Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

March 30, 2017

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

RE: **Notice of Exempt Modification for Sprint PCS / Crown Site BU: 876360**
Sprint Site ID: CT23XC411
Located at: 389 Rt. 2, Preston, CT 06365
Latitude: 41° 29′ 25.25″ / Longitude: -71° 59′ 29.55″

Dear Ms. Bachman,

Sprint currently maintains six (6) antennas at the 147-foot level of the existing 147-foot monopole at 389 Rt. 2, Preston, CT. The tower is owned by Crown Castle. The property is owned by the Town of Preston. Sprint now intends to replace six (6) antennas with three (3) new antennas, and add three (3) hybriflex cables and six (6) RRHs. Sprint also intends to remove six (6) 1-5/8" coax lines. The antennas would be installed at the same 147-foot level of the tower.

In a conversation with the Town of Preston Planning and Zoning Department, the tower is an approved structure and no conditions were placed on the tower by the town. The Town does not have an original approval for the construction of the tower.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to First Selectman Robert Congdon, Kathy B. Warzecha-Town Planner, the property owner and the tower owner.

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

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

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

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

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

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

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

Sincerely,

Amanda Cornwall
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
339-205-7017
Amanda.Cornwall@crowncastle.com
Attachments:

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: First Selectman Robert Congdon (Property Owner)
389 Route 2
Preston, CT 06365

Kathy B. Warzecha
Town Planner
389 Route 2
Preston, CT 06365

Crown Castle (Tower Owner)
12 Gill Street, Suite 5800
Woburn, Ma 01801

Town of Preston
Property Listing Report

Parcel ID 24-0-2-389

Account 00173000

Property Information

Owner	PRESTON TOWN OF
Address	389 ROUTE 2
Mailing Address	389 ROUTE 2 PRESTON , CT 06365
Land Use	9035 - MUN TOWN MDL-96
Land Class	E

Census Tract	7001
Neighborhood	8000
Zoning	R-C
Acreage	25.86
Utilities	Well,Septic
Lot Setting/ Desc	Rural / Low

Photo

No Photo Available

PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings	459200	321400
Outbuildings	12900	9100
Improvements	477300	334100
Extras	5200	3600
Land	438450	306800
Total	915750	640900
Previous		

Construction Details

Year Built	1974
Stories	1
Building Style	City/Town Hall
Building Use	Comm/Ind
Building Condition	Average
Total Rooms	
Bedrooms	
Full Bathrooms	3
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable/Hip
Roof Cover	Asph/F Gls/Cmp

EXTERIOR WALLS:	
Primary	Brick/Masonry
Secondary	
INTERIOR WALLS:	
Primary	Drywall/Sheet
Secondary	
FLOORS:	
Primary	Inlaid Sht Gds
Secondary	
HEATING/AC:	
Heating Type	Electr Basebrd
Heating Fuel	Electric
AC Type	None

BUILDING AREA:	
Effective Building Area	
Gross Building Area	7056
Total Living Area	5292

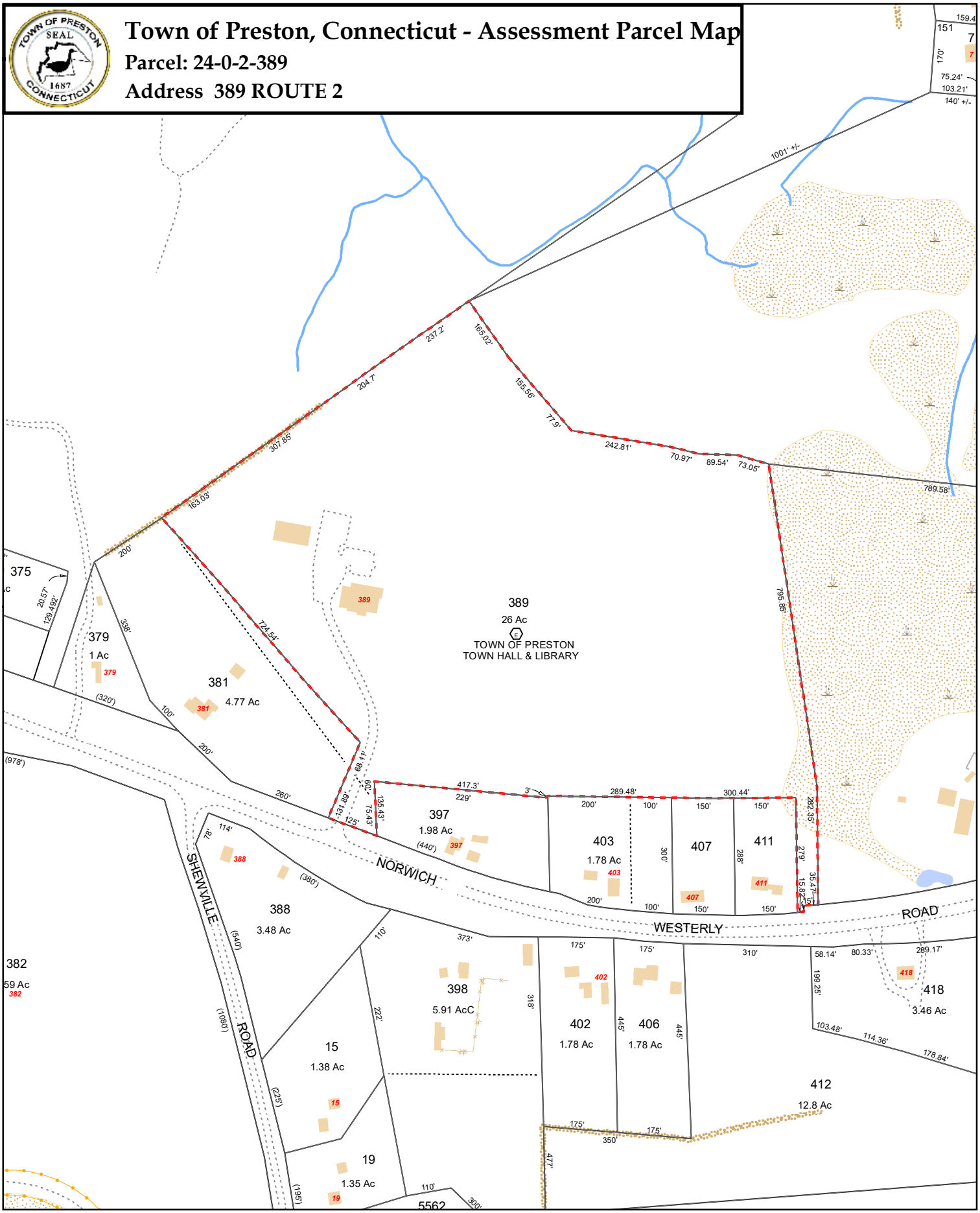
SALES HISTORY:	
Sale Date	9/26/1973
Sale Price	17500
Book/ Page	56/ 174

Report Created On 1/17/2017

Town of Preston, Connecticut - Assessment Parcel Map

Parcel: 24-0-2-389

Address 389 ROUTE 2



Approximate Scale: **1:3,600**

0 62.5125 250 375 500

Feet

Map Produced:
November 2016

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The Town of Preston and its mapping contractors assume no legal responsibility for the information contained herein.

Sprint

SPRINT SITE NUMBER: CT23XC411
SPRINT SITE NAME: ---
SITE TYPE: MONOPOLE
TOWER HEIGHT: 147'-0"

CROWN CASTLE BU #: 876360
SITE ADDRESS: 389 RT. 2 PRESTON, CT 06365
COUNTY: NEW LONDON
JURISDICTION: TOWN OF PRESTON

SPRINT 2016-2017 LOCAL ASK INITIATIVE

SITE INFORMATION

CROWN CASTLE SITE NAME:	PRESTON / TOWN HALL
SITE ADDRESS:	389 RT. 2 PRESTON, CT 06365
COUNTY:	NEW LONDON
MAP/PARCEL #:	PRES-000017-003000
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 29' 25.25"
LONGITUDE:	-71° 59' 29.55"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	138 FT.
CURRENT ZONING:	R-C
JURISDICTION:	TOWN OF PRESTON
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	VB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TOWN OF PRESTON TOWN HALL 389 RTE 2 PRESTON, CT 06365-8830
TOWER OWNER:	GLOBAL SIGNAL ACQUISITIONS II LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	SPRINT 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251-2650
CROWN CASTLE APPLICATION ID:	363243
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-2000
TELCO PROVIDER:	AT&T (866) 620-6900

PROJECT TEAM

CROWN CASTLE A&E FIRM:
CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
CROWNAE.APPROVAL@CROWNCASTLE.COM

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

MARYELLEN PERROTTA - PROJECT MANAGER
(781) 970-0057
JASON D'AMICO - CONSTRUCTION MANAGER
(860) 209-0104

WILLIAM STONE - A&E PROJECT MANAGER
WILLIAM.STONE.CONTRACTOR@CROWNCASTLE.COM
(518) 373-3543

SPRINT CONTACT:

FLORENCE NICOLAS
FLORENCE.NICOLAS@SPRINT.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
T-3	GENERAL NOTES
C-1	ENLARGED SITE PLAN
C-2	EXISTING AND NEW ELEVATION
C-3	ANTENNA PLANS AND SCHEMATIC
C-4	CONDUIT ROUTING SCHEMATIC
C-5	INSTALLATION SPECS AND DETAILS
C-6	PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

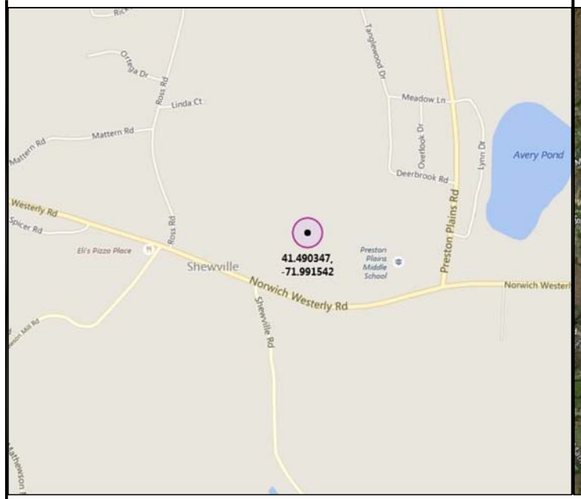
- REMOVE (6) ANTENNAS
- REMOVE (6) 1-5/8" COAX CABLES
- RELOCATE (3) RRHs FROM GROUND TO TOWER
- INSTALL (3) ANTENNAS
- INSTALL (3) 1-1/4" HYBRID CABLES
- INSTALL (3) RRHs
- INSTALL (1) JUNCTION BOX

DESIGN PACKAGE BASED ON RF DATA SHEET
VERSION: 3.15
ISSUED: 10/04/16

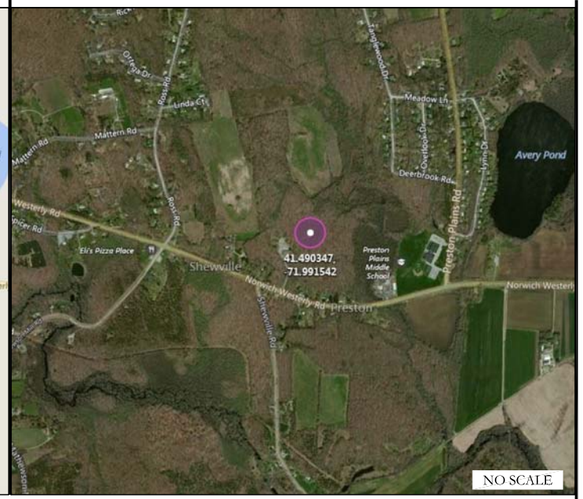
DESIGN PACKAGE BASED ON THE APPLICATION
ID: 363243
REVISION: 6

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

VICINITY MAP



AERIAL MAP



NO SCALE

DRIVING DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
EXIT BRADLEY INTERNATIONAL AIRPORT VIA SHOEPHOESTER RD TOWARD CT-20 E. CONTINUE ONTO CT-20 E/BRADLEY INTERNATIONAL AIRPORT CON, THEN USE THE RIGHT TWO LANES TO MERGE ONTO I-91 S TOWARD HARTFORD. USE THE LEFT LANE TO TAKE EXIT 30 FOR I-84 E TOWARD CT-2/EAST HARTFORD/NEW LONDON. MERGE ONTO I-84 E THEN TAKE EXIT 55 FOR CT-2 E TOWARD NORWICH/NEW LONDON/I-84 E. CONTINUE ONTO CT-2 E THEN AFTER APPROXIMATELY 23 MILES, KEEP LEFT AT THE FORK TO CONTINUE ON CT-2 E/HWY 2 E. AFTER APPROXIMATELY 13 MILES, TAKE THE CT-2 E/CT-32 S EXIT TOWARD NORWICH/HARBOR AREA/DOWNTOWN. TURN RIGHT ONTO CT-2 E/CT-32 S/WASHINGTON ST THEN TURN RIGHTONTO WATER ST. CONTINUE ONTO N MAIN ST/VIADUCT RD THEN TURN RIGHT ONTO MAIN ST. CONTINUE ONTO PALMER ST THEN MAKE A SLIGHT LEFT ONTO CT-2 E/STONINGTON RD. TURN LEFT ONTO HALL RD, SITE ACCESS IS IN THE EASTERN CORNER OF THE NORTH PARKING LOT.

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2016 CONNECTICUT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS
MECHANICAL	2016 CONNECTICUT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS
ELECTRICAL	2016 CONNECTICUT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS

REFERENCE DOCUMENTS:
STRUCTURAL ANALYSIS: B+T GROUP DATED FEBRUARY 21, 2017

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811

APPROVALS

APPROVAL	SIGNATURE	DATE
SITE ACQ. & ZONING		
CONSTRUCTION MGR		
A&E MGR		
PLANNING CONSULTANT		
RF MGR		
PROPERTY OWNER		
SPRINT REP.		

Sprint

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

SPRINT SITE NUMBER:
CT23XC411

BU #: **876360**
PRESTON / TOWN HALL

389 RT. 2
PRESTON, CT 06365

EXISTING 147'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	11/17/16	CJ	PRELIMINARY	LR
0	01/05/17	ZTK	CONSTRUCTION	JL
1	02/28/17	CJ	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
1B4005B2547C41D...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

3/1/2017 | 8:50:47 AM EST

Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: T-1
REVISION: 1

CROWN CASTLE SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR 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 SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR 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 AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. 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.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS 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.
11. THE AREAS OF THE OWNERS 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 AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

SPRINT CONSTRUCTION NOTES

SECTION 01 100 – SCOPE OF WORK

THE WORK:

MUST COMPLY WITH ALL APPLICABLE ADOPTED CODES AND STANDARDS, AND PORTIONS THEREOF. SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

PRECEDENCE:

SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS. INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

SITE FAMILIARITY:

CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:

THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUITE JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:

CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE FOR DISTRIBUTION OF LATEST MOPS.

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF FIBER CABLE
F. INSTALLATION OF RRU'S
G. CABLING
H. TS-0200 REV 5 – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
J. COMMISSIONING MOPS

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS.

B. CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

C. CONTRACTOR IS RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

SECTION 01 300 – CELL SITE CONSTRUCTION

NOTICE TO PROCEED:

NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

SITE CLEANLINESS:

CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

SECTION 01 400 – SUBMITTALS AND TESTS

ALTERNATIVES:

AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER TS-200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT: PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS – ANTENNA ALIGNMENT TOOL (AAT)
2. SWEEP AND FIBER TESTS.
3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT.
4. ALL AVAILABLE JURISDICTIONAL PERMIT AND OCCUPANCY INFORMATION.
5. PDF SCAN OF REDLINES PRODUCED IN FIELD.
6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE IN ELECTRONIC AS-BUILT DRAWING PRODUCTION.
7. LIEN WAIVERS.
8. FINAL PAYMENT APPLICATION.
9. REQUIRED FINAL CONSTRUCTION PHOTOS.
10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS.
11. APPLICABLE POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINT'S DOCUMENT REPOSITORY OF RECORD).
12. CLOSEOUT PHOTOGRAPHS AND CLOSEOUT CHECKLIST: SPRINT WILL PROVIDE SEPARATE GUIDANCE.

a. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING LIST. ADDITIONAL PHOTOS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCESSES
(i) BACK MAIN FIBER CABLE ROUTE (MINIMUM TWO PHOTOS)
(ii) OF EACH ANTENNA AND RRU
(iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT
(iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRU'S AND RBS (DOOR OPEN)
(v) RBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS
(vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED
(vii) BREAK OUT CYLINDERS
(viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS
(ix) RADIATION EXPOSURE WARNING SIGNS
(x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY RAD CENTER OF ANY NEW ANTENNA AT HORIZON.

b. LOAD PHOTOS TO SITERRA PROJECT LIBRARY 15. IN 15 CREATE NEW CATEGORY; 2.5 DEPLOYMENT, AND SECTION; PERMANENT CONSTRUCTION. LABEL PHOTOS WITH SITE CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE PHOTOS SHALL BE GPS ENABLED SUCH THAT THE GPS COORDINATES ARE INCLUDED IN THE PHOTO MEDIA-FILE INFORMATION.

COMMISSIONING:

PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:

PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTION WHENEVER POSSIBLE.

B. WATER TANKS: TOUCH UP – PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT".
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 – ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

NV FIBER CABLE:

EXISTING NV FIBER CABLE WILL BE USED AT EACH SITE. CABLE SHALL BE USED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTIONS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2" FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MINIMUM LENGTH FOR JUMPER SHALL BE SO AS TO ALLOW FOR THE PROPER BEND RADIUS PER MANUFACTURER OR SPRINT SPECIFICATIONS.

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH AND FEED ORIENTATION INFORMATION SHALL BE AS DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE CONSTRUCTION DRAWINGS.

FIBER CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAT THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

a. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

1. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

2. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

3. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY A ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

Sprint

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

SPRINT SITE NUMBER:
CT23XC411

BU #: **876360**
PRESTON / TOWN HALL

389 RT. 2
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EXISTING 147'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	11/17/16	CJ	PRELIMINARY	LR
0	01/05/17	ZTK	CONSTRUCTION	JL
1	02/28/17	CJ	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
1B4005B2547C41D...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

3/1/2017 | 8:50:47 AM EST

Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: T-2
REVISION: 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

C. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE CONSTRUCTION DRAWINGS.

FIBER CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAT THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

b. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

3. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

4. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.

6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.

7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 – INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING:

A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

SECTION 26 100 – BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTING ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE NEW USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PROVIDE PRODUCTS BY THE FOLLOWING:

1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS AND CONSTRUCTION FEATURES AS FOLLOWS:

1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL. DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS IN WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
2. USE VIBRATION AND SHOCK-RESISTANT FASTNERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 – ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. ALL UNDERGROUND CONDUIT OR CONDUIT IN CONCRETE SHOULD BE PVC. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATIONS C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED HUB SHALL INCLUDE LOCK NUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075, OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION, PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMET. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO-HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CONSTRUCTION MANAGER FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

ADDITIONAL REQUIRED NOTES:

- GC IS RESPONSIBLE FOR HIRING ALL 3RD PARTY SPECIAL INSPECTIONS AS REQUIRED PER MUNICIPALITY
- GC IS RESPONSIBLE FOR VERIFYING ALL FIELD MEASUREMENTS PRIOR TO STARTING CONSTRUCTION
- DO NOT OPEN RRU PACKAGES IN THE RAIN
- NO OPEN FLAME ON SITE
- GC TO ENSURE HYBRIDS ARE SUPPORTED EVERY 3'-0" ON HORIZONTAL AND 4'-0" ON VERTICAL RUNS

Sprint

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

SPRINT SITE NUMBER:
CT23XC411

BU #: **876360**
PRESTON / TOWN HALL

389 RT. 2
PRESTON, CT 06365

EXISTING 147'-0" MONOPOLE

ISSUED FOR:

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A	11/17/16	CJ	PRELIMINARY	LR
0	01/05/17	ZTK	CONSTRUCTION	JL
1	02/28/17	CJ	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
1B40058254704D...

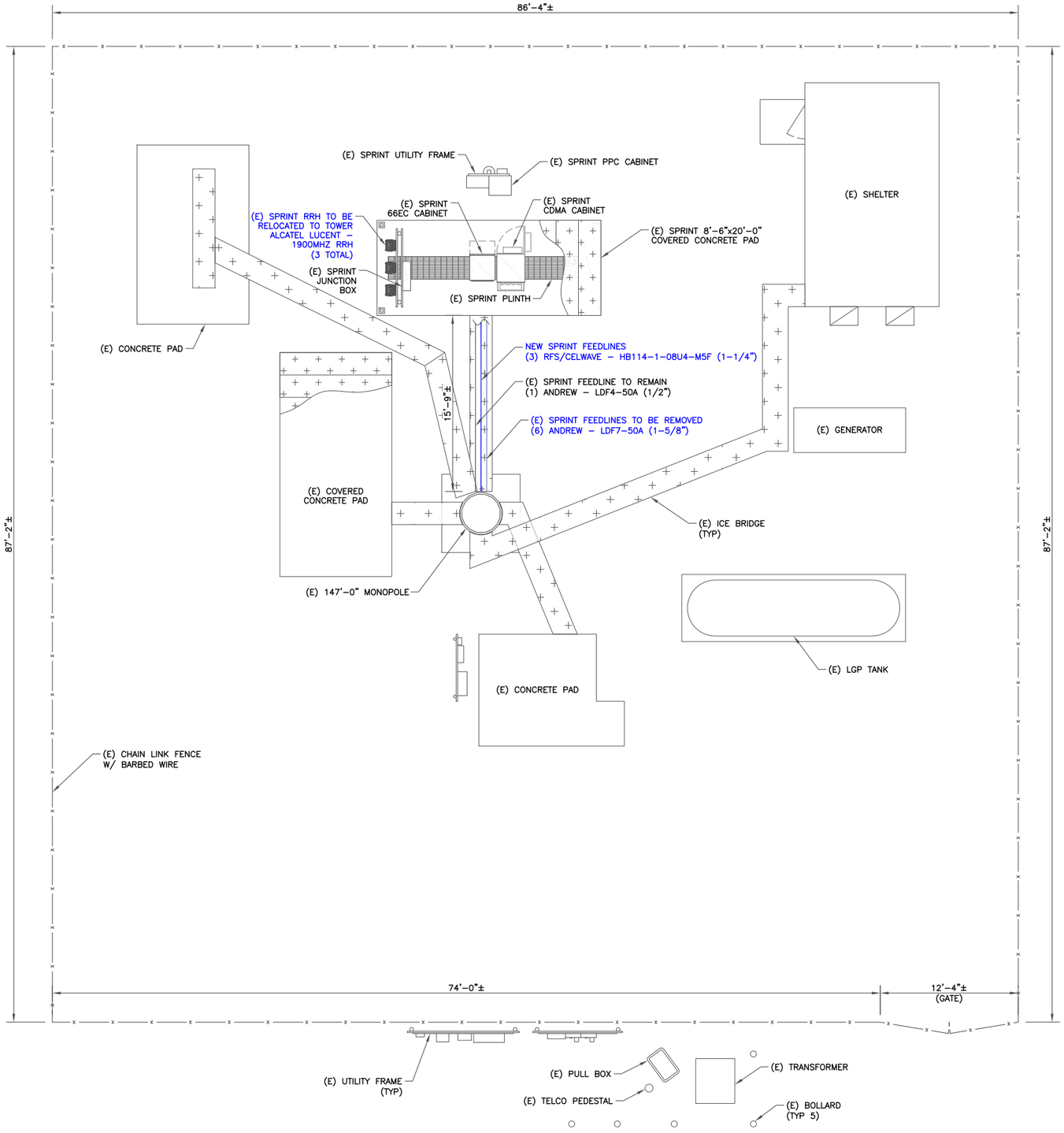
STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

3/1/2017 | 8:50:47 AM EST

Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: T-3

REVISION: 1



1 ENLARGED SITE PLAN

SCALE: 4' 2' 0 4' 3/16"=1'-0" (FULL SIZE) 3/32"=1'-0" (11x17)

N

Sprint

CROWN CASTLE
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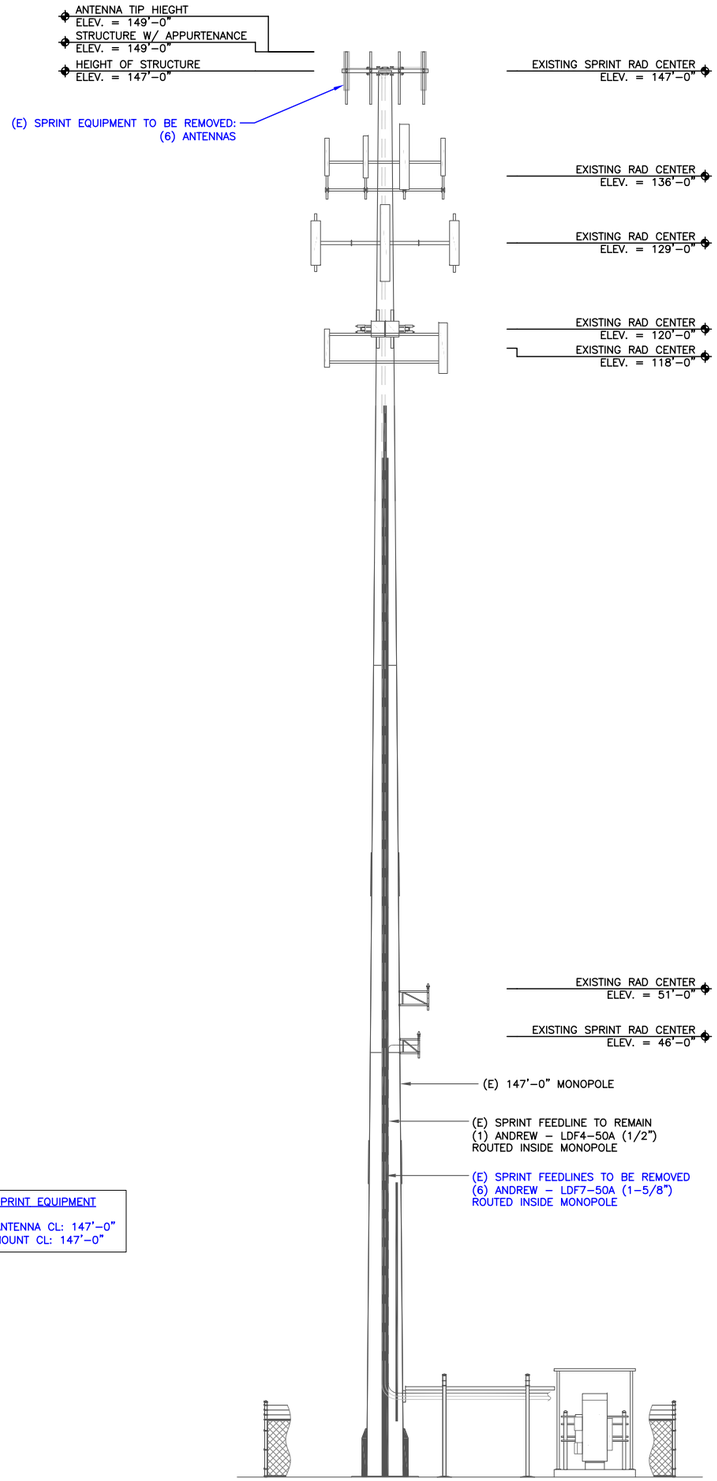
Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: C-1

REVISION: 1



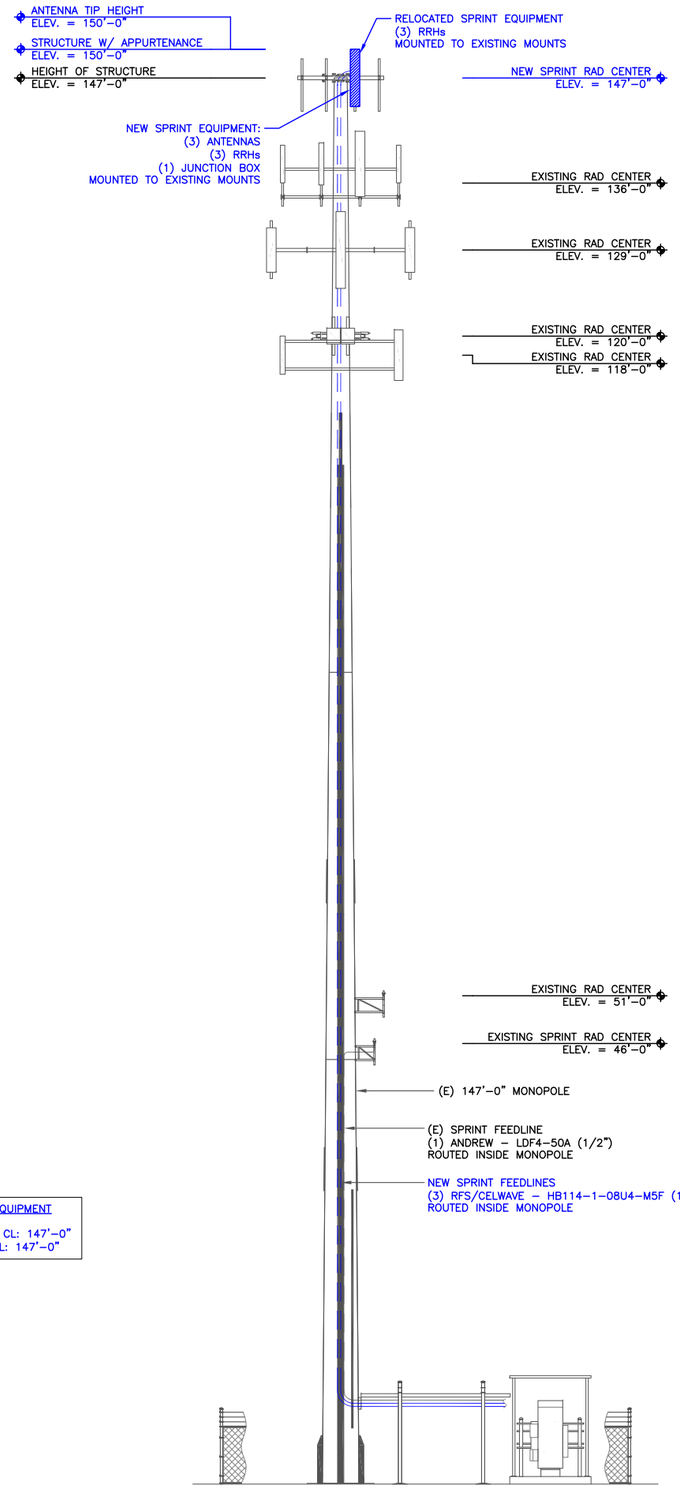
SPRINT EQUIPMENT

ANTENNA CL: 147'-0"
MOUNT CL: 147'-0"

1 EXISTING ELEVATION
SCALE: NOT TO SCALE

INSTALLER NOTE:

DIRECT TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ CLIMBING PEGS/STEPS AND SAFETY CLIMB.



