Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

February 27, 2017

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 806352**
AT&T Site ID: CT2104
126 Ledge Road, Darien, CT 06820
Latitude: 41° 4' 20.75" / Longitude: -73° 28' 41.4"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 89-foot level of the existing 117-foot monopole at 126 Ledge Road in Darien, CT. The tower is owned by Crown Castle. The property is owned by the Town of Darien. AT&T now intends to replace three (3) Powerwave antennas with two (2) Quintel and one (1) CCI antenna, as well as install six (6) triplexers, one (1) raycap, two (2) DC lines, one (1) fiber. AT&T also intends to remove six (6) diplexers.

This facility was approved by the by the Connecticut Siting Council on December 30, 1992. This approval included the conditions that:

1. The self-supporting monopole tower shall be no taller than necessary to provide the proposed communications service and the tower shall not exceed a total height of 113 feet above ground level (AGL), with appurtenances.

   However, this condition was rendered moot by the approval for Petition 803, which allows Sprint to install antennas at the 120-foot level. (The approval letter includes the condition that the applicant would flush-mount its antennas ton the pipe extension, but this condition only applies to Sprint.) The petition was approved without conditions restricting exempt modification.

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

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

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

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

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

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

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

For the foregoing reasons, AT&T respectfully submits that 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: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

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

cc:

Ms. Jayme Stevenson, First Selectman
Town of Darien
2 Renshaw Road
Darien, CT 06820

Town of Darien
Department of Planning & Zoning
2 Renshaw Road
Darien, CT 06820

DOCKET NO. 155 - An application of Metro Mobile CTS of Fairfield County, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone telecommunications tower, antennas, associated equipment, and building on a 17-acre parcel of land used and owned by the Town of Darien as the Town waste transfer station off Ledge Road, with an alternative site on a 1 acre parcel owned by the Noroton Heights Fire Department, Inc., located immediately adjacent to the Noroton Heights Fire Department Building at 209 Noroton Avenue in the Town of Darien, Connecticut.

Connecticut

Siting

Council

December 30, 1992

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact, and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed Darien, Connecticut, prime site including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need as provided by section 16-50k of the Connecticut General Statutes (CGS), be issued to Metro Mobile CTS of Fairfield County, Inc. (Metro Mobile), for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building within property owned by the Town of Darien located on Ledge Road, Darien, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting monopole tower shall be no taller than necessary to provide the proposed communications service and the tower shall not exceed a total height of 113 feet above ground level (AGL), with antennas and appurtenances.

2. The Certificate holder shall prepare a Development and Management (D&M) plan for this site in compliance with sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans of the tower, tower foundation, equipment building, access road including all upgrades, utility connection, security fence, and detailed plans for drainage, erosion, and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sedimentation Control. In addition, the D&M plan shall include detailed landscaping plans for the facility site, with options to provide landscaping on the Town property boundary north of the site and on the Middlesex Common Condominium property subject to their approval.

3. The Certificate Holder shall comply with any existing and future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted herein shall be brought into compliance with such standards.

4. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. If the facility does not initially provide, or permanently ceases to provide cellular or other services following completion of construction, this Decision and Order shall be void, and the Certificate holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

7. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to CGS section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Norwalk Hour, Stamford Advocate, and Darien News-Review.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with section 16-50j-17 of the Regulations of State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT	ITS REPRESENTATIVES
Metro Mobile CTS of Fairfield County, Inc.	Metro Mobile CTS of Fairfield County, Inc. 20 Alexander Drive Wallingford, CT 06492 Attn: David S. Malko, P.E. Manager, Engineering and Regulatory Services Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 Attn: Earl W. Phillips, Jr., Esq. Charles R. Wolfe, Esq. Henry H. Sprague, III, Esq.
INTERVENOR	ITS REPRESENTATIVE
The Springwich Cellular Limited Partnership	Peter J. Tyrrell Senior Attorney SNET Cellular, Inc. 227 Church Street Room 1021 New Haven, CT 06506
PARTY	ITS REPRESENTATIVE
Middlesex Common Condominium Association, Inc.	Rebecca Oldfield Smith 53 Hale Lane Darien, Connecticut 06820
INTERVENOR	
Bruce Fletcher 236 Noroton Avenue Darien, Connecticut 06820	

PARID: 29014

TOWN OF DARIEN PUBLIC WORKS GARAGE 126 LEDGE ROAD

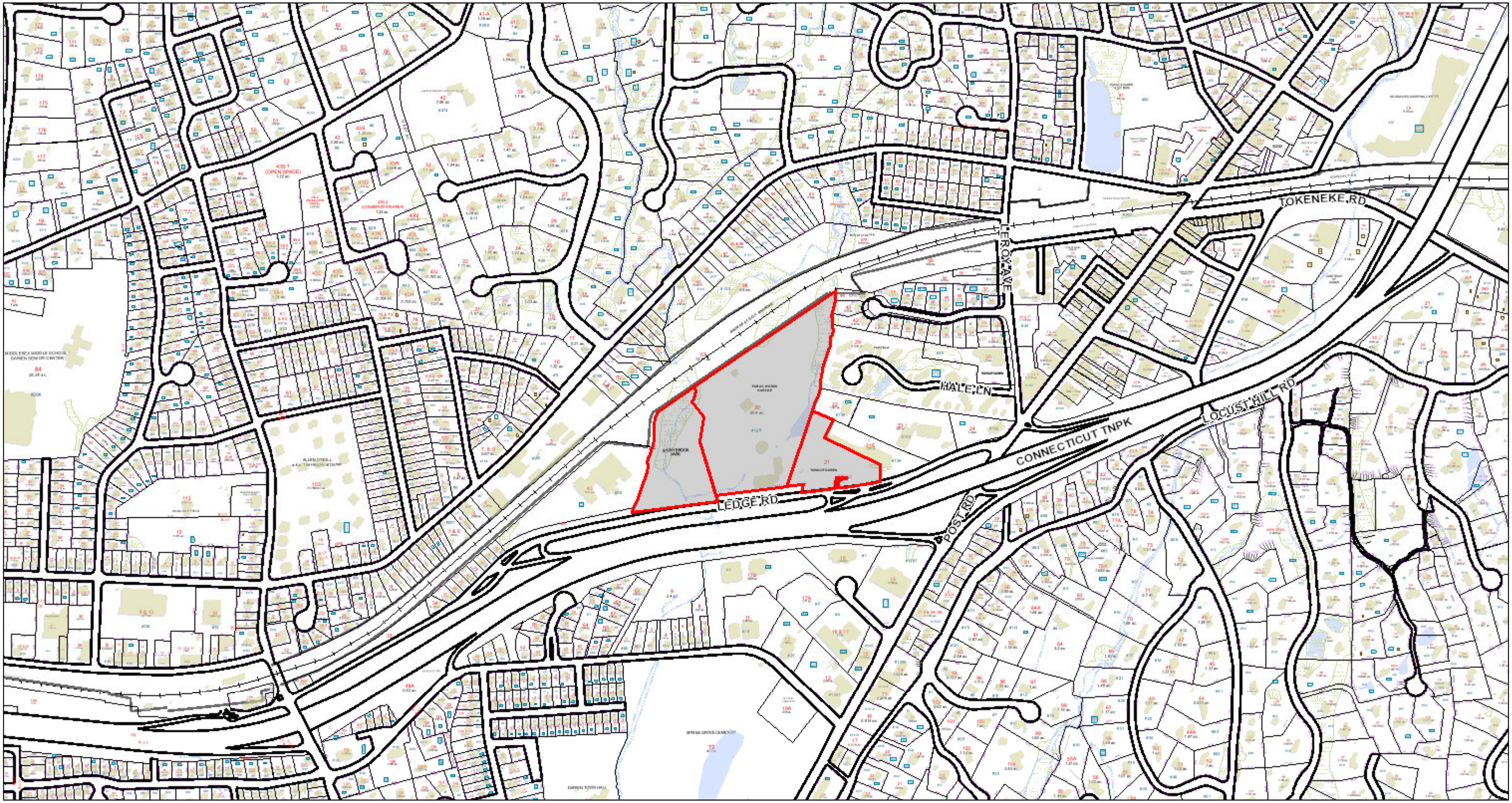
Parcel

Alt ID	39 20&21
Address	126 LEDGE ROAD
Unit	
Neighborhood	1032
Class	300
Land Use Code	903-MUNICIPAL
Living Units	
Acres	20.4
Zoning	R13
Street1/Street2	8-SECONDARY /-
Topo1/Topo2/Topo3	1-LEVEL/-/-
Util1/Util2/Util3	1-ALL PUBLIC/1-/1-
Notes	TOWN GARAGE / FIRE TRAINING=-'13 '15,AH,PRICE TOWER AND CROWN OBLD '0718X40' BLD-VERIZON-'16-ATT 110' TOWER 117'TOWERTMOBILSPRINT-'13CROWN-'15

Owners

Owner		Address	City	State	Zip
TOWN OF DARIEN	PUBLIC WORKS GARAGE	126 LEDGE ROAD	DARIEN	CT	06820

29014 126 LEDGE ROAD



February 14, 2017

1:9,526

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

Town of Darien Connecticut

SITE NAME: DARIEN
FA NUMBER: 10035058
SITE NUMBER: CTL02104
MULTI-CARRIER-MRCTB017061
126 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

CROWN CASTLE SITE NAME: BRG 302 943052
CROWN CASTLE SITE ID#: 806352

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: SMARTLINK, LLC
ADDRESS: 85 RANGEWAY ROAD, BUILDING #3, SUITE 102
CITY, STATE, ZIP: NORTH BILLERICA, MA 01862
CONTACT: TODD OLIVER
PHONE: (774) 369-3618
E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY: SMARTLINK, LLC
ADDRESS: 85 RANGEWAY ROAD, BUILDING #3, SUITE 102
CITY, STATE, ZIP: NORTH BILLERICA, MA 01862
CONTACT: TODD OLIVER
PHONE: (774) 369-3618
E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

ENGINEER

COMPANY: MASER CONSULTING CONNECTICUT
ADDRESS: 331 NEWMAN SPRINGS ROAD
CITY, STATE, ZIP: RED BANK, NJ 07701-5699
CONTACT: FRANK PAZDEN
PHONE: (732) 383-1950
E-MAIL: FPAZDEN@MASERCONSULTING.COM

RF ENGINEER

COMPANY: NEW CINGULAR WIRELESS PCS, LLC
ADDRESS: 550 COCHITUATE RD.
CITY, STATE, ZIP: FRAMINGHAM, MA 01701
CONTACT: SAJJAD SALAHUDDIN
E-MAIL: SS315Y@ATT.COM

CONSTRUCTION MANAGER

COMPANY: SMARTLINK, LLC.
ADDRESS: 33 BOSTON POST ROAD WEST, SUITE 210
CITY, STATE, ZIP: MARLBOROUGH, MA 01752
CONTACT: MARK DONNELLY
PHONE: (617) 515-2080
E-MAIL: MARK.DONNELLY@SMARTLINKLLC.COM

SITE INFORMATION

APPLICANT/LESSEE

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE RD.
FRAMINGHAM, MA 01701

PROPERTY/TOWER OWNER:

NAME: CROWN CASTLE
ADDRESS: 12 GILL ST., # 5800
CITY, STATE, ZIP: WOBURN, MA 01801
SITE ID#: 806352

LATITUDE: 41.072431° N

LONGITUDE: 73.4781° W

LAT./LONG. TYPE: NAD 83

AREA OF CONSTRUCTION: EXISTING EQUIPMENT SHELTER AND MONOPOLE

ZONING/JURISDICTION: CITY OF DARIEN

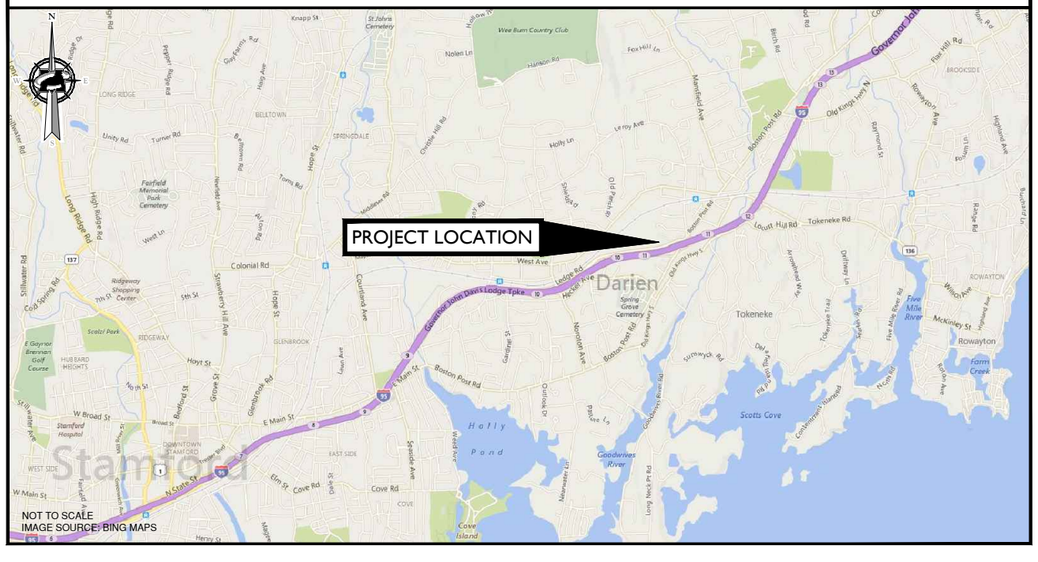
CURRENT USE/PROPOSED USE: UNMANNED TELECOMMUNICATIONS FACILITY

HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.

CONSTRUCTION TYPE: IIB

USE GROUP: U

VICINITY MAP



CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE INCORPORATING THE 2012 IBC
2. NATIONAL ELECTRIC CODE 2014
3. NATIONAL FIRE PROTECTION ASSOCIATION 70 - 2015
4. LIGHTNING PROTECTION CODE 201
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRICTION 360-10.
7. EIA/TIA-222 REVISION F
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275 12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN AND EQUIPMENT PLAN
A-2	ELEVATION VIEW AND ANTENNA SCHEDULE
A-3	ANTENNA LAYOUTS
A-4	DETAILS
A-5	RF PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- (3) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS, (1) PER SECTOR
- (3) NEW RRU'S TO REPLACE (3) EXISTING RRU'S, (1) PER SECTOR
- (6) NEW TRIPLEXERS, (2) PER SECTOR

THE PROPOSED PROJECT SCOPE IS BASED ON RFDS ID #999530, VERSION 2.00, LAST UPDATED 7/22/16

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Landscape Architects ■ Environmental Scientists

smartlink
85 RANGEWAY ROAD
BUILDING 3, SUITE 102
NORTH BILLERICA, MA 01862
TEL: (774) 369-3613

at&t
NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

811 Know what's below. Call before you dig
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	16946007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	02/14/17	FOR CONSTRUCTION	RA	FEP
0	10/31/16	ISSUED FOR REVIEW	AN	FEP

STATE OF CONNECTICUT
FRANK E. PAZDEN
No. 28180
LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28180

SITE NAME:
DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR - SMARTLINK
   SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
3. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
11. 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 RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
12. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
13. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
14. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
15. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
16. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
18. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
19. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
20. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
21. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
22. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILITIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
23. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
24. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
25. ALL STRUCTUAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
26. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
27. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
28. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
29. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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SCALE :	JOB NUMBER :
AS SHOWN	16946007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	02/14/17	FOR CONSTRUCTION	RA	FEP
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STATE OF CONNECTICUT — FRANK E. PAZDEN — LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025

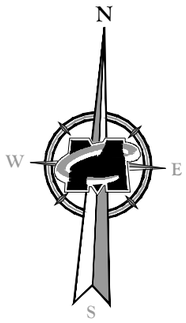
SITE NAME:

