Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

April 28, 2015

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 829046**
T-Mobile Site ID: CT11118C
Located at: 56 Norfield Road (Town Hall), Weston, CT 06883

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. Gayle Weinstein, First Selectman for the Town of Weston. The Town of Weston is also the Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **56 Norfield Road (Town Hall), Weston, CT 06883**. 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 replacement 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. The operation of the replacement 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.

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

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).

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

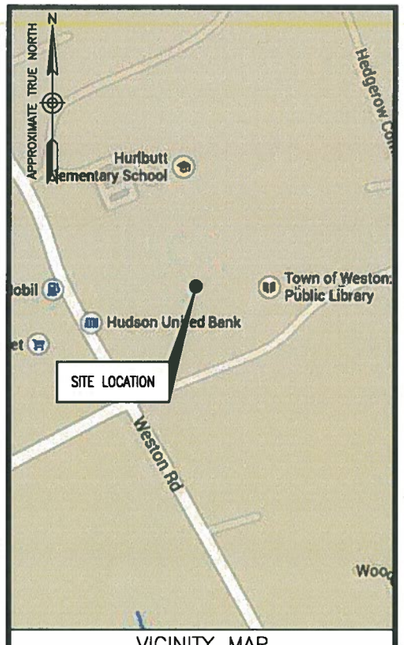
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mrs. Gayle Weinstein, First Selectman
56 Norfield Rd
Weston, CT 06883

cc: Town of Weston
ATTN: Tom Landry
56 Norfield Rd
Weston, CT 06883

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11118C
CROWN CASTLE BU #: 829046
SITE NAME: WESTON / RT-57 / NORFIELD RD
56 NORFIELD ROAD (TOWN HALL)
WESTON, CT 06883
FAIRFIELD COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY TOWARD CENTURY DR. TURN RIGHT ONTO US-202/LITTLETON RD. TAKE I-80 E AND CONTINUE ONTO I-95 N. TAKE EXIT 1C-D FOR ALBANY AND MERGE ONTO I-87 N. TAKE 4 TOWARD CROSS COUNTY PKWY E AND FOLLOW SIGNS AND MERGE ONTO HUTCHINSON RIVER PKWY N. CONTINUE ONTO CT-15 N. TAKE EXIT 42 FOR CT-57/WESTON TOWARD WESTPORT. TURN RIGHT ONTO WESTON RD. TURN RIGHT ONTO NORFIELD RD. SITE WILL BE ON THE LEFT.

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

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

CONSTRUCTION
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CONTACT: WARREN KELLEHER
PHONE #: (781) 970-0055

CONSULTANT TEAM

SITE NAME:
WESTON / RT-57 / NORFIELD RD

SITE NUMBER:
CT11118C

TOWER OWNER:
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

COORDINATES:
LATITUDE: 41°-12'-08.4" N (NAD83)
LONGITUDE: 73°-22'-46.6" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cc

PROJECT SUMMARY

SITE ADDRESS:
56 NORFIELD RD.
WESTON, CT 06883
FAIRFIELD COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- REMOVE (6) LINES OF COAX.

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
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
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CT11118C
WESTON/ RT-57/
NORFIELD RD

CONSTRUCTION DRAWINGS		
0	04/24/15	ISSUED AS FINAL

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

STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER
NO. 0023222
JIANG YU
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50072426
SITE ADDRESS:	

56 NORFIELD ROAD
WESTON, CT 06883
FAIRFIELD 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.

T·Mobile

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

CROWN CASTLE

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CT11118C
WESTON/ RT-57/
NORFIELD RD

CONSTRUCTION DRAWINGS		
0	04/24/15	ISSUED AS FINAL

Dewberry

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

STATE OF CONNECTICUT
JIANG YU
No. 30122
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50072426
SITE ADDRESS:	

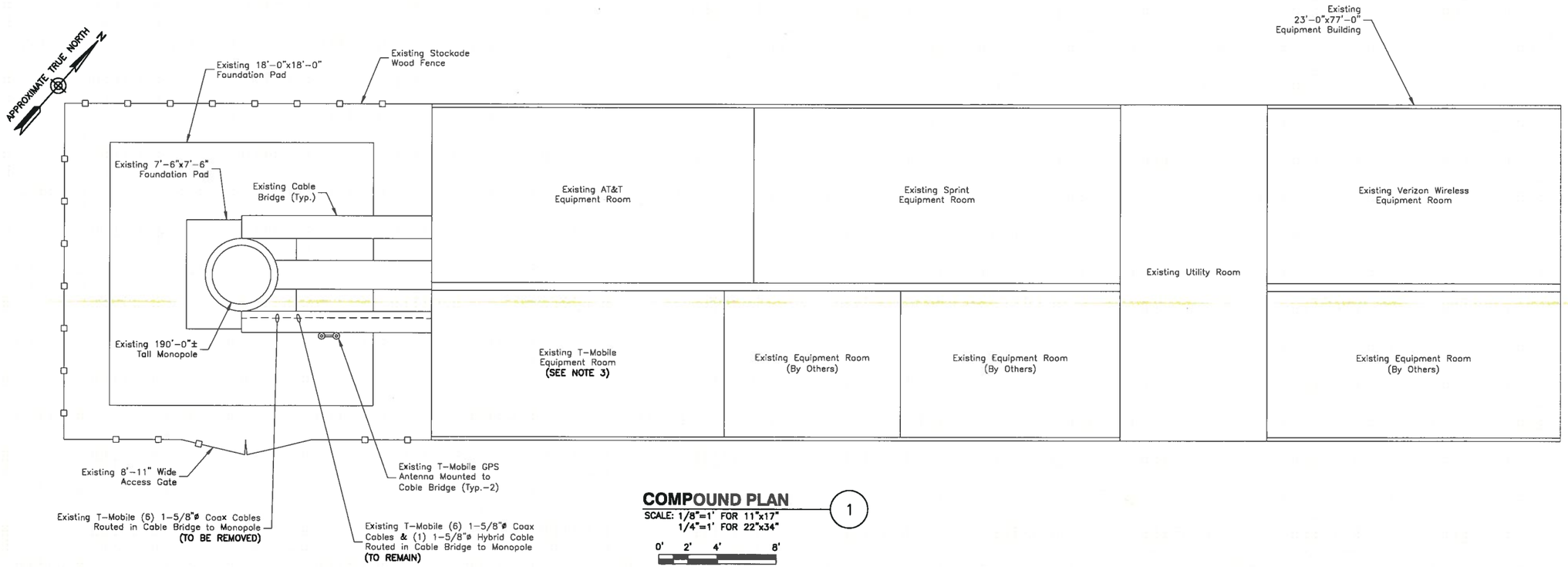
56 NORFIELD ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1



COMPOUND PLAN 1

SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"

0' 2' 4' 8'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. NO PROPOSED EQUIPMENT IS TO BE INSTALLED WITHIN T-MOBILE EQUIPMENT ROOM AT GRADE.
4. PLANS BASED ON DRAWINGS PROVIDED TO DEWBERRY ENGINEERS INC. BY CROWN CASTLE. NO SITE VISIT WAS CONDUCTED BY DEWBERRY ENGINEERS INC.
5. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY PAUL J FORD AND COMPANY DATED MARCH 31, 2015.

T-Mobile

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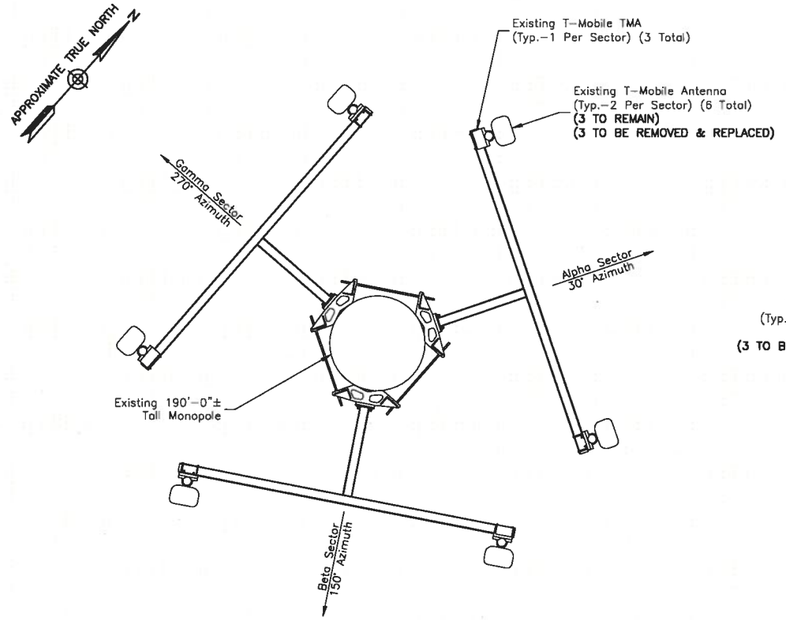
SHEET TITLE

COMPOUND PLAN

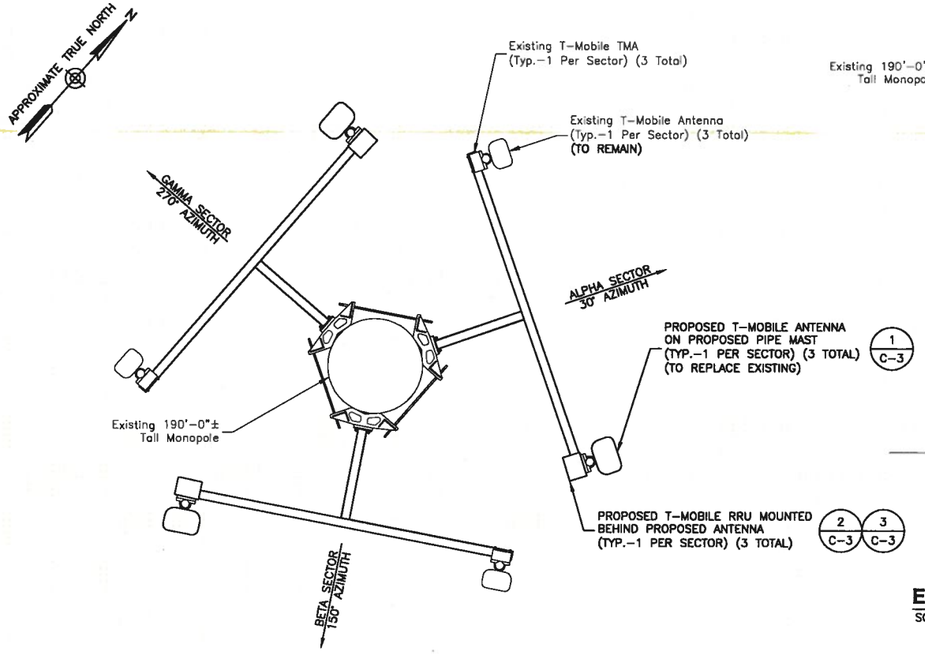
SHEET NUMBER

C-1



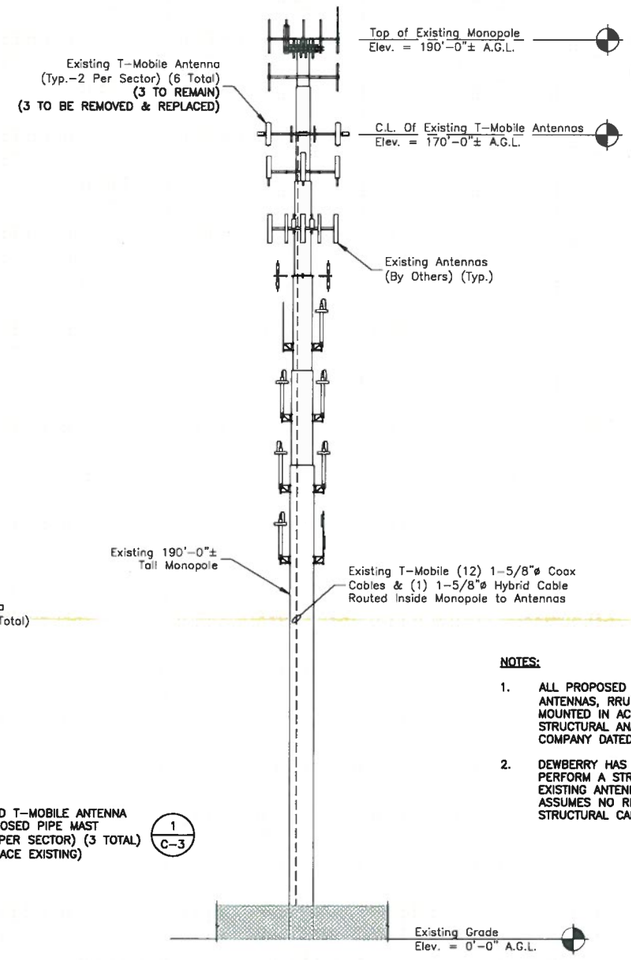
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.



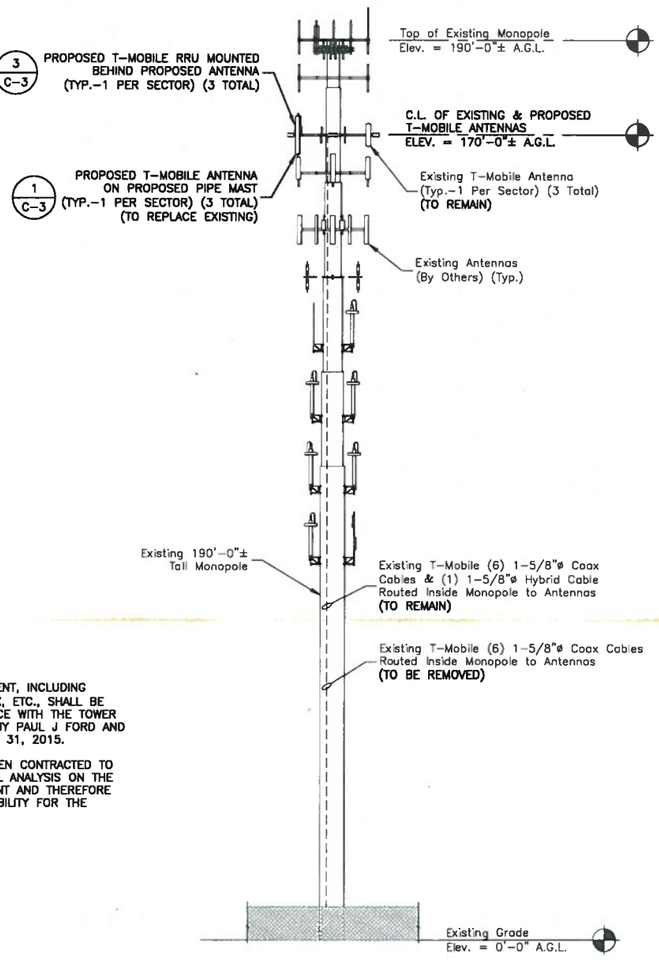
EXISTING ELEVATION (3)

SCALE: 1/32=1' FOR 11"x17"
1/16"=1' FOR 22"x34"

0' 8' 16' 32'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY PAUL J FORD AND COMPANY DATED MARCH 31, 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.



PROPOSED ELEVATION (4)

SCALE: 1/32=1' FOR 11"x17"
1/16"=1' FOR 22"x34"

0' 8' 16' 32'

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STATE OF CONNECTICUT
JIANG
No. 23222
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PROJECT NUMBER:	50066258
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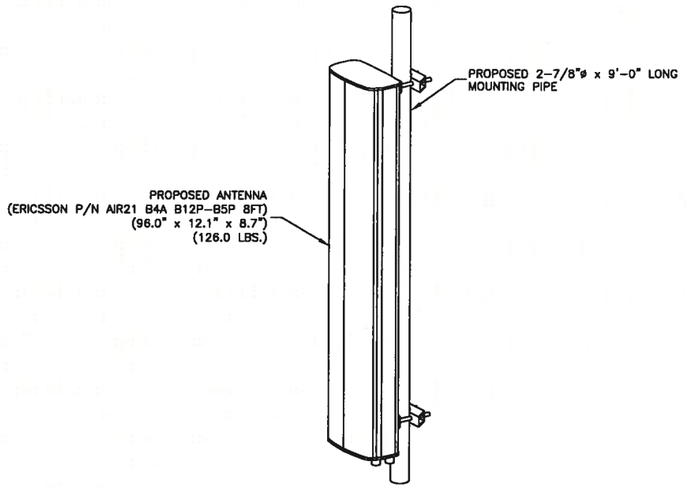
56 NORFIELD ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

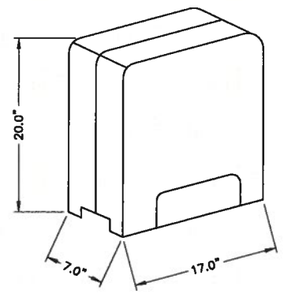
C-2



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.



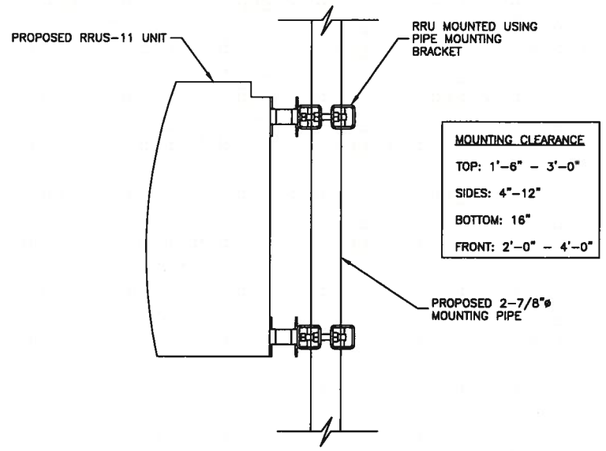
SPECIFICATIONS:	
HEIGHT:	20.0"
WIDTH:	17.0"
DEPTH:	7.0"
WEIGHT:	50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

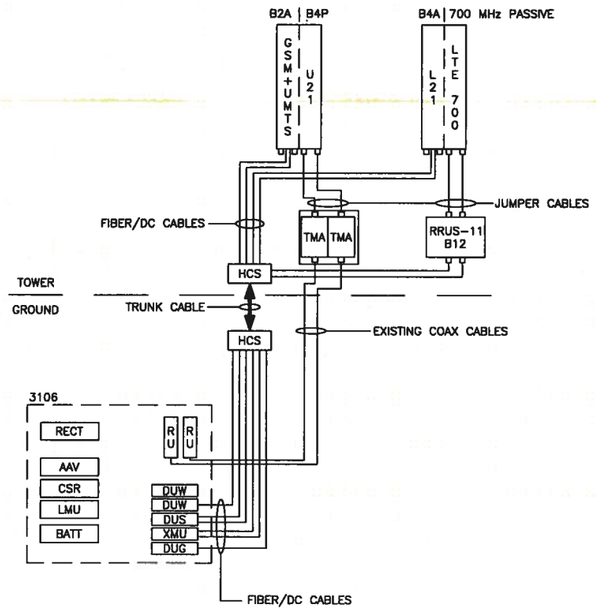
1. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT (2)
SCALE: N.T.S.



