6125	Reinf. 1 Tension Rupture	95.6%	Pass
2.83 - 0	Pole + Reinf.	TP43.58x42.999x0.6125	Reinf. 1 Tension Rupture	96.5%	Pass
				Summary	
			Pole	88.0%	Pass
			Reinforcement	96.5%	Pass
			Overall	96.5%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity												
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
140 - 135	486	n/a	486	13.48	n/a	13.48	10.1%												
135 - 130	580	n/a	580	14.31	n/a	14.31	19.9%												
130 - 125	686	n/a	686	15.13	n/a	15.13	33.9%												
125 - 120	805	n/a	805	15.96	n/a	15.96	46.1%												
120 - 115	936	n/a	936	16.78	n/a	16.78	56.2%												
115 - 110	1081	n/a	1081	17.60	n/a	17.60	64.9%												
110 - 105	1240	n/a	1240	18.43	n/a	18.43	75.7%												
105 - 102.33	1330	n/a	1330	18.87	n/a	18.87	81.3%												
102.33 - 102.08	1339	684	2024	18.91	8.76	27.67	52.3%							59.6%					
102.08 - 97.08	1522	742	2263	19.73	8.76	28.49	60.8%							69.0%					
97.08 - 95	1603	766	2369	20.08	8.76	28.84	64.4%							73.1%					
95 - 90.75	2193	282	2475	25.40	12.00	37.40	80.0%												60.7%
90.75 - 85.75	2464	309	2772	26.43	12.00	38.43	87.4%												66.2%
85.75 - 85.33	2487	311	2798	26.52	12.00	38.52	88.0%												66.7%
85.33 - 85.08	2458	1275	3733	26.57	20.76	47.33	65.5%						63.5%						55.0%
85.08 - 82.5	2607	1325	3931	27.10	20.76	47.86	68.4%						66.4%						58.6%
82.5 - 82.25	2618	1382	4000	27.16	20.76	47.92	67.9%						78.0%					58.8%	
82.25 - 77.15	2938	1429	4367	28.21	23.68	51.89	74.2%					71.8%						61.1%	
77.15 - 76.92	2953	1434	4387	28.25	23.68	51.93	74.4%					72.0%						61.3%	
76.92 - 71.92	3284	1537	4820	29.28	23.68	52.96	79.2%					76.8%						65.8%	
71.92 - 66.92	3638	1644	5282	30.32	23.68	54.00	83.7%					81.2%						70.1%	
66.92 - 66.67	3656	1649	5305	30.37	23.68	54.05	83.9%					81.5%						71.4%	
66.67 - 66.42	3568	2203	5771	30.42	16.95	47.37	67.6%				80.1%								
66.42 - 61.42	3943	2345	6288	31.45	16.95	48.40	71.2%				84.3%								
61.42 - 60	4054	2386	6440	31.74	16.95	48.69	72.2%				85.4%								
60 - 59.75	4081	2500	6581	31.79	22.95	54.74	75.5%				78.9%						68.1%		
59.75 - 54.75	4496	2725	7221	32.82	22.95	55.77	78.6%				82.5%						70.5%		
54.75 - 51	4820	2847	7667	33.60	22.95	56.55	81.0%				85.0%						74.1%		
51 - 45.5	5999	2731	8730	40.85	16.95	57.80	74.3%				87.7%								
45.5 - 44.25	6136	2770	8906	41.15	16.95	58.10	74.9%				88.4%								
44.25 - 44	6257	3560	9817	41.22	28.95	70.17	76.3%			75.3%						73.8%			
44 - 39	6833	3767	10600	42.45	28.95	71.40	78.7%			77.7%						75.2%			
39 - 34	7444	3980	11423	43.69	28.95	72.64	80.9%			80.0%						77.6%			
34 - 29	8090	4199	12288	44.92	28.95	73.87	82.9%			82.1%						79.8%			
29 - 27.75	8257	4254	12511	45.23	28.95	74.18	83.4%			82.6%						80.4%			
27.75 - 27.5	8284	5560	13844	45.30	37.08	82.37	75.8%			83.4%					65.5%	80.3%			
27.5 - 24.08	8754	5761	14515	46.14	37.08	83.22	77.1%			84.7%					65.8%	83.0%			
24.08 - 23.83	8713	3834	12547	46.20	30.73	76.93	85.4%		90.4%						72.0%				
23.83 - 18.83	9430	4030	13461	47.44	30.73	78.16	87.2%		92.3%						73.9%				
18.83 - 18.08	9541	4060	13601	47.62	30.73	78.35	87.5%		92.6%						74.2%				
18.08 - 17.83	9807	6225	16031	47.69	30.73	78.41	80.8%	90.6%							72.6%				
17.83 - 12.83	10580	6544	17124	48.92	30.73	79.65	82.4%	92.3%							74.4%				
12.83 - 7.83	11393	6871	18265	50.16	30.73	80.88	84.0%	94.0%							76.1%				
7.83 - 2.83	12247	7207	19454	51.39	30.73	82.12	85.5%	95.6%							77.7%				
2.83 - 0	12749	7401	20150	52.10	30.73	82.82	86.3%	96.5%							79.9%				

