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

September 23, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 806353**
Sprint PCS Site ID: CT03XC369
Located at: 128 Mather Street, Wilton, CT 06897

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of Sprint PCS (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their 2.5GHz LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. William F. Brennan, First Selectman for Town of Wilton. Town of Wilton is also the Property Owner.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **128 Mather Street, Wilton, CT 06897**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's additional antennas will be located at the same elevation on the existing tower.

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

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

4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

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

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

Sincerely,

Raymond Perry
Real Estate Specialist

Enclosures

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

cc: Mr. William F. Brennan, First Selectman
Wilton Town Hall
238 Danbury Road
Wilton, CT 06897

Sprint

2.5 EQUIPMENT DEPLOYMENT

CROWN ID#: 806353

CROWN SITE NAME: WILTON

SITE NUMBER:

CT03XC369

SITE NAME:

N. WILTON

SITE ADDRESS:

128 MATHER STREET
WILTON, CT 06897

SHEET INFORMATION

SITE NUMBER:	CT03XC369
SITE NAME:	N. WILTON
SITE ADDRESS:	128 MATHER STREET WILTON, CT 06897
COUNTY:	FAIRFIELD
COORDINATES: (NAD 83)	41° 14' 18.34" N 73° 25' 26.44" W
GROUND ELEV:	415'± AMSL
STRUCTURE TYPE:	SELF SUPPORT TOWER
STRUCTURE HEIGHT:	180'-0"± AGL
STRUCTURE RAD CENTER:	143'-0"± AGL
ZONING CLASSIFICATION:	R-2
MAP-BLOCK-LOT:	23//23//

LANDLORD:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
LOCAL POWER COMPANY:	CONNECTICUT LIGHT AND POWER CONTACT CUSTOMER SERVICE (800) 286-2000
APPLICANT:	SPRINT 6580 SPRINT PARKWAY OVERLAND PARK, KANSAS 66251
ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
SPRINT CM:	GARY WOOD (860) 940-9168 gary.wood@sprint.com
CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico@crowncastle.com
AAV:	AT&T

VICINITY MAP (NOT TO SCALE)

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION: HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED. FACILITY HAS NO PLUMBING OR REFRIGERANTS. THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATOR REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
3. DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - 2005 STATE OF CONNECTICUT BUILDING CODE.
   - ANSI/TIA/EIA-222-F-1996.
   - NATIONAL ELECTRICAL CODE, LATEST EDITION.

PROJECT DESCRIPTION

1. (1) NEW 2.5 EQUIPMENT RACK INSIDE EXIST MMBTS CABINET.
2. (3) NEW RFS APXVTM14-C-120 ANTENNAS.
3. (3) NEW TD-RRH8x20-25 RRH.
4. (1) NEW 5/8" FIBER CABLE.
5. (3) NEW FIBER JUMPERS.

AERIAL VIEW (NOT TO SCALE)

SHEET INDEX

SHT. NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
SP-1	GENERAL NOTES
SP-2	GENERAL NOTES
A-1	SITE PLAN
A-2	ELEVATION
A-3	ENLARGED EQUIPMENT LAYOUT PLANS
A-4	ANTENNA LAYOUT PLANS
A-5	RAN WIRING DIAGRAM
A-6	CABLE DETAILS
S-1	EQUIPMENT DETAILS
S-2	EQUIPMENT SCHEMATIC DETAILS
E-1	ELECTRICAL & GROUNDING PLANS
E-2	GROUNDING DETAILS & NOTES

APPROVALS

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

CONSTRUCTION: _____ DATE: _____

LEASING/
SITE ACQUISITION: _____ DATE: _____

LANDLORD/
PROPERTY OWNER: _____ DATE: _____

R.F. ENGINEER: _____ DATE: _____

Sprint
2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

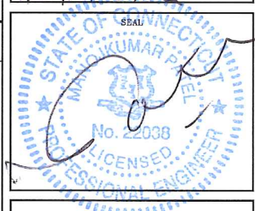
SUBMITTALS

PROJECT NO: 7225.CT03XC369

NO	DATE	DESCRIPTION	BY
0	06/18/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL



SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
TITLE SHEET

SHEET NO:
T-1

DIVISION 01000–GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1–800–788–7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. 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 THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING AND EXCAVATION OF 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 THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
16. THE CONTRACTOR SHALL NOTIFY THE THE RF ENGINEER FOR ANTENNA AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO CONDUCTING SWEEP TESTS.
17. THE CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS–BUILT DRAWINGS TO THE CLIENT REPRESENTATIVE.
18. REFER TO: CONSTRUCTION STANDARDS–SPRINT DOCUMENT EXHIBIT A–STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV. 4.0– 02.15.2011.DOCM.
19. REFER TO: WEATHER PROOFING SPECS: EXCERPT EXH A–WIHRPRF–STD CONSTR SPECS._1572011104218554 92.DOCM.
20. REFER TO: COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09–08–11.PDF
21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000–CONCRETE

1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)

A. ACI–301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
B. ACI–347 GUIDE TO FORM WORK FOR CONCRETE.
C. ASTM C33– CONCRETE AGGREGATE
D. ASTM C94 – READY MIXED CONCRETE e. ASTM C150 – PORTLAND CEMENT.
E. ASTM C260 – AIR–ENTRAINING ADMIXTURES FOR CONCRETE
F. ASTM C309– LIQUID MEMBRANE FORMING COMPOUNDS FOR CURING CONCRETE.
H. ASTM C494 – CHEMICAL ADMIXTURES FOR CONCRETE
I. ASTM A615– DEFORMED AND PLAIN BILLET–STEEL BARS FOR CONCRETE REINFORCEMENT
J. ASTM A185– STEEL WELDED WIRE FABRIC (PLAIN) FOR CONCRETE REINFORCEMENT

1.04 QUALITY ASSURANCE

CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ARCHITECT/ENGINEER AS DIRECTED BY THE CLIENT'S REPRESENTATIVE.

3.04 SURFACE FINISHES

A. SURFACES AGAINST WHICH BACKFILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.

B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINS AND THE FILLING HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY SACKING WITH UTILITY OR ORDINARY GROUT.

C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE OR SURFACES SUCH AS STAIR TREADS, WALLS, CURBS, AND PARAPETS SHALL BE SLOPED APPROXIMATELY 1/4" PER FOOT.

D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREENED.

E. EXPOSED SLAB SURFACES SHALL BE CONSOLIDATED, SCREENED, FLOATED, AND STEEL TROWELED. HAND OR POWER–DRIVEN EQUIPMENT MAY BE USED FOR FLOATING. FLOATING SHALL BE STARTED AS SOON AS THE SCREENED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. OPERATIONS. ALL EDGES MUST HAVE A 3/4" CHAMFER.

1.04 QUALITY ASSURANCE CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER.

3.05 PATCHING

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEER'S DIRECTION.

3.06 DEFECTIVE CONCRETE

THE CONTRACTOR SHALL NOTIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS AS SPECIFIED IN ACI 301.

3.07 PROTECTION

A. IMMEDIATELY AFTER PLACEMENT. THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.

B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

C. ALL CONCRETE SHALL BE WATER CURED PER ACCEPTABLE PRACTICES SPECIFIED BY ACI CODE (LATEST EDITION)

DIVISION 05000 – METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. THE WORK CONSISTS OF THE FABRICATION AND INSTALLATION OF ALL MATERIALS TO BE FURNISHED. AND WITHOUT LIMITING THE GENERALITY THEREOF, INCLUDING ALL EQUIPMENT, LABOR AND SERVICES REQUIRED FOR ALL STRUCTURAL STEEL WORK AND ALL ITEMS INCIDENTAL AS SPECIFIED AND AS SHOWN ON THE DRAWINGS:

1. STEEL FRAMING INCLUDING BEAMS, ANGLES, CHANNELS AND PLATES.
2. WELDING AND BOLTING OF ATTACHMENTS.

1.02 REFERENCE STANDARDS

A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

1. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUILDING CODES" OR LATEST EDITION.
2. AWS: AMERICAN WELDING SOCIETY CODE OR LATEST EDITION.
3. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

PART 2 – PRODUCTS

2.01 MATERIALS

A. STRUCTURAL STEEL: SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A36 AND A992 FOR STRUCTURAL STEEL.

ALL PROPOSED STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC CODE AND ASTM SPECIFICATIONS (LATEST EDITION) ALL NEW STEEL SHALL CONFORM TO THE FOLLOWING.

1. STRUCTURAL WIDE FLANGE: ASTM A992 Fy=50KSI.
2. MISCELLANEOUS STEEL (PLATES), CHANNELS, ANGLES, ETC): ASTM A36 (Fy=36KSI).
3. STRUCTURAL TUBING: ASTM A500 Gr. B (Fy=46KSI).
4. STEEL PIPE: ASTM A53 Gr B (Fy=35KSI).

2.02 WELDING

A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.

B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM 1–233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.

C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.

D. STUD WELDING SHALL BE ACCOMPLISHED BY CAPACITOR DISCHARGE (CD) WELDING TECHNIQUE USING CAPACITOR DISCHARGE STUD WELDER.

E. PROVIDE STUD FASTENERS OF MATERIALS AND SIZES SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER FOR STRUCTURAL LOADINGS REQUIRED.

F. FOLLOW MANUFACTURERS SPECIFICATIONS AND INSTRUCTIONS TO PROPERLY SELECT AND INSTALL STUD WELDS.

2.03 BOLTING

A. BOLTS SHALL BE CONFORMING TO ASTM A35 HIGH STRENGTH HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4" (MINIMUM) CONFORMING TO ASTM A325, HOT DIP GALVANIZED, ASTM A153 NUTS SHALL BE HEAVY HEX TYPE.

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

D. EXCEPT WHERE SHOWN, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS TO BE DOUBLE ANGLED CONNECTIONS WITH HIGH STRENGTH BOLTS (THREADS EXCLUDED FROM SHEAR PLANE) AND HARDENED WASHERS.

E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.

F. SNUG–TIGHT STRENGTH BEARING BOLTS MAY BE USED IN STANDARD HOLES CONFORMING TO ACIS, USING THE TURN OF THE NUT METHOD.

H. FULLY–TENSIONED HIGH STRENGTH (SLIP CRITICAL) SHALL BE USED IN OVERSIZED SLOT HOLES (RESPECTIVE OF SLOT ORIENTATION).

I. ALL BRACED CONNECTION, MOMENT CONNECTION AND CONNECTIONS NOTED AS "SLIP CRITICAL" SHALL BE BE SLIP CRITICAL JOINTS WITH CLASS A SURFACE CONDITIONS, UNLESS OTHERWISE NOTED.

J. EPOXY ANCHOR ASSEMBLIES SHALL BE AS MANUFACTURED BY HILTI OR ENGINEER APPROVED EQUAL, AS FOLLOWS:

BASE MATERIAL	ANCHOR SYSTEM
CONCRETE	HILTI HIT–HY 200
HOLLOW & GROUTED CMU OR BRICK	HILTI HIT–HY 70

2.04 FABRICATION

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS

2.05 FINISH

A. STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. (LATEST EDITION) UNLESS OTHERWISE NOTED.

2.06 PROTECTION

A. UPON COMPLETION OF ERECTION, INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS OR GALVANIZED BREAKS WITH (2) COATS OF ZINC–RICH COLD GALVANIZING PAINT.

PART 3 – ERECTION

A. PROVIDE ALL ERECTION, EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION, BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING

C. TEMPORARY BRACING, GUYING, AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SET AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC • PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT

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1279 Route 300
Newburgh, NY 12550

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www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC369

NO	DATE	DESCRIPTION	BY
0	06/18/14	FOR COMMENT	JT
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DATE	REVIEWED BY
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SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22033
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
GENERAL NOTES

SHEET NO:
SP–1

DIVISION 13000–SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 – GENERAL

1.01 WORK INCLUDED

A. ANTENNAS AND HYBRIFLEX CABLES ARE FURNISHED BY CLIENT'S REPRESENTATIVE UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPERTY.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT RESULT

F. INSTALL HYBRIFLEX CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

G. ANTENNA AND HYBRIFLEX CABLE GROUNDING:

1. ALL EXTERIOR #6 GREEN GROUND WIRE DAISY CHAIN CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE 3221213 OR EQUIVALENT.

2. ALL HYBRIFLEX CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF HYBRIFLEX CABLE (NOT WITHIN BENDS). 1.02 RELATED WORK FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH QOTHER TRADES PRIOR TO BID:

   1. FLASHING OF OPENING INTO OUTSIDE WALLS.
   2. SEALING AND CAULKING ALL OPENINGS.
   3. PAINTING.
   4. CUTTING AND PATCHING.

1.03 REQUIREMENTS OF REGULATOR AGENCIES

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. EIA – ELECTRONIC INDUSTRIES ASSOCIATION RS–22. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7480–IH, CONSTRUCTION MARKING AND LIGHTING.

3. FCC – FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES

4. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION FOR STRUCTURAL JOINTS USING ASTM 1325 OR A490 BOLTS.

5. NEC – NATIONAL ELECTRIC CODE – ON TOWER LIGHTING KITS.

6. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

8. LIFE SAFETY CODE NFPA, LATEST EDITION.

DIVISION 13000–EARTHWORK

PART 1 GENERAL

1.01 WORK INCLUDED: REFER TO SURVEY AND SITE PLAN FOR WORK INCLUDED.

1.02 RELATED WORK

A. CONSTRUCTION OF EQUIPMENT FOUNDATIONS
B. INSTALLATION OF ANTENNA SYSTEM

PART 2 PRODUCTS

2.01 MATERIALS

A. ROAD AND SITE MATERIALS; FILL MATERIAL SHALL BE ACCEPTABLE, SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS.

B. SOIL STERILIZER SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE–EMERGENCE DESIGN.

C. SOIL STABILIZER FABRIC SHALL BE MIRAFI OR EQUAL – 600X AT ACCESS ROAD AND COMPOUND.

D. GRAVEL FILL; WELL GRADED, HARD, DURABLE, NATURAL SAND AND GRAVEL, FREE FROM ICE AND SNOW, ROOTS, SOD RUBBISH, AND OTHER DELETERIOUS OR ORGANIC MATTER.

MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS.

GRAVEL FILL TO BE PLACED IN LIFTS OF 9" MAXIMUM THICKNESS AND 90 % DENSITY. COMPACTED TO 95

E. NO FILL OR EMBANKMENT MATERIALS SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OF EMBANKMENT

2.02 EQUIPMENT

A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS. LARGER AREAS SHALL BE COMPACTED BY SHEEPS FOOT, VIBRATORY OR RUBBER TIED ROLLERS WEIGHING AT LEAST FIVE TONS. SMALLER AREAS SHALL BE COMPACTED BY POWER–DRIVER, HAND HELD TAMPERS.

B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS GRUB ORGANIC MATERIAL TO A MINIMUM OF 6" BELOW ORIGINAL GROUND LEVEL.

C. UNLESS OTHERWISE INSTRUCTED BY CLIENT'S REPRESENTATIVE. REMOVE TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED DISPOSAL LOCATION.

D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.

E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE GRUBBED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

3.03 INSTALLATION

A. THE SITE AND TURNAROUND AREAS SHALL BE AT THE SUB–BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED TO PRODUCE EVEN DISTRIBUTION OF SPOILS RESULTING FROM FOUNDATION EXCAVATIONS. THE RESULTING GRADE SHALL CORRESPOND WITH SAID SUB–BASE COURSE, ELEVATIONS ARE TO BE CALCULATED FORM FINISHED GRADES OR SLOPES INDICATED.

B. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION.

C. DO NOT CREATE DEPRESSIONS WHERE WATER MAY POND.

D. THE CONTRACT INCLUDES ALL NECESSARY GRADING, BANKING, DITCHING AND COMPLETE SURFACE COURSE FOR ACCESS ROAD. ALL ROADS OR ROUTES UTILIZED FOR ACCESS TO PUBLIC THOROUGHFARE IS INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE INDICATED.

E. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.

F. PLACE FILL OR STONE IN 3" MAXIMUM LIFTS AND COMPACT BEFORE PLACING NEXT LIFT.

G. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF 12" BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN 2:1.

I. RIPRAP SHALL BE APPLIED TO THE SIDES OF DITCHES OR DRAINAGE SWALES AS INDICATED ON PLANS.

J. RIPRAP ENTIRE DITCH FOR 6'–0" IN ALL DIRECTIONS AT CULVERT OPENINGS.

K. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES, NOT OTHERWISE RIP–RAPPED.

L. UNDER NO CIRCUMSTANCES SHALL DITCHES, SWALES OR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF OWNER DESIGNS OR IF DESIGN ELEVATIONS CONFLICT WITH THIS GUIDANCE ADVISE THE OWNER IMMEDIATELY.

M. IF A DITCH LIES WITH SLOPE GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALL IN THE DITCH AT CULVERT ENTRANCES. RIP–RAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR 6'–0" ABOVE THE CULVERT.

N. IF A DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH FOR 6'–0" ABOVE THE CULVERT ENTRANCE.

O. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND TO LOOSEN THE SOIL.

P. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.

Q. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

3.04 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE D–1557 FOR SITE WORK AND 95 % MAXIMUM DENSITY UNDER SLAB AREAS. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE. REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. THE COMPACTION TEST RESULTS SHALL BE AVAILABLE PRIOR TO THE CONCRETE POUR.