SPRINT EQUIPMENT

ANTENNA CL: 147'-0"
MOUNT CL: 147'-0"

2 FINAL ELEVATION
SCALE: NOT TO SCALE

Sprint

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PRESTON, CT 06365

EXISTING 147'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	11/17/16	CJ	PRELIMINARY	LR
0	01/05/17	ZTK	CONSTRUCTION	JL
1	02/28/17	CJ	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
1B4005B2547C41D...

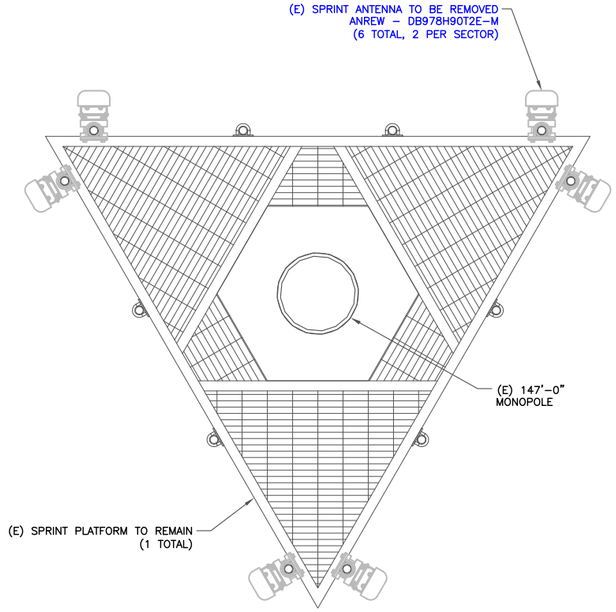
STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

3/1/2017 | 8:50:47 AM EST

Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: C-2

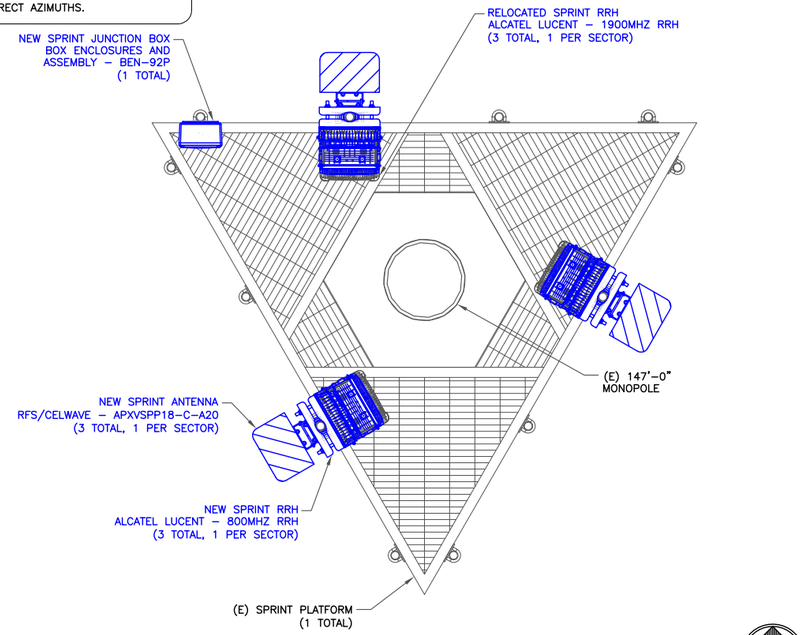
REVISION: 1



1 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

INSTALLER NOTE:

CONTRACTOR TO REFERENCE LATEST RFDS FOR CORRECT AZIMUTHS.

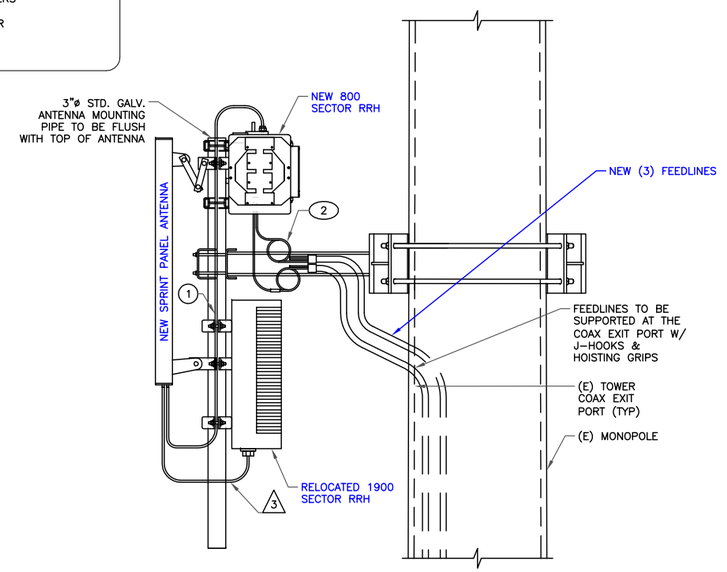


2 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

KEYED CABLE LEGEND

1. 1/2" RF JUMPERS
2. ETHERNET/FIBER
3. RET



4 800/1900 ANTENNA SCHEMATIC
SCALE: NOT TO SCALE

Sprint

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

SPRINT SITE NUMBER:
CT23XC411

BU #: **876360**
PRESTON / TOWN HALL

389 RT. 2
PRESTON, CT 06365

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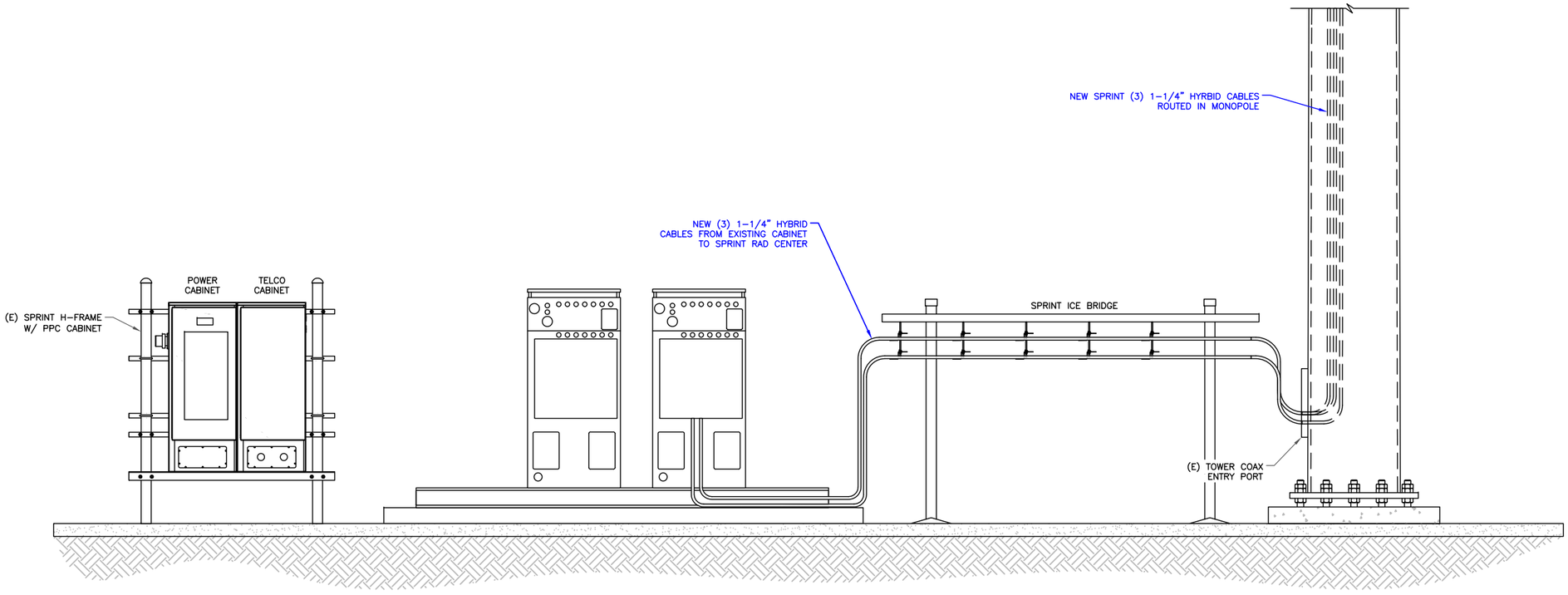
SHEET NUMBER: C-3

REVISION: 1



1 CONDUIT ROUTING SCHEMATIC
SCALE: NOT TO SCALE

Sprint

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

SPRINT SITE NUMBER:
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SHEET NUMBER: C-4

REVISION: 1

REV. 0 7/25/16

SPRINT CONSTRUCTION SPECIFICATIONS
MINI–MACRO CELL SITES

1) BASIC REQUIREMENTS
- a) MEET ALL REQUIREMENTS OF JURISDICTIONS.
- b) IF EQUIPMENT FURNISHED BY THE COMPANY DOES NOT MATCH THE EQUIPMENT LISTED ON THE RFDS AND SHOWN ON THE PERMITTING DRAWINGS, RESOLVE DISCREPANCY THROUGH INSTALLER'S CONSTRUCTION MANAGER AND COMPANY'S POINT OF CONTACT
- c) CABLE INSTALLATIONS
  - i) ALL CABLES MUST BE OUTDOOR RATED AND HAVE UV RESISTANT OUTER JACKETS
  - ii) CABLE BENDS MUST NOT EXCEED MANUFACTURER'S ALLOWABLE CABLE BEND RADII
  - iii) AT RADIOS INSTALL SERVICE LOOPS FOR POWER, FIBER, AND ETHERNET SECURED AT LEAST TWICE 180° TO THE STRUCTURE
  - iv) SPARE FIBERS MUST BE ENCASED IN A LOW PROFILE WEATHERTIGHT ASSEMBLY
- d) FIBERS MUST BE FIELD–TERMINATED WITH LC TYPE CONNECTORS
- e) CONDUITS IN EARTH: PROVIDE PVC. CONDUITS EXPOSED IN FACILITIES: PROVIDE RGS. HAND DIG TRENCHES IN COMPOUNDS
- f) SECURE AND SUPPORT CONDUITS AND CABLES ON NO MORE THAN 48" INTERVALS
- g) ON TOWER SITES RGS CONDUITS MAY BE SURFACE MOUNTED AWAY FROM WALKWAYS AND ACCESS/EGRESS PATHS. IF INSTALLATIONS IN WALKWAYS AND ACCESS/EGRESS PATHS CANNOT BE AVOIDED, IDENTIFY THE CONDUIT ENVELOPE/TRIP HAZARD BY ALTERNATING YELLOW AND BLACK STRIPES PAINTED ON CONCRETE AND CONDUIT.

2) SPRINT – FURNISHED EQUIPMENT
- a) INSTALL THE FOLLOWING EQUIPMENT AT LOCATIONS AND AZIMUTHS SHOWN ON THE CONSTRUCTION DRAWINGS.
  - i) PANEL ANTENNAS
  - ii) RADIOS
  - iii) GPS ANTENNAS
  - iv) FILTERS
  - v) 120 VOLT DIN–RAIL CIRCUIT BREAKER ASSEMBLY

3) TOWER INSTALLATIONS
- a)MEET ALL REQUIREMENTS OF THE TOWER OWNER
- b) INSTALL CORRUGATED FLEXIBLE CONDUIT UP THE TOWER TO COMPANY'S RAD CENTER
- c) PROVIDE HANGING GRIPS OR CONDUIT CLAMPS AND ENSURE CONDUITS AS WELL AS INNER CABLES ARE SUPPORTED
- d) CONDUIT RISERS: AT THE TOP OF THE TOWER TURN CONDUIT DOWN AND PROVIDE CABLE TERMINATION FITTINGS. EXTEND CABLES TO RADIOS EXPOSED AND SECURED TO THE STRUCTURE, AT CONDUIT EXIT FROM TOWER, PROVIDE DRIP LOOPS AND WEEP HOLES.
- e) AT THE ICE BRIDGE RUN CABLES IN RGS CONDUIT. UTILIZE CONDULETS TO MAKE COMPACT 90 DEGREE TURNS

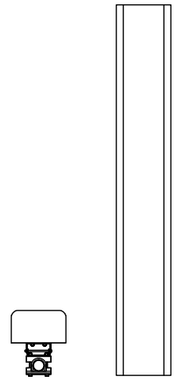
4) AC POWER TIE–IN
- a) INSTALL SPRINT'S 120 VOLT DIN–RAIL CIRCUIT BREAKER ASSEMBLY IN THE EXISTING POWER PROTECTION CABINET TELCO SECTION
- b) INSTALL A 20 AMPERE MOLDED CASE CIRCUIT BREAKER IN AVAILABLE SPACE IN THE ADJACENT PPC POWER SECTION LOAD CENTER

5) GROUNDING
- a) 120 VOLT CIRCUITS: POWER CABLES MUST BE 3–WIRE WITH EQUIPMENT GROUNDING CONDUCTOR
- b) SUPPLEMENTAL GROUNDING: ALL GROUNDING HARDWARE MUST BE UL STAMPED AS SUITABLE FOR GROUNDING HARDWARE
- c) RADIOS: BOND RADIO TO THE TOWER TOP OR SECTOR GROUND BAR WITH #6 BARE TINNED COPPER WIRE (GREEN INSULATED ON ROOFTOPS)
- d) DIN–RAIL CIRCUIT BREAKER ASSEMBLY: BOND SURGE ARRESTOR TO PPC TELCO BOARD GROUND BAR

6) MINOR MATERIALS
- a) CONDUIT
  - i) RIGID GALVANIZED STEEL CONDUIT (RGS): UL LISTED, COMPLIANT WITH ANSI STANDARD C80, HOT–DIP GALVANIZED, WITH THREADED FITTINGS. MANUFACTURERS: ALLIED, REPUBLIC, WHEATLAND, OR EQUAL.
  - ii)CORRUGATED FLEXIBLE CONDUIT: DURALINE OR EQUAL.
  - iii) LIQUID–TIGHT FLEXIBLEMETALLIC CONDUIT (LFMC): UL LABLED, UC RESISTANT, FLAME RETARDANT PVC JACKET, HOT–DIP GALVANIZED, GREY. MANUFACTURERS: AFC, ANACONDA, SOUTHWIRE, OR EQUAL.
  - iv) PVC CONDUIT: SCHEDULE 40. CARLON OR EQUAL
  - v) CABINET HUBS AND CABLE TERMINATION FITTINGS: OZ GEDNEY OR ROXTEC
- b) COAXIAL CABLE JUMPERS: ½" LDF–4 MANUFACTURERS: COMMSCOPE, RFS OR FCT.
- c)FASTENERS AND HARDWARE
  - i) TO SECURE RACEWAYS, UTILIZE NON CORRODING NON–MAGNETS METALLIC FASTENERS AND HARDWARE SUITABLE FOR THE PURPOSE
- d) POWER CABLES – 3/C #12 SOOW BY SOUTHWIRE OR EQUAL
- e) ETHERNET CABLES AND CONNECTORS: OUTDOOR RATED, CAT 5E, BELDEN OR EQUAL
- f) FIBER CABLES: CORNING "FREEDOM FAN OUT" OUTDOOR RISER CABLE, 4F, SINGLE MODE, OR EQUAL
- g) RF TRANSPARENT PAINT FOR ANTENNA CONCEALMENT: SELECT NO/LOW CARBON PAINTS, WITH NO/LOW TITANIUM DIOXIDE, AND WITHOUT SUSPENDED METAL PARTICLES (ALUMINUM, ZINC, COPPER, ETC)

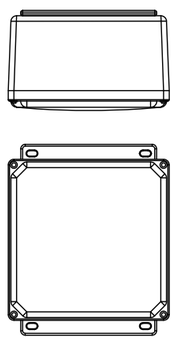
7) COLOR CODING
- a) COLOR CODE CABLES AND CONDUITS AS REQUIRED BY SPRINT STANDARD TS–0200

8) TESTING AND CONSTRUCTION COMPLETE
- a) SWEEP ALL COAXIAL CABLES ACCORDING TO SPRINT STANDARD TS–0200
- b) PANEL ANTENNA ALIGNMENT – USING ELECTRONIC ALIGNMENT TOOL. AZIMUTH/DOWNTILT +/– 1 DEGREE
- c) LEAVE EQUIPMENT DE–ENERGIZED UNTIL INSTRUCTED BY THE COMMISSIONING AND INTEGRATION TEAM TO ENERGIZE
- d) OTHER REQUIREMENTS AND DELIVERABLES MAY BE REQUIRED BEFORE THE CONSTRUCTION COMPLETE MILESTONE CAN BE ACTUALIZED IN SITERRA (SPRINT'S DATABASE–OF–RECORD).



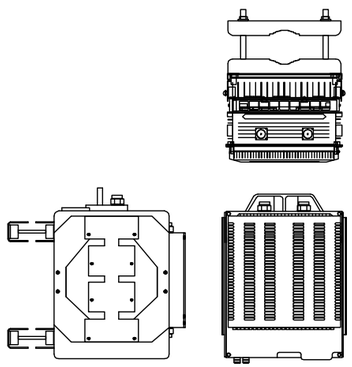
RFS/CELWAVE – APXVSPP18–C–A20
WEIGHT (WITHOUT MOUNTING HARDWARE): 92.0 LBS
SIZE (HxWxD): 72.0x11.8x7.9 IN.
MOUNTING HARDWARE: APM40–2 DOWNTILT KIT
MOUNTING HARDWARE WEIGHT: 7.5 LBS

1 RFS/CELWAVE – APXVSPP18–C–A20
SCALE: NOT TO SCALE



BOX ENCLOSURES AND ASSEMBLY – BEN–92P
WEIGHT (WITHOUT MOUNTING HARDWARE): 2.2 LBS
SIZE (HxWxD): 9.7x12.8"x6.3 IN.

2 BOX ENCLOSURES AND ASSEMBLY – BEN–92P
SCALE: NOT TO SCALE



ALCATEL LUCENT – 800MHZ RRH
WEIGHT (WITHOUT MOUNTING HARDWARE): 53.0 LBS
SIZE (HxWxD): 19.7x13.0x10.8 IN.

3 ALCATEL LUCENT – 800MHZ RRH
SCALE: NOT TO SCALE

Sprint

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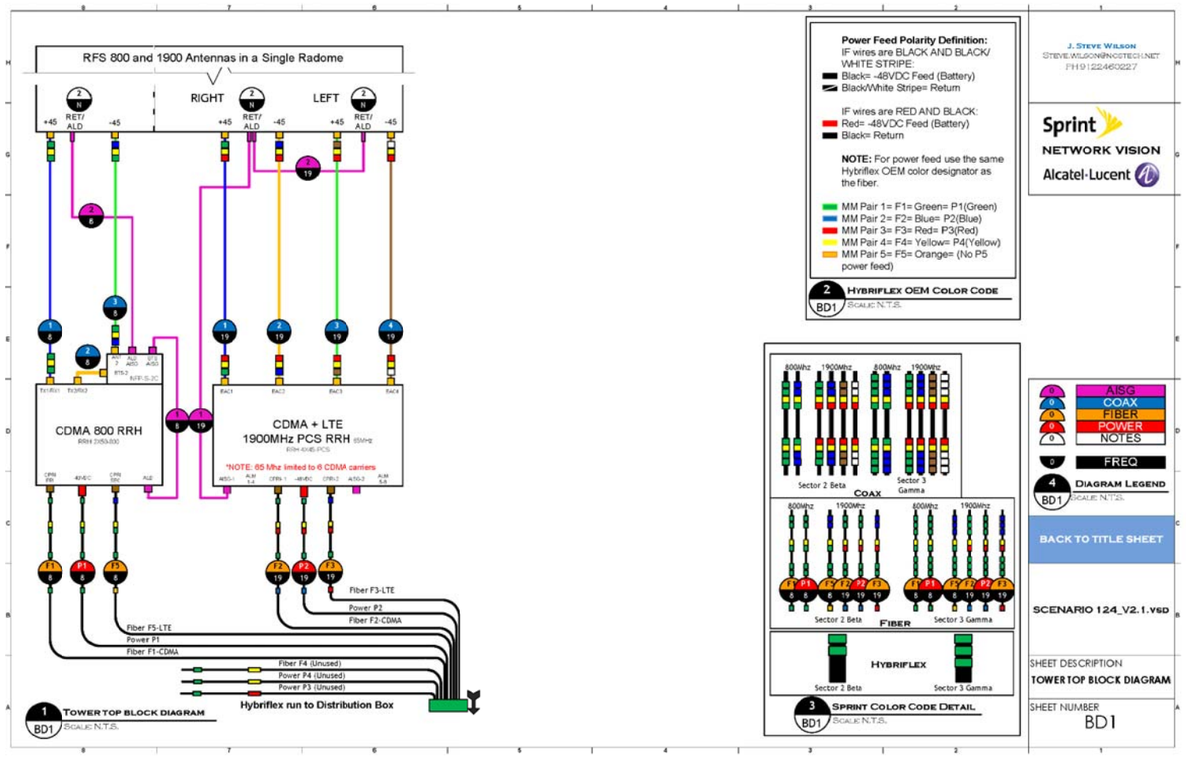
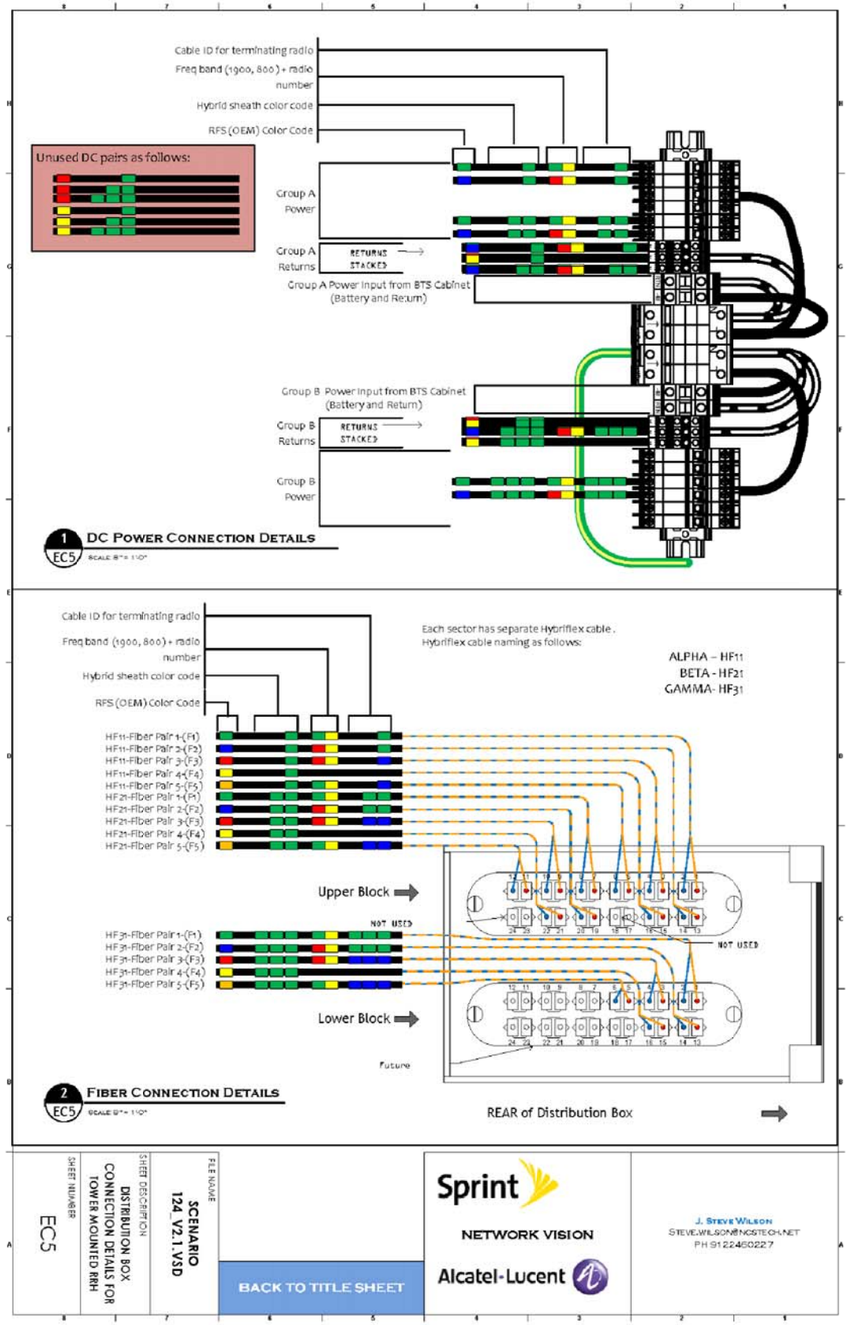
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: C-5

REVISION: 1





1 PLUMBING DIAGRAMS
SCALE: NOT TO SCALE

Sprint

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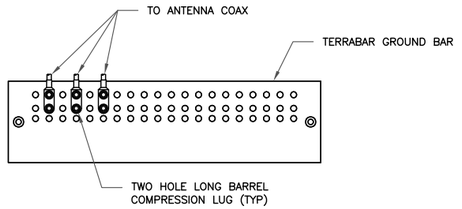
SHEET NUMBER: C-6

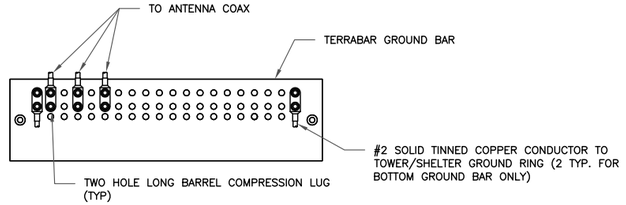
REVISION: 1



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

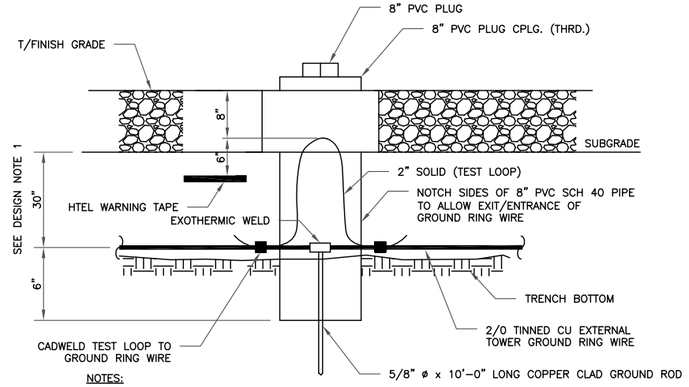
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. INSTALL GROUND BARS AT 75 FT. INTERVAL MAXIMUM.
4. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

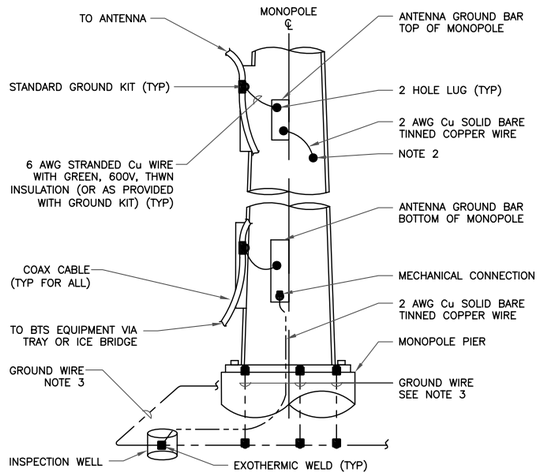
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

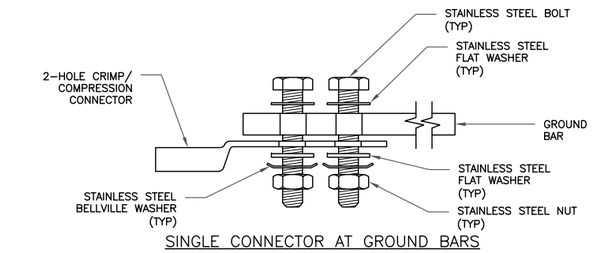
3 INSPECTION PORT DETAIL
SCALE: NOT TO SCALE



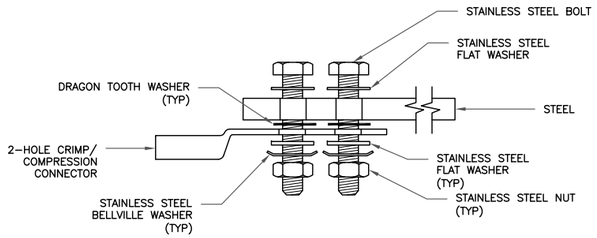
NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF MONOPOLE, ANTENNA LOCATION AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET IN/ON THE POLE SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE 2/0 AWG. STRANDED IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM 8 FEET TO 10 FEET.