MOUNTING CLEARANCE
TOP: 1'-6" - 3'-0"
SIDES: 4"-12"
BOTTOM: 16"
FRONT: 2'-0" - 4'-0"

RRUS-11 PIPE MOUNTING DETAIL (3)
SCALE: N.T.S.



SITE CONFIGURATION 702Cc (4)
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) 1-5/8"ø	(4) 1-5/8"ø	220'-0"	(1) 1-5/8"ø @ 220'-0"
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	(4) 1-5/8"ø	220'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	(4) 1-5/8"ø	220'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				

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JIANG YU
CONNECTICUT LICENSE NO. 023222

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:	50072426
SITE ADDRESS:	

56 NORFIELD ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE

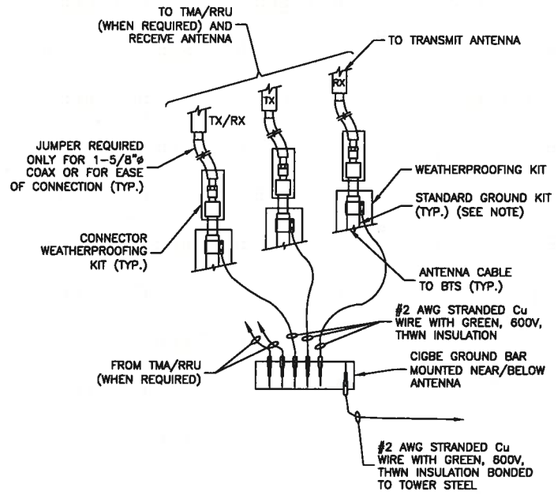
CONSTRUCTION DETAILS

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.

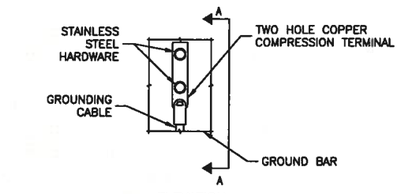


NOTE:

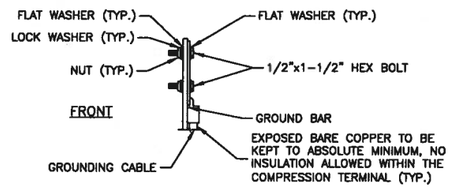
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

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

SCALE: N.T.S.



ELEVATION



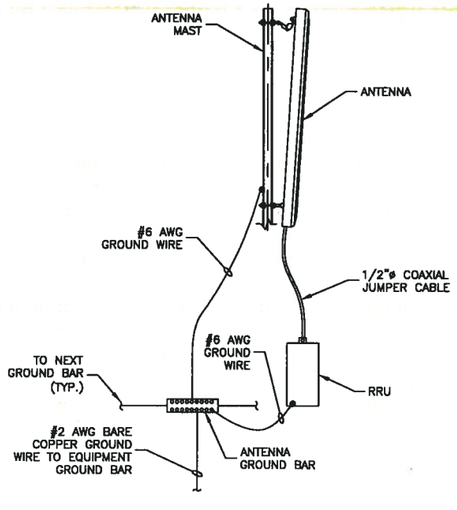
SECTION 'A-A'

NOTES:

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

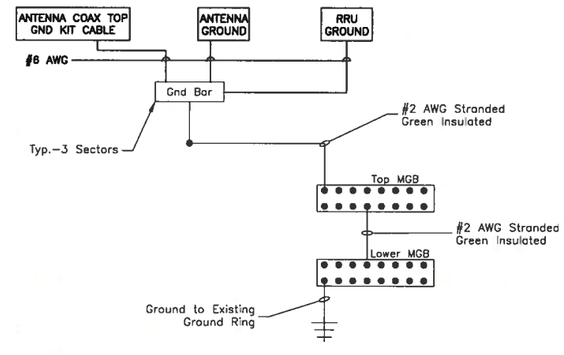
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

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.

T-Mobile

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STATE OF CONNECTICUT
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FAIRFIELD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **March 31, 2015**

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

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11118C
	Carrier Site Name:	Weston/ Rt-57/ Norfield R
Crown Castle Designation:	**Crown Castle BU Number:**	829046
	Crown Castle Site Name:	Weston/ Rt-57/ Norfield R
	Crown Castle JDE Job Number:	322292
	Crown Castle Work Order Number:	1034493
	Crown Castle Application Number:	282652 Rev. 4
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37515-0537.002.7805
Site Data:	**56 Norfield Rd. (Town Hall), Weston, Fairfield County, CT**	
	Latitude *41° 12' 8.4"*, Longitude *-73° 22' 46.6"*	
	190 Foot - Monopole Tower	

Dear Holly Haas,

Paul J Ford and Company 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 771502, in accordance with application 282652, revision 4.

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

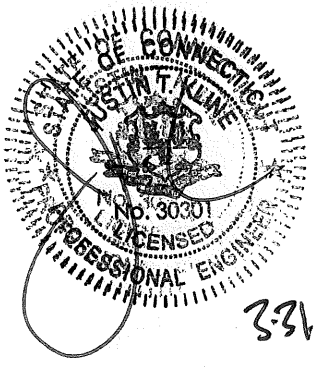
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* 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:

John J. Woolley, E.I.
Structural Designer



tnxTower Report - version 6.1.4.1

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **March 31, 2015**

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Charlotte, NC 28277

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250 E. Broad Street, Suite 600
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614.221.6679
jwoolley@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11118C
	Carrier Site Name:	Weston/ Rt-57/ Norfield R
Crown Castle Designation:	**Crown Castle BU Number:**	829046
	Crown Castle Site Name:	Weston/ Rt-57/ Norfield R
	Crown Castle JDE Job Number:	322292
	Crown Castle Work Order Number:	1034493
	Crown Castle Application Number:	282652 Rev. 4
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37515-0537.002.7805
Site Data:	**56 Norfield Rd. (Town Hall), Weston, Fairfield County, CT**	
	Latitude *41° 12' 8.4"*, Longitude *-73° 22' 46.6"*	
	190 Foot - Monopole Tower	

Dear Holly Haas,

Paul J Ford and Company 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 771502, in accordance with application 282652, revision 4.

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

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

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* 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:

John J. Woolley, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190 ft Monopole tower designed by PIROD MANUFACTURES INC. in January of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 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
173.0	170.0	3	ericsson	Ericsson Air 21 B4A B12P-B5P 8FT 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
190.0	190.0	3	alcatel lucent	TD-RRH8x20-25	4	1-1/4	2
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	-	-	1
		1	tower mounts	Platform Mount [LP 403-1]			
188.0	188.0	3	alcatel lucent	1900MHz RRH	-	-	1
		3	alcatel lucent	800MHZ RRH			
		1	tower mounts	Side Arm Mount [SO 102-3]			
182.0	182.0	1	tower mounts	Platform Mount [LP 403-1]	-	-	1
173.0	173.0	1	tower mounts	Platform Mount [LP 405-1]	7	1-5/8	1
	170.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	6	1-5/8	3
162.0	163.0	6	ericsson	RRUS-11	1 2 12	3/4 7/8 1-5/8	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		3	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
	162.0	1	tower mounts	Platform Mount [LP 403-1]			
151.0	151.0	3	alcatel lucent	RRH2X40-AWS	-	-	2
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	150.0	2	andrew	LNX-6514DS-T4M w/ Mount Pipe	13	1-5/8	1
		6	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		2	antel	LPA-80080/6CF w/ Mount Pipe			
		4	decibel	DB846F65ZAXY w/ Mount Pipe			
		1	powerwave technologies	P65-16-XL-R w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 403-1]			
125.0	130.0	1	rfs celwave	PD128-1	1 1	1/2 7/8	1
		1	rfs celwave	PD201-1			
	125.0	1	tower mounts	Side Arm Mount [SO 701-3]			
110.0	115.0	2	rfs celwave	PD128-1	2	7/8	1
	110.0	1	tower mounts	Side Arm Mount [SO 701-3]			
95.0	100.0	2	rfs celwave	PD128-1	2	1/2	1
	95.0	1	tower mounts	Side Arm Mount [SO 701-3]			
80.0	85.0	1	decibel	DB222	2	1/2	1
		1	rfs celwave	PD128-1			
	80.0	1	tower mounts	Side Arm Mount [SO 701-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Arcnet, A99.506-247B, 10/15/1999	3529916	CCISITES
4-POST-MODIFICATION INSPECTION	Sabre, 61801, 11/19/2012	3774763	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, A-116331, 1/5/2000	3529917	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	TEP, 1/25/2012	3667108	CCISITES
FABRICATION DRAWINGS	Sabre, 61801-MR, 8/2/2012	-	SABRE
4-POST-MODIFICATION INSPECTION	TEP, 48073, 11/10/14	5392198	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.
4) Monopole has been reinforced in conformance with the referenced modification drawings.
5) The rock anchors have been analyzed assuming reinforced concrete-type action in the interaction between the rock anchors and the rock.
6) The existing anchor brackets have been welded through their chamfer region. This analysis assumes no damage to the weld from the pole shaft to the base plate has occurred and that the weld is complete and effective.
7) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	190 - 180	Pole	30" x 0.375"	1	-5.304	1166.570	9.9	Pass
L2	180 - 160	Pole	36" x 0.375"	2	-13.320	1325.678	34.5	Pass
L3	160 - 140	Pole	42" x 0.375"	3	-19.395	1484.549	66.7	Pass
L4	140 - 120	Pole	P48x3/8	4	-24.114	1643.282	92.1	Pass
L5	120 - 113.33	Pole	54" x 0.375"	5	-25.789	1801.923	86.0	Pass
L6	113.33 - 103	Pole	RPS 54" x 0.49054"	6	-29.275	2350.759	80.3	Pass
L7	103 - 100	Pole	RPS 54" x 0.49054"	7	-30.233	2350.759	84.6	Pass
L8	100 - 90	Pole	RPS 60" x 0.47803"	8	-33.860	2493.470	84.1	Pass
L9	90 - 85.5	Pole	RPS 60" x 0.55603"	9	-35.620	2896.062	77.5	Pass
L10	85.5 - 84	Pole	RPS 60" x 0.63464"	10	-36.279	3001.849	69.8	Pass
L11	84 - 80	Pole	RPS 60" x 0.52996"	11	-37.787	2761.003	87.8	Pass
L12	80 - 60	Pole	RPS 60" x 0.57817"	12	-46.214	3211.717	97.0	Pass
L13	60 - 58.5	Pole	RPS 60" x 0.70417"	13	-46.947	3764.312	77.0	Pass
L14	58.5 - 47.25	Pole	P60x5/8	14	-51.945	3682.439	97.4	Pass
L15	47.25 - 40	Pole	RPS 60" x 0.76962"	15	-55.817	4113.078	85.8	Pass
L16	40 - 32.25	Pole	RPS 60" x 0.76962"	16	-59.970	4113.078	92.4	Pass
L17	32.25 - 29.75	Pole	RPS 60" x 0.96202"	17	-61.605	5123.199	76.4	Pass
L18	29.75 - 20	Pole	RPS 60" x 0.81453"	18	-67.123	4346.166	97.7	Pass
L19	20 - 4.25	Pole	RPS 60" x 0.94201"	19	-77.298	5311.885	91.2	Pass
L20	4.25 - 0	Pole	RPS 60" x 1.07924"	20	-80.405	6049.207	83.2	Pass
							Summary	
						Pole (L18)	97.7	Pass
						Rating =	97.7	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.0	Pass
1	Base Plate	0	73.8	Pass
1	Base Foundation	0	79.1	Pass
1	Flange Connection	20	79.3	Pass
1	Flange Connection	40	81.7	Pass
1	Flange Connection	60	80.2	Pass
1	Flange Connection	80	77.3	Pass
1	Flange Connection	100	66.5	Pass
1, 2	Flange Connection	120	92.1	Pass
1, 2	Flange Connection	140	66.7	Pass
1, 2	Flange Connection	160	34.5	Pass
1, 2	Flange Connection	180	9.9	Pass

Structure Rating (max from all components) =	97.7%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) See assumption #7.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.750 in.
4) Ice density of 56.000 pcf.
5) A wind speed of 28 mph is used in combination with ice.
6) Temperature drop of 50.000 °F.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) 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		

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	190.000-180.000	10.000	30" x 0.375"	A53-B-42 (42 ksi)	5.000
L2	175.000-155.000	20.000	36" x 0.375"	A53-B-42 (42 ksi)	5.000
L3	155.000-135.000	20.000	42" x 0.375"	A53-B-42 (42 ksi)	5.000
L4	135.000-115.000	20.000	P48x3/8	A53-B-42 (42 ksi)	5.000
L5	115.000-108.330	6.670	54" x 0.375"	A53-B-42 (42 ksi)	5.000
L6	108.330-98.000	10.330	RPS 54" x 0.49054"	Reinf 38.43 ksi (38 ksi)	5.000
L7	98.000-95.000	3.000	RPS 54" x 0.49054"	Reinf 38.43 ksi (38 ksi)	5.000
L8	95.000-85.000	10.000	RPS 60" x 0.47803"	Reinf 39.13 ksi (39 ksi)	5.000

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L9	85.000-80.500	4.500	RPS 60" x 0.55603"	Reinf 36.97 ksi (37 ksi)	5.000
L10	80.500-79.000	1.500	RPS 60" x 0.63464"	Reinf 31.71 ksi (32 ksi)	5.000
L11	79.000-75.000	4.000	RPS 60" x 0.52996"	Reinf 37.68 ksi (38 ksi)	5.000
L12	75.000-55.000	20.000	RPS 60" x 0.57817"	Reinf 39.86 ksi (40 ksi)	5.000
L13	55.000-53.500	1.500	RPS 60" x 0.70417"	Reinf 35.88 ksi (36 ksi)	5.000
L14	53.500-42.250	11.250	P60x5/8	A53-B-42 (42 ksi)	5.000
L15	42.250-35.000	7.250	RPS 60" x 0.76962"	Reinf 35.91 ksi (36 ksi)	5.000
L16	35.000-27.250	7.750	RPS 60" x 0.76962"	Reinf 35.91 ksi (36 ksi)	5.000
L17	27.250-24.750	2.500	RPS 60" x 0.96202"	Reinf 35.90 ksi (36 ksi)	5.000
L18	24.750-15.000	9.750	RPS 60" x 0.81453"	Reinf 35.88 ksi (36 ksi)	5.000
L19	15.000-0.750	15.750	RPS 60" x 0.94201"	Reinf 38.00 ksi (38 ksi)	5.000
L20	0.750-3.500	4.250	RPS 60" x 1.07924"	Reinf 37.86 ksi (38 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 190.000-180.000				1	1	1		
L2 180.000-160.000				1	1	1		
L3 160.000-140.000				1	1	1		
L4 140.000-120.000				1	1	1		
L5 120.000-113.330				1	1	1		
L6 113.330-103.000				1	1	1		
L7 103.000-100.000				1	1	1		
L8 100.000-90.000				1	1	1		
L9 90.000-85.500				1	1	1		
L10 85.500-84.000				1	1	1		
L11 84.000-80.000				1	1	1		
L12 80.000-60.000				1	1	1		
L13 60.000-58.500				1	1	1		

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L14 58.500-47.250				1	1	1		
L15 47.250-40.000				1	1	1		
L16 40.000-32.250				1	1	1		
L17 32.250-29.750				1	1	1		
L18 29.750-20.000				1	1	1		
L19 20.000-4.250				1	1	1		
L20 4.250-0.000				1	1	1		

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 klf
HB114-21U3M12-XXXF(1-1/4")	C	No	CaAa (Out Of Face)	190.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
TYPE I(1-1/4")	C	No	Inside Pole	190.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	173.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	173.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.109	0.000
						1/2" Ice	0.209	0.001
						1" Ice	0.309	0.003
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	2	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	162.000 - 0.000	10	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
9776(3/4")	C	No	CaAa (Out Of Face)	162.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
LDF7-50A(1-5/8")	C	No	Inside Pole	150.000 - 0.000	13	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF5-50A(7/8")	C	No	Inside Pole	125.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	110.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	95.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	80.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000

***

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	15.000 - 0.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	112.500 - 57.500	1	No Ice	0.167	0.000
						1/2" Ice	0.278	0.000
						1" Ice	0.389	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.000 - 25.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	45.000 - 35.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	51.000 - 45.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	25.000 - 15.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	45.000 - 35.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	65.000 - 55.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	87.250 - 75.000	1	No Ice	0.208	0.000
						1/2" Ice	0.319	0.000
						1" Ice	0.431	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	190.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.031
L2	180.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	3.584	0.158
L3	160.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	14.060	0.500
L4	140.000-120.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	14.060	0.610
L5	120.000-113.330	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.689	0.207
L6	113.330-103.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	8.845	0.325
L7	103.000-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	2.609	0.095
L8	100.000-90.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	8.697	0.320
L9	90.000-85.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.278	0.145
L10	85.500-84.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.617	0.048
L11	84.000-80.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.312	0.129

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
L12	80.000-60.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	19.477	0.659
L13	60.000-58.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.617	0.049
L14	58.500-47.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	9.586	0.371
L15	47.250-40.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	7.649	0.239
L16	40.000-32.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	8.104	0.255
L17	32.250-29.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	2.278	0.082
L18	29.750-20.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	8.885	0.321
L19	20.000-4.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	14.353	0.519
L20	4.250-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	3.873	0.140

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	190.000-180.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.053
L2	180.000-160.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	6.434	0.508
L3	160.000-140.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	26.060	1.622
L4	140.000-120.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	26.060	1.732
L5	120.000-113.330	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	8.691	0.581
L6	113.330-103.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	16.627	0.904
L7	103.000-100.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	4.909	0.263
L8	100.000-90.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	16.363	0.881
L9	90.000-85.500	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	8.020	0.398
L10	85.500-84.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	3.017	0.133
L11	84.000-80.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	8.045	0.354

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
L12	80.000-60.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	36.477	1.782
L13	60.000-58.500	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	3.017	0.134
L14	58.500-47.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	17.711	1.002
L15	47.250-40.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	14.041	0.646
L16	40.000-32.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	14.880	0.690
L17	32.250-29.750	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	4.195	0.223
L18	29.750-20.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	16.361	0.868
L19	20.000-4.250	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	26.429	1.403
L20	4.250-0.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	7.132	0.379