3.05 PROTECTION

A. PROTECT SEEDED AREAS FORM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1"–2". STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT SHALL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE AND SECURED TO STAKES EXTENDING 2'–0" INTO THE GROUND ON FOUR SIDES OF THE TREE.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES SHALL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS. REFER TO DETAILS ON DRAWINGS

SYMBOLS	ABBREVIATIONS
— — — G — — — G —	GROUND WIRE
— — — E — — — E —	ELECTRIC
— — — T — — — T —	TELEPHONE
—OHW—OHW—OHW—OHW—	OVERHEAD WIRE
——— — — ———	PROPERTY LINE
—X———X———X———	CHAIN LINK FENCE
A–1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
DET # / SHT #	REFERENCE
⊕	SURFACE ELEVATION

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OVERLAND PARK, KANSAS 66251

CROWN CASTLE

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Newburgh, NY 12550
Phone: (845) 567–6656
Fax: (845) 567–8703
www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC369

NO	DATE	DESCRIPTION	BY
0	06/18/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL

SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
GENERAL NOTES

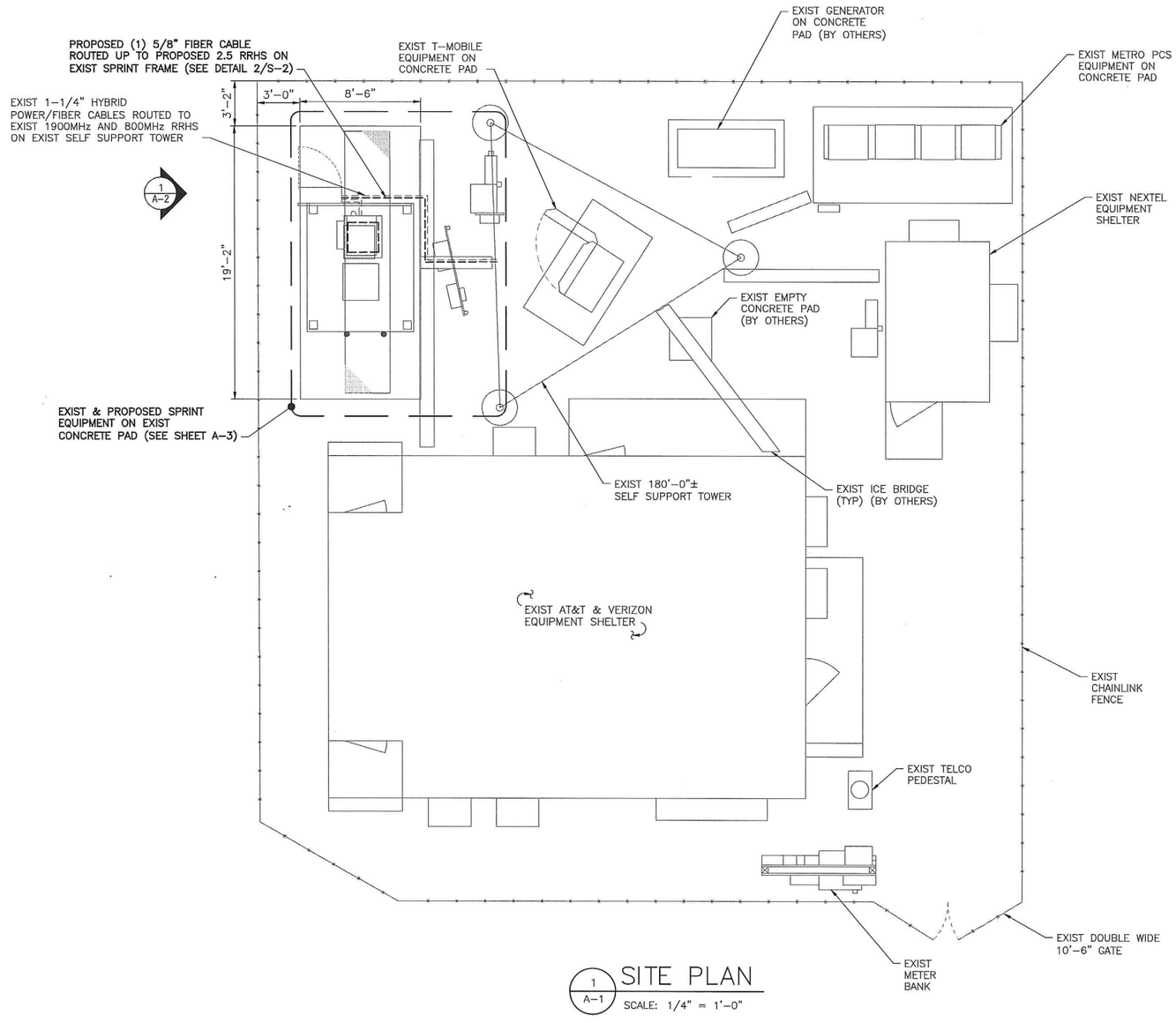
SHEET NO:
SP–2

NORTH NOTE:

NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.

N

APPROX



1 A-1 SITE PLAN

SCALE: 1/4" = 1'-0"

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DATE	REVIEWED BY
9/22/14	JMC

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

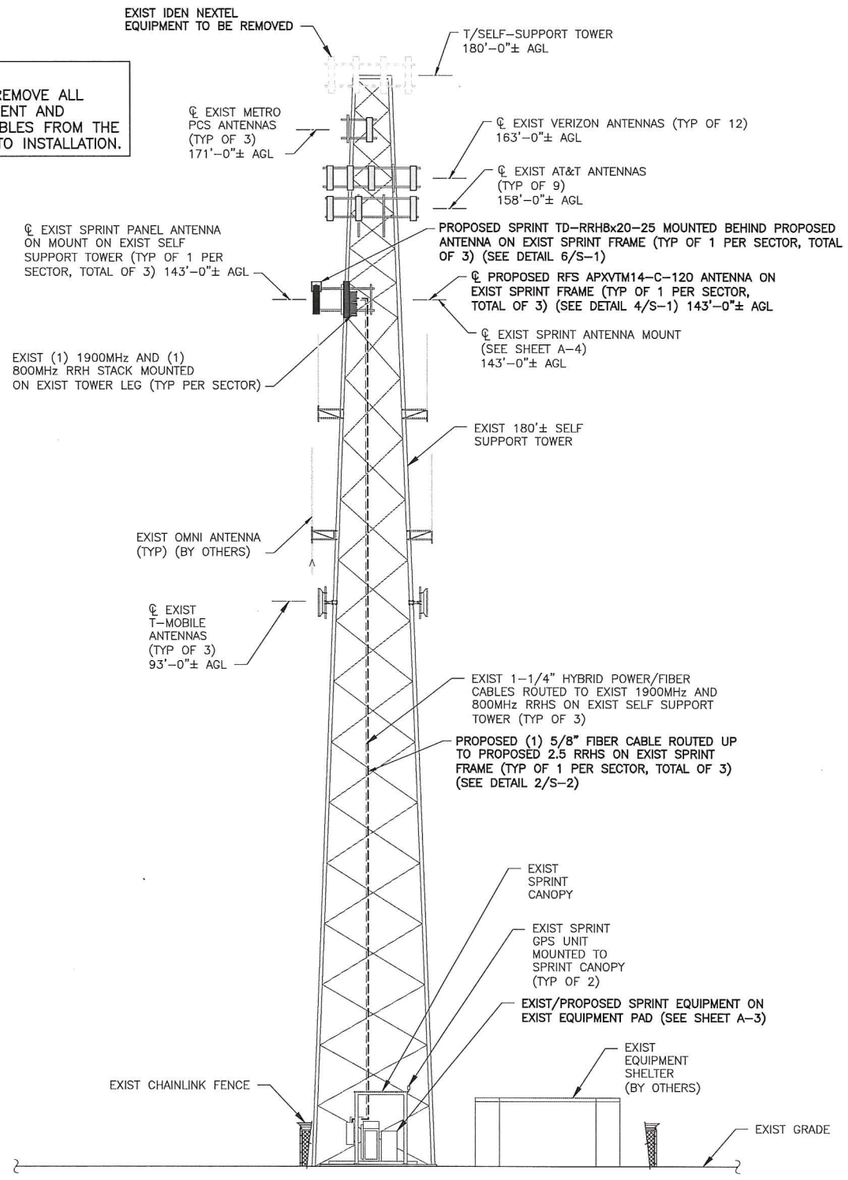
SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
SITE PLAN

SHEET NO:
A-1

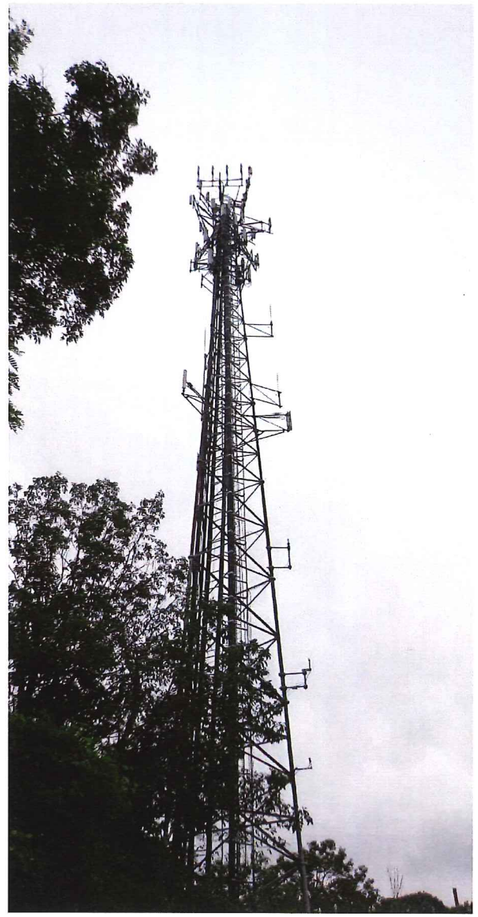
NOTE:
SPRINT MUST REMOVE ALL NEXTEL EQUIPMENT AND ASSOCIATED CABLES FROM THE TOWER PRIOR TO INSTALLATION.



1/A-2 ELEVATION
SCALE: 3/32" = 1'-0"

THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE ONCE THE PROPOSED MODIFICATIONS HAVE BEEN COMPLETED AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 09/22/14.



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SEAL
STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

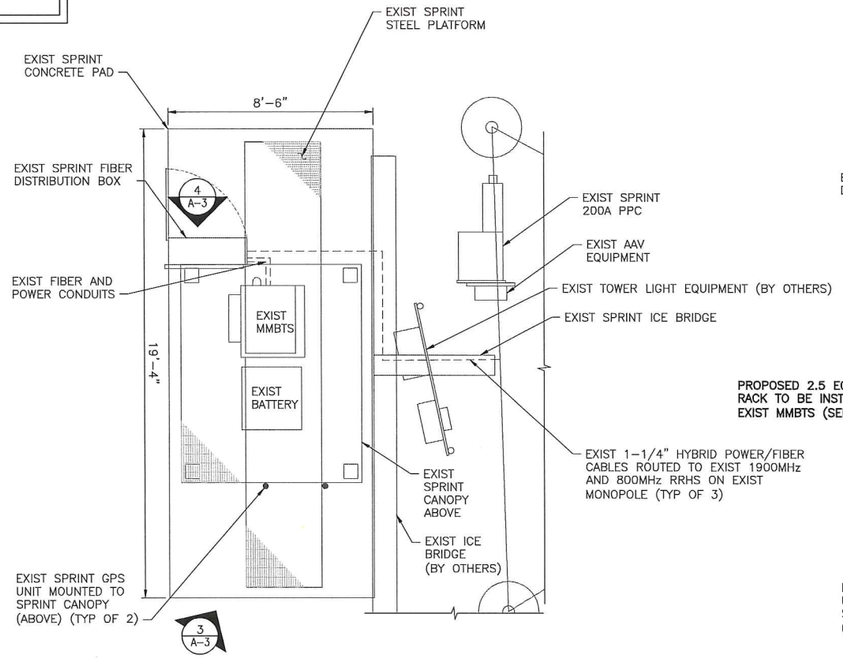
SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
ELEVATION

SHEET NO:
A-2

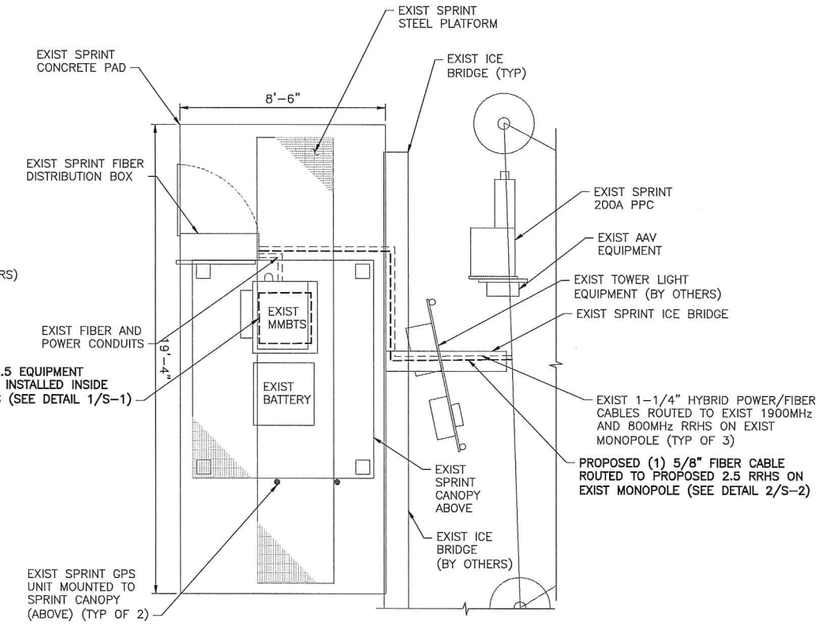
NORTH NOTE:

NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.



1 A-3 ENLARGED EQUIPMENT LAYOUT PLAN (EXIST)

SCALE: 3/8" = 1'-0"



2 A-3 ENLARGED EQUIPMENT LAYOUT PLAN (FINAL)

SCALE: 3/4" = 1'-0"

3 A-3 EXIST EQUIPMENT PAD

SCALE: NTS

4 A-3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

Sprint

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MANOJKUMAR PATEL
No. 22038
LICENSED PROFESSIONAL ENGINEER

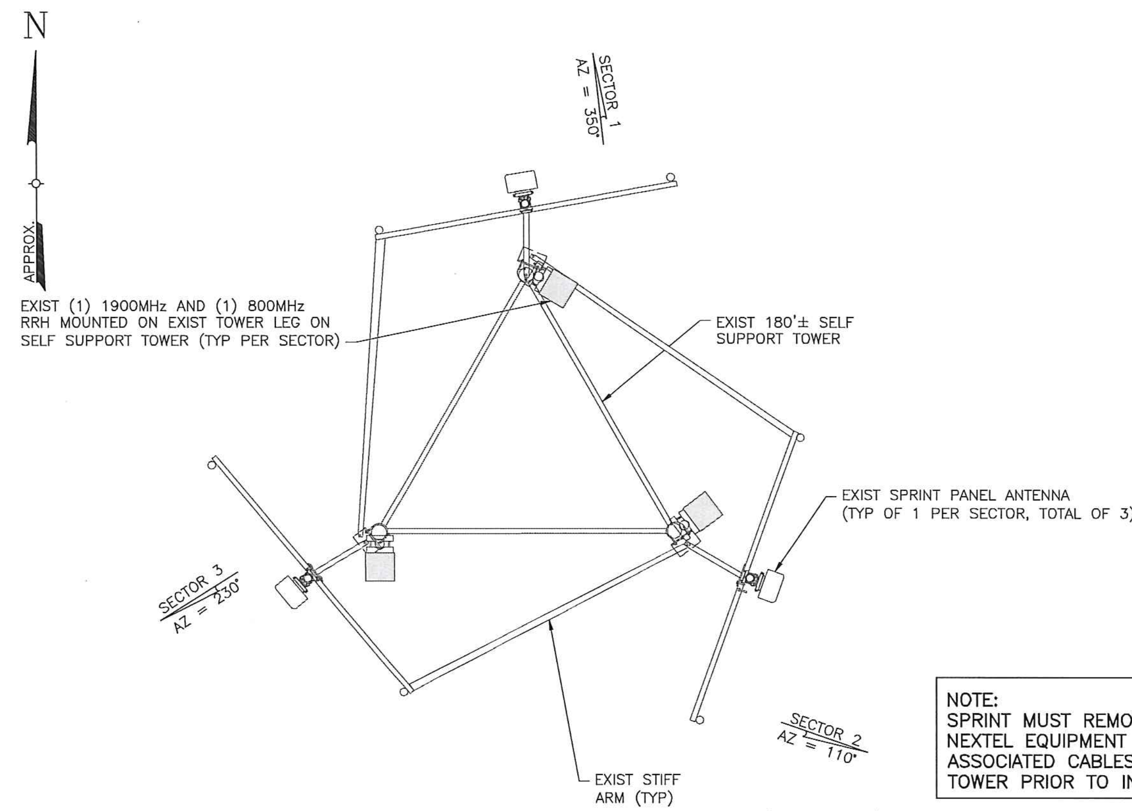
SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