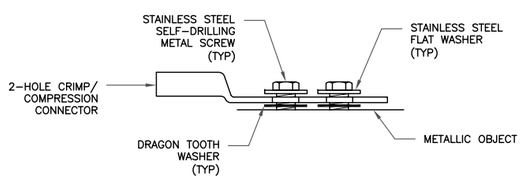
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

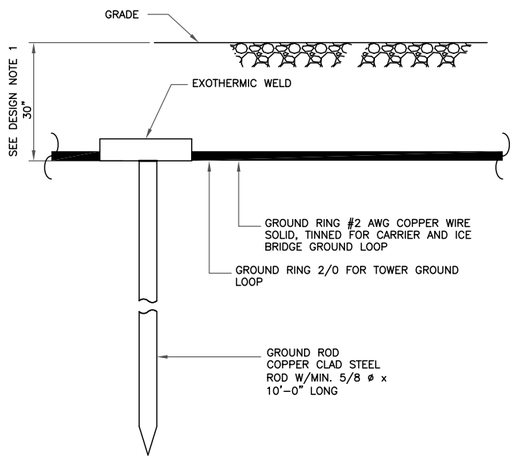


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

Sprint

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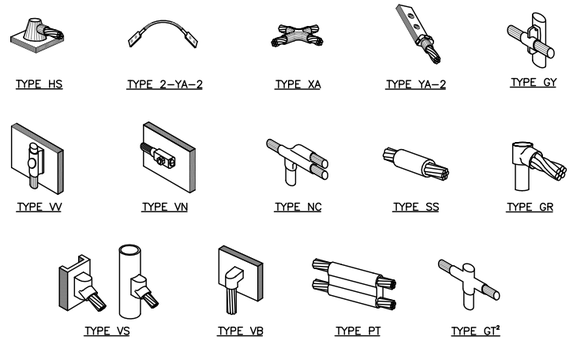
SHEET NUMBER: G-1

REVISION: 1

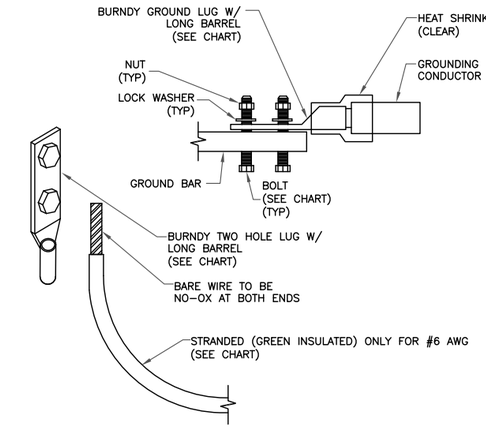


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

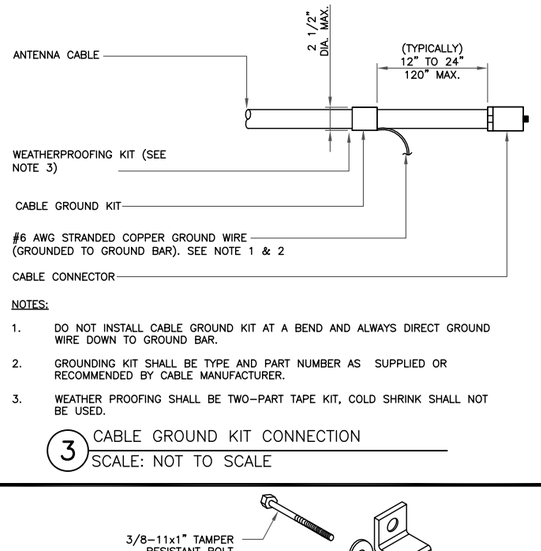
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

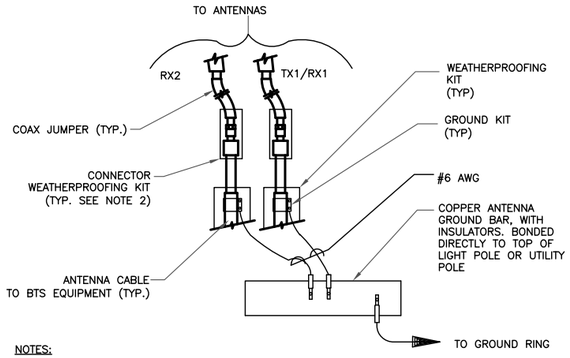
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

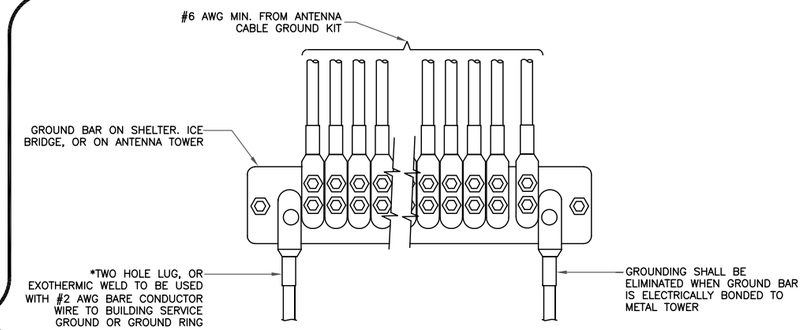
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



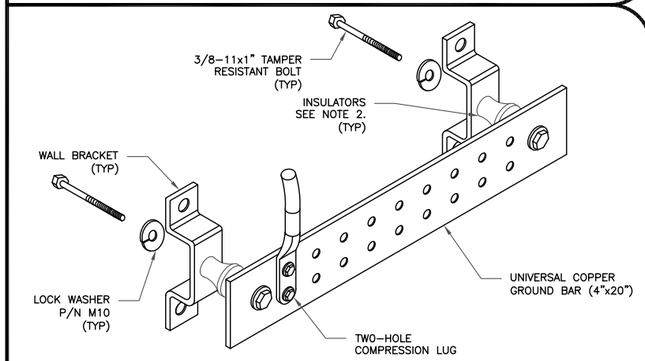
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



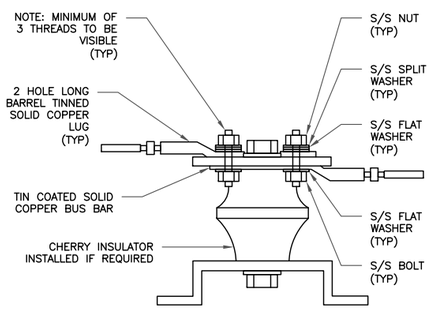
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



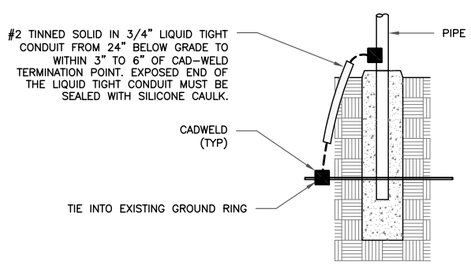
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

Sprint

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

SPRINT SITE NUMBER:
CT23XC411

BU #: **876360**
PRESTON / TOWN HALL

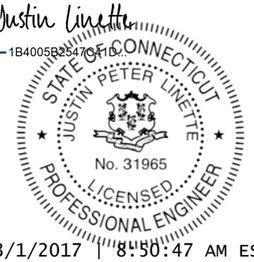
389 RT. 2
PRESTON, CT 06365

EXISTING 147'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	11/17/16	CJ	PRELIMINARY	LR
0	01/05/17	ZTK	CONSTRUCTION	JL
1	02/28/17	CJ	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
1B40058254704D...



3/1/2017 | 8:50:47 AM EST

Justin Peter Linette, P.E.
Professional Engineer License: 31965
Crown Castle USA, Inc. Firm Registration #PEC.0001101

SHEET NUMBER: G-2
REVISION: 1

Certificate Of Completion

Envelope Id: 2A4A52F29C5D4F189BC0F6E23A45BAE5
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Document Pages: 11
Signatures: 11
Envelope Originator:
Supplemental Document Pages: 0
Initials: 0
Jordan Stanga
Certificate Pages: 1
AutoNav: Enabled
Payments: 0
Canonsburg, PA 15317
EnvelopeId Stamping: Enabled
jordan.stanga@crowncastle.com
Time Zone: (UTC-05:00) Eastern Time (US & Canada)
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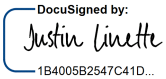
Status: Original
3/1/2017 | 8:09:54 AM
Holder: Jordan Stanga
jordan.stanga@crowncastle.com
Location: DocuSign

Signer Events	Signature	Timestamp
Justin Linette justin.linette@crowncastle.com Crown Castle International Corp. Security Level: Email, Account Authentication (None) Electronic Record and Signature Disclosure: Not Offered via DocuSign ID:	DocuSigned by:  1B4005B2547C41D... Using IP Address: 64.213.130.241	Sent: 3/1/2017 | 8:10:59 AM Viewed: 3/1/2017 | 8:49:27 AM Signed: 3/1/2017 | 8:50:47 AM

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Notary Events		Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	3/1/2017 | 8:10:59 AM
Certified Delivered	Security Checked	3/1/2017 | 8:49:27 AM
Signing Complete	Security Checked	3/1/2017 | 8:50:47 AM
Completed	Security Checked	3/1/2017 | 8:50:47 AM

Payment Events	Status	Timestamps

February 21, 2017

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate** **Carrier Site Number:**	 CT23XC411
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	876360 Preston / Town Hall 399007 1362920 363243 Rev. 6
Engineering Firm Designation:	**B+T Group Project Number:**	108665.006.01
Site Data:	**389 Rt. 2, Preston, New London County, CT** **Latitude *41° 29' 25.25"*, Longitude *-71° 59' 29.55"*** **147 Foot - Monopole Tower**	

Dear Charles McGuirt,

B+T Group 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 1002242, in accordance with application 363243, revision 6.

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

LC7: Existing + Reserved + Proposed Equipment ***Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with Risk Category II was used in this analysis.

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

We at *B+T Group* 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:
B+T Engineering, Inc.

Krista M. Murphy, E.I.T.
Project Engineer

Scott S. Vance, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2017

STATE OF CONNECTICUT · SCOTT S. VANCE · 31627 · LICENSED PROFESSIONAL ENGINEER

2/21/17

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 147 ft. Monopole tower designed by Engineered Endeavors, Inc. in May of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. This tower has been modified several times in the past and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 105 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	147.0	3	Alcatel Lucent	1900MHz RRH	3	1-1/4	--
		3	Alcatel Lucent	800MHZ RRH			
		3	RFS Celwave	APXVSPP18-C-A20			

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
147.0	147.0	1	--	Platform Mount [LP 712-1]	--	--	1
		6	**decibel**	**DB978H90T2E-M**	**6**	**1-5/8**	**3**
136.0	138.0	3	Alcatel Lucent	RRH2x60-700	2	1-5/8	2
		3	Alcatel Lucent	RRH4X45-AWS4 B66			
		6	Andrew	SBNHH-1D65A			
		6	Antel	LPA-80080/4CF			
		2	Rfs Celwave	DB-B1-6C-12AB-0Z			
	136.0	1	--	Platform Mount [LP 601-1]	12	1-5/8	1
129.0	129.0	3	Ericsson	KRY 112 144/1	6	1-5/8	1
		3	Andrew	LNX-6515DS-VTM			
		3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	RRUS 11 B12			
		1	--	Platform Mount [LP 714-1]			
120.0	120.0	6	Ericsson	TME-RRUS-11	--	--	1
		1	--	Side Arm Mount [SO 102-3]			
118.0	120.0	6	Powerwave Tech.	LGP21401	6 3	1-1/4 3/8	1
		3	Kmw Communications	AM-X-WM-17-65-00T			
		3	Powerwave Tech.	RA21.7770.00			
	118.0	1	Raycap	DC6-48-60-18-8F			
		1	--	Platform Mount [LP 303-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
50.0	51.0	1	Lucent	KS24019-L112A	1	1/2	1
	50.0	1	--	Side Arm Mount [SO 701-1]			
45.0	46.0	1	Lucent	KS24019-L112A	1	1/2	1
	45.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
147	147	12	Decibel	DB980	--	--
		1	Generic	Low profile Platform		
137	137	12	Decibel	DB980	--	--
		1	Generic	Low profile Platform		
127	127	12	Decibel	DB980	--	--
		1	Generic	Low profile Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Applications	Sprint Co-Locate Rev# 6	363243	CCI Sites
Tower Manufacturer Drawing	EEI, Job No. 6938	1615372	CCI Sites
Tower Modification Drawing	Vertical Solutions, Project No. 080609.05, Date: 09/26/2008	2331612	CCI Sites
Post Modification Inspection	Vertical Solutions, Project No. 080609.05, Date: 09/26/2008	2331610	CCI Sites
Tower Modification Drawing	PJF, Project No. 37512-2207, Date: 11/06/2012	3846963	CCI Sites
Post Modification Inspection	TEP, Project No. 131001.876360, Date: 04/04/2013	3846952	CCI Sites
Tower Modification Drawing	PJF, Project No. 37515-0448.002.7700, Date: 02/23/2015	5573224	CCI Sites
Post Modification Inspection	FDH, Project No. 15BIUM1500, Date: 11/30/2015	5995667	CCI Sites
Tower Modification Drawing	PJF, Project No. 37515-0448.007.7700, Date: 10/28/2015	5959061	CCI Sites
Post Modification Inspection	ETS, Project No. 151886, Date: 01/26/2016	6072770	CCI Sites
Foundation Drawing	EEI, Job No. 6938	1615411	CCI Sites
Geotech Report	FDH, Project No. 08-01210G	2192501	CCI Sites
Antenna Configurations	Crown CAD Package	Date: 02/13/2017	CCI Sites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	147 - 120.37	Pole	TP21.98x16.25x0.188	1	-7.382	903.550	56.5	Pass
L2	120.37 - 110.5	Pole	TP23.686x20.906x0.25	2	-11.374	1381.650	74.2	Pass
L3	110.5 - 105	Pole	TP24.852x23.686x0.452	3	-12.372	1481.580	84.0	Pass
L4	105 - 103.5	Pole	TP25.17x24.852x0.701	4	-12.734	2231.460	59.2	Pass
L5	103.5 - 94.16	Pole	TP27.15x25.17x0.469	5	-14.578	1630.480	98.2	Pass
L6	94.16 - 84.91	Pole	TP29.11x27.15x0.577	6	-15.783	2061.530	85.7	Pass
L7	84.91 - 58.58	Pole	TP34.188x27.726x0.596	7	-24.900	2602.010	99.9	Pass
L8	58.58 - 57.25	Pole	TP34.47x34.188x0.643	8	-25.322	2954.560	89.2	Pass
L9	57.25 - 44.41	Pole	TP37.19x34.47x0.635	9	-27.877	3064.330	91.6	Pass
L10	44.41 - 29.583	Pole	TP39.717x35.47x0.666	10	-36.516	3552.100	92.3	Pass
L11	29.583 - 28.5	Pole	TP39.947x39.717x0.746	11	-36.961	3990.690	83.1	Pass
L12	28.5 - 27.5	Pole	TP40.159x39.947x0.711	12	-37.374	3888.690	85.6	Pass
L13	27.5 - 6.917	Pole	TP44.531x40.159x0.673	13	-43.320	3982.500	90.1	Pass
L14	6.917 - 0	Pole	TP46x44.531x0.669	14	-45.978	4076.310	90.6	Pass
							Summary	
						Pole (L7)	99.9	Pass
						Rating =	99.9	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	76.8	Pass
1	Base Plate	Base	76.0	Pass
1	Base Foundation(Structural)	Base	82.0	Pass
1	Base Foundation (Soil Interaction)	Base	49.8	Pass

Structure Rating (max from all components) =	99.9%

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

4.1) Recommendations

The tower and foundation have sufficient capacity to carry the final load configurations. In order for the results of this analysis to be considered valid the loading modification listed below must be completed.

Loading Changes:

1.) Proposed TMEs installed directly behind proposed RFS Celwave APXVSPP18-C-A20 antennas at Level 147 ft.

2.) Remove all Empty Mount pipes at Level 147 ft.

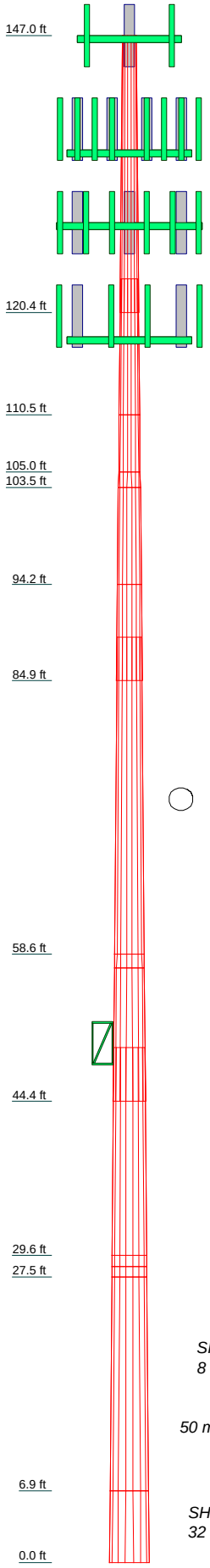
3.) Proposed TMEs installed directly behind proposed Andrew SBNHH-1D65A antennas at Level 136 ft.

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Length (ft)	26.630	13.120	5.500	1.500	9.340	9.250	30.500	1.330	12.840	19.997	1.000	1.000	20.583	6.917
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.188	0.250	0.452	0.701	0.469	0.577	0.596	0.643	0.635	0.666	0.746	0.746	0.673	0.669
Socket Length (ft)	3.250					4.170			5.170					
Top Dia (in)	16.250	20.906	23.686	24.850	25.170	27.150	27.726	34.188	34.470	35.470	39.317	39.317	40.159	44.531
Bot Dia (in)	21.980	23.686	24.852	25.170	27.150	29.110	34.188	34.470	37.190	39.717	40.063	40.063	44.531	46.000
Grade	A572-65		37.064833ksi	37.837527ksi	35.950704ksi		35.64561ksi		35.825686ksi	37.497476ksi	37.634847ksi	37.639691ksi	38.223862ksi	38.296054ksi
Weight (K)	1.0	0.8	0.6	0.2	1.1	1.5	5.7	0.3	2.9	5.1	0.3	0.3	6.2	2.3



ALL REACTIONS ARE FACTORED

AXIAL 81 K
SHEAR 8 K
MOMENT 884 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 49 K
SHEAR 32 K
MOMENT 3487 kip-ft
TORQUE 1 kip-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe (P)	147	KRY 112 144/1 (E)	129
APXVSPP18-C-A20 w/ Mount Pipe (P)	147	RRUS 11 B12 (E)	129
APXVSPP18-C-A20 w/ Mount Pipe (P)	147	RRUS 11 B12 (E)	129
Platform Mount [LP 712-1] (E-Per previous SA)	147	RRUS 11 B12 (E)	129
1900MHz RRH (P)	147	Platform Mount [LP 714-1] (E-14' flat)	129
1900MHz RRH (P)	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	129
1900MHz RRH (P)	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	129
800MHZ RRH (P)	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	129
800MHZ RRH (P)	147	LNX-6515DS-VTM w/ Mount Pipe (E)	129
800MHZ RRH (P)	147	LNX-6515DS-VTM w/ Mount Pipe (E)	129
RRH4X45-AWS4 B66 (R)	136	LNX-6515DS-VTM w/ Mount Pipe (E)	129
RRH4X45-AWS4 B66 (R)	136	(2) TME-RRUS-11 (E)	120
RRH4X45-AWS4 B66 (R)	136	(2) TME-RRUS-11 (E)	120
RRH2x60-700 (R)	136	(2) TME-RRUS-11 (E)	120
RRH2x60-700 (R)	136	Side Arm Mount [SO 102-3] (E)	120
RRH2x60-700 (R)	136	(2) 2' x 2-1/2" Mount Pipe (E)	120
(2) DB-B1-6C-12AB-0Z (R)	136	(2) 2' x 2-1/2" Mount Pipe (E)	120
Platform Mount [LP 601-1] (E)	136	(2) 2' x 2-1/2" Mount Pipe (E)	120
(2) SBNHH-1D65A w/ Mount Pipe (R)	136	DC6-48-60-18-8F (E)	118
(2) SBNHH-1D65A w/ Mount Pipe (R)	136	Platform Mount [LP 303-1] (E)	118
(2) SBNHH-1D65A w/ Mount Pipe (R)	136	AM-X-WM-17-65-00T w/ Mount Pipe (E)	118
(2) LPA-80080/4CF w/ Mount Pipe (R)	136	RA21.7770.00 w/ Mount Pipe (E)	118
(2) LPA-80080/4CF w/ Mount Pipe (R)	136	RA21.7770.00 w/ Mount Pipe (E)	118
(2) LPA-80080/4CF w/ Mount Pipe (R)	136	RA21.7770.00 w/ Mount Pipe (E)	118
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	129	AM-X-WM-17-65-00T w/ Mount Pipe (E-Off set per photo)	118
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	129	AM-X-WM-17-65-00T w/ Mount Pipe (E)	118
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	129	(2) LGP21401 (E)	118
KRY 112 144/1 (E)	129	(2) LGP21401 (E)	118
KRY 112 144/1 (E)	129	(2) LGP21401 (E)	118
		Side Arm Mount [SO 701-1] (E)	50
		KS24019-L112A (E)	50
		Side Arm Mount [SO 701-1] (E)	45
		KS24019-L112A (E)	45

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	37.497476ksi	37 ksi	52 ksi
37.064833ksi	37 ksi	52 ksi	37.634847ksi	38 ksi	53 ksi
35.837527ksi	36 ksi	51 ksi	37.639691ksi	38 ksi	53 ksi
35.950704ksi	36 ksi	51 ksi	38.223862ksi	38 ksi	53 ksi
35.64561ksi	36 ksi	51 ksi	38.363063ksi	38 ksi	53 ksi
35.825686ksi	36 ksi	51 ksi	38.296054ksi	38 ksi	53 ksi
37.4372ksi	37 ksi	52 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 99.9%

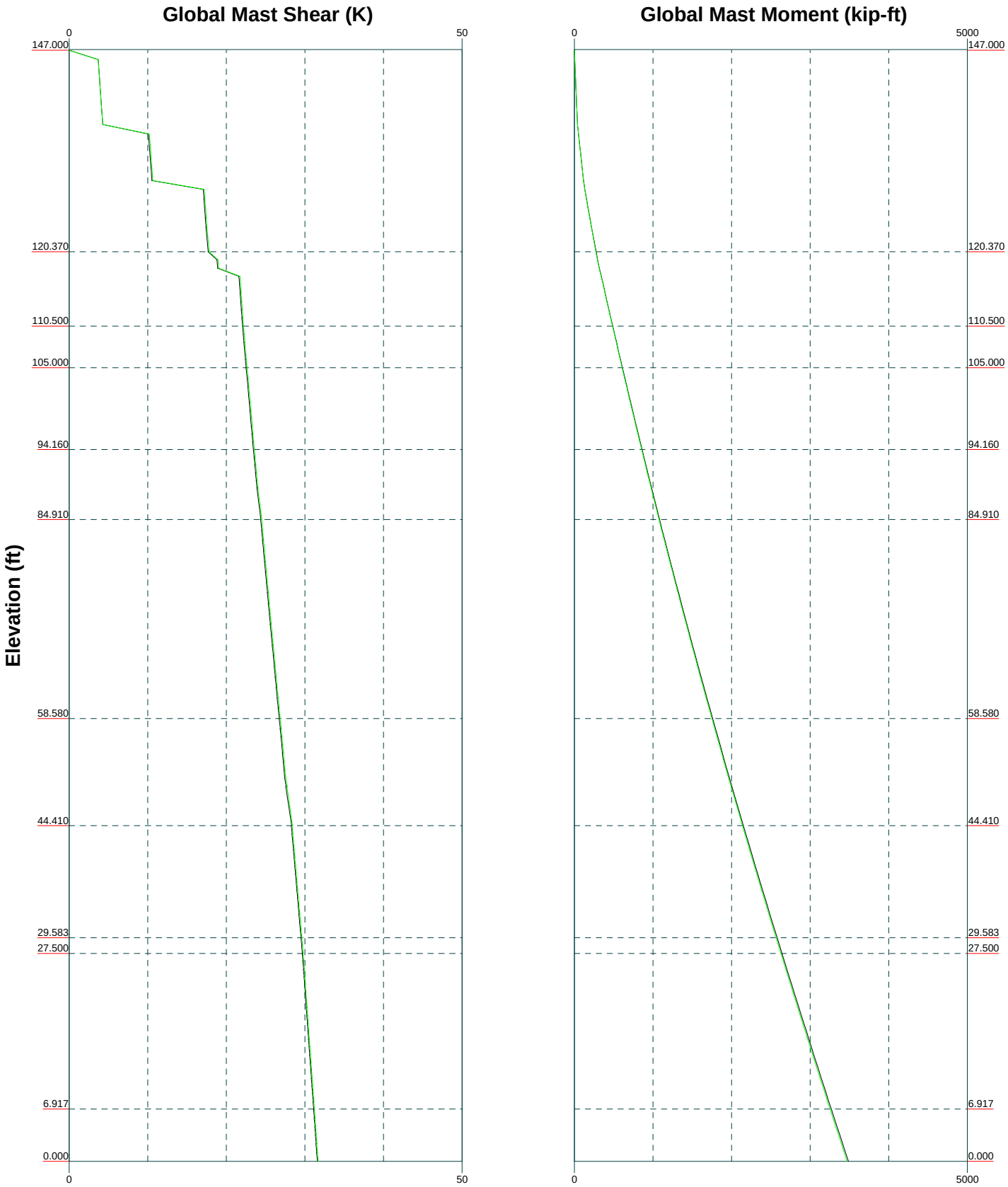
B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***108665.006.01 - PRESTON / TOWN HALL, CT (BU# 87636***		
Project:			
Client: Crown Castel	Drawn by: Devaraj Sanamuri	App'd:	
Code: TIA-222-G	Date: 02/15/17	Scale: NTS	
Path:		Dwg No. E-1	

TIA-222-G - 105 mph/50 mph 0.750 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz

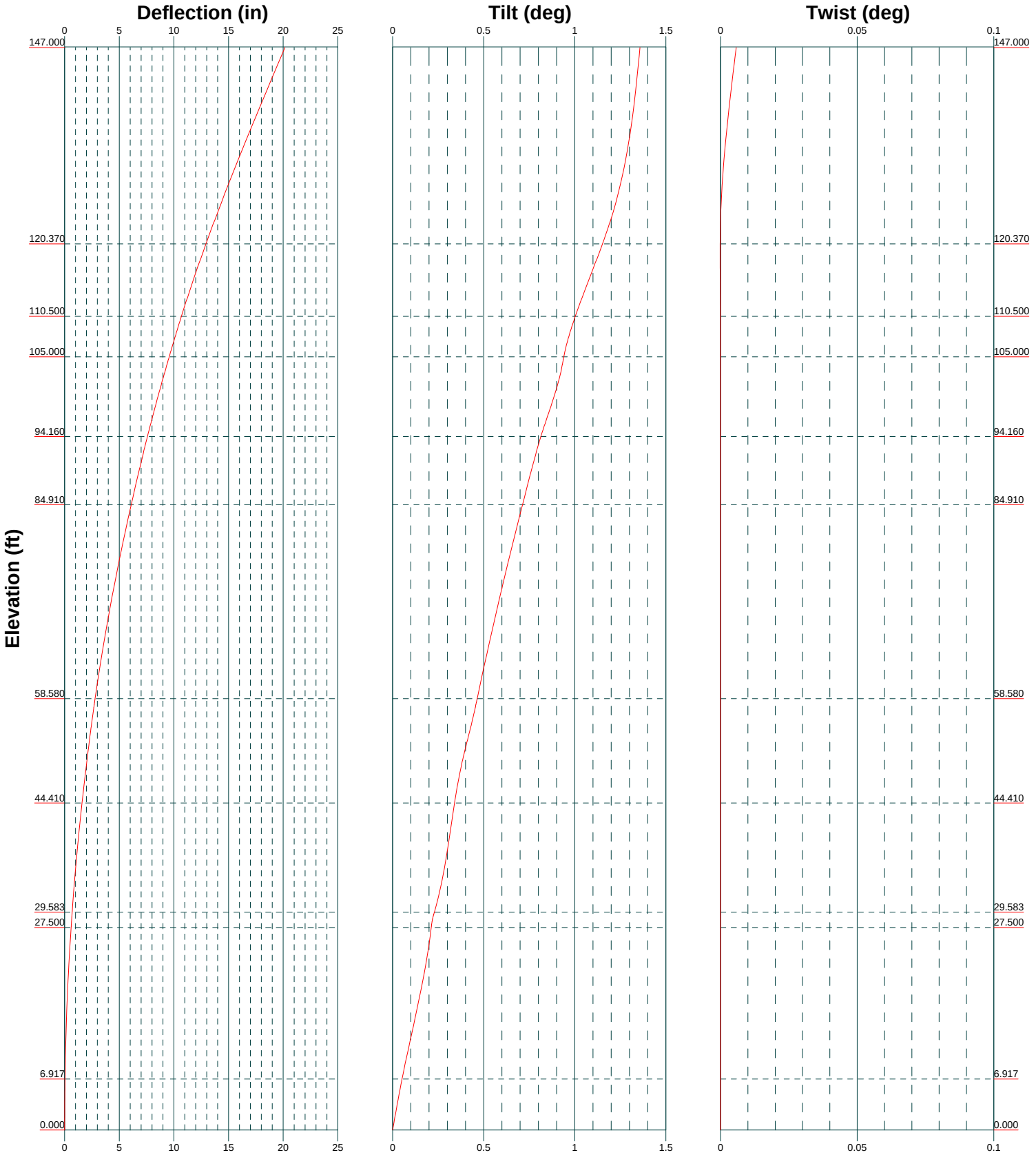


B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 108665.006.01 - PRESTON / TOWN HALL, CT (BU# 87636(			
Project:			
Client: Crown Castel	Drawn by: Devaraj Sanamuri	App'd:	
Code: TIA-222-G	Date: 02/15/17	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



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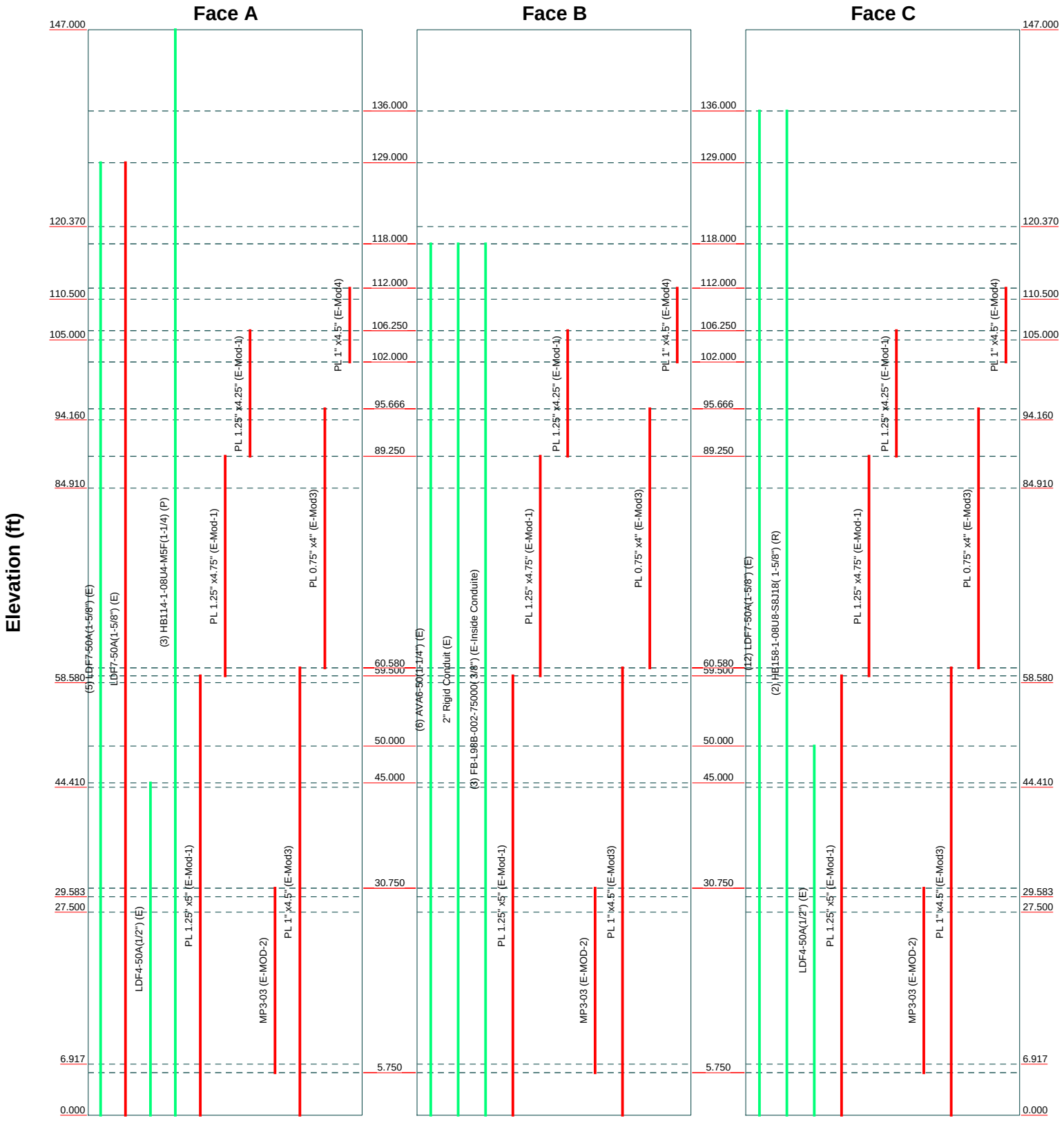
Job:	***108665.006.01 - PRESTON / TOWN HALL, CT (BU# 87636***		
Project:			
Client: Crown Castel	Drawn by: Devaraj Sanamuri	App'd:	
Code: TIA-222-G	Date: 02/15/17	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 147'