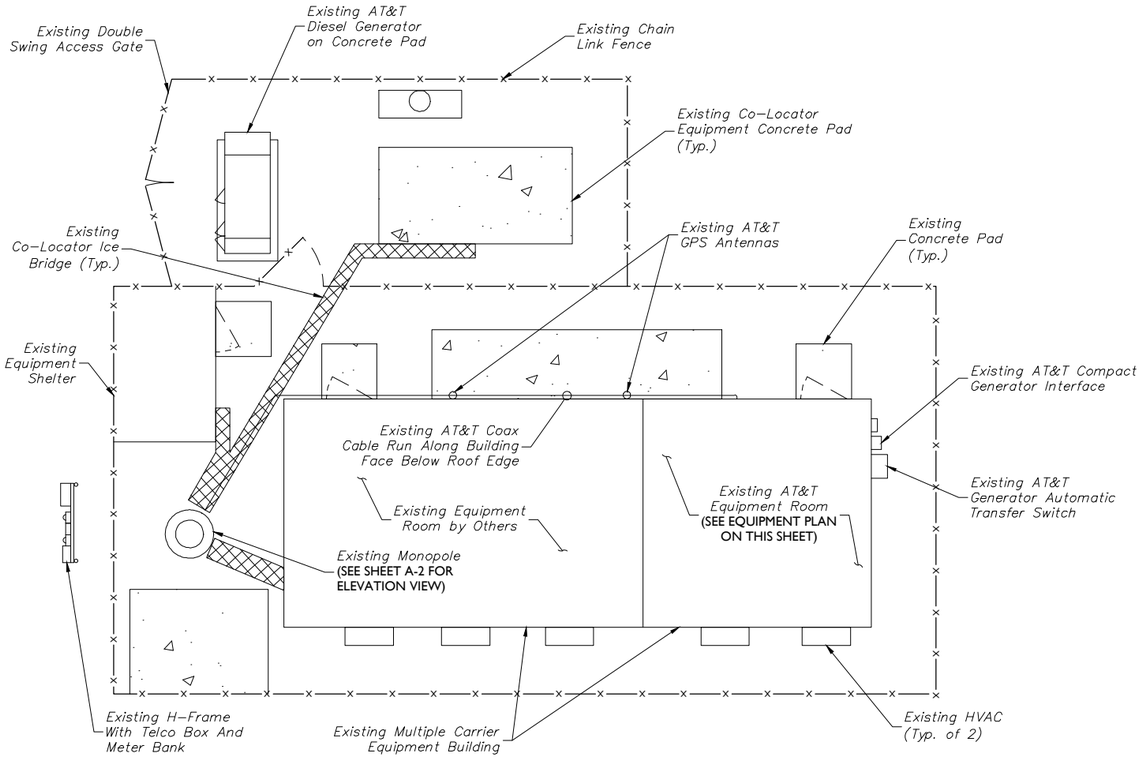
DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1





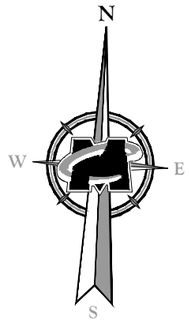
COMPOUND PLAN

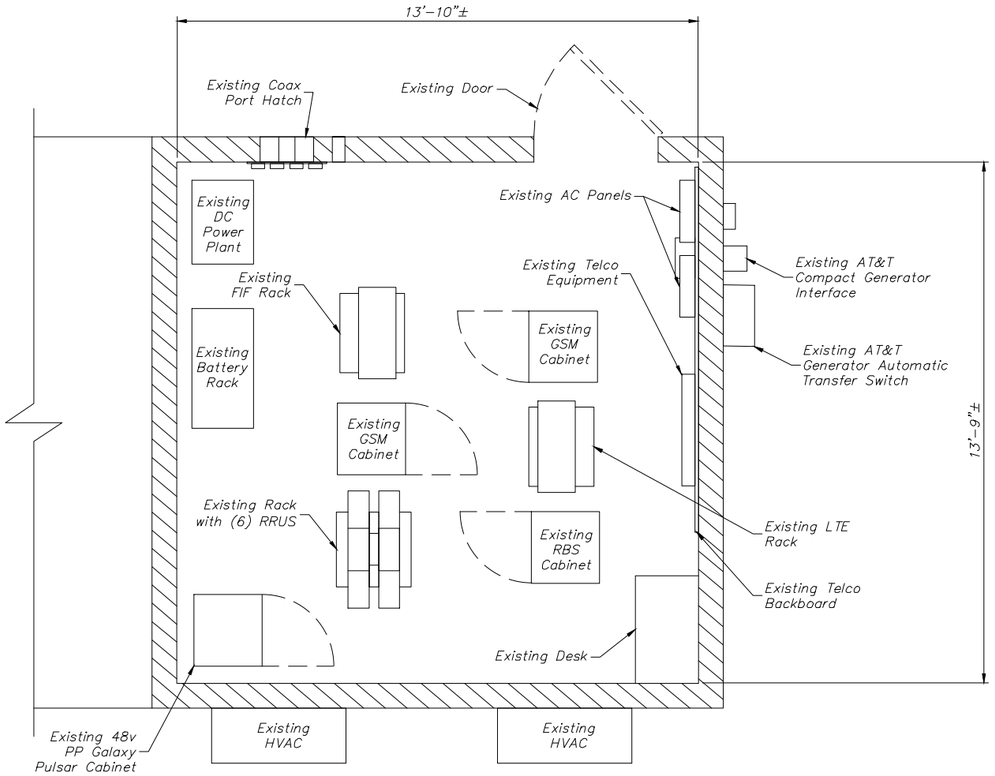
GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)

SCALE: 1" = 5' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)





EQUIPMENT PLAN

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

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SCALE:	JOB NUMBER:
AS SHOWN	16946007A

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STATE OF CONNECTICUT
FRANK E. PAZDEN
LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER PEN.0025

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

SITE NAME:

DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

RED BANK OFFICE
331 Newman Springs Road
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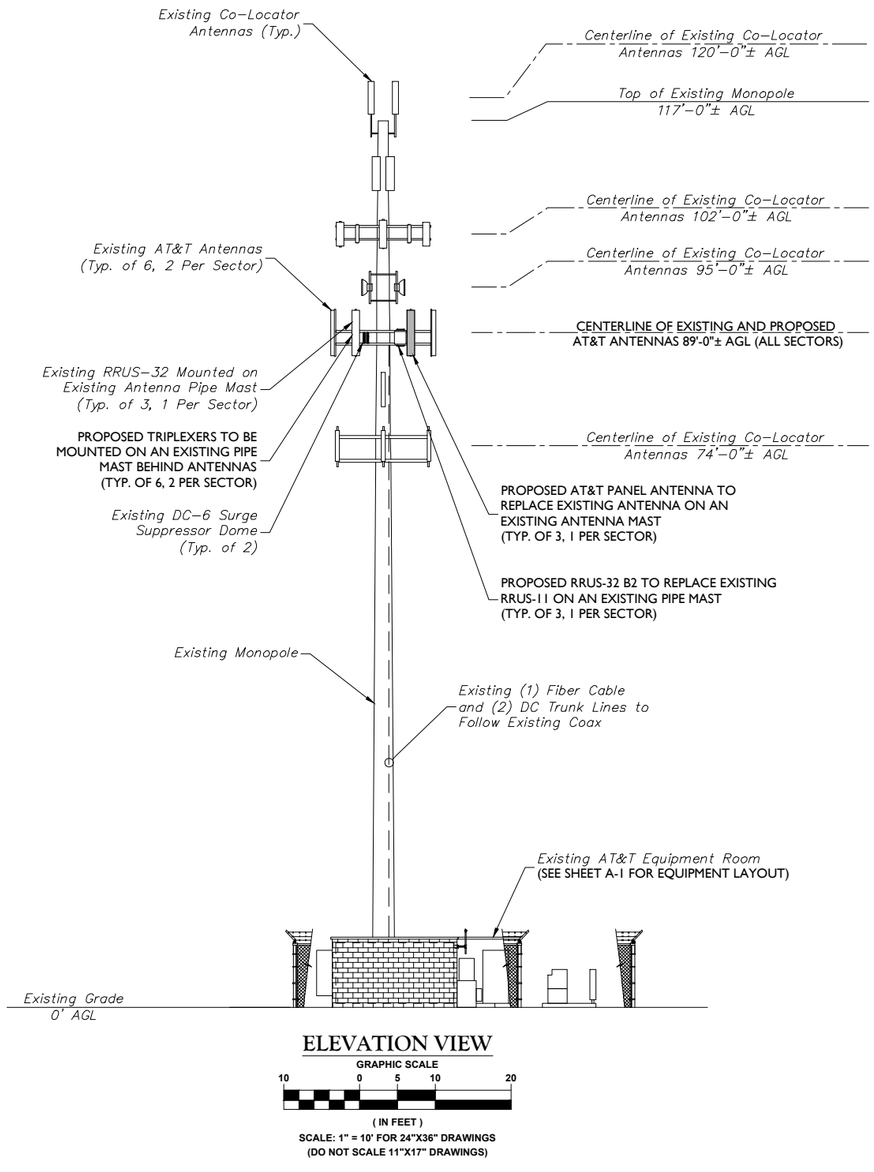
email: solutions@maserconsulting.com

SHEET TITLE:
COMPOUND PLAN AND EQUIPMENT PLAN

SHEET NUMBER:
A-1



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

NOTES:

1. EXISTING BIRDS NEST ON TOWER: CONTRACTOR RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOLLOWING ALL REGULATIONS FOR WORKING AROUND NEST.
2. THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING P.A. OF RED BANK, NJ DATED 02/24/16. WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WOK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

PROPOSED ANTENNA AND RRH CONFIGURATION

SECTOR		EXISTING ANTENNA CONFIGURATION	SECTOR	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL., ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Powerwave P65-16-XLH-RR	A1	QS66512-2	LTE 1900	NEW	72.00	12.00	9.60	111.00	75°	89'	(1) RRUS-32 B2, (1) RRUS-11	NEW REAMAIN
	A3	CCI OPA-65R-LCUU-H6	A3	CCI OPA-65R-LCUU-H6	LTE WCS/GSM	REMAIN	72.00	14.80	7.40	73.00	75°	89'	(1) RRUS-32	REMAIN
	A4	Powerwave 7770	A4	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	142°	89'	-	-
BETA	B1	Powerwave P65-16-XLH-RR	B1	QS66512-2	LTE 1900	NEW	72.00	12.00	9.60	111.00	195°	89'	(1) RRUS-32 B2, (1) RRUS-11	NEW REAMAIN
	B3	CCI OPA-65R-LCUU-H6	B3	CCI OPA-65R-LCUU-H6	LTE WCS/GSM	REMAIN	72.00	14.80	7.40	73.00	195°	89'	(1) RRUS-32	REMAIN
	B4	Powerwave 7770	B4	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	262°	89'	-	-
GAMMA	C1	Powerwave P65-17-XLH-RR	C1	CCITPA-65R-LCUUUU-H8	LTE 1900	NEW	96.00	14.40	8.60	75.00	315°	89'	(1) RRUS-32 B2, (1) RRUS-11	NEW REAMAIN
	C3	CCI OPA-65R-LCUU-H8	C3	CCI OPA-65R-LCUU-H8	LTE WCS/GSM	REMAIN	92.70	14.40	7.00	88.00	315°	89'	(1) RRUS-32	REMAIN
	C4	Powerwave 7770	C4	Powerwave 7770	UMTS-850/UMTS-1900	REMAIN	55.00	11.00	5.00	35.00	22°	89'	-	-

ANTENNA SCHEDULE

STRUCTURAL NOTES:

1. NO CONSTRUCTION OF THE PROPOSED LOADING SHOWN SHALL PROCEED UNTIL ADEQUACY OF THE EXISTING STRUCTURE AND FOUNDATION, INCLUDING THE PROPOSED AT&T ANTENNA MOUNTING CONFIGURATION SHOWN HEREIN, HAS BEEN COMPLETED.
2. THE STRUCTURE ELEVATION IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REFLECT AS-BUILT FIELD CONDITIONS FOR ALL EXISTING INVENTORY LOADING/ANTENNAS/APPURTANENCES ON STRUCTURE. REFER TO THE LATEST STRUCTURAL ANALYSIS FOR EXISTING STRUCTURE LOADING AND THE PROPOSED METHOD OF ATTACHMENT OF THE PROPOSED ANTENNAS/CABLES.
3. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

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SCALE: AS SHOWN
JOB NUMBER: 16946007A

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STATE OF CONNECTICUT
FRANK E. PAZDEN
No. 28186
LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28186

SITE NAME:
DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

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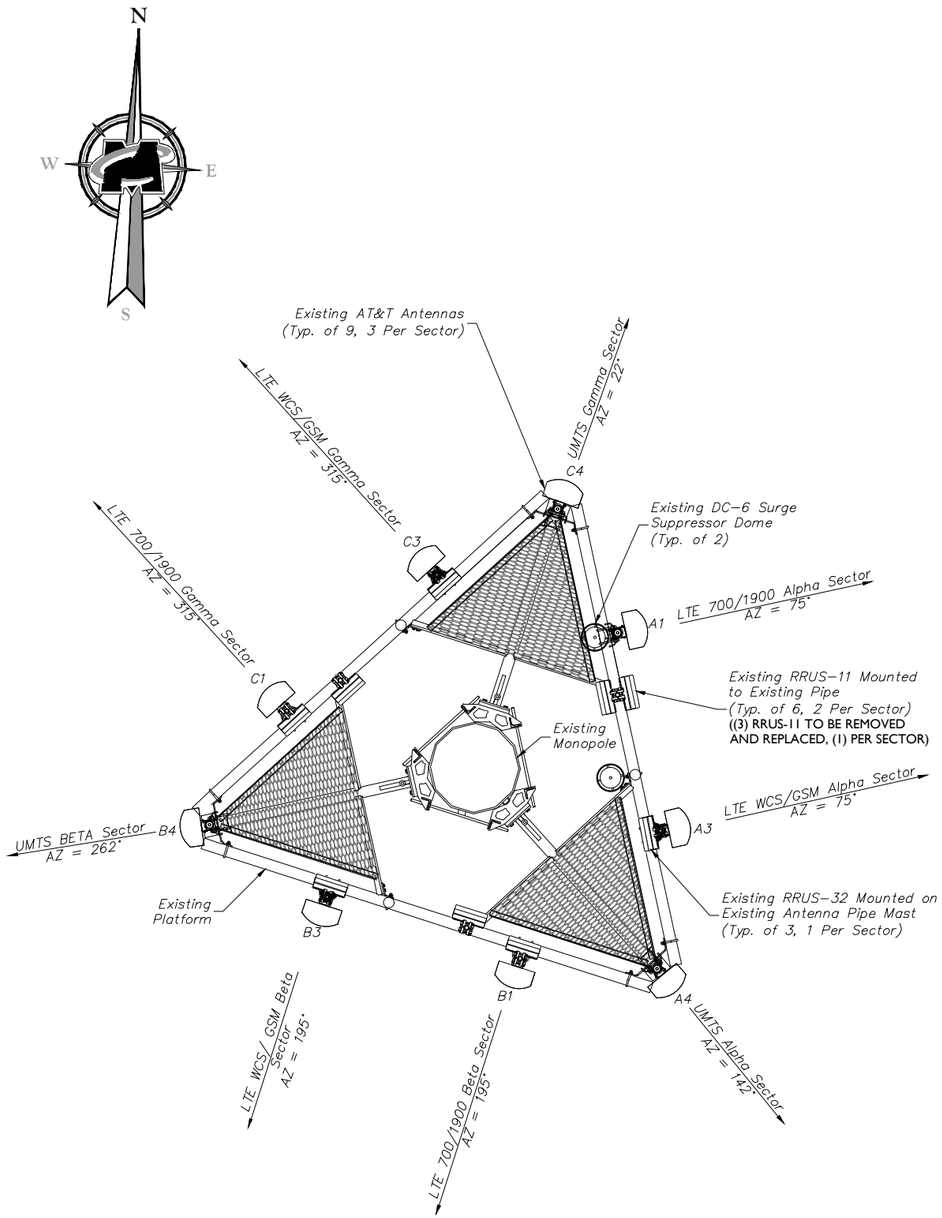
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

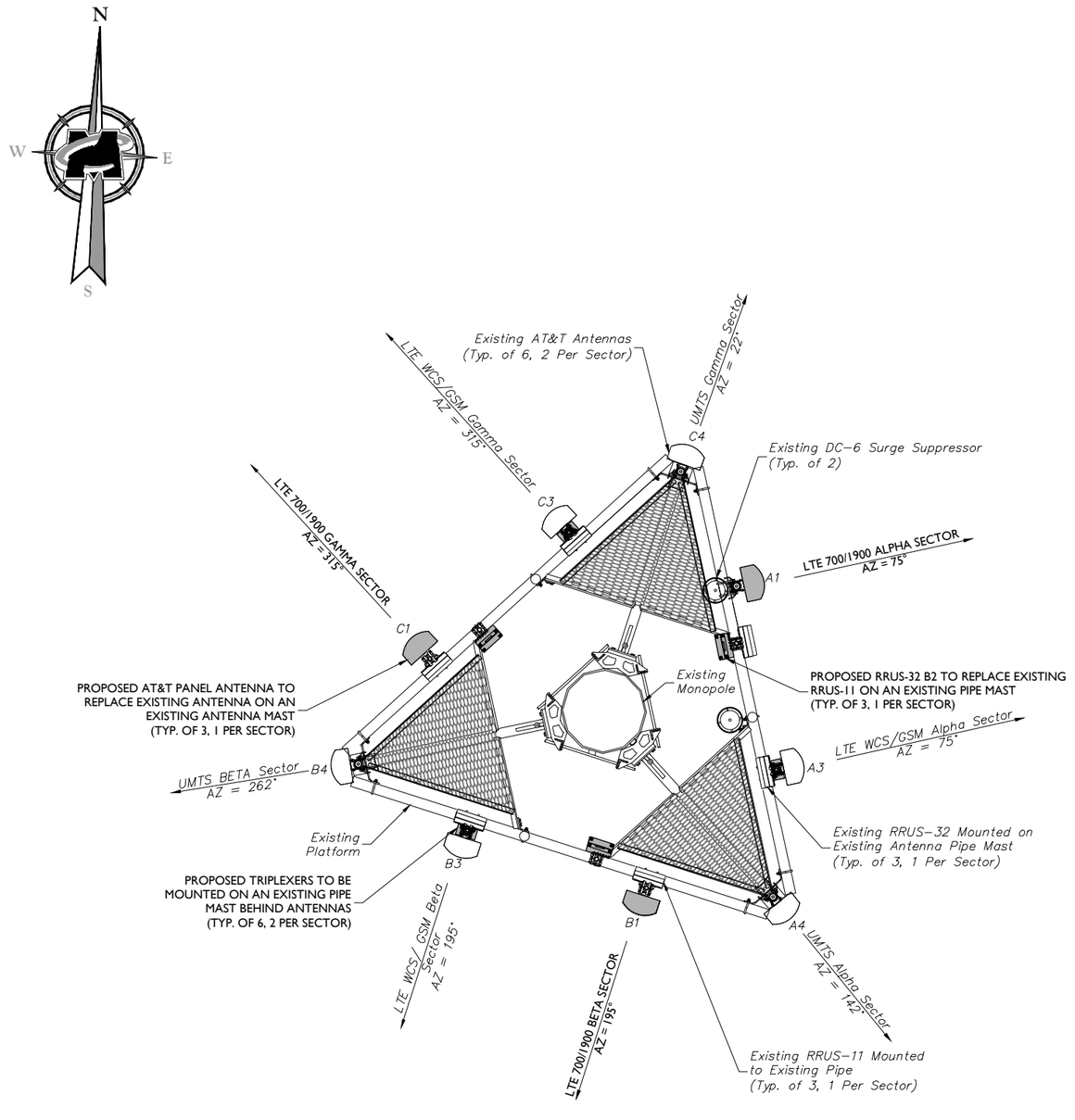
SHEET TITLE:
ELEVATION VIEW AND ANTENNA SCHEDULE

SHEET NUMBER:
A-2



EXISTING - ANTENNA LAYOUT

NOT TO SCALE



PROPOSED - ANTENNA LAYOUT

NOT TO SCALE

NOTES:

1. EXISTING BIRDS NEST ON TOWER: CONTRACTOR RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOLLOWING ALL REGULATIONS FOR WORKING AROUND NEST.