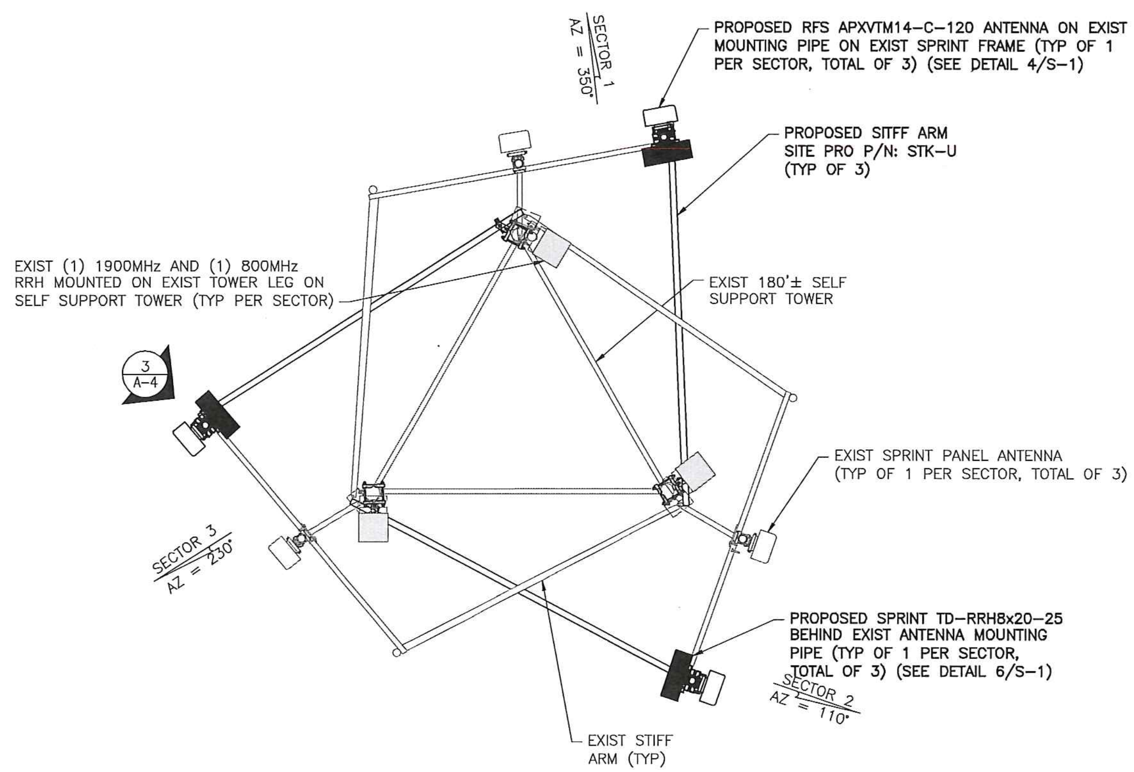
SHEET NO:
A-3



1 / A-4 ANTENNA LAYOUT PLAN (EXIST)

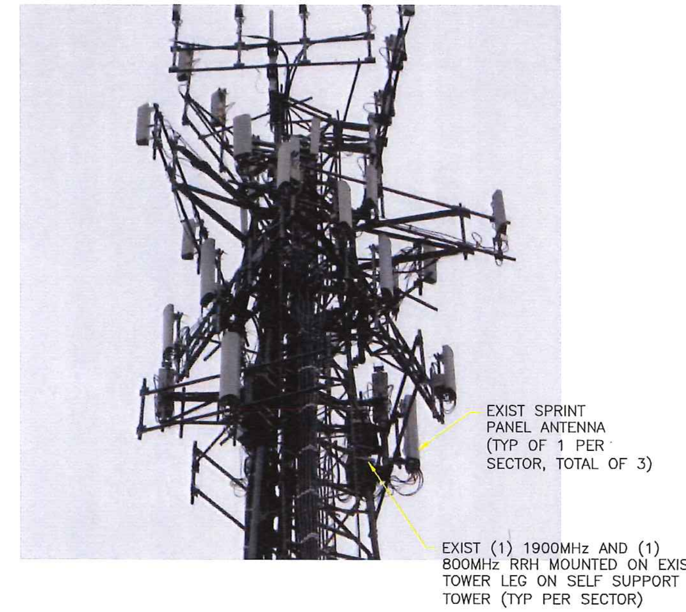
SCALE: 3/8" = 1'-0"

NOTE:
SPRINT MUST REMOVE ALL NEXTEL EQUIPMENT AND ASSOCIATED CABLES FROM THE TOWER PRIOR TO INSTALLATION.



2 / A-4 ANTENNA LAYOUT PLAN (FINAL)

SCALE: 3/8" = 1'-0"



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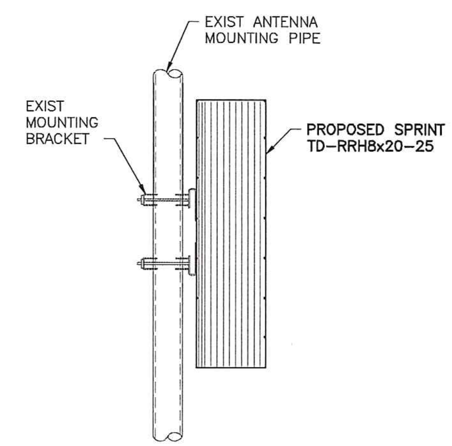

3 / A-4 RRH MOUNTING DETAIL

SCALE: 1 1/2" = 1'-0"

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CEL WAVE	**RFS-CEL WAVE**
Antenna Model Number	APXVSPP18C-A20	**APXVTM14-C-120**
Number of Antennas	3	**3**
Antenna RAD Center	143'	**143'**
Antenna Azimuth	350/110/230	**350/110/230**
Antenna RRH Model Number	1900MHz/800MHz RRHS	**TD-RRH8x20-25**
Number of RRH	6	**3**

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9/22/14	DMQ

SEAL
STATE OF CONNECTICUT · MANOJKUMAR PATEL · No. 22030 · LICENSED PROFESSIONAL ENGINEER

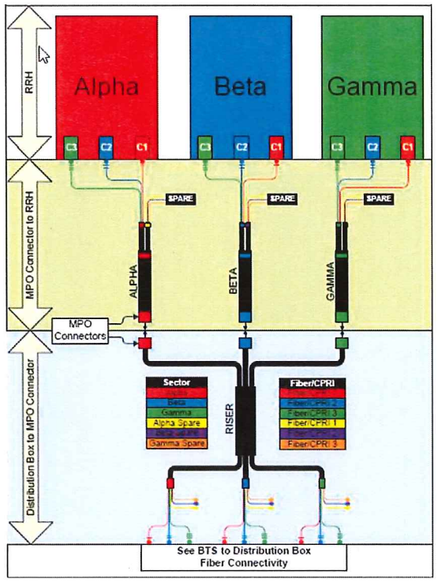
SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

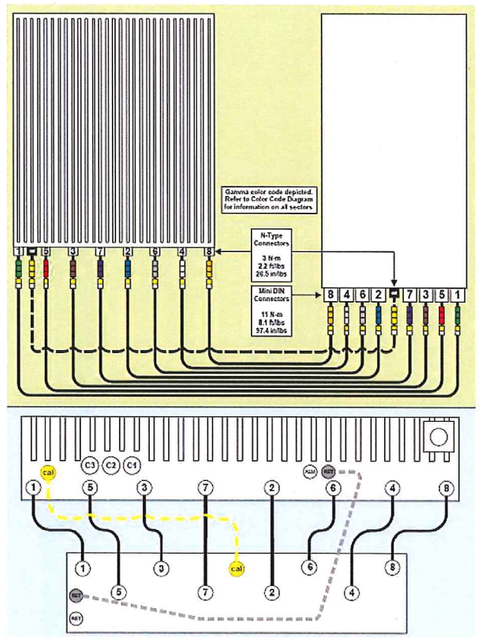
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



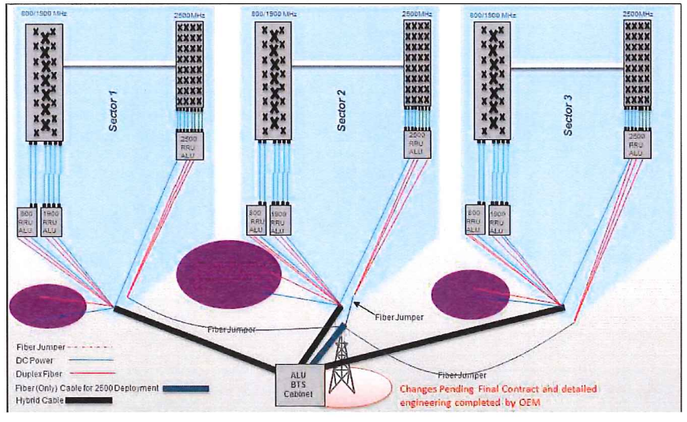
1 / A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



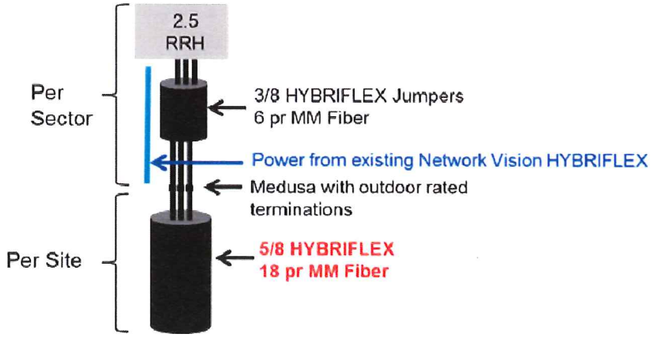
2 / A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 / A–5 RAN WIRING

SCALE: N.T.S.



4 / A–5 CABLE SCENARIO

SCALE: N.T.S.

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1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/23/14	JMQ

SEAL
STATE OF CONNECTICUT
ANANDKUMAR KARUPPIAH
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

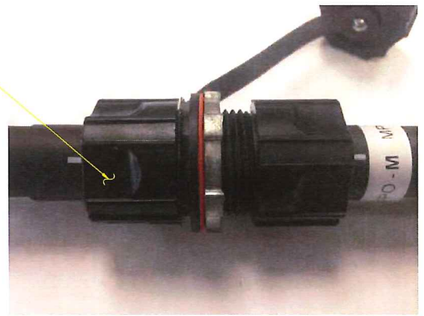
SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

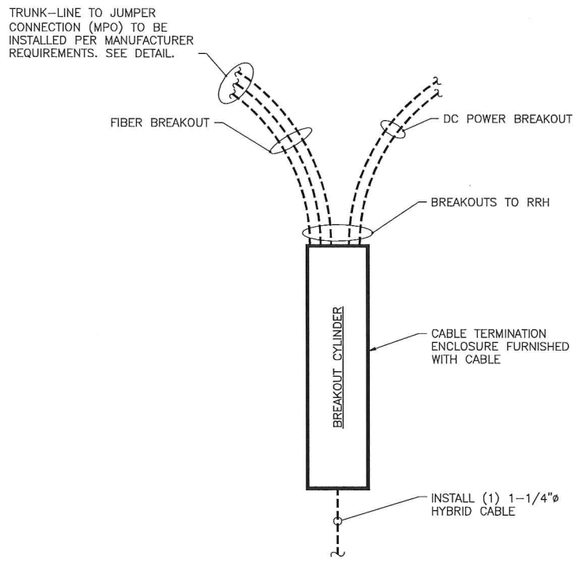
SHEET TITLE:
RAN WIRING DIAGRAM

SHEET NO:
A–5

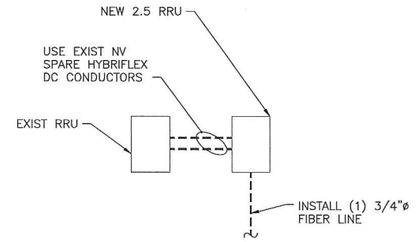
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION





2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

1 / A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

SCALE: N.T.S.

2 / A-6 TRUNK LINE DETAILS (TYPICAL)

SCALE: N.T.S.

SPECIAL NOTES: CABLE MARKINGS AT RAD CENTER AND ALL WALL/BLDG. PENETRATIONS

- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) WRAPS OF TAPE.
- ALL COLOR BANDS INSTALLED AT THE TOWER TOP SHALL BE A MINIMUM OF 3" WIDE AND SHALL HAVE A MINIMUM OF 3/4" OF SPACING BETWEEN EACH COLOR.
- ALL COLOR BANDS INSTALLED AT OR NEAR THE GROUND MAY BE ONLY 3/4" WIDE. EACH TOP-JUMPER SHALL BE COLOR CORDED WITH (1) SET OF 3" WIDE BANDS.
- EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH 3/4" COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
- ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" BANDS ON EACH END OF THE BOTTOM JUMPER.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- EACH COLOR BAND SHALL HAVE A MINIMUM OF (3) WRAPS AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT AS TO AVOID UNRAVELING.
- X-POLE ANTENNAS SHOULD USE "XX-1" FOR THE "+45" PORT, "XX-2" FOR THE "-45" PORT.
- COLOR BAND #4 REFERS TO THE FREQUENCY BAND: ORANGE=850, VIOLET=1900. USED ON JUMPERS ONLY.
- RF FEEDLINE SHALL BE IDENTIFIED WITH A METAL TAG (STAINLESS OR BRASS) AND STAMPED WITH THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER.
- ANTENNAS MUST BE IDENTIFIED, USING THE SECTOR LETTER AND ANTENNA NUMBER, WITH A BLACK MARKER PRIOR TO INSTALLATION.

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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SUBMITTALS

PROJECT NO: 7225.CT03XC369

NO	DATE	DESCRIPTION	BY
0	06/18/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL

STATE OF CONNECTICUT
JOSEPH M. QUINN
No. 22039
LICENSED PROFESSIONAL ENGINEER

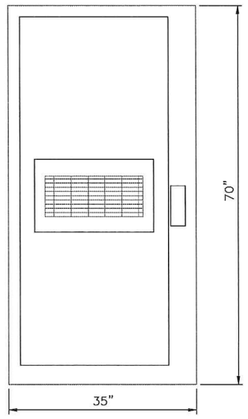
SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
CABLE DETAILS

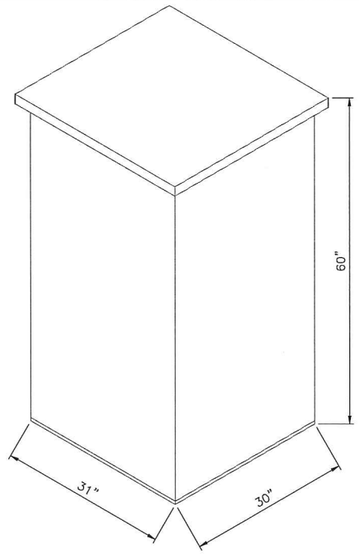
SHEET NO:
A-6



CABINET FRONT 9928 MMBTS MODULAR CELL
SPECIFICATIONS:
HEIGHT: 70" WIDTH: 35" DEPTH: 37.8" WEIGHT: 1090 LBS.

1 S-1 (EXIST) MMBTS CABINET

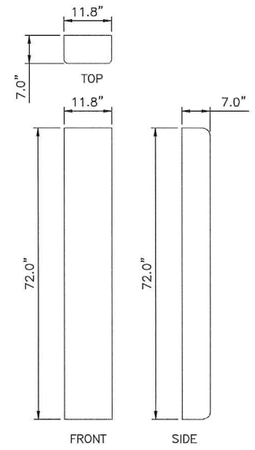
SCALE: 1" = 1'-0"



ANDREW 60ECv2
SPECIFICATIONS:
HEIGHT: 60" WIDTH: 31" DEPTH: 30" WEIGHT: 2430 LBS.

2 S-1 (EXIST) BATTERY CABINET

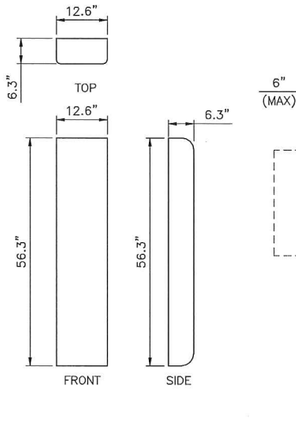
SCALE: 1" = 1'-0"



APXVSPP18-C-A20

3 S-1 (EXIST) ANTENNA DETAILS

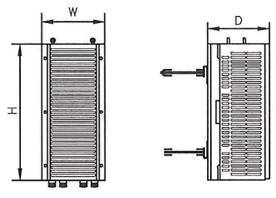
SCALE: 3/4"=1'-0"



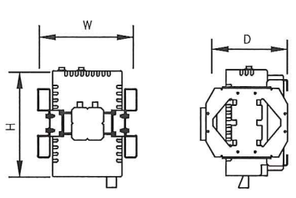
APXVTM14-C-120

4 S-1 (PROPOSED) ANTENNA DETAIL

SCALE: 3/4"=1'-0"



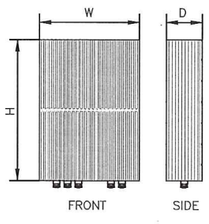
TYPE: 1900 MHz 4x45W MODEL #: RRH 1900 4X45 65MHz HEIGHT: 25.0" WIDTH: 11.1" DEPTH: 11.4" WEIGHT: ±60 LBS.