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.000-180.000	0.000	0.000	0.000	0.000
L2	180.000-160.000	-0.220	0.127	-0.364	0.210
L3	160.000-140.000	-0.760	0.439	-1.202	0.694
L4	140.000-120.000	-0.777	0.448	-1.247	0.720
L5	120.000-113.330	-0.790	0.456	-1.285	0.742
L6	113.330-103.000	-0.935	0.540	-1.509	0.871
L7	103.000-100.000	-0.947	0.547	-1.528	0.882
L8	100.000-90.000	-0.962	0.556	-1.572	0.908
L9	90.000-85.500	-1.038	0.599	-1.676	0.968
L10	85.500-84.000	-1.152	0.665	-1.831	1.057
L11	84.000-80.000	-1.152	0.665	-1.831	1.057
L12	80.000-60.000	-1.059	0.611	-1.705	0.984
L13	60.000-58.500	-1.152	0.665	-1.831	1.057
L14	58.500-47.250	-0.946	0.546	-1.526	0.881
L15	47.250-40.000	-1.132	0.653	-1.781	1.028
L16	40.000-32.250	-1.123	0.649	-1.770	1.022
L17	32.250-29.750	-1.001	0.578	-1.602	0.925
L18	29.750-20.000	-1.001	0.578	-1.602	0.925
L19	20.000-4.250	-1.001	0.578	-1.602	0.925
L20	4.250-0.000	-1.001	0.578	-1.602	0.925

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
PD201-7	C	From Leg	4.000 0.000 3.000	0.000	190.000	No Ice 1/2" Ice 1" Ice	1.015 1.809 2.620	1.015 1.809 2.620	0.004 0.013 0.026
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	50.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	45.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	60.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
800MHZ RRH	A	From Leg	4.000 0.000 0.000	50.000	188.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH	B	From Leg	4.000 0.000 0.000	45.000	188.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH	C	From Leg	4.000 0.000 0.000	60.000	188.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
1900MHz RRH	A	From Leg	4.000 0.000 0.000	50.000	188.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
1900MHz RRH	B	From Leg	4.000 0.000 0.000	45.000	188.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
1900MHz RRH	C	From Leg	4.000 0.000 0.000	60.000	188.000	No Ice 1/2" Ice 1" Ice	2.907 3.145 3.391	3.801 4.065 4.337	0.044 0.075 0.110
Platform Mount [LP 403-1]	C	None		0.000	190.000	No Ice 1/2" Ice 1" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093
Side Arm Mount [SO 102-3]	C	None		0.000	188.000	No Ice 1/2" Ice 1" Ice	3.000 3.480 3.960	3.000 3.480 3.960	0.081 0.111 0.141
TD-RRH8x20-25	A	From Leg	4.000 0.000 0.000	50.000	190.000	No Ice 1/2" Ice 1" Ice	4.720 5.014 5.316	1.703 1.920 2.145	0.070 0.097 0.128
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	45.000	190.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	60.000	190.000	No Ice 1/2" Ice 1" Ice	7.134 7.662 8.183	4.959 5.754 6.472	0.077 0.131 0.193
TD-RRH8x20-25	B	From Leg	4.000 0.000 0.000	50.000	190.000	No Ice 1/2" Ice 1" Ice	4.720 5.014 5.316	1.703 1.920 2.145	0.070 0.097 0.128
APXVSPP18-C-A20 w/	B	From Leg	4.000	45.000	190.000	No Ice	8.498	6.946	0.083

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
Mount Pipe			0.000				1/2" Ice	9.149	8.127	0.151
			0.000				1" Ice	9.767	9.021	0.227
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000		60.000	190.000	No Ice	7.134	4.959	0.077
			0.000				1/2" Ice	7.662	5.754	0.131
			0.000				1" Ice	8.183	6.472	0.193
TD-RRH8x20-25	C	From Leg	4.000		50.000	190.000	No Ice	4.720	1.703	0.070
			0.000				1/2" Ice	5.014	1.920	0.097
			0.000				1" Ice	5.316	2.145	0.128
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000		45.000	190.000	No Ice	8.498	6.946	0.083
			0.000				1/2" Ice	9.149	8.127	0.151
			0.000				1" Ice	9.767	9.021	0.227
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000		60.000	190.000	No Ice	7.134	4.959	0.077
			0.000				1/2" Ice	7.662	5.754	0.131
			0.000				1" Ice	8.183	6.472	0.193
****										
Platform Mount [LP 403-1]	C	None			0.000	182.000	No Ice	18.850	18.850	1.500
							1/2" Ice	24.300	24.300	1.797
							1" Ice	29.750	29.750	2.093
(4) 6' x 2'' Mount Pipe	A	From Leg	4.000		0.000	182.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
(4) 6' x 2'' Mount Pipe	B	From Leg	4.000		0.000	182.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
(4) 6' x 2'' Mount Pipe	C	From Leg	4.000		0.000	182.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
***										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000		0.000	173.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			-3.000				1" Ice	7.863	7.257	0.233
KRY 112 144/1	A	From Leg	4.000		0.000	173.000	No Ice	0.408	0.204	0.011
			0.000				1/2" Ice	0.497	0.273	0.014
			-3.000				1" Ice	0.594	0.351	0.019
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000		0.000	173.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			-3.000				1" Ice	7.863	7.257	0.233
KRY 112 144/1	B	From Leg	4.000		0.000	173.000	No Ice	0.408	0.204	0.011
			0.000				1/2" Ice	0.497	0.273	0.014
			-3.000				1" Ice	0.594	0.351	0.019
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000		0.000	173.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			-3.000				1" Ice	7.863	7.257	0.233
KRY 112 144/1	C	From Leg	4.000		0.000	173.000	No Ice	0.408	0.204	0.011
			0.000				1/2" Ice	0.497	0.273	0.014
			-3.000				1" Ice	0.594	0.351	0.019
Platform Mount [LP 405-1]	C	None			0.000	173.000	No Ice	20.800	20.800	1.800
							1/2" Ice	28.100	28.100	2.066
							1" Ice	35.400	35.400	2.332

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
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	A	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	11.782 12.502 13.232	11.038 12.564 14.116	0.159 0.254 0.360
RRUS 11 B12	A	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	3.306 3.550 3.802	1.361 1.540 1.728	0.051 0.072 0.095
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	B	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	11.782 12.502 13.232	11.038 12.564 14.116	0.159 0.254 0.360
RRUS 11 B12	B	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	3.306 3.550 3.802	1.361 1.540 1.728	0.051 0.072 0.095
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	C	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	11.782 12.502 13.232	11.038 12.564 14.116	0.159 0.254 0.360
RRUS 11 B12	C	From Leg	4.000 0.000 -3.000	0.000	173.000	No Ice 1/2" Ice 1" Ice	3.306 3.550 3.802	1.361 1.540 1.728	0.051 0.072 0.095
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.221 6.714 7.218	4.820 5.508 6.213	0.086 0.143 0.208
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.221 6.714 7.218	4.820 5.508 6.213	0.086 0.143 0.208
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	6.221 6.714 7.218	4.820 5.508 6.213	0.086 0.143 0.208
TT19-08BP111-001	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.645 0.757 0.877	0.520 0.623 0.735	0.016 0.022 0.029
TT19-08BP111-001	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.645 0.757 0.877	0.520 0.623 0.735	0.016 0.022 0.029
TT19-08BP111-001	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	0.645 0.757 0.877	0.520 0.623 0.735	0.016 0.022 0.029
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.362 7.538 8.427	0.079 0.144 0.218
(2) RRUS-11	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092

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) RRUS-11	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092
(2) RRUS-11	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.048 0.068 0.092
(2) LGP21401	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.364 0.479 0.602	0.014 0.021 0.030
(2) LGP21401	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.364 0.479 0.602	0.014 0.021 0.030
(2) LGP21401	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.288 1.445 1.611	0.364 0.479 0.602	0.014 0.021 0.030
DC6-48-60-18-8F	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.467 1.667 1.878	1.467 1.667 1.878	0.019 0.037 0.057
Platform Mount [LP 403-1]	C	None		0.000	162.000	No Ice 1/2" Ice 1" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	162.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
***									
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.449 9.044 9.631	6.885 7.951 8.809	0.056 0.124 0.199
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.449 9.044 9.631	6.885 7.951 8.809	0.056 0.124 0.199
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	7.271 7.877 8.484	7.821 9.010 9.912	0.047 0.114 0.189
(2) DB846F65ZAXY w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	7.271 7.877 8.484	7.821 9.010 9.912	0.047 0.114 0.189
P65-16-XL-R w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.544 9.128 9.716	6.569 7.480 8.335	0.082 0.149 0.225
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	4.564 5.105 5.612	10.728 11.990 12.968	0.046 0.113 0.187

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
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.367 0.451 0.543	0.085 0.136 0.196	0.003 0.005 0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.367 0.451 0.543	0.085 0.136 0.196	0.003 0.005 0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.367 0.451 0.543	0.085 0.136 0.196	0.003 0.005 0.009
Platform Mount [LP 403-1]	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	5.029 5.583 6.103	5.289 6.459 7.348	0.041 0.087 0.140
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	5.029 5.583 6.103	5.289 6.459 7.348	0.041 0.087 0.140
DB-T1-6Z-8AB-0Z	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	5.600 5.915 6.240	2.333 2.558 2.791	0.044 0.080 0.120
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	5.029 5.583 6.103	5.289 6.459 7.348	0.041 0.087 0.140
***									
Pipe Mount [PM 601-3]	C	None		0.000	151.000	No Ice 1/2" Ice 1" Ice	4.390 5.480 6.570	4.390 5.480 6.570	0.195 0.237 0.280
RRH2X40-AWS	A	From Leg	0.500 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice	2.522 2.753 2.993	1.589 1.795 2.010	0.044 0.061 0.082
RRH2X40-AWS	B	From Leg	0.500 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice	2.522 2.753 2.993	1.589 1.795 2.010	0.044 0.061 0.082
RRH2X40-AWS	C	From Leg	0.500 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice	2.522 2.753 2.993	1.589 1.795 2.010	0.044 0.061 0.082
****									
PD128-1	A	From Leg	4.000 0.000 5.000	0.000	125.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
PD201-1	A	From Leg	4.000 0.000 5.000	0.000	125.000	No Ice 1/2" Ice 1" Ice	0.628 1.539 2.467	0.628 1.539 2.467	0.004 0.011 0.023
Side Arm Mount [SO 701-3]	C	None		0.000	125.000	No Ice 1/2" Ice 1" Ice	2.830 3.920 5.010	2.830 3.920 5.010	0.195 0.237 0.279
***									
PD128-1	A	From Leg	4.000 0.000	0.000	110.000	No Ice 1/2"	1.277 2.272	1.277 2.272	0.013 0.024

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
			5.000			Ice 1" Ice	3.282	3.282	0.041
PD128-1	A	From Leg	4.000 0.000 5.000	0.000	110.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
Side Arm Mount [SO 701-3]	C	None		0.000	110.000	No Ice 1/2" Ice 1" Ice	2.830 3.920 5.010	2.830 3.920 5.010	0.195 0.237 0.279
***									
PD128-1	A	From Leg	4.000 0.000 5.000	0.000	95.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
PD128-1	A	From Leg	4.000 0.000 5.000	0.000	95.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
Side Arm Mount [SO 701-3]	C	None		0.000	95.000	No Ice 1/2" Ice 1" Ice	2.830 3.920 5.010	2.830 3.920 5.010	0.195 0.237 0.279
***									
DB222	A	From Leg	4.000 0.000 5.000	0.000	80.000	No Ice 1/2" Ice 1" Ice	1.600 2.880 4.160	1.600 2.880 4.160	0.016 0.021 0.026
PD128-1	C	From Leg	4.000 0.000 5.000	0.000	80.000	No Ice 1/2" Ice 1" Ice	1.277 2.272 3.282	1.277 2.272 3.282	0.013 0.024 0.041
Side Arm Mount [SO 701-3]	C	None		0.000	80.000	No Ice 1/2" Ice 1" Ice	2.830 3.920 5.010	2.830 3.920 5.010	0.195 0.237 0.279
****									

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 190.000-180.000	185.000	1.636	0.030	25.000	A	0.000	25.000	25.000	100.00	0.000	0.000
					B	0.000	25.000		100.00	0.000	0.000
					C	0.000	25.000		100.00	0.000	0.000
L2 180.000-160.000	170.000	1.597	0.030	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	3.584
L3 160.000-140.000	150.000	1.541	0.029	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	14.060
L4 140.000-120.000	130.000	1.48	0.027	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	14.060
L5 120.000-	116.665	1.434	0.027	30.015	A	0.000	30.015	30.015	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
113.330					B	0.000	30.015		100.00	0.000	0.000
					C	0.000	30.015		100.00	0.000	4.689
L6 113.330-103.000	108.165	1.404	0.026	46.485	A	0.000	46.485	46.485	100.00	0.000	0.000
					B	0.000	46.485		100.00	0.000	0.000
					C	0.000	46.485		100.00	0.000	8.845
L7 103.000-100.000	101.500	1.379	0.025	13.500	A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
					C	0.000	13.500		100.00	0.000	2.609
L8 100.000-90.000	95.000	1.353	0.025	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	8.697
L9 90.000-85.500	87.750	1.322	0.024	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	4.278
L10 85.500-84.000	84.750	1.309	0.024	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.617
L11 84.000-80.000	82.000	1.297	0.024	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	4.312
L12 80.000-60.000	70.000	1.24	0.023	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	19.477
L13 60.000-58.500	59.250	1.182	0.022	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.617
L14 58.500-47.250	52.875	1.144	0.021	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250		100.00	0.000	0.000
					C	0.000	56.250		100.00	0.000	9.586
L15 47.250-40.000	43.625	1.083	0.020	36.250	A	0.000	36.250	36.250	100.00	0.000	0.000
					B	0.000	36.250		100.00	0.000	0.000
					C	0.000	36.250		100.00	0.000	7.649
L16 40.000-32.250	36.125	1.026	0.019	38.750	A	0.000	38.750	38.750	100.00	0.000	0.000
					B	0.000	38.750		100.00	0.000	0.000
					C	0.000	38.750		100.00	0.000	8.104
L17 32.250-29.750	31.000	1	0.018	12.500	A	0.000	12.500	12.500	100.00	0.000	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	0.000	2.278
L18 29.750-20.000	24.875	1	0.018	48.750	A	0.000	48.750	48.750	100.00	0.000	0.000
					B	0.000	48.750		100.00	0.000	0.000
					C	0.000	48.750		100.00	0.000	8.885
L19 20.000-4.250	12.125	1	0.018	78.750	A	0.000	78.750	78.750	100.00	0.000	0.000
					B	0.000	78.750		100.00	0.000	0.000
					C	0.000	78.750		100.00	0.000	14.353
L20 4.250-0.000	2.125	1	0.018	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	3.873

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.000-180.000	185.000	1.636	0.003	0.750	26.250	A	0.000	26.250	26.250	100.00	0.000	0.000
						B	0.000	26.250		100.00	0.000	0.000
						C	0.000	26.250		100.00	0.000	0.000
L2 180.000-160.000	170.000	1.597	0.003	0.750	62.500	A	0.000	62.500	62.500	100.00	0.000	0.000
						B	0.000	62.500		100.00	0.000	0.000
						C	0.000	62.500		100.00	0.000	6.434
L3 160.000-140.000	150.000	1.541	0.003	0.750	72.500	A	0.000	72.500	72.500	100.00	0.000	0.000
						B	0.000	72.500		100.00	0.000	0.000
						C	0.000	72.500		100.00	0.000	26.060

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L4 140.000-120.000	130.000	1.48	0.003	0.750	82.500	A	0.000	82.500	82.500	100.00	0.000	0.000
						B	0.000	82.500		100.00	0.000	0.000
						C	0.000	82.500		100.00	0.000	26.060
L5 120.000-113.330	116.665	1.434	0.003	0.750	30.849	A	0.000	30.849	30.849	100.00	0.000	0.000
						B	0.000	30.849		100.00	0.000	0.000
						C	0.000	30.849		100.00	0.000	8.691
L6 113.330-103.000	108.165	1.404	0.003	0.750	47.776	A	0.000	47.776	47.776	100.00	0.000	0.000
						B	0.000	47.776		100.00	0.000	0.000
						C	0.000	47.776		100.00	0.000	16.627
L7 103.000-100.000	101.500	1.379	0.003	0.750	13.875	A	0.000	13.875	13.875	100.00	0.000	0.000
						B	0.000	13.875		100.00	0.000	0.000
						C	0.000	13.875		100.00	0.000	4.909
L8 100.000-90.000	95.000	1.353	0.003	0.750	51.250	A	0.000	51.250	51.250	100.00	0.000	0.000
						B	0.000	51.250		100.00	0.000	0.000
						C	0.000	51.250		100.00	0.000	16.363
L9 90.000-85.500	87.750	1.322	0.003	0.750	23.063	A	0.000	23.063	23.063	100.00	0.000	0.000
						B	0.000	23.063		100.00	0.000	0.000
						C	0.000	23.063		100.00	0.000	8.020
L10 85.500-84.000	84.750	1.309	0.003	0.750	7.688	A	0.000	7.688	7.688	100.00	0.000	0.000
						B	0.000	7.688		100.00	0.000	0.000
						C	0.000	7.688		100.00	0.000	3.017
L11 84.000-80.000	82.000	1.297	0.003	0.750	20.500	A	0.000	20.500	20.500	100.00	0.000	0.000
						B	0.000	20.500		100.00	0.000	0.000
						C	0.000	20.500		100.00	0.000	8.045
L12 80.000-60.000	70.000	1.24	0.003	0.750	102.500	A	0.000	102.500	102.500	100.00	0.000	0.000
						B	0.000	102.500		100.00	0.000	0.000
						C	0.000	102.500		100.00	0.000	36.477
L13 60.000-58.500	59.250	1.182	0.002	0.750	7.688	A	0.000	7.688	7.688	100.00	0.000	0.000
						B	0.000	7.688		100.00	0.000	0.000
						C	0.000	7.688		100.00	0.000	3.017
L14 58.500-47.250	52.875	1.144	0.002	0.750	57.656	A	0.000	57.656	57.656	100.00	0.000	0.000
						B	0.000	57.656		100.00	0.000	0.000
						C	0.000	57.656		100.00	0.000	17.711
L15 47.250-40.000	43.625	1.083	0.002	0.750	37.156	A	0.000	37.156	37.156	100.00	0.000	0.000
						B	0.000	37.156		100.00	0.000	0.000
						C	0.000	37.156		100.00	0.000	14.041
L16 40.000-32.250	36.125	1.026	0.002	0.750	39.719	A	0.000	39.719	39.719	100.00	0.000	0.000
						B	0.000	39.719		100.00	0.000	0.000
						C	0.000	39.719		100.00	0.000	14.880
L17 32.250-29.750	31.000	1	0.002	0.750	12.813	A	0.000	12.813	12.813	100.00	0.000	0.000
						B	0.000	12.813		100.00	0.000	0.000
						C	0.000	12.813		100.00	0.000	4.195
L18 29.750-20.000	24.875	1	0.002	0.750	49.969	A	0.000	49.969	49.969	100.00	0.000	0.000
						B	0.000	49.969		100.00	0.000	0.000
						C	0.000	49.969		100.00	0.000	16.361
L19 20.000-4.250	12.125	1	0.002	0.750	80.719	A	0.000	80.719	80.719	100.00	0.000	0.000
						B	0.000	80.719		100.00	0.000	0.000
						C	0.000	80.719		100.00	0.000	26.429
L20 4.250-0.000	2.125	1	0.002	0.750	21.781	A	0.000	21.781	21.781	100.00	0.000	0.000
						B	0.000	21.781		100.00	0.000	0.000
						C	0.000	21.781		100.00	0.000	7.132