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STATE OF CONNECTICUT
FRANK E. PAZDEN
12
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL
ENGINEER - LICENSE NUMBER: PEC.0023

SITE NAME:

DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

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Red Bank, NJ 07701
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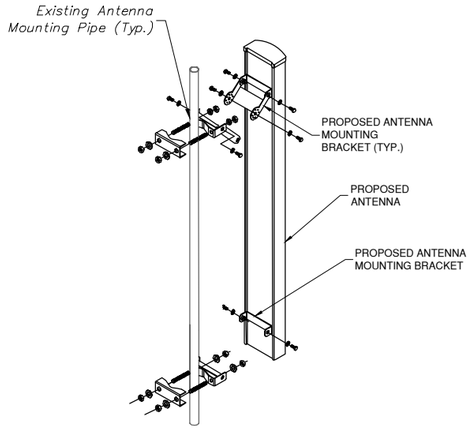
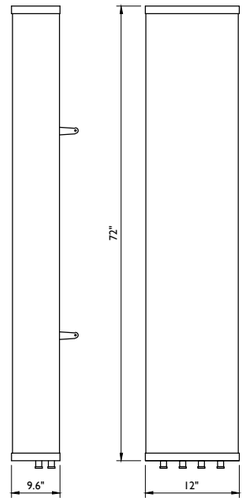
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
ANTENNA LAYOUTS

SHEET NUMBER:
A-3

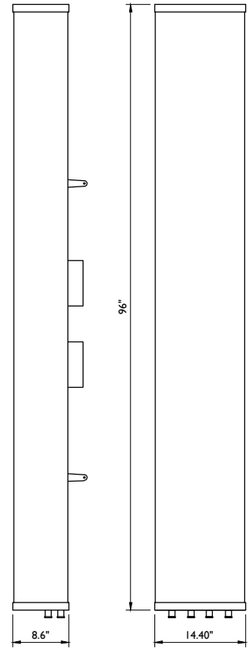


ANTENNA MOUNTING DETAIL
NOT TO SCALE



WEIGHT = 111 LBS

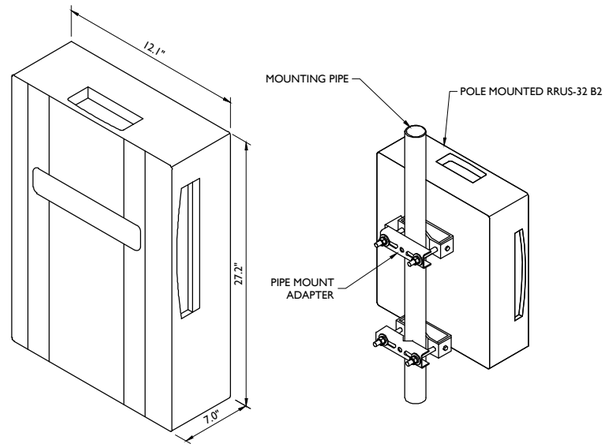
QUINTEL QS66512-2



WEIGHT = 75 LBS

CCI TRP-65R-LCUUUU-H8

ANTENNA DETAILS
NOT TO SCALE



RRUS-32 B2 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 B2 DETAIL
NOT TO SCALE

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AS SHOWN	16946007A

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STATE OF CONNECTICUT
FRANK E. PAZDEN
10
LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0029

SITE NAME:

DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

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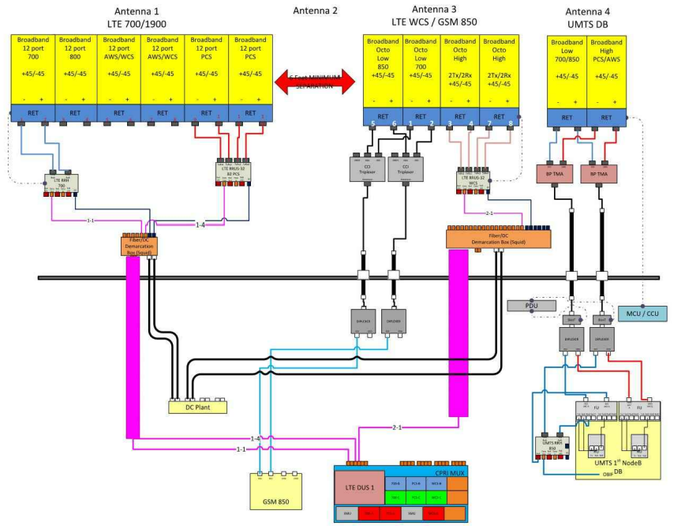
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
DETAILS

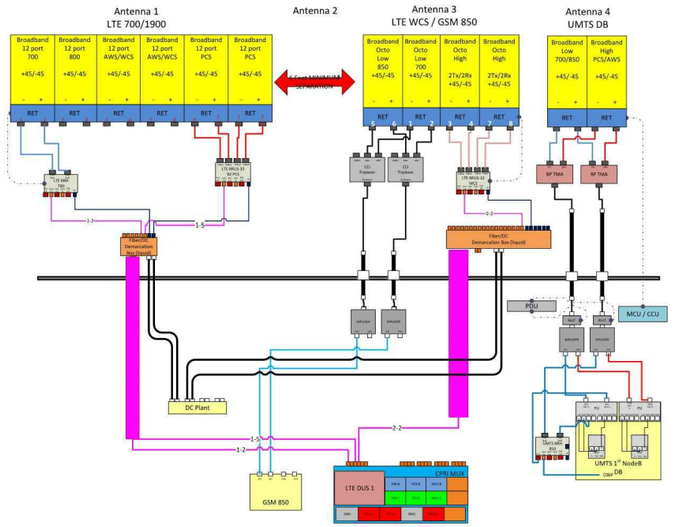
SHEET NUMBER :
A-4

Diagram - Sector A | Diagram File Name - CT2104_A_PCS_Retrofit_Triplexer_Rev1.vsd
Atoll Site Name - CT2104 | Location Name - DARIEN | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments:



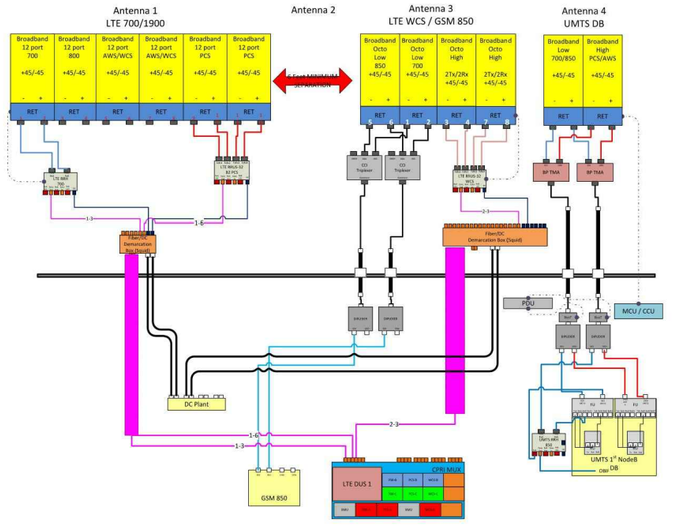
ALPHA SECTOR

Diagram - Sector B | Diagram File Name - CT2104_B_PCS_Retrofit_Triplexer_Rev1.vsd
Atoll Site Name - CT2104 | Location Name - DARIEN | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments:



BETA SECTOR

Diagram - Sector C | Diagram File Name - CT2104_C_PCS_Retrofit_Triplexer_Rev1.vsd
Atoll Site Name - CT2104 | Location Name - DARIEN | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments:



GAMMA SECTOR

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CT2104_2017-Antenna-Modifications_4TXRX_mm093q_2051A0494S_10035058_60391_12-22-2015_Preliminary-Approved_v2.00", LAST UPDATED 07/22/16

RF PLUMBING DIAGRAMS

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SCALE: AS SHOWN | JOB NUMBER: 16946007A

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STATE OF CONNECTICUT — FRANK E. PAZDEN — 20 — LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.20[illegible]

SITE NAME:
DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

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331 Newman Springs Road
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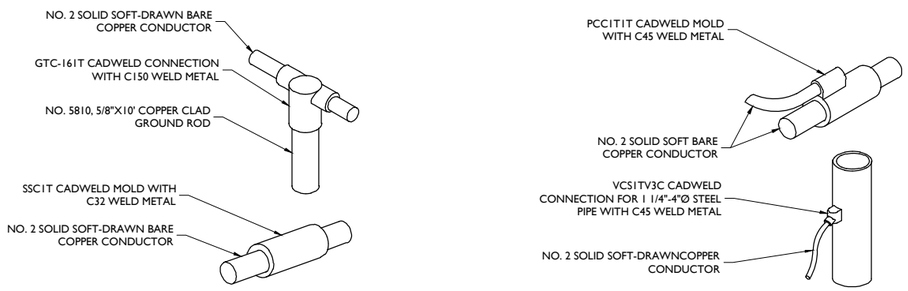
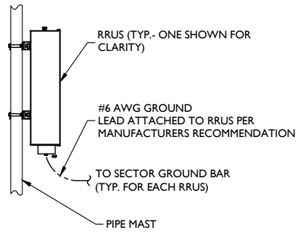
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: RF PLUMBING DIAGRAMS

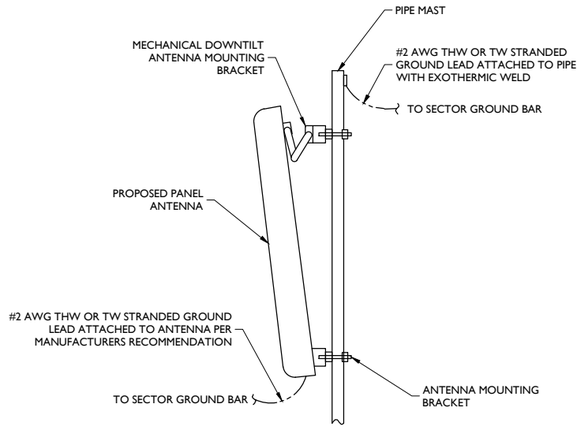
SHEET NUMBER: A-5



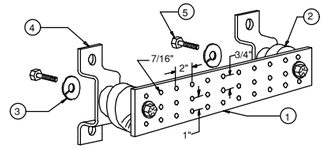
CADWELD DETAILS
NOT TO SCALE



RRH GROUNDING
NOT TO SCALE



ANTENNA GROUNDING
NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

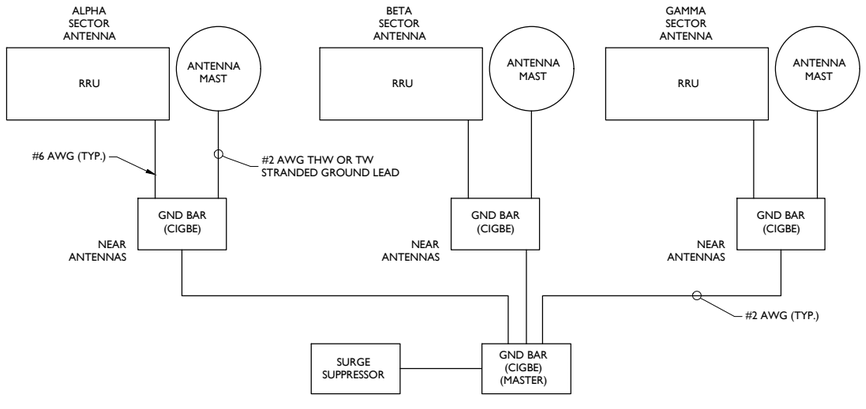
SECTION "P" - SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLT RETURN BAR (#2)
RECTIFIER FRAMES.

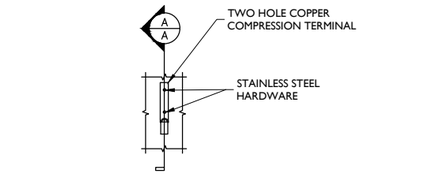
SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

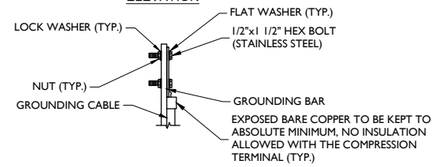
MASTER GROUND BAR
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

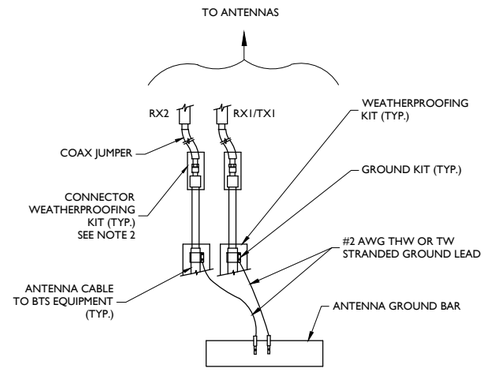


ELEVATION



SECTION A-A

TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



NOTES:

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

TYPICAL GROUND WIRE TO GROUNDING BAR
NOT TO SCALE

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811 Know what's below. Call before you dig
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE: AS SHOWN
JOB NUMBER: 16946007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	02/14/17	FOR CONSTRUCTION	RA	FEP
0	10/31/16	ISSUED FOR REVIEW	AN	FEP

STATE OF CONNECTICUT — FRANK E. PRAZDEN — LICENSED PROFESSIONAL ENGINEER
FRANK E. PRAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0028

SITE NAME:
DARIEN
FA# 10035058
SITE # CTL02104
CROWN CASTLE#: 806352
125 LEDGE ROAD
DARIEN, CT 06820
FAIRFIELD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: GROUNDING DETAILS

SHEET NUMBER: G-1

PAUL J. FORD & COMPANY

Date: **January 25, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6607

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02104
	Carrier Site Name:	Darien
Crown Castle Designation:	**Crown Castle BU Number:**	806352
	Crown Castle Site Name:	BRG 302 943052
	Crown Castle JDE Job Number:	397086
	Crown Castle Work Order Number:	1299598
	Crown Castle Application Number:	361974 Rev. 5
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-0051.003.7805
Site Data:	**126 Ledge Road, DARIEN, Fairfield County, CT**	
	Latitude *41° 4' 20.75"*, Longitude *-73° 28' 41.4"*	
	117 Foot - Monopole Tower	

Dear Charles McGuirt,

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 947998, in accordance with application 361974, revision 5.