Note: Section capacity checked in 5 degree increments.

FDH ENGINEERING INNOVATION
FDH Engineering, Inc., 6521 Meridien Dr. Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

Anchor Rod Design

Site Name:	
Job No. :	
Elevation:	
	Input Cells in Yellow

*Note: Use Anchor Rod Transfer Plate Design Tab in Conjunction

Legend
Input
Output/ Notes

Code (F or G):	F	Pull Down
Anchor Bolts (Yes or No)	Yes	Pull Down
P (from RISA)	37	kips
V (from RISA)	33	kips
M (from RISA)	2998	ft-kips

Existing Rods		
y	25.5	in
No. Bolts	12	
BC	51	in
I	15527.97	in^4
Bolt Grade	A615-75	Pull Down
Thread Form	Non-Upset	-
d (in)	2.25	Pull Down
Ag	3.98	in^2
Ae	3.25	in^2
Fy	75	ksi
Fu	100	ksi

Itot	20206.6	in^4

T	178.327	kips
V	2.111	kips

New Rods		
y new	27	in
No. Bolts new	6	
BC new	54	in
Inew from CAD	4,679	in^4
Bolt Grade	A193 B7	Pull Down
Thread Form	Non-Upset	Pull Down
d new (in)	1.75	Pull Down
Ag new	2.41	in^2
Ae new	1.90	in^2
Fy new	105	ksi
Fu new	125	ksi

Tnew	114.418	kips
Vnew	1.278	kips

Req'd Embedment Length for New Rods		
f'c, caisson's concrete strength	3000	psi
fy, rebar yield strength	60000	psi
d_b, diameter of vertical rebar	1	in
vertical rebar cage BC ø	24	in
vertical rebar top cover distance	3	in
τ, Ultimate Hilti Bond Resistance	1.8	ksi

Note For New Anchor Rods:
Williams Bars (Upset)
A722 (Fy=127.7 ksi, Fu=150 ksi)
A615-75 (Fy=75 ksi, Fu=100 ksi)

l_d (vertical rebar dev. Length)	32.863	in
l_{dH} (Hilti dev. length)	57.599	in
G/1.5	-10.000	in

Capacity (%)					Pullout Test Value
Tn/Ω	194.5	kips	OK	**91.68**	**111 kips**
Tn/Ω, new	132.55	kips	OK	**86.32**	
øTn	260	kips			
øTn, new	190	kips			

Total Embed. Length of New Bolts	**57.60**	in
	4.80	ft
Less than 7' design embedment	OK	

Equations:

f = (M*y*Ag)/Itot-P*(Ag/Atotal)

Tn/Ω = 0.33*Fu*Ag*(4/3)

= 0.8*Fu*Ae (anchor bolts only) **øTn = 0.75*Fu*Ae (non anchor bolts)**

I = (No. Bolts/8)*BC^2*Ag

Notes:

***Ag and Ae are taken from AISC 13th Ed. Manual (pg. 7-83)**

***I calc. will only work for symmetric bolt group, otherwise use CAD**

Bearing Strength Check of Anchor Rod Pipe Sleeve		
New Anchor Rod Diameter	1.75	in
Selected Pipe Sleeve Area	6.72	in^2
Selected Pipe Sleeve Fy	42	ksi
Rn/Ω (Rev F) or øRn (Rev G)	338.69	k
% Capacity (Analysis)	**33.78%**	OK
% Capacity (Design)	**39.14%**	OK

Interaction Equation Checks (Rev. G: Section 4.9.9)		
Detail Type (hover for detail)	d	Pull Down
η	0.5	
l_{ar}, for Detail Type d only	0	in
øRnt	194.5	kips
øRnv	119.4	kips
øRnm	94.922	kip-in
Mu	0	kip-in
(Pu+Vu/η)/øRnt < 1?	**0.939**	OK
$(Vu/øRnv)^2$ + $((Pu/øRnt)+(Mu/øRnm))^2$	**0.841**	OK