TYPE: 800 MHz 2x50W MODEL #: FD-RRH-2x50-800 HEIGHT: 19.7" WIDTH: 13" DEPTH: 10.8" WEIGHT: ±53 LBS

5 S-1 (EXIST) RRH DETAILS

SCALE: 1 1/2"=1'-0"



TYPE: 2.5 RRH MODEL #: TD-RRH8x20-25 HEIGHT: 26.1" WIDTH: 18.6" DEPTH: 6.7" WEIGHT: ±70 LBS

6 S-1 (PROPOSED) RRH DETAIL

SCALE: N.T.S.

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DATE	REVIEWED BY
9/22/14	TMQ

SEAL

STATE OF CONNECTICUT
MANOJ KUMAR QUINTYNE
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

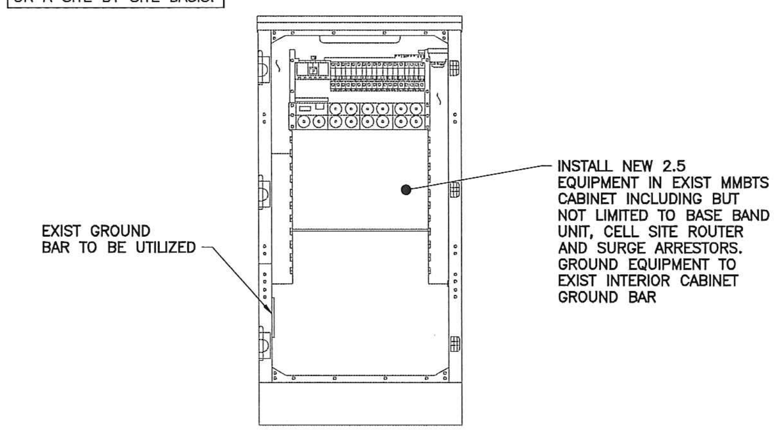
SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1

NOTE:
LOCATIONS SHOWN FOR INSTALLATION OF NEW EQUIPMENT IN EXISTING CABINET ARE APPROXIMATE. ACTUAL SPACE AVAILABLE TO BE VERIFIED IN FIELD ON A SITE BY SITE BASIS.

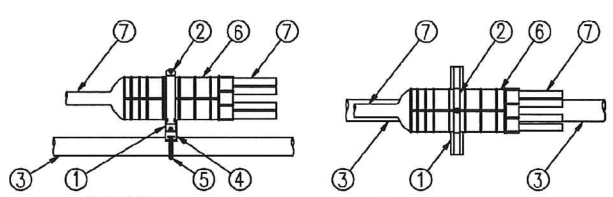


FRONT ELEVATION
(CABINET INTERIOR)

1 / S-2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

LEGEND:
1. P1000T-HG UNISTRUT, 12" LONG.
2. 6" PIPE HANGER.
3. EXISTING SUPPORT PIPE.
4. NEW STANDOFF BRACKET, ANDREW PART# 30848-4.
5. NEW ROUND MEMBER ADAPTER SIZED FOR EXISTING PIPE SUPPORT.
6. BREAKOUT UNIT.
7. CABLE.



3 / S-2 MEDUSA HEAD DETAIL

SCALE: NTS

RFS HYBRIFLEX RISER CABLES SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft

8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft

6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft

4 AWG Power	Hybrid cable MN: HB114-21U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	Hybrid Jumper cable MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft

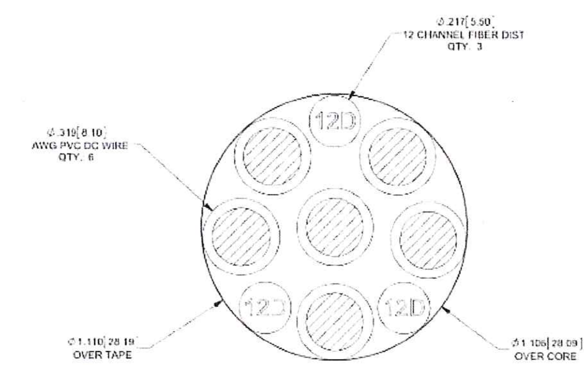
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft

6 AWG Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft

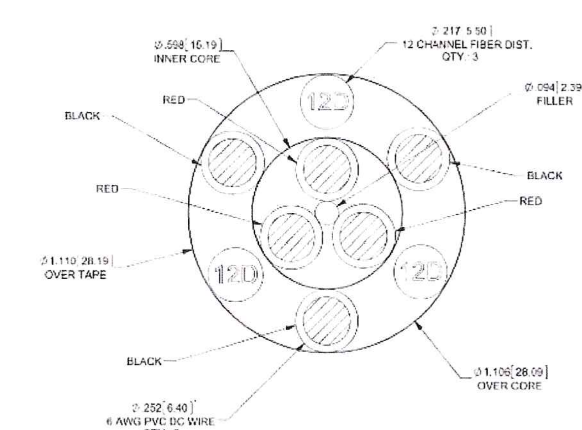
4 AWG Power	Hybrid Jumper cable MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

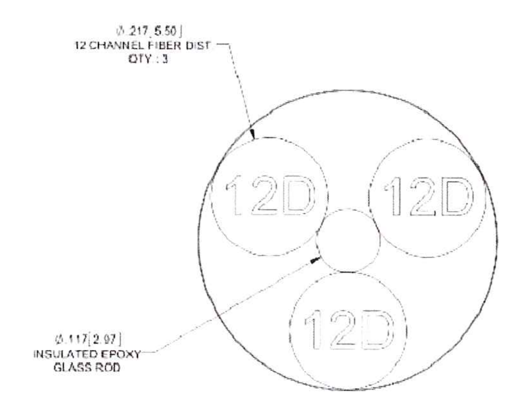
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG



FIBER ONLY

2 / S-2 2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: NTS

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1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMa

SEAL:
STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER
No. 23030

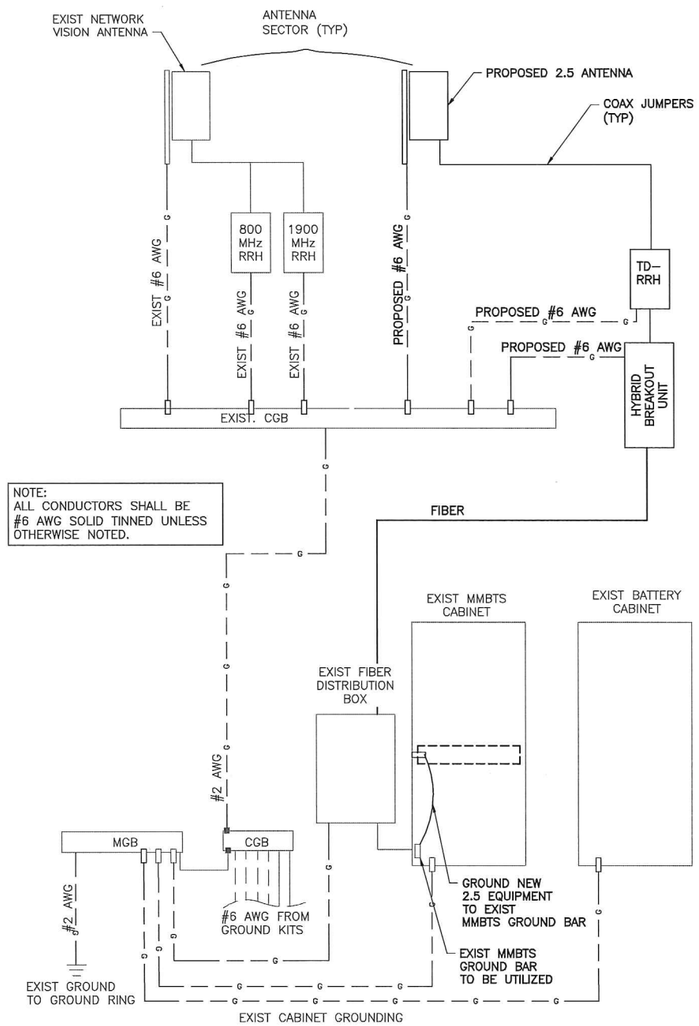
SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

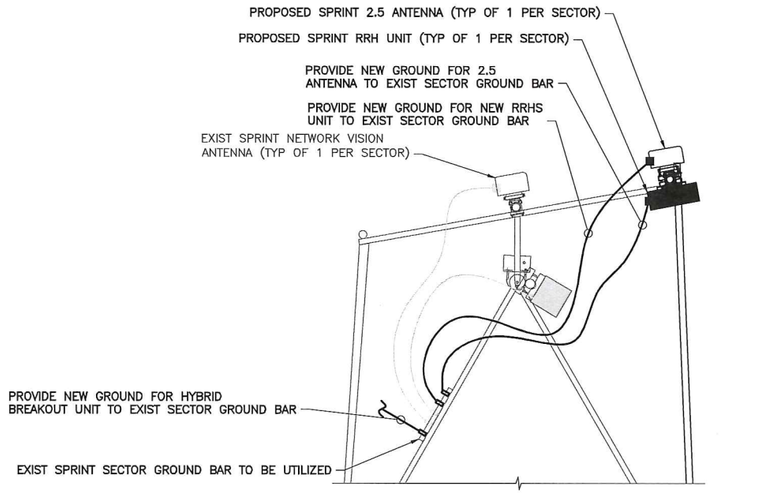
SHEET TITLE:
EQUIPMENT SCHEMATIC DETAILS

SHEET NO:
S-2



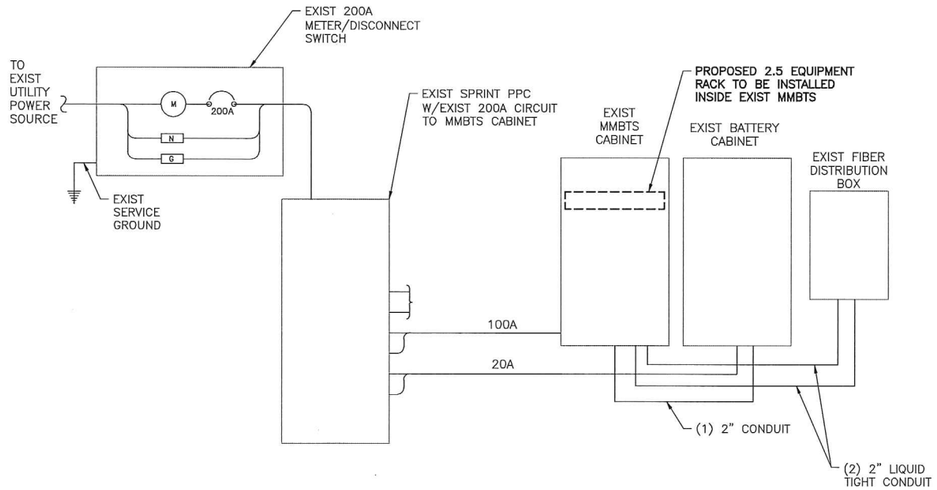
1 / E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 / E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 / E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

Sprint

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9/22/14	JMA

SEAL

STATE OF CONNECTICUT — JOSHUA M. ANDERSON — No. 22038 — LICENSED PROFESSIONAL ENGINEER

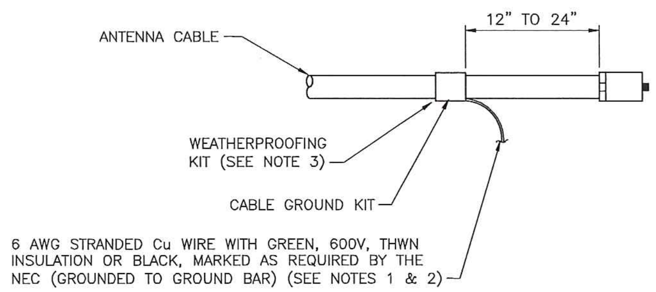
SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

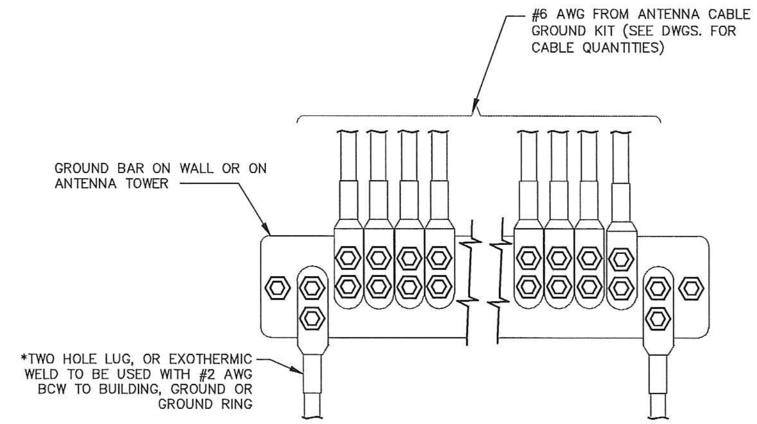
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

WEATHER PROOFING SHALL BE (TYPE AND PART NUMBER) AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER AND APPROVED BY CONTRACTOR.

1 / E-2 CABLE GROUNDING KIT DETAIL

SCALE: N.T.S.



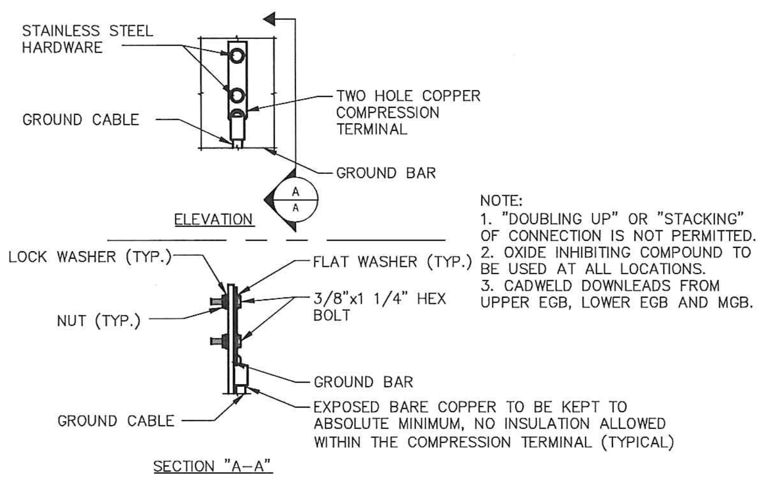
* – GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

– ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRID GROUND POINT OR BACK–A–LITE PLATE LABEL ON GROUND BAR.

– CONNECT SEQUENCE– BOLT/WASHER/NO–OX/GROUND BAR/NO–OX/WASHER/LOCK–WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

4 / E-2 ANTENNA GROUND BAR DETAIL

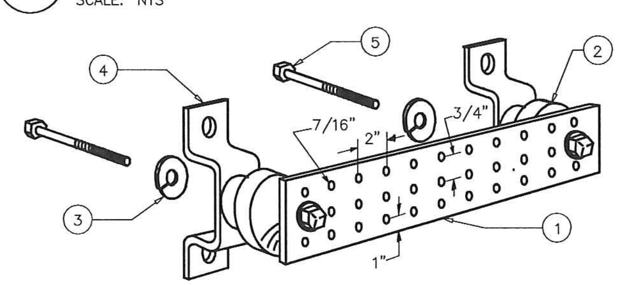
SCALE: NTS



NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

2 / E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



LEGEND

1– COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2– INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4 OR EQUAL
3– 5/8" LOCKWASHERS OR EQUAL
4– WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056 OR EQUAL
5– 5/8–11 X 1" H.H.C.S.BOLTS

NOTE:
ALL BOLTS, NUTS, WASHERS AND LOCK WASHERS SHALL BE 18–8 STAINLESS STEEL.

3 / E-2 GROUNDING BAR DETAIL

SCALE: NTS

GROUNDING NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250–GROUNDING AND BONDING.
2. ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.
3. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
6. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
7. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
8. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
9. WHEN CABLE LENGTH IS OVER 20' THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.
10. REFER TO "ANTI–THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNDING.
11. HOME RUN GROUNDS ARE NOT APPROVED BY CROWN CASTLE CONSTRUCTION STANDARDS AND THAT ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS.

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:

1. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF–TAPPING SCREWS.
2. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
3. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI–CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH PROJECT MANAGER.
4. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
5. INSTALL GROUND BUSHING ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
6. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
7. GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THNN INSULATION.
6. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. USE #2 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #2 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
16. BOND ANTENNA MOUNTING BRACKETS, HYBRID CABLE GROUND KITS, AND RRHs TO EGB PLACED NEAR THE ANTENNA LOCATION.
17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE–OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
19. CONTRACTOR SHALL CONDUCT ANTENNA, HYBRID CABLES, GPS COAX AND RRH RETURN–LOSS AND DISTANCE– TO–FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
20. CONTRACTOR SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.
21. LOCATION OF ALL OUTLET, BOXES, ETC, AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH–IN.
22. ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNERS REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH–IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT.