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

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

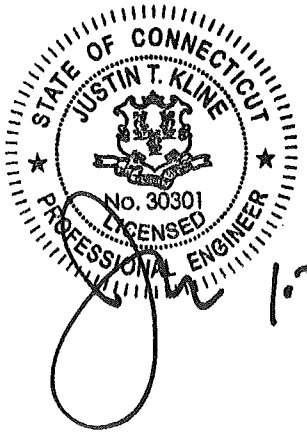
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

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:

Robert Koors

Bob Koors, E.I.
Structural Designer



1.25.17

tnxTower Report - version 7.0.5.1

PAUL J. FORD & COMPANY

Date: **January 25, 2017**

Charles McGuirt
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3530 Toringdon Way, Suite 300
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Respectfully submitted by:

Bob Koors, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 117 ft Monopole tower designed by VALMONT in May of 1992. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
88.0	89.0	2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2	3/8 5/8	-
		1	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe			
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe			
		6	cci antennas	TPX-070821			
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B30			
		2	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

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
117.0	118.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	3	1-1/4	1
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	117.0	1	tower mounts	Pipe Mount [PM 601-3]			
115.0	115.0	3	alcatel lucent	TME-800MHZ RRH	-	-	1
		3	alcatel lucent	TME-PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			
110.0	110.0	3	ericsson	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	1	1-5/8	2
		3	ericsson	RRUS 11 B12			
		1	tower mounts	T-Arm Mount [TA 602-3]			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12	1-5/8	1
		3	ericsson	KRY 112 144/1			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	100.0	3	alcatel lucent	RRH2X40-07-U	2	1-5/8	2
		3	alcatel lucent	RRH2X60-AWS			
		3	alcatel lucent	RRH2X60-PCS			
		6	andrew	HBXX-6516DS-A2M w/ Mount Pipe			
		3	kathrein	800 10735V01 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	decibel	DB844G65ZAXY w/ Mount Pipe	1 12	1-1/4 7/8	1
		1	gps	GPS_A			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 715-1]			
93.0	95.0	1	andrew	VHLP1-23	4	1/2	1
	94.0	1	andrew	VHLP2-11			
		1	andrew	VHLP2.5-11			
	93.0	1	tower mounts	Pipe Mount [PM 601-3]			
	92.0	1	andrew	VHLP1-23			
88.0	89.0	3	ericsson	RRUS-11	-	-	3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
		2	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		3	ericsson	RRUS-11	1 2 12	3/8 5/8 1-1/4	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
	88.0	1	tower mounts	Platform Mount [LP 1301-1]			
81.0	81.0	3	kathrein	800 10504 w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1307951600, 9/26/13	217769	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2007278.24, 03/11/08	2218625	CCISITES
4-POST-MODIFICATION INSPECTION	Sabre, 11-1114, 12/7/10	2785508	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 131001.806352, 11/7/13	4069331	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25562, 5/12/14	5077215	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25562.32675, 03/01/2016	6122311	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25562, 04/06/2016	6232380	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH, 1308201500, 6/7/13	3907710	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont, 10844-92, 5/19/92	217772	CCISITES
MONOPOLE PRE-MOD MAPPING	FDH, 146IQW1500, 1/9/2015	-	PJF

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	117 - 110	Pole	TP15.94x14.36x0.1875	1	-1.19	701.02	6.0	Pass
L2	110 - 100	Pole	TP18.2x15.94x0.1875	2	-3.85	775.82	21.2	Pass
L3	100 - 81.875	Pole	TP22.2676x18.2x0.25	3	-13.73	1301.71	51.4	Pass
L4	81.875 - 76.0833	Pole	TP23.5674x22.2676x0.3262	4	-14.96	1461.93	58.3	Pass
L5	76.0833 - 71	Pole	TP24.7082x23.5674x0.4537	5	-15.96	1633.76	61.8	Pass
L6	71 - 68.0833	Pole	TP25.3627x24.7082x0.6488	6	-16.71	2076.71	53.4	Pass
L7	68.0833 - 63.5	Pole	TP26.3913x25.3627x0.685	7	-17.98	2399.72	51.5	Pass
L8	63.5 - 47.42	Pole	TP30x26.3913x0.8147	8	-21.87	3134.39	49.2	Pass
L9	47.42 - 38.0833	Pole	TP31.6377x27.3428x0.8045	9	-24.81	3019.88	57.2	Pass
L10	38.0833 - 35	Pole	TP32.339x31.6377x0.7403	10	-29.30	3144.21	62.2	Pass
L11	35 - 12.5	Pole	TP37.4568x32.339x0.7647	11	-38.26	3949.43	61.1	Pass
L12	12.5 - 11	Pole	TP37.798x37.4568x0.7495	12	-38.88	3919.73	62.2	Pass
L13	11 - 2.5	Pole	TP39.7314x37.798x0.9196	13	-43.23	5035.53	52.0	Pass
L14	2.5 - 0	Pole	TP40.3x39.7314x0.9631	14	-44.60	5509.93	48.4	Pass
							Summary	
						Pole (L12)	62.2	Pass
						RATING =	62.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	43.6	Pass
1	Base Plate	0	30.0	Pass
1	Base Foundation Steel	0	54.3	Pass
1	Base Foundation Soil Interaction	0	36.2	Pass
1	Flange	100	19.0	Pass
1	Flange	110	5.8	Pass

Structure Rating (max from all components) =	**62.2%**

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Fairfield County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 93 mph.
4) Structure Class II.
5) Exposure Category B.
6) Topographic Category 1.
7) Crest Height 0.0000 ft.
8) Nominal ice thickness of 0.7500 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Temperature drop of 50 °F.
13) Deflections calculated using a wind speed of 60 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	117.0000-110.0000	7.0000	0.00	12	14.3600	15.9400	0.1875	0.7500	A572-65 (65 ksi)
L2	110.0000-100.0000	10.0000	0.00	12	15.9400	18.2000	0.1875	0.7500	A572-65 (65 ksi)
L3	100.0000-81.8750	18.1250	0.00	12	18.2000	22.2676	0.2500	1.0000	A572-65 (65 ksi)
L4	81.8750-76.0833	5.7917	0.00	12	22.2676	23.5674	0.3262	1.3048	Reinf 52.81 ksi (53 ksi)
L5	76.0833-71.0000	5.0833	0.00	12	23.5674	24.7082	0.4537	1.8148	Reinf 40.66 ksi (41 ksi)
L6	71.0000-68.0833	2.9167	0.00	12	24.7082	25.3627	0.6488	2.5952	Reinf 35.47 ksi (35 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L7	68.0833-63.5000	4.5833	0.00	12	25.3627	26.3913	0.6850	2.7401	Reinf 37.32 ksi (37 ksi)
L8	63.5000-47.4200	16.0800	4.58	12	26.3913	30.0000	0.8147	3.2587	Reinf 37.42 ksi (37 ksi)
L9	47.4200-38.0833	13.9167	0.00	12	27.3428	31.6377	0.8045	3.2178	Reinf 36.78 ksi (37 ksi)
L10	38.0833-35.0000	3.0833	0.00	12	31.6377	32.3390	0.7403	2.9612	Reinf 36.81 ksi (37 ksi)
L11	35.0000-12.5000	22.5000	0.00	12	32.3390	37.4568	0.7647	3.0586	Reinf 38.55 ksi (39 ksi)
L12	12.5000-11.0000	1.5000	0.00	12	37.4568	37.7980	0.7495	2.9979	Reinf 38.66 ksi (39 ksi)
L13	11.0000-2.5000	8.5000	0.00	12	37.7980	39.7314	0.9195	3.6782	Reinf 38.64 ksi (39 ksi)
L14	2.5000-0.0000	2.5000		12	39.7314	40.3000	0.9631	3.8524	Reinf 39.83 ksi (40 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.8666	8.5566	219.3727	5.0738	7.4385	29.4916	444.5085	4.2113	3.3460	17.845
	16.5023	9.5106	301.2254	5.6394	8.2569	36.4816	610.3643	4.6808	3.7694	20.104
L2	16.5023	9.5106	301.2254	5.6394	8.2569	36.4816	610.3643	4.6808	3.7694	20.104
	18.8420	10.8750	450.3655	6.4485	9.4276	47.7710	912.5625	5.3524	4.3751	23.334
L3	18.8420	14.4498	594.2582	6.4261	9.4276	63.0339	1204.1282	7.1117	4.2076	16.83
	23.0531	17.7242	1096.7114	7.8823	11.5346	95.0800	2222.2346	8.7233	5.2977	21.191
L4	23.0531	23.0465	1416.1830	7.8550	11.5346	122.7767	2869.5707	11.3428	5.0935	15.615
	24.3987	24.4117	1683.0627	8.3203	12.2079	137.8667	3410.3414	12.0147	5.4418	16.683
L5	24.3987	33.7664	2302.5490	8.2747	12.2079	188.6113	4665.5885	16.6188	5.1002	11.242
	25.5798	35.4329	2660.5870	8.6831	12.7988	207.8772	5391.0707	17.4390	5.4059	11.915
L6	25.5798	50.2626	3713.6400	8.6133	12.7988	290.1545	7524.8415	24.7377	4.8830	7.526
	26.2574	51.6300	4025.0609	8.8476	13.1379	306.3702	8155.8647	25.4107	5.0585	7.797
L7	26.2574	54.4340	4231.2237	8.8346	13.1379	322.0624	8573.6063	26.7908	4.9613	7.243
	27.3223	56.7029	4782.6668	9.2029	13.6707	349.8478	9690.9796	27.9074	5.2370	7.645
L8	27.3223	67.0944	5602.2161	9.1564	13.6707	409.7970	11351.6087	33.0218	4.8895	6.002
	31.0583	76.5610	8323.8119	10.4483	15.5400	535.6378	16866.2995	37.6810	5.8567	7.189
L9	29.7706	68.7430	6179.6253	9.5007	14.1636	436.3044	12521.5961	33.8332	5.1719	6.429
	32.7537	79.8682	9691.6361	11.0383	16.3883	591.3750	19637.8823	39.3087	6.3230	7.86
L10	32.7537	73.6521	8974.5709	11.0613	16.3883	547.6203	18184.9137	36.2493	6.4949	8.773
	33.4798	75.3239	9599.6720	11.3123	16.7516	573.0603	19451.5380	37.0721	6.6828	9.027
L11	33.4798	77.7425	9892.6402	11.3036	16.7516	590.5493	20045.1710	38.2625	6.6176	8.654
	38.7781	90.3435	15524.8928	13.1358	19.4026	800.1445	31457.6418	44.4643	7.9891	10.448
L12	38.7781	88.5855	15235.3962	13.1412	19.4026	785.2240	30871.0433	43.5991	8.0298	10.714
	39.1313	89.4089	15664.1907	13.2634	19.5793	800.0364	31739.8972	44.0043	8.1213	10.836
L13	39.1313	109.1952	18955.4496	13.2025	19.5793	968.1348	38408.8799	53.7426	7.6655	8.336
	41.1329	114.9199	22095.7558	13.8946	20.5808	1073.6078	44771.9916	56.5601	8.1836	8.9
L14	41.1329	120.2262	23064.1769	13.8790	20.5808	1120.6623	46734.2753	59.1717	8.0669	8.376
	41.7216	121.9897	24094.0286	14.0826	20.8754	1154.1828	48821.0342	60.0396	8.2193	8.534

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 117.0000-110.0000				1	1	1			
L2 110.0000-100.0000				1	1	1			
L3 100.0000-81.8750				1	1	1			
L4 81.8750-76.0833				1	1	1			
L5 76.0833-71.0000				1	1	1			
L6 71.0000-68.0833				1	1	1			
L7 68.0833-63.5000				1	1	1			
L8 63.5000-47.4200				1	1	1			
L9 47.4200-38.0833				1	1	1			
L10 38.0833-35.0000				1	1	1			
L11 35.0000-12.5000				1	1	1			
L12 12.5000-11.0000				1	1	1			
L13 11.0000-2.5000				1	1	1			
L14 2.5000-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
**										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF6-50A(1-1/4")	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	110.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	110.0000 - 0.0000	1	No Ice	0.1625	1.07
						1/2" Ice	0.2625	2.37
						1" Ice	0.3625	4.28
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	100.0000 - 0.0000	1	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
LDF5-50A(7/8")	C	No	Inside Pole	100.0000 - 0.0000	12	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	100.0000 - 0.0000	2	No Ice	0.0000	1.30
						1/2" Ice	0.0000	1.30
						1" Ice	0.0000	1.30
***								
7983A(1/2")	C	No	CaAa (Out Of	93.0000 - 0.0000	3	No Ice	0.0000	0.08

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
7983A(1/2")	C	No	CaAa (Out Of Face)	81.0000 - 0.0000	1	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
7983A(1/2")	C	No	CaAa (Out Of Face)	93.0000 - 81.0000	1	No Ice	0.0580	0.08
						1/2" Ice	0.1580	0.74
						1" Ice	0.2580	2.01
***								
FB-L98-002-XXX(3/8")	C	No	Inside Pole	88.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG82ST-BRDA(5/8)	C	No	Inside Pole	88.0000 - 0.0000	2	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
2" (Nominal) Conduit	C	No	Inside Pole	88.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
FB-L98-002-XXX(3/8")	C	No	Inside Pole	88.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG82ST-BRDA(5/8)	C	No	Inside Pole	88.0000 - 0.0000	2	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
2" (Nominal) Conduit	C	No	Inside Pole	88.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
LDF6-50A(1-1/4")	C	No	Inside Pole	88.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
***								
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	81.0000 - 0.0000	2	No Ice	0.2010	0.70
						1/2" Ice	0.3010	2.23
						1" Ice	0.4010	4.38
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	81.0000 - 0.0000	4	No Ice	0.0000	0.70
						1/2" Ice	0.0000	2.23
						1" Ice	0.0000	4.38
**								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	72.5000 - 0.0000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	77.0800 - 72.5000	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00
***								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	83.8750 - 0.0000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	117.0000-110.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L2	110.0000-100.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.625	0.13
L3	100.0000-81.8750	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.924	0.43
L4	81.8750-76.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.058	0.20

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
L5	76.0833-71.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.415	0.18
L6	71.0000-68.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.619	0.10
L7	68.0833-63.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.115	0.16
L8	63.5000-47.4200	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.437	0.57
L9	47.4200-38.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.383	0.33
L10	38.0833-35.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.768	0.11
L11	35.0000-12.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	20.201	0.80
L12	12.5000-11.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.347	0.05
L13	11.0000-2.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.632	0.30
L14	2.5000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.245	0.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	117.0000-110.0000	A	1.697	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.01
L2	110.0000-100.0000	A	1.684	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.993	0.20
L3	100.0000-81.8750	A	1.659	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.369	0.77
L4	81.8750-76.0833	A	1.637	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.929	0.57
L5	76.0833-71.0000	A	1.625	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	13.043	0.54
L6	71.0000-68.0833	A	1.616	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.542	0.31
L7	68.0833-63.5000	A	1.607	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.808	0.48
L8	63.5000-47.4200	A	1.579	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	40.963	1.66
L9	47.4200-38.0833	A	1.539	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.785	0.96
L10	38.0833-35.0000	A	1.515	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.648	0.31
L11	35.0000-12.5000	A	1.450	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	54.271	2.14
L12	12.5000-11.0000	A	1.353	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.466	0.13
L13	11.0000-2.5000	A	1.279	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.988	0.72
L14	2.5000-0.0000	A	1.081	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.067	0.18

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	117.0000-110.0000	0.0000	0.0000	0.0000	0.0000
L2	110.0000-100.0000	-0.1836	0.1060	-0.4096	0.2365
L3	100.0000-81.8750	-0.2451	0.1415	-0.6282	0.3627
L4	81.8750-76.0833	-0.6508	0.3757	-1.1882	0.6860
L5	76.0833-71.0000	-0.7692	0.4441	-1.3630	0.7870
L6	71.0000-68.0833	-0.7958	0.4594	-1.3974	0.8068
L7	68.0833-63.5000	-0.8035	0.4639	-1.4216	0.8208
L8	63.5000-47.4200	-0.8229	0.4751	-1.4830	0.8562
L9	47.4200-38.0833	-0.8378	0.4837	-1.5376	0.8877
L10	38.0833-35.0000	-0.8500	0.4908	-1.5638	0.9029
L11	35.0000-12.5000	-0.8678	0.5010	-1.6087	0.9288
L12	12.5000-11.0000	-0.8825	0.5095	-1.6278	0.9398
L13	11.0000-2.5000	-0.8881	0.5128	-1.6187	0.9345
L14	2.5000-0.0000	-0.8941	0.5162	-1.5514	0.8957

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.9458 8.1266 9.0212	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.9458 8.1266 9.0212	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.9458 8.1266 9.0212	0.08 0.15 0.23
800 EXTERNAL NOTCH FILTER	A	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02