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.000-180.000	185.000	1.636	0.010	25.000	A	0.000	25.000	25.000	100.00	0.000	0.000
					B	0.000	25.000		100.00	0.000	0.000
					C	0.000	25.000		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2 180.000-160.000	170.000	1.597	0.010	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	3.584
L3 160.000-140.000	150.000	1.541	0.010	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	14.060
L4 140.000-120.000	130.000	1.48	0.009	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	14.060
L5 120.000-113.330	116.665	1.434	0.009	30.015	A	0.000	30.015	30.015	100.00	0.000	0.000
					B	0.000	30.015		100.00	0.000	0.000
					C	0.000	30.015		100.00	0.000	4.689
L6 113.330-103.000	108.165	1.404	0.009	46.485	A	0.000	46.485	46.485	100.00	0.000	0.000
					B	0.000	46.485		100.00	0.000	0.000
					C	0.000	46.485		100.00	0.000	8.845
L7 103.000-100.000	101.500	1.379	0.009	13.500	A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
					C	0.000	13.500		100.00	0.000	2.609
L8 100.000-90.000	95.000	1.353	0.009	50.000	A	0.000	50.000	50.000	100.00	0.000	0.000
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	8.697
L9 90.000-85.500	87.750	1.322	0.008	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	4.278
L10 85.500-84.000	84.750	1.309	0.008	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.617
L11 84.000-80.000	82.000	1.297	0.008	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	4.312
L12 80.000-60.000	70.000	1.24	0.008	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	19.477
L13 60.000-58.500	59.250	1.182	0.008	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.617
L14 58.500-47.250	52.875	1.144	0.007	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250		100.00	0.000	0.000
					C	0.000	56.250		100.00	0.000	9.586
L15 47.250-40.000	43.625	1.083	0.007	36.250	A	0.000	36.250	36.250	100.00	0.000	0.000
					B	0.000	36.250		100.00	0.000	0.000
					C	0.000	36.250		100.00	0.000	7.649
L16 40.000-32.250	36.125	1.026	0.007	38.750	A	0.000	38.750	38.750	100.00	0.000	0.000
					B	0.000	38.750		100.00	0.000	0.000
					C	0.000	38.750		100.00	0.000	8.104
L17 32.250-29.750	31.000	1	0.006	12.500	A	0.000	12.500	12.500	100.00	0.000	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	0.000	2.278
L18 29.750-20.000	24.875	1	0.006	48.750	A	0.000	48.750	48.750	100.00	0.000	0.000
					B	0.000	48.750		100.00	0.000	0.000
					C	0.000	48.750		100.00	0.000	8.885
L19 20.000-4.250	12.125	1	0.006	78.750	A	0.000	78.750	78.750	100.00	0.000	0.000
					B	0.000	78.750		100.00	0.000	0.000
					C	0.000	78.750		100.00	0.000	14.353
L20 4.250-0.000	2.125	1	0.006	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	3.873

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice

Comb. No.	Description
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
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	190 - 180	Pole	Max Tension	11	0.000	-0.000	0.002
			Max. Compression	14	-8.533	0.139	-0.081
			Max. Mx	11	-5.309	66.178	0.112
			Max. My	8	-5.307	-0.107	-66.293
			Max. Vy	11	-8.760	66.178	0.112
			Max. Vx	8	8.773	-0.107	-66.293
			Max. Torque	7			-0.361
L2	180 - 160	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-21.095	1.024	-0.815
			Max. Mx	11	-13.331	323.165	0.144
			Max. My	8	-13.326	-0.132	-323.579
			Max. Vy	11	-20.337	323.165	0.144
			Max. Vx	8	20.351	-0.132	-323.579
			Max. Torque	6			-0.996
L3	160 - 140	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.495	2.969	-2.517
			Max. Mx	11	-19.429	823.693	2.949
			Max. My	8	-19.413	-2.970	-826.329
			Max. Vy	11	-29.610	823.693	2.949
			Max. Vx	8	29.807	-2.970	-826.329
			Max. Torque	6			-2.488
L4	140 - 120	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.246	5.633	-3.759
			Max. Mx	11	-24.144	1446.922	8.900
			Max. My	8	-24.130	-8.558	-1453.201
			Max. Vy	11	-32.716	1446.922	8.900

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	32.914	-8.558	-1453.201
			Max. Torque	6			-2.625
L5	120 - 113.33	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-40.595	6.629	-4.333
			Max. Mx	11	-25.818	1668.680	10.847
			Max. My	8	-25.804	-10.398	-1676.202
			Max. Vy	11	-33.729	1668.680	10.847
			Max. Vx	8	33.927	-10.398	-1676.202
			Max. Torque	13			2.389
L6	113.33 - 103	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-45.240	8.172	-4.816
			Max. Mx	11	-29.302	2028.064	14.000
			Max. My	8	-29.289	-13.251	-2037.351
			Max. Vy	11	-35.602	2028.064	14.000
			Max. Vx	8	35.799	-13.251	-2037.351
			Max. Torque	13			2.432
L7	103 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.495	8.619	-5.074
			Max. Mx	11	-30.259	2135.621	14.876
			Max. My	8	-30.247	-14.081	-2145.470
			Max. Vy	11	-36.060	2135.621	14.876
			Max. Vx	8	36.257	-14.081	-2145.470
			Max. Torque	13			2.217
L8	100 - 90	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-51.297	10.273	-5.604
			Max. Mx	11	-33.885	2506.403	17.922
			Max. My	8	-33.873	-16.808	-2517.937
			Max. Vy	11	-37.933	2506.403	17.922
			Max. Vx	8	38.130	-16.808	-2517.937
			Max. Torque	13			2.292
L9	90 - 85.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-53.536	11.015	-6.032
			Max. Mx	11	-35.645	2678.863	19.228
			Max. My	8	-35.633	-18.036	-2691.234
			Max. Vy	11	-38.668	2678.863	19.228
			Max. Vx	8	38.865	-18.036	-2691.234
			Max. Torque	2			2.217
L10	85.5 - 84	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-54.356	11.261	-6.174
			Max. Mx	11	-36.303	2737.091	19.663
			Max. My	8	-36.292	-18.446	-2749.741
			Max. Vy	11	-38.919	2737.091	19.663
			Max. Vx	8	39.119	-18.446	-2749.741
			Max. Torque	2			2.240
L11	84 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-56.280	11.924	-6.555
			Max. Mx	11	-37.811	2894.177	20.825
			Max. My	8	-37.800	-19.538	-2907.570
			Max. Vy	11	-39.574	2894.177	20.825
			Max. Vx	8	39.770	-19.538	-2907.570
			Max. Torque	2			2.303
L12	80 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-66.834	15.399	-8.408
			Max. Mx	11	-46.233	3721.404	26.679
			Max. My	8	-46.224	-24.934	-3738.382
			Max. Vy	11	-42.773	3721.404	26.679
			Max. Vx	8	42.969	-24.934	-3738.382
			Max. Torque	2			2.866
L13	60 - 58.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-67.721	15.643	-8.549
			Max. Mx	11	-46.965	3785.753	27.114
			Max. My	8	-46.957	-25.344	-3803.011
			Max. Vy	5	42.987	-3778.588	-31.193
			Max. Vx	8	43.186	-25.344	-3803.011
			Max. Torque	2			2.888
L14	58.5 - 47.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-73.812	17.424	-9.577
			Max. Mx	11	-51.960	4277.593	30.366
			Max. My	8	-51.953	-28.407	-4296.938

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	-44.399	4277.593	30.366
			Max. Vx	8	44.596	-28.407	-4296.938
			Max. Torque	2			3.008
L15	47.25 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-78.394	18.572	-10.240
			Max. Mx	11	-55.830	4602.931	32.457
			Max. My	8	-55.824	-30.377	-4623.618
			Max. Vy	11	-45.305	4602.931	32.457
			Max. Vx	8	45.502	-30.377	-4623.618
			Max. Torque	2			3.100
L16	40 - 32.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-83.292	19.796	-10.946
			Max. Mx	11	-59.981	4957.634	34.687
			Max. My	8	-59.976	-32.479	-4979.754
			Max. Vy	5	46.185	-4948.537	-39.955
			Max. Vx	8	46.383	-32.479	-4979.754
			Max. Torque	2			3.193
L17	32.25 - 29.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-85.172	20.191	-11.175
			Max. Mx	11	-61.615	5073.486	35.405
			Max. My	8	-61.610	-33.155	-5096.068
			Max. Vy	5	46.456	-5064.206	-40.786
			Max. Vx	2	-46.654	43.040	5090.954
			Max. Torque	2			3.218
L18	29.75 - 20	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-91.608	21.732	-12.064
			Max. Mx	11	-67.130	5531.457	38.198
			Max. My	8	-67.127	-35.788	-5555.833
			Max. Vy	5	47.438	-5521.465	-44.017
			Max. Vx	2	-47.634	46.432	5550.301
			Max. Torque	2			3.316
L19	20 - 4.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-103.255	24.220	-13.501
			Max. Mx	11	-77.299	6290.992	42.678
			Max. My	8	-77.299	-40.015	-6318.247
			Max. Vy	5	48.947	-6279.859	-49.201
			Max. Vx	2	-49.142	51.871	6312.045
			Max. Torque	2			3.474
L20	4.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-106.759	24.892	-13.889
			Max. Mx	11	-80.405	6499.928	43.879
			Max. My	8	-80.405	-41.148	-6527.954
			Max. Vy	5	49.339	-6488.489	-50.590
			Max. Vx	2	-49.534	53.329	6521.573
			Max. Torque	2			3.517

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	106.759	-0.001	0.001
	Max. H_x	11	80.415	49.318	0.304
	Max. H_z	2	80.415	0.304	49.518
	Max. M_x	2	6521.573	0.304	49.518
	Max. M_z	5	6488.489	-49.323	-0.304
	Max. Torsion	2	3.517	0.304	49.518
	Min. Vert	11	80.415	49.318	0.304
	Min. H_x	5	80.415	-49.323	-0.304
	Min. H_z	8	80.415	-0.304	-49.516
	Min. M_x	8	-6527.954	-0.304	-49.516
	Min. M_z	11	-6499.928	49.318	0.304
	Min. Torsion	8	-3.514	-0.304	-49.516

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	80.415	-0.000	0.000	3.269	5.946	0.000
Dead+Wind 0 deg - No Ice	80.415	-0.304	-49.518	-6521.573	53.328	-3.517
Dead+Wind 30 deg - No Ice	80.415	24.400	-42.733	-5624.005	-3200.564	-2.723
Dead+Wind 60 deg - No Ice	80.415	42.566	-24.496	-3218.336	-5595.251	-1.199
Dead+Wind 90 deg - No Ice	80.415	49.323	0.304	50.590	-6488.489	0.646
Dead+Wind 120 deg - No Ice	80.415	42.870	25.023	3306.824	-5642.419	2.317
Dead+Wind 150 deg - No Ice	80.415	24.927	43.037	5677.878	-3282.345	3.366
Dead+Wind 180 deg - No Ice	80.415	0.304	49.516	6527.954	-41.148	3.514
Dead+Wind 210 deg - No Ice	80.415	-24.400	42.733	5630.710	3212.741	2.721
Dead+Wind 240 deg - No Ice	80.415	-42.566	24.496	3225.043	5607.429	1.200
Dead+Wind 270 deg - No Ice	80.415	-49.318	-0.304	-43.879	6499.928	-0.643
Dead+Wind 300 deg - No Ice	80.415	-42.870	-25.023	-3300.119	5654.599	-2.315
Dead+Wind 330 deg - No Ice	80.415	-24.927	-43.037	-5671.175	3294.524	-3.367
Dead+Ice+Temp	106.759	0.001	-0.001	13.889	24.892	-0.000
Dead+Wind 0 deg+Ice+Temp	106.759	-0.034	-6.719	-881.169	30.594	-0.641
Dead+Wind 30 deg+Ice+Temp	106.759	3.320	-5.802	-758.601	-416.145	-0.592
Dead+Wind 60 deg+Ice+Temp	106.759	5.784	-3.330	-428.974	-744.584	-0.384
Dead+Wind 90 deg+Ice+Temp	106.759	6.698	0.034	19.389	-866.717	-0.073
Dead+Wind 120 deg+Ice+Temp	106.759	5.818	3.388	466.348	-749.820	0.258
Dead+Wind 150 deg+Ice+Temp	106.759	3.378	5.836	792.141	-425.214	0.519
Dead+Wind 180 deg+Ice+Temp	106.759	0.034	6.719	909.474	20.121	0.641
Dead+Wind 210 deg+Ice+Temp	106.759	-3.320	5.802	786.905	466.859	0.592
Dead+Wind 240 deg+Ice+Temp	106.759	-5.784	3.330	457.278	795.298	0.384
Dead+Wind 270 deg+Ice+Temp	106.759	-6.698	-0.034	8.916	917.431	0.073
Dead+Wind 300 deg+Ice+Temp	106.759	-5.818	-3.388	-438.043	800.534	-0.258
Dead+Wind 330 deg+Ice+Temp	106.759	-3.378	-5.836	-763.837	475.929	-0.519
Dead+Wind 0 deg - Service	80.415	-0.105	-17.132	-2255.041	22.448	-1.220
Dead+Wind 30 deg - Service	80.415	8.442	-14.785	-1944.525	-1103.869	-0.944
Dead+Wind 60 deg - Service	80.415	14.728	-8.476	-1111.869	-1932.871	-0.416
Dead+Wind 90 deg - Service	80.415	17.065	0.105	19.706	-2241.897	0.224
Dead+Wind 120 deg - Service	80.415	14.834	8.658	1146.905	-1949.221	0.804
Dead+Wind 150 deg - Service	80.415	8.625	14.891	1967.587	-1132.190	1.168
Dead+Wind 180 deg - Service	80.415	0.105	17.132	2261.753	-10.253	1.219
Dead+Wind 210 deg - Service	80.415	-8.443	14.786	1951.336	1116.121	0.944
Dead+Wind 240 deg - Service	80.415	-14.728	8.476	1118.582	1945.067	0.416
Dead+Wind 270 deg - Service	80.415	-17.065	-0.105	-12.994	2254.092	-0.224
Dead+Wind 300 deg - Service	80.415	-14.834	-8.658	-1140.191	1961.417	-0.804
Dead+Wind 330 deg - Service	80.415	-8.625	-14.891	-1960.973	1144.443	-1.168

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-80.415	0.000	0.000	80.415	-0.000	0.000%
2	-0.304	-80.415	-49.519	0.304	80.415	49.518	0.002%
3	24.400	-80.415	-42.733	-24.400	80.415	42.733	0.000%
4	42.566	-80.415	-24.496	-42.566	80.415	24.496	0.000%
5	49.327	-80.415	0.304	-49.323	80.415	-0.304	0.004%
6	42.870	-80.415	25.023	-42.870	80.415	-25.023	0.000%
7	24.927	-80.415	43.037	-24.927	80.415	-43.037	0.000%
8	0.304	-80.415	49.519	-0.304	80.415	-49.516	0.004%
9	-24.400	-80.415	42.733	24.400	80.415	-42.733	0.000%
10	-42.566	-80.415	24.496	42.566	80.415	-24.496	0.000%
11	-49.327	-80.415	-0.304	49.318	80.415	0.304	0.009%
12	-42.870	-80.415	-25.023	42.870	80.415	25.023	0.000%
13	-24.927	-80.415	-43.037	24.927	80.415	43.037	0.000%
14	0.000	-106.759	0.000	-0.001	106.759	0.001	0.002%
15	-0.034	-106.759	-6.719	0.034	106.759	6.719	0.000%
16	3.320	-106.759	-5.802	-3.320	106.759	5.802	0.000%
17	5.784	-106.759	-3.330	-5.784	106.759	3.330	0.000%
18	6.698	-106.759	0.034	-6.698	106.759	-0.034	0.000%
19	5.818	-106.759	3.389	-5.818	106.759	-3.388	0.000%
20	3.378	-106.759	5.836	-3.378	106.759	-5.836	0.000%
21	0.034	-106.759	6.719	-0.034	106.759	-6.719	0.000%
22	-3.320	-106.759	5.802	3.320	106.759	-5.802	0.000%
23	-5.784	-106.759	3.330	5.784	106.759	-3.330	0.000%
24	-6.698	-106.759	-0.034	6.698	106.759	0.034	0.000%
25	-5.818	-106.759	-3.389	5.818	106.759	3.388	0.000%
26	-3.378	-106.759	-5.836	3.378	106.759	5.836	0.000%
27	-0.105	-80.415	-17.135	0.105	80.415	17.132	0.004%
28	8.443	-80.415	-14.786	-8.442	80.415	14.785	0.002%
29	14.729	-80.415	-8.476	-14.728	80.415	8.476	0.001%
30	17.068	-80.415	0.105	-17.065	80.415	-0.105	0.004%
31	14.834	-80.415	8.659	-14.834	80.415	-8.658	0.001%
32	8.625	-80.415	14.892	-8.625	80.415	-14.891	0.002%
33	0.105	-80.415	17.135	-0.105	80.415	-17.132	0.004%
34	-8.443	-80.415	14.786	8.443	80.415	-14.786	0.001%
35	-14.729	-80.415	8.476	14.728	80.415	-8.476	0.001%
36	-17.068	-80.415	-0.105	17.065	80.415	0.105	0.004%
37	-14.834	-80.415	-8.659	14.834	80.415	8.658	0.001%
38	-8.625	-80.415	-14.892	8.625	80.415	14.891	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00002107	0.00010720
3	Yes	18	0.00000001	0.00010193
4	Yes	18	0.00000001	0.00010469
5	Yes	14	0.00005005	0.00011825
6	Yes	18	0.00000001	0.00011107
7	Yes	18	0.00000001	0.00010549
8	Yes	14	0.00005003	0.00013222
9	Yes	18	0.00000001	0.00010716
10	Yes	18	0.00000001	0.00010404
11	Yes	13	0.00011552	0.00009066
12	Yes	18	0.00000001	0.00010629
13	Yes	18	0.00000001	0.00011226
14	Yes	8	0.00000001	0.00005239
15	Yes	16	0.00000001	0.00007327
16	Yes	16	0.00000001	0.00007334
17	Yes	16	0.00000001	0.00007291
18	Yes	16	0.00000001	0.00007203
19	Yes	16	0.00000001	0.00007522
20	Yes	16	0.00000001	0.00007642
21	Yes	16	0.00000001	0.00007574
22	Yes	16	0.00000001	0.00007815