Round | Flat | App In Face | App Out Face | Truss Leg



B+T Group
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Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***108665.006.01 - PRESTON / TOWN HALL, CT (BU# 87636***		
Project:			
Client: Crown Castel	Drawn by: Devaraj Sanamuri	App'd:	
Code: TIA-222-G	Date: 02/15/17	Scale: NTS	
Path:		Dwg No. E-7	

tnxTower	Job	Page
B+T Group 1717 S Boulder Ave, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	108665.006.01 - PRESTON / TOWN HALL, CT (BU# 876360)	1 of 38
	Project	Date 15:40:33 02/15/17
	Client Crown Castel	Designed by Devaraj Sanamuri

Tower Input Data

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

Tower is located in New London County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TOWER RATING: 99.9%.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	147.000-120.370	26.630	3.250	18	16.250	21.980	0.188	0.750	A572-65 (65 ksi)
L2	120.370-110.50	13.120	0.000	18	20.906	23.686	0.250	1.000	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
	0								(65 ksi)
L3	110.500-105.00	5.500	0.000	18	23.686	24.852	0.452	1.806	37.064833ksi
	0								(37 ksi)
L4	105.000-103.50	1.500	0.000	18	24.852	25.170	0.701	2.806	35.837527ksi
	0								(36 ksi)
L5	103.500-94.160	9.340	0.000	18	25.170	27.150	0.469	1.874	35.950704ksi
									(36 ksi)
L6	94.160-84.910	9.250	4.170	18	27.150	29.110	0.577	2.306	35.64561ksi
									(36 ksi)
L7	84.910-58.580	30.500	0.000	18	27.726	34.188	0.596	2.384	35.825686ksi
									(36 ksi)
L8	58.580-57.250	1.330	0.000	18	34.188	34.470	0.643	2.572	37.4372ksi
									(37 ksi)
L9	57.250-44.410	12.840	5.170	18	34.470	37.190	0.635	2.541	37.497476ksi
									(37 ksi)
L10	44.410-29.583	19.997	0.000	18	35.470	39.717	0.666	2.665	37.634847ksi
									(38 ksi)
L11	29.583-28.500	1.083	0.000	18	39.717	39.947	0.746	2.982	37.639691ksi
									(38 ksi)
L12	28.500-27.500	1.000	0.000	18	39.947	40.159	0.711	2.843	38.223862ksi
									(38 ksi)
L13	27.500-6.917	20.583	0.000	18	40.159	44.531	0.673	2.690	38.363063ksi
									(38 ksi)
L14	6.917-0.000	6.917		18	44.531	46.000	0.669	2.676	38.296054ksi
									(38 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.501	9.559	311.591	5.702	8.255	37.746	623.592	4.781	2.530	13.493
	22.319	12.969	778.156	7.736	11.166	69.691	1557.336	6.486	3.538	18.872
L2	21.928	16.390	883.494	7.333	10.620	83.191	1768.151	8.197	3.239	12.958
	24.052	18.597	1290.495	8.320	12.033	107.249	2582.687	9.300	3.729	14.915
L3	24.052	33.301	2271.290	8.248	12.033	188.760	4545.568	16.654	3.374	7.472
	25.235	34.972	2630.577	8.662	12.625	208.365	5264.616	17.489	3.579	7.926
L4	25.235	53.768	3962.043	8.573	12.625	313.829	7929.299	26.889	3.139	4.476
	25.558	54.476	4120.578	8.686	12.786	322.264	8246.578	27.243	3.195	4.555
L5	25.558	36.735	2831.816	8.769	12.786	221.472	5667.359	18.371	3.605	7.695
	27.568	39.679	3568.649	9.472	13.792	258.748	7141.994	19.843	3.954	8.438
L6	27.568	48.628	4338.153	9.433	13.792	314.542	8682.015	24.319	3.764	6.528
	29.559	52.216	5370.900	10.129	14.788	363.196	10748.866	26.113	4.109	7.126
L7	29.051	51.320	4772.323	9.631	14.085	338.825	9550.926	25.665	3.831	6.428
	34.715	63.543	9058.908	11.925	17.367	521.602	18129.736	31.778	4.968	8.336
L8	34.715	68.471	9734.166	11.908	17.367	560.483	19481.140	34.242	4.885	7.596
	35.001	69.047	9981.531	12.008	17.511	570.027	19976.196	34.530	4.935	7.674
L9	35.001	68.220	9866.659	12.011	17.511	563.467	19746.302	34.117	4.949	7.79
	37.764	73.705	12442.961	12.977	18.893	658.618	24902.295	36.860	5.427	8.544
L10	37.132	73.594	11262.264	12.355	18.019	625.036	22539.347	36.804	5.070	7.61
	40.330	82.575	15908.989	13.863	20.176	788.504	31838.912	41.295	5.818	8.732
L11	40.330	92.215	17694.101	13.835	20.176	876.981	35411.485	46.116	5.678	7.616
	40.563	92.759	18009.258	13.916	20.293	887.461	36042.213	46.388	5.719	7.671
L12	40.563	88.528	17218.104	13.929	20.293	848.475	34458.865	44.272	5.780	8.13
	40.779	89.007	17499.234	14.004	20.401	857.768	35021.494	44.512	5.817	8.183
L13	40.779	84.291	16604.257	14.018	20.401	813.898	33230.362	42.153	5.884	8.749
	45.218	93.623	22752.190	15.570	22.622	1005.769	45534.318	46.820	6.654	9.893

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L14	45.218	93.125	22635.007	15.571	22.622	1000.588	45299.797	46.571	6.660	9.957
	46.710	96.244	24986.433	16.093	23.368	1069.259	50005.745	48.131	6.919	10.343

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 147.000-120.370				1	1	1			
L2 120.370-110.500				1	1	1			
L3 110.500-105.000				1	1	0.944896			
L4 105.000-103.500				1	1	0.904156			
L5 103.500-94.160				1	1	0.940301			
L6 94.160-84.910				1	1	0.932384			
L7 84.910-58.580				1	1	0.951472			
L8 58.580-57.250				1	1	0.944938			
L9 57.250-44.410				1	1	0.948255			
L10 44.410-29.583				1	1	0.958327			
L11 29.583-28.500				1	1	0.950624			
L12 28.500-27.500				1	1	0.993543			
L13 27.500-6.917				1	1	1.0002			
L14 6.917-0.000				1	1	1.03006			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
LDF7-50A(1-5/8") (E) **-** **MOD-01**	A	Surface Ar (CaAa)	129.000 - 0.000	1	1	-0.500 -0.460	1.980		0.001
PL 1.25" x5" (E-Mod-1)	A	Surface Af (CaAa)	59.500 - 0.000	1	1	0.200 0.250	5.000	7.500	0.000
PL 1.25" x5" (E-Mod-1)	B	Surface Af (CaAa)	59.500 - 0.000	1	1	0.200 0.250	5.000	7.500	0.000
PL 1.25" x5" (E-Mod-1)	C	Surface Af (CaAa)	59.500 - 0.000	1	1	0.200 0.250	5.000	7.500	0.000

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
*									
PL 1.25" x4.75" (E-Mod-1)	A	Surface Af (CaAa)	89.250 - 59.500	1	1	0.200 0.250	4.750	7.250	0.000
PL 1.25" x4.75" (E-Mod-1)	B	Surface Af (CaAa)	89.250 - 59.500	1	1	0.200 0.250	4.750	7.250	0.000
PL 1.25" x4.75" (E-Mod-1)	C	Surface Af (CaAa)	89.250 - 59.500	1	1	0.200 0.250	4.750	7.250	0.000
*									
PL 1.25" x4.25" (E-Mod-1)	A	Surface Af (CaAa)	106.250 - 89.250	1	1	0.200 0.250	4.250	6.750	0.000
PL 1.25" x4.25" (E-Mod-1)	B	Surface Af (CaAa)	106.250 - 89.250	1	1	0.200 0.250	4.250	6.750	0.000
PL 1.25" x4.25" (E-Mod-1)	C	Surface Af (CaAa)	106.250 - 89.250	1	1	0.200 0.250	4.250	6.750	0.000
*									
MOD-02									
MP3-03 (E-MOD-2)	A	Surface Af (CaAa)	30.750 - 5.750	1	1	0.000 0.000	4.060	11.260	0.000
MP3-03 (E-MOD-2)	B	Surface Af (CaAa)	30.750 - 5.750	1	1	0.000 0.000	4.060	11.260	0.000
MP3-03 (E-MOD-2)	C	Surface Af (CaAa)	30.750 - 5.750	1	1	0.000 0.000	4.060	11.260	0.000
*									
MOD-03									
PL 1" x4.5" (E-Mod3)	A	Surface Af (CaAa)	60.580 - 0.000	1	1	-0.250 -0.200	4.500	6.500	0.000
PL 1" x4.5" (E-Mod3)	B	Surface Af (CaAa)	60.580 - 0.000	1	1	-0.250 -0.200	4.500	6.500	0.000
PL 1" x4.5" (E-Mod3)	C	Surface Af (CaAa)	60.580 - 0.000	1	1	-0.250 -0.200	4.500	6.500	0.000
*									
PL 0.75" x4" (E-Mod3)	A	Surface Af (CaAa)	95.666 - 60.580	1	1	-0.250 -0.200	4.000	5.500	0.000
PL 0.75" x4" (E-Mod3)	B	Surface Af (CaAa)	95.666 - 60.580	1	1	-0.250 -0.200	4.000	5.500	0.000
PL 0.75" x4" (E-Mod3)	C	Surface Af (CaAa)	95.666 - 60.580	1	1	-0.250 -0.200	4.000	5.500	0.000
*									
MOD-04									
PL 1" x4.5" (E-Mod4)	A	Surface Af (CaAa)	112.000 - 102.000	1	1	0.000 0.000	4.500	6.500	0.000
PL 1" x4.5" (E-Mod4)	B	Surface Af (CaAa)	112.000 - 102.000	1	1	0.000 0.000	4.500	6.500	0.000
PL 1" x4.5" (E-Mod4)	C	Surface Af (CaAa)	112.000 - 102.000	1	1	0.000 0.000	4.400	6.500	0.000
-									

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
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	136.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
HB158-1-08U8-S8J18(1-5/8") (R)	C	No	Inside Pole	136.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
-								
LDF7-50A(1-5/8") (E)	A	No	Inside Pole	129.000 - 0.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
-								
AVA6-50(1-1/4") (E)	B	No	Inside Pole	118.000 - 0.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
2" Rigid Conduit (E)	B	No	Inside Pole	118.000 - 0.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
FB-L98B-002-75000(3/8") (E-Inside Conduite)	B	No	Inside Pole	118.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
-								
LDF4-50A(1/2") (E)	C	No	Inside Pole	50.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
-								
LDF4-50A(1/2") (E)	A	No	Inside Pole	45.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
HB114-1-08U4-M5F(1-1/4) (P)	A	No	Inside Pole	147.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
-								
-								
*								
*								
*								
-								

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	147.000-120.370	A	0.000	0.000	1.709	0.000	0.129
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.194
L2	120.370-110.500	A	0.000	0.000	3.079	0.000	0.081
		B	0.000	0.000	1.125	0.000	0.043
		C	0.000	0.000	1.100	0.000	0.123
L3	110.500-105.000	A	0.000	0.000	6.099	0.000	0.045
		B	0.000	0.000	5.010	0.000	0.031
		C	0.000	0.000	4.919	0.000	0.068
L4	105.000-103.500	A	0.000	0.000	2.485	0.000	0.012
		B	0.000	0.000	2.188	0.000	0.009
		C	0.000	0.000	2.163	0.000	0.019
L5	103.500-94.160	A	0.000	0.000	10.594	0.000	0.076
		B	0.000	0.000	8.745	0.000	0.053
		C	0.000	0.000	8.720	0.000	0.116
L6	94.160-84.910	A	0.000	0.000	14.912	0.000	0.075
		B	0.000	0.000	13.080	0.000	0.053
		C	0.000	0.000	13.080	0.000	0.115
L7	84.910-58.580	A	0.000	0.000	43.816	0.000	0.215
		B	0.000	0.000	38.603	0.000	0.149
		C	0.000	0.000	38.603	0.000	0.328

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
L8	58.580-57.250	A	0.000	0.000	2.369	0.000	0.011
		B	0.000	0.000	2.106	0.000	0.008
		C	0.000	0.000	2.106	0.000	0.017
L9	57.250-44.410	A	0.000	0.000	22.872	0.000	0.105
		B	0.000	0.000	20.330	0.000	0.073
		C	0.000	0.000	20.330	0.000	0.161
L10	44.410-29.583	A	0.000	0.000	27.201	0.000	0.123
		B	0.000	0.000	24.266	0.000	0.084
		C	0.000	0.000	24.266	0.000	0.187
L11	29.583-28.500	A	0.000	0.000	2.662	0.000	0.009
		B	0.000	0.000	2.448	0.000	0.006
		C	0.000	0.000	2.448	0.000	0.014
L12	28.500-27.500	A	0.000	0.000	2.458	0.000	0.008
		B	0.000	0.000	2.260	0.000	0.006
		C	0.000	0.000	2.260	0.000	0.013
L13	27.500-6.917	A	0.000	0.000	50.593	0.000	0.171
		B	0.000	0.000	46.518	0.000	0.117
		C	0.000	0.000	46.518	0.000	0.259
L14	6.917-0.000	A	0.000	0.000	13.111	0.000	0.057
		B	0.000	0.000	11.742	0.000	0.039
		C	0.000	0.000	11.742	0.000	0.087

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	147.000-120.370	A	1.724	0.000	0.000	4.685	0.000	0.196
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.194
L2	120.370-110.500	A	1.700	0.000	0.000	6.781	0.000	0.173
		B		0.000	0.000	1.423	0.000	0.058
		C		0.000	0.000	1.407	0.000	0.138
L3	110.500-105.000	A	1.688	0.000	0.000	9.441	0.000	0.154
		B		0.000	0.000	6.495	0.000	0.099
		C		0.000	0.000	6.439	0.000	0.136
L4	105.000-103.500	A	1.683	0.000	0.000	3.783	0.000	0.053
		B		0.000	0.000	2.981	0.000	0.038
		C		0.000	0.000	2.966	0.000	0.048
L5	103.500-94.160	A	1.674	0.000	0.000	17.639	0.000	0.265
		B		0.000	0.000	12.663	0.000	0.172
		C		0.000	0.000	12.648	0.000	0.235
L6	94.160-84.910	A	1.657	0.000	0.000	24.110	0.000	0.320
		B		0.000	0.000	19.213	0.000	0.228
		C		0.000	0.000	19.213	0.000	0.291
L7	84.910-58.580	A	1.620	0.000	0.000	69.999	0.000	0.920
		B		0.000	0.000	56.058	0.000	0.661
		C		0.000	0.000	56.058	0.000	0.839
L8	58.580-57.250	A	1.587	0.000	0.000	3.635	0.000	0.046
		B		0.000	0.000	2.950	0.000	0.033
		C		0.000	0.000	2.950	0.000	0.042
L9	57.250-44.410	A	1.566	0.000	0.000	34.937	0.000	0.433
		B		0.000	0.000	28.373	0.000	0.314
		C		0.000	0.000	28.373	0.000	0.402
L10	44.410-29.583	A	1.517	0.000	0.000	41.498	0.000	0.515
		B		0.000	0.000	33.919	0.000	0.375
		C		0.000	0.000	33.919	0.000	0.477
L11	29.583-28.500	A	1.481	0.000	0.000	3.945	0.000	0.045

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	3.410	0.000	0.036
		C		0.000	0.000	3.410	0.000	0.043
L12	28.500-27.500	A	1.476	0.000	0.000	3.638	0.000	0.042
		B		0.000	0.000	3.145	0.000	0.033
		C		0.000	0.000	3.145	0.000	0.040
L13	27.500-6.917	A	1.404	0.000	0.000	73.712	0.000	0.810
		B		0.000	0.000	63.857	0.000	0.636
		C		0.000	0.000	63.857	0.000	0.778
L14	6.917-0.000	A	1.196	0.000	0.000	18.356	0.000	0.188
		B		0.000	0.000	15.331	0.000	0.138
		C		0.000	0.000	15.331	0.000	0.186

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.000-120.370	-0.097	0.051	-0.216	0.113
L2	120.370-110.500	-0.220	0.112	-0.466	0.242
L3	110.500-105.000	-0.116	0.050	-0.243	0.122
L4	105.000-103.500	-0.089	0.039	-0.180	0.090
L5	103.500-94.160	-0.118	0.060	-0.234	0.122
L6	94.160-84.910	-0.097	0.051	-0.188	0.098
L7	84.910-58.580	-0.101	0.053	-0.199	0.104
L8	58.580-57.250	-0.101	0.053	-0.200	0.105
L9	57.250-44.410	-0.104	0.054	-0.205	0.107
L10	44.410-29.583	-0.106	0.055	-0.209	0.109
L11	29.583-28.500	-0.089	0.046	-0.169	0.088
L12	28.500-27.500	-0.089	0.046	-0.169	0.088
L13	27.500-6.917	-0.092	0.048	-0.173	0.090
L14	6.917-0.000	-0.114	0.059	-0.206	0.108

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	5	LDF7-50A(1-5/8")	120.37 - 129.00	1.0000	1.0000
L1	50	PL 1" x4.5"	120.37 - 112.00	1.0000	1.0000
L1	51	PL 1" x4.5"	120.37 - 112.00	1.0000	1.0000
L1	52	PL 1" x4.5"	120.37 - 112.00	1.0000	1.0000
L3	5	LDF7-50A(1-5/8")	105.00 - 110.50	1.0000	1.0000
L3	31	PL 1.25" x4.25"	105.00 - 106.25	1.0000	1.0000
L3	32	PL 1.25" x4.25"	105.00 - 106.25	1.0000	1.0000
L3	33	PL 1.25" x4.25"	105.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			106.25		
L3	50	PL 1" x4.5"	105.00 - 110.50	1.0000	1.0000
L3	51	PL 1" x4.5"	105.00 - 110.50	1.0000	1.0000
L3	52	PL 1" x4.5"	105.00 - 110.50	1.0000	1.0000
L4	5	LDF7-50A(1-5/8")	103.50 - 105.00	1.0000	1.0000
L4	31	PL 1.25" x4.25"	103.50 - 105.00	1.0000	1.0000
L4	32	PL 1.25" x4.25"	103.50 - 105.00	1.0000	1.0000
L4	33	PL 1.25" x4.25"	103.50 - 105.00	1.0000	1.0000
L4	50	PL 1" x4.5"	103.50 - 105.00	1.0000	1.0000
L4	51	PL 1" x4.5"	103.50 - 105.00	1.0000	1.0000
L4	52	PL 1" x4.5"	103.50 - 105.00	1.0000	1.0000
L5	5	LDF7-50A(1-5/8")	94.16 - 103.50	1.0000	1.0000
L5	31	PL 1.25" x4.25"	94.16 - 103.50	1.0000	1.0000
L5	32	PL 1.25" x4.25"	94.16 - 103.50	1.0000	1.0000
L5	33	PL 1.25" x4.25"	94.16 - 103.50	1.0000	1.0000
L5	45	PL 0.75" x4"	94.16 - 95.67	1.0000	1.0000
L5	46	PL 0.75" x4"	94.16 - 95.67	1.0000	1.0000
L5	47	PL 0.75" x4"	94.16 - 95.67	1.0000	1.0000
L5	50	PL 1" x4.5"	102.00 - 103.50	1.0000	1.0000
L5	51	PL 1" x4.5"	102.00 - 103.50	1.0000	1.0000
L5	52	PL 1" x4.5"	102.00 - 103.50	1.0000	1.0000
L6	5	LDF7-50A(1-5/8")	84.91 - 94.16	1.0000	1.0000
L6	27	PL 1.25" x4.75"	84.91 - 89.25	1.0000	1.0000
L6	28	PL 1.25" x4.75"	84.91 - 89.25	1.0000	1.0000
L6	29	PL 1.25" x4.75"	84.91 - 89.25	1.0000	1.0000
L6	31	PL 1.25" x4.25"	89.25 - 94.16	1.0000	1.0000
L6	32	PL 1.25" x4.25"	89.25 - 94.16	1.0000	1.0000
L6	33	PL 1.25" x4.25"	89.25 - 94.16	1.0000	1.0000
L6	45	PL 0.75" x4"	84.91 - 94.16	1.0000	1.0000
L6	46	PL 0.75" x4"	84.91 - 94.16	1.0000	1.0000
L6	47	PL 0.75" x4"	84.91 - 94.16	1.0000	1.0000
L6	23	PL 1.25" x5"	84.91 - 59.50	1.0000	1.0000
L6	24	PL 1.25" x5"	84.91 - 59.50	1.0000	1.0000
L6	25	PL 1.25" x5"	84.91 - 59.50	1.0000	1.0000
L6	41	PL 1" x4.5"	84.91 - 60.58	1.0000	1.0000
L6	42	PL 1" x4.5"	84.91 - 60.58	1.0000	1.0000
L6	43	PL 1" x4.5"	84.91 - 60.58	1.0000	1.0000
L8	5	LDF7-50A(1-5/8")	57.25 - 58.58	1.0000	1.0000
L8	23	PL 1.25" x5"	57.25 - 58.58	1.0000	1.0000
L8	24	PL 1.25" x5"	57.25 - 58.58	1.0000	1.0000
L8	25	PL 1.25" x5"	57.25 - 58.58	1.0000	1.0000
L8	41	PL 1" x4.5"	57.25 - 58.58	1.0000	1.0000
L8	42	PL 1" x4.5"	57.25 - 58.58	1.0000	1.0000
L8	43	PL 1" x4.5"	57.25 - 58.58	1.0000	1.0000
L9	5	LDF7-50A(1-5/8")	44.41 - 57.25	1.0000	1.0000
L9	23	PL 1.25" x5"	44.41 - 57.25	1.0000	1.0000
L9	24	PL 1.25" x5"	44.41 - 57.25	1.0000	1.0000
L9	25	PL 1.25" x5"	44.41 - 57.25	1.0000	1.0000
L9	41	PL 1" x4.5"	44.41 - 57.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L9	42	PL 1" x4.5"	44.41 - 57.25	1.0000	1.0000
L9	43	PL 1" x4.5"	44.41 - 57.25	1.0000	1.0000
L9	36	MP3-03	44.41 - 30.75	1.0000	1.0000
L9	37	MP3-03	44.41 - 30.75	1.0000	1.0000
L9	38	MP3-03	44.41 - 30.75	1.0000	1.0000
L11	5	LDF7-50A(1-5/8")	28.50 - 29.58	1.0000	1.0000
L11	23	PL 1.25" x5"	28.50 - 29.58	1.0000	1.0000
L11	24	PL 1.25" x5"	28.50 - 29.58	1.0000	1.0000
L11	25	PL 1.25" x5"	28.50 - 29.58	1.0000	1.0000
L11	36	MP3-03	28.50 - 29.58	1.0000	1.0000
L11	37	MP3-03	28.50 - 29.58	1.0000	1.0000
L11	38	MP3-03	28.50 - 29.58	1.0000	1.0000
L11	41	PL 1" x4.5"	28.50 - 29.58	1.0000	1.0000
L11	42	PL 1" x4.5"	28.50 - 29.58	1.0000	1.0000
L11	43	PL 1" x4.5"	28.50 - 29.58	1.0000	1.0000
L12	5	LDF7-50A(1-5/8")	27.50 - 28.50	1.0000	1.0000
L12	23	PL 1.25" x5"	27.50 - 28.50	1.0000	1.0000
L12	24	PL 1.25" x5"	27.50 - 28.50	1.0000	1.0000
L12	25	PL 1.25" x5"	27.50 - 28.50	1.0000	1.0000
L12	36	MP3-03	27.50 - 28.50	1.0000	1.0000
L12	37	MP3-03	27.50 - 28.50	1.0000	1.0000
L12	38	MP3-03	27.50 - 28.50	1.0000	1.0000
L12	41	PL 1" x4.5"	27.50 - 28.50	1.0000	1.0000
L12	42	PL 1" x4.5"	27.50 - 28.50	1.0000	1.0000
L12	43	PL 1" x4.5"	27.50 - 28.50	1.0000	1.0000
L13	5	LDF7-50A(1-5/8")	6.92 - 27.50	1.0000	1.0000
L13	23	PL 1.25" x5"	6.92 - 27.50	1.0000	1.0000
L13	24	PL 1.25" x5"	6.92 - 27.50	1.0000	1.0000
L13	25	PL 1.25" x5"	6.92 - 27.50	1.0000	1.0000
L13	36	MP3-03	6.92 - 27.50	1.0000	1.0000
L13	37	MP3-03	6.92 - 27.50	1.0000	1.0000
L13	38	MP3-03	6.92 - 27.50	1.0000	1.0000
L13	41	PL 1" x4.5"	6.92 - 27.50	1.0000	1.0000
L13	42	PL 1" x4.5"	6.92 - 27.50	1.0000	1.0000
L13	43	PL 1" x4.5"	6.92 - 27.50	1.0000	1.0000
L14	5	LDF7-50A(1-5/8")	0.00 - 6.92	1.0000	1.0000
L14	23	PL 1.25" x5"	0.00 - 6.92	1.0000	1.0000
L14	24	PL 1.25" x5"	0.00 - 6.92	1.0000	1.0000
L14	25	PL 1.25" x5"	0.00 - 6.92	1.0000	1.0000
L14	36	MP3-03	5.75 - 6.92	1.0000	1.0000
L14	37	MP3-03	5.75 - 6.92	1.0000	1.0000
L14	38	MP3-03	5.75 - 6.92	1.0000	1.0000
L14	41	PL 1" x4.5"	0.00 - 6.92	1.0000	1.0000
L14	42	PL 1" x4.5"	0.00 - 6.92	1.0000	1.0000
L14	43	PL 1" x4.5"	0.00 - 6.92	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	K

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
APXVSPP18-C-A20 w/ Mount Pipe (P)	A	From Leg	4.000 0.000 0.000	0.000	147.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	147.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (P)	C	From Leg	4.000 0.000 0.000	0.000	147.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
Platform Mount [LP 712-1] (E-Per previous SA)	C	None		0.000	147.000	No Ice 1/2" Ice 1" Ice	20.433 29.940 35.350	24.530 29.940 35.350	1.335 1.646 1.956
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(2) SBNHH-1D65A w/ Mount Pipe (R)	A	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	5.954 6.390 6.820	5.190 5.961 6.658	0.061 0.114 0.174
(2) SBNHH-1D65A w/ Mount Pipe (R)	B	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	5.954 6.390 6.820	5.190 5.961 6.658	0.061 0.114 0.174
(2) SBNHH-1D65A w/ Mount Pipe (R)	C	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	5.954 6.390 6.820	5.190 5.961 6.658	0.061 0.114 0.174
(2) LPA-80080/4CF w/ Mount Pipe (R)	A	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	2.856 3.220 3.592	6.569 7.195 7.837	0.030 0.076 0.128
(2) LPA-80080/4CF w/ Mount Pipe (R)	B	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	2.856 3.220 3.592	6.569 7.195 7.837	0.030 0.076 0.128
(2) LPA-80080/4CF w/ Mount Pipe (R)	C	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	2.856 3.220 3.592	6.569 7.195 7.837	0.030 0.076 0.128
RRH4X45-AWS4 B66 (R)	A	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
RRH4X45-AWS4 B66 (R)	B	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
RRH4X45-AWS4 B66 (R)	C	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
RRH2x60-700 (R)	A	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 3.761 4.029	1.816 2.052 2.289	0.060 0.083 0.109
RRH2x60-700 (R)	B	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 3.761 4.029	1.816 2.052 2.289	0.060 0.083 0.109
RRH2x60-700 (R)	C	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.000 3.761 4.029	1.816 2.052 2.289	0.060 0.083 0.109
(2) DB-B1-6C-12AB-0Z (R)	A	From Leg	4.000 0.000 2.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	3.364 3.597 3.838	2.192 2.395 2.606	0.021 0.050 0.082
Platform Mount [LP 601-1] (E)	C	None		0.000	136.000	No Ice 1/2" Ice 1" Ice	28.470 33.590 38.710	28.470 33.590 38.710	1.122 1.514 1.905
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ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112

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
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	129.000	No Ice	11.626	9.793	0.074
			0.000			1/2" Ice	12.346	11.311	0.163
(E)			0.000			1" Ice	13.074	12.854	0.262
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.000	0.000	129.000	No Ice	11.626	9.793	0.074
			0.000			1/2" Ice	12.346	11.311	0.163
(E)			0.000			1" Ice	13.074	12.854	0.262
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.000	0.000	129.000	No Ice	11.626	9.793	0.074
			0.000			1/2" Ice	12.346	11.311	0.163
(E)			0.000			1" Ice	13.074	12.854	0.262
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	129.000	No Ice	6.329	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
KRY 112 144/1	A	From Leg	4.000	0.000	129.000	No Ice	0.000	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
KRY 112 144/1	B	From Leg	4.000	0.000	129.000	No Ice	0.000	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
KRY 112 144/1	C	From Leg	4.000	0.000	129.000	No Ice	0.000	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
RRUS 11 B12	A	From Leg	4.000	0.000	129.000	No Ice	2.833	1.182	0.051
(E)			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
RRUS 11 B12	B	From Leg	4.000	0.000	129.000	No Ice	2.833	1.182	0.051
(E)			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
RRUS 11 B12	C	From Leg	4.000	0.000	129.000	No Ice	2.833	1.182	0.051
(E)			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
Platform Mount [LP 714-1]	C	None		0.000	129.000	No Ice	37.470	37.470	1.600
(E-14' flat)						1/2" Ice	44.230	44.230	2.040
						1" Ice	50.990	50.990	2.480
-									
(2) TME-RRUS-11	A	From Leg	1.000	0.000	120.000	No Ice	2.959	1.665	0.057
(E)			0.000			1/2" Ice	3.226	1.976	0.085
			0.000			1" Ice	3.504	2.304	0.117
(2) TME-RRUS-11	B	From Leg	1.000	0.000	120.000	No Ice	2.959	1.665	0.057
(E)			0.000			1/2" Ice	3.226	1.976	0.085
			0.000			1" Ice	3.504	2.304	0.117
(2) TME-RRUS-11	C	From Leg	1.000	0.000	120.000	No Ice	2.959	1.665	0.057
(E)			0.000			1/2" Ice	3.226	1.976	0.085
			0.000			1" Ice	3.504	2.304	0.117