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			
800 EXTERNAL NOTCH FILTER	B	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	C	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02
(3) ACU-A20-N	A	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(3) ACU-A20-N	B	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(3) ACU-A20-N	C	From Face	4.0000 0.00 1.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
Pipe Mount [PM 601-3]	C	None		0.00	117.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
***									
TME-PCS 1900MHz 4x45W-65MHz	A	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
TME-PCS 1900MHz 4x45W-65MHz	B	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
TME-PCS 1900MHz 4x45W-65MHz	C	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
TME-800MHZ RRH	A	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
TME-800MHZ RRH	B	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
TME-800MHZ RRH	C	From Face	2.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
Side Arm Mount [SO 102-3]	C	None		0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.0000 3.4800 3.9600	3.0000 3.4800 3.9600	0.08 0.11 0.14
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	1.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice	6.3292 6.7751 7.2137	5.6424 6.4259 7.1313	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	1.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice	6.3292 6.7751 7.2137	5.6424 6.4259 7.1313	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	1.0000 0.00	0.00	110.0000	No Ice 1/2"	6.3292 6.7751	5.6424 6.4259	0.11 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
			0.00			Ice	7.2137	7.1313	0.23
						1" Ice			
KRY 112 144/1	A	From Face	1.0000	0.00	110.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			0.00			Ice	0.5093	0.3009	0.02
						1" Ice			
KRY 112 144/1	B	From Face	1.0000	0.00	110.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			0.00			Ice	0.5093	0.3009	0.02
						1" Ice			
KRY 112 144/1	B	From Face	1.0000	0.00	110.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			0.00			Ice	0.5093	0.3009	0.02
						1" Ice			
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	A	From Face	4.0000	0.00	110.0000	No Ice	7.8625	6.8796	0.16
			0.00			1/2"	8.3076	7.5944	0.23
			0.00			Ice	8.7610	8.3255	0.31
						1" Ice			
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	B	From Face	4.0000	0.00	110.0000	No Ice	7.8625	6.8796	0.16
			0.00			1/2"	8.3076	7.5944	0.23
			0.00			Ice	8.7610	8.3255	0.31
						1" Ice			
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	C	From Face	4.0000	0.00	110.0000	No Ice	7.8625	6.8796	0.16
			0.00			1/2"	8.3076	7.5944	0.23
			0.00			Ice	8.7610	8.3255	0.31
						1" Ice			
RRUS 11 B12	A	From Face	4.0000	0.00	110.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2"	3.0426	1.3299	0.07
			0.00			Ice	3.2593	1.4848	0.10
						1" Ice			
RRUS 11 B12	B	From Face	4.0000	0.00	110.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2"	3.0426	1.3299	0.07
			0.00			Ice	3.2593	1.4848	0.10
						1" Ice			
RRUS 11 B12	C	From Face	4.0000	0.00	110.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2"	3.0426	1.3299	0.07
			0.00			Ice	3.2593	1.4848	0.10
						1" Ice			
T-Arm Mount [TA 602-3]	C	None		0.00	110.0000	No Ice	11.5900	11.5900	0.77
						1/2"	15.4400	15.4400	0.99
						Ice	19.2900	19.2900	1.21
						1" Ice			
(2) 2.375" OD x 4' Mount Pipe	A	From Face	4.0000	0.00	110.0000	No Ice	0.8657	0.8657	0.02
			0.00			1/2"	1.1106	1.1106	0.03
			0.00			Ice	1.3648	1.3648	0.04
						1" Ice			
(2) 2.375" OD x 4' Mount Pipe	B	From Face	4.0000	0.00	110.0000	No Ice	0.8657	0.8657	0.02
			0.00			1/2"	1.1106	1.1106	0.03
			0.00			Ice	1.3648	1.3648	0.04
						1" Ice			
(2) 2.375" OD x 4' Mount Pipe	C	From Face	4.0000	0.00	110.0000	No Ice	0.8657	0.8657	0.02
			0.00			1/2"	1.1106	1.1106	0.03
			0.00			Ice	1.3648	1.3648	0.04
						1" Ice			
***									
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.0000	0.00	100.0000	No Ice	4.5782	4.8023	0.03
			0.00			1/2"	4.9555	5.4160	0.08
			0.00			Ice	5.3404	6.0401	0.13
						1" Ice			
(2) DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.0000	0.00	100.0000	No Ice	4.5782	4.8023	0.03
			0.00			1/2"	4.9555	5.4160	0.08
			0.00			Ice	5.3404	6.0401	0.13
						1" Ice			
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.0000	0.00	100.0000	No Ice	4.5782	4.8023	0.03
			0.00			1/2"	4.9555	5.4160	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
			0.00			Ice	5.3404	6.0401	0.13
						1" Ice			
GPS_A	C	From Face	4.0000	0.00	100.0000	No Ice	0.2550	0.2550	0.00
			0.00			1/2"	0.3205	0.3205	0.00
			0.00			Ice	0.3934	0.3934	0.01
						1" Ice			
(2) FD9R6004/2C-3L	A	From Face	4.0000	0.00	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			0.00			Ice	0.4656	0.1685	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Face	4.0000	0.00	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			0.00			Ice	0.4656	0.1685	0.01
						1" Ice			
(2) FD9R6004/2C-3L	C	From Face	4.0000	0.00	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			0.00			Ice	0.4656	0.1685	0.01
						1" Ice			
DB-T1-6Z-8AB-0Z	A	From Face	4.0000	0.00	100.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			0.00			Ice	5.3481	2.3926	0.12
						1" Ice			
(2) HBXX-6516DS-A2M w/ Mount Pipe	A	From Face	4.0000	0.00	100.0000	No Ice	6.6672	5.5365	0.07
			0.00			1/2"	7.5501	6.8440	0.13
			0.00			Ice	8.4493	8.1652	0.19
						1" Ice			
(2) HBXX-6516DS-A2M w/ Mount Pipe	B	From Face	4.0000	0.00	100.0000	No Ice	6.6672	5.5365	0.07
			0.00			1/2"	7.5501	6.8440	0.13
			0.00			Ice	8.4493	8.1652	0.19
						1" Ice			
(2) HBXX-6516DS-A2M w/ Mount Pipe	C	From Face	4.0000	0.00	100.0000	No Ice	6.6672	5.5365	0.07
			0.00			1/2"	7.5501	6.8440	0.13
			0.00			Ice	8.4493	8.1652	0.19
						1" Ice			
800 10735V01 w/ Mount Pipe	A	From Face	4.0000	0.00	100.0000	No Ice	8.8727	5.4888	0.06
			0.00			1/2"	9.4550	6.7103	0.12
			0.00			Ice	10.0100	7.6880	0.19
						1" Ice			
800 10735V01 w/ Mount Pipe	B	From Face	4.0000	0.00	100.0000	No Ice	8.8727	5.4888	0.06
			0.00			1/2"	9.4550	6.7103	0.12
			0.00			Ice	10.0100	7.6880	0.19
						1" Ice			
800 10735V01 w/ Mount Pipe	C	From Face	4.0000	0.00	100.0000	No Ice	8.8727	5.4888	0.06
			0.00			1/2"	9.4550	6.7103	0.12
			0.00			Ice	10.0100	7.6880	0.19
						1" Ice			
RRH2X60-PCS	A	From Face	4.0000	0.00	100.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			0.00			Ice	2.5926	2.0870	0.10
						1" Ice			
RRH2X60-PCS	B	From Face	4.0000	0.00	100.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			0.00			Ice	2.5926	2.0870	0.10
						1" Ice			
RRH2X60-PCS	C	From Face	4.0000	0.00	100.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			0.00			Ice	2.5926	2.0870	0.10
						1" Ice			
DB-T1-6Z-8AB-0Z	A	From Face	4.0000	0.00	100.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			0.00			Ice	5.3481	2.3926	0.12
						1" Ice			
RRH2X40-07-U	A	From Face	4.0000	0.00	100.0000	No Ice	1.9250	1.0523	0.05
			0.00			1/2"	2.0976	1.1871	0.07
			0.00			Ice	2.2776	1.3294	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
RRH2X40-07-U	B	From Face	4.0000	0.00	100.0000	No Ice	1.9250	1.0523	0.05
			0.00			1/2" Ice	2.0976	1.1871	0.07
			0.00			1" Ice	2.2776	1.3294	0.09
RRH2X40-07-U	C	From Face	4.0000	0.00	100.0000	No Ice	1.9250	1.0523	0.05
			0.00			1/2" Ice	2.0976	1.1871	0.07
			0.00			1" Ice	2.2776	1.3294	0.09
RRH2X60-AWS	A	From Face	4.0000	0.00	100.0000	No Ice	1.8775	1.2359	0.04
			0.00			1/2" Ice	2.0551	1.3858	0.06
			0.00			1" Ice	2.2401	1.5441	0.08
RRH2X60-AWS	B	From Face	4.0000	0.00	100.0000	No Ice	1.8775	1.2359	0.04
			0.00			1/2" Ice	2.0551	1.3858	0.06
			0.00			1" Ice	2.2401	1.5441	0.08
RRH2X60-AWS	C	From Face	4.0000	0.00	100.0000	No Ice	1.8775	1.2359	0.04
			0.00			1/2" Ice	2.0551	1.3858	0.06
			0.00			1" Ice	2.2401	1.5441	0.08
Platform Mount [LP 715-1]	C	None		0.00	100.0000	No Ice	44.2100	44.2100	1.77
						1/2" Ice	53.9700	53.9700	2.32
						1" Ice	63.7300	63.7300	2.87
***									
Pipe Mount [PM 601-3]	C	None		0.00	93.0000	No Ice	4.3900	4.3900	0.20
						1/2" Ice	5.4800	5.4800	0.24
						1" Ice	6.5700	6.5700	0.28
***									
7770.00 w/ Mount Pipe	A	From Face	4.0000	0.00	88.0000	No Ice	5.8474	4.8204	0.09
			0.00			1/2" Ice	6.2677	5.5082	0.14
			1.00			1" Ice	6.6966	6.2127	0.21
7770.00 w/ Mount Pipe	B	From Face	4.0000	0.00	88.0000	No Ice	5.8474	4.8204	0.09
			0.00			1/2" Ice	6.2677	5.5082	0.14
			1.00			1" Ice	6.6966	6.2127	0.21
7770.00 w/ Mount Pipe	C	From Face	4.0000	0.00	88.0000	No Ice	5.8474	4.8204	0.09
			0.00			1/2" Ice	6.2677	5.5082	0.14
			1.00			1" Ice	6.6966	6.2127	0.21
RRUS-11	A	From Face	4.0000	0.00	88.0000	No Ice	2.7908	1.1923	0.05
			0.00			1/2" Ice	2.9984	1.3395	0.07
			1.00			1" Ice	3.2134	1.4957	0.09
RRUS-11	B	From Face	4.0000	0.00	88.0000	No Ice	2.7908	1.1923	0.05
			0.00			1/2" Ice	2.9984	1.3395	0.07
			1.00			1" Ice	3.2134	1.4957	0.09
RRUS-11	C	From Face	4.0000	0.00	88.0000	No Ice	2.7908	1.1923	0.05
			0.00			1/2" Ice	2.9984	1.3395	0.07
			1.00			1" Ice	3.2134	1.4957	0.09
DC6-48-60-18-8F	A	From Face	4.0000	0.00	88.0000	No Ice	0.9167	0.9167	0.02
			0.00			1/2" Ice	1.4583	1.4583	0.04
			1.00			1" Ice	1.6431	1.6431	0.06
QS66512-2 w/ Mount Pipe	A	From Face	4.0000	0.00	88.0000	No Ice	8.3708	8.4625	0.14
			0.00			1/2" Ice	8.9314	9.6573	0.21
			1.00			1" Ice	9.4571	10.5478	0.30
QS66512-2 w/ Mount Pipe	B	From Face	4.0000	0.00	88.0000	No Ice	8.3708	8.4625	0.14
			0.00			1/2" Ice	8.9314	9.6573	0.21

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
			1.00			Ice	9.4571	10.5478	0.30
						1" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	13.5353 14.2380 14.9495	10.9597 12.4861 14.0367	0.11 0.22 0.33
OPA-65R-LCUU-H8 w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	12.9838 13.6685 14.3572	9.3187 10.7901 12.2416	0.12 0.21 0.32
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	9.8953 10.4700 11.0098	7.1792 8.3621 9.2588	0.10 0.18 0.26
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	9.8953 10.4700 11.0098	7.1792 8.3621 9.2588	0.10 0.18 0.26
RRUS 32 B2	A	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7313 2.9531 3.1823	1.6681 1.8552 2.0493	0.05 0.07 0.10
RRUS 32 B2	B	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7313 2.9531 3.1823	1.6681 1.8552 2.0493	0.05 0.07 0.10
RRUS 32 B2	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7313 2.9531 3.1823	1.6681 1.8552 2.0493	0.05 0.07 0.10
RRUS 32 B30	A	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7427 2.9647 3.1941	1.6681 1.8552 2.0493	0.05 0.07 0.10
RRUS 32 B30	B	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7427 2.9647 3.1941	1.6681 1.8552 2.0493	0.05 0.07 0.10
RRUS 32 B30	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	2.7427 2.9647 3.1941	1.6681 1.8552 2.0493	0.05 0.07 0.10
(2) TPX-070821	A	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	0.4688 0.5585 0.6556	0.1009 0.1471 0.2020	0.01 0.01 0.02
(2) TPX-070821	B	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	0.4688 0.5585 0.6556	0.1009 0.1471 0.2020	0.01 0.01 0.02
(2) TPX-070821	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	0.4688 0.5585 0.6556	0.1009 0.1471 0.2020	0.01 0.01 0.02
(2) LGP2140X	A	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	1.0800 1.2137 1.3548	0.3580 0.4536 0.5563	0.01 0.02 0.03
(2) LGP2140X	B	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice 1" Ice	1.0800 1.2137 1.3548	0.3580 0.4536 0.5563	0.01 0.02 0.03
(2) LGP2140X	C	From Face	4.0000 0.00 1.00	0.00	88.0000	No Ice 1/2" Ice	1.0800 1.2137 1.3548	0.3580 0.4536 0.5563	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DC6-48-60-18-8F	C	From Face	4.0000 0.00 1.00	0.00	88.0000	1" Ice No Ice 1/2" Ice 1" Ice	0.9167 1.4583 1.6431	0.9167 1.4583 1.6431	0.02 0.04 0.06
Platform Mount [LP 1301-1] **	C	None		0.00	88.0000	1" Ice No Ice 1/2" Ice 1" Ice	51.7000 62.7000 73.7000	51.7000 62.7000 73.7000	2.26 2.94 3.61
800 10504 w/ Mount Pipe	A	From Face	1.0000 0.00 0.00	0.00	81.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
800 10504 w/ Mount Pipe	B	From Face	1.0000 0.00 0.00	0.00	81.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
800 10504 w/ Mount Pipe	C	From Face	1.0000 0.00 0.00	0.00	81.0000	No Ice 1/2" Ice 1" Ice	3.5887 4.0069 4.4217	3.1779 3.9053 4.5808	0.04 0.07 0.11
Pipe Mount [PM 601-3] **	C	None		0.00	81.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-11	A	Paraboloid w/o Radome	From Leg	2.0000 0.00 1.00	48.00		93.0000	2.1750	No Ice 1/2" Ice 1" Ice	3.7200 4.0100 4.3000	0.03 0.05 0.07
VHLP1-23	A	Paraboloid w/o Radome	From Leg	2.0000 0.00 2.00	68.00		93.0000	1.2750	No Ice 1/2" Ice 1" Ice	1.2800 1.4500 1.6200	0.01 0.02 0.03
VHLP2.5-11	C	Paraboloid w/Shroud (HP)	From Leg	2.0000 0.00 1.00	-2.00		93.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.05 0.08 0.12
VHLP1-23 **	A	Paraboloid w/o Radome	From Leg	2.0000 0.00 -1.00	68.00		93.0000	1.2750	No Ice 1/2" Ice 1" Ice	1.2800 1.4500 1.6200	0.01 0.02 0.03

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 117.0000-110.0000	113.4392	1.024	21.549	9.149	A B C	0.000 0.000 0.000	9.149 9.149 9.149	9.149	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 0.000
L2 110.0000-	104.8897	1.002	21.07	14.727	A	0.000	14.727	14.727	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
100.0000			2		B	0.000	14.727		100.00	0.000	0.000
					C	0.000	14.727		100.00	0.000	1.625
L3 100.0000-81.8750	90.6339	0.961	20.211	31.640	A	0.000	31.640	31.640	100.00	0.000	0.000
					B	0.000	31.640		100.00	0.000	0.000
					C	0.000	31.640		100.00	0.000	3.924
L4 81.8750-76.0833	78.9518	0.924	19.430	11.451	A	0.000	11.451	11.451	100.00	0.000	0.000
					B	0.000	11.451		100.00	0.000	0.000
					C	0.000	11.451		100.00	0.000	4.058
L5 76.0833-71.0000	73.5216	0.905	19.038	10.586	A	0.000	10.586	10.586	100.00	0.000	0.000
					B	0.000	10.586		100.00	0.000	0.000
					C	0.000	10.586		100.00	0.000	4.415
L6 71.0000-68.0833	69.5353	0.891	18.737	6.300	A	0.000	6.300	6.300	100.00	0.000	0.000
					B	0.000	6.300		100.00	0.000	0.000
					C	0.000	6.300		100.00	0.000	2.619
L7 68.0833-63.5000	65.7765	0.877	18.442	10.232	A	0.000	10.232	10.232	100.00	0.000	0.000
					B	0.000	10.232		100.00	0.000	0.000
					C	0.000	10.232		100.00	0.000	4.115
L8 63.5000-47.4200	55.2885	0.834	17.549	39.115	A	0.000	39.115	39.115	100.00	0.000	0.000
					B	0.000	39.115		100.00	0.000	0.000
					C	0.000	39.115		100.00	0.000	14.437
L9 47.4200-38.0833	42.6774	0.775	16.298	24.324	A	0.000	24.324	24.324	100.00	0.000	0.000
					B	0.000	24.324		100.00	0.000	0.000
					C	0.000	24.324		100.00	0.000	8.383
L10 38.0833-35.0000	36.5360	0.741	15.590	8.509	A	0.000	8.509	8.509	100.00	0.000	0.000
					B	0.000	8.509		100.00	0.000	0.000
					C	0.000	8.509		100.00	0.000	2.768
L11 35.0000-12.5000	23.4750	0.7	14.724	67.742	A	0.000	67.742	67.742	100.00	0.000	0.000
					B	0.000	67.742		100.00	0.000	0.000
					C	0.000	67.742		100.00	0.000	20.201
L12 12.5000-11.0000	11.7489	0.7	14.724	4.869	A	0.000	4.869	4.869	100.00	0.000	0.000
					B	0.000	4.869		100.00	0.000	0.000
					C	0.000	4.869		100.00	0.000	1.347
L13 11.0000-2.5000	6.7147	0.7	14.724	28.427	A	0.000	28.427	28.427	100.00	0.000	0.000
					B	0.000	28.427		100.00	0.000	0.000
					C	0.000	28.427		100.00	0.000	7.632
L14 2.5000-0.0000	1.2470	0.7	14.724	8.631	A	0.000	8.631	8.631	100.00	0.000	0.000
					B	0.000	8.631		100.00	0.000	0.000
					C	0.000	8.631		100.00	0.000	2.245