(works for Rev F also)

(top of concrete to bottom of leveling nut)

(only applicable for Detail Type d)

Equivalent BC		
No. Existing Rebar		
Existing Rebar BC		in
Area rebar		in^2
Irebar	0	in^4
Itot	4,679	in^4
Equivalent Area	2.410	in^2
Equivalent BC	**50.877**	in
Total Area	**14.46**	in^2

(assuming new bolts are reinforcement)

$l_d = [(fy*ψ_t ψ_e λ)/(20*\sqrt{f'c})]*d_b$ **PER ACI 12.2.2**

$l_{dH} = (øTn*FS)/(τ*pi*d_{new})$

See Worksheet "New (Design Procedure)"

FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

Anchor Rod Transfer Stiffeners

Site Name:	
Job No. :	
Elevation:	

Code	F	F or G

Reactions:		
Moment	1956.0587	k-ft
Axial	37	k
Shear	33	k

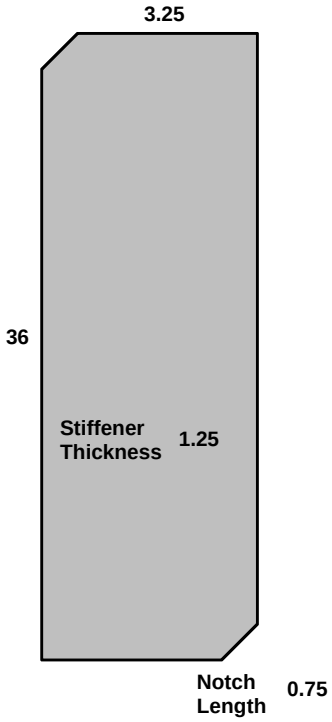
***Moment adjusted to match tension in A.R.**

Monopole and Flat Plate Properties		
Monopole Ø	43.58	in
Monopole Thickness	0.375	in
No. of Sides	12	
No. of Flat Plates	3	
No. of Term Bolts at Btm	9	

Eccentric Weld Properties		
Weld Thk	6	No. of 1/16ths (whole number)
L_{weld}	35.25	in
e_x	1.625	in
a	0.0460993	use in Table 8-4, pg 8-66 AISC
C	3.7146099	From Table 8-4, pg. 8-66 AISC
C1	1.03	70 ksi weld = 1, 80 ksi = 1.03

Transfer Stiffener Input		
Gap Between BP and Bottom of FP	6	in
Width of Transfer Stiffener	3.25	in
Stiffener Thickness	1.25	in
No. of Transfer Sitffeners	6	
Notch Length	0.75	in
Height of Stiffener	36	in
Transfer Stiffener Plate Fy	65	ksi
Transfer Stiffener Plate Fu	80	ksi

Legend
Input
Output
Notes



Transfer Stiffener Section Properties		
Gross Cross Sectional Area (Ag)	4.0625	in^2
Ø of Stiffeners	46.83	in
Outermost Fiber (y)	25.04	in
$I_{stiffeners\ from\ CAD}$	6086.372	in^4

Check Tension		
Tu	114.42	k
Tn/Ω	162.46	k
%Capacity	70.43%	Pass

Check Compression		
Pu	126.75	k
b/a	0.090278	
z	1.201556	
Pn/Ω	253.77	k
%Capacity	49.95%	Pass

Check Stress		
σu	33.26028	ksi
σn/Ω	51.99	ksi
%Capacity	63.98%	Pass

Check Eccentric Weld		
Tu	114.42	k
Rn/Ω	539.34	k
%Capacity	21.21%	Pass

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Base Transfer Stiffeners for Flat Plate Reinforcement Termination

Site Name:	
Job No. :	
Elevation:	

Code	F	F or G

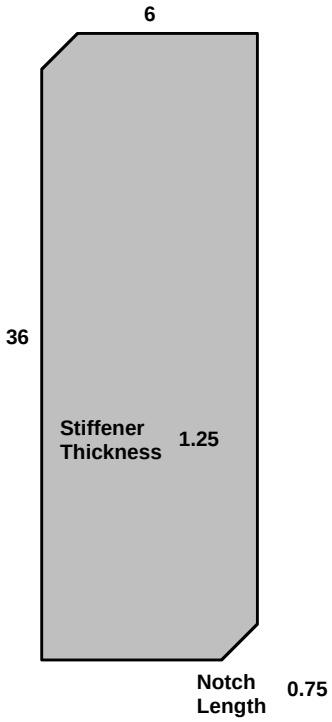
Reactions:		
Moment	2998	k-ft
Axial	37	k
Shear	33	k