23	Yes	16	0.00000001	0.00007827
24	Yes	16	0.00000001	0.00007637
25	Yes	16	0.00000001	0.00007766
26	Yes	16	0.00000001	0.00007676
27	Yes	13	0.00011778	0.00006779
28	Yes	14	0.00000001	0.00014359
29	Yes	15	0.00000001	0.00007232
30	Yes	13	0.00011779	0.00003838
31	Yes	15	0.00000001	0.00007996
32	Yes	14	0.00000001	0.00014834
33	Yes	13	0.00011778	0.00005826
34	Yes	15	0.00000001	0.00007722
35	Yes	15	0.00000001	0.00007116
36	Yes	13	0.00011778	0.00003279
37	Yes	15	0.00000001	0.00007087
38	Yes	15	0.00000001	0.00008233

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	26.277	32	1.142	0.002
L2	180 - 160	23.890	32	1.134	0.002
L3	160 - 140	19.222	38	1.083	0.002
L4	140 - 120	14.871	38	0.980	0.001
L5	120 - 113.33	11.036	38	0.839	0.001
L6	113.33 - 103	9.895	38	0.793	0.001
L7	103 - 100	8.246	38	0.729	0.001
L8	100 - 90	7.795	38	0.708	0.001
L9	90 - 85.5	6.371	38	0.650	0.001
L10	85.5 - 84	5.771	38	0.624	0.001
L11	84 - 80	5.576	38	0.617	0.001
L12	80 - 60	5.070	38	0.591	0.001
L13	60 - 58.5	2.871	38	0.453	0.000
L14	58.5 - 47.25	2.730	38	0.443	0.000
L15	47.25 - 40	1.787	38	0.356	0.000
L16	40 - 32.25	1.285	38	0.305	0.000
L17	32.25 - 29.75	0.837	38	0.246	0.000
L18	29.75 - 20	0.713	38	0.230	0.000
L19	20 - 4.25	0.321	38	0.153	0.000
L20	4.25 - 0	0.014	38	0.031	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	PD201-7	32	26.277	1.142	0.002	93536
188.000	800MHZ RRH	32	25.799	1.141	0.002	93536
182.000	Platform Mount [LP 403-1]	32	24.366	1.137	0.002	58401
173.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	32	22.234	1.122	0.002	26991
162.000	(2) 7770.00 w/ Mount Pipe	38	19.678	1.090	0.002	16197
151.000	Pipe Mount [PM 601-3]	38	17.212	1.043	0.001	11666
150.000	LNX-6514DS-T4M w/ Mount Pipe	38	16.994	1.038	0.001	11377
125.000	PD128-1	38	11.937	0.875	0.001	7519
110.000	PD128-1	38	9.348	0.773	0.001	9184
95.000	PD128-1	38	7.068	0.677	0.001	9686
80.000	DB222	38	5.070	0.591	0.001	9181

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	75.844	7	3.297	0.005
L2	180 - 160	68.959	7	3.275	0.005
L3	160 - 140	55.490	13	3.126	0.005
L4	140 - 120	42.934	13	2.829	0.003
L5	120 - 113.33	31.864	13	2.422	0.002
L6	113.33 - 103	28.572	13	2.291	0.002
L7	103 - 100	23.812	13	2.105	0.002
L8	100 - 90	22.508	13	2.045	0.002
L9	90 - 85.5	18.399	13	1.876	0.002
L10	85.5 - 84	16.665	13	1.803	0.002
L11	84 - 80	16.102	13	1.781	0.002
L12	80 - 60	14.641	13	1.707	0.001
L13	60 - 58.5	8.292	13	1.309	0.001
L14	58.5 - 47.25	7.885	13	1.281	0.001
L15	47.25 - 40	5.161	13	1.027	0.001
L16	40 - 32.25	3.712	13	0.880	0.001
L17	32.25 - 29.75	2.419	13	0.711	0.001
L18	29.75 - 20	2.059	13	0.664	0.000
L19	20 - 4.25	0.928	13	0.441	0.000
L20	4.25 - 0	0.040	13	0.090	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	PD201-7	7	75.844	3.297	0.005	32649
188.000	800MHZ RRH	7	74.465	3.294	0.005	32649
182.000	Platform Mount [LP 403-1]	7	70.333	3.281	0.005	20384
173.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7	64.180	3.240	0.005	9413
162.000	(2) 7770.00 w/ Mount Pipe	7	56.806	3.148	0.005	5651
151.000	Pipe Mount [PM 601-3]	13	49.691	3.011	0.004	4068
150.000	LNX-6514DS-T4M w/ Mount Pipe	13	49.061	2.996	0.004	3967
125.000	PD128-1	13	34.466	2.526	0.003	2617
110.000	PD128-1	13	26.993	2.232	0.002	3192
95.000	PD128-1	13	20.409	1.956	0.002	3363
80.000	DB222	13	14.641	1.707	0.001	3186

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	190 - 180 (1)	30" x 0.375"	10.000	0.000	0.0	25.075	34.901	-5.304	875.146	0.006
L2	180 - 160 (2)	36" x 0.375"	20.000	0.000	0.0	23.696	41.970	-13.320	994.507	0.013
L3	160 - 140 (3)	42" x 0.375"	20.000	0.000	0.0	22.711	49.038	-19.395	1113.690	0.017
L4	140 - 120 (4)	P48x3/8	20.000	0.000	0.0	21.972	56.107	-24.114	1232.770	0.020
L5	120 - 113.33 (5)	54" x 0.375"	6.670	0.000	0.0	21.397	63.175	-25.789	1351.780	0.019
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	10.330	0.000	0.0	21.386	82.462	-29.275	1763.510	0.017
L7	103 - 100 (7)	RPS 54" x 0.49054"	3.000	0.000	0.0	21.386	82.462	-30.233	1763.510	0.017

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 $\frac{P}{P_a}$
L8	100 - 90 (8)	RPS 60" x 0.47803"	10.000	0.000	0.0	20.926	89.389	-33.860	1870.570	0.018
L9	90 - 85.5 (9)	RPS 60" x 0.55603"	4.500	0.000	0.0	20.923	103.838	-35.620	2172.590	0.016
L10	85.5 - 84 (10)	RPS 60" x 0.63464"	1.500	0.000	0.0	19.026	118.361	-36.279	2251.950	0.016
L11	84 - 80 (11)	RPS 60" x 0.52996"	4.000	0.000	0.0	20.919	99.013	-37.787	2071.270	0.018
L12	80 - 60 (12)	RPS 60" x 0.57817"	20.000	0.000	0.0	22.323	107.932	-46.214	2409.390	0.019
L13	60 - 58.5 (13)	RPS 60" x 0.70417"	1.500	0.000	0.0	21.528	131.175	-46.947	2823.940	0.017
L14	58.5 - 47.25 (14)	P60x5/8	11.250	0.000	0.0	23.696	116.583	-51.945	2762.520	0.019
L15	47.25 - 40 (15)	RPS 60" x 0.76962"	7.250	0.000	0.0	21.546	143.209	-55.817	3085.580	0.018
L16	40 - 32.25 (16)	RPS 60" x 0.76962"	7.750	0.000	0.0	21.546	143.209	-59.970	3085.580	0.019
L17	32.25 - 29.75 (17)	RPS 60" x 0.96202"	2.500	0.000	0.0	21.540	178.429	-61.605	3843.360	0.016
L18	29.75 - 20 (18)	RPS 60" x 0.81453"	9.750	0.000	0.0	21.528	151.451	-67.123	3260.440	0.021
L19	20 - 4.25 (19)	RPS 60" x 0.94201"	15.750	0.000	0.0	22.800	174.777	-77.298	3984.910	0.019
L20	4.25 - 0 (20)	RPS 60" x 1.07924"	4.250	0.000	0.0	22.716	199.773	-80.405	4538.040	0.018

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	190 - 180 (1)	30" x 0.375"	66.358	3.119	25.075	0.124	0.000	0.000	25.075	0.000
L2	180 - 160 (2)	36" x 0.375"	323.677	10.499	23.696	0.443	0.000	0.000	23.696	0.000
L3	160 - 140 (3)	42" x 0.375"	828.471	19.656	22.711	0.865	0.000	0.000	22.711	0.000
L4	140 - 120 (4)	P48x3/8	1459.450	26.422	21.972	1.203	0.000	0.000	21.972	0.000
L5	120 - 113.33 (5)	54" x 0.375"	1683.808	24.023	21.397	1.123	0.000	0.000	21.397	0.000
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	2047.083	22.471	21.386	1.051	0.000	0.000	21.386	0.000
L7	103 - 100 (7)	RPS 54" x 0.49054"	2155.808	23.664	21.386	1.107	0.000	0.000	21.386	0.000
L8	100 - 90 (8)	RPS 60" x 0.47803"	2530.425	23.010	20.926	1.100	0.000	0.000	20.926	0.000
L9	90 - 85.5 (9)	RPS 60" x 0.55603"	2704.633	21.227	20.923	1.015	0.000	0.000	20.923	0.000
L10	85.5 - 84 (10)	RPS 60" x 0.63464"	2763.442	19.077	20.929	0.912	0.000	0.000	20.929	0.000
L11	84 - 80 (11)	RPS 60" x 0.52996"	2922.083	24.031	20.919	1.149	0.000	0.000	20.919	0.000
L12	80 - 60 (12)	RPS 60" x 0.57817"	3757.092	28.390	22.323	1.272	0.000	0.000	22.323	0.000
L13	60 - 58.5 (13)	RPS 60" x 0.70417"	3822.017	23.863	23.681	1.008	0.000	0.000	23.681	0.000
L14	58.5 - 47.25 (14)	P60x5/8	4318.217	30.256	23.696	1.277	0.000	0.000	23.696	0.000
L15	47.25 - 40 (15)	RPS 60" x 0.76962"	4646.358	26.630	23.701	1.124	0.000	0.000	23.701	0.000
L16	40 - 32.25 (16)	RPS 60" x 0.76962"	5004.050	28.680	23.701	1.210	0.000	0.000	23.701	0.000
L17	32.25 - 29.75 (17)	RPS 60" x 0.96202"	5120.867	23.708	23.694	1.001	0.000	0.000	23.694	0.000
L18	29.75 - 20 (18)	RPS 60" x 0.81453"	5582.575	30.300	23.681	1.280	0.000	0.000	23.681	0.000
L19	20 - 4.25 (19)	RPS 60" x 0.94201"	6348.125	29.984	25.080	1.196	0.000	0.000	25.080	0.000
L20	4.25 - 0 (20)	RPS 60" x 1.07924"	6558.667	27.226	24.988	1.090	0.000	0.000	24.988	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	190 - 180 (1)	30" x 0.375"	8.783	0.503	16.800	0.030	0.335	0.008	15.644	0.001
L2	180 - 160 (2)	36" x 0.375"	20.365	0.970	16.800	0.058	0.975	0.016	11.901	0.001
L3	160 - 140 (3)	42" x 0.375"	30.031	1.225	16.800	0.073	2.369	0.028	9.619	0.003
L4	140 - 120 (4)	P48x3/8	33.138	1.181	16.800	0.070	2.313	0.021	8.021	0.003
L5	120 - 113.33 (5)	54" x 0.375"	34.151	1.081	16.800	0.064	2.389	0.017	7.343	0.002
L6	113.33 - 103 (6)	RPS 54" x 0.49054"	36.024	0.874	15.372	0.057	2.175	0.012	10.272	0.001
L7	103 - 100 (7)	RPS 54" x 0.49054"	36.482	0.885	15.372	0.058	2.216	0.012	10.272	0.001
L8	100 - 90 (8)	RPS 60" x 0.47803"	38.353	0.858	15.652	0.055	2.007	0.009	9.190	0.001
L9	90 - 85.5 (9)	RPS 60" x 0.55603"	39.090	0.753	14.788	0.051	2.079	0.008	11.101	0.001
L10	85.5 - 84 (10)	RPS 60" x 0.63464"	39.343	0.665	12.684	0.052	2.107	0.007	12.684	0.001
L11	84 - 80 (11)	RPS 60" x 0.52996"	39.994	0.808	15.072	0.054	2.179	0.009	10.454	0.001
L12	80 - 60 (12)	RPS 60" x 0.57817"	43.191	0.800	15.944	0.050	2.615	0.010	11.656	0.001
L13	60 - 58.5 (13)	RPS 60" x 0.70417"	43.409	0.662	14.352	0.046	2.640	0.008	14.352	0.001
L14	58.5 - 47.25 (14)	P60x5/8	44.817	0.769	16.800	0.046	2.779	0.010	12.848	0.001
L15	47.25 - 40 (15)	RPS 60" x 0.76962"	45.723	0.639	14.364	0.044	2.886	0.008	14.364	0.001
L16	40 - 32.25 (16)	RPS 60" x 0.76962"	46.603	0.651	14.364	0.045	2.993	0.009	14.364	0.001
L17	32.25 - 29.75 (17)	RPS 60" x 0.96202"	46.874	0.525	14.360	0.037	3.022	0.007	14.360	0.000
L18	29.75 - 20 (18)	RPS 60" x 0.81453"	47.854	0.632	14.352	0.044	3.135	0.009	14.352	0.001
L19	20 - 4.25 (19)	RPS 60" x 0.94201"	49.360	0.565	15.200	0.037	3.318	0.008	15.200	0.001
L20	4.25 - 0 (20)	RPS 60" x 1.07924"	49.751	0.498	15.144	0.033	3.367	0.007	15.144	0.000

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	190 - 180 (1)	0.006	0.124	0.000	0.030	0.001	0.131 ✔	1.333	H1-3+VT ✔
L2	180 - 160 (2)	0.013	0.443	0.000	0.058	0.001	0.460 ✔	1.333	H1-3+VT ✔
L3	160 - 140 (3)	0.017	0.865	0.000	0.073	0.003	0.889 ✔	1.333	H1-3+VT ✔
L4	140 - 120 (4)	0.020	1.203	0.000	0.070	0.003	1.227 ✔	1.333	H1-3+VT ✔
L5	120 - 113.33 (5)	0.019	1.123	0.000	0.064	0.002	1.146 ✔	1.333	H1-3+VT ✔
L6	113.33 - 103 (6)	0.017	1.051	0.000	0.057	0.001	1.071 ✔	1.333	H1-3+VT ✔
L7	103 - 100 (7)	0.017	1.107	0.000	0.058	0.001	1.127 ✔	1.333	H1-3+VT ✔
L8	100 - 90 (8)	0.018	1.100	0.000	0.055	0.001	1.121 ✔	1.333	H1-3+VT ✔
L9	90 - 85.5 (9)	0.016	1.015	0.000	0.051	0.001	1.034 ✔	1.333	H1-3+VT ✔
L10	85.5 - 84 (10)	0.016	0.912	0.000	0.052	0.001	0.930 ✔	1.333	H1-3+VT ✔
L11	84 - 80 (11)	0.018	1.149	0.000	0.054	0.001	1.170 ✔	1.333	H1-3+VT ✔
L12	80 - 60 (12)	0.019	1.272	0.000	0.050	0.001	1.294 ✔	1.333	H1-3+VT ✔