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
Side Arm Mount [SO 102-3]	C	None		0.000	120.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
-									
AM-X-WM-17-65-00T w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	3.314 3.682	2.732 3.332	0.034 0.064
(E-Off set per photo)			2.000			1" Ice	4.050	3.943	0.099
AM-X-WM-17-65-00T w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	3.314 3.682	2.732 3.332	0.034 0.064
(E)			2.000			1" Ice	4.050	3.943	0.099
AM-X-WM-17-65-00T w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	3.314 3.682	2.732 3.332	0.034 0.064
(E)			2.000			1" Ice	4.050	3.943	0.099
RA21.7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	118.000	No Ice	6.766	5.002	0.060
(E)			0.000 2.000			1/2" Ice 1" Ice	7.261 7.735	5.960 6.747	0.114 0.175
RA21.7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	118.000	No Ice	6.766	5.002	0.060
(E)			0.000 2.000			1/2" Ice 1" Ice	7.261 7.735	5.960 6.747	0.114 0.175
RA21.7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	118.000	No Ice	6.766	5.002	0.060
(E)			0.000 2.000			1/2" Ice 1" Ice	7.261 7.735	5.960 6.747	0.114 0.175
(2) LGP21401	A	From Leg	4.000	0.000	118.000	No Ice	0.000	1.100	0.014
(E)			0.000 2.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
(2) LGP21401	B	From Leg	4.000	0.000	118.000	No Ice	0.000	1.100	0.014
(E)			0.000 2.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
(2) LGP21401	C	From Leg	4.000	0.000	118.000	No Ice	0.000	1.100	0.014
(E)			0.000 2.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
DC6-48-60-18-8F	A	From Leg	1.000	0.000	118.000	No Ice	0.791	0.791	0.020
(E)			0.000 0.000			1/2" Ice 1" Ice	1.274 1.450	1.274 1.450	0.035 0.053
Platform Mount [LP 303-1]	C	None		0.000	118.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
-									
KS24019-L112A	C	From Leg	3.000	0.000	50.000	No Ice	0.100	0.100	0.005
(E)			0.000 1.000			1/2" Ice 1" Ice	0.180 0.260	0.180 0.260	0.006 0.008
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	50.000	No Ice	0.850	1.670	0.065
(E)			0.000 0.000			1/2" Ice 1" Ice	1.140 1.430	2.340 3.010	0.079 0.093
***									
KS24019-L112A	A	From Leg	3.000	0.000	45.000	No Ice	0.100	0.100	0.005
(E)			0.000 1.000			1/2" Ice 1" Ice	0.180 0.260	0.180 0.260	0.006 0.008
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	45.000	No Ice	0.850	1.670	0.065
(E)			0.000 0.000			1/2" Ice 1" Ice	1.140 1.430	2.340 3.010	0.079 0.093
-									
1900MHz RRH	A	From Leg	4.000	0.000	147.000	No Ice	0.000	3.258	0.044
(P)			0.000 0.000			1/2" Ice 1" Ice	2.695 2.906	3.484 3.718	0.075 0.110
1900MHz RRH	B	From Leg	4.000	0.000	147.000	No Ice	0.000	3.258	0.044
(P)			0.000			1/2" Ice	2.695	3.484	0.075

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	2.906	3.718	0.110
1900MHz RRH (P)	C	From Leg	4.000 0.000	0.000	147.000	No Ice 1/2" Ice	0.000 2.695	3.258 3.484	0.044 0.075
			0.000			1" Ice	2.906	3.718	0.110
800MHZ RRH (P)	A	From Leg	4.000 0.000	0.000	147.000	No Ice 1/2" Ice	0.000 2.320	1.773 1.946	0.053 0.074
			0.000			1" Ice	2.512	2.127	0.098
800MHZ RRH (P)	B	From Leg	4.000 0.000	0.000	147.000	No Ice 1/2" Ice	0.000 2.320	1.773 1.946	0.053 0.074
			0.000			1" Ice	2.512	2.127	0.098
800MHZ RRH (P)	C	From Leg	4.000 0.000	0.000	147.000	No Ice 1/2" Ice	0.000 2.320	1.773 1.946	0.053 0.074
			0.000			1" Ice	2.512	2.127	0.098
(2) 2' x 2-1/2" Mount Pipe (E)	A	From Leg	1.000 0.000	0.000	120.000	No Ice 1/2" Ice	0.357 0.488	0.357 0.488	0.027 0.031
			0.000			1" Ice	0.628	0.628	0.037
(2) 2' x 2-1/2" Mount Pipe (E)	B	From Leg	1.000 0.000	0.000	120.000	No Ice 1/2" Ice	0.357 0.488	0.357 0.488	0.027 0.031
			0.000			1" Ice	0.628	0.628	0.037
(2) 2' x 2-1/2" Mount Pipe (E)	C	From Leg	1.000 0.000	0.000	120.000	No Ice 1/2" Ice	0.357 0.488	0.357 0.488	0.027 0.031
			0.000			1" Ice	0.628	0.628	0.037

Load Combinations

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

Comb. No.	Description
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147 - 120.37	Pole	Max Tension	26	0.000	-0.000	-0.000
			Max. Compression	26	-21.839	0.070	1.390
			Max. Mx	20	-7.409	216.066	0.156
			Max. My	2	-7.382	0.009	218.079
			Max. Vy	20	-17.418	216.066	0.156
			Max. Vx	2	-17.543	0.009	218.079
			Max. Torque	8			1.082
L2	120.37 - 110.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-29.910	0.173	1.561
			Max. Mx	20	-11.398	483.829	0.224
			Max. My	2	-11.374	0.022	487.517
			Max. Vy	20	-22.074	483.829	0.224
			Max. Vx	2	-22.200	0.022	487.517
			Max. Torque	8			1.155
L3	110.5 - 105	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.349	0.222	1.547
			Max. Mx	20	-12.395	606.421	0.233
			Max. My	2	-12.372	0.029	610.792
			Max. Vy	20	-22.524	606.421	0.233
			Max. Vx	2	-22.650	0.029	610.792
			Max. Torque	8			1.153
L4	105 - 103.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.880	0.235	1.541
			Max. Mx	20	-12.756	640.303	0.235
			Max. My	2	-12.734	0.031	644.860
			Max. Vy	20	-22.664	640.303	0.235
			Max. Vx	2	-22.790	0.031	644.860

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	8			1.152
L5	103.5 - 94.16	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.509	0.317	1.498
			Max. Mx	20	-14.597	855.584	0.245
			Max. My	2	-14.577	0.043	861.302
			Max. Vy	20	-23.453	855.584	0.245
			Max. Vx	2	-23.580	0.043	861.302
			Max. Torque	8			1.152
L6	94.16 - 84.91	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.265	0.364	1.474
			Max. Mx	20	-15.801	975.845	0.249
			Max. My	2	-15.782	0.050	982.193
			Max. Vy	20	-23.910	975.845	0.249
			Max. Vx	2	-24.037	0.050	982.193
			Max. Torque	8			1.151
L7	84.91 - 58.58	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.114	0.674	1.312
			Max. Mx	20	-24.911	1749.045	0.261
			Max. My	2	-24.900	0.097	1759.178
			Max. Vy	20	-26.751	1749.045	0.261
			Max. Vx	2	-26.878	0.097	1759.178
			Max. Torque	8			1.149
L8	58.58 - 57.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.688	0.688	1.304
			Max. Mx	20	-25.333	1784.685	0.261
			Max. My	2	-25.322	0.100	1794.982
			Max. Vy	20	-26.871	1784.685	0.261
			Max. Vx	2	-26.997	0.100	1794.982
			Max. Torque	8			1.146
L9	57.25 - 44.41	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.176	1.129	1.054
			Max. Mx	20	-27.887	1993.546	0.143
			Max. My	2	-27.877	0.338	2004.439
			Max. Vy	20	-27.614	1993.546	0.143
			Max. Vx	2	-27.761	0.338	2004.439
			Max. Torque	8			1.146
L10	44.41 - 29.583	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-64.666	1.356	1.353
			Max. Mx	20	-36.521	2566.163	0.760
			Max. My	2	-36.516	0.740	2579.553
			Max. Vy	20	-29.522	2566.163	0.760
			Max. Vx	2	-29.626	0.740	2579.553
			Max. Torque	8			1.289
L11	29.583 - 28.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.266	1.368	1.347
			Max. Mx	20	-36.966	2598.169	0.779
			Max. My	2	-36.961	0.762	2611.668
			Max. Vy	20	-29.611	2598.169	0.779
			Max. Vx	2	-29.715	0.762	2611.668
			Max. Torque	8			1.288
L12	28.5 - 27.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.821	1.379	1.341
			Max. Mx	20	-37.379	2627.808	0.797
			Max. My	2	-37.374	0.782	2641.408
			Max. Vy	20	-29.691	2627.808	0.797
			Max. Vx	2	-29.796	0.782	2641.408
			Max. Torque	8			1.288
L13	27.5 - 6.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-77.194	1.608	1.221
			Max. Mx	20	-45.955	3253.406	1.159
			Max. My	2	-45.954	1.196	3269.054

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-31.128	3253.406	1.159
			Max. Vx	2	-31.229	1.196	3269.054
			Max. Torque	8			1.288
L14	6.917 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-80.972	1.676	1.186
			Max. Mx	20	-49.080	3470.226	1.278
			Max. My	2	-49.080	1.335	3486.548
			Max. Vy	20	-31.598	3470.226	1.278
			Max. Vx	2	-31.697	1.335	3486.548
			Max. Torque	8			1.288

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	80.972	0.006	7.928
	Max. H_x	20	49.092	31.578	0.018
	Max. H_z	2	49.092	0.018	31.678
	Max. M_x	2	3486.548	0.018	31.678
	Max. M_z	8	3469.422	-31.578	-0.018
	Max. Torsion	8	1.288	-31.578	-0.018
	Min. Vert	19	36.819	27.338	-15.823
	Min. H_x	8	49.092	-31.578	-0.018
	Min. H_z	14	49.092	-0.018	-31.678
	Min. M_x	14	-3485.832	-0.018	-31.678
	Min. M_z	20	-3470.226	31.578	0.018
	Min. Torsion	20	-1.288	31.578	0.018

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	40.910	0.000	0.000	-0.280	0.325	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	49.092	-0.018	-31.678	-3486.548	1.334	-0.239
0.9 Dead+1.6 Wind 0 deg - No Ice	36.819	-0.018	-31.678	-3450.132	1.227	-0.240
1.2 Dead+1.6 Wind 30 deg - No Ice	49.092	15.773	-27.424	-3019.048	-1733.679	-0.858
0.9 Dead+1.6 Wind 30 deg - No Ice	36.819	15.773	-27.424	-2987.492	-1715.717	-0.856
1.2 Dead+1.6 Wind 60 deg - No Ice	49.092	27.338	-15.823	-1742.674	-3004.077	-1.242
0.9 Dead+1.6 Wind 60 deg - No Ice	36.819	27.338	-15.823	-1724.418	-2972.887	-1.237
1.2 Dead+1.6 Wind 90 deg - No Ice	49.092	31.578	0.018	0.586	-3469.422	-1.288
0.9 Dead+1.6 Wind 90 deg - No Ice	36.819	31.578	0.018	0.674	-3433.389	-1.282
1.2 Dead+1.6 Wind 120 deg - No Ice	49.092	27.357	15.855	1743.590	-3004.997	-0.988

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 120 deg - No Ice	36.819	27.357	15.855	1725.512	-2973.805	-0.983
1.2 Dead+1.6 Wind 150 deg - No Ice	49.092	15.805	27.443	3019.269	-1735.282	-0.429
0.9 Dead+1.6 Wind 150 deg - No Ice	36.819	15.805	27.443	2987.896	-1717.316	-0.426
1.2 Dead+1.6 Wind 180 deg - No Ice	49.092	0.018	31.678	3485.832	-0.530	0.240
0.9 Dead+1.6 Wind 180 deg - No Ice	36.819	0.018	31.678	3449.605	-0.629	0.241
1.2 Dead+1.6 Wind 210 deg - No Ice	49.092	-15.773	27.424	3018.338	1734.472	0.844
0.9 Dead+1.6 Wind 210 deg - No Ice	36.819	-15.773	27.424	2986.969	1716.307	0.842
1.2 Dead+1.6 Wind 240 deg - No Ice	49.092	-27.338	15.823	1741.976	3004.870	1.228
0.9 Dead+1.6 Wind 240 deg - No Ice	36.819	-27.338	15.823	1723.905	2973.476	1.223
1.2 Dead+1.6 Wind 270 deg - No Ice	49.092	-31.578	-0.018	-1.278	3470.226	1.288
0.9 Dead+1.6 Wind 270 deg - No Ice	36.819	-31.578	-0.018	-1.183	3433.987	1.281
1.2 Dead+1.6 Wind 300 deg - No Ice	49.092	-27.357	-15.855	-1744.288	3005.812	1.002
0.9 Dead+1.6 Wind 300 deg - No Ice	36.819	-27.357	-15.855	-1726.025	2974.411	0.996
1.2 Dead+1.6 Wind 330 deg - No Ice	49.092	-15.805	-27.443	-3019.979	1736.097	0.443
0.9 Dead+1.6 Wind 330 deg - No Ice	36.819	-15.805	-27.443	-2988.418	1717.922	0.439
1.2 Dead+1.0 Ice+1.0 Temp	80.972	-0.000	-0.000	-1.186	1.676	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	80.972	-0.006	-7.928	-883.333	2.111	-0.080
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	80.972	3.953	-6.862	-765.010	-437.678	-0.221
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	80.972	6.852	-3.958	-442.048	-759.715	-0.302
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	80.972	7.916	0.006	-0.992	-877.699	-0.303
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	80.972	6.859	3.969	439.974	-760.043	-0.222
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	80.972	3.964	6.869	762.695	-438.248	-0.082
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	80.972	0.006	7.928	880.688	1.452	0.080
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	80.972	-3.953	6.862	762.365	441.240	0.220
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	80.972	-6.852	3.958	439.403	763.276	0.302
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	80.972	-7.916	-0.006	-1.651	881.260	0.303
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	80.972	-6.859	-3.969	-442.618	763.606	0.222
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	80.972	-3.964	-6.869	-765.339	441.811	0.082
Dead+Wind 0 deg - Service	40.910	-0.003	-5.784	-633.633	0.504	-0.044
Dead+Wind 30 deg - Service	40.910	2.880	-5.008	-548.698	-314.692	-0.158
Dead+Wind 60 deg - Service	40.910	4.992	-2.889	-316.819	-545.478	-0.229
Dead+Wind 90 deg - Service	40.910	5.766	0.003	-0.128	-630.013	-0.238
Dead+Wind 120 deg - Service	40.910	4.995	2.895	316.517	-545.647	-0.184
Dead+Wind 150 deg - Service	40.910	2.886	5.011	548.272	-314.986	-0.081

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 180 deg - Service	40.910	0.003	5.784	633.037	0.165	0.044
Dead+Wind 210 deg - Service	40.910	-2.880	5.008	548.102	315.361	0.157
Dead+Wind 240 deg - Service	40.910	-4.992	2.889	316.223	546.146	0.228
Dead+Wind 270 deg - Service	40.910	-5.766	-0.003	-0.467	630.682	0.238
Dead+Wind 300 deg - Service	40.910	-4.995	-2.895	-317.113	546.316	0.185
Dead+Wind 330 deg - Service	40.910	-2.886	-5.011	-548.867	315.655	0.081

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-40.910	0.000	0.000	40.910	0.000	0.000%
2	-0.018	-49.092	-31.678	0.018	49.092	31.678	0.000%
3	-0.018	-36.819	-31.678	0.018	36.819	31.678	0.000%
4	15.773	-49.092	-27.424	-15.773	49.092	27.424	0.000%
5	15.773	-36.819	-27.424	-15.773	36.819	27.424	0.000%
6	27.338	-49.092	-15.823	-27.338	49.092	15.823	0.000%
7	27.338	-36.819	-15.823	-27.338	36.819	15.823	0.000%
8	31.578	-49.092	0.018	-31.578	49.092	-0.018	0.000%
9	31.578	-36.819	0.018	-31.578	36.819	-0.018	0.000%
10	27.357	-49.092	15.855	-27.357	49.092	-15.855	0.000%
11	27.357	-36.819	15.855	-27.357	36.819	-15.855	0.000%
12	15.805	-49.092	27.443	-15.805	49.092	-27.443	0.000%
13	15.805	-36.819	27.443	-15.805	36.819	-27.443	0.000%
14	0.018	-49.092	31.678	-0.018	49.092	-31.678	0.000%
15	0.018	-36.819	31.678	-0.018	36.819	-31.678	0.000%
16	-15.773	-49.092	27.424	15.773	49.092	-27.424	0.000%
17	-15.773	-36.819	27.424	15.773	36.819	-27.424	0.000%
18	-27.338	-49.092	15.823	27.338	49.092	-15.823	0.000%
19	-27.338	-36.819	15.823	27.338	36.819	-15.823	0.000%
20	-31.578	-49.092	-0.018	31.578	49.092	0.018	0.000%
21	-31.578	-36.819	-0.018	31.578	36.819	0.018	0.000%
22	-27.357	-49.092	-15.855	27.357	49.092	15.855	0.000%
23	-27.357	-36.819	-15.855	27.357	36.819	15.855	0.000%
24	-15.805	-49.092	-27.443	15.805	49.092	27.443	0.000%
25	-15.805	-36.819	-27.443	15.805	36.819	27.443	0.000%
26	0.000	-80.972	0.000	0.000	80.972	0.000	0.000%
27	-0.006	-80.972	-7.928	0.006	80.972	7.928	0.000%
28	3.953	-80.972	-6.862	-3.953	80.972	6.862	0.000%
29	6.852	-80.972	-3.958	-6.852	80.972	3.958	0.000%
30	7.916	-80.972	0.006	-7.916	80.972	-0.006	0.000%
31	6.859	-80.972	3.969	-6.859	80.972	-3.969	0.000%
32	3.964	-80.972	6.869	-3.964	80.972	-6.869	0.000%
33	0.006	-80.972	7.928	-0.006	80.972	-7.928	0.000%
34	-3.953	-80.972	6.862	3.953	80.972	-6.862	0.000%
35	-6.852	-80.972	3.958	6.852	80.972	-3.958	0.000%
36	-7.916	-80.972	-0.006	7.916	80.972	0.006	0.000%
37	-6.859	-80.972	-3.969	6.859	80.972	3.969	0.000%
38	-3.964	-80.972	-6.869	3.964	80.972	6.869	0.000%
39	-0.003	-40.910	-5.784	0.003	40.910	5.784	0.000%
40	2.880	-40.910	-5.008	-2.880	40.910	5.008	0.000%
41	4.992	-40.910	-2.889	-4.992	40.910	2.889	0.000%
42	5.766	-40.910	0.003	-5.766	40.910	-0.003	0.000%
43	4.995	-40.910	2.895	-4.995	40.910	-2.895	0.000%
44	2.886	-40.910	5.011	-2.886	40.910	-5.011	0.000%
45	0.003	-40.910	5.784	-0.003	40.910	-5.784	0.000%
46	-2.880	-40.910	5.008	2.880	40.910	-5.008	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
47	-4.992	-40.910	2.889	4.992	40.910	-2.889	0.000%
48	-5.766	-40.910	-0.003	5.766	40.910	0.003	0.000%
49	-4.995	-40.910	-2.895	4.995	40.910	2.895	0.000%
50	-2.886	-40.910	-5.011	2.886	40.910	5.011	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00048464
3	Yes	4	0.00000001	0.00020140
4	Yes	6	0.00000001	0.00009615
5	Yes	5	0.00000001	0.00091120
6	Yes	6	0.00000001	0.00009912
7	Yes	5	0.00000001	0.00093983
8	Yes	5	0.00000001	0.00007571
9	Yes	5	0.00000001	0.00003316
10	Yes	6	0.00000001	0.00009550
11	Yes	5	0.00000001	0.00090533
12	Yes	6	0.00000001	0.00009821
13	Yes	5	0.00000001	0.00093096
14	Yes	4	0.00000001	0.00047725
15	Yes	4	0.00000001	0.00019488
16	Yes	6	0.00000001	0.00009843
17	Yes	5	0.00000001	0.00093308
18	Yes	6	0.00000001	0.00009539
19	Yes	5	0.00000001	0.00090430
20	Yes	5	0.00000001	0.00007706
21	Yes	5	0.00000001	0.00003375
22	Yes	6	0.00000001	0.00009903
23	Yes	5	0.00000001	0.00093892
24	Yes	6	0.00000001	0.00009639
25	Yes	5	0.00000001	0.00091345
26	Yes	4	0.00000001	0.00002472
27	Yes	5	0.00000001	0.00095437
28	Yes	6	0.00000001	0.00013447
29	Yes	6	0.00000001	0.00013512
30	Yes	5	0.00000001	0.00094543
31	Yes	6	0.00000001	0.00013299
32	Yes	6	0.00000001	0.00013378
33	Yes	5	0.00000001	0.00094537
34	Yes	6	0.00000001	0.00013435
35	Yes	6	0.00000001	0.00013341
36	Yes	5	0.00000001	0.00094893
37	Yes	6	0.00000001	0.00013563
38	Yes	6	0.00000001	0.00013513
39	Yes	4	0.00000001	0.00007263
40	Yes	4	0.00000001	0.00044286
41	Yes	4	0.00000001	0.00048753
42	Yes	4	0.00000001	0.00009957
43	Yes	4	0.00000001	0.00043365
44	Yes	4	0.00000001	0.00047161
45	Yes	4	0.00000001	0.00007247
46	Yes	4	0.00000001	0.00047557
47	Yes	4	0.00000001	0.00043277

48	Yes	4	0.00000001	0.00009981
49	Yes	4	0.00000001	0.00048643
50	Yes	4	0.00000001	0.00044656

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 120.37	20.160	39	1.359	0.004
L2	123.62 - 110.5	13.749	39	1.197	0.002
L3	110.5 - 105	10.688	39	1.001	0.001
L4	105 - 103.5	9.571	39	0.937	0.001
L5	103.5 - 94.16	9.279	39	0.926	0.001
L6	94.16 - 84.91	7.578	39	0.812	0.001
L7	89.08 - 58.58	6.743	39	0.759	0.001
L8	58.58 - 57.25	2.788	39	0.463	0.000
L9	57.25 - 44.41	2.661	39	0.451	0.000
L10	49.58 - 29.583	1.995	39	0.380	0.000
L11	29.583 - 28.5	0.692	39	0.227	0.000
L12	28.5 - 27.5	0.642	39	0.219	0.000
L13	27.5 - 6.917	0.596	39	0.212	0.000
L14	6.917 - 0	0.037	39	0.051	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	APXVSPP18-C-A20 w/ Mount Pipe	39	20.160	1.359	0.004	20794
136.000	(2) SBNHH-1D65A w/ Mount Pipe	39	17.054	1.308	0.003	9452
129.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	39	15.147	1.256	0.002	5776
120.000	(2) TME-RRUS-11	39	12.851	1.146	0.002	4048
118.000	AM-X-WM-17-65-00T w/ Mount Pipe	39	12.371	1.116	0.002	3856
50.000	KS24019-L112A	39	2.029	0.383	0.000	8035
45.000	KS24019-L112A	39	1.640	0.341	0.000	8039

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 120.37	110.773	2	7.473	0.019
L2	123.62 - 110.5	75.615	2	6.584	0.011
L3	110.5 - 105	58.803	2	5.510	0.006
L4	105 - 103.5	52.664	2	5.160	0.005
L5	103.5 - 94.16	51.055	2	5.095	0.005
L6	94.16 - 84.91	41.706	2	4.469	0.004
L7	89.08 - 58.58	37.110	2	4.180	0.003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	58.58 - 57.25	15.349	2	2.548	0.002
L9	57.25 - 44.41	14.649	2	2.481	0.002
L10	49.58 - 29.583	10.980	2	2.090	0.001
L11	29.583 - 28.5	3.810	2	1.252	0.001
L12	28.5 - 27.5	3.531	2	1.208	0.001
L13	27.5 - 6.917	3.283	2	1.165	0.001
L14	6.917 - 0	0.201	2	0.279	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	APXVSPP18-C-A20 w/ Mount Pipe	2	110.773	7.473	0.019	3921
136.000	(2) SBNHH-1D65A w/ Mount Pipe	2	93.742	7.194	0.015	1780
129.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	83.286	6.908	0.013	1086
120.000	(2) TME-RRUS-11	2	70.685	6.306	0.009	757
118.000	AM-X-WM-17-65-00T w/ Mount Pipe	2	68.051	6.139	0.009	719
50.000	KS24019-L112A	2	11.167	2.110	0.001	1463
45.000	KS24019-L112A	2	9.028	1.878	0.001	1463

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	147 - 145.769	TP21.98x16.25x0.188	26.630	0.000	0.0	9.717	-1.851	721.907	0.003
	145.769 - 144.539					9.874	-1.909	733.614	0.003
	144.539 - 143.308					10.032	-1.967	745.321	0.003
	143.308 - 142.078					10.189	-2.027	757.028	0.003
	142.078 - 140.847					10.347	-2.087	768.735	0.003
	140.847 - 139.617					10.505	-2.149	780.442	0.003
	139.617 - 138.386					10.662	-2.211	792.149	0.003
	138.386 - 137.156					10.820	-2.274	803.856	0.003
	137.156 - 135.925					10.977	-4.105	815.563	0.005
	135.925 - 134.695					11.135	-4.175	827.270	0.005
	134.695 -					11.292	-4.246	836.582	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	133.464								
	133.464 - 132.234					11.450	-4.320	845.243	0.005
	132.234 - 131.003					11.608	-4.396	853.822	0.005
	131.003 - 129.773					11.765	-4.473	862.317	0.005
	129.773 - 128.542					11.923	-7.001	870.729	0.008
	128.542 - 127.312					12.080	-7.091	879.059	0.008
	127.312 - 126.081					12.238	-7.185	887.306	0.008
	126.081 - 124.851					12.396	-7.282	895.469	0.008
	124.851 - 123.62					12.553	-7.382	903.550	0.008
	123.62 - 120.37					12.969	-3.399	924.494	0.004
L2	123.62 - 120.37	TP23.686x20.906x0.25	13.120	0.000	0.0	16.937	-4.426	1258.320	0.004
	120.37 - 119.273					17.121	-8.549	1272.030	0.007
	119.273 - 118.177					17.306	-8.680	1285.730	0.007
	118.177 - 117.08					17.490	-10.501	1299.430	0.008
	117.08 - 115.983					17.675	-10.640	1313.130	0.008
	115.983 - 114.887					17.859	-10.783	1326.840	0.008
	114.887 - 113.79					18.044	-10.927	1340.540	0.008
	113.79 - 112.693					18.228	-11.074	1354.240	0.008
	112.693 - 111.597					18.412	-11.223	1367.940	0.008
	111.597 - 110.5					18.597	-11.374	1381.650	0.008
L3	110.5 - 109.4	TP24.852x23.686x0.452	5.500	0.000	0.0	33.635	-11.578	1424.950	0.008
	109.4 - 108.3					33.969	-11.773	1439.110	0.008
	108.3 - 107.2					34.303	-11.971	1453.260	0.008
	107.2 - 106.1					34.638	-12.171	1467.420	0.008
	106.1 - 105					34.972	-12.372	1481.580	0.008
L4	105 - 103.5 (4)	TP25.17x24.852x0.701	1.500	0.000	0.0	54.476	-12.734	2231.460	0.006
L5	103.5 - 102.462	TP27.15x25.17x0.469	9.340	0.000	0.0	37.062	-12.932	1522.950	0.008
	102.462 - 101.424					37.389	-13.132	1536.400	0.009
	101.424 - 100.387					37.717	-13.333	1549.840	0.009
	100.387 - 99.3489					38.044	-13.536	1563.280	0.009
	99.3489 - 98.3111					38.371	-13.741	1576.720	0.009
	98.3111 - 97.2733					38.698	-13.948	1590.160	0.009
	97.2733 - 96.2356					39.025	-14.156	1603.600	0.009
	96.2356 -					39.352	-14.366	1617.040	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	95.1978								
	95.1978 - 94.16					39.679	-14.578	1630.480	0.009
L6	94.16 - 93.144	TP29.11x27.15x0.577	9.250	0.000	0.0	49.022	-14.817	1997.310	0.007
	93.144 - 92.128					49.416	-15.056	2013.360	0.007
	92.128 - 91.112					49.810	-15.296	2029.420	0.008
	91.112 - 90.096					50.204	-15.539	2045.470	0.008
	90.096 - 89.08					50.598	-15.783	2061.530	0.008
	89.08 - 84.91					52.216	-8.748	2127.420	0.004
L7	89.08 - 84.91	TP34.188x27.726x0.596	30.500	0.000	0.0	52.991	-8.832	2169.920	0.004
	84.91 - 83.5242					53.546	-17.945	2192.660	0.008
	83.5242 - 82.1384					54.102	-18.304	2215.400	0.008
	82.1384 - 80.7526					54.657	-18.666	2238.140	0.008
	80.7526 - 79.3668					55.213	-19.032	2260.880	0.008
	79.3668 - 77.9811					55.768	-19.401	2283.620	0.008
	77.9811 - 76.5953					56.323	-19.773	2306.370	0.009
	76.5953 - 75.2095					56.879	-20.148	2329.110	0.009
	75.2095 - 73.8237					57.434	-20.527	2351.850	0.009
	73.8237 - 72.4379					57.989	-20.908	2374.590	0.009
	72.4379 - 71.0521					58.545	-21.293	2397.330	0.009
	71.0521 - 69.6663					59.100	-21.681	2420.070	0.009
	69.6663 - 68.2805					59.655	-22.073	2442.820	0.009
	68.2805 - 66.8947					60.211	-22.467	2465.560	0.009
	66.8947 - 65.5089					60.766	-22.865	2488.300	0.009
	65.5089 - 64.1232					61.321	-23.265	2511.040	0.009
	64.1232 - 62.7374					61.877	-23.669	2533.780	0.009
	62.7374 - 61.3516					62.432	-24.076	2556.520	0.009
	61.3516 - 59.9658					62.988	-24.486	2579.260	0.009
	59.9658 - 58.58					63.543	-24.900	2602.010	0.010
L8	58.58 - 57.25 (8)	TP34.47x34.188x0.643	1.330	0.000	0.0	69.047	-25.322	2954.560	0.009
L9	57.25 - 56.1543	TP37.19x34.47x0.635	12.840	0.000	0.0	68.688	-25.671	2943.960	0.009
	56.1543 - 55.0586					69.157	-26.020	2964.020	0.009
	55.0586 - 53.9629					69.625	-26.371	2984.080	0.009
	53.9629 -					70.093	-26.724	3004.140	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	52.8671								
	52.8671 - 51.7714					70.561	-27.079	3024.200	0.009
	51.7714 - 50.6757					71.029	-27.436	3044.270	0.009
	50.6757 - 49.58					71.497	-27.877	3064.330	0.009
	49.58 - 44.41					73.705	-15.398	3158.980	0.005
L10	49.58 - 44.41	TP39.717x35.47x0.666	19.997	0.000	0.0	75.916	-15.713	3265.650	0.005
	44.41 - 43.3509					76.392	-31.502	3286.110	0.010
	43.3509 - 42.2919					76.867	-31.876	3306.570	0.010
	42.2919 - 41.2328					77.343	-32.251	3327.030	0.010
	41.2328 - 40.1737					77.819	-32.629	3347.490	0.010
	40.1737 - 39.1146					78.294	-33.009	3367.960	0.010
	39.1146 - 38.0556					78.770	-33.390	3388.420	0.010
	38.0556 - 36.9965					79.245	-33.774	3408.880	0.010
	36.9965 - 35.9374					79.721	-34.160	3429.340	0.010
	35.9374 - 34.8784					80.197	-34.547	3449.800	0.010
	34.8784 - 33.8193					80.673	-34.937	3470.260	0.010
	33.8193 - 32.7602					81.148	-35.329	3490.720	0.010
	32.7602 - 31.7011					81.624	-35.723	3511.180	0.010
	31.7011 - 30.6421					82.099	-36.118	3531.640	0.010
	30.6421 - 29.583					82.575	-36.516	3552.100	0.010
L11	29.583 - 28.5 (11)	TP39.947x39.717x0.746	1.083	0.000	0.0	92.759	-36.961	3990.690	0.009
L12	28.5 - 27.5 (12)	TP40.159x39.947x0.711	1.000	0.000	0.0	89.007	-37.374	3888.690	0.010
L13	27.5 - 26.4708	TP44.531x40.159x0.673	20.583	0.000	0.0	84.757	-37.783	3716.520	0.010
	26.4708 - 25.4417					85.224	-38.195	3736.980	0.010
	25.4417 - 24.4126					85.690	-38.609	3757.440	0.010
	24.4126 - 23.3834					86.157	-39.026	3777.900	0.010
	23.3834 - 22.3543					86.624	-39.444	3798.360	0.010
	22.3543 - 21.3251					87.090	-39.864	3818.820	0.010
	21.3251 - 20.296					87.557	-40.286	3839.280	0.010
	20.296 - 19.2668					88.023	-40.711	3859.740	0.011
	19.2668 - 18.2376					88.490	-41.137	3880.200	0.011
	18.2376 - 17.2085					88.957	-41.565	3900.660	0.011
	17.2085 -					89.423	-41.995	3921.120	0.011