Monopole and Flat Plate Properties		
Monopole Ø	43.58	in
Monopole Thickness	0.375	in
No. of Sides	12	
No. of Flat Plates	3	
No. of Term Bolts at Btm	9	

Eccentric Weld Properties		
Weld Thk	6	No. of 1/16ths (whole number)
L_{weld}	35.25	in
e_x	3	in
a	0.0851064	use in Table 8-4, pg 8-66 AISC
C	3.7185106	From Table 8-4, pg. 8-66 AISC
C1	1.03	70 ksi weld = 1, 80 ksi = 1.03

Transfer Stiffener Input		
Gap Between BP and Bottom of FP	6	in
Width of Transfer Stiffener	6	in
Stiffener Thickness	1.25	in
No. of Transfer Sitffeners	7	
Notch Length	0.75	in
Height of Stiffener	36	in
Transfer Stiffener Plate Fy	65	ksi
Transfer Stiffener Plate Fu	80	ksi

Legend
Input
Output
Notes



Transfer Stiffener Section Properties		
Gross Cross Sectional Area (Ag)	7.5	in^2
Ø of Stiffeners	49.58	in
Outermost Fiber (y)	27.79	in
$I_{stiffeners\ from\ CAD}$	13788.74	in^4

Check Tension		
Tu	249.83	k
Tn/Ω	341.16	k
%Capacity	73.23%	Pass

Check Compression		
Pu	260.40	k
b/a	0.166667	
z	1.057454	
Pn/Ω	412.30	k
%Capacity	63.16%	Pass

Check Stress		
σu	38.8366	ksi
σn/Ω	51.99	ksi
%Capacity	74.70%	Pass

Check Eccentric Weld		
Tu	249.83	k
Rn/Ω	539.90	k
%Capacity	46.27%	Pass

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

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

Site Data

Site ID:	
Site Name:	
Job No.	

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

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

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

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

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2312.9839	ft-kips
Unfactored Axial, P:	37	kips
Unfactored Shear, V:	33	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	178.3 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	91.5% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	44.5 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	89.0% **Pass**

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

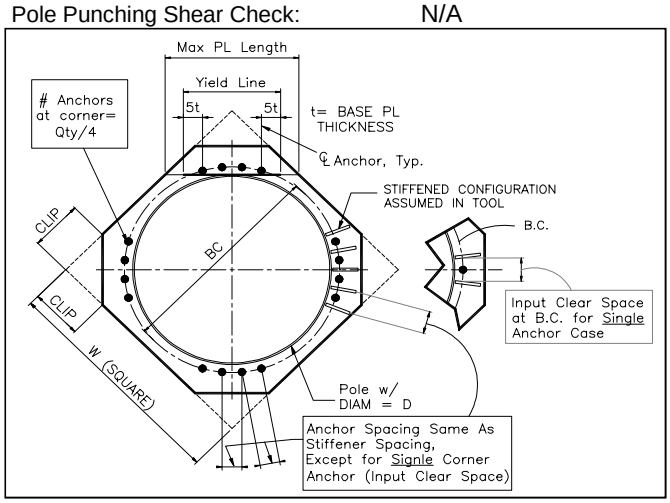
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

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

Site Data

Site ID:
Site Name:
Job No.:

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	37	kips
Unfactored WL Axial, PW:		kips
Unfactored WL Shear, V:	33	kips
Unfactored WL Moment, M:	2998	ft-kips

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	44.4	kips
0.90	0.9D+1.6W, Pu:	33.3	kips
1.35	Vu:	44.55	kips
	Mu:	4047.3	ft-kips

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

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	530.83	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	4401.05	ft-kips

Soil Parameters		
Unit Weight, γ:	67.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	3.00	

Orthogonal Direction:

ecc1 = M1/P1 =	8.29	ft
Orthogonal qu=	7.76	ksf
qu/ϕ*qn Ratio=	**34.51%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.86	ft
Diagonal qu=	7.75	ksf
qu/ϕ*qn Ratio=	**34.44%**	**Pass**