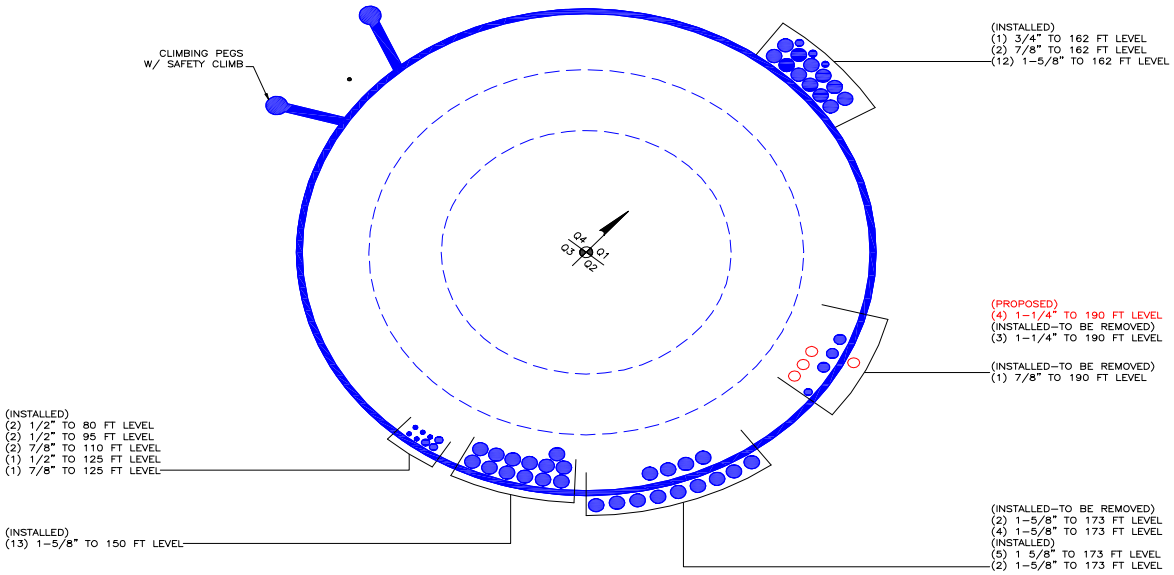
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L13	60 - 58.5 (13)	0.017	1.008	0.000	0.046	0.001	1.026 ✔	1.333	H1-3+VT ✔
L14	58.5 - 47.25 (14)	0.019	1.277	0.000	0.046	0.001	1.298 ✔	1.333	H1-3+VT ✔
L15	47.25 - 40 (15)	0.018	1.124	0.000	0.044	0.001	1.144 ✔	1.333	H1-3+VT ✔
L16	40 - 32.25 (16)	0.019	1.210	0.000	0.045	0.001	1.232 ✔	1.333	H1-3+VT ✔
L17	32.25 - 29.75 (17)	0.016	1.001	0.000	0.037	0.000	1.018 ✔	1.333	H1-3+VT ✔
L18	29.75 - 20 (18)	0.021	1.280	0.000	0.044	0.001	1.302 ✔	1.333	H1-3+VT ✔
L19	20 - 4.25 (19)	0.019	1.196	0.000	0.037	0.001	1.216 ✔	1.333	H1-3+VT ✔
L20	4.25 - 0 (20)	0.018	1.090	0.000	0.033	0.000	1.108 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	190 - 180	Pole	30" x 0.375"	1	-5.304	1166.570	9.9	Pass
L2	180 - 160	Pole	36" x 0.375"	2	-13.320	1325.678	34.5	Pass
L3	160 - 140	Pole	42" x 0.375"	3	-19.395	1484.549	66.7	Pass
L4	140 - 120	Pole	P48x3/8	4	-24.114	1643.282	92.1	Pass
L5	120 - 113.33	Pole	54" x 0.375"	5	-25.789	1801.923	86.0	Pass
L6	113.33 - 103	Pole	RPS 54" x 0.49054"	6	-29.275	2350.759	80.3	Pass
L7	103 - 100	Pole	RPS 54" x 0.49054"	7	-30.233	2350.759	84.6	Pass
L8	100 - 90	Pole	RPS 60" x 0.47803"	8	-33.860	2493.470	84.1	Pass
L9	90 - 85.5	Pole	RPS 60" x 0.55603"	9	-35.620	2896.062	77.5	Pass
L10	85.5 - 84	Pole	RPS 60" x 0.63464"	10	-36.279	3001.849	69.8	Pass
L11	84 - 80	Pole	RPS 60" x 0.52996"	11	-37.787	2761.003	87.8	Pass
L12	80 - 60	Pole	RPS 60" x 0.57817"	12	-46.214	3211.717	97.0	Pass
L13	60 - 58.5	Pole	RPS 60" x 0.70417"	13	-46.947	3764.312	77.0	Pass
L14	58.5 - 47.25	Pole	P60x5/8	14	-51.945	3682.439	97.4	Pass
L15	47.25 - 40	Pole	RPS 60" x 0.76962"	15	-55.817	4113.078	85.8	Pass
L16	40 - 32.25	Pole	RPS 60" x 0.76962"	16	-59.970	4113.078	92.4	Pass
L17	32.25 - 29.75	Pole	RPS 60" x 0.96202"	17	-61.605	5123.199	76.4	Pass
L18	29.75 - 20	Pole	RPS 60" x 0.81453"	18	-67.123	4346.166	97.7	Pass
L19	20 - 4.25	Pole	RPS 60" x 0.94201"	19	-77.298	5311.885	91.2	Pass
L20	4.25 - 0	Pole	RPS 60" x 1.07924"	20	-80.405	6049.207	83.2	Pass
						Summary		
						Pole (L18)	97.7	Pass
						RATING =	**97.7**	**Pass**

APPENDIX B

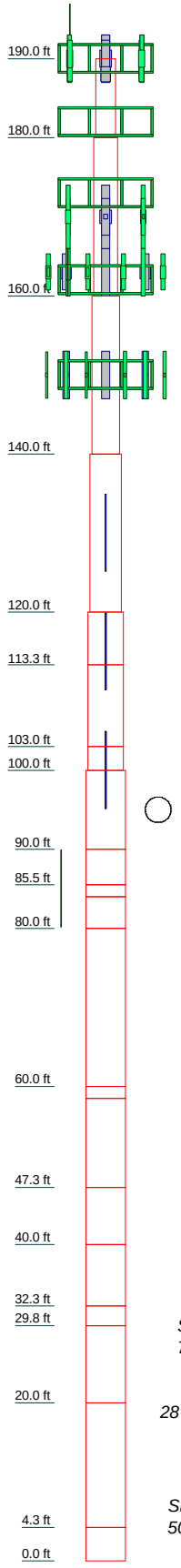
BASE LEVEL DRAWING

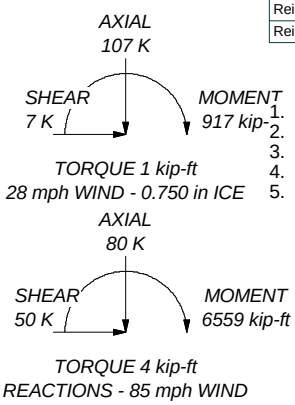

CLIMBING PEGS
W/ SAFETY CLIMB
(INSTALLED)
(1) 3/4" TO 162 FT LEVEL
(2) 7/8" TO 162 FT LEVEL
(12) 1-5/8" TO 162 FT LEVEL
Q4
Q1
Q3
Q2
(PROPOSED)
(4) 1-1/4" TO 190 FT LEVEL
(INSTALLED-TO BE REMOVED)
(3) 1-1/4" TO 190 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 7/8" TO 190 FT LEVEL
(INSTALLED)
(2) 1/2" TO 80 FT LEVEL
(2) 1/2" TO 95 FT LEVEL
(2) 7/8" TO 110 FT LEVEL
(1) 1/2" TO 125 FT LEVEL
(1) 7/8" TO 125 FT LEVEL
(INSTALLED)
(13) 1-5/8" TO 150 FT LEVEL
(INSTALLED-TO BE REMOVED)
(2) 1-5/8" TO 173 FT LEVEL
(4) 1-5/8" TO 173 FT LEVEL
(INSTALLED)
(5) 1 5/8" TO 173 FT LEVEL
(2) 1-5/8" TO 173 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Socket Length (ft)	Grade	Weight (K)
1	30" x 0.375"	10.000	5.000	A53-B-42	1.2
2	36" x 0.375"	20.000	5.000		2.9
3	42" x 0.375"	20.000	5.000		3.3
4	P48x3/8	20.000	5.000		3.8
5	41" x 0.375"	6.670	5.000		1.4
6	39" x 0.496"	10.330	5.000	Reinf 38.43 ksi	2.9
7	39" x 0.496"	3.000	5.000		0.8
8	39" x 0.496"	10.000	5.000	Reinf 39.13 ksi	3.0
9	39" x 0.496"	4.500	5.000		1.6
10	39" x 0.496"	1.500	5.000		0.6
11	39" x 0.496"	4.000	5.000		1.3
12	60" x 0.578"	20.000	5.000	Reinf 39.86 ksi	7.3
13	60" x 0.703"	1.500	5.000	Reinf 35.88 ksi	0.7
14	60" x 0.703"	11.250	5.000	A53-B-42	4.5
15	60" x 0.766"	7.250	5.000	Reinf 35.91 ksi	3.5
16	60" x 0.766"	7.750	5.000	Reinf 35.90 ksi	3.8
17	60" x 0.766"	2.500	5.000	Reinf 35.90 ksi	1.5
18	60" x 0.766"	9.750	5.000	Reinf 35.90 ksi	5.0
19	60" x 0.942"	15.750	5.000	Reinf 38.00 ksi	9.4
20	60" x 1.072"	4.250		Reinf 37.86 ksi	2.9
	RPS				61.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD201-7	190	TT19-08BP111-001	162
APXVSPP18-C-A20 w/ Mount Pipe	190	P65-16-XLH-RR w/ Mount Pipe	162
APXVSPP18-C-A20 w/ Mount Pipe	190	P65-16-XLH-RR w/ Mount Pipe	162
APXVSPP18-C-A20 w/ Mount Pipe	190	P65-16-XLH-RR w/ Mount Pipe	162
Platform Mount [LP 403-1]	190	(2) RRUS-11	162
TD-RRH8x20-25	190	(2) RRUS-11	162
APXVSPP18-C-A20 w/ Mount Pipe	190	(2) RRUS-11	162
APXVTM14-C-120 w/ Mount Pipe	190	(2) LGP21401	162
TD-RRH8x20-25	190	(2) LGP21401	162
APXVSPP18-C-A20 w/ Mount Pipe	190	(2) LGP21401	162
APXVTM14-C-120 w/ Mount Pipe	190	DC6-48-60-18-8F	162
TD-RRH8x20-25	190	Platform Mount [LP 403-1]	162
APXVSPP18-C-A20 w/ Mount Pipe	190	6' x 2" Mount Pipe	162
APXVTM14-C-120 w/ Mount Pipe	190	(2) 6' x 2" Mount Pipe	162
1900MHz RRH	188	(2) 6' x 2" Mount Pipe	162
1900MHz RRH	188	Pipe Mount [PM 601-3]	151
1900MHz RRH	188	RRH2X40-AWS	151
800MHZ RRH	188	RRH2X40-AWS	151
Side Arm Mount [SO 102-3]	188	RRH2X40-AWS	151
800MHZ RRH	188	P65-16-XL-R w/ Mount Pipe	150
800MHZ RRH	188	(2) LPA-80080/6CF w/ Mount Pipe	150
Platform Mount [LP 403-1]	182	(2) FD9R6004/2C-3L	150
(4) 6' x 2" Mount Pipe	182	(2) FD9R6004/2C-3L	150
(4) 6' x 2" Mount Pipe	182	(2) FD9R6004/2C-3L	150
(4) 6' x 2" Mount Pipe	182	Platform Mount [LP 403-1]	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
KRY 112 144/1	173	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	DB-T1-6Z-8AB-0Z	150
KRY 112 144/1	173	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	173	LNX-6514DS-T4M w/ Mount Pipe	150
KRY 112 144/1	173	LNX-6514DS-T4M w/ Mount Pipe	150
Platform Mount [LP 405-1]	173	(2) DB846F65ZAXY w/ Mount Pipe	150
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	173	(2) DB846F65ZAXY w/ Mount Pipe	150
RRUS 11 B12	173	PD128-1	125
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	173	PD201-1	125
RRUS 11 B12	173	Side Arm Mount [SO 701-3]	125
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	173	PD128-1	110
RRUS 11 B12	173	PD128-1	110
(2) 7770.00 w/ Mount Pipe	162	Side Arm Mount [SO 701-3]	110
(2) 7770.00 w/ Mount Pipe	162	PD128-1	95
(2) 7770.00 w/ Mount Pipe	162	PD128-1	95
TT19-08BP111-001	162	Side Arm Mount [SO 701-3]	95
TT19-08BP111-001	162	DB222	80
		PD128-1	80
		Side Arm Mount [SO 701-3]	80

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 39.86 ksi	40 ksi	50 ksi
Reinf 38.43 ksi	38 ksi	49 ksi	Reinf 35.88 ksi	36 ksi	45 ksi
Reinf 39.13 ksi	39 ksi	49 ksi	Reinf 35.91 ksi	36 ksi	45 ksi
Reinf 36.97 ksi	37 ksi	47 ksi	Reinf 35.90 ksi	36 ksi	45 ksi
Reinf 31.71 ksi	32 ksi	40 ksi	Reinf 38.00 ksi	38 ksi	48 ksi
Reinf 37.68 ksi	38 ksi	48 ksi	Reinf 37.86 ksi	38 ksi	48 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.7%

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Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: **190' Monopole / Weston Rt-57 Norfield R**		
Project: **PJF 37515-0537 / BU 829046**		
Client: CCI	Drawn by: John J Woolley	App'd:
Code: TIA/EIA-222-F	Date: 03/31/15	Scale: NTS
Path: G:\TOWER\375_Crown_Castle\2015\37515-0537_829046_WESTON- RT-57- NORFIELD\37515-0537.002.7805_SA_1034493\37515-0537.002.7805.eri		Dwg No. E-1

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STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708
Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description:
Owner:
Engineer: JJW

Asymmetric Anchor Rod Analysis

Moment =	6559	k-ft	TIA Ref.	F	Location =	Base Plate	
Axial =	80.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	50.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	60						

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A687	105	125	0.0	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
2	1.250	A687	105	125	6.9	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
3	1.250	A687	105	125	13.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
4	1.250	A687	105	125	20.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
5	1.250	A687	105	125	27.7	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
6	1.250	A687	105	125	34.6	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
7	1.250	A687	105	125	41.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
8	1.250	A687	105	125	48.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
9	1.250	A687	105	125	55.4	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
10	1.250	A687	105	125	62.3	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
11	1.250	A687	105	125	69.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
12	1.250	A687	105	125	76.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
13	1.250	A687	105	125	83.1	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
14	1.250	A687	105	125	90.0	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
15	1.250	A687	105	125	96.9	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
16	1.250	A687	105	125	103.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
17	1.250	A687	105	125	110.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
18	1.250	A687	105	125	117.7	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
19	1.250	A687	105	125	124.6	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
20	1.250	A687	105	125	131.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
21	1.250	A687	105	125	138.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
22	1.250	A687	105	125	145.4	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
23	1.250	A687	105	125	152.3	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
24	1.250	A687	105	125	159.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
25	1.250	A687	105	125	166.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
26	1.250	A687	105	125	173.1	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
27	1.250	A687	105	125	180.0	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
28	1.250	A687	105	125	186.9	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
29	1.250	A687	105	125	193.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
30	1.250	A687	105	125	200.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
31	1.250	A687	105	125	207.7	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
32	1.250	A687	105	125	214.6	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
33	1.250	A687	105	125	221.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
34	1.250	A687	105	125	228.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
35	1.250	A687	105	125	235.4	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
36	1.250	A687	105	125	242.3	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
37	1.250	A687	105	125	249.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
38	1.250	A687	105	125	256.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
39	1.250	A687	105	125	263.1	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
40	1.250	A687	105	125	270.0	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
41	1.250	A687	105	125	276.9	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
42	1.250	A687	105	125	283.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
43	1.250	A687	105	125	290.8	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
44	1.250	A687	105	125	297.7	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
45	1.250	A687	105	125	304.6	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
46	1.250	A687	105	125	311.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
47	1.250	A687	105	125	318.5	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
48	1.250	A687	105	125	325.4	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
49	1.250	A687	105	125	332.3	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
50	1.250	A687	105	125	339.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
51	1.250	A687	105	125	346.2	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
52	1.250	A687	105	125	353.1	67.00	0.00	1.23	56.08	54.03	54.03	0.00	67.50	80.0%
53	2.250	F1554 Gr 105	105	125	3.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
54	2.250	F1554 Gr 105	105	125	48.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
55	2.250	F1554 Gr 105	105	125	93.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
56	2.250	F1554 Gr 105	105	125	138.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
57	2.250	F1554 Gr 105	105	125	183.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%

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STRUCTURAL ENGINEERS
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Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description:
Owner:
Engineer: JJW

Asymmetric Anchor Rod Analysis

Moment =	6559	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	80.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	50.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	60							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

58	2.250	F1554 Gr 105	105	125	228.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
59	2.250	F1554 Gr 105	105	125	273.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
60	2.250	F1554 Gr 105	105	125	318.5	76.00	0.00	3.98	205.66	199.01	199.01	0.00	218.68	91.0%
								95.62						

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

TIA Rev F

Site Data

BU#:	*829046*
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	3996.1	ft-kips
Axial:	53.4	kips
Shear:	33.4	kips

Reactions adjusted to account for additional anchors

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

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

Anchor Rod Results

			Stiffened
Maximum Rod Tension:	54.0	Kips	Service, ASD
Allowable Tension:	81.0	Kips	Fty*ASIF
Anchor Rod Stress Ratio:	66.7%	Pass	

Plate Data		
Diam:	70	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Base Plate Results — Shear Check Only

			Stiffened
Base Plate Stress:	5.0	ksi	Service, ASD
Allowable Plate Stress:	19.2	ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	26.0%	Pass	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	4.5	in
Height:	8	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Stiffener Results

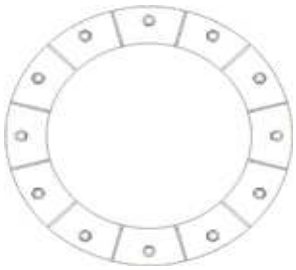
Horizontal Weld :	67.9%	Pass
Vertical Weld:	43.7%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	31.3%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	51.1%	Pass
Plate Comp. (AISC Bracket):	73.8%	Pass

Pole Results

Pole Punching Shear Check:	10.6%	Pass

Pole Data		
Diam:	60	in
Thick:	0.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	



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

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

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 20'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	4325	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	67.1	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	47.9	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	36.18	34.89	34.89	0.00	71.99	48.5%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 20'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	4325	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	67.1	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	47.9	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	32.16	30.86	30.86	0.00	71.99	42.9%
65	0.000	Sabre 6.5 x 1.25	65	80	0.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
66	0.000	Sabre 6.5 x 1.25	65	80	60.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
67	0.000	Sabre 6.5 x 1.25	65	80	120.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
68	0.000	Sabre 6.5 x 1.25	65	80	180.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
69	0.000	Sabre 6.5 x 1.25	65	80	240.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
70	0.000	Sabre 6.5 x 1.25	65	80	300.0	61.25	8.13	8.13	276.17	267.60	276.17	345.86	345.86	79.9%
								127.29						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	20' Flange
BU#:	829046
Site Name:	
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	2242.9	ft-kips
Axial:	67.1	kips
Shear:	47.9	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

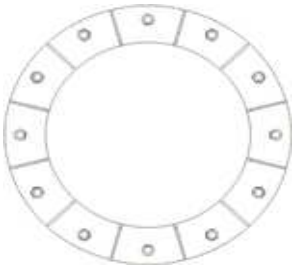
Elevation: 20 feet

PLATE CHECK ONLY

Interior Flange Plate Results	Flexural Check	
Controlling Bolt Axial Force:	69.4	Kips, Ext. C= Interior C
Plate Stress:	28.3	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	78.5%	**Pass**

Stiffener Results		
Horizontal Weld :	43.9%	**Pass**
Vertical Weld:	38.4%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	26.6%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	31.3%	**Pass**
Plate Comp. (AISC Bracket):	63.3%	**Pass**

Pole Results		
Pole Punching Shear Check:	12.4%	**Pass**



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

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

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Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 40'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3801	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	55.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	45.7	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	36.45	35.25	35.25	0.00	71.99	49.0%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 40'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3801	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	55.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	45.7	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	70							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	32.39	31.19	31.19	0.00	71.99	43.3%
65	0.000	Sabre 6 x 1	65	80	0.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
66	0.000	Sabre 6 x 1	65	80	60.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
67	0.000	Sabre 6 x 1	65	80	120.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
68	0.000	Sabre 6 x 1	65	80	180.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
69	0.000	Sabre 6 x 1	65	80	240.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
70	0.000	Sabre 6 x 1	65	80	300.0	61.00	6.00	6.00	204.64	198.80	204.64	250.40	250.40	81.7%
								114.54						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	40' Flange
BU#:	829046
Site Name:	
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	2262.7	ft-kips
Axial:	55.817	kips
Shear:	45.723	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