Sprint
2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656
Fax: (845) 567–8703
www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC369

NO	DATE	DESCRIPTION	BY
0	06/18/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL: STATE OF CONNECTICUT ... No. 22030 ... LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC369

SITE NAME:
N. WILTON

SITE ADDRESS:
128 MATHER STREET
WILTON, CT 06897

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2

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

Date: **June 09, 2014**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	**2.5 Scenario A**
	Carrier Site Number:	CT03XC369
Crown Castle Designation:	**Crown Castle BU Number:**	806353
	Crown Castle Site Name:	BRG 124 943066
	Crown Castle JDE Job Number:	288072
	Crown Castle Work Order Number:	772280
	Crown Castle Application Number:	245864 Rev. 3
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37514-0096.002.8700
Site Data:	**128 MATHER STREET, WILTON, Fairfield County, CT** **Latitude *41° 14' 18.34"*, Longitude *-73° 25' 26.44"*** **180 Foot - Self Support Tower**	

Dear Patrick Byrum,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 652820, in accordance with application 245864, revision 3.

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:

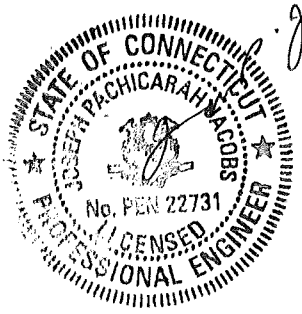
LC11: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 Connecticut Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Charles J. Weir, E.I.
Structural Designer



tnxTower Report - version 6.1.4.1

JUN 10 2014

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

Date: **June 09, 2014**

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

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

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	**2.5 Scenario A**
	Carrier Site Number:	CT03XC369
Crown Castle Designation:	**Crown Castle BU Number:**	806353
	Crown Castle Site Name:	BRG 124 943066
	Crown Castle JDE Job Number:	288072
	Crown Castle Work Order Number:	772280
	Crown Castle Application Number:	245864 Rev. 3
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37514-0096.002.8700
Site Data:	**128 MATHER STREET, WILTON, Fairfield County, CT** **Latitude *41° 14' 18.34"*, Longitude *-73° 25' 26.44"*** **180 Foot - Self Support Tower**	

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Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 Connecticut Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

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Charles J. Weir, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by FWT INC. in May of 1988. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
143.0	143.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe		

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
178.0	184.0	1	RFS Celwave	PD10017	2	7/8	1
177.0	183.0	12	Decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	3
	177.0	1	-	Sector Mount [SM 307-3]			
170.0	171.0	3	Kathrein	800 10504 w/ Mount Pipe	6	1-5/8	1
	170.0	3	Kathrein	860 10025			
		1	-	Side Arm Mount [SO 103-3]			
162.0	163.0	3	Alcatel Lucent	RRH2X40-AWS	7	1-5/8	2
		3	Kathrein	742 213 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	APL868013-42T0 w/ Mount Pipe	6	1-5/8	1
		3	RFS Celwave	APX75-866512-CT2 w/ Mount Pipe			
		3	Rymsa Wireless	MG D3-800Tx w/ Mount Pipe			
	162.0	6	RFS Celwave	FD9R6004/2C-3L			
		1	-	Sector Mount [SM 602-3]			
154.0	158.0	6	Ericsson	RRUS-11	2 1	5/8 3/8	1
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		3	Powerwave Technologies	P65-16-XLH-RR w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	154.0	1	Raycap	DC6-48-60-18-8F			
		1	-	Sector Mount [SM 602-3]			
146.0	146.0	3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER	-	-	1
		3	Alcatel Lucent	TME-800MHZ 2X50W RRH			
		3	Alcatel Lucent	TME-PCS 1900 MHz 4x45W-65MHz			
143.0	143.0	9	RFS Celwave	ACU-A20-N	3	1-1/4	1
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	-	Sector Mount [SM 701-3]			
124.0	131.0	2	RFS Celwave	1142-2C	2	1/2	1
	124.0	2	-	Side Arm Mount [SO 306-1]			
104.0	111.0	1	RFS Celwave	1142-2C	1 1	7/8 1/2	1
	108.0	1	RFS Celwave	220-3BN			
	104.0	2	-	Side Arm Mount [SO 306-1]			
93.0	93.0	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	1	5/16	3
		6	Remec	S20057A1			
		1	-	Side Arm Mount [SO 308-3]			
		3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 1	1-1/4 1-5/8	2
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1	-	Side Arm Mount [SO 101-3]			
		-	-	-	6	1-1/4	1
62.0	65.0	1	GPS	GPS_A	1	1/2	1
	62.0	1	-	Side Arm Mount [SO 301-1]			
42.0	44.0	1	GPS	GPS_A	1	1/2	1
	42.0	1	-	Side Arm Mount [SO 301-1]			
31.0	32.0	1	GPS	GPS_A	1	1/2	1
	31.0	1	-	Side Arm Mount [SO 301-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed, Not Considered in this Analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
GEOTECHNICAL REPORTS	FDH, 09-04219E G1 - 4/29/2009	262283	CCISITES
POST-MODIFICATION INSPECTION	Paul J. Ford, 37509-0801 - 1/11/2010	2575710	CCISITES

Document	Remarks	Reference	Source
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT, 18888-81 - 5/31/1988	262285	CCISITES
TOWER MANUFACTURER DRAWINGS	FWT, 18888-81 - 5/6/1988	217757	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford, 37509-0801 - 12/8/2009	2434484	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	HEB, 98124A - 1/7/2000	3290324	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	APT, CT105271 - 1/17/2003	801524	CCISITES
FOUNDATION MAPPING	FDH, 09-11077 E N1 - 8/7/2012	-	-

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 168	Leg	Pipe 2.375" x 0.154" (2 STD)	2	-2.48	24.25	10.2	Pass
T2	168 - 160	Leg	Pipe 2.375" x 0.154" (2 STD) (GR)	25	-9.18	35.52	25.9	Pass
T3	160 - 140	Leg	Pipe 3.5" x 0.216" (3 STD) (GR)	40	39.58	62.38	63.4	Pass
T4	140 - 120	Leg	Pipe 4" x 0.318" (3.5 XS) (GR)	67	-83.27	112.76	73.8	Pass
T5	120 - 100	Leg	Pipe 4.5" x 0.337" (4 XS) (GR)	88	98.97	123.38	80.2	Pass
T6	100 - 80	Leg	Pipe 5.563" x 0.375" (5 XS) (GR)	109	123.19	171.09	72.0	Pass
T7	80 - 60	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	130	144.23	235.28	61.3	Pass
T8	60 - 40	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	145	165.64	235.28	70.4	Pass
T9	40 - 20	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	160	185.61	235.28	78.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T10	20 - 0	Leg	Pipe 8.625" x 0.500" (8 XS) (GR)	181	205.08	357.27	57.4	Pass
T1	180 - 168	Diagonal	L 2 x 1.5 x 3/16 LLV	10	-0.69	11.64	6.0	Pass
T2	168 - 160	Diagonal	L 2 x 1.5 x 3/16 LLV	28	-1.95	11.64	16.8	Pass
T3	160 - 140	Diagonal	L 2 x 1.5 x 3/16 LLV	44	-4.48	8.26	54.3	Pass
T4	140 - 120	Diagonal	L 2 x 2 x 3/16	71	-4.77	7.23	65.9	Pass
T5	120 - 100	Diagonal	L 2.5 x 2 x 3/16 LLV	92	-4.76	7.03	67.7	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	113	-5.28	7.87	67.1	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	133	-6.28	8.53	73.6	Pass
T8	60 - 40	Diagonal	L 3.5 x 3 x 1/4 LLV	148	-6.65	11.26	59.0	Pass
T9	40 - 20	Diagonal	L 3.5 x 3 x 1/4 LLV	163	-7.31	9.07	80.6	Pass
T10	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	184	-7.75	10.44	74.2	Pass
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	169	-3.78	15.70	24.1	Pass
T1	180 - 168	Top Girt	L 2 x 1.5 x 3/16 LLH	5	-0.11	7.05	1.5	Pass
							Summary	
						Leg (T5)	80.2	Pass
						Diagonal (T9)	80.6	Pass
						Secondary Horizontal (T9)	24.1	Pass
						Top Girt (T1)	1.5	Pass
						Bolt Checks	90.2	Pass
						Rating =	90.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC11

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	75.8	Pass
1	Base Foundation	-	48.7	Pass
1	Base Foundation Soil Interaction	-	67.5	Pass

Structure Rating (max from all components) =	90.2%

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

APPENDIX A

TNXTOWER OUTPUT

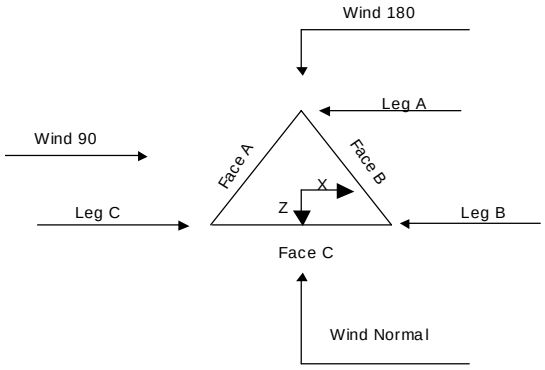
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 20.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.75 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Grouted pipe f'_c is 7 ksi.
10) Pressures are calculated at each section.
11) Stress ratio used in tower member design is 1.333.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-168.00			4.00	1	12.00
T2	168.00-160.00			4.00	1	8.00
T3	160.00-140.00			4.00	1	20.00
T4	140.00-120.00			6.00	1	20.00
T5	120.00-100.00			8.00	1	20.00
T6	100.00-80.00			10.00	1	20.00
T7	80.00-60.00			12.00	1	20.00
T8	60.00-40.00			14.00	1	20.00
T9	40.00-20.00			16.00	1	20.00
T10	20.00-0.00			18.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-168.00	4.00	X Brace	No	No	0.00	0.00
T2	168.00-160.00	4.00	X Brace	No	No	0.00	0.00
T3	160.00-140.00	5.00	X Brace	No	No	0.00	0.00
T4	140.00-120.00	6.67	X Brace	No	No	0.00	0.00
T5	120.00-100.00	6.67	X Brace	No	No	0.00	0.00
T6	100.00-80.00	6.67	X Brace	No	No	0.00	0.00
T7	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T8	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	Yes	0.00	0.00
T10	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-168.00	Pipe	Pipe 2.375" x 0.154" (2 STD)	A53-B-35 (35 ksi)	Single Angle	L 2 x 1.5 x 3/16 LLV	A36 (36 ksi)
T2 168.00-160.00	Grouted Pipe	Pipe 2.375" x 0.154" (2 STD)	A53-B-35 (35 ksi)	Single Angle	L 2 x 1.5 x 3/16 LLV	A36 (36 ksi)
T3 160.00-140.00	Grouted Pipe	Pipe 3.5" x 0.216" (3 STD)	A53-B-35 (35 ksi)	Single Angle	L 2 x 1.5 x 3/16 LLV	A36 (36 ksi)
T4 140.00-120.00	Grouted Pipe	Pipe 4" x 0.318" (3.5 XS)	A53-B-35 (35 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T5 120.00-100.00	Grouted Pipe	Pipe 4.5" x 0.337" (4 XS)	A53-B-35 (35 ksi)	Single Angle	L 2.5 x 2 x 3/16 LLV	A36 (36 ksi)
T6 100.00-80.00	Grouted Pipe	Pipe 5.563" x 0.375" (5 XS)	A53-B-35 (35 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	Grouted Pipe	Pipe 6.625" x 0.432" (6 XS)	A53-B-35 (35 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T8 60.00-40.00	Grouted Pipe	Pipe 6.625" x 0.432" (6 XS)	A53-B-35 (35 ksi)	Single Angle	L 3.5 x 3 x 1/4 LLV	A36 (36 ksi)
T9 40.00-20.00	Grouted Pipe	Pipe 6.625" x 0.432" (6 XS)	A53-B-35 (35 ksi)	Single Angle	L 3.5 x 3 x 1/4 LLV	A36 (36 ksi)
T10 20.00-0.00	Grouted Pipe	Pipe 8.625" x 0.500" (8 XS)	A53-B-35 (35 ksi)	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-	Single Angle	L 2 x 1.5 x 3/16 LLH	A36	Single Angle		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
168.00			(36 ksi)			(36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 40.00-20.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 180.00-168.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T2 168.00-160.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T3 160.00-140.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T4 140.00-120.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T5 120.00-100.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T6 100.00-80.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T7 80.00-60.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T8 60.00-40.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T9 40.00-20.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00
T10 20.00-0.00	0.00	0.38	A36 (36 ksi)	1	1	1	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 180.00-168.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 168.00-160.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-	No	No	1	1	1	1	1	1	0.5	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
20.00				1	1	1	1	1	0.5	1
T10 20.00-0.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-168.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 168.00-160.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 160.00-140.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 140.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 180.00-168.00	4.50	4.19	4.50	4.19	0.00	0.00	0.00	0.00
T2 168.00-160.00	4.50	4.19	4.50	4.19	0.00	0.00	0.00	0.00
T3 160.00-140.00	4.60	4.75	4.60	4.75	0.00	0.00	0.00	0.00
T4 140.00-120.00	4.50	5.00	4.00	5.00	0.00	0.00	0.00	0.00
T5 120.00-100.00	3.50	5.25	3.50	5.25	0.00	0.00	0.00	0.00
T6 100.00-80.00	2.50	5.78	2.50	5.78	0.00	0.00	0.00	0.00
T7 80.00-60.00	4.00	6.31	4.00	6.31	0.00	0.00	0.00	0.00
T8 60.00-40.00	4.00	6.31	4.00	6.31	0.00	0.00	0.00	0.00
T9 40.00-20.00	3.90	6.31	3.90	6.31	0.00	0.00	0.00	0.00

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T10 20.00-0.00	4.00	7.31	4.00	7.31	0.00	0.00	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-168.00	Flange	0.00 A325N	0	0.63 A325N	1	0.63 A325N	1	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T2 168.00-160.00	Flange	0.63 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T3 160.00-140.00	Flange	0.63 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T4 140.00-120.00	Flange	0.75 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T5 120.00-100.00	Flange	0.88 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T6 100.00-80.00	Flange	0.88 A490N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T7 80.00-60.00	Flange	1.00 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T8 60.00-40.00	Flange	1.13 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0
T9 40.00-20.00	Flange	1.13 A325N	4	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.50 A325N	1
T10 20.00-0.00	Flange	1.50 F1554-36	6	0.63 A325N	1	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.00 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
Pipe 2.375" x 0.154" (2 STD) (GR)	35	1.07	3.36	10.65	4769	40914	54
Pipe 3.5" x 0.216" (3 STD) (GR)	35	2.23	7.39	22.98	4769	41656	55
Pipe 4" x 0.318" (3.5 XS) (GR)	35	3.68	8.89	31.03	4769	38218	49
Pipe 4.5" x 0.337" (4 XS) (GR)	35	4.41	11.50	38.95	4769	38952	51
Pipe 5.563" x 0.375" (5 XS) (GR)	35	6.11	18.19	58.70	4769	40357	53
Pipe 6.625" x 0.432" (6 XS) (GR)	35	8.40	26.07	82.91	4769	40832	53
Pipe 8.625" x 0.500" (8 XS) (GR)	35	12.76	45.66	138.56	4769	42650	56

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
2" flat Cable Ladder Rail	C	Yes	Af (CfAe)	180.00 - 5.00	0.00	0	2	2	2.00	2.00	7.00	2.12