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	16.1793								
	16.1793 - 15.1502					89.890	-42.427	3941.580	0.011
	15.1502 - 14.121					90.356	-42.861	3962.040	0.011
	14.121 - 13.0919					90.823	-43.297	3982.500	0.011
	13.0919 - 12.0627					90.823	-43.320	3982.500	0.011
	12.0627 - 11.0336					91.290	-43.758	4002.960	0.011
	11.0336 - 10.0045					91.756	-44.198	4023.420	0.011
	10.0045 - 8.9753					92.223	-44.640	4043.880	0.011
	8.9753 - 7.94615					92.689	-45.083	4064.340	0.011
	7.94615 - 6.917					93.156	-45.529	4084.800	0.011
L14	6.917 - 5.76417	TP46x44.531x0.669	6.917	0.000	0.0	93.125	-45.978	4076.310	0.011
	5.76417 - 4.61133					93.645	-46.493	4099.060	0.011
	4.61133 - 3.4585					94.165	-47.010	4121.820	0.011
	3.4585 - 2.30567					94.685	-47.530	4144.570	0.011
	2.30567 - 1.15283					95.204	-48.053	4167.330	0.012
	1.15283 - 0					95.724	-48.578	4190.080	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	147 - 145.769	TP21.98x16.25x0.188	4.506	241.507	0.019	0.000	241.507	0.000
	145.769 - 144.539		9.108	249.448	0.037	0.000	249.448	0.000
	144.539 - 143.308		13.809	257.518	0.054	0.000	257.518	0.000
	143.308 - 142.078		18.610	265.717	0.070	0.000	265.717	0.000
	142.078 - 140.847		23.511	274.043	0.086	0.000	274.043	0.000
	140.847 - 139.617		28.515	282.499	0.101	0.000	282.499	0.000
	139.617 - 138.386		33.622	291.082	0.116	0.000	291.082	0.000
	138.386 - 137.156		38.834	299.795	0.130	0.000	299.795	0.000
	137.156 - 135.925		52.331	308.637	0.170	0.000	308.637	0.000
	135.925 - 134.695		64.951	317.606	0.205	0.000	317.606	0.000
	134.695 -		77.676	325.771	0.238	0.000	325.771	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	133.464							
	133.464 - 132.234		90.508	333.782	0.271	0.000	333.782	0.000
	132.234 - 131.003		103.449	341.854	0.303	0.000	341.854	0.000
	131.003 - 129.773		116.498	349.987	0.333	0.000	349.987	0.000
	129.773 - 128.542		132.616	358.179	0.370	0.000	358.179	0.000
	128.542 - 127.312		153.822	366.428	0.420	0.000	366.428	0.000
	127.312 - 126.081		175.136	374.735	0.467	0.000	374.735	0.000
	126.081 - 124.851		196.555	383.096	0.513	0.000	383.096	0.000
	124.851 - 123.62		218.079	391.511	0.557	0.000	391.511	0.000
	123.62 - 120.37		122.355	413.983	0.296	0.000	413.983	0.000
L2	123.62 - 120.37	TP23.686x20.906x0.25	153.160	550.192	0.278	0.000	550.192	0.000
	120.37 - 119.273		295.857	562.310	0.526	0.000	562.310	0.000
	119.273 - 118.177		316.674	574.560	0.551	0.000	574.560	0.000
	118.177 - 117.08		343.013	586.942	0.584	0.000	586.942	0.000
	117.08 - 115.983		366.890	599.456	0.612	0.000	599.456	0.000
	115.983 - 114.887		390.850	612.102	0.639	0.000	612.102	0.000
	114.887 - 113.79		414.892	624.880	0.664	0.000	624.880	0.000
	113.79 - 112.693		439.018	637.790	0.688	0.000	637.790	0.000
	112.693 - 111.597		463.227	650.832	0.712	0.000	650.832	0.000
	111.597 - 110.5		487.517	664.006	0.734	0.000	664.006	0.000
L3	110.5 - 109.4	TP24.852x23.686x0.452	511.973	679.972	0.753	0.000	679.972	0.000
	109.4 - 108.3		536.528	693.678	0.773	0.000	693.678	0.000
	108.3 - 107.2		561.183	707.522	0.793	0.000	707.522	0.000
	107.2 - 106.1		585.937	721.501	0.812	0.000	721.501	0.000
	106.1 - 105		610.793	735.617	0.830	0.000	735.617	0.000
L4	105 - 103.5 (4)	TP25.17x24.852x0.701	644.860	1100.058	0.586	0.000	1100.058	0.000
L5	103.5 - 102.462	TP27.15x25.17x0.469	668.548	772.080	0.866	0.000	772.080	0.000
	102.462 - 101.424		692.324	785.895	0.881	0.000	785.895	0.000
	101.424 - 100.387		716.192	799.833	0.895	0.000	799.833	0.000
	100.387 - 99.3489		740.149	813.893	0.909	0.000	813.893	0.000
	99.3489 - 98.3111		764.197	828.077	0.923	0.000	828.077	0.000
	98.3111 - 97.2733		788.336	842.383	0.936	0.000	842.383	0.000
	97.2733 - 96.2356		812.567	856.808	0.948	0.000	856.808	0.000
	96.2356 -		836.892	871.358	0.960	0.000	871.358	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	95.1978							
	95.1978 - 94.16		861.300	886.033	0.972	0.000	886.033	0.000
L6	94.16 - 93.144	TP29.11x27.15x0.577	885.292	1085.508	0.816	0.000	1085.508	0.000
	93.144 - 92.128		909.383	1103.217	0.824	0.000	1103.217	0.000
	92.128 - 91.112		933.558	1121.067	0.833	0.000	1121.067	0.000
	91.112 - 90.096		957.825	1139.058	0.841	0.000	1139.058	0.000
	90.096 - 89.08		982.192	1157.200	0.849	0.000	1157.200	0.000
	89.08 - 84.91		547.946	1233.142	0.444	0.000	1233.142	0.000
L7	89.08 - 84.91	TP34.188x27.726x0.596	535.432	1233.567	0.434	0.000	1233.567	0.000
	84.91 - 83.5242		1117.417	1259.833	0.887	0.000	1259.833	0.000
	83.5242 - 82.1384		1151.625	1286.375	0.895	0.000	1286.375	0.000
	82.1384 - 80.7526		1185.992	1313.192	0.903	0.000	1313.192	0.000
	80.7526 - 79.3668		1220.533	1340.283	0.911	0.000	1340.283	0.000
	79.3668 - 77.9811		1255.242	1367.658	0.918	0.000	1367.658	0.000
	77.9811 - 76.5953		1290.117	1395.308	0.925	0.000	1395.308	0.000
	76.5953 - 75.2095		1325.158	1423.233	0.931	0.000	1423.233	0.000
	75.2095 - 73.8237		1360.375	1451.433	0.937	0.000	1451.433	0.000
	73.8237 - 72.4379		1395.767	1479.908	0.943	0.000	1479.908	0.000
	72.4379 - 71.0521		1431.325	1508.667	0.949	0.000	1508.667	0.000
	71.0521 - 69.6663		1467.050	1537.700	0.954	0.000	1537.700	0.000
	69.6663 - 68.2805		1502.958	1567.008	0.959	0.000	1567.008	0.000
	68.2805 - 66.8947		1539.033	1596.592	0.964	0.000	1596.592	0.000
	66.8947 - 65.5089		1575.283	1626.450	0.969	0.000	1626.450	0.000
	65.5089 - 64.1232		1611.708	1656.592	0.973	0.000	1656.592	0.000
	64.1232 - 62.7374		1648.317	1687.008	0.977	0.000	1687.008	0.000
	62.7374 - 61.3516		1685.092	1717.700	0.981	0.000	1717.700	0.000
	61.3516 - 59.9658		1722.042	1748.667	0.985	0.000	1748.667	0.000
	59.9658 - 58.58		1759.175	1779.917	0.988	0.000	1779.917	0.000
L8	58.58 - 57.25 (8)	TP34.47x34.188x0.643	1794.983	2032.658	0.883	0.000	2032.658	0.000
L9	57.25 - 56.1543	TP37.19x34.47x0.635	1824.600	2040.467	0.894	0.000	2040.467	0.000
	56.1543 - 55.0586		1854.317	2068.625	0.896	0.000	2068.625	0.000
	55.0586 - 53.9629		1884.150	2096.975	0.899	0.000	2096.975	0.000
	53.9629 -		1914.083	2125.525	0.901	0.000	2125.525	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	52.8671							
	52.8671 - 51.7714		1944.125	2154.258	0.902	0.000	2154.258	0.000
	51.7714 - 50.6757		1974.275	2183.192	0.904	0.000	2183.192	0.000
	50.6757 - 49.58		2004.442	2212.317	0.906	0.000	2212.317	0.000
	49.58 - 44.41		1079.042	2352.342	0.459	0.000	2352.342	0.000
L10	49.58 - 44.41	TP39.717x35.47x0.666	1070.650	2385.558	0.449	0.000	2385.558	0.000
	44.41 - 43.3509		2179.800	2415.817	0.902	0.000	2415.817	0.000
	43.3509 - 42.2919		2209.992	2446.275	0.903	0.000	2446.275	0.000
	42.2919 - 41.2328		2240.275	2476.917	0.904	0.000	2476.917	0.000
	41.2328 - 40.1737		2270.658	2507.750	0.905	0.000	2507.750	0.000
	40.1737 - 39.1146		2301.125	2538.767	0.906	0.000	2538.767	0.000
	39.1146 - 38.0556		2331.692	2569.983	0.907	0.000	2569.983	0.000
	38.0556 - 36.9965		2362.350	2601.392	0.908	0.000	2601.392	0.000
	36.9965 - 35.9374		2393.092	2632.983	0.909	0.000	2632.983	0.000
	35.9374 - 34.8784		2423.933	2664.775	0.910	0.000	2664.775	0.000
	34.8784 - 33.8193		2454.875	2696.750	0.910	0.000	2696.750	0.000
	33.8193 - 32.7602		2485.900	2728.917	0.911	0.000	2728.917	0.000
	32.7602 - 31.7011		2517.025	2761.275	0.912	0.000	2761.275	0.000
	31.7011 - 30.6421		2548.242	2793.825	0.912	0.000	2793.825	0.000
	30.6421 - 29.583		2579.550	2826.567	0.913	0.000	2826.567	0.000
L11	29.583 - 28.5 (11)	TP39.947x39.717x0.746	2611.667	3181.708	0.821	0.000	3181.708	0.000
L12	28.5 - 27.5 (12)	TP40.159x39.947x0.711	2641.408	3122.983	0.846	0.000	3122.983	0.000
L13	27.5 - 26.4708	TP44.531x40.159x0.673	2672.092	3007.342	0.889	0.000	3007.342	0.000
	26.4708 - 25.4417		2702.850	3040.825	0.889	0.000	3040.825	0.000
	25.4417 - 24.4126		2733.683	3074.492	0.889	0.000	3074.492	0.000
	24.4126 - 23.3834		2764.583	3108.342	0.889	0.000	3108.342	0.000
	23.3834 - 22.3543		2795.558	3142.375	0.890	0.000	3142.375	0.000
	22.3543 - 21.3251		2826.617	3176.600	0.890	0.000	3176.600	0.000
	21.3251 - 20.296		2857.733	3211.008	0.890	0.000	3211.008	0.000
	20.296 - 19.2668		2888.933	3245.600	0.890	0.000	3245.600	0.000
	19.2668 - 18.2376		2920.208	3280.375	0.890	0.000	3280.375	0.000
	18.2376 - 17.2085		2951.550	3315.333	0.890	0.000	3315.333	0.000
	17.2085 -		2982.967	3350.483	0.890	0.000	3350.483	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	16.1793							
	16.1793 - 15.1502		3014.458	3385.817	0.890	0.000	3385.817	0.000
	15.1502 - 14.121		3046.025	3421.342	0.890	0.000	3421.342	0.000
	14.121 - 13.0919		3077.667	3457.042	0.890	0.000	3457.042	0.000
	13.0919 - 12.0627		3077.667	3457.042	0.890	0.000	3457.042	0.000
	12.0627 - 11.0336		3109.375	3492.933	0.890	0.000	3492.933	0.000
	11.0336 - 10.0045		3141.167	3529.008	0.890	0.000	3529.008	0.000
	10.0045 - 8.9753		3173.025	3565.267	0.890	0.000	3565.267	0.000
	8.9753 - 7.94615		3204.958	3601.717	0.890	0.000	3601.717	0.000
	7.94615 - 6.917		3236.967	3638.342	0.890	0.000	3638.342	0.000
L14	6.917 - 5.76417	TP46x44.531x0.669	3269.050	3649.842	0.896	0.000	3649.842	0.000
	5.76417 - 4.61133		3305.075	3691.017	0.895	0.000	3691.017	0.000
	4.61133 - 3.4585		3341.192	3732.417	0.895	0.000	3732.417	0.000
	3.4585 - 2.30567		3377.400	3774.050	0.895	0.000	3774.050	0.000
	2.30567 - 1.15283		3413.692	3815.917	0.895	0.000	3815.917	0.000
	1.15283 - 0		3450.075	3858.008	0.894	0.000	3858.008	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	147 - 145.769	TP21.98x16.25x0.188	3.701	360.954	0.010	0.000	483.603	0.000
	145.769 - 144.539		3.780	366.807	0.010	0.000	499.506	0.000
	144.539 - 143.308		3.861	372.661	0.010	0.000	515.666	0.000
	143.308 - 142.078		3.942	378.514	0.010	0.000	532.083	0.000
	142.078 - 140.847		4.025	384.367	0.010	0.000	548.758	0.000
	140.847 - 139.617		4.109	390.221	0.011	0.000	565.689	0.000
	139.617 - 138.386		4.193	396.074	0.011	0.000	582.878	0.000
	138.386 - 137.156		4.279	401.928	0.011	0.000	600.324	0.000
	137.156 - 135.925		10.214	407.781	0.025	0.000	618.028	0.000
	135.925 - 134.695		10.300	413.635	0.025	0.000	635.988	0.000
	134.695 -		10.387	418.291	0.025	0.000	652.339	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	133.464							
	133.464 - 132.234		10.475	422.622	0.025	0.000	668.380	0.000
	132.234 - 131.003		10.563	426.911	0.025	0.000	684.544	0.000
	131.003 - 129.773		10.652	431.158	0.025	0.000	700.830	0.000
	129.773 - 128.542		17.196	435.365	0.039	0.000	717.233	0.000
	128.542 - 127.312		17.283	439.529	0.039	0.000	733.753	0.000
	127.312 - 126.081		17.369	443.653	0.039	0.000	750.386	0.000
	126.081 - 124.851		17.456	447.735	0.039	0.000	767.129	0.000
	124.851 - 123.62		17.543	451.775	0.039	0.000	783.979	0.000
	123.62 - 120.37		7.981	451.775	0.018	0.000	828.980	0.000
L2	123.62 - 120.37	TP23.686x20.906x0.25	9.839	629.162	0.016	0.000	1101.733	0.000
	120.37 - 119.273		18.951	636.014	0.030	0.000	1125.992	0.000
	119.273 - 118.177		19.030	642.865	0.030	0.000	1150.525	0.000
	118.177 - 117.08		21.744	649.716	0.033	0.000	1175.317	0.000
	117.08 - 115.983		21.820	656.567	0.033	0.000	1200.375	0.000
	115.983 - 114.887		21.897	663.419	0.033	0.000	1225.700	0.000
	114.887 - 113.79		21.973	670.270	0.033	0.000	1251.292	0.000
	113.79 - 112.693		22.049	677.121	0.033	0.000	1277.142	0.000
	112.693 - 111.597		22.124	683.972	0.032	0.000	1303.258	0.000
	111.597 - 110.5		22.200	690.824	0.032	0.000	1329.633	0.000
L3	110.5 - 109.4	TP24.852x23.686x0.452	22.285	712.476	0.031	0.000	1361.608	0.000
	109.4 - 108.3		22.376	719.554	0.031	0.000	1389.050	0.000
	108.3 - 107.2		22.467	726.632	0.031	0.000	1416.775	0.000
	107.2 - 106.1		22.559	733.710	0.031	0.000	1444.767	0.000
	106.1 - 105		22.650	740.788	0.031	0.000	1473.033	0.000
L4	105 - 103.5 (4)	TP25.17x24.852x0.701	22.790	1115.730	0.020	0.000	2202.800	0.000
L5	103.5 - 102.462	TP27.15x25.17x0.469	22.877	761.477	0.030	0.000	1546.050	0.000
	102.462 - 101.424		22.964	768.198	0.030	0.000	1573.708	0.000
	101.424 - 100.387		23.051	774.918	0.030	0.000	1601.625	0.000
	100.387 - 99.3489		23.139	781.639	0.030	0.000	1629.775	0.000
	99.3489 - 98.3111		23.226	788.359	0.029	0.000	1658.175	0.000
	98.3111 - 97.2733		23.314	795.080	0.029	0.000	1686.825	0.000
	97.2733 - 96.2356		23.402	801.801	0.029	0.000	1715.717	0.000
	96.2356 -		23.491	808.521	0.029	0.000	1744.850	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	95.1978							
	95.1978 - 94.16		23.580	815.242	0.029	0.000	1774.233	0.000
L6	94.16 - 93.144	TP29.11x27.15x0.577	23.669	998.653	0.024	0.000	2173.675	0.000
	93.144 - 92.128		23.760	1006.680	0.024	0.000	2209.133	0.000
	92.128 - 91.112		23.852	1014.710	0.024	0.000	2244.875	0.000
	91.112 - 90.096		23.944	1022.740	0.023	0.000	2280.908	0.000
	90.096 - 89.08		24.037	1030.760	0.023	0.000	2317.225	0.000
	89.08 - 84.91		12.498	1030.760	0.012	0.000	2469.292	0.000
L7	89.08 - 84.91	TP34.188x27.726x0.596	12.024	1084.960	0.011	0.000	2470.158	0.000
	84.91 - 83.5242		24.637	1096.330	0.022	0.000	2522.750	0.000
	83.5242 - 82.1384		24.757	1107.700	0.022	0.000	2575.892	0.000
	82.1384 - 80.7526		24.878	1119.070	0.022	0.000	2629.592	0.000
	80.7526 - 79.3668		24.999	1130.440	0.022	0.000	2683.850	0.000
	79.3668 - 77.9811		25.121	1141.810	0.022	0.000	2738.658	0.000
	77.9811 - 76.5953		25.243	1153.180	0.022	0.000	2794.025	0.000
	76.5953 - 75.2095		25.366	1164.550	0.022	0.000	2849.942	0.000
	75.2095 - 73.8237		25.489	1175.920	0.022	0.000	2906.417	0.000
	73.8237 - 72.4379		25.613	1187.300	0.022	0.000	2963.442	0.000
	72.4379 - 71.0521		25.737	1198.670	0.021	0.000	3021.017	0.000
	71.0521 - 69.6663		25.862	1210.040	0.021	0.000	3079.150	0.000
	69.6663 - 68.2805		25.987	1221.410	0.021	0.000	3137.842	0.000
	68.2805 - 66.8947		26.113	1232.780	0.021	0.000	3197.083	0.000
	66.8947 - 65.5089		26.239	1244.150	0.021	0.000	3256.883	0.000
	65.5089 - 64.1232		26.366	1255.520	0.021	0.000	3317.233	0.000
	64.1232 - 62.7374		26.493	1266.890	0.021	0.001	3378.142	0.000
	62.7374 - 61.3516		26.621	1278.260	0.021	0.001	3439.600	0.000
	61.3516 - 59.9658		26.749	1289.630	0.021	0.001	3501.608	0.000
	59.9658 - 58.58		26.878	1301.000	0.021	0.001	3564.175	0.000
L8	58.58 - 57.25 (8)	TP34.47x34.188x0.643	26.997	1477.280	0.018	0.001	4070.283	0.000
L9	57.25 - 56.1543	TP37.19x34.47x0.635	27.092	1471.980	0.018	0.001	4085.925	0.000
	56.1543 - 55.0586		27.189	1482.010	0.018	0.001	4142.308	0.000
	55.0586 - 53.9629		27.286	1492.040	0.018	0.001	4199.083	0.000
	53.9629 -		27.383	1502.070	0.018	0.001	4256.250	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	52.8671							
	52.8671 - 51.7714		27.481	1512.100	0.018	0.001	4313.792	0.000
	51.7714 - 50.6757		27.579	1522.130	0.018	0.001	4371.725	0.000
	50.6757 - 49.58		27.761	1532.160	0.018	0.240	4430.050	0.000
	49.58 - 44.41		14.406	1579.490	0.009	0.120	4710.442	0.000
L10	49.58 - 44.41	TP39.717x35.47x0.666	14.011	1632.830	0.009	0.119	4776.950	0.000
	44.41 - 43.3509		28.483	1643.060	0.017	0.240	4837.550	0.000
	43.3509 - 42.2919		28.570	1653.290	0.017	0.240	4898.525	0.000
	42.2919 - 41.2328		28.657	1663.520	0.017	0.240	4959.883	0.000
	41.2328 - 40.1737		28.744	1673.750	0.017	0.240	5021.625	0.000
	40.1737 - 39.1146		28.831	1683.980	0.017	0.240	5083.750	0.000
	39.1146 - 38.0556		28.919	1694.210	0.017	0.240	5146.250	0.000
	38.0556 - 36.9965		29.007	1704.440	0.017	0.240	5209.142	0.000
	36.9965 - 35.9374		29.095	1714.670	0.017	0.240	5272.408	0.000
	35.9374 - 34.8784		29.183	1724.900	0.017	0.240	5336.058	0.000
	34.8784 - 33.8193		29.271	1735.130	0.017	0.240	5400.092	0.000
	33.8193 - 32.7602		29.360	1745.360	0.017	0.240	5464.508	0.000
	32.7602 - 31.7011		29.449	1755.590	0.017	0.240	5529.308	0.000
	31.7011 - 30.6421		29.538	1765.820	0.017	0.240	5594.483	0.000
	30.6421 - 29.583		29.627	1776.050	0.017	0.240	5660.050	0.000
L11	29.583 - 28.5 (11)	TP39.947x39.717x0.746	29.715	1995.350	0.015	0.240	6371.200	0.000
L12	28.5 - 27.5 (12)	TP40.159x39.947x0.711	29.796	1944.350	0.015	0.240	6253.600	0.000
L13	27.5 - 26.4708	TP44.531x40.159x0.673	29.868	1858.260	0.016	0.240	6022.041	0.000
	26.4708 - 25.4417		29.939	1868.490	0.016	0.240	6089.083	0.000
	25.4417 - 24.4126		30.010	1878.720	0.016	0.240	6156.500	0.000
	24.4126 - 23.3834		30.082	1888.950	0.016	0.240	6224.283	0.000
	23.3834 - 22.3543		30.153	1899.180	0.016	0.240	6292.441	0.000
	22.3543 - 21.3251		30.224	1909.410	0.016	0.240	6360.967	0.000
	21.3251 - 20.296		30.296	1919.640	0.016	0.240	6429.867	0.000
	20.296 - 19.2668		30.367	1929.870	0.016	0.240	6499.133	0.000
	19.2668 - 18.2376		30.439	1940.100	0.016	0.240	6568.775	0.000
	18.2376 - 17.2085		30.510	1950.330	0.016	0.240	6638.783	0.000
	17.2085 -		30.582	1960.560	0.016	0.240	6709.167	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	16.1793							
	16.1793 - 15.1502		30.654	1970.790	0.016	0.240	6779.917	0.000
	15.1502 - 14.121		30.725	1981.020	0.016	0.240	6851.041	0.000
	14.121 - 13.0919		30.797	1991.250	0.015	0.240	6922.541	0.000
	13.0919 - 12.0627		30.869	2001.480	0.015	0.240	6922.541	0.000
	12.0627 - 11.0336		30.941	2011.710	0.015	0.240	6994.408	0.000
	11.0336 - 10.0045		31.013	2021.940	0.015	0.239	7066.641	0.000
	10.0045 - 8.9753		31.084	2032.170	0.015	0.239	7139.258	0.000
	8.9753 - 7.94615		31.157	2042.400	0.015	0.239	7212.233	0.000
	7.94615 - 6.917		31.229	2052.630	0.015	0.239	7285.583	0.000
L14	6.917 - 5.76417	TP46x44.531x0.669	31.308	2049.530	0.015	0.239	7308.617	0.000
	5.76417 - 4.61133		31.386	2060.910	0.015	0.239	7391.058	0.000
	4.61133 - 3.4585		31.464	2072.290	0.015	0.239	7473.967	0.000
	3.4585 - 2.30567		31.542	2083.660	0.015	0.239	7557.333	0.000
	2.30567 - 1.15283		31.619	2095.040	0.015	0.239	7641.158	0.000
	1.15283 - 0		31.697	2106.420	0.015	0.239	7725.450	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 145.769	0.003	0.019	0.000	0.010	0.000	0.021 ✔	1.000	4.8.2 ✔
	145.769 - 144.539	0.003	0.037	0.000	0.010	0.000	0.039 ✔	1.000	4.8.2 ✔
	144.539 - 143.308	0.003	0.054	0.000	0.010	0.000	0.056 ✔	1.000	4.8.2 ✔
	143.308 - 142.078	0.003	0.070	0.000	0.010	0.000	0.073 ✔	1.000	4.8.2 ✔
	142.078 - 140.847	0.003	0.086	0.000	0.010	0.000	0.089 ✔	1.000	4.8.2 ✔
	140.847 - 139.617	0.003	0.101	0.000	0.011	0.000	0.104 ✔	1.000	4.8.2 ✔
	139.617 - 138.386	0.003	0.116	0.000	0.011	0.000	0.118 ✔	1.000	4.8.2 ✔
	138.386 - 137.156	0.003	0.130	0.000	0.011	0.000	0.132 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	137.156 - 135.925	0.005	0.170	0.000	0.025	0.000	0.175 ✔	1.000	4.8.2 ✔
	135.925 - 134.695	0.005	0.205	0.000	0.025	0.000	0.210 ✔	1.000	4.8.2 ✔
	134.695 - 133.464	0.005	0.238	0.000	0.025	0.000	0.244 ✔	1.000	4.8.2 ✔
	133.464 - 132.234	0.005	0.271	0.000	0.025	0.000	0.277 ✔	1.000	4.8.2 ✔
	132.234 - 131.003	0.005	0.303	0.000	0.025	0.000	0.308 ✔	1.000	4.8.2 ✔
	131.003 - 129.773	0.005	0.333	0.000	0.025	0.000	0.339 ✔	1.000	4.8.2 ✔
	129.773 - 128.542	0.008	0.370	0.000	0.039	0.000	0.380 ✔	1.000	4.8.2 ✔
	128.542 - 127.312	0.008	0.420	0.000	0.039	0.000	0.429 ✔	1.000	4.8.2 ✔
	127.312 - 126.081	0.008	0.467	0.000	0.039	0.000	0.477 ✔	1.000	4.8.2 ✔
	126.081 - 124.851	0.008	0.513	0.000	0.039	0.000	0.523 ✔	1.000	4.8.2 ✔
	124.851 - 123.62	0.008	0.557	0.000	0.039	0.000	0.567 ✔	1.000	4.8.2 ✔
	123.62 - 120.37	0.004	0.296	0.000	0.018	0.000	0.300 ✔	1.000	4.8.2 ✔
L2	123.62 - 120.37	0.004	0.278	0.000	0.016	0.000	0.282 ✔	1.000	4.8.2 ✔
	120.37 - 119.273	0.007	0.526	0.000	0.030	0.000	0.534 ✔	1.000	4.8.2 ✔
	119.273 - 118.177	0.007	0.551	0.000	0.030	0.000	0.559 ✔	1.000	4.8.2 ✔
	118.177 - 117.08	0.008	0.584	0.000	0.033	0.000	0.594 ✔	1.000	4.8.2 ✔
	117.08 - 115.983	0.008	0.612	0.000	0.033	0.000	0.621 ✔	1.000	4.8.2 ✔
	115.983 - 114.887	0.008	0.639	0.000	0.033	0.000	0.648 ✔	1.000	4.8.2 ✔
	114.887 - 113.79	0.008	0.664	0.000	0.033	0.000	0.673 ✔	1.000	4.8.2 ✔
	113.79 - 112.693	0.008	0.688	0.000	0.033	0.000	0.698 ✔	1.000	4.8.2 ✔
	112.693 - 111.597	0.008	0.712	0.000	0.032	0.000	0.721 ✔	1.000	4.8.2 ✔
	111.597 - 110.5	0.008	0.734	0.000	0.032	0.000	0.743 ✔	1.000	4.8.2 ✔
L3	110.5 - 109.4	0.008	0.753	0.000	0.031	0.000	0.762 ✔	1.000	4.8.2 ✔
	109.4 - 108.3	0.008	0.773	0.000	0.031	0.000	0.783 ✔	1.000	4.8.2 ✔
	108.3 - 107.2	0.008	0.793	0.000	0.031	0.000	0.802 ✔	1.000	4.8.2 ✔
	107.2 - 106.1	0.008	0.812	0.000	0.031	0.000	0.821 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	106.1 - 105	0.008	0.830	0.000	0.031	0.000	0.840 ✔	1.000	4.8.2 ✔
L4	105 - 103.5 (4)	0.006	0.586	0.000	0.020	0.000	0.592 ✔	1.000	4.8.2 ✔
L5	103.5 - 102.462	0.008	0.866	0.000	0.030	0.000	0.875 ✔	1.000	4.8.2 ✔
	102.462 - 101.424	0.009	0.881	0.000	0.030	0.000	0.890 ✔	1.000	4.8.2 ✔
	101.424 - 100.387	0.009	0.895	0.000	0.030	0.000	0.905 ✔	1.000	4.8.2 ✔
	100.387 - 99.3489	0.009	0.909	0.000	0.030	0.000	0.919 ✔	1.000	4.8.2 ✔
	99.3489 - 98.3111	0.009	0.923	0.000	0.029	0.000	0.932 ✔	1.000	4.8.2 ✔
	98.3111 - 97.2733	0.009	0.936	0.000	0.029	0.000	0.945 ✔	1.000	4.8.2 ✔
	97.2733 - 96.2356	0.009	0.948	0.000	0.029	0.000	0.958 ✔	1.000	4.8.2 ✔
	96.2356 - 95.1978	0.009	0.960	0.000	0.029	0.000	0.970 ✔	1.000	4.8.2 ✔
	95.1978 - 94.16	0.009	0.972	0.000	0.029	0.000	0.982 ✔	1.000	4.8.2 ✔
L6	94.16 - 93.144	0.007	0.816	0.000	0.024	0.000	0.824 ✔	1.000	4.8.2 ✔
	93.144 - 92.128	0.007	0.824	0.000	0.024	0.000	0.832 ✔	1.000	4.8.2 ✔
	92.128 - 91.112	0.008	0.833	0.000	0.024	0.000	0.841 ✔	1.000	4.8.2 ✔
	91.112 - 90.096	0.008	0.841	0.000	0.023	0.000	0.849 ✔	1.000	4.8.2 ✔
	90.096 - 89.08	0.008	0.849	0.000	0.023	0.000	0.857 ✔	1.000	4.8.2 ✔
	89.08 - 84.91	0.004	0.444	0.000	0.012	0.000	0.449 ✔	1.000	4.8.2 ✔
L7	89.08 - 84.91	0.004	0.434	0.000	0.011	0.000	0.438 ✔	1.000	4.8.2 ✔
	84.91 - 83.5242	0.008	0.887	0.000	0.022	0.000	0.896 ✔	1.000	4.8.2 ✔
	83.5242 - 82.1384	0.008	0.895	0.000	0.022	0.000	0.904 ✔	1.000	4.8.2 ✔
	82.1384 - 80.7526	0.008	0.903	0.000	0.022	0.000	0.912 ✔	1.000	4.8.2 ✔
	80.7526 - 79.3668	0.008	0.911	0.000	0.022	0.000	0.920 ✔	1.000	4.8.2 ✔
	79.3668 - 77.9811	0.008	0.918	0.000	0.022	0.000	0.927 ✔	1.000	4.8.2 ✔
	77.9811 - 76.5953	0.009	0.925	0.000	0.022	0.000	0.934 ✔	1.000	4.8.2 ✔
	76.5953 - 75.2095	0.009	0.931	0.000	0.022	0.000	0.940 ✔	1.000	4.8.2 ✔
	75.2095 - 73.8237	0.009	0.937	0.000	0.022	0.000	0.946 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	73.8237 - 72.4379	0.009	0.943	0.000	0.022	0.000	0.952 ✔	1.000	4.8.2 ✔
	72.4379 - 71.0521	0.009	0.949	0.000	0.021	0.000	0.958 ✔	1.000	4.8.2 ✔
	71.0521 - 69.6663	0.009	0.954	0.000	0.021	0.000	0.963 ✔	1.000	4.8.2 ✔
	69.6663 - 68.2805	0.009	0.959	0.000	0.021	0.000	0.969 ✔	1.000	4.8.2 ✔
	68.2805 - 66.8947	0.009	0.964	0.000	0.021	0.000	0.974 ✔	1.000	4.8.2 ✔
	66.8947 - 65.5089	0.009	0.969	0.000	0.021	0.000	0.978 ✔	1.000	4.8.2 ✔
	65.5089 - 64.1232	0.009	0.973	0.000	0.021	0.000	0.983 ✔	1.000	4.8.2 ✔
	64.1232 - 62.7374	0.009	0.977	0.000	0.021	0.000	0.987 ✔	1.000	4.8.2 ✔
	62.7374 - 61.3516	0.009	0.981	0.000	0.021	0.000	0.991 ✔	1.000	4.8.2 ✔
	61.3516 - 59.9658	0.009	0.985	0.000	0.021	0.000	0.995 ✔	1.000	4.8.2 ✔
	59.9658 - 58.58	0.010	0.988	0.000	0.021	0.000	0.998 ✔	1.000	4.8.2 ✔
L8	58.58 - 57.25 (8)	0.009	0.883	0.000	0.018	0.000	0.892 ✔	1.000	4.8.2 ✔
L9	57.25 - 56.1543	0.009	0.894	0.000	0.018	0.000	0.903 ✔	1.000	4.8.2 ✔
	56.1543 - 55.0586	0.009	0.896	0.000	0.018	0.000	0.906 ✔	1.000	4.8.2 ✔
	55.0586 - 53.9629	0.009	0.899	0.000	0.018	0.000	0.908 ✔	1.000	4.8.2 ✔
	53.9629 - 52.8671	0.009	0.901	0.000	0.018	0.000	0.910 ✔	1.000	4.8.2 ✔
	52.8671 - 51.7714	0.009	0.902	0.000	0.018	0.000	0.912 ✔	1.000	4.8.2 ✔
	51.7714 - 50.6757	0.009	0.904	0.000	0.018	0.000	0.914 ✔	1.000	4.8.2 ✔
	50.6757 - 49.58	0.009	0.906	0.000	0.018	0.000	0.915 ✔	1.000	4.8.2 ✔
	49.58 - 44.41	0.005	0.459	0.000	0.009	0.000	0.464 ✔	1.000	4.8.2 ✔
L10	49.58 - 44.41	0.005	0.449	0.000	0.009	0.000	0.454 ✔	1.000	4.8.2 ✔
	44.41 - 43.3509	0.010	0.902	0.000	0.017	0.000	0.912 ✔	1.000	4.8.2 ✔
	43.3509 - 42.2919	0.010	0.903	0.000	0.017	0.000	0.913 ✔	1.000	4.8.2 ✔
	42.2919 - 41.2328	0.010	0.904	0.000	0.017	0.000	0.914 ✔	1.000	4.8.2 ✔
	41.2328 - 40.1737	0.010	0.905	0.000	0.017	0.000	0.916 ✔	1.000	4.8.2 ✔
	40.1737 - 39.1146	0.010	0.906	0.000	0.017	0.000	0.916 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	39.1146 - 38.0556	0.010	0.907	0.000	0.017	0.000	0.917 ✔	1.000	4.8.2 ✔
	38.0556 - 36.9965	0.010	0.908	0.000	0.017	0.000	0.918 ✔	1.000	4.8.2 ✔
	36.9965 - 35.9374	0.010	0.909	0.000	0.017	0.000	0.919 ✔	1.000	4.8.2 ✔
	35.9374 - 34.8784	0.010	0.910	0.000	0.017	0.000	0.920 ✔	1.000	4.8.2 ✔
	34.8784 - 33.8193	0.010	0.910	0.000	0.017	0.000	0.921 ✔	1.000	4.8.2 ✔
	33.8193 - 32.7602	0.010	0.911	0.000	0.017	0.000	0.921 ✔	1.000	4.8.2 ✔
	32.7602 - 31.7011	0.010	0.912	0.000	0.017	0.000	0.922 ✔	1.000	4.8.2 ✔
	31.7011 - 30.6421	0.010	0.912	0.000	0.017	0.000	0.923 ✔	1.000	4.8.2 ✔
	30.6421 - 29.583	0.010	0.913	0.000	0.017	0.000	0.923 ✔	1.000	4.8.2 ✔
L11	29.583 - 28.5 (11)	0.009	0.821	0.000	0.015	0.000	0.830 ✔	1.000	4.8.2 ✔
L12	28.5 - 27.5 (12)	0.010	0.846	0.000	0.015	0.000	0.856 ✔	1.000	4.8.2 ✔
L13	27.5 - 26.4708	0.010	0.889	0.000	0.016	0.000	0.899 ✔	1.000	4.8.2 ✔
	26.4708 - 25.4417	0.010	0.889	0.000	0.016	0.000	0.899 ✔	1.000	4.8.2 ✔
	25.4417 - 24.4126	0.010	0.889	0.000	0.016	0.000	0.900 ✔	1.000	4.8.2 ✔
	24.4126 - 23.3834	0.010	0.889	0.000	0.016	0.000	0.900 ✔	1.000	4.8.2 ✔
	23.3834 - 22.3543	0.010	0.890	0.000	0.016	0.000	0.900 ✔	1.000	4.8.2 ✔
	22.3543 - 21.3251	0.010	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	21.3251 - 20.296	0.010	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	20.296 - 19.2668	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	19.2668 - 18.2376	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	18.2376 - 17.2085	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	17.2085 - 16.1793	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	16.1793 - 15.1502	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	15.1502 - 14.121	0.011	0.890	0.000	0.016	0.000	0.901 ✔	1.000	4.8.2 ✔
	14.121 - 13.0919	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
	13.0919 - 12.0627	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	12.0627 - 11.0336	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
	11.0336 - 10.0045	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
	10.0045 - 8.9753	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
	8.9753 - 7.94615	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
	7.94615 - 6.917	0.011	0.890	0.000	0.015	0.000	0.901 ✔	1.000	4.8.2 ✔
L14	6.917 - 5.76417	0.011	0.896	0.000	0.015	0.000	0.907 ✔	1.000	4.8.2 ✔
	5.76417 - 4.61133	0.011	0.895	0.000	0.015	0.000	0.907 ✔	1.000	4.8.2 ✔
	4.61133 - 3.4585	0.011	0.895	0.000	0.015	0.000	0.907 ✔	1.000	4.8.2 ✔
	3.4585 - 2.30567	0.011	0.895	0.000	0.015	0.000	0.907 ✔	1.000	4.8.2 ✔
	2.30567 - 1.15283	0.012	0.895	0.000	0.015	0.000	0.906 ✔	1.000	4.8.2 ✔
	1.15283 - 0	0.012	0.894	0.000	0.015	0.000	0.906 ✔	1.000	4.8.2 ✔