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 117.0000-110.0000	113.4392	1.024	6.229	1.6971	11.129	A	0.000	11.129	11.129	100.00	0.000	0.000
						B	0.000	11.129		100.00	0.000	0.000
						C	0.000	11.129		100.00	0.000	0.000
L2 110.0000-100.0000	104.8897	1.002	6.091	1.6839	17.533	A	0.000	17.533	17.533	100.00	0.000	0.000
						B	0.000	17.533		100.00	0.000	0.000
						C	0.000	17.533		100.00	0.000	4.993
L3 100.0000-81.8750	90.6339	0.961	5.842	1.6595	36.653	A	0.000	36.653	36.653	100.00	0.000	0.000
						B	0.000	36.653		100.00	0.000	0.000
						C	0.000	36.653		100.00	0.000	14.369
L4 81.8750-76.0833	78.9518	0.924	5.616	1.6367	13.031	A	0.000	13.031	13.031	100.00	0.000	0.000
						B	0.000	13.031		100.00	0.000	0.000
						C	0.000	13.031		100.00	0.000	11.929
L5 76.0833-71.0000	73.5216	0.905	5.503	1.6251	11.962	A	0.000	11.962	11.962	100.00	0.000	0.000
						B	0.000	11.962		100.00	0.000	0.000
						C	0.000	11.962		100.00	0.000	13.043
L6 71.0000-68.0833	69.5353	0.891	5.416	1.6161	7.085	A	0.000	7.085	7.085	100.00	0.000	0.000
						B	0.000	7.085		100.00	0.000	0.000
						C	0.000	7.085		100.00	0.000	7.542
L7 68.0833-	65.7765	0.877	5.331	1.6071	11.460	A	0.000	11.460	11.460	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
63.5000						B	0.000	11.460		100.00	0.000	0.000
						C	0.000	11.460		100.00	0.000	11.808
L8 63.5000-47.4200	55.2885	0.834	5.073	1.5794	43.348	A	0.000	43.348	43.348	100.00	0.000	0.000
						B	0.000	43.348		100.00	0.000	0.000
						C	0.000	43.348		100.00	0.000	40.963
L9 47.4200-38.0833	42.6774	0.775	4.711	1.5391	26.782	A	0.000	26.782	26.782	100.00	0.000	0.000
						B	0.000	26.782		100.00	0.000	0.000
						C	0.000	26.782		100.00	0.000	23.785
L10 38.0833-35.0000	36.5360	0.741	4.506	1.5153	9.288	A	0.000	9.288	9.288	100.00	0.000	0.000
						B	0.000	9.288		100.00	0.000	0.000
						C	0.000	9.288		100.00	0.000	7.648
L11 35.0000-12.5000	23.4750	0.7	4.256	1.4498	73.178	A	0.000	73.178	73.178	100.00	0.000	0.000
						B	0.000	73.178		100.00	0.000	0.000
						C	0.000	73.178		100.00	0.000	54.271
L12 12.5000-11.0000	11.7489	0.7	4.256	1.3528	5.208	A	0.000	5.208	5.208	100.00	0.000	0.000
						B	0.000	5.208		100.00	0.000	0.000
						C	0.000	5.208		100.00	0.000	3.466
L13 11.0000-2.5000	6.7147	0.7	4.256	1.2792	30.239	A	0.000	30.239	30.239	100.00	0.000	0.000
						B	0.000	30.239		100.00	0.000	0.000
						C	0.000	30.239		100.00	0.000	18.988
L14 2.5000-0.0000	1.2470	0.7	4.256	1.0810	9.081	A	0.000	9.081	9.081	100.00	0.000	0.000
						B	0.000	9.081		100.00	0.000	0.000
						C	0.000	9.081		100.00	0.000	5.067

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 117.0000-110.0000	113.4392	1.024	8.025	9.149	A	0.000	9.149	9.149	100.00	0.000	0.000
					B	0.000	9.149		100.00	0.000	0.000
					C	0.000	9.149		100.00	0.000	0.000
L2 110.0000-100.0000	104.8897	1.002	7.848	14.727	A	0.000	14.727	14.727	100.00	0.000	0.000
					B	0.000	14.727		100.00	0.000	0.000
					C	0.000	14.727		100.00	0.000	1.625
L3 100.0000-81.8750	90.6339	0.961	7.527	31.640	A	0.000	31.640	31.640	100.00	0.000	0.000
					B	0.000	31.640		100.00	0.000	0.000
					C	0.000	31.640		100.00	0.000	3.924
L4 81.8750-76.0833	78.9518	0.924	7.236	11.451	A	0.000	11.451	11.451	100.00	0.000	0.000
					B	0.000	11.451		100.00	0.000	0.000
					C	0.000	11.451		100.00	0.000	4.058
L5 76.0833-71.0000	73.5216	0.905	7.090	10.586	A	0.000	10.586	10.586	100.00	0.000	0.000
					B	0.000	10.586		100.00	0.000	0.000
					C	0.000	10.586		100.00	0.000	4.415
L6 71.0000-68.0833	69.5353	0.891	6.978	6.300	A	0.000	6.300	6.300	100.00	0.000	0.000
					B	0.000	6.300		100.00	0.000	0.000
					C	0.000	6.300		100.00	0.000	2.619
L7 68.0833-63.5000	65.7765	0.877	6.868	10.232	A	0.000	10.232	10.232	100.00	0.000	0.000
					B	0.000	10.232		100.00	0.000	0.000
					C	0.000	10.232		100.00	0.000	4.115
L8 63.5000-47.4200	55.2885	0.834	6.536	39.115	A	0.000	39.115	39.115	100.00	0.000	0.000
					B	0.000	39.115		100.00	0.000	0.000
					C	0.000	39.115		100.00	0.000	14.437
L9 47.4200-38.0833	42.6774	0.775	6.070	24.324	A	0.000	24.324	24.324	100.00	0.000	0.000
					B	0.000	24.324		100.00	0.000	0.000
					C	0.000	24.324		100.00	0.000	8.383
L10 38.0833-35.0000	36.5360	0.741	5.806	8.509	A	0.000	8.509	8.509	100.00	0.000	0.000
					B	0.000	8.509		100.00	0.000	0.000
					C	0.000	8.509		100.00	0.000	2.768
L11 35.0000-12.5000	23.4750	0.7	5.484	67.742	A	0.000	67.742	67.742	100.00	0.000	0.000
					B	0.000	67.742		100.00	0.000	0.000
					C	0.000	67.742		100.00	0.000	20.201
L12 12.5000-	11.7489	0.7	5.484	4.869	A	0.000	4.869	4.869	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
11.0000					B	0.000	4.869		100.00	0.000	0.000
					C	0.000	4.869		100.00	0.000	1.347
L13 11.0000-2.5000	6.7147	0.7	5.484	28.427	A	0.000	28.427	28.427	100.00	0.000	0.000
					B	0.000	28.427		100.00	0.000	0.000
					C	0.000	28.427		100.00	0.000	7.632
L14 2.5000-0.0000	1.2470	0.7	5.484	8.631	A	0.000	8.631	8.631	100.00	0.000	0.000
					B	0.000	8.631		100.00	0.000	0.000
					C	0.000	8.631		100.00	0.000	2.245

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	117 - 110	Pole	Max Tension	21	0.00	-0.00	-0.00
			Max. Compression	26	-3.36	0.01	0.00
			Max. Mx	20	-1.19	13.08	-0.00
			Max. My	14	-1.19	0.01	-13.08
			Max. Vy	20	-2.07	13.08	-0.00
			Max. Vx	14	2.07	0.01	-13.08
			Max. Torque	22			-0.00
L2	110 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.42	0.07	0.05
			Max. Mx	8	-3.85	-58.88	0.06
			Max. My	2	-3.85	-0.02	58.80
			Max. Vy	20	-4.90	58.88	-0.01
			Max. Vx	14	4.89	0.08	-58.76
			Max. Torque	3			0.03
L3	100 - 81.875	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.47	3.32	0.61
			Max. Mx	20	-13.73	292.78	-1.72
			Max. My	2	-13.75	-0.22	289.08
			Max. Vy	20	-16.79	292.78	-1.72
			Max. Vx	14	16.67	3.94	-289.06
			Max. Torque	14			-2.14
L4	81.875 - 76.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.84	3.71	0.41
			Max. Mx	20	-14.96	393.82	-2.94
			Max. My	14	-14.98	5.68	-389.36
			Max. Vy	20	-17.80	393.82	-2.94
			Max. Vx	14	17.67	5.68	-389.36
			Max. Torque	14			-2.26
L5	76.0833 - 71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.40	4.10	0.21
			Max. Mx	20	-15.96	485.64	-4.01
			Max. My	14	-15.97	7.20	-480.53
			Max. Vy	20	-18.34	485.64	-4.01
			Max. Vx	14	18.21	7.20	-480.53
			Max. Torque	14			-2.39
L6	71 - 68.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.49	4.32	0.09
			Max. Mx	20	-16.71	539.60	-4.62
			Max. My	14	-16.72	8.07	-534.12
			Max. Vy	20	-18.67	539.60	-4.62
			Max. Vx	14	18.55	8.07	-534.12
			Max. Torque	14			-2.46
L7	68.0833 - 63.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.30	4.68	-0.11
			Max. Mx	20	-17.98	626.36	-5.58
			Max. My	14	-17.99	9.44	-620.30
			Max. Vy	20	-19.19	626.36	-5.58
			Max. Vx	14	19.07	9.44	-620.30
			Max. Torque	14			-2.59
L8	63.5 - 47.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.55	5.63	-0.63
			Max. Mx	20	-21.87	854.59	-8.01
			Max. My	14	-21.87	12.88	-847.08
			Max. Vy	20	-20.51	854.59	-8.01
			Max. Vx	14	20.39	12.88	-847.08
			Max. Torque	14			-2.91
L9	47.42 - 38.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.84	6.82	-1.29
			Max. Mx	20	-28.20	1151.81	-10.95
			Max. My	14	-28.20	17.05	-1142.52
			Max. Vy	20	-22.13	1151.81	-10.95
			Max. Vx	14	22.01	17.05	-1142.52
			Max. Torque	14			-3.30
L10	38.0833 - 35	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.30	7.08	-1.44

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-29.30	1220.54	-11.61
			Max. My	14	-29.31	17.97	-1210.86
			Max. Vy	20	-22.45	1220.54	-11.61
			Max. Vx	14	22.33	17.97	-1210.86
			Max. Torque	14			-3.39
L11	35 - 12.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.81	8.95	-2.53
			Max. Mx	20	-38.25	1751.07	-16.33
			Max. My	14	-38.26	24.64	-1738.57
			Max. Vy	20	-24.75	1751.07	-16.33
			Max. Vx	14	24.63	24.64	-1738.57
			Max. Torque	14			-4.05
L12	12.5 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.60	9.08	-2.60
			Max. Mx	20	-38.88	1788.31	-16.65
			Max. My	14	-38.88	25.08	-1775.62
			Max. Vy	20	-24.91	1788.31	-16.65
			Max. Vx	14	24.79	25.08	-1775.62
			Max. Torque	14			-4.09
L13	11 - 2.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.81	9.74	-2.98
			Max. Mx	20	-43.23	2003.91	-18.41
			Max. My	14	-43.23	27.57	-1990.17
			Max. Vy	20	-25.84	2003.91	-18.41
			Max. Vx	14	25.72	27.57	-1990.17
			Max. Torque	14			-4.37
L14	2.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.39	9.90	-3.08
			Max. Mx	20	-44.60	2068.85	-18.93
			Max. My	14	-44.60	28.30	-2054.80
			Max. Vy	20	-26.12	2068.85	-18.93
			Max. Vx	14	26.00	28.30	-2054.80
			Max. Torque	14			-4.45

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	74.39	-0.00	0.00
	Max. H_x	20	44.61	26.11	-0.20
	Max. H_z	2	44.61	-0.10	25.91
	Max. M_x	2	2047.46	-0.10	25.91
	Max. M_z	8	2060.59	-26.05	0.03
	Max. Torsion	24	3.84	13.01	22.39
	Min. Vert	21	33.46	26.10	-0.20
	Min. H_x	8	44.61	-26.05	0.03
	Min. H_z	15	33.46	0.28	-25.99
	Min. M_x	14	-2054.80	0.28	-25.99
	Min. M_z	20	-2068.85	26.11	-0.20
	Min. Torsion	14	-4.45	0.28	-25.99

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	37.17	0.00	0.00	-0.12	1.14	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	44.61	0.10	-25.91	-2047.46	-8.32	-3.61
0.9 Dead+1.6 Wind 0 deg - No Ice	33.46	0.10	-25.91	-2033.21	-8.62	-3.60
1.2 Dead+1.6 Wind 30 deg - No Ice	44.61	13.05	-22.47	-1776.00	-1031.77	-2.58

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 30 deg - No Ice	33.46	13.05	-22.47	-1763.69	-1025.00	-2.56
1.2 Dead+1.6 Wind 60 deg - No Ice	44.61	22.57	-12.98	-1026.12	-1785.51	-1.01
0.9 Dead+1.6 Wind 60 deg - No Ice	33.46	22.57	-12.98	-1018.99	-1773.52	-1.00
1.2 Dead+1.6 Wind 90 deg - No Ice	44.61	26.05	-0.03	-2.72	-2060.59	0.95
0.9 Dead+1.6 Wind 90 deg - No Ice	33.46	26.05	-0.03	-2.66	-2046.56	0.95
1.2 Dead+1.6 Wind 120 deg - No Ice	44.61	22.58	12.84	1013.23	-1786.10	2.67
0.9 Dead+1.6 Wind 120 deg - No Ice	33.46	22.58	12.84	1006.27	-1774.11	2.67
1.2 Dead+1.6 Wind 150 deg - No Ice	44.61	12.90	22.47	1776.23	-1018.18	4.07
0.9 Dead+1.6 Wind 150 deg - No Ice	33.46	12.90	22.47	1764.00	-1011.49	4.06
1.2 Dead+1.6 Wind 180 deg - No Ice	44.61	-0.28	25.99	2054.80	28.30	4.45
0.9 Dead+1.6 Wind 180 deg - No Ice	33.46	-0.28	25.99	2040.66	27.74	4.44
1.2 Dead+1.6 Wind 210 deg - No Ice	44.61	-13.20	22.45	1773.86	1048.64	3.20
0.9 Dead+1.6 Wind 210 deg - No Ice	33.46	-13.20	22.45	1761.64	1041.03	3.19
1.2 Dead+1.6 Wind 240 deg - No Ice	44.61	-22.62	13.03	1030.78	1792.59	1.25
0.9 Dead+1.6 Wind 240 deg - No Ice	33.46	-22.62	13.03	1023.71	1779.84	1.23
1.2 Dead+1.6 Wind 270 deg - No Ice	44.61	-26.11	0.20	18.93	2068.85	-0.74
0.9 Dead+1.6 Wind 270 deg - No Ice	33.46	-26.10	0.20	18.84	2054.04	-0.75
1.2 Dead+1.6 Wind 300 deg - No Ice	44.61	-22.71	-12.75	-1004.16	1802.14	-2.37
0.9 Dead+1.6 Wind 300 deg - No Ice	33.46	-22.71	-12.75	-997.18	1789.32	-2.37
1.2 Dead+1.6 Wind 330 deg - No Ice	44.61	-13.01	-22.39	-1769.11	1031.46	-3.84
0.9 Dead+1.6 Wind 330 deg - No Ice	33.46	-13.01	-22.39	-1756.83	1023.96	-3.84
1.2 Dead+1.0 Ice+1.0 Temp	74.39	0.00	-0.00	3.08	9.90	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	74.39	0.03	-7.01	-576.64	7.47	-1.57
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	74.39	3.53	-6.08	-499.85	-282.42	-1.03
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	74.39	6.10	-3.51	-287.67	-495.70	-0.27
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	74.39	7.04	-0.01	2.19	-573.42	0.60
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	74.39	6.10	3.48	290.34	-495.37	1.32
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	74.39	3.49	6.07	505.70	-278.70	1.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	74.39	-0.07	7.03	584.79	17.08	1.77
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	74.39	-3.57	6.07	505.68	306.28	1.19
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	74.39	-6.12	3.53	295.12	517.12	0.33
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	74.39	-7.06	0.05	8.12	595.10	-0.55
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	74.39	-6.13	-3.45	-281.63	518.99	-1.24
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	74.39	-3.52	-6.05	-497.73	301.36	-1.71
Dead+Wind 0 deg - Service	37.17	0.02	-6.03	-474.63	-1.07	-0.27
Dead+Wind 30 deg - Service	37.17	3.04	-5.23	-411.71	-238.27	-0.27