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
5/8" ladder rung (12" long 12" oc)	C	Yes	Ar (CfAe)	180.00 - 5.00	0.00	0	1	1	0.63	0.63		1.04
Safety Line 3/8 ***	C	Yes	Ar (CfAe)	180.00 - 5.00	3.00	0	1	1	0.38	0.38		0.22
1.5" flat Cable Ladder Rail	A	Yes	Af (CfAe)	180.00 - 5.00	0.00	0	2	2	48.00 1.50	1.50	6.00	1.80
FSJ4-50B(1/2")	A	Yes	Ar (CfAe)	42.00 - 5.00	0.00	-0.1	4	4	0.52	0.52		0.14
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	62.00 - 42.00	0.00	-0.1	3	3	0.63	0.63		0.15
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	124.00 - 62.00	0.00	-0.1	2	2	0.63	0.63		0.15
HB114-1-0813U4-M5J(1 1/4")	A	Yes	Ar (CfAe)	143.00 - 5.00	0.00	-0.075	4	4	1.50 0.50	1.54		1.20
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	178.00 - 5.00	0.00	-0.05	2	1	1.09	1.09		0.33
561(1-5/8")	A	Yes	Ar (CfAe)	162.00 - 5.00	0.00	0	6	2	1.00 0.50	1.63		1.35
HB158-1-08U8-S8J18(1-5/8) ***	A	Yes	Ar (CfAe)	162.00 - 5.00	0.00	0.075	7	4	1.00 0.50	1.98		1.30
1.5" flat Cable Ladder Rail	B	Yes	Af (CfAe)	54.00 - 5.00	0.00	0.12	2	2	36.00 1.50	1.50	6.00	1.80
1.5" flat Cable Ladder Rail	B	Yes	Af (CfAe)	93.00 - 5.00	0.00	0.38	2	2	36.00 1.50	1.50	6.00	1.80
LDF6-50A(1-1/4")	B	Yes	Ar (CfAe)	93.00 - 5.00	0.00	0.15	12	6	1.55 0.50	1.55		0.66
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	B	Yes	Ar (CfAe)	93.00 - 0.00	0.00	0.1	1	1	1.63	1.63		1.07
LCF158-50JA-A0(1 5/8")	B	Yes	Ar (CfAe)	154.00 - 5.00	0.00	0.35	12	6	1.00 0.50	1.98		0.08
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	104.00 - 5.00	0.00	0.4	1	1	0.63	0.63		0.15
LDF5-50A(7/8")	B	Yes	Ar (CfAe)	104.00 - 5.00	0.00	0.41	1	1	1.09	1.09		0.33
2" Conduit (1 1/2" EMT)	B	Yes	Ar (CfAe)	104.00 - 5.00	0.00	0.43	1	1	1.74	1.74		1.16
FB-L98B-002-75000(3/8")	B	Yes	Ar (CaAa)	154.00 - 5.00	0.00	0.43	1	1	0.39	0.39		0.06
WR-VG82ST-BRDA(5/8") ***	B	Yes	Ar (CaAa)	154.00 - 5.00	0.00	0.43	2	2	0.65	0.65		0.31
1.5" flat Cable Ladder Rail	C	Yes	Af (CfAe)	180.00 - 5.00	-1.00	-0.35	4	2	36.00 1.50	1.50	6.00	1.80
CR 50 1873PE(1-5/8")	C	Yes	Ar (CfAe)	170.00 - 5.00	0.00	-0.35	6	4	1.00 0.50	1.98		0.83
LDF4-50A(1/2") ***	C	Yes	Ar (CfAe)	31.00 - 5.00	-1.00	-0.32	1	1	0.63	0.63		0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-168.00	A	0.908	3.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	2.320	7.000	0.000	0.000	0.16
T2	168.00-160.00	A	2.588	2.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	5.947	4.667	0.000	0.000	0.14
T3	160.00-140.00	A	21.973	5.000	0.000	0.000	0.44
		B	13.860	0.000	2.357	0.000	0.02
		C	14.867	11.667	0.000	0.000	0.35
T4	140.00-120.00	A	31.120	5.000	0.000	0.000	0.53
		B	19.800	0.000	3.367	0.000	0.03
		C	14.867	11.667	0.000	0.000	0.35
T5	120.00-100.00	A	32.800	5.000	0.000	0.000	0.53
		B	20.953	0.000	3.367	0.000	0.04
		C	14.867	11.667	0.000	0.000	0.35
T6	100.00-80.00	A	32.800	5.000	0.000	0.000	0.53
		B	37.402	3.250	3.367	0.000	0.23
		C	14.867	11.667	0.000	0.000	0.35
T7	80.00-60.00	A	32.905	5.000	0.000	0.000	0.53
		B	43.775	5.000	3.367	0.000	0.32
		C	14.867	11.667	0.000	0.000	0.35
T8	60.00-40.00	A	33.882	5.000	0.000	0.000	0.53
		B	43.775	8.500	3.367	0.000	0.37
		C	14.867	11.667	0.000	0.000	0.35
T9	40.00-20.00	A	34.167	5.000	0.000	0.000	0.54
		B	43.775	10.000	3.367	0.000	0.39
		C	15.444	11.667	0.000	0.000	0.36
T10	20.00-0.00	A	25.625	3.750	0.000	0.000	0.40
		B	33.508	7.500	2.526	0.000	0.30
		C	11.938	8.750	0.000	0.000	0.27

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
T1	180.00-168.00	A	0.916	2.434	5.442	0.000	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.00
		C		5.298	13.373	0.000	0.000	0.48
T2	168.00-160.00	A	0.909	3.146	5.544	0.000	0.000	0.22
		B		0.000	0.000	0.000	0.000	0.00
		C		5.623	13.859	0.000	0.000	0.46
T3	160.00-140.00	A	0.899	17.654	30.552	0.000	0.000	1.29
		B		4.409	17.383	9.501	0.000	0.50
		C		13.961	34.562	0.000	0.000	1.14
T4	140.00-120.00	A	0.884	22.979	43.824	0.000	0.000	1.58
		B		6.247	24.833	13.450	0.000	0.71
		C		13.808	34.426	0.000	0.000	1.13
T5	120.00-100.00	A	0.867	25.885	45.426	0.000	0.000	1.61
		B		9.075	24.833	13.310	0.000	0.73
		C		13.632	34.270	0.000	0.000	1.11
T6	100.00-80.00	A	0.846	25.541	45.335	0.000	0.000	1.58
		B		27.452	47.319	13.145	0.000	1.50
		C		13.426	34.086	0.000	0.000	1.09
T7	80.00-60.00	A	0.821	25.122	45.433	0.000	0.000	1.56
		B		30.775	59.315	12.944	0.000	1.81
		C		13.175	33.863	0.000	0.000	1.07
T8	60.00-40.00	A	0.788	24.562	47.279	0.000	0.000	1.55
		B		30.125	65.123	12.684	0.000	1.90
		C		12.850	33.574	0.000	0.000	1.04
T9	40.00-20.00	A	0.750	23.758	48.008	0.000	0.000	1.51
		B		54.775	41.500	12.377	0.000	1.86
		C		14.419	33.233	0.000	0.000	1.02
T10	20.00-0.00	A	0.750	17.819	36.006	0.000	0.000	1.13

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		42.383	31.125	9.283	0.000	1.41
		C		12.012	24.925	0.000	0.000	0.77

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-168.00	A	0.000	1.097	0.501	1.167
		B	0.000	0.000	0.000	0.000
		C	0.000	2.547	1.195	2.708
T2	168.00-160.00	A	0.000	1.018	0.541	1.119
		B	0.000	0.000	0.000	0.000
		C	0.000	2.261	1.251	2.486
T3	160.00-140.00	A	0.000	4.290	2.563	4.770
		B	0.000	2.453	1.504	2.727
		C	0.000	4.488	2.521	4.990
T4	140.00-120.00	A	0.000	4.213	2.503	4.765
		B	0.000	2.503	1.566	2.831
		C	0.000	3.195	1.838	3.614
T5	120.00-100.00	A	0.000	3.956	2.945	5.706
		B	0.000	2.353	1.851	3.394
		C	0.000	2.795	2.067	4.032
T6	100.00-80.00	A	0.000	3.602	2.765	5.322
		B	0.000	4.233	3.179	6.255
		C	0.000	2.538	1.941	3.750
T7	80.00-60.00	A	0.000	2.500	2.393	4.569
		B	0.000	3.498	3.256	6.392
		C	0.000	1.751	1.675	3.199
T8	60.00-40.00	A	0.000	2.325	2.727	5.162
		B	0.000	3.392	3.863	7.530
		C	0.000	1.577	1.861	3.502
T9	40.00-20.00	A	0.000	3.048	3.794	7.113
		B	0.000	4.504	5.481	10.509
		C	0.000	2.117	2.626	4.939
T10	20.00-0.00	A	0.000	1.556	1.937	3.631
		B	0.000	2.336	2.843	5.451
		C	0.000	1.114	1.364	2.600

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-168.00	0.45	2.30	0.07	2.02
T2	168.00-160.00	1.71	3.38	0.75	2.57
T3	160.00-140.00	2.97	2.46	2.12	2.24
T4	140.00-120.00	3.62	3.05	2.65	2.80
T5	120.00-100.00	4.18	3.59	3.45	3.46
T6	100.00-80.00	8.71	4.41	8.16	4.50
T7	80.00-60.00	11.17	4.90	10.88	5.18
T8	60.00-40.00	12.48	5.12	12.33	5.47
T9	40.00-20.00	12.41	5.02	13.11	5.42
T10	20.00-0.00	12.17	4.87	13.68	5.64

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PD10017	A	From Leg	0.50 0 6	0.000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.11 5.64 7.19 10.32 14.45	4.11 5.64 7.19 10.32 14.45	0.03 0.06 0.09 0.20 0.54
***									
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800 10504 w/ Mount Pipe	A	From Leg	2.00 0 1	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	B	From Leg	2.00 0 1	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	C	From Leg	2.00 0 1	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
860 10025	A	From Leg	2.00 0 0	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	0.00 0.00 0.01 0.01 0.05
860 10025	B	From Leg	2.00 0 0	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	0.00 0.00 0.01 0.01 0.05
860 10025	C	From Leg	2.00 0 0	0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	0.00 0.00 0.01 0.01 0.05
Side Arm Mount [SO 103-3]	A	None		0.000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.50 11.80 14.10 18.70 27.90	9.50 11.80 14.10 18.70 27.90	0.22 0.32 0.41 0.60 0.97
***									
(2) APL868013-42T0 w/ Mount Pipe	A	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.87 3.18 3.52 4.27 5.88	3.73 4.10 4.48 5.25 6.91	0.02 0.05 0.07 0.15 0.35
(2) APL868013-42T0 w/ Mount Pipe	B	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.87 3.18 3.52 4.27 5.88	3.73 4.10 4.48 5.25 6.91	0.02 0.05 0.07 0.15 0.35

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						4" Ice			
(2) APL868013-42T0 w/ Mount Pipe	C	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.87 3.18 3.52 4.27 5.88	3.73 4.10 4.48 5.25 6.91	0.02 0.05 0.07 0.15 0.35
APX75-866512-CT2 w/ Mount Pipe	A	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.43 6.92 7.41 8.43 10.58	3.89 4.59 5.25 6.63 9.77	0.04 0.09 0.14 0.27 0.64
APX75-866512-CT2 w/ Mount Pipe	B	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.43 6.92 7.41 8.43 10.58	3.89 4.59 5.25 6.63 9.77	0.04 0.09 0.14 0.27 0.64
APX75-866512-CT2 w/ Mount Pipe	C	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.43 6.92 7.41 8.43 10.58	3.89 4.59 5.25 6.63 9.77	0.04 0.09 0.14 0.27 0.64
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
(2) FD9R6004/2C-3L	A	From Leg	4.00 0 0	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0 0	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0 0	0.000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
742 213 w/ Mount Pipe	A	From Leg	4.00 0 1	0.000	162.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50 7.61	4.62 6.00 6.98 8.85	0.05 0.09 0.15 0.28

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						2" Ice	9.93	12.79	0.68
						4" Ice			
742 213 w/ Mount Pipe	B	From Leg	4.00	0.000	162.00	No Ice	5.37	4.62	0.05
			0			1/2"	5.95	6.00	0.09
			1			Ice	6.50	6.98	0.15
						1" Ice	7.61	8.85	0.28
						2" Ice	9.93	12.79	0.68
						4" Ice			
742 213 w/ Mount Pipe	C	From Leg	4.00	0.000	162.00	No Ice	5.37	4.62	0.05
			0			1/2"	5.95	6.00	0.09
			1			Ice	6.50	6.98	0.15
						1" Ice	7.61	8.85	0.28
						2" Ice	9.93	12.79	0.68
						4" Ice			
RRH2X40-AWS	A	From Leg	4.00	0.000	162.00	No Ice	2.52	1.59	0.04
			0			1/2"	2.75	1.80	0.06
			1			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	B	From Leg	4.00	0.000	162.00	No Ice	2.52	1.59	0.04
			0			1/2"	2.75	1.80	0.06
			1			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	C	From Leg	4.00	0.000	162.00	No Ice	2.52	1.59	0.04
			0			1/2"	2.75	1.80	0.06
			1			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
DB-T1-6Z-8AB-0Z	C	From Leg	4.00	0.000	162.00	No Ice	5.60	2.33	0.04
			0			1/2"	5.92	2.56	0.08
			1			Ice	6.24	2.79	0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
						4" Ice			
Sector Mount [SM 602-3]	A	None		0.000	162.00	No Ice	33.11	33.11	1.54
						1/2"	44.90	44.90	2.16
						Ice	56.69	56.69	2.78
						1" Ice	80.27	80.27	4.01
						2" Ice	127.43	127.43	6.49
						4" Ice			
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.000	154.00	No Ice	6.12	4.25	0.06
			0			1/2"	6.63	5.01	0.10
			4			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.000	154.00	No Ice	6.12	4.25	0.06
			0			1/2"	6.63	5.01	0.10
			4			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.000	154.00	No Ice	6.12	4.25	0.06
			0			1/2"	6.63	5.01	0.10
			4			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.000	154.00	No Ice	8.64	6.36	0.08
			0			1/2"	9.29	7.54	0.14

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
			4			Ice	9.91	8.43	0.22
						1" Ice	11.18	10.24	0.39
						2" Ice	13.83	14.10	0.89
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.000	154.00	No Ice	8.64	6.36	0.08
			0			1/2"	9.29	7.54	0.14
			4			Ice	9.91	8.43	0.22
						1" Ice	11.18	10.24	0.39
						2" Ice	13.83	14.10	0.89
						4" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.000	154.00	No Ice	8.64	6.36	0.08
			0			1/2"	9.29	7.54	0.14
			4			Ice	9.91	8.43	0.22
						1" Ice	11.18	10.24	0.39
						2" Ice	13.83	14.10	0.89
						4" Ice			
(2) LGP21901	A	From Leg	4.00	0.000	154.00	No Ice	0.27	0.18	0.01
			0			1/2"	0.34	0.25	0.01
			4			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
(2) LGP21901	B	From Leg	4.00	0.000	154.00	No Ice	0.27	0.18	0.01
			0			1/2"	0.34	0.25	0.01
			4			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
(2) LGP21901	C	From Leg	4.00	0.000	154.00	No Ice	0.27	0.18	0.01
			0			1/2"	0.34	0.25	0.01
			4			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
(2) RRUS-11	A	From Leg	4.00	0.000	154.00	No Ice	3.25	1.37	0.05
			0			1/2"	3.49	1.55	0.07
			4			Ice	3.74	1.74	0.09
						1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
(2) RRUS-11	B	From Leg	4.00	0.000	154.00	No Ice	3.25	1.37	0.05
			0			1/2"	3.49	1.55	0.07
			4			Ice	3.74	1.74	0.09
						1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
(2) RRUS-11	C	From Leg	4.00	0.000	154.00	No Ice	3.25	1.37	0.05
			0			1/2"	3.49	1.55	0.07
			4			Ice	3.74	1.74	0.09
						1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
(2) LGP21401	A	From Leg	4.00	0.000	154.00	No Ice	1.29	0.23	0.01
			0			1/2"	1.45	0.31	0.02
			4			Ice	1.61	0.40	0.03
						1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
(2) LGP21401	B	From Leg	4.00	0.000	154.00	No Ice	1.29	0.23	0.01
			0			1/2"	1.45	0.31	0.02
			4			Ice	1.61	0.40	0.03
						1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
(2) LGP21401	C	From Leg	4.00	0.000	154.00	No Ice	1.29	0.23	0.01

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
			0			1/2"	1.45	0.31	0.02
			4			Ice	1.61	0.40	0.03
						1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.000	154.00	No Ice	2.22	2.22	0.02
			0			1/2"	2.44	2.44	0.04
			0			Ice	2.66	2.66	0.06
						1" Ice	3.15	3.15	0.12
						2" Ice	4.21	4.21	0.27
						4" Ice			
Sector Mount [SM 602-3]	A	None		0.000	154.00	No Ice	33.11	33.11	1.54
						1/2"	44.90	44.90	2.16
						Ice	56.69	56.69	2.78
						1" Ice	80.27	80.27	4.01
						2" Ice	127.43	127.43	6.49
						4" Ice			
***									
800 EXTERNAL NOTCH FILTER	A	From Leg	1.00	0.000	146.00	No Ice	0.77	0.37	0.01
			0			1/2"	0.89	0.46	0.02
			0			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	1.00	0.000	146.00	No Ice	0.77	0.37	0.01
			0			1/2"	0.89	0.46	0.02
			0			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Leg	1.00	0.000	146.00	No Ice	0.77	0.37	0.01
			0			1/2"	0.89	0.46	0.02
			0			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
TME-800MHZ 2X50W RRH	A	From Leg	1.00	0.000	146.00	No Ice	2.49	2.07	0.05
			0			1/2"	2.71	2.27	0.07
			0			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
TME-800MHZ 2X50W RRH	B	From Leg	1.00	0.000	146.00	No Ice	2.49	2.07	0.05
			0			1/2"	2.71	2.27	0.07
			0			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
TME-800MHZ 2X50W RRH	C	From Leg	1.00	0.000	146.00	No Ice	2.49	2.07	0.05
			0			1/2"	2.71	2.27	0.07
			0			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
***									
TME-PCS 1900 MHz 4x45W-65MHz	A	From Leg	2.00	0.000	146.00	No Ice	2.71	2.61	0.06
			0			1/2"	2.95	2.85	0.08
			0			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
TME-PCS 1900 MHz 4x45W-65MHz	B	From Leg	2.00	0.000	146.00	No Ice	2.71	2.61	0.06
			0			1/2"	2.95	2.85	0.08
			0			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
						2" Ice	4.86	4.74	0.35
						4" Ice			
TME-PCS 1900 MHz 4x45W-65MHz	C	From Leg	2.00 0 0	0.000	146.00	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	2.00 0 0	0.000	143.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	2.00 0 0	0.000	143.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	2.00 0 0	0.000	143.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
(3) ACU-A20-N	A	From Leg	2.00 0 0	0.000	143.00	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	B	From Leg	2.00 0 0	0.000	143.00	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	C	From Leg	2.00 0 0	0.000	143.00	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
Sector Mount [SM 701-3]	A	None		0.000	143.00	No Ice	19.73	19.73	0.82
						1/2" Ice	27.41	27.41	1.17
						1" Ice	35.09	35.09	1.51
						2" Ice	50.45	50.45	2.19
						4" Ice	81.17	81.17	3.55
***									
1142-2C	B	From Leg	4.00 0 7	0.000	124.00	No Ice	2.09	2.09	0.02
						1/2" Ice	3.37	3.37	0.04
						1" Ice	4.67	4.67	0.07
						2" Ice	7.32	7.32	0.14
						4" Ice	10.79	10.79	0.39
1142-2C	C	From Leg	4.00 0 7	0.000	124.00	No Ice	2.09	2.09	0.02
						1/2" Ice	3.37	3.37	0.04
						1" Ice	4.67	4.67	0.07
						2" Ice	7.32	7.32	0.14
						4" Ice	10.79	10.79	0.39
Side Arm Mount [SO 306-1]	B	From Leg	2.00 0	0.000	124.00	No Ice	0.98	2.18	0.04
						1/2"	1.70	3.80	0.06