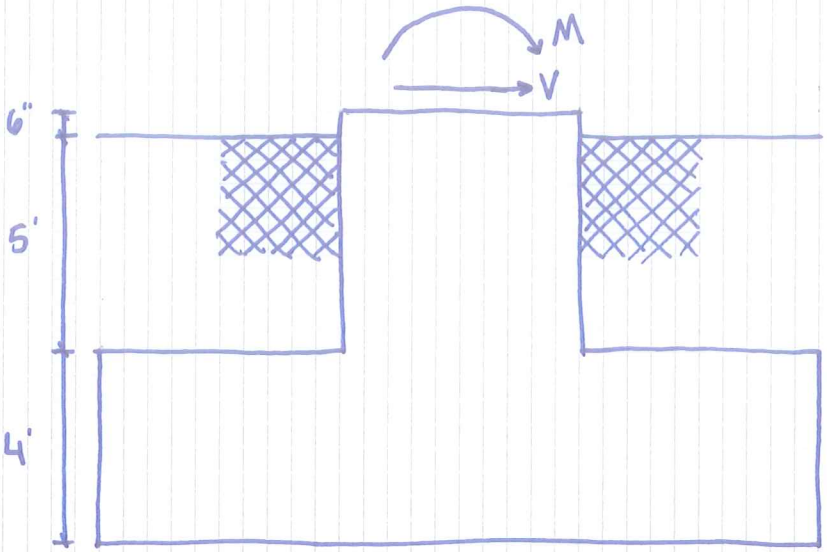
Run <-- Press Upon Completing All Input

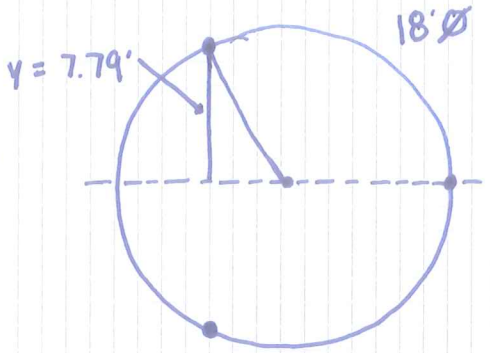
Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	44.6	kips
Pad Force Location Above D:	1.81	ft
ϕ(Passive Pressure Moment):	80.61	ft-kips
Factored O.T. M(WL), "1.6W":	4481.7	ft-kips
Factored OT (MW-Msoil), M1	4401.05	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.89	ft
Sum of Soil Wedges Wt:	31.00	kips
Soil Wedges ecc, K1:	4.04	ft
Ftg+Soil above Pad wt:	405.4	kips
Unfactored (Total ftg-soil Wt):	436.36	kips
1.2D. **No Soil Wedges**.	530.83	kips
0.9D. **With Soil Wedges**	426.02	kips

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

Overturn Check





Allowable Uplift = 262 kips

TNX Reactions: M = 2998 k-ft
V = 33k

$M_T = M + 9.5V$
$= 3312 k\text{-}ft$

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

$T_u = \frac{M_T y}{I}$
$= 212.4 k$

$\frac{T_u}{\phi T_n} = \frac{}{262} = 81.1\%$ PASS

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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTHA233B

CT233/ Global Signal
3 A Birdseye Road
Farmington, CT 06032

August 24, 2015

EBI Project Number: 6215004428

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	57.84 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

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August 24, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CTHA233B – CT233/ Global Signal**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **3 A Birdseye Road, Farmington, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **3 A Birdseye Road, Farmington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** & **B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** & **B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **100 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	100	Height (AGL):	100	Height (AGL):	100
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.90	Antenna B1 MPE%	1.90	Antenna C1 MPE%	1.90
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	100	Height (AGL):	100	Height (AGL):	100
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.90	Antenna B2 MPE%	1.90	Antenna C2 MPE%	1.90
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	100	Height (AGL):	100	Height (AGL):	100
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.75	Antenna B3 MPE%	0.75	Antenna C3 MPE%	0.75

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**4.55 %**
Nextel	3.96 %
Sprint	6.56 %
MetroPCS	15.01 %
Verizon Wireless	8.47 %
AT&T	19.29 %
Site Total MPE %:	**57.84 %**

T-Mobile Sector 1 Total:	4.55 %
T-Mobile Sector 2 Total:	4.55 %
T-Mobile Sector 3 Total:	4.55 %
Site Total:	57.84 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**100**	**18.99**	**2100**	**1000**	**1.90 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**100**	**3.52**	**700**	**467**	**0.75 %**
T-Mobile 1900 MHz (PCS) GSM / UMTS	**2**	**1167.14**	**100**	**9.50**	**1900**	**1000**	**0.95 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**100**	**9.50**	**2100**	**1000**	**0.95 %**
						Total:	**4.55%**

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Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	4.55 %
Sector 2:	4.55 %
Sector 3 :	4.55 %
T-Mobile Total:	4.55 %
Site Total:	57.84 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **57.84%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

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