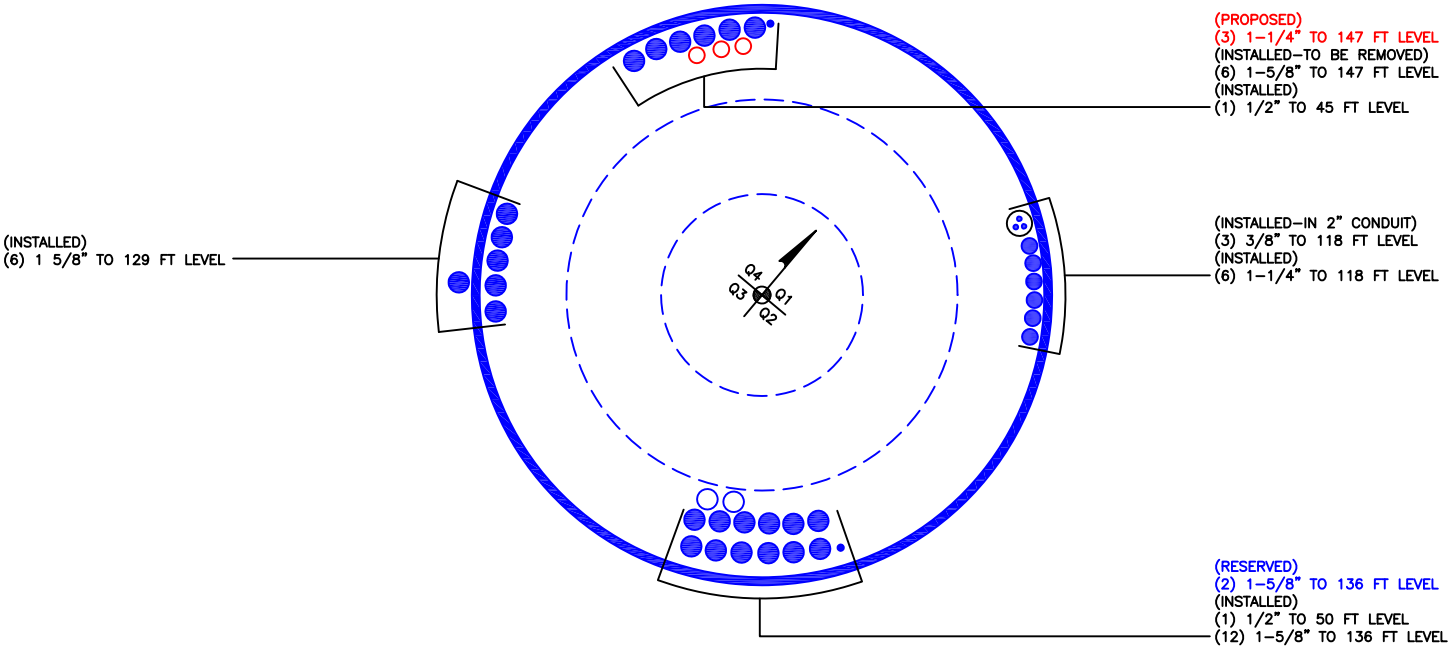
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	147 - 120.37	Pole	TP21.98x16.25x0.188	1	-7.382	903.550	**	**
L2	120.37 - 110.5	Pole	TP23.686x20.906x0.25	2	-11.374	1381.650	**	**
L3	110.5 - 105	Pole	TP24.852x23.686x0.452	3	-12.372	1481.580	**	**
L4	105 - 103.5	Pole	TP25.17x24.852x0.701	4	-12.734	2231.460	**	**
L5	103.5 - 94.16	Pole	TP27.15x25.17x0.469	5	-14.578	1630.480	**	**
L6	94.16 - 84.91	Pole	TP29.11x27.15x0.577	6	-15.783	2061.530	**	**
L7	84.91 - 58.58	Pole	TP34.188x27.726x0.596	7	-24.900	2602.010	**	**
L8	58.58 - 57.25	Pole	TP34.47x34.188x0.643	8	-25.322	2954.560	**	**
L9	57.25 - 44.41	Pole	TP37.19x34.47x0.635	9	-27.877	3064.330	**	**
L10	44.41 - 29.583	Pole	TP39.717x35.47x0.666	10	-36.516	3552.100	**	**
L11	29.583 - 28.5	Pole	TP39.947x39.717x0.746	11	-36.961	3990.690	**	**
L12	28.5 - 27.5	Pole	TP40.159x39.947x0.711	12	-37.374	3888.690	**	**
L13	27.5 - 6.917	Pole	TP44.531x40.159x0.673	13	-43.320	3982.500	**	**
L14	6.917 - 0	Pole	TP46x44.531x0.669	14	-45.978	4076.310	**	**
							Summary	
						Pole (L7)	**	**
						RATING =	**	**

** See Additional Calculations

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876360

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	6.917	5	PL1.25x5	F	0	T&C
6.917	27.5	3	PL1.25x5	F	0	T&C
27.5	57.25	3	PL1.25x5	F	0	T&C
57.25	87.25	3	PL1.25x4.75	F	0	T&C
87.25	105	3	PL1.25x4.25	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

1

Reinforcement 2

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
6.917	29.583	3	MP303	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	28.5	3	PL1x4.5	F	0	T&C
28.5	58.58	3	PL1x4.5	F	0	T&C
58.58	94.16	3	PL0.75x4	F	0	T&C
103.5	110.5	3	PL1x4.5	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

	Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.		Bottom Elevation Failure	Top Elevation Failure	Section Failure %
1	120.3700	147.0000	0.1875	65	80	56.5%										**56.5%**	147.0000	26.6300	3.2500	18	16.2500	21.9800	0.1875	65.0	1.00	1			
2	110.5000	123.6200	0.2500	65	80	74.2%										**74.2%**	123.6200	13.1200	0.0000	18	20.9057	23.6864	0.2500	65.0	1.00	2			
3	105.0000	110.5000	0.2500	65	80	60.3%							3	PL1x4.5	84.0%	**84.0%**	110.5000	5.5000	0.0000	18	23.6864	24.8521	0.4516	36.1	0.94	3			
4	103.5000	105.0000	0.2500	65	80	41.5%	3	PL1.25x4.25	59.2%				3	PL1x4.5	53.9%	**59.2%**	105.0000	1.5000	0.0000	18	24.8521	25.1700	0.7014	34.9	0.90	4			
5	94.1600	103.5000	0.2500	65	80	68.4%	3	PL1.25x4.25	98.2%							**98.2%**	103.5000	9.3400	0.0000	18	25.1700	27.1495	0.4685	35.1	0.94	5			
6	84.9100	94.1600	0.2500	65	80	59.4%	3	PL1.25x4.25	79.8%				3	PL0.75x4	85.7%	**85.7%**	94.1600	9.2500	4.1700	18	27.1495	29.1100	0.5766	34.8	0.93	6			
7	58.5800	89.0800	0.3125	65	80	69.4%	3	PL1.25x4.75	88.7%				3	PL0.75x4	99.9%	**99.9%**	89.0800	30.5000	0.0000	18	27.7262	34.1879	0.5960	34.9	0.95	7			
8	57.2500	58.5800	0.3125	65	80	64.9%	3	PL1.25x4.75	82.8%				3	PL1x4.5	89.2%	**89.2%**	58.5800	1.3300	0.0000	18	34.1879	34.4697	0.6431	36.5	0.94	8			
9	44.4100	57.2500	0.3125	65	80	66.7%	3	PL1.25x5	83.4%				3	PL1x4.5	91.6%	**91.6%**	57.2500	12.8400	5.1700	18	34.4697	37.1900	0.6353	36.5	0.95	9			
10	29.5830	49.5800	0.3750	65	80	67.4%	3	PL1.25x5	84.0%				3	PL1x4.5	92.3%	**92.3%**	49.5800	19.9970	0.0000	18	35.4697	39.7169	0.6662	36.6	0.96	10			
11	28.5000	29.5830	0.3750	65	80	60.8%	3	PL1.25x5	75.6%	3	MP303	68.0%	3	PL1x4.5	83.1%	**83.1%**	29.5830	1.0830	0.0000	18	39.7169	39.9469	0.7455	36.6	0.95	11			
12	27.5000	28.5000	0.3750	65	80	66.5%	3	PL1.25x5	80.1%	3	MP303	77.0%	3	PL1x4.5	85.6%	**85.6%**	28.5000	1.0000	0.0000	18	39.9469	40.1593	0.7109	38.4	0.99	12			
13	6.9170	27.5000	0.3750	65	80	70.1%	3	PL1.25x5	84.4%	3	MP303	80.9%	3	PL1x4.5	90.1%	**90.1%**	27.5000	20.5830	0.0000	18	40.1593	44.5309	0.6725	38.4	1.00	13			
14	0.0000	6.9170	0.3750	65	80	68.9%	5	PL1.25x5	90.6%				3	PL1x4.5	86.2%	**90.6%**	6.9170	6.9170	0.0000	18	44.5309	46.0000	0.6689	37.6	1.03	14			
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Section (Section)	Elevation (ft) (Elevation)	Moment (ft-kip) (Moment)	Compression (kip) (Compression)	Shear (kip) (Shear)	Torsion (kip-ft) (Torsion)	Number of Sides (PoleSides)	OD (in) (PoleOD)	Thickness (in) (PoleT)	Yield Strength (ksi) (PoleFy)	Flat Width (in) (PoleW)	Area (in^2) (PoleA)	Moment of Inertia (in^4) (PoleI)	Percent of Composite Moment of Inertia (PoleIPer)	Angle Offset to Pole Flat (PoleCPoint)	Distance to Extreme Fiber (in) (PoleC)	Section Modulus (in^3) (PoleS)	Torsion Constant (in^4) (PoleJ)
1	147	0.0	0.0	0.0	0.0	18	16.2500	0.1875	65	2.53	9.5	311	100%	TRUE	8.24	38	617
2	123.62	218.1	7.4	17.5	0.0	18	21.2807	0.1875	65	3.42	12.5	705	100%	TRUE	10.79	65	1397
3	120.37	275.5	7.9	17.8	0.0	18	21.9800	0.4375	65	3.10	29.9	1750	100%	TRUE	11.13	157	3475
4	110.5	487.6	11.4	22.2	0.0	18	23.6864	0.2500	65	3.74	18.6	1289	100%	TRUE	12.01	107	2556
5	105	610.9	12.4	22.7	0.0	18	24.8521	0.2500	65	3.94	19.5	1491	57%	0	12.43	120	2956
6	103.5	645.0	12.7	22.8	0.0	18	25.1700	0.2500	65	4.00	19.8	1549	38%	0	12.58	123	3072
7	94.16	861.5	14.6	23.6	0.0	18	27.1495	0.2500	65	4.35	21.3	1949	55%	0	13.57	144	3864
8	89.08	982.4	15.8	24.0	0.0	18	28.2262	0.2500	65	4.54	22.2	2192	45%	0	14.11	155	4346
9	87.25	1026.5	16.6	24.2	0.0	18	28.6141	0.5625	65	4.05	50.0	4968	64%	0	14.31	347	9864
10	84.91	1083.6	17.6	24.5	0.0	18	29.1100	0.5625	65	4.14	50.9	5236	63%	0	14.56	360	10396
11	58.58	1759.6	24.9	26.9	0.0	18	34.1879	0.3125	65	5.48	33.6	4865	54%	0	17.09	285	9646
12	57.25	1795.4	25.3	27.0	0.0	18	34.4697	0.3125	65	5.53	33.9	4988	50%	0	17.23	289	9889
13	49.58	2004.9	27.9	27.8	0.2	18	36.0947	0.3125	65	5.81	35.5	5734	50%	0	18.05	318	11368
14	44.41	2150.2	31.2	28.4	0.2	18	37.1900	0.6875	65	5.35	79.5	13381	69%	0	18.60	720	26562
15	29.583	2580.1	36.5	29.6	0.2	18	39.7169	0.3750	65	6.34	46.8	9145	57%	0	19.86	461	18132
16	28.5	2612.3	37.0	29.7	0.2	18	39.9469	0.3750	65	6.38	47.1	9307	52%	0	19.97	466	18452
17	27.5	2642.1	37.4	29.8	0.2	18	40.1593	0.3750	65	6.42	47.3	9479	54%	10	21.03	451	18750
18	6.917	3270.0	46.0	31.2	0.2	18	44.5309	0.3750	65	7.19	52.5	12957	57%	10	23.28	556	25634
19	0	3487.5	49.1	31.7	0.2	18	46.0000	0.3750	65	7.45	54.3	14280	57%	0	23.51	607	28278

Unreinforced Pole - Rev. G

Section	Effective Yield Stress (ksi) (PoleFye)	Nominal Bending Moment Strength (ft-kip) (PoleMn)	Strength Resistance Factor (PolePhiF)	Design Bending Moment Strength (ft-kip) (PolePhiMn)	Nominal Compressive Strength (kip) (PolePn)	Strength Resistance Factor (PolePhiC)	Design Compressive Strength (kip) (PolePhiPn)	Nominal Shear Strength (kip) (PoleVn)	Strength Resistance Factor (PolePhiV)	Design Shear Strength (kip) (PolePhiVn)	Nominal Torsion Shear Strength (kip-ft) (PoleVtn)	Strength Resistance Factor (PolePhiVt)	Design Torsion Shear Strength (kip-ft) (PolenPhiVt)	**Stress Ratio (PoleSRG)**
1	82.6	259.9	0.9	233.9	788.2	0.9	709.4	394.1	0.9	354.7	6185.1	0.9	5566.6	**0.000**
2	79.9	435.1	0.9	391.6	1002.6	0.9	902.3	501.3	0.9	451.2	10350.9	0.9	9315.8	**0.567**
3	82.6	1082.1	0.9	973.9	2464.8	0.9	2218.3	1232.4	0.9	1109.1	25780.8	0.9	23202.7	**0.287**
4	82.6	738.4	0.9	664.5	1533.6	0.9	1380.2	766.8	0.9	690.1	17570.4	0.9	15813.4	**0.743**
5	65.0	649.9	0.9	584.9	1267.7	0.9	1140.9	633.8	0.9	570.5	15463.1	0.9	13916.8	**1.057**
6	65.0	666.9	0.9	600.2	1284.1	0.9	1155.7	642.0	0.9	577.8	15867.3	0.9	14280.5	**1.087**
7	65.0	777.6	0.9	699.9	1386.2	0.9	1247.6	693.1	0.9	623.8	18501.0	0.9	16650.9	**1.244**
8	65.0	841.5	0.9	757.3	1441.7	0.9	1297.5	720.9	0.9	648.8	20018.3	0.9	18016.5	**1.311**
9	65.0	1880.9	0.9	1692.8	3249.3	0.9	2924.3	1624.6	0.9	1462.2	44812.5	0.9	40331.2	**0.612**
10	65.0	1948.7	0.9	1753.9	3306.8	0.9	2976.1	1653.4	0.9	1488.1	46426.5	0.9	41783.8	**0.624**
11	65.0	1541.7	0.9	1387.5	2182.1	0.9	1963.9	1091.0	0.9	981.9	36678.6	0.9	33010.7	**1.282**
12	65.0	1567.6	0.9	1410.8	2200.3	0.9	1980.2	1100.1	0.9	990.1	37293.9	0.9	33564.6	**1.286**
13	65.0	1721.1	0.9	1549.0	2305.0	0.9	2074.5	1152.5	0.9	1037.3	40942.5	0.9	36848.3	**1.308**
14	65.0	3897.8	0.9	3508.0	5168.3	0.9	4651.5	2584.2	0.9	2325.7	92850.6	0.9	83565.5	**0.620**
15	65.0	2494.5	0.9	2245.0	3041.0	0.9	2736.9	1520.5	0.9	1368.4	59348.5	0.9	53413.6	**1.163**
16	65.0	2523.9	0.9	2271.5	3058.8	0.9	2752.9	1529.4	0.9	1376.4	60047.6	0.9	54042.8	**1.164**
17	65.0	2440.9	0.9	2196.8	3075.2	0.9	2767.7	1537.6	0.9	1383.8	57941.5	0.9	52147.4	**1.217**
18	65.0	3014.3	0.9	2712.8	3413.4	0.9	3072.1	1706.7	0.9	1536.0	71559.7	0.9	64403.8	**1.221**
19	65.0	3290.1	0.9	2961.1	3527.1	0.9	3174.3	1763.5	0.9	1587.2	78183.7	0.9	70365.3	**1.194**
														1.311

Reinforced Pole / Rev. G

Section	Moment in Pole when Reinforced (PoleMome)	Bending Stress (ksi) (RPoleFbAc)	Axial Stress (ksi) (RPoleFaAc)	Shear Stress (ksi) (RPoleFvAc)	Torsion Shear Stress (ksi) (RPoleFvtAc)	Allowable Bending Stress (ksi) (PoleFbG)	Allowable Compressive Stress (ksi) (PoleFpG)	Allowable Shear Stress (ksi) (PoleFvG)	Allowable Torsion Shear Stress (ksi) (PoleFvtG)	**Reinforced Pole Stress Ratio (RPoleSRG)**
1	0.0	0.0	0.00	0.00	0.00	74.3	74.3	74.3	74.3	**0.000**
2	218.1	40.1	0.59	0.00	0.00	71.9	71.9	71.9	71.9	**0.565**
3	275.5	21.0	0.26	0.00	0.00	74.3	74.3	74.3	74.3	**0.286**
4	487.6	54.5	0.61	0.00	0.00	74.3	74.3	74.3	74.3	**0.742**
5	346.2	34.6	0.63	0.00	0.00	58.5	58.5	58.5	58.5	**0.603**
6	242.5	23.6	0.64	0.00	0.00	58.5	58.5	58.5	58.5	**0.415**
7	470.4	39.3	0.68	0.00	0.00	58.5	58.5	58.5	58.5	**0.684**
8	440.7	34.0	0.71	0.00	0.00	58.5	58.5	58.5	58.5	**0.594**
9	659.4	22.8	0.33	0.00	0.00	58.5	58.5	58.5	58.5	**0.395**
10	682.3	22.8	0.35	0.00	0.00	58.5	58.5	58.5	58.5	**0.395**
11	945.0	39.8	0.74	0.00	0.00	58.5	58.5	58.5	58.5	**0.694**
12	897.1	37.2	0.75	0.00	0.00	58.5	58.5	58.5	58.5	**0.649**
13	1012.2	38.2	0.79	0.00	0.00	58.5	58.5	58.5	58.5	**0.667**
14	1487.8	24.8	0.39	0.00	0.00	58.5	58.5	58.5	58.5	**0.431**
15	1483.2	38.6	0.78	0.00	0.00	58.5	58.5	58.5	58.5	**0.674**
16	1350.0	34.8	0.79	0.00	0.00	58.5	58.5	58.5	58.5	**0.608**
17	1431.1	38.1	0.79	0.00	0.00	58.5	58.5	58.5	58.5	**0.665**
18	1862.2	40.2	0.88	0.00	0.00	58.5	58.5	58.5	58.5	**0.701**
19	1993.1	39.4	0.90	0.00	0.00	58.5	58.5	58.5	58.5	**0.689**
										0.742