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			0			Ice	2.42	5.42	0.08
						1" Ice	3.86	8.66	0.12
						2" Ice	6.74	15.14	0.20
						4" Ice			
Side Arm Mount [SO 306-1]	C	From Leg	2.00 0 0	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	2.18 3.80 5.42 8.66 15.14	0.04 0.06 0.08 0.12 0.20
***									
220-3BN	B	From Leg	4.00 0 4	0.000	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.72 7.83 9.96 14.27 22.63	5.72 7.83 9.96 14.27 22.63	0.02 0.07 0.12 0.27 0.73
1142-2C	C	From Leg	4.00 0 7	0.000	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 3.37 4.67 7.32 10.79	2.09 3.37 4.67 7.32 10.79	0.02 0.04 0.07 0.14 0.39
Side Arm Mount [SO 306-1]	B	From Leg	2.00 0 0	0.000	104.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	2.18 3.80 5.42 8.66 15.14	0.04 0.06 0.08 0.12 0.20
Side Arm Mount [SO 306-1]	C	From Leg	2.00 0 0	0.000	104.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	2.18 3.80 5.42 8.66 15.14	0.04 0.06 0.08 0.12 0.20
***									
***									
GPS_A	C	From Leg	2.00 0 3	0.000	62.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 301-1]	C	From Leg	1.00 0 0	0.000	62.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.78 2.56 4.12	0.90 1.42 1.94 2.98 5.06	0.02 0.03 0.04 0.06 0.10
***									
GPS_A	C	From Leg	2.00 0 2	0.000	42.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 301-1]	C	From Leg	1.00 0 0	0.000	42.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.78 2.56 4.12	0.90 1.42 1.94 2.98 5.06	0.02 0.03 0.04 0.06 0.10
***									
GPS_A	C	From Leg	2.00 0	0.000	31.00	No Ice 1/2"	0.30 0.37	0.30 0.37	0.00 0.00

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			1			Ice	0.46	0.46	0.01
						1" Ice	0.65	0.65	0.02
						2" Ice	1.15	1.15	0.08
						4" Ice			
Side Arm Mount [SO 301-1]	C	From Leg	1.00 0 0	0.000	31.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.78 2.56 4.12	0.90 1.42 1.94 2.98 5.06	0.02 0.03 0.04 0.06 0.10
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	B	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	C	From Leg	4.00 0 0	0.000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
Side Arm Mount [SO 101-3]	C	None		0.000	93.00	No Ice	7.50	7.50	0.25
						1/2" Ice	8.90	8.90	0.33
						1" Ice	10.30	10.30	0.41
						2" Ice	13.10	13.10	0.58
						4" Ice	18.70	18.70	0.90
***									
TD-RRH8x20-25	A	From Leg	4.00 0 0	0.000	143.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	143.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	B	From Leg	4.00 0 0	0.000	143.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	143.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	C	From Leg	4.00 0 0	0.000	143.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	143.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice
15	Dead+Wind 0 deg+Ice

Comb. No.	Description
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	5.32	35	0.292	0.024
T2	168 - 160	4.60	35	0.288	0.025
T3	160 - 140	4.12	35	0.277	0.025
T4	140 - 120	3.00	35	0.231	0.022
T5	120 - 100	2.08	35	0.181	0.019
T6	100 - 80	1.39	35	0.132	0.015
T7	80 - 60	0.86	35	0.097	0.011
T8	60 - 40	0.48	35	0.071	0.007
T9	40 - 20	0.21	35	0.044	0.005
T10	20 - 0	0.06	35	0.017	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	PD10017	35	5.20	0.292	0.024	187836
170.00	800 10504 w/ Mount Pipe	35	4.71	0.290	0.025	97431
162.00	(2) APL868013-42T0 w/ Mount Pipe	35	4.24	0.281	0.025	143151
154.00	(2) 7770.00 w/ Mount Pipe	35	3.77	0.265	0.024	53544
146.00	800 EXTERNAL NOTCH FILTER	35	3.32	0.246	0.023	26434
143.00	APXVSPP18-C-A20 w/ Mount Pipe	35	3.16	0.239	0.023	22284
124.00	1142-2C	35	2.25	0.191	0.019	20453
104.00	220-3BN	35	1.51	0.141	0.016	27567
93.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	35	1.19	0.118	0.013	31504
62.00	GPS_A	35	0.51	0.073	0.008	38717
42.00	GPS_A	35	0.23	0.047	0.005	43441
31.00	GPS_A	35	0.13	0.031	0.004	43932

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	15.34	10	0.840	0.070
T2	168 - 160	13.26	10	0.830	0.072
T3	160 - 140	11.90	10	0.799	0.072
T4	140 - 120	8.66	10	0.667	0.064
T5	120 - 100	6.01	10	0.522	0.054
T6	100 - 80	4.01	10	0.382	0.043
T7	80 - 60	2.49	10	0.280	0.031
T8	60 - 40	1.38	10	0.204	0.021
T9	40 - 20	0.62	10	0.127	0.014
T10	20 - 0	0.18	10	0.049	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	PD10017	10	14.99	0.840	0.070	66754
170.00	800 10504 w/ Mount Pipe	10	13.60	0.835	0.071	34636
162.00	(2) APL868013-42T0 w/ Mount Pipe	10	12.24	0.809	0.072	51490
154.00	(2) 7770.00 w/ Mount Pipe	10	10.89	0.765	0.070	18786
146.00	800 EXTERNAL NOTCH FILTER	10	9.58	0.711	0.067	9189
143.00	APXVSPP18-C-A20 w/ Mount Pipe	10	9.11	0.689	0.065	7735
124.00	1142-2C	10	6.49	0.551	0.056	7102
104.00	220-3BN	10	4.37	0.407	0.045	9573
93.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10	3.43	0.341	0.038	10933
62.00	GPS_A	10	1.47	0.212	0.022	13413
42.00	GPS_A	10	0.68	0.135	0.015	15038
31.00	GPS_A	10	0.38	0.090	0.011	15215

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.63	1	0.66	4.76	0.139 ✔	1.333	Member Block Shear
		Top Girt	A325N	0.63	1	0.07	3.40	0.020 ✔	1.333	Member Block Shear
T2	168	Leg	A325N	0.63	4	1.60	13.50	0.118 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	1.88	4.76	0.395 ✔	1.333	Member Block Shear
T3	160	Leg	A325N	0.63	4	9.89	13.50	0.733 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	4.42	4.76	0.929 ✔	1.333	Member Block Shear
T4	140	Leg	A325N	0.75	4	18.04	19.44	0.928 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	5.13	4.76	1.077 ✔	1.333	Member Block Shear
T5	120	Leg	A325N	0.88	4	24.74	26.46	0.935 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	4.76	6.44	0.739 ✔	1.333	Bolt Shear
T6	100	Leg	A490N	0.88	4	30.80	32.47	0.948 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	5.28	6.44	0.820 ✔	1.333	Bolt Shear
T7	80	Leg	A325N	1.00	4	36.06	34.56	1.043 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	6.28	6.44	0.974 ✔	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T8	60	Leg	A325N	1.13	4	41.41	43.74	0.947 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	6.65	6.44	1.031 ✔	1.333	Bolt Shear
T9	40	Leg	A325N	1.13	4	46.30	43.74	1.059 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	7.31	6.44	1.135 ✔	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.50	1	3.78	4.12	0.917 ✔	1.333	Bolt Shear
T10	20	Leg	F1554-36	1.50	6	34.18	33.82	1.011 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	7.75	6.44	1.203 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 168	Pipe 2.375" x 0.154" (2 STD)	12.00	4.00	61.0 K=1.00	16.93	1.07	-2.48	18.20	0.136 ✔
T2	168 - 160	Pipe 2.375" x 0.154" (2 STD) (GR)	8.00	4.00	61.0 K=1.00	24.80	1.07	-9.18	26.65	0.345 ✔
T3	160 - 140	Pipe 3.5" x 0.216" (3 STD) (GR)	20.03	5.01	51.7 K=1.00	26.83	2.23	-47.31	59.80	0.791 ✔
T4	140 - 120	Pipe 4" x 0.318" (3.5 XS) (GR)	20.03	6.68	61.3 K=1.00	23.00	3.68	-83.27	84.59	0.984 ✔
T5	120 - 100	Pipe 4.5" x 0.337" (4 XS) (GR)	20.03	6.68	54.3 K=1.00	24.54	4.41	-113.31	108.17	1.048 ✔
T6	100 - 80	Pipe 5.563" x 0.375" (5 XS) (GR)	20.03	6.68	43.6 K=1.00	27.10	6.11	-141.78	165.62	0.856 ✔
T7	80 - 60	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	10.02	54.8 K=1.00	25.76	8.40	-166.70	216.54	0.770 ✔
T8	60 - 40	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	10.02	54.8 K=1.00	25.76	8.40	-192.90	216.54	0.891 ✔
T9	40 - 20	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	5.15	28.2 K=1.00	29.47	8.40	-218.06	247.73	0.880 ✔
T10	20 - 0	Pipe 8.625" x 0.500" (8 XS) (GR)	20.03	10.02	41.8 K=1.00	29.10	12.76	-243.89	371.42	0.657 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 168	L 2 x 1.5 x 3/16 LLV	4.63	2.19	91.3 K=1.12	14.05	0.62	-0.69	8.73	0.079 ✔
T2	168 - 160	L 2 x 1.5 x 3/16 LLV	4.63	2.19	91.3 K=1.12	14.05	0.62	-1.95	8.73	0.224 ✔
T3	160 - 140	L 2 x 1.5 x 3/16 LLV	6.52	3.28	122.1 K=1.00	9.97	0.62	-4.48	6.19	0.724 ✔
T4	140 - 120	L 2 x 2 x 3/16	9.07	4.61	140.3 K=1.00	7.59	0.71	-4.77	5.43	0.879 ✔
T5	120 - 100	L 2.5 x 2 x 3/16 LLV	10.69	5.38	151.3 K=1.00	6.52	0.81	-4.76	5.28	0.903 ✔
T6	100 - 80	L 2.5 x 2.5 x 3/16	12.40	6.23	151.0 K=1.00	6.55	0.90	-5.28	5.91	0.894

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	80 - 60	L 3 x 3 x 3/16	15.56	7.92	159.4 K=1.00	5.87	1.09	-6.28	6.40	0.981 ✔
T8	60 - 40	L 3.5 x 3 x 1/4 LLV	17.20	8.73	166.1 K=1.00	5.41	1.56	-6.65	8.45	0.787 ✔
T9	40 - 20	L 3.5 x 3 x 1/4 LLV	18.92	9.73	185.1 K=1.00	4.36	1.56	-7.31	6.80	1.075 ✔
T10	20 - 0	L 3.5 x 3.5 x 1/4	20.53	10.38	179.5 K=1.00	4.63	1.69	-7.75	7.83	0.989 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.49	16.93	146.4 K=0.50	6.97	1.69	-3.78	11.77	0.321 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 168	L 2 x 1.5 x 3/16 LLH	4.00	3.55	132.4 K=1.00	8.52	0.62	-0.11	5.29	0.020 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 168	Pipe 2.375" x 0.154" (2 STD)	12.00	4.00	61.0	21.00	1.07	1.77	22.57	0.078 ✔
T2	168 - 160	Pipe 2.375" x 0.154" (2 STD) (GR)	8.00	4.00	61.0	21.00	1.07	6.39	22.57	0.283 ✔
T3	160 - 140	Pipe 3.5" x 0.216" (3 STD) (GR)	20.03	5.01	51.7	21.00	2.23	39.58	46.80	0.846 ✔
T4	140 - 120	Pipe 4" x 0.318" (3.5 XS) (GR)	20.03	6.68	61.3	21.00	3.68	72.16	77.25	0.934 ✔
T5	120 - 100	Pipe 4.5" x 0.337" (4 XS) (GR)	20.03	6.68	54.3	21.00	4.41	98.97	92.56	1.069 ✔
T6	100 - 80	Pipe 5.563" x 0.375" (5 XS) (GR)	20.03	6.68	43.6	21.00	6.11	123.19	128.35	0.960 ✔
T7	80 - 60	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	10.02	54.8	21.00	8.40	144.23	176.50	0.817 ✔
T8	60 - 40	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	10.02	54.8	21.00	8.40	165.64	176.50	0.938 ✔
T9	40 - 20	Pipe 6.625" x 0.432" (6 XS) (GR)	20.03	4.87	26.6	21.00	8.40	185.61	176.50	1.052 ✔
T10	20 - 0	Pipe 8.625" x 0.500" (8 XS) (GR)	20.03	10.02	41.8	21.00	12.76	205.08	268.02	0.765 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 168	L 2 x 1.5 x 3/16 LLV	4.63	2.19	63.2	29.00	0.36	0.66	10.45	0.063 ✔
T2	168 - 160	L 2 x 1.5 x 3/16 LLV	4.63	2.19	63.2	29.00	0.36	1.88	10.45	0.180 ✔
T3	160 - 140	L 2 x 1.5 x 3/16 LLV	6.52	3.28	92.9	29.00	0.36	4.42	10.45	0.423 ✔
T4	140 - 120	L 2 x 2 x 3/16	8.11	4.14	83.0	29.00	0.43	5.13	12.49	0.410 ✔
T5	120 - 100	L 2.5 x 2 x 3/16 LLV	10.69	5.38	110.7	29.00	0.50	4.65	14.54	0.320 ✔
T6	100 - 80	L 2.5 x 2.5 x 3/16	12.40	6.23	98.2	29.00	0.57	5.20	16.56	0.314 ✔
T7	80 - 60	L 3 x 3 x 3/16	15.56	7.92	103.1	29.00	0.71	6.11	20.65	0.296 ✔
T8	60 - 40	L 3.5 x 3 x 1/4 LLV	17.20	8.73	116.7	29.00	1.03	6.48	29.85	0.217 ✔
T9	40 - 20	L 3.5 x 3 x 1/4 LLV	18.92	9.73	127.9	29.00	1.03	6.86	29.85	0.230 ✔
T10	20 - 0	L 3.5 x 3.5 x 1/4	20.53	10.38	115.8	29.00	1.13	7.43	32.68	0.227 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.49	16.93	186.4	29.00	1.15	3.78	33.36	0.113 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 168	L 2 x 1.5 x 3/16 LLH	4.00	3.55	103.8	29.00	0.36	0.07	10.45	0.006 ✔