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - Service	37.17	5.25	-3.02	-237.91	-412.96	-0.23
Dead+Wind 90 deg - Service	37.17	6.06	-0.01	-0.73	-476.75	-0.11
Dead+Wind 120 deg - Service	37.17	5.25	2.99	234.73	-413.10	0.05
Dead+Wind 150 deg - Service	37.17	3.00	5.23	411.57	-235.12	0.29
Dead+Wind 180 deg - Service	37.17	-0.07	6.05	476.14	7.41	0.47
Dead+Wind 210 deg - Service	37.17	-3.07	5.22	411.02	243.89	0.41
Dead+Wind 240 deg - Service	37.17	-5.26	3.03	238.80	416.31	0.29
Dead+Wind 270 deg - Service	37.17	-6.08	0.05	4.29	480.37	0.16
Dead+Wind 300 deg - Service	37.17	-5.29	-2.97	-232.82	418.52	0.02
Dead+Wind 330 deg - Service	37.17	-3.03	-5.21	-410.10	239.90	-0.24

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-37.17	0.00	-0.00	37.17	-0.00	0.000%
2	0.10	-44.61	-25.91	-0.10	44.61	25.91	0.001%
3	0.10	-33.46	-25.91	-0.10	33.46	25.91	0.003%
4	13.05	-44.61	-22.47	-13.05	44.61	22.47	0.000%
5	13.05	-33.46	-22.47	-13.05	33.46	22.47	0.000%
6	22.57	-44.61	-12.98	-22.57	44.61	12.98	0.000%
7	22.57	-33.46	-12.98	-22.57	33.46	12.98	0.000%
8	26.05	-44.61	-0.03	-26.05	44.61	0.03	0.003%
9	26.05	-33.46	-0.03	-26.05	33.46	0.03	0.007%
10	22.58	-44.61	12.84	-22.58	44.61	-12.84	0.000%
11	22.58	-33.46	12.84	-22.58	33.46	-12.84	0.000%
12	12.90	-44.61	22.47	-12.90	44.61	-22.47	0.000%
13	12.90	-33.46	22.47	-12.90	33.46	-22.47	0.000%
14	-0.28	-44.61	25.99	0.28	44.61	-25.99	0.001%
15	-0.28	-33.46	25.99	0.28	33.46	-25.99	0.001%
16	-13.20	-44.61	22.45	13.20	44.61	-22.45	0.000%
17	-13.20	-33.46	22.45	13.20	33.46	-22.45	0.000%
18	-22.62	-44.61	13.03	22.62	44.61	-13.03	0.000%
19	-22.62	-33.46	13.03	22.62	33.46	-13.03	0.000%
20	-26.11	-44.61	0.20	26.11	44.61	-0.20	0.003%
21	-26.11	-33.46	0.20	26.10	33.46	-0.20	0.007%
22	-22.71	-44.61	-12.75	22.71	44.61	12.75	0.000%
23	-22.71	-33.46	-12.75	22.71	33.46	12.75	0.000%
24	-13.01	-44.61	-22.39	13.01	44.61	22.39	0.000%
25	-13.01	-33.46	-22.39	13.01	33.46	22.39	0.000%
26	0.00	-74.39	0.00	-0.00	74.39	0.00	0.001%
27	0.03	-74.39	-7.01	-0.03	74.39	7.01	0.001%
28	3.53	-74.39	-6.08	-3.53	74.39	6.08	0.001%
29	6.10	-74.39	-3.51	-6.10	74.39	3.51	0.001%
30	7.04	-74.39	-0.01	-7.04	74.39	0.01	0.001%
31	6.10	-74.39	3.48	-6.10	74.39	-3.48	0.001%
32	3.49	-74.39	6.07	-3.49	74.39	-6.07	0.001%
33	-0.07	-74.39	7.03	0.07	74.39	-7.03	0.001%
34	-3.57	-74.39	6.07	3.57	74.39	-6.07	0.001%
35	-6.12	-74.39	3.53	6.12	74.39	-3.53	0.001%
36	-7.06	-74.39	0.05	7.06	74.39	-0.05	0.001%
37	-6.13	-74.39	-3.45	6.13	74.39	3.45	0.001%
38	-3.52	-74.39	-6.06	3.52	74.39	6.05	0.001%
39	0.02	-37.17	-6.03	-0.02	37.17	6.03	0.002%
40	3.04	-37.17	-5.23	-3.04	37.17	5.23	0.002%
41	5.25	-37.17	-3.02	-5.25	37.17	3.02	0.002%
42	6.06	-37.17	-0.01	-6.06	37.17	0.01	0.002%
43	5.25	-37.17	2.99	-5.25	37.17	-2.99	0.002%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
44	3.00	-37.17	5.23	-3.00	37.17	-5.23	0.002%
45	-0.07	-37.17	6.05	0.07	37.17	-6.05	0.002%
46	-3.07	-37.17	5.23	3.07	37.17	-5.22	0.002%
47	-5.26	-37.17	3.03	5.26	37.17	-3.03	0.002%
48	-6.08	-37.17	0.05	6.08	37.17	-0.05	0.002%
49	-5.29	-37.17	-2.97	5.29	37.17	2.97	0.002%
50	-3.03	-37.17	-5.21	3.03	37.17	5.21	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00000001	0.00006293
3	Yes	13	0.00000001	0.00012904
4	Yes	15	0.00000001	0.00012794
5	Yes	15	0.00000001	0.00010136
6	Yes	15	0.00000001	0.00014430
7	Yes	15	0.00000001	0.00011458
8	Yes	13	0.00005370	0.00006203
9	Yes	12	0.00009806	0.00013962
10	Yes	15	0.00000001	0.00014255
11	Yes	15	0.00000001	0.00011339
12	Yes	15	0.00000001	0.00012341
13	Yes	15	0.00000001	0.00009782
14	Yes	14	0.00000001	0.00010161
15	Yes	14	0.00000001	0.00008378
16	Yes	16	0.00000001	0.00005841
17	Yes	15	0.00000001	0.00012341
18	Yes	15	0.00000001	0.00013162
19	Yes	15	0.00000001	0.00010415
20	Yes	13	0.00005369	0.00006245
21	Yes	12	0.00009805	0.00014034
22	Yes	15	0.00000001	0.00013186
23	Yes	15	0.00000001	0.00010430
24	Yes	16	0.00000001	0.00005665
25	Yes	15	0.00000001	0.00011972
26	Yes	9	0.00000001	0.00003975
27	Yes	14	0.00000001	0.00012375
28	Yes	14	0.00000001	0.00013187
29	Yes	14	0.00000001	0.00013216
30	Yes	14	0.00000001	0.00012091
31	Yes	14	0.00000001	0.00013237
32	Yes	14	0.00000001	0.00013174
33	Yes	14	0.00000001	0.00012508
34	Yes	14	0.00000001	0.00013919
35	Yes	14	0.00000001	0.00013840
36	Yes	14	0.00000001	0.00012729
37	Yes	14	0.00000001	0.00013732
38	Yes	14	0.00000001	0.00013786
39	Yes	12	0.00000001	0.00004456
40	Yes	12	0.00000001	0.00003134
41	Yes	12	0.00000001	0.00004037
42	Yes	12	0.00000001	0.00004332
43	Yes	12	0.00000001	0.00003532
44	Yes	12	0.00000001	0.00003119
45	Yes	12	0.00000001	0.00004827
46	Yes	12	0.00000001	0.00004558
47	Yes	12	0.00000001	0.00003159
48	Yes	12	0.00000001	0.00004402
49	Yes	12	0.00000001	0.00003581
50	Yes	12	0.00000001	0.00003987

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	117 - 110	11.55	48	0.97	0.00
L2	110 - 100	10.13	48	0.96	0.00
L3	100 - 81.875	8.18	48	0.90	0.00
L4	81.875 - 76.0833	5.15	48	0.67	0.00
L5	76.0833 - 71	4.39	48	0.59	0.00
L6	71 - 68.0833	3.79	48	0.53	0.00
L7	68.0833 - 63.5	3.48	48	0.50	0.00
L8	63.5 - 47.42	3.02	48	0.46	0.00
L9	52 - 38.0833	2.01	48	0.37	0.00
L10	38.0833 - 35	1.04	48	0.28	0.00
L11	35 - 12.5	0.87	48	0.25	0.00
L12	12.5 - 11	0.10	48	0.08	0.00
L13	11 - 2.5	0.08	48	0.07	0.00
L14	2.5 - 0	0.00	48	0.01	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.0000	APXVSPP18-C-A20 w/ Mount Pipe	48	11.55	0.97	0.00	23354
115.0000	TME-PCS 1900MHz 4x45W-65MHz	48	11.14	0.97	0.00	23354
110.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	48	10.13	0.96	0.00	16807
100.0000	(2) DB844G65ZAXY w/ Mount Pipe	48	8.18	0.90	0.00	7070
95.0000	VHLP1-23	48	7.27	0.85	0.00	5465
94.0000	VHLP2-11	48	7.09	0.83	0.00	5227
93.0000	Pipe Mount [PM 601-3]	48	6.91	0.82	0.00	5009
92.0000	VHLP1-23	48	6.74	0.81	0.00	4809
88.0000	7770.00 w/ Mount Pipe	48	6.08	0.76	0.00	4145
81.0000	800 10504 w/ Mount Pipe	48	5.03	0.66	0.00	3650

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	117 - 110	49.70	20	4.17	0.03
L2	110 - 100	43.62	20	4.12	0.03
L3	100 - 81.875	35.23	20	3.86	0.02
L4	81.875 - 76.0833	22.18	20	2.89	0.01
L5	76.0833 - 71	18.90	20	2.52	0.01
L6	71 - 68.0833	16.35	20	2.27	0.01
L7	68.0833 - 63.5	15.00	20	2.16	0.01
L8	63.5 - 47.42	13.01	20	1.99	0.01
L9	52 - 38.0833	8.67	20	1.62	0.01
L10	38.0833 - 35	4.49	20	1.20	0.00
L11	35 - 12.5	3.75	20	1.09	0.00
L12	12.5 - 11	0.42	20	0.33	0.00
L13	11 - 2.5	0.32	20	0.29	0.00
L14	2.5 - 0	0.02	20	0.06	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.0000	APXVSPP18-C-A20 w/ Mount Pipe	20	49.70	4.17	0.03	5494

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
115.0000	TME-PCS 1900MHz 4x45W-65MHz	20	47.95	4.16	0.03	5494
110.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	43.62	4.12	0.03	3946
100.0000	(2) DB844G65ZAXY w/ Mount Pipe	20	35.23	3.86	0.02	1665
95.0000	VHLP1-23	20	31.29	3.64	0.02	1285
94.0000	VHLP2-11	20	30.52	3.59	0.02	1229
93.0000	Pipe Mount [PM 601-3]	20	29.77	3.54	0.02	1177
92.0000	VHLP1-23	20	29.03	3.49	0.02	1130
88.0000	7770.00 w/ Mount Pipe	20	26.17	3.26	0.02	973
81.0000	800 10504 w/ Mount Pipe	20	21.66	2.83	0.01	854

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	117 - 110 (1)	TP15.94x14.36x0.1875	7.0000	0.0000	0.0	9.5106	-1.19	701.02	0.002
L2	110 - 100 (2)	TP18.2x15.94x0.1875	10.0000	0.0000	0.0	10.8750	-3.85	775.82	0.005
L3	100 - 81.875 (3)	TP22.2676x18.2x0.25	18.1250	0.0000	0.0	17.7242	-13.73	1301.71	0.011
L4	81.875 - 76.0833 (4)	TP23.5674x22.2676x0.3262	5.7917	0.0000	0.0	24.4117	-14.96	1461.93	0.010
L5	76.0833 - 71 (5)	TP24.7082x23.5674x0.4537	5.0833	0.0000	0.0	35.4329	-15.96	1633.76	0.010
L6	71 - 68.0833 (6)	TP25.3627x24.7082x0.6488	2.9167	0.0000	0.0	51.6300	-16.71	2076.71	0.008
L7	68.0833 - 63.5 (7)	TP26.3913x25.3627x0.685	4.5833	0.0000	0.0	56.7029	-17.98	2399.72	0.007
L8	63.5 - 47.42 (8)	TP30x26.3913x0.8147	16.0800	0.0000	0.0	73.8647	-21.87	3134.39	0.007
L9	47.42 - 38.0833 (9)	TP31.6377x27.3428x0.8045	13.9167	0.0000	0.0	72.4043	-24.81	3019.88	0.008
L10	38.0833 - 35 (10)	TP32.339x31.6377x0.7403	3.0833	0.0000	0.0	75.3239	-29.30	3144.21	0.009
L11	35 - 12.5 (11)	TP37.4568x32.339x0.7647	22.5000	0.0000	0.0	90.3435	-38.26	3949.43	0.010
L12	12.5 - 11 (12)	TP37.798x37.4568x0.7495	1.5000	0.0000	0.0	89.4089	-38.88	3919.73	0.010
L13	11 - 2.5 (13)	TP39.7314x37.798x0.9196	8.5000	0.0000	0.0	114.9200	-43.23	5035.53	0.009
L14	2.5 - 0 (14)	TP40.3x39.7314x0.9631	2.5000	0.0000	0.0	121.9900	-44.60	5509.93	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	117 - 110 (1)	TP15.94x14.36x0.1875	13.08	224.09	0.058	0.00	224.09	0.000
L2	110 - 100 (2)	TP18.2x15.94x0.1875	58.89	284.00	0.207	0.00	284.00	0.000
L3	100 - 81.875 (3)	TP22.2676x18.2x0.25	292.78	581.91	0.503	0.00	581.91	0.000
L4	81.875 - 76.0833 (4)	TP23.5674x22.2676x0.3262	393.83	688.03	0.572	0.00	688.03	0.000
L5	76.0833 - 71 (5)	TP24.7082x23.5674x0.4537	485.65	798.74	0.608	0.00	798.74	0.000
L6	71 - 68.0833 (6)	TP25.3627x24.7082x0.6488	539.62	1026.93	0.525	0.00	1026.93	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L7	68.0833 - 63.5 (7)	TP26.3913x25.3627x0.685	626.38	1233.83	0.508	0.00	1233.83	0.000
L8	63.5 - 47.42 (8)	TP30x26.3913x0.8147	854.63	1761.31	0.485	0.00	1761.31	0.000
L9	47.42 - 38.0833 (9)	TP31.6377x27.3428x0.8045	949.99	1684.81	0.564	0.00	1684.81	0.000
L10	38.0833 - 35 (10)	TP32.339x31.6377x0.7403	1220.59	1993.42	0.612	0.00	1993.42	0.000
L11	35 - 12.5 (11)	TP37.4568x32.339x0.7647	1751.15	2914.91	0.601	0.00	2914.91	0.000
L12	12.5 - 11 (12)	TP37.798x37.4568x0.7495	1788.38	2922.82	0.612	0.00	2922.82	0.000
L13	11 - 2.5 (13)	TP39.7314x37.798x0.9196	2004.00	3920.26	0.511	0.00	3920.26	0.000
L14	2.5 - 0 (14)	TP40.3x39.7314x0.9631	2068.93	4344.27	0.476	0.00	4344.27	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	117 - 110 (1)	TP15.94x14.36x0.1875	2.07	350.51	0.006	0.00	454.38	0.000
L2	110 - 100 (2)	TP18.2x15.94x0.1875	4.90	387.91	0.013	0.01	575.85	0.000
L3	100 - 81.875 (3)	TP22.2676x18.2x0.25	16.79	650.86	0.026	0.60	1179.93	0.001
L4	81.875 - 76.0833 (4)	TP23.5674x22.2676x0.3262	17.80	730.97	0.024	0.54	1395.11	0.000
L5	76.0833 - 71 (5)	TP24.7082x23.5674x0.4537	18.34	816.88	0.022	0.47	1619.60	0.000
L6	71 - 68.0833 (6)	TP25.3627x24.7082x0.6488	18.67	1038.36	0.018	0.43	2082.28	0.000
L7	68.0833 - 63.5 (7)	TP26.3913x25.3627x0.685	19.19	1199.86	0.016	0.35	2501.81	0.000
L8	63.5 - 47.42 (8)	TP30x26.3913x0.8147	20.52	1567.20	0.013	0.17	3571.38	0.000
L9	47.42 - 38.0833 (9)	TP31.6377x27.3428x0.8045	21.24	1527.23	0.014	0.07	3416.28	0.000
L10	38.0833 - 35 (10)	TP32.339x31.6377x0.7403	22.45	1572.10	0.014	0.13	4042.03	0.000
L11	35 - 12.5 (11)	TP37.4568x32.339x0.7647	24.75	1974.72	0.013	0.51	5910.52	0.000
L12	12.5 - 11 (12)	TP37.798x37.4568x0.7495	24.91	1959.86	0.013	0.54	5926.58	0.000
L13	11 - 2.5 (13)	TP39.7314x37.798x0.9196	25.84	2517.77	0.010	0.69	7949.06	0.000
L14	2.5 - 0 (14)	TP40.3x39.7314x0.9631	26.12	2754.97	0.009	0.74	8808.83	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	117 - 110 (1)	0.002	0.058	0.000	0.006	0.000	0.060 ✔	1.000	4.8.2 ✔
L2	110 - 100 (2)	0.005	0.207	0.000	0.013	0.000	0.212 ✔	1.000	4.8.2 ✔
L3	100 - 81.875 (3)	0.011	0.503	0.000	0.026	0.001	0.514 ✔	1.000	4.8.2 ✔
L4	81.875 - 76.0833 (4)	0.010	0.572	0.000	0.024	0.000	0.583 ✔	1.000	4.8.2 ✔
L5	76.0833 - 71 (5)	0.010	0.608	0.000	0.022	0.000	0.618 ✔	1.000	4.8.2 ✔