Reinforcement 1 / Reinforcement 2

Section	Rein 1 Qty (Rein1Qty)	Rein 1 Model (Rein1Model)	Position (F-Flat, C Corner) (Rein1Pos)	Gap Between Pole and Back of Rein. (in) (Rein1Gap)	Tension only or Tension & Comp (Rein1TC)	Total Moment of Inertia (in^4) (Rein1ITotal)	Axial Force (kip) (Rein1P)	**Stress Ratio (Rein1SR)**	Rein 2 Qty (Rein2Qty)	Rein 2 Model (Rein2Model)	Position (F-Flat, C Corner) (Rein2Pos)	Gap Between Pole and Back of Rein. (in) (Rein2Gap)	Tension only or Tension & Comp (Rein2TC)	Total Moment of Inertia (in^4) (Rein2ITotal)	Axial Force (kip) (Rein2P)	**Stress Ratio (Rein2SR)**
1																
2																
3																
4																
5																
6	3	PL1.25x4.25	F	0	T&C	1404	131.9	**0.592**								
7	3	PL1.25x4.25	F	0	T&C	1620	218.7	**0.982**								
8	3	PL1.25x4.25	F	0	T&C	1744	177.7	**0.798**								
9	3	PL1.25x4.25	F	0	T&C	1790	118.9	**0.534**								
10	3	PL1.25x4.75	F	0	T&C	2070	132.7	**0.510**								
11	3	PL1.25x4.75	F	0	T&C	2814	230.7	**0.887**								
12	3	PL1.25x4.75	F	0	T&C	2859	215.3	**0.828**								
13	3	PL1.25x5	F	0	T&C	3289	232.6	**0.834**								
14	3	PL1.25x5	F	0	T&C	3484	150.8	**0.541**								
15	3	PL1.25x5	F	0	T&C	3954	234.3	**0.840**								
16	3	PL1.25x5	F	0	T&C	3999	210.8	**0.756**	3	MP303	F	0	T&C	1863	98.3	**0.680**
17	3	PL1.25x5	F	0	T&C	4048	223.4	**0.801**	3	MP303	F	0	T&C	1886	111.3	**0.770**
18	3	PL1.25x5	F	0	T&C	4942	235.5	**0.844**	3	MP303	F	0	T&C	2303	117.0	**0.809**
19	5	PL1.25x5	F	0	T&C	8347	252.7	**0.906**								
								0.982								**0.809**

Reinforcement 3

Section	Qty (Rein3Qty)	Model (Rein3Model)	Position (F-Flat, C Corner) (Rein3Pos)	Gap Between Pole and Back of Rein. (in) (Rein3Gap)	Tension only or Tension & Comp (Rein3TC)	Total Moment of Inertia (in^4) (Rein3ITotal)	Axial Force (kip) (Rein3P)	**Stress Ratio (Rein3SR)**
1								
2								
3								
4								
5	3	PL1x4.5	F	0	T&C	1140	162.2	**0.840**
6	3	PL1x4.5	F	0	T&C	1168	104.1	**0.539**
7								
8	3	PL0.75x4	F	0	T&C	951	104.9	**0.857**
9	3	PL0.75x4	F	0	T&C	976	70.2	**0.574**
10	3	PL0.75x4	F	0	T&C	1009	70.0	**0.573**
11	3	PL0.75x4	F	0	T&C	1379	122.2	**0.999**
12	3	PL1x4.5	F	0	T&C	2135	172.3	**0.892**
13	3	PL1x4.5	F	0	T&C	2334	176.8	**0.916**
14	3	PL1x4.5	F	0	T&C	2473	114.7	**0.594**
15	3	PL1x4.5	F	0	T&C	2810	178.3	**0.923**
16	3	PL1x4.5	F	0	T&C	2841	160.4	**0.831**
17	3	PL1x4.5	F	0	T&C	2086	165.3	**0.856**
18	3	PL1x4.5	F	0	T&C	2550	174.0	**0.901**
19	3	PL1x4.5	F	0	T&C	2360	166.5	**0.862**
								0.999

Composite

Section	Centroid Offset (in) (CompYBar)	Area (in^2) (CompA)	Moment of Inertia (in^4) (CompI)	**Controlling Stress Ratio (CompSR)**	**Thickness (in) (EPoleT)**	**Weight Multiplier (EPoleWM)**	**Derated Yield Stress (ksi) (EDPoleFy)**	**% Error in Derated Yield Stress (EDPoleSRCheck)**
1	0.000	9.5	311	**0.000**	**0.1875**	**1.00**	**65.0**	**0.1%**
2	0.000	12.5	705	**0.565**	**0.1875**	**1.00**	**65.0**	**0.3%**
3	0.000	29.9	1750	**0.286**	**0.4375**	**1.00**	**65.0**	**0.2%**
4	0.000	18.6	1289	**0.742**	**0.2500**	**1.00**	**65.0**	**0.2%**
5	0.000	33.0	2631	**0.840**	**0.4516**	**0.94**	**36.1**	**2.7%**
6	0.000	49.2	4121	**0.592**	**0.7014**	**0.90**	**34.9**	**2.6%**
7	0.000	37.3	3569	**0.982**	**0.4685**	**0.94**	**35.1**	**2.6%**
8	0.000	47.1	4887	**0.857**	**0.5766**	**0.93**	**34.8**	**2.6%**
9	0.000	74.9	7734	**0.574**	**0.9067**	**0.94**	**34.8**	**2.5%**
10	0.000	77.7	8316	**0.573**	**0.9263**	**0.94**	**34.8**	**2.6%**
11	0.000	60.4	9059	**0.999**	**0.5960**	**0.95**	**34.9**	**2.6%**
12	0.000	65.2	9982	**0.892**	**0.6431**	**0.94**	**36.5**	**2.6%**
13	0.000	67.7	11358	**0.916**	**0.6353**	**0.95**	**36.5**	**2.6%**
14	0.000	111.8	19338	**0.594**	**1.0190**	**0.96**	**36.6**	**2.7%**
15	0.000	79.0	15909	**0.923**	**0.6662**	**0.96**	**36.6**	**2.8%**
16	0.000	88.1	18009	**0.831**	**0.7455**	**0.95**	**36.6**	**2.8%**
17	0.674	88.3	17499	**0.856**	**0.7109**	**0.99**	**38.4**	**0.4%**
18	0.704	93.5	22752	**0.901**	**0.6725**	**1.00**	**38.4**	**0.1%**
19	-0.510	99.0	24987	**0.906**	**0.6689**	**1.03**	**37.6**	**2.0%**
				0.999				

Rein1

Bottom	Top	Qty	Model	Position	T or T&C	Flats (Used for relative orientation only. Actual flat numbers may vary.) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	6.917	5	PL1.25x5	F	T&C		1				1		1		1				1				
6.917	27.5	3	PL1.25x5	F	T&C		1						1						1				
27.5	57.25	3	PL1.25x5	F	T&C		1						1						1				
57.25	87.25	3	L1.25x4.75	F	T&C		1						1						1				
87.25	105	3	L1.25x4.25	F	T&C		1						1						1				
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		

Rein2

Bottom	Top	Qty	Model	Position	T or T&C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
6.917	29.583	3	MP303	F	T&C					1						1						1	
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		

Rein3

Bottom	Top	Qty	Model	Position	T or T&C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	28.5	3	PL1x4.5	F	T&C	1						1								1			
28.5	58.58	3	PL1x4.5	F	T&C	1						1						1					
58.58	94.16	3	PL0.75x4	F	T&C	1						1						1					
103.5	110.5	3	PL1x4.5	F	T&C	1						1						1					
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		
				F	T&C																		

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure

5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
MP303	9.9	2.92	0.66	6.57	0.59	0	0.30	4.06	1.57	0.64	1.21875	65	80	0.80	18	1.00	18	96.4	128.6	Rupture	**144.7**	Rupture
PL1.25x4.25	18.1	5.31	0.69	8.00	0.625	0	1.25	4.25	0	0	1.21875	65	80	0.80	21	1.00	21	148.4	197.9	Rupture	222.7	Rupture
PL1.25x4.75	20.2	5.94	0.77	11.16	0.625	0	1.25	4.75	0	0	1.21875	65	80	0.80	18	1.00	18	173.4	231.3	Rupture	260.2	Rupture
PL1.25x5	21.3	6.25	0.81	13.02	0.625	0	1.25	5	0	0	1.21875	65	80	0.80	18	1.00	18	185.9	247.9	Rupture	278.9	Rupture
PL1x4.5	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
PL0.75x4	10.2	3.00	0.14	4.00	0.375	0	0.75	4	0	0	1.21875	65	80	0.80	16	1.00	16	81.6	108.8	Rupture	122.3	Rupture

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	876360
Name:	PRESTON - TOWN HALL
App. #:	363243 Revision # 6

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	3488	ft-kip
Axial:	49	kip
Shear:	32	kip
Base Plate Type:	Circular	

Design Information	
TIA Code:	G
ASIF:	1.000
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data

Quantity:	12	
Diameter:	2.25	in
Material:	A615 GR 75	
Bolt Circle:	55.0	in
Bolt Spacing:		in
Bolt Group Area:	47.71	in^2
Bolt Group MOIx:	18041	in^4

Reactions Seen by Original AR Group

Moment:	2615.6	kip-ft
Axial:	49.1	kip
Shear:	31.7	kip

Original AR Capacity Check

Combined Load:	199.6	kip
Allowable load:	259.8	kip
AR Capacity:	76.8%	Pass

First Added Anchor Rod Data

Quantity:	4	
Diameter:	2.25	in
Material:	A615 GR 75	
Bolt Circle:	55.0	in
Bolt Group Area:	15.90	in^2
Bolt Group MOIx:	6014	in^4

Reactions Seen by First Added AR Group

Moment:	871.9	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check

Combined Load:	183.7	kip
Allowable load:	259.8	kip
AR Capacity:	70.7%	Pass

Second Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Rev.4.1

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

TIA Rev G

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

Site Data

BU#:	*876360*
Site Name:	*PRESTON - TOWN HALL*
App #:	*363243 Revision # 6*
Pole Manufacturer:	*Other*

Reactions		
Mu:	2615.626	ft-kips
Axial, Pu:	49.0784	kips
Shear, Vu:	31.70771	kips
Eta Factor, ή	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	55	in

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	199.6 Kips	
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	
Anchor Rod Stress Ratio:	76.8%	**Pass**

Non-Rigid
AISC LRFD
φ*Tn

Plate Data		
Diam:	61	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.17	in

Non-Rigid
AISC LRFD
φ*Fy
Y.L. Length: 30.15

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

n/a

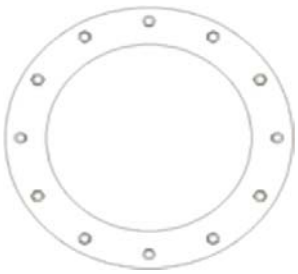
Stiffener Results

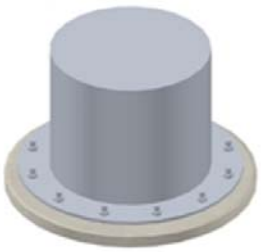
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	46	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None





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

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

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

TIA Rev G

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

Site Data

BU#: *876360*
Site Name: *PRESTON - TOWN HALL*
App #: *363243 Revision # 6*

Pole Manufacturer:	*Other*

Reactions		
Mu:	5231.2519	ft-kips
Axial, Pu:	98.1568	kips
Shear, Vu:	63.41541	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
	24	
	2.25	
	A615-J	
	100	
	75	
	55	

Stiffened
AISC LRFD
φ*Tn
Pass

Plate Data		
Diam:	61	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	6.08	in

Base Plate Results — Flexural Check

Base Plate Stress:	41.0 ksi	
Allowable Plate Stress:	54.0 ksi	
Base Plate Stress Ratio:	76.0%	Pass

Stiffened
AISC LRFD
φ*Fy
Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.5	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.375	in
Width:	6	in
Height:	14	in
Thick:	1	in
Notch:	0.75	in
Grade:	65	ksi
Weld str.:	80	ksi

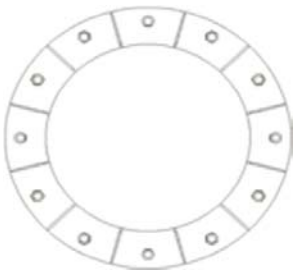
Stiffener Results

Horizontal Weld :	57.9%	Pass
Vertical Weld:	72.9%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	24.1%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^	58.4%	Pass
Plate Comp. (AISC Bracket):	65.6%	Pass

Pole Results

Pole Punching Shear Check:	29.8%	Pass

Pole Data		
Diam:	46	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

PROJECT	**876360 - Preston / Town Hall, CT**			
SUBJECT	**Foundation Analysis**			
DATE	**02-15-17**	PAGE 1	OF 1	

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

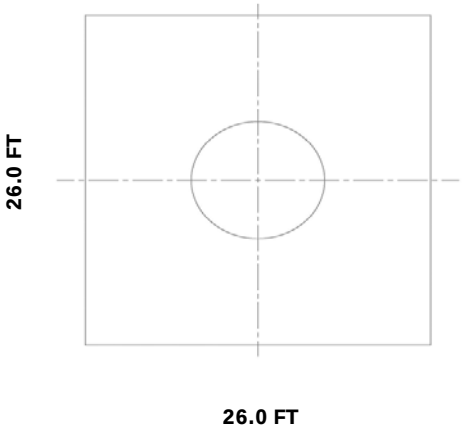
Rev. Type: G

Design Loads:

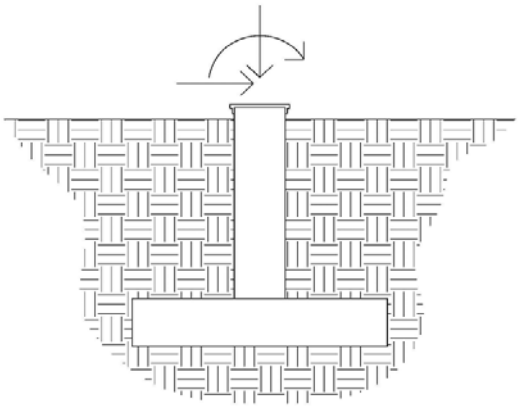
	Input factored loads	
Shear:	32.0	kips
Moment:	3,487.0	ft-kips
Tower Height:	147.0	ft
Tower Weight:	49.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	46.00	in
Bearing Depth:	6.0	ft
Pad Width:	26.0	ft
Neglected Depth:	2.0	ft
Thickness:	3.0	ft
Pier Diameter:	7.0	ft
Pier Height Above Grade:	1.0	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	8	
Pier Rebar Quanity:	33	
Pad Rebar Size:	8	
Pad Rebar Quanity:	26	
Pier Tie Size:	4	
Tie Quanity:	5	
Rebar Yield Strength:	60000	psi
Concrete Strength:	4000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.127	kcf
Ult. Bearing Capacity:	15.000	ksf
Angle of Friction:	40.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

** Notes:

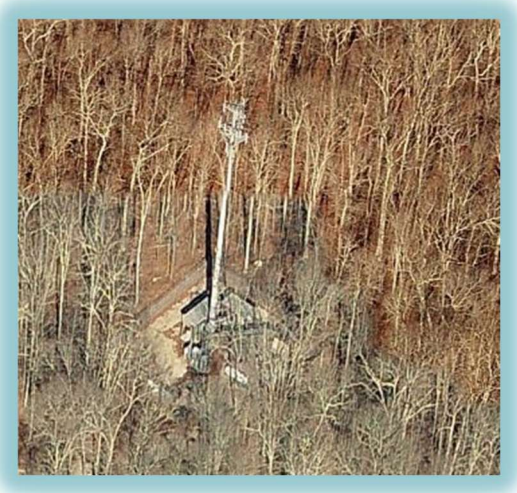
Summary of Results

Req'd Pier Diam.	OK
Overturning	49.8%
Shear Capacity	21.2%
Bearing	18.2%
Pad Shear - 1-way	35.9%
Pad Shear - 2-way	4.0%
Pad Moment Capacity	42.1%
Pier Moment Capacity	82.0%

Radio Frequency – Electromagnetic Energy (RF-EME) Compliance Report

Site No. CT23XC411
389 Rt. 2
Preston, Connecticut 06365
New London County
41.490347; -71.991542 NAD83
Monopole

EBI Project No. 62170011116
March 29, 2017



Prepared for:

Sprint
3 Van De Graaff
Burlington, Massachusetts 1803

Prepared by:

EBI Consulting
environmental | engineering | due diligence

EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by Sprint to conduct radio frequency electromagnetic (RF-EME) modeling for Sprint Site CT23XC411 located at 389 Rt. 2 in Preston, Connecticut to determine RF-EME exposure levels from proposed Sprint wireless communications equipment at this site. As described in greater detail in Appendix A of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public exposures and occupational exposures. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

This report contains a detailed summary of the RF EME analysis for the site.

This document addresses the compliance of Sprint's proposed transmitting facilities independently and in relation to all existing collocated facilities at the site.

Modeling results included in this report are based on drawings dated February 28, 2017 as provided to EBI Consulting. Subsequent changes to the drawings or site design may yield changes in the MPE levels or FCC Compliance recommendations.

Maximum Permissible Exposure (MPE) Summary			
Location	**% of FCC General Public/Uncontrolled Exposure Limit**	**% of FCC Occupational/Controlled Exposure Limit**	**Power Density (mW/cm^2)**
All Carrier Equipment			
Ground	3.00	0.60	0.01600
Sprint Equipment			
Ground	1.60	0.32	0.00853

Statement of Compliance

Based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0. Posting of the signage brings the site into compliance with FCC rules and regulations.

1.0 LOCATION OF ALL EXISTING ANTENNAS AND FACILITIES AND EXISTING RF LEVELS

Sprint proposes the replacement of three (3) wireless telecommunication antennas on a monopole in Preston, Connecticut. The proposed modification will result in a total of three (3) Sprint antennas at the site. There are three sectors (A, B and C) proposed at the site, with one (1) proposed antenna per sector.

Based on drawings and aerial photography review, unknown carrier wireless antennas are also present on the monopole. These antennas were included in the modeling analysis.

2.0 LOCATION OR ALL APPROVED (BUT NOT INSTALLED) ANTENNAS AND FACILITIES AND EXPECTED RF LEVELS FROM THE APPROVED FACILITIES

There are no antennas or facilities that are approved and not installed based on information provided to EBI and Sprint at the time of this report.

3.0 NUMBER AND TYPES OF WIRELESS TELECOMMUNICATION SITES (WTS) WITHIN 100 FEET OF THE PROPOSED SITE

There are no other Wireless Telecommunication Service (WTS) sites observed within 100 feet of the proposed site.

4.0 LOCATION AND NUMBER OF THE SPRINT ANTENNAS AND BACK-UP FACILITIES PER STRUCTURE AND NUMBER AND LOCATION OF OTHER TELECOMMUNICATION FACILITIES ON THE PROPERTY

Sprint proposes the replacement of three (3) wireless telecommunication antennas on a monopole in Preston, Connecticut. The proposed modification will result in a total of three (3) Sprint antennas at the site. There are three sectors (A, B and C) proposed at the site, with one (1) proposed antenna per sector. In each sector, there is proposed to be one antenna transmitting in the 800 MHz and the 1900 MHz frequency ranges. For modeling purposes the Sector A antenna was assumed be oriented 0° from true north. The Sector B antenna was assumed to be oriented 120° from true north. The Sector C antenna was assumed to be oriented 240° from true north. The bottoms of the Sector A, B, and C antennas will be 144 feet above ground level.

Based on drawings and aerial photography review, unknown carrier wireless antennas are also present on the monopole. These antennas were included in the modeling analysis.

5.0 POWER RATING FOR ALL EXISTING AND PROPOSED BACKUP EQUIPMENT SUBJECT TO THE APPLICATION

The operating power of each frequency, for modeling purposes, was assumed to be the following:

Sprint Operating Powers Per Sector		
Frequency (MHz)	**Power (Watts)**	**# of Transmitters**
800	20	1
1900	20	6

Additional transmitter information used in the modeling of Sprint antennas is summarized in the RoofView® export file presented in Appendix C.

6.0 TOTAL NUMBER OF WATTS PER INSTALLATION AND THE TOTAL NUMBER OF WATTS FOR ALL INSTALLATIONS ON THE STRUCTURE

The Effective Radiated Power (ERP) for each carrier and frequency is summarized below:

Effective Radiated Power (ERP) per Frequency	
Frequency (MHz)	**ERP (Watts)**
800	1,107
1900	11,811
Other Carriers (Total)*	7,149

* Other carrier ERPs were not provided. The ERP calculation is based on worst-case assumptions of other carrier operating powers.

7.0 PREFERRED METHOD OF ATTACHMENT OF PROPOSED ANTENNA WITH PLOT OR ROOF PLAN INCLUDING: DIRECTIONALITY OF ANTENNAS, HEIGHT OF ANTENNAS ABOVE NEAREST WALKING SURFACE, DISCUSS NEARBY INHABITED BUILDINGS

Based on the information provided to EBI, the proposed antennas are to be pipe-mounted to the monopole antenna array and operating in the directions, frequencies, and heights mentioned in section 4.0 above.The monopole stands in a wooded area. The nearest structure is a public library building approximately 400 feet to the southwest of the monopole.

8.0 ESTIMATED AMBIENT RADIO FREQUENCY FIELDS FOR THE PROPOSED SITE

Based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Maximum Permissible Exposure (MPE) Summary			
Location	**% of FCC General Public/Uncontrolled Exposure Limit**	**% of FCC Occupational/Controlled Exposure Limit**	**Power Density (mW/cm^2)**
All Carrier Equipment			
Ground	3.00	0.60	0.01600
Sprint Equipment			
Ground	1.60	0.32	0.00853

The inputs used in the modeling are summarized in the RoofView® export file presented in Appendix C.

There are no modeled areas on the ground that exceed the FCC's limits for general public or occupational exposure in front of the other carrier antennas.

9.0 SIGNAGE AT THE FACILITY IDENTIFYING ALL WTS EQUIPMENT AND SAFETY PRECAUTIONS FOR PEOPLE NEARING THE EQUIPMENT AS MAY BE REQUIRED BY THE APPLICABLE FCC ADOPTED STANDARDS (DISCUSS SIGNAGE FOR THOSE WHO SPEAK LANGUAGES OTHER THAN ENGLISH)

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. It is recommended that Notice signs be installed for the new antennas making people aware of the antennas locations. There are no exposures above the FCC limits in front of the proposed antennas and therefore barriers are not recommended.

Workers that are elevated above the ground may be exposed to power densities greater than the occupational limit. Workers should be informed about the presence of antennas and their associated fields and practice RF Safety Procedures.

Access to this site is accomplished via a gate in the fence surrounding the monopole. Workers must be elevated to antenna level to access them, so these antennas are not accessible to the general public.

10.0 STATEMENT ON WHO PRODUCED THIS REPORT AND QUALIFICATIONS

Please see the certifications attached in Appendix B below.

11.0 LIMITATIONS

This report was prepared for the use of Sprint. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

12.0 SUMMARY AND CONCLUSIONS

EBI has prepared this Radiofrequency Emissions Compliance Report for the proposed Sprint telecommunications equipment at the site located at 389 Rt. 2 in Preston, Connecticut.

EBI has conducted theoretical modeling to estimate the worst-case power density from proposed Sprint antennas and the other carriers' existing antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements. As presented in the preceding sections, based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0. Posting of the signage brings the site into compliance with FCC rules and regulations.

Appendix A

Federal Communications

Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

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 public/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.

General public/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.

Table 1 and Figure 1 (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm^2). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm^2) and an uncontrolled MPE of 1 mW/cm2 for equipment operating in the 1900 MHz frequency range. For the Sprint equipment operating at 800 MHz, the FCC's occupational MPE is 2.66 mW/cm^2 and an uncontrolled MPE of 0.53 mW/cm^2. These limits are considered protective of these populations.

Table 1: Limits for Maximum Permissible Exposure (MPE)

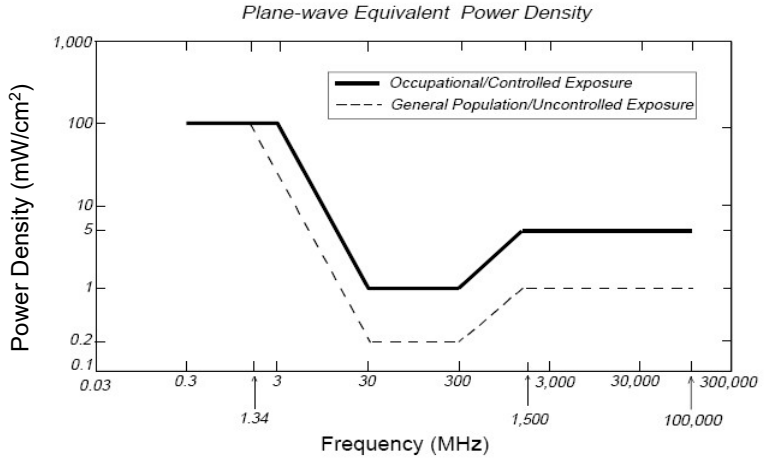
(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$, $[H]^2$, or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6

(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)
* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication Services (PCS)	1,950 MHz	5.00 mW/cm^2	1.00 mW/cm^2
Cellular Telephone	870 MHz	2.90 mW/cm^2	0.58 mW/cm^2
Specialized Mobile Radio	855 MHz	2.85 mW/cm^2	0.57 mW/cm^2
Most Restrictive Freq, Range	30-300 MHz	1.00 mW/cm^2	0.20 mW/cm^2

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication Services (PCS) facilities used by Sprint in this area operate within a frequency range of 800-1900 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

FCC Compliance Requirement

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

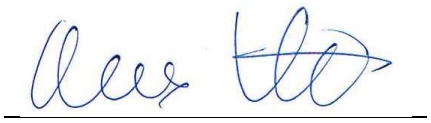
Appendix B

Certifications

Preparer Certification

I, Alexandra Vest, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified "occupational" under the FCC regulations.
- I am familiar with the FCC rules and regulations as well as OSHA regulations both in general and as they apply to RF-EME exposure.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



Appendix C

Roofview® Export File / Antenna Inventory

StartMapDefinition

Roof Max X	Roof Max Y	Map Max X	Map Max Y	Y Offset	X Offset	Number of	envelope		List Of Areas
120	100	150	120	0	0	1	$K$101:$D	$K$101:$DF$220	$K$101:$DF$220

StartSettingsData

Standard	Method	Uptime	Scale Factor	Low Thr	Low Color	Mid Thr	Mid Color	Hi Thr	Hi Color	Over Color	Ap Ht Mult	Ap Ht Method
4	2	1	1	5	1	500	6	5000	6	6	1.5	1

StartAntennaData It is advisable to provide an ID (ant 1) for all antennas

ID	Name	Freq (MHz)	Trans Power	Trans Count	Coax Len	Coax Type	Other Loss	Input Power	Calc Power	Mfg	Model	X (ft)	Y (ft)	Z (ft)	Type	Aper (ft)	Gain dBd	BWdth Pt Dir	Uptime Profile	ON flag
SPT A1	Sprint	800	20	1	10	1/2 LDF	0.5		16.8667	RFS	APXVSPP1	7	14	144		6	13.4	65;0		ON•
SPT A1	Sprint	1900	20	6	10	1/2 LDF	0.5		101.2002	RFS	APXVSPP1	7	14	144		6	15.9	65;0		ON•
SPT B1	Sprint	800	20	1	10	1/2 LDF	0.5		16.8667	RFS	APXVSPP1	13	10	144		6	13.4	65;120		ON•
SPT B1	Sprint	1900	20	6	10	1/2 LDF	0.5		101.2002	RFS	APXVSPP1	13	10	144		6	15.9	65;120		ON•
SPT C1	Sprint	800	20	1	10	1/2 LDF	0.5		16.8667	RFS	APXVSPP1	6	7	144		6	13.4	65;240		ON•
SPT C1	Sprint	1900	20	6	10	1/2 LDF	0.5		101.2002	RFS	APXVSPP1	6	7	144		6	15.9	65;240		ON•
UNK 1 A1	Unknown	850	25	1			3		12.52968	Unknown	Unknown	5	13	134		4	12	63;0		ON•
UNK 1 A2	Unknown	850	25	1			3		12.52968	Unknown	Unknown	8	13	134		4	12	63;0		ON•
UNK 1 A3	Unknown	850	25	1			3		12.52968	Unknown	Unknown	10	13	134		4	12	63;0		ON•
UNK 1 A4	Unknown	850	25	1			3		12.52968	Unknown	Unknown	13	13	134		4	12	63;0		ON•
UNK 1 B1	Unknown	850	25	1			3		12.52968	Unknown	Unknown	14	12	134		4	12	63;120		ON•
UNK 1 B2	Unknown	850	25	1			3		12.52968	Unknown	Unknown	12	10	134		4	12	63;120		ON•
UNK 1 B3	Unknown	850	25	1			3		12.52968	Unknown	Unknown	11	7	134		4	12	63;120		ON•
UNK 1 B4	Unknown	850	25	1			3		12.52968	Unknown	Unknown	10	5	134		4	12	63;120		ON•
UNK 1 C1	Unknown	850	25	1			3		12.52968	Unknown	Unknown	8	5	134		4	12	63;240		ON•
UNK 1 C2	Unknown	850	25	1			3		12.52968	Unknown	Unknown	7	7	134		4	12	63;240		ON•
UNK 1 C3	Unknown	850	25	1			3		12.52968	Unknown	Unknown	5	10	134		4	12	63;240		ON•
UNK 1 C4	Unknown	850	25	1			3		12.52968	Unknown	Unknown	4	12	134		4	12	63;240		ON•
UNK 2 A1	Unknown	850	33	1			3		16.53918	Unknown	Unknown	5	13	127		4	12	63;0		ON•
UNK 2 A2	Unknown	850	34	1			3		17.04037	Unknown	Unknown	9	13	127		4	12	63;0		ON•
UNK 2 A3	Unknown	850	33	1			3		16.53918	Unknown	Unknown	13	13	127		4	12	63;0		ON•
UNK 2 B1	Unknown	850	33	1			3		16.53918	Unknown	Unknown	14	12	127		4	12	63;120		ON•
UNK 2 B2	Unknown	850	34	1			3		17.04037	Unknown	Unknown	12	9	127		4	12	63;120		ON•
UNK 2 B3	Unknown	850	33	1			3		16.53918	Unknown	Unknown	10	5	127		4	12	63;120		ON•
UNK 2 C1	Unknown	850	33	1			3		16.53918	Unknown	Unknown	8	5	127		4	12	63;240		ON•
UNK 2 C2	Unknown	850	34	1			3		17.04037	Unknown	Unknown	6	9	127		4	12	63;240		ON•
UNK 2 C3	Unknown	850	33	1			3		16.53918	Unknown	Unknown	4	12	127		4	12	63;240		ON•
UNK 3 A1	Unknown	850	50	1			3		25.05936	Unknown	Unknown	5	13	118		4	12	63;0		ON•
UNK 3 A2	Unknown	850	50	1			3		25.05936	Unknown	Unknown	13	13	116		4	12	63;0		ON•
UNK 3 B1	Unknown	850	50	1			3		25.05936	Unknown	Unknown	14	12	118		4	12	63;120		ON•
UNK 3 B2	Unknown	850	50	1			3		25.05936	Unknown	Unknown	10	5	116		4	12	63;120		ON•
UNK 3 C1	Unknown	850	50	1			3		25.05936	Unknown	Unknown	8	5	118		4	12	63;240		ON•
UNK 3 C2	Unknown	850	50	1			3		25.05936	Unknown	Unknown	4	12	116		4	12	63;240		ON•

StartSymbolData

Sym	Map Mark	Roof X	Roof Y	Map Label	Description (notes for this table only)
Sym		5	35	AC Unit	Sample symbols
Sym		14	5	Roof Access	
Sym		45	5	AC Unit	
Sym		45	20	Ladder	