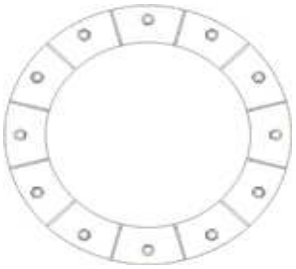
Elevation: 40 feet

PLATE CHECK ONLY

Interior Flange Plate Results	Flexural Check	
Controlling Bolt Axial Force:	69.6	Kips, Ext. C= Interior C
Plate Stress:	28.4	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	78.8%	**Pass**

Stiffener Results		
Horizontal Weld :	49.3%	**Pass**
Vertical Weld:	43.0%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	30.8%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	35.7%	**Pass**
Plate Comp. (AISC Bracket):	71.0%	**Pass**

Pole Results		
Pole Punching Shear Check:	17.4%	**Pass**



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

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

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 60'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3262	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	46.2	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	43.2	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	35.85	34.75	34.75	0.00	71.99	48.3%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%

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Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 60'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	3262	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	46.2	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	43.2	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	31.85	30.75	30.75	0.00	71.99	42.7%
65	0.000	Sabre 6.5 x 1.25	65	80	0.0	61.25	8.13	8.13	273.73	266.43	273.73	345.86	345.86	79.1%
66	0.000	Sabre 6.5 x 1.25	65	80	120.0	61.25	8.13	8.13	273.73	266.43	273.73	345.86	345.86	79.1%
67	0.000	Sabre 6.5 x 1.25	65	80	240.0	61.25	8.13	8.13	273.73	266.43	273.73	345.86	345.86	79.1%
								102.91						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	60' Flange
BU#:	829046
Site Name:	
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	2228	ft-kips
Axial:	46.8	kips
Shear:	44.9	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

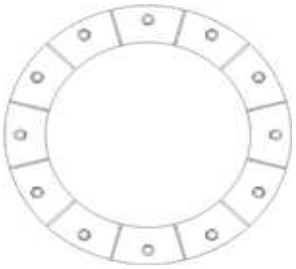
Elevation: 60 feet

PLATE CHECK ONLY

Interior Flange Plate Results	Flexural Check	
Controlling Bolt Axial Force:	68.3	Kips, Ext. C= Interior C
Plate Stress:	27.8	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	77.3%	**Pass**

Stiffener Results		
Horizontal Weld :	48.3%	**Pass**
Vertical Weld:	42.2%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	30.0%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	34.9%	**Pass**
Plate Comp. (AISC Bracket):	69.6%	**Pass**

Pole Results		
Pole Punching Shear Check:	17.0%	**Pass**



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

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

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 80'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	2433	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	37.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	40.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.250	A325	81	105	0.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
2	1.250	A325	81	105	11.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
3	1.250	A325	81	105	22.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
4	1.250	A325	81	105	33.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
5	1.250	A325	81	105	45.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
6	1.250	A325	81	105	56.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
7	1.250	A325	81	105	67.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
8	1.250	A325	81	105	78.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
9	1.250	A325	81	105	90.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
10	1.250	A325	81	105	101.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
11	1.250	A325	81	105	112.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
12	1.250	A325	81	105	123.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
13	1.250	A325	81	105	135.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
14	1.250	A325	81	105	146.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
15	1.250	A325	81	105	157.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
16	1.250	A325	81	105	168.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
17	1.250	A325	81	105	180.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
18	1.250	A325	81	105	191.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
19	1.250	A325	81	105	202.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
20	1.250	A325	81	105	213.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
21	1.250	A325	81	105	225.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
22	1.250	A325	81	105	236.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
23	1.250	A325	81	105	247.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
24	1.250	A325	81	105	258.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
25	1.250	A325	81	105	270.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
26	1.250	A325	81	105	281.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
27	1.250	A325	81	105	292.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
28	1.250	A325	81	105	303.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
29	1.250	A325	81	105	315.0	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
30	1.250	A325	81	105	326.3	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
31	1.250	A325	81	105	337.5	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
32	1.250	A325	81	105	348.8	53.00	0.00	1.23	31.22	30.21	30.21	0.00	71.99	42.0%
33	1.250	A325	81	105	0.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
34	1.250	A325	81	105	11.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
35	1.250	A325	81	105	22.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
36	1.250	A325	81	105	33.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
37	1.250	A325	81	105	45.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
38	1.250	A325	81	105	56.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
39	1.250	A325	81	105	67.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
40	1.250	A325	81	105	78.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
41	1.250	A325	81	105	90.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
42	1.250	A325	81	105	101.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
43	1.250	A325	81	105	112.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
44	1.250	A325	81	105	123.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
45	1.250	A325	81	105	135.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
46	1.250	A325	81	105	146.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
47	1.250	A325	81	105	157.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
48	1.250	A325	81	105	168.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
49	1.250	A325	81	105	180.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
50	1.250	A325	81	105	191.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
51	1.250	A325	81	105	202.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
52	1.250	A325	81	105	213.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
53	1.250	A325	81	105	225.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
54	1.250	A325	81	105	236.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
55	1.250	A325	81	105	247.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
56	1.250	A325	81	105	258.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
57	1.250	A325	81	105	270.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%

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v4.1 - Effective 7-3-12

Date: 3/31/2015
PJF Project: 37515-0537.002.7805
Client Ref. # 829046
Site Name:
Description: Flange at 80'
Owner:
Engineer: JJW

Asymmetric Bolt Analysis

Moment adjusted to account for load in Reinforcing Flat Plate on Pole Exterior

Moment =	2433	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	37.8	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	40.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	67							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

58	1.250	A325	81	105	281.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
59	1.250	A325	81	105	292.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
60	1.250	A325	81	105	303.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
61	1.250	A325	81	105	315.0	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
62	1.250	A325	81	105	326.3	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
63	1.250	A325	81	105	337.5	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
64	1.250	A325	81	105	348.8	47.00	0.00	1.23	27.74	26.73	26.73	0.00	71.99	37.1%
65	0.000	Sabre 4.5 x 1	65	80	0.0	61.00	4.50	4.50	131.47	127.77	131.47	170.16	170.16	77.3%
66	0.000	Sabre 4.5 x 1	65	80	120.0	61.00	4.50	4.50	131.47	127.77	131.47	170.16	170.16	77.3%
67	0.000	Sabre 4.5 x 1	65	80	240.0	61.00	4.50	4.50	131.47	127.77	131.47	170.16	170.16	77.3%
								92.04						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	80' Flange
BU#:	*829046*
Site Name:	
App #:	

Manufacturer:	Other

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle:	50	in	

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	41	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.82	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	10	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

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

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	1938.6	ft-kips
Axial:	37.8	kips
Shear:	40	kips
Exterior Flange Run, T+Q:	0	kips

Reactions adjusted to account for flange jumps

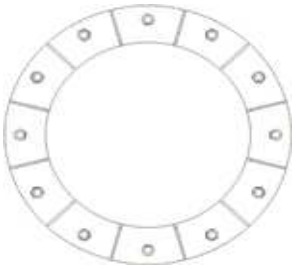
Elevation: 80 feet

PLATE CHECK ONLY

Interior Flange Plate Results	Flexural Check	
Controlling Bolt Axial Force:	59.3	Kips, Ext. C= Interior C
Plate Stress:	24.2	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	67.2%	**Pass**

Stiffener Results		
Horizontal Weld :	47.6%	**Pass**
Vertical Weld:	41.6%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	29.5%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	34.3%	**Pass**
Plate Comp. (AISC Bracket):	68.6%	**Pass**

Pole Results		
Pole Punching Shear Check:	22.4%	**Pass**



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

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

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

Site Data

BU#: *829046*
Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	1658.693	ft-kips
Axial:	30.233	kips
Shear:	36.482	kips
Elevation:	100	feet

Reactions adjusted to account for load in flat plate shaft reinforcing.

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

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	57		

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

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Stiffened
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	28.47	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened	in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened	in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened	in	
T allowable	46.07	kips	<-- B, Stiffened
Prying Force, Q:	0.00	kips	Stiffened
Total Bolt Tension=T+Q:	28.47	kips	
Non-Prying Bolt Stress Ratio, T/B:	61.8%	**Pass**	

Exterior Flange Plate Results Shear Check Only

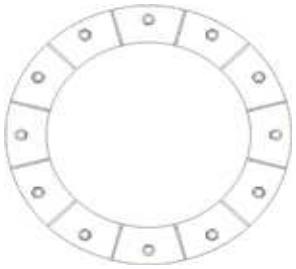
			Stiffened
Compression Side Plate Stress:	4.0	ksi	Service, ASD
Allowable Plate Stress:	19.2	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	20.7%	**Pass**	Comp. Y.L. Length:
Stiffened			N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A		

Stiffener Results

Horizontal Weld :	61.9%	**Pass**
Vertical Weld:	42.0%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	29.7%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	46.4%	**Pass**
Plate Comp. (AISC Bracket):	66.5%	**Pass**

Pole Results

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



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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name:
App #:

Manufacturer:	Other

Reactions

Moment:	1658.693	ft-kips
Axial:	30.233	kips
Shear:	36.482	kips
Exterior Flange Run, T+Q:	28.47	kips

Reactions adjusted to account for load in flat plate shaft reinforcing

Elevation: 100 feet

Bolt Data			
Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle:	57	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	28.5	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	61.8%	**Pass**

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

Interior Flange Plate Results Shear Check Only

Controlling Bolt Axial Force:	29.7	Kips, Ext. C= Interior C
Plate Stress:	4.5	ksi
Allowable Plate Stress:	19.2	ksi
Plate Stress Ratio:	23.6%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

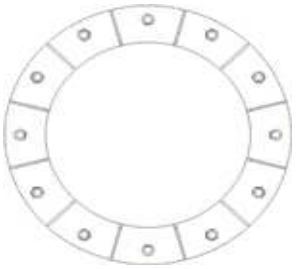
Stiffener Results

Horizontal Weld :	61.6%	**Pass**
Vertical Weld:	34.5%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	22.7%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	45.6%	**Pass**
Plate Comp. (AISC Bracket):	57.5%	**Pass**

Pole Results

Pole Punching Shear Check:	16.4%	**Pass**

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



Stress Increase Factor		
ASIF:	1.333	

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

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

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

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	1459.45	ft-kips
Axial:	24.11	kips
Shear:	33.14	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

Flange Bolt Results — Rigid: Service, ASD; Fty*ASIF

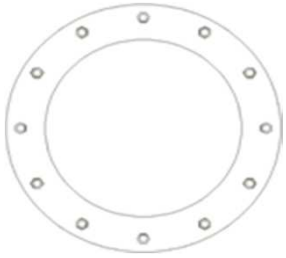
Bolt Tension Capacity, **B**:	46.08	kips	
Max Bolt directly applied T:	37.49	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.354	in	
Min PL "treq" for actual **T w/ Pry**:	0.924	in	
Min PL "t1" for actual **T w/o Pry**:	1.221	in	
T allowable with Prying:	43.81	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	37.49	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	81.4%	**Pass**	

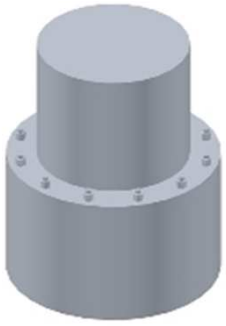
Exterior Flange Plate Results — Flexural Check — Rigid: Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 17.23

Compression Side Plate Stress:	Rohn/Pirod, OK	
Allowable Plate Stress:	36.0	ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK	
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	54.7%	**Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Manufacturer:	Pirod

Reactions

Moment:	1459.45	ft-kips
Axial:	24.11	kips
Shear:	33.14	kips
Exterior Flange Run, T+Q:	37.49	kips

Elevation: 120 feet

Bolt Data

Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	51	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	37.5	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	81.4%	**Pass**

Plate Data

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

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	38.8	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

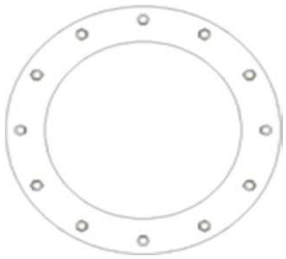
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

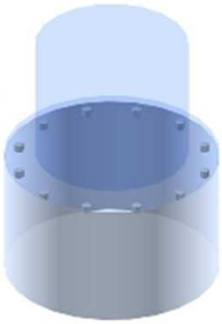
Pole Data

Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Pole Results

Pole Punching Shear Check: N/A





Stress Increase Factor

ASIF:	1.3333333	

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

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

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

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	828.47	ft-kips
Axial:	19.4	kips
Shear:	30.03	kips
Elevation:	140	feet

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

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Flange Bolt Results

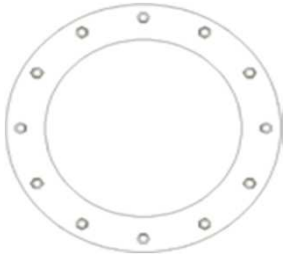
			Rigid
Bolt Tension Capacity, **B**:	46.08	kips	Service, ASD
Max Bolt directly applied T:	27.01	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.365	in	
Min PL "treq" for actual **T w/ Pry**:	0.792	in	
Min PL "t1" for actual **T w/o Pry**:	1.045	in	
T allowable with Prying:	43.60	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	27.01	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	58.6%	**Pass**	

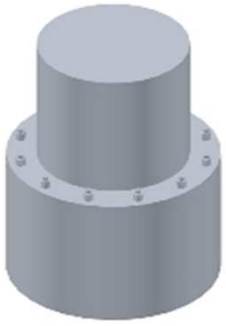
Exterior Flange Plate Results — Flexural Check

			Rigid
Compression Side Plate Stress:	Rohn/Pirod,	OK	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod,	OK	Comp. Y.L. Length:
No Prying			16.16
Tension Side Stress Ratio, (treq/t)^2:	40.1%	**Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Manufacturer:	Pirod

Reactions

Moment:	828.47	ft-kips
Axial:	19.4	kips
Shear:	30.03	kips
Exterior Flange Run, T+Q:	27.01	kips

Elevation: 140 feet

Bolt Data

Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	45	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	27.0	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	58.6%	**Pass**

Plate Data

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

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	28.2	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

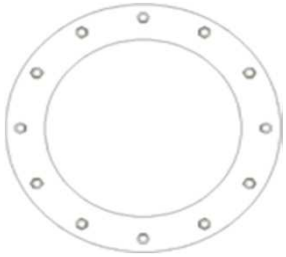
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

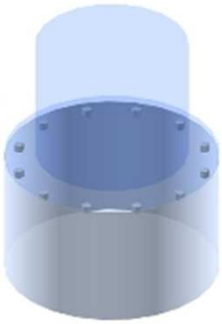
Pole Data

Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Pole Results

Pole Punching Shear Check: N/A





Stress Increase Factor

ASIF:	1.3333333	

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

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

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

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	323.68	ft-kips
Axial:	13.32	kips
Shear:	20.37	kips
Elevation:	160	feet

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

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Flange Bolt Results — Rigid: Service, ASD; Fty*ASIF

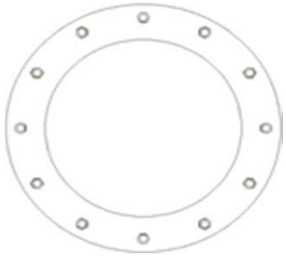
Bolt Tension Capacity, **B**:	46.08	kips	
Max Bolt directly applied T:	13.75	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379	in	
Min PL "treq" for actual **T w/ Pry**:	0.572	in	
Min PL "t1" for actual **T w/o Pry**:	0.753	in	
T allowable with Prying:	43.34	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	13.75	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	29.8%	**Pass**	

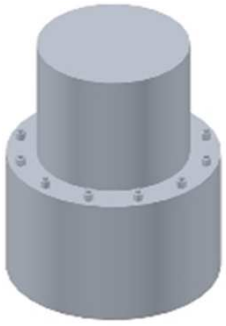
Exterior Flange Plate Results — Flexural Check — Rigid: Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 15.00

Compression Side Plate Stress:	Rohn/Pirod, OK	
Allowable Plate Stress:	36.0	ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK	
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	20.9%	**Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Manufacturer:	Pirod

Reactions		
Moment:	323.68	ft-kips
Axial:	13.32	kips
Shear:	20.37	kips
Exterior Flange Run, T+Q:	13.75	kips

Elevation: 160 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	39	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	13.8	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	29.8%	**Pass**

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

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	14.7	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results N/A for Rohn / Pirod

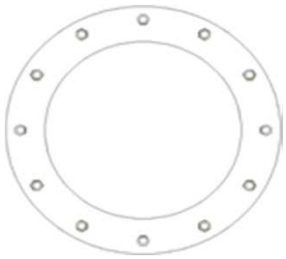
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

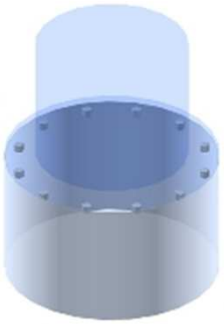
Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor		
ASIF:	1.3333333	





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

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

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

Site Data

BU#: *829046*
Site Name: *Weston*
App #:

Pole Manufacturer:	Pirod

Reactions		
Moment:	66.36	ft-kips
Axial:	5.3	kips
Shear:	8.78	kips
Elevation:	180	feet

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

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	33		

Plate Data		
Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

Flange Bolt Results — Rigid: Service, ASD; Fty*ASIF

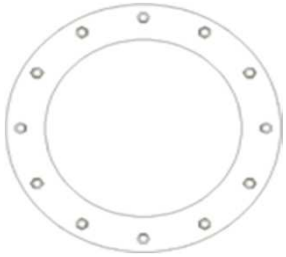
Bolt Tension Capacity, **B**:	46.08	kips	
Max Bolt directly applied T:	3.80	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.398	in	
Min PL "treq" for actual **T w/ Pry**:	0.305	in	
Min PL "t1" for actual **T w/o Pry**:	0.402	in	
T allowable with Prying:	42.99	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	3.80	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	8.2%	**Pass**	

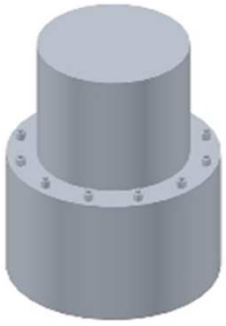
Exterior Flange Plate Results — Flexural Check — Rigid: Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 13.75