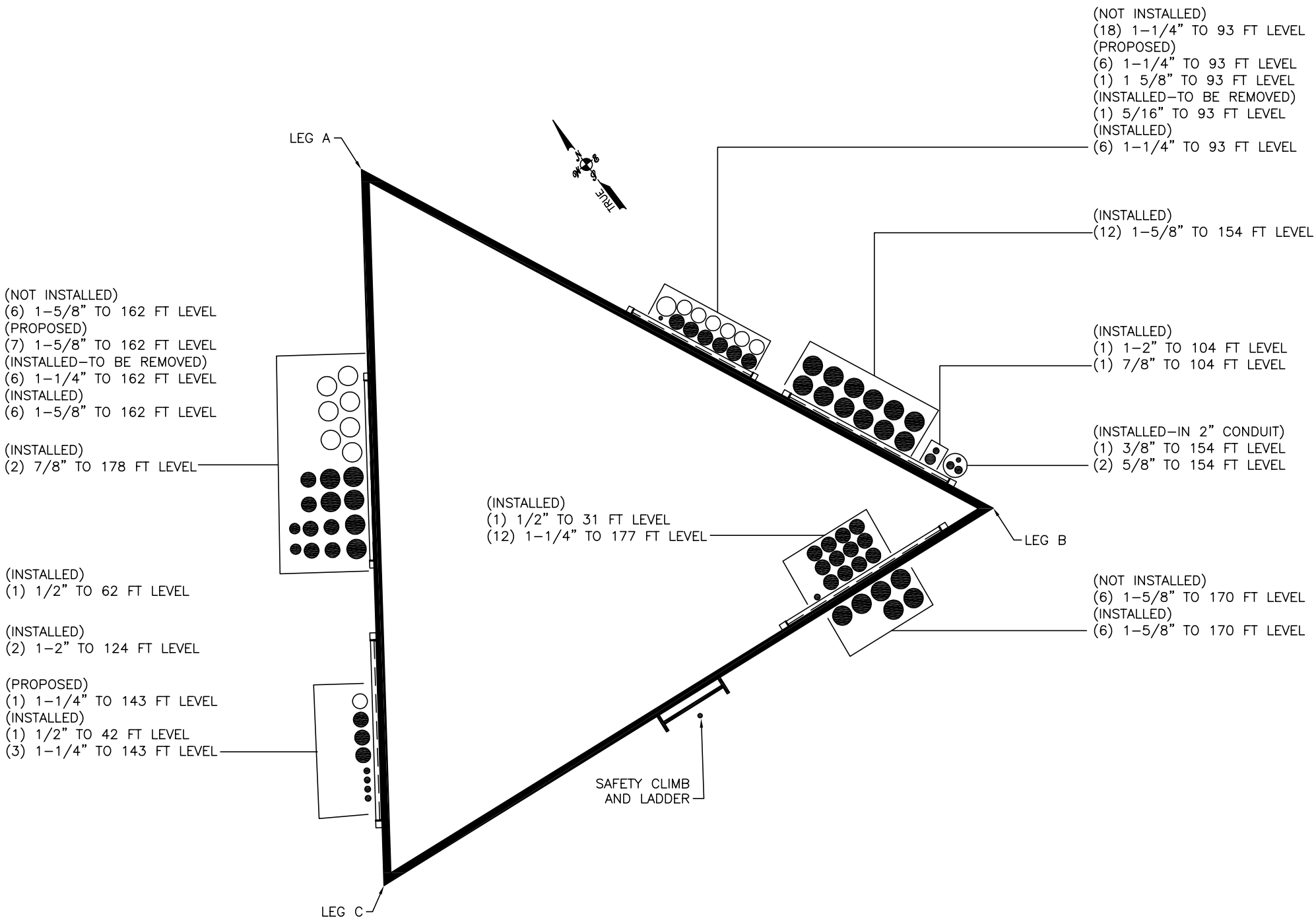
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 168	Leg	Pipe 2.375" x 0.154" (2 STD)	2	-2.48	24.25	10.2	Pass
T2	168 - 160	Leg	Pipe 2.375" x 0.154" (2 STD) (GR)	25	-9.18	35.52	25.9	Pass
T3	160 - 140	Leg	Pipe 3.5" x 0.216" (3 STD) (GR)	40	39.58	62.38	63.4	Pass
T4	140 - 120	Leg	Pipe 4" x 0.318" (3.5 XS) (GR)	67	-83.27	112.76	73.8	Pass
T5	120 - 100	Leg	Pipe 4.5" x 0.337" (4 XS) (GR)	88	98.97	123.38	80.2	Pass
T6	100 - 80	Leg	Pipe 5.563" x 0.375" (5 XS) (GR)	109	123.19	171.09	72.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T7	80 - 60	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	130	144.23	235.28	61.3	Pass
T8	60 - 40	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	145	165.64	235.28	70.4	Pass
T9	40 - 20	Leg	Pipe 6.625" x 0.432" (6 XS) (GR)	160	185.61	235.28	78.9	Pass
T10	20 - 0	Leg	Pipe 8.625" x 0.500" (8 XS) (GR)	181	205.08	357.27	57.4	Pass
T1	180 - 168	Diagonal	L 2 x 1.5 x 3/16 LLV	10	-0.69	11.64	6.0	Pass
T2	168 - 160	Diagonal	L 2 x 1.5 x 3/16 LLV	28	-1.95	11.64	16.8	Pass
T3	160 - 140	Diagonal	L 2 x 1.5 x 3/16 LLV	44	-4.48	8.26	54.3	Pass
T4	140 - 120	Diagonal	L 2 x 2 x 3/16	71	-4.77	7.23	65.9	Pass
T5	120 - 100	Diagonal	L 2.5 x 2 x 3/16 LLV	92	-4.76	7.03	67.7	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	113	-5.28	7.87	67.1	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	133	-6.28	8.53	73.6	Pass
T8	60 - 40	Diagonal	L 3.5 x 3 x 1/4 LLV	148	-6.65	11.26	59.0	Pass
T9	40 - 20	Diagonal	L 3.5 x 3 x 1/4 LLV	163	-7.31	9.07	80.6	Pass
T10	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	184	-7.75	10.44	74.2	Pass
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	169	-3.78	15.70	24.1	Pass
T1	180 - 168	Top Girt	L 2 x 1.5 x 3/16 LLH	5	-0.11	7.05	1.5	Pass
							Summary	
						Leg (T5)	80.2	Pass
						Diagonal (T9)	80.6	Pass
						Secondary Horizontal (T9)	24.1	Pass
						Top Girt (T1)	1.5	Pass
						Bolt Checks	90.2	Pass
						RATING =	**90.2**	**Pass**

APPENDIX B

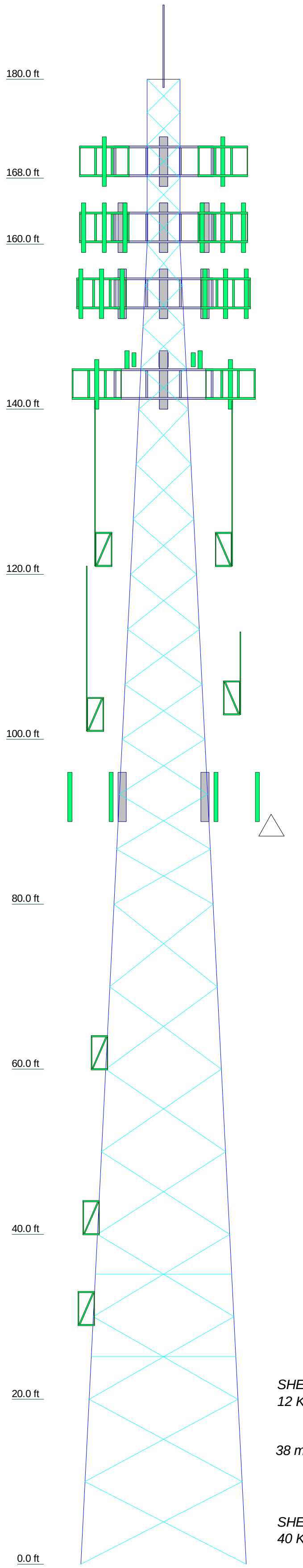
BASE LEVEL DRAWING


LEG A
LEG B
LEG C
TRUE
(NOT INSTALLED)
(18) 1–1/4" TO 93 FT LEVEL
(PROPOSED)
(6) 1–1/4" TO 93 FT LEVEL
(1) 1 5/8" TO 93 FT LEVEL
(INSTALLED–TO BE REMOVED)
(1) 5/16" TO 93 FT LEVEL
(INSTALLED)
(6) 1–1/4" TO 93 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 154 FT LEVEL
(INSTALLED)
(1) 1–2" TO 104 FT LEVEL
(1) 7/8" TO 104 FT LEVEL
(INSTALLED–IN 2" CONDUIT)
(1) 3/8" TO 154 FT LEVEL
(2) 5/8" TO 154 FT LEVEL
(NOT INSTALLED)
(6) 1–5/8" TO 162 FT LEVEL
(PROPOSED)
(7) 1–5/8" TO 162 FT LEVEL
(INSTALLED–TO BE REMOVED)
(6) 1–1/4" TO 162 FT LEVEL
(INSTALLED)
(6) 1–5/8" TO 162 FT LEVEL
(INSTALLED)
(2) 7/8" TO 178 FT LEVEL
(INSTALLED)
(1) 1/2" TO 31 FT LEVEL
(12) 1–1/4" TO 177 FT LEVEL
(NOT INSTALLED)
(6) 1–5/8" TO 170 FT LEVEL
(INSTALLED)
(6) 1–5/8" TO 170 FT LEVEL
(INSTALLED)
(1) 1/2" TO 62 FT LEVEL
(INSTALLED)
(2) 1–2" TO 124 FT LEVEL
(PROPOSED)
(1) 1–1/4" TO 143 FT LEVEL
(INSTALLED)
(1) 1/2" TO 42 FT LEVEL
(3) 1–1/4" TO 143 FT LEVEL
SAFETY CLIMB
AND LADDER

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	A	A53-B-35	L 2 x 1.5 x 3/16 LLV	A36	L 2 x 1.5 x 3/16 LLH	N.A.	4	5 @ 4	0.3
T2	B				N.A.				0.3
T3	Pipe 3.5" x 0.216" (3 STD) (GR)							4 @ 5	1.2
T4	Pipe 4" x 0.318" (3.5 XS) (GR)		L 2 x 2 x 3/16				6	9 @ 6.66667	1.7
T5	Pipe 4.5" x 0.337" (4 XS) (GR)		L 2.5 x 2 x 3/16 LLV				8		2.1
T6	Pipe 5.563" x 0.375" (5 XS) (GR)		L 2.5 x 2.5 x 3/16				10		3.0
T7	Pipe 6.625" x 0.432" (6 XS) (GR)		L 3 x 3 x 3/16				12	8 @ 10	4.0
T8			L 3.5 x 3 x 1/4 LLV				14		4.4
T9						L3 1/2x3 1/2x1/4	16		5.1
T10	Pipe 8.625" x 0.500" (8 XS) (GR)		L 3.5 x 3.5 x 1/4			N.A.	18		6.9
							20		29.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD10017	178	800 EXTERNAL NOTCH FILTER	146
800 10504 w/ Mount Pipe	170	800 EXTERNAL NOTCH FILTER	146
800 10504 w/ Mount Pipe	170	TME-800MHZ 2X50W RRH	146
800 10504 w/ Mount Pipe	170	TME-800MHZ 2X50W RRH	146
860 10025	170	TME-800MHZ 2X50W RRH	146
860 10025	170	TME-PCS 1900 MHz 4x45W-65MHz	146
860 10025	170	TME-PCS 1900 MHz 4x45W-65MHz	146
Side Arm Mount [SO 103-3]	170	TME-PCS 1900 MHz 4x45W-65MHz	146
(2) APL868013-42T0 w/ Mount Pipe	162	APXVSPP18-C-A20 w/ Mount Pipe	143
(2) APL868013-42T0 w/ Mount Pipe	162	APXVSPP18-C-A20 w/ Mount Pipe	143
(2) APL868013-42T0 w/ Mount Pipe	162	APXVSPP18-C-A20 w/ Mount Pipe	143
APX75-866512-CT2 w/ Mount Pipe	162	(3) ACU-A20-N	143
APX75-866512-CT2 w/ Mount Pipe	162	(3) ACU-A20-N	143
APX75-866512-CT2 w/ Mount Pipe	162	(3) ACU-A20-N	143
MG D3-800Tx w/ Mount Pipe	162	Sector Mount [SM 701-3]	143
MG D3-800Tx w/ Mount Pipe	162	TD-RRH8x20-25	143
MG D3-800Tx w/ Mount Pipe	162	APXVTM14-C-120 w/ Mount Pipe	143
(2) FD9R6004/2C-3L	162	TD-RRH8x20-25	143
(2) FD9R6004/2C-3L	162	APXVTM14-C-120 w/ Mount Pipe	143
(2) FD9R6004/2C-3L	162	TD-RRH8x20-25	143
742 213 w/ Mount Pipe	162	APXVTM14-C-120 w/ Mount Pipe	143
742 213 w/ Mount Pipe	162	1142-2C	124
742 213 w/ Mount Pipe	162	1142-2C	124
RRH2X40-AWS	162	Side Arm Mount [SO 306-1]	124
RRH2X40-AWS	162	Side Arm Mount [SO 306-1]	124
RRH2X40-AWS	162	Side Arm Mount [SO 306-1]	104
DB-T1-6Z-8AB-0Z	162	Side Arm Mount [SO 306-1]	104
Sector Mount [SM 602-3]	162	220-3BN	104
(2) 7770.00 w/ Mount Pipe	154	1142-2C	104
(2) 7770.00 w/ Mount Pipe	154	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	93
(2) 7770.00 w/ Mount Pipe	154	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	93
P65-16-XLH-RR w/ Mount Pipe	154	KRY 112 144/1	93
P65-16-XLH-RR w/ Mount Pipe	154	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	93
P65-16-XLH-RR w/ Mount Pipe	154	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	93
(2) LGP21901	154	KRY 112 144/1	93
(2) LGP21901	154	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	93
(2) LGP21901	154	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	93
(2) RRUS-11	154	KRY 112 144/1	93
(2) RRUS-11	154	Side Arm Mount [SO 101-3]	93
(2) RRUS-11	154	GPS_A	62
(2) LGP21401	154	Side Arm Mount [SO 301-1]	62
(2) LGP21401	154	GPS_A	42
(2) LGP21401	154	Side Arm Mount [SO 301-1]	42
DC6-48-60-18-8F	154	GPS_A	31
Sector Mount [SM 602-3]	154	Side Arm Mount [SO 301-1]	31
800 EXTERNAL NOTCH FILTER	146		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 2.375" x 0.154" (2 STD)	B	Pipe 2.375" x 0.154" (2 STD) (GR)

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Grouted pipe f'c is 7 ksi
6. TOWER RATING: 90.2%

MAX. CORNER REACTIONS AT BASE:
DOWN: 250 K
SHEAR: 25 K

UPLIFT: -209 K
SHEAR: 22 K

AXIAL 89 K
SHEAR 12 K
MOMENT 1280 kip-ft
TORQUE 7 kip-ft
38 mph WIND - 0.75 in ICE

AXIAL 46 K
SHEAR 40 K
MOMENT 4064 kip-ft
TORQUE 22 kip-ft
REACTIONS - 85 mph WIND

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: **180-ft S/S Tower - Wilton, CT**		
Project: **PJF# 37514-0096 (BU# 806353)**		
Client: Crown Castle	Drawn by: Charles Weir	App'd:
Code: TIA/EIA-222-F	Date: 06/03/14	Scale: NTS
Path:		Dwg No. E-1

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

Job Number: 37514-0096.002.8700
Site Number: BU 806353
Site Name: BRG 124 943066

By: CJW
Date: 6/3/2014

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =			k-ft
Shear, V =	25.0	22.0	kips
Axial Load, P =	250.0	-209.0	kips
OTM =	6.3	5.5	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Self-Supported
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	2.5	ft
Height Above Grade =	0.25	ft
Depth Below Grade =	13.5	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =	5	ft
Mat Ftdn. Cap Length =	12	ft
Depth Below Grade =	5	ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00
 + Effective Soil Wt. - Buoyant Conc. Wt. ≥ Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

Number of Bars =	14	
Rebar Size =	#8	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#4	
Side Clear Cover to Ties =	3	in

Soil Parameters

Water Table Depth =	99.00	ft
Depth to Ignore Soil =	5.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	5	110	0	30	Sand	0	0	0	5
2	99	140	8000	0	Clay	56000	8000	8000	104
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	10.16	ft, from Grade	Shear, V =	25.00	kips
Bending Moment, M =	260.18	k-ft, from COR	Resisting Shear, Va =	145.17	kips
Resisting Moment, Ma =	1510.86	k-ft, from COR			

MOMENT RATIO = 17.2% OK **SHEAR RATIO = 17.2% OK**

Soil Results: Uplift

Uplift, T =	209.00	kips
Allowable Uplift Cap., Ta =	309.84	kips

UPLIFT RATIO = 67.5% OK

Soil Results: Compression

Compression, C =	250.00	kips
Allowable Comp. Cap., Ca =	389.81	kips

COMPRESSION RATIO = 64.1% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	2.36	sq in	Axial Load, P =	-151.40	kips @ 6.25 ft Below Grade
Actual Steel Area =	11.06	sq in	Moment, M =	133.53	k-ft @ 6.25 ft Below Grade
			Allowable Moment, Ma =	274.03	k-ft
Allowable Min Axial, Pa =	-459.42	kips, Where Ma = 0 k-ft			
Allowable Max Axial, Pa =	975.15	kips, Where Ma = 0 k-ft			

MOMENT RATIO = 48.7% OK

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY FCC REGULATORY COMPLIANCE MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT03XC369

North Wilton

128 Mather Street
Wilton, CT 06897

September 16, 2014

EBI Project Number: 62144684

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

EBI Consulting
environmental | engineering | due diligence

September 16, 2014

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC369 - North Wilton

Site Total: 34.65% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at **128 Mather Street, Wilton, CT**, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at **128 Mather Street, Wilton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 2 channels in the 1900 MHz Band were considered for each sector of the proposed installation.

2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation.

3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.

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

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

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline for the proposed antennas is **143 feet** above ground level (AGL).

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

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

Site ID	CT03XC369 - North Wilton
Site Addresss	128 Mather Street, Wilton, CT, 06897
Site Type	Self Support Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.27%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	143	137	1/2 "	0.5	0	39.00	0.13%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.47%
														Sector total Power Density Value:		0.87%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.27%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	143	137	1/2 "	0.5	0	39.00	0.13%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.47%
														Sector total Power Density Value:		0.87%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.27%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	143	137	1/2 "	0.5	0	39.00	0.13%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	143	137	1/2 "	0.5	0	138.69	0.47%
														Sector total Power Density Value:		0.87%

Site Composite MPE %	
Carrier	MPE %
Sprint	2.60%
Verizon Wireless	15.37%
AT&T	8.22%
MetroPCS	1.68%
T-Mobile	0.40%
Nextel	1.76%
Town	4.62%
Total Site MPE %	**34.65%**

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **2.60% (0.87% from sector 1, 0.87% from sector 2 and 0.87% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **34.65%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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