Compression Side Plate Stress:	Rohn/Pirod,	OK
Allowable Plate Stress:	36.0	ksi
Compression Plate Stress Ratio:	Rohn/Pirod,	OK
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	6.0%	**Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data	
BU#:	*829046*
Site Name:	*Weston*
App #:	

Manufacturer:	Pirod

Reactions		
Moment:	66.36	ft-kips
Axial:	5.3	kips
Shear:	8.78	kips
Exterior Flange Run, T+Q:	3.8	kips

Elevation: 180 feet

Bolt Data			
Qty:	24		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	33	in	

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

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor	
ASIF:	1.3333333

Interior Flange Bolt Results

Maximum Bolt Tension:	3.8	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	8.2%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	4.2	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

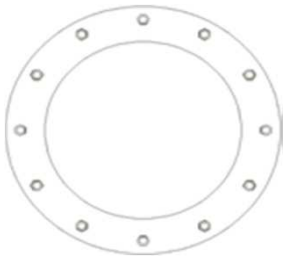
n/a

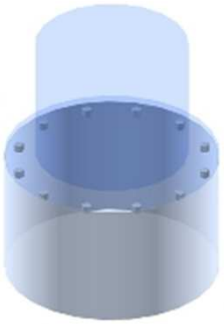
Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A





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

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

Moment Capacity of Rock Anchored Foundation - Wind into Corner

PJF job no. 37515-0537.002

Note: For purposes of this check, max allowable rock anchor cap limited to proved rock anchor cap / lock-off load of 172 kips

Determination of effective rock compression area (for moment loads)

Controlling foundation % Capacity = **63.7%** **OK**

Elevation = **0** feet Total pole plus soil & fdn weight = **370.4** kips

Diagonal dimension = **305.40** in 1/2 x diagonal dimension = **152.70** in

Neutral axis location = **108.70** in (Measured from max. compression fiber)

Therefore c= **108.70** inches and a = β_1 x c = **92.40** inches β_1 = **0.85**

Area of fdn-rock contact, Afr = **8537.1** square inches Net area of Afr = **8447.7** square inches

Centroid of Afr located **243.80** inches from maximum tension fiber of cross-section

Check fdn-rock contact area compression capacity versus actual rock compressive stress

Rock f'c = **277** psi Gross area of rock, Ac = **######** sq. in. $\Sigma T - \Sigma C$ = **0.0**

Total rock anchor load, T_L, on annulus area, ΣT = **732.2** kips

Usable rock and rock anchor compression capacity, SC = **1102.6** kips

Rock contribution to Mn = **4328** ft-kips

Pole / foundation / soil wt contribution to Mn = **1358.1** ft-kips

Cross-section Moment Cap.		
M_{cap} =	12073.9	ft-kips

M_{actual} = **6934** ft-kips (At bottom of pad)

Mact / Mcap = **57.4%**

Rock anchor steel capacity = **200** kips (SF = 2)

Rock anchor % Cap = **49.4%** **OK**

Max rock strain = **0.0015** (SF=2)

Rock % Cap = **63.7%** **OK**

Additional bar reinforcement information

No. of bars, Nb = 4 Number of bar group locations = 3 No. of bars per group location = 1

Separation angle between bar groups = 90 degrees Area of bar = 2.6 sq. in.

Bar edge distance = 44.5 inches (measured to center of bar group) Modulus of elasticity of bar, E_b = 29000 ksi

Bar strain calculations

Assumed rock strain = 0.001663

Location	No. of bar groups, N_{BG}	Dist. to neutral axis	ε (Tension)	Tension per bar, T_B	$T_L = N_{BG} \times T_B$	Mn Contribution
1	1	152.20	0.0023	172.1	172.1	2182.5
2	2	44.00	0.0006	47.3	94.5	346.6
3	1	-64.20	0.0000	0.0	0.0	0.0
4	0	- - -	- - -	- - -	- - -	- - -
5	0	- - -	- - -	- - -	- - -	- - -
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, N_{BG}	ε (C)	Comp. per bar, C_B	$C_L = N_{BG} \times C_B$	Mn Contribution	Area Occupied by Bar
1	1	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	1	-0.0010	-77.5	0.0	0.0	28.27
4	0	- - -	- - -	- - -	- - -	- - -
5	0	- - -	- - -	- - -	- - -	- - -
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

$M_n = \Sigma$ (Load in bar groups x bar group distance to N.A.) = **2529.2** ft-kips

$M_u = \phi M_n = 0.75 \times M_n =$ **1896.9** ft-kips

Bar yield strength = **332.000** kips

Additional bar reinforcement information

No. of bar, Nf = 12 Number of bar group locations = 7 No. of bar per group location = 1

Separation angle between bar groups = 30 degrees Area of bar = 2.6 sq. in.

bar edge distance = 72.1 inches (measured to center of bar group) Modulus of elasticity of bar, Ef = 29000 ksi

Bar strain calculations

(Type of bar = B ("B" for bar, "T" for tape or "L" for laminate)

Assumed rock strain = 0.001663

Location	No. of bar groups, NFG	Dist. to neutral axis	ε (Tension)	Tension per bar, TF	$T_L = N_{FG} \times T_F$	Mn Contribution
1	0	124.60	0.0019	143.7	0.0	0.0
2	2	113.80	0.0017	131.3	262.5	2489.8
3	2	84.30	0.0013	97.2	194.5	1366.2
4	0	44.00	0.0007	50.8	0.0	0.0
5	2	3.70	0.0001	4.3	8.5	2.6
6	2	-25.80	0.0000	0.0	0.0	0.0
7	0	-36.60	0.0000	0.0	0.0	0.0
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, NFG	ε (Comp)	Comp. per bar, CF	$C_L = N_{FG} \times C_F$	Mn Contribution	Area Occupied by bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	2	0.0000	0.0	0.0	0.0	- - -
4	0	0.0000	0.0	0.0	0.0	- - -
5	2	0.0000	0.0	0.0	0.0	- - -
6	2	-0.0004	-29.8	0.0	0.0	28.27
7	0	-0.0006	-42.2	0.0	0.0	28.27
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Mn = S (Load in bar groups x bar group distance to N.A.) = **3858.6** ft-kips

$M_u = \phi M_n = 0.9 \times M_n =$ **3472.8** ft-kips

bar yield strength = **332.000** kips

Rock Anchored Foundation Structural and Overturning Checks

Beam Shear, Tension Side - Wind into corner

b =	151	in	(Critical section at distance of d away from center of anchor, towards face of pier)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	562.7	kips	
% Cap=	22.8%	OK	(Vu adjusted for actual rock bolt load)

Beam Shear, Compression Side - Wind into corner

b =	270.8	in	(Critical section at distance of a plus d away from corner of foundation)
d=	43	in	
f'c=	5000	psi	
Vu=	823.2	kips	(1.3 times SC, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	1399.7	kips	
% Cap=	58.8%	OK	

Punching Shear, Tension Side - Wind into corner

b =	94	in	(Critical section at distance of 0.5d away from center of anchor in all applicable directions)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	700.6	kips	
% Cap=	18.3%	OK	(Adjusted for actual rock bolt load)

Centroid of loads on tension and compression sides of foundation less than distance of d away from face of pier. Therefore, load assumed to be transferred through deep beam type action (bending is negligible)

Overturning / Stability - Worst case assumed to be wind into the side

Rock anchor proof load, PL =	259	kips	(Assumed to be ultimate anchor capacity)
# of anchors in Line 1, N1 =	4		
Line 1 distance to rotation pt, d1 =	13.75	feet	
# of anchors in Line 2, N2 =	4		(Combined anchors on either side of foundation centerline)
Line 2 distance to rotation pt, d2 =	9	feet	
Foundation / pole / soil wt, W =	370.4	kips	
Distance to rotation pt, dw =	9	feet	
Foundation actual OTM, Mo =	6934	ft-k	(At bottom of foundation)
Overturning resistance, Mr =	23682	ft-k	(N1 x d1 x PL + N2 x d2 x [d2/d1 x PL] + W x dw)
% Cap = Mo / 0.5Mr =	58.6%	OK	(Min SF=2)

Note - Overturning % Cap conservative due to:

1) Line of anchors closest to point of overturning not included in calculation
2) Ultimate / maximum anchor capacity likely greater than proof load applied to anchor during installation

Moment Capacity of Rock Anchored Foundation - Wind into Side

PJF job no. 37515-0537.002

Note: For purposes of this check, max allowable rock anchor cap limited to proved rock anchor cap / lock-off load of 172 kips

Determination of effective rock compression area (for moment loads)

Controlling foundation % Capacity = **79.1%** **OK**

Elevation = **0** feet Total pole plus soil & fdn weight = **370.4** kips

Side dimension = **216.00** in 1/2 x diagonal dimension = **108.00** in

Neutral axis location = **68.08** in (Measured from max. compression fiber)

Therefore c= **68.08** inches and a = β_1 x c = **57.87** inches β_1 = **0.85**

Area of fdn-rock contact, Afr = **12499.0** square inches Net area of Afr = **12325.2** square inches

Centroid of Afr located **187.07** inches from maximum tension fiber of cross-section

Check fdn-rock contact area compression capacity versus actual rock compressive stress

Rock f'c = **277** psi Gross area of rock, Ac = **######** sq. in. $\Sigma T - \Sigma C$ = **0.0**

Total rock anchor load, T_L, on annulus area, ΣT = **918.8** kips

Usable rock and rock anchor compression capacity, SC = **1289.2** kips

Rock contribution to Mn = **4205.6** ft-kips

Pole / foundation / soil wt contribution to Mn = **1232.3** ft-kips

Cross-section Moment Cap.		
M_{cap} =	13159.3	ft-kips

M_{actual} = **6934** ft-kips (At bottom of pad)

Mact / Mcap = **52.7%**

Rock anchor steel capacity = **200** kips (SF = 2)

Rock anchor % Cap = **45.3%** **OK**

Max rock strain = **0.0015** (SF=2)

Rock % Cap = **46.8%** **OK**

Additional bar reinforcement information

No. of bars, Nb = 8 Number of bar group locations = 5 No. of bars per group location = 1

Separation angle between bar groups = 45 degrees Area of bar = 2.6 sq. in.

Bar edge distance = -0.187 inches (measured to center of bar group) Modulus of elasticity of bar, E_b = 29000 ksi

Bar strain calculations

Assumed rock strain = 0.0013328

Location	No. of bar groups, N_{BG}	Dist. to neutral axis	ε (Tension)	Tension per bar, T_B	$T_L = N_{BG} \times T_B$	Mn Contribution
1	0	148.11	0.0029	216.2	0.0	0.0
2	2	116.42	0.0022	169.5	338.9	3288.4
3	0	39.92	0.0007	56.5	0.0	0.0
4	2	-36.58	0.0000	0.0	0.0	0.0
5	0	-68.26	0.0000	0.0	0.0	0.0
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, N_{BG}	ε (C)	Comp. per bar, C_B	$C_L = N_{BG} \times C_B$	Mn Contribution	Area Occupied by Bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	0	0.0000	0.0	0.0	0.0	- - -
4	2	-0.0007	-54.0	0.0	0.0	28.27
5	0	-0.0013	-100.8	0.0	0.0	28.27
6	0	- - -	- - -	- - -	- - -	- - -
7	0	- - -	- - -	- - -	- - -	- - -
8	0	- - -	- - -	- - -	- - -	- - -
9	0	- - -	- - -	- - -	- - -	- - -
10	0	- - -	- - -	- - -	- - -	- - -

$M_n = \Sigma$ (Load in bar groups x bar group distance to N.A.) = **3288.4** ft-kips

$M_u = \phi M_n = 0.75 \times M_n =$ **2466.3** ft-kips

Bar yield strength = **332.000** kips

Additional bar reinforcement information

No. of bar, Nf = 20 Number of bar group locations = 11 No. of bar per group location = 1

Separation angle between bar groups = 18 degrees Area of bar = 2.6 sq. in.

bar edge distance = 27.4 inches (measured to center of bar group) Modulus of elasticity of bar, Ef = 29000 ksi

Bar strain calculations

(Type of bar = B ("B" for bar, "T" for tape or "L" for laminate)

Assumed rock strain = 0.0013328

Location	No. of bar groups, NFG	Dist. to neutral axis	ε (Tension)	Tension per bar, TF	$T_L = N_{FG} \times T_F$	Mn Contribution
1	0	120.52	0.0024	177.9	0.0	0.0
2	2	116.58	0.0023	172.1	344.2	3343.6
3	0	105.13	0.0021	155.2	0.0	0.0
4	0	87.30	0.0017	128.9	0.0	0.0
5	2	64.83	0.0013	95.7	191.4	1034.0
6	0	39.92	0.0008	58.9	0.0	0.0
7	2	15.02	0.0003	22.2	44.3	55.5
8	0	-7.45	0.0000	0.0	0.0	0.0
9	0	-25.28	0.0000	0.0	0.0	0.0
10	2	-36.73	0.0000	0.0	0.0	0.0
11	0	-40.68	0.0000	0.0	0.0	0.0
12	0	- - -	- - -	- - -	- - -	- - -
13	0	- - -	- - -	- - -	- - -	- - -

Determination of bar contribution to ultimate moment capacity

Location	No. of bar groups, NFG	ε (Comp)	Comp. per bar, CF	$C_L = N_{FG} \times C_F$	Mn Contribution	Area Occupied by bar
1	0	0.0000	0.0	0.0	0.0	- - -
2	2	0.0000	0.0	0.0	0.0	- - -
3	0	0.0000	0.0	0.0	0.0	- - -
4	0	0.0000	0.0	0.0	0.0	- - -
5	2	0.0000	0.0	0.0	0.0	- - -
6	0	0.0000	0.0	0.0	0.0	- - -
7	2	0.0000	0.0	0.0	0.0	- - -
8	0	-0.0001	-11.0	0.0	0.0	28.27
9	0	-0.0005	-37.3	0.0	0.0	28.27
10	2	-0.0007	-54.2	0.0	0.0	28.27
11	0	-0.0008	-60.0	0.0	0.0	28.27
12	0	- - -	- - -	- - -	- - -	- - -
13	0	- - -	- - -	- - -	- - -	- - -

Mn = S (Load in bar groups x bar group distance to N.A.) = **4433.1** ft-kips

$M_u = \phi M_n = 0.9 \times M_n =$ **3989.8** ft-kips

bar yield strength = **332.000** kips

Rock Anchored Foundation Structural and Overturning Checks

Beam Shear, Tension Side - Wind into Side

b =	216.00	in	(Equal to width of mat)
d=	31	in	
f'c=	5000	psi	
Vu=	471.3	kips	(1.3 times max proven anchor capacity, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	804.9	kips	
% Cap=	58.6%	OK	

Beam Shear, Compression Side - Wind into Side

b =	216.0	in	(Equal to width of mat)
d=	43	in	
f'c=	5000	psi	
Vu=	883.1	kips	(1.3 times SC, adjusted for overall foundation % Capacity)
ϕ=	0.85		
ϕVc=	1116.5	kips	
% Cap=	79.1%	OK	

Punching Shear, Tension Side - Wind into Side

b =	94	in	(Critical section at distance of 0.5d away from center of anchor in all applicable directions)
d=	31	in	
f'c=	5000	psi	
Vu=	223.6	kips	(Assumed to be 1.3 times max proven anchor capacity)
ϕ=	0.85		
ϕVc=	700.6	kips	
% Cap=	16.8%	OK	(Adjusted for actual rock bolt load)

Centroid of loads on tension and compression sides of foundation less than distance of d away from face of pier. Therefore, load assumed to be transferred through deep beam type action (bending is negligible)

Overturning / Stability - Worst case assumed to be wind into the side

Rock anchor proof load, PL =	259	kips	(Assumed to be ultimate anchor capacity)
# of anchors in Line 1, N1 =	4		
Line 1 distance to rotation pt, d1 =	13.75	feet	
# of anchors in Line 2, N2 =	4		(Combined anchors on either side of foundation centerline)
Line 2 distance to rotation pt, d2 =	9	feet	
Foundation / pole / soil wt, W =	370.4	kips	
Distance to rotation pt, dw =	9	feet	
Foundation actual OTM, Mo =	6934	ft-k	(At bottom of foundation)
Overturning resistance, Mr =	23682	ft-k	(N1 x d1 x PL + N2 x d2 x [d2/d1 x PL] + W x dw)
% Cap = Mo / 0.5Mr =	58.6%	OK	(Min SF=2)

Note - Overturning % Cap conservative due to:

1) Line of anchors closest to point of overturning not included in calculation
2) Ultimate / maximum anchor capacity likely greater than proof load applied to anchor during installation

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

T-Mobile Existing Facility

Site ID: CT11118C

Weston/ Rt-57/ Norfield R
56 Norfield Road
Weston, CT 06883

April 8, 2015

EBI Project Number: 6215002469

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	48.97 %

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

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April 8, 2015

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

Emissions Analysis for Site: **CT11118C – Weston/ Rt-57/ Norfield R**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **56 Norfield Road, Weston, 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 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 **56 Norfield Road, Weston, 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 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Ericsson AIR21 B4A/B12P** for 2100 MHz (AWS) and 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B4A/B12P** has a maximum gain of **15.9 dBd** at its main lobe at 2100 MHz **13.6 dBd** at its main lobe at 700 MHz. 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 **170 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 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	170	Height (AGL):	170	Height (AGL):	170
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	# PCS Channels:	4
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%	0.62	Antenna B1 MPE%	0.62	Antenna C1 MPE%	0.62
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B12P	Make / Model:	Ericsson AIR21 B4A/B12P	Make / Model:	Ericsson AIR21 B4A/B12P
Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd
Height (AGL):	170	Height (AGL):	170	Height (AGL):	170
Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power:	150	Total TX Power:	150	Total TX Power:	150
ERP (W):	5,355.80	ERP (W):	5,355.80	ERP (W):	5,355.80
Antenna A2 MPE%	0.82	Antenna B2 MPE%	0.82	Antenna C2 MPE%	0.82

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**4.33**
Town Fire Dept	2.46 %
Town Fire Dept	1.52 %
Town of Weston	2.97 %
EMS	2.97 %
Town of Weston	2.93 %
Sprint	1.96 %
AT&T	5.46 %
Verizon Wireless	24.37 %
Site Total MPE %:	**48.97 %**

T-Mobile Sector 1 Total:	1.44 %
T-Mobile Sector 2 Total:	1.44 %
T-Mobile Sector 3 Total:	1.44 %
Site Total:	48.97 %

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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:	1.44 %
Sector 2:	1.44 %
Sector 3 :	1.44 %
T-Mobile Total:	4.33 %
Site Total:	48.97 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **48.97%** 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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