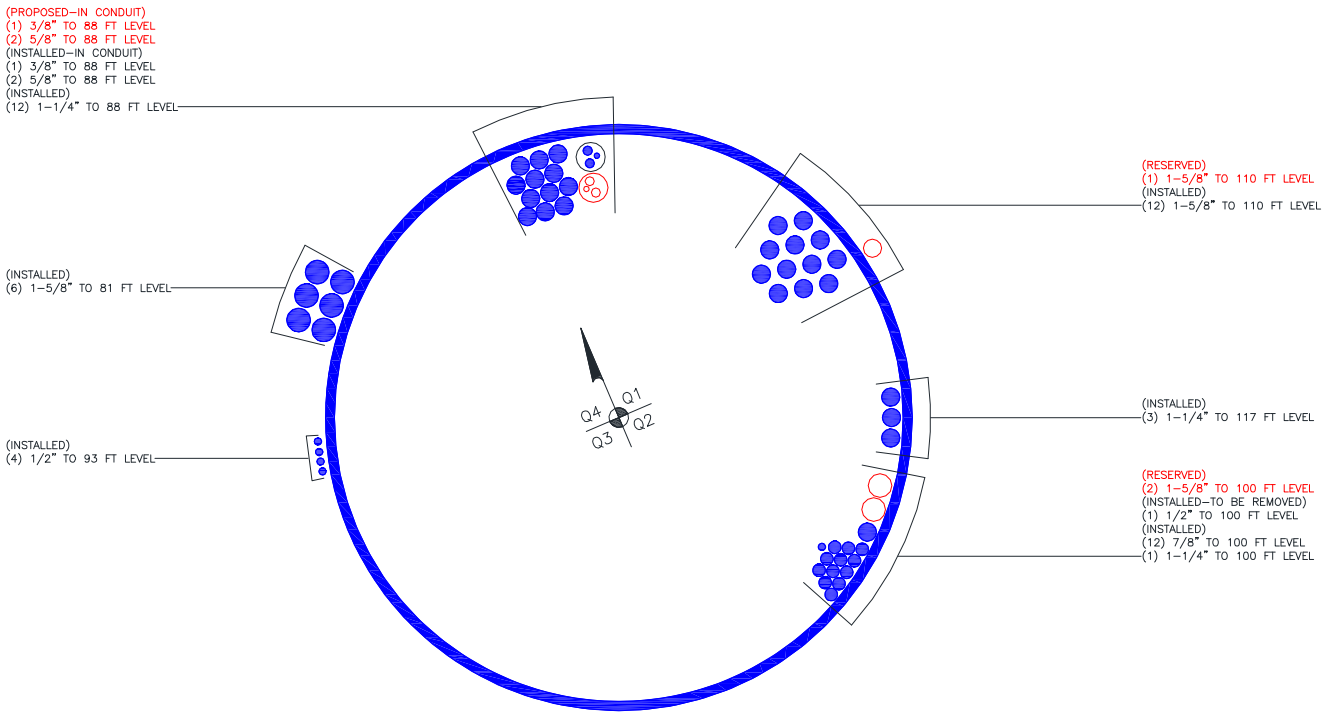
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L6	71 - 68.0833 (6)	0.008	0.525	0.000	0.018	0.000	0.534 ✔	1.000	4.8.2 ✔
L7	68.0833 - 63.5 (7)	0.007	0.508	0.000	0.016	0.000	0.515 ✔	1.000	4.8.2 ✔
L8	63.5 - 47.42 (8)	0.007	0.485	0.000	0.013	0.000	0.492 ✔	1.000	4.8.2 ✔
L9	47.42 - 38.0833 (9)	0.008	0.564	0.000	0.014	0.000	0.572 ✔	1.000	4.8.2 ✔
L10	38.0833 - 35 (10)	0.009	0.612	0.000	0.014	0.000	0.622 ✔	1.000	4.8.2 ✔
L11	35 - 12.5 (11)	0.010	0.601	0.000	0.013	0.000	0.611 ✔	1.000	4.8.2 ✔
L12	12.5 - 11 (12)	0.010	0.612	0.000	0.013	0.000	0.622 ✔	1.000	4.8.2 ✔
L13	11 - 2.5 (13)	0.009	0.511	0.000	0.010	0.000	0.520 ✔	1.000	4.8.2 ✔
L14	2.5 - 0 (14)	0.008	0.476	0.000	0.009	0.000	0.484 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	117 - 110	Pole	TP15.94x14.36x0.1875	1	-1.19	701.02	6.0	Pass
L2	110 - 100	Pole	TP18.2x15.94x0.1875	2	-3.85	775.82	21.2	Pass
L3	100 - 81.875	Pole	TP22.2676x18.2x0.25	3	-13.73	1301.71	51.4	Pass
L4	81.875 - 76.0833	Pole	TP23.5674x22.2676x0.3262	4	-14.96	1461.93	58.3	Pass
L5	76.0833 - 71	Pole	TP24.7082x23.5674x0.4537	5	-15.96	1633.76	61.8	Pass
L6	71 - 68.0833	Pole	TP25.3627x24.7082x0.6488	6	-16.71	2076.71	53.4	Pass
L7	68.0833 - 63.5	Pole	TP26.3913x25.3627x0.685	7	-17.98	2399.72	51.5	Pass
L8	63.5 - 47.42	Pole	TP30x26.3913x0.8147	8	-21.87	3134.39	49.2	Pass
L9	47.42 - 38.0833	Pole	TP31.6377x27.3428x0.8045	9	-24.81	3019.88	57.2	Pass
L10	38.0833 - 35	Pole	TP32.339x31.6377x0.7403	10	-29.30	3144.21	62.2	Pass
L11	35 - 12.5	Pole	TP37.4568x32.339x0.7647	11	-38.26	3949.43	61.1	Pass
L12	12.5 - 11	Pole	TP37.798x37.4568x0.7495	12	-38.88	3919.73	62.2	Pass
L13	11 - 2.5	Pole	TP39.7314x37.798x0.9196	13	-43.23	5035.53	52.0	Pass
L14	2.5 - 0	Pole	TP40.3x39.7314x0.9631	14	-44.60	5509.93	48.4	Pass
							Summary	
						Pole (L12)	62.2	Pass
						RATING =	**62.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

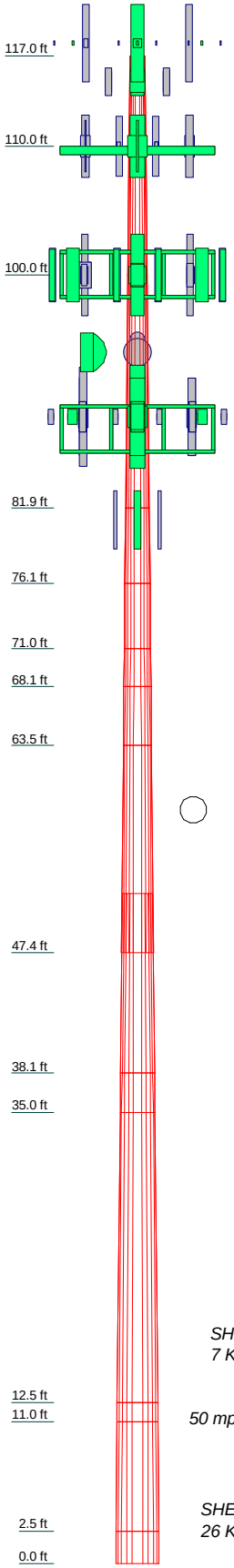

(PROPOSED–IN CONDUIT)
(1) 3/8" TO 88 FT LEVEL
(2) 5/8" TO 88 FT LEVEL
(INSTALLED–IN CONDUIT)
(1) 3/8" TO 88 FT LEVEL
(2) 5/8" TO 88 FT LEVEL
(INSTALLED)
(12) 1–1/4" TO 88 FT LEVEL
(INSTALLED)
(6) 1–5/8" TO 81 FT LEVEL
(INSTALLED)
(4) 1/2" TO 93 FT LEVEL
(RESERVED)
(1) 1–5/8" TO 110 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 110 FT LEVEL
(INSTALLED)
(3) 1–1/4" TO 117 FT LEVEL
(RESERVED)
(2) 1–5/8" TO 100 FT LEVEL
(INSTALLED–TO BE REMOVED)
(1) 1/2" TO 100 FT LEVEL
(INSTALLED)
(12) 7/8" TO 100 FT LEVEL
(1) 1–1/4" TO 100 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

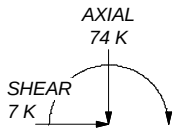
ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Length (ft)	7.0000	10.0000	18.1250	5.7917	5.0833	2.9167	4.5833	16.0800	13.9167	3.0833	22.5000	1.5000	8.5000	2.5000
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.1875	0.1875	0.2500	0.3262	0.4537	0.6488	0.6850	0.8147	0.8045	0.7403	0.7647	0.7495	0.9195	0.9631
Socket Length (ft)								4.5800						
Top Dia (in)	14.3600	15.9400	18.2000	22.2676	23.5674	24.7082	25.3627	26.3913	27.3428	31.6377	32.3390	37.4568	37.7980	39.7314
Bot Dia (in)	15.9400	18.2000	22.2676	23.5674	24.7082	25.3627	26.3913	30.0000	31.6377	32.3390	37.4568	37.7980	39.7314	40.3000
Grade	A572-65													
Weight (K)	0.2	0.3	1.0	0.5	0.6	0.5	0.9	3.9	3.5	0.8	6.4	0.5	3.2	1.0

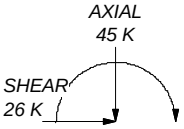
Reinf 52.81 ksi
Reinf 40.66 ksi
Reinf 35.42 ksi
Reinf 37.32 ksi
Reinf 37.42 ksi
Reinf 36.78 ksi
Reinf 36.81 ksi
Reinf 38.55 ksi
Reinf 38.66 ksi
Reinf 38.68 ksi



ALL REACTIONS ARE FACTORED



TORQUE 2 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 4 kip-ft
REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	117	800 10735V01 w/ Mount Pipe	100
APXVSPP18-C-A20 w/ Mount Pipe	117	800 10735V01 w/ Mount Pipe	100
APXVSPP18-C-A20 w/ Mount Pipe	117	800 10735V01 w/ Mount Pipe	100
800 EXTERNAL NOTCH FILTER	117	RRH2X60-PCS	100
800 EXTERNAL NOTCH FILTER	117	RRH2X60-PCS	100
800 EXTERNAL NOTCH FILTER	117	RRH2X60-PCS	100
(3) ACU-A20-N	117	DB-T1-6Z-8AB-0Z	100
(3) ACU-A20-N	117	RRH2X40-07-U	100
(3) ACU-A20-N	117	RRH2X40-07-U	100
Pipe Mount [PM 601-3]	117	RRH2X40-07-U	100
TME-PCS 1900MHz 4x45W-65MHz	115	RRH2X60-AWS	100
TME-PCS 1900MHz 4x45W-65MHz	115	RRH2X60-AWS	100
TME-PCS 1900MHz 4x45W-65MHz	115	RRH2X60-AWS	100
TME-800MHZ RRH	115	Platform Mount [LP 715-1]	100
TME-800MHZ RRH	115	Pipe Mount [PM 601-3]	93
TME-800MHZ RRH	115	VHLP2-11	93
Side Arm Mount [SO 102-3]	115	VHLP1-23	93
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	110	VHLP2.5-11	93
		VHLP1-23	93
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	110	RRUS-11	88
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	110	RRUS-11	88
		DC6-48-60-18-8F	88
KRY 112 144/1	110	QS66512-2 w/ Mount Pipe	88
KRY 112 144/1	110	QS66512-2 w/ Mount Pipe	88
KRY 112 144/1	110	TPA-65R-LCUUUU-H8 w/ Mount Pipe	88
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	110	OPA-65R-LCUU-H8 w/ Mount Pipe	88
		OPA-65R-LCUU-H6 w/ Mount Pipe	88
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	110	OPA-65R-LCUU-H6 w/ Mount Pipe	88
		RRUS 32 B2	88
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	110	RRUS 32 B2	88
		RRUS 32 B2	88
RRUS 11 B12	110	RRUS 32 B30	88
RRUS 11 B12	110	RRUS 32 B30	88
RRUS 11 B12	110	RRUS 32 B30	88
T-Arm Mount [TA 602-3]	110	(2) TPX-070821	88
(2) 2.375" OD x 4' Mount Pipe	110	(2) TPX-070821	88
(2) 2.375" OD x 4' Mount Pipe	110	(2) TPX-070821	88
(2) 2.375" OD x 4' Mount Pipe	110	(2) LGP2140X	88
(2) DB844G65ZAXY w/ Mount Pipe	100	(2) LGP2140X	88
(2) DB844G65ZAXY w/ Mount Pipe	100	(2) LGP2140X	88
(2) DB844G65ZAXY w/ Mount Pipe	100	DC6-48-60-18-8F	88
GPS_A	100	Platform Mount [LP 1301-1]	88
(2) FD9R6004/2C-3L	100	7770.00 w/ Mount Pipe	88
(2) FD9R6004/2C-3L	100	7770.00 w/ Mount Pipe	88
(2) FD9R6004/2C-3L	100	7770.00 w/ Mount Pipe	88
DB-T1-6Z-8AB-0Z	100	RRUS-11	88
(2) HBXX-6516DS-A2M w/ Mount Pipe	100	800 10504 w/ Mount Pipe	81
(2) HBXX-6516DS-A2M w/ Mount Pipe	100	800 10504 w/ Mount Pipe	81
(2) HBXX-6516DS-A2M w/ Mount Pipe	100	800 10504 w/ Mount Pipe	81
		Pipe Mount [PM 601-3]	81

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 62.2%

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

Job:	***117' Monopole / Darien, CT***		
Project:	***PJF 37516-0051 / BU 806352***		
Client: Crown Castle	Drawn by: Robert Koors	App'd:	
Code: TIA-222-G	Date: 01/25/17	Scale: NTS	
Path:		Dwg No. E-1	

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

Reactions		
Mu	13.08	ft-kips
Axial, Pu:	1.19	kips
Shear, Vu:	2.07	kips
Elevation:	110	feet

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

Site Data

BU#:
Site Name:
App #:

Pole Manufacturer: Other

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

Bolt Data			
Qty:	10		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	19.2		

Plate Data		
Diam:	22	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.13	in

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

Pole Data		
Diam:	15.94	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	Rigid / φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	3.15	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.971	in	
Min PL "treq" for actual **T w/ Pry**:	0.174	in	
Min PL "t1" for actual **T w/o Pry**:	0.233	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	3.15	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	5.8%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	1.2	ksi	Rigid / TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	3.8%	**Pass**	Comp. Y.L. Length: 10.70
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	1.4%	**Pass**	

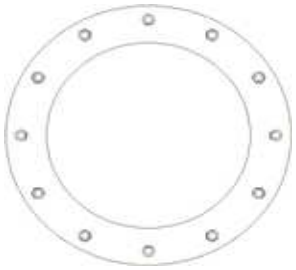
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

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

Site Data

BU#:	
Site Name:	
App #:	

Reactions		
Mu	58.89	ft-kips
Axial, Pu:	3.85	kips
Shear, Vu:	4.9	kips
Elevation:	100	feet

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

Pole Manufacturer:	Other

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

Bolt Data

Qty:	12		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	22		

Plate Data

Diam:	24	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.88	in

Stiffener Data (Welding at Both Sides)

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

Pole Data

Diam:	18.2	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	Rigid / φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	10.39	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.108	in	
Min PL "treq" for actual **T w/ Pry**:	0.363	in	
Min PL "t1" for actual **T w/o Pry**:	0.483	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	10.39	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	19.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	4.7	ksi	Rigid / TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	14.4%	**Pass**	Comp. Y.L. Length: 12.36
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	5.8%	**Pass**	

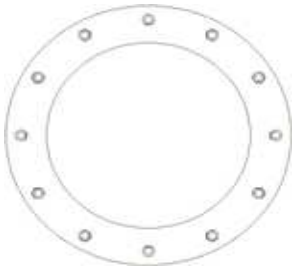
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

PAUL J. FORD & COMPANY
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Phone 614.221.6679 www.pauljford.com

v4.4 - Effective 7-12-13

Date: 1/25/2017
PJF Project: 37516-0051.003.7805
Client Ref. # 806352
Site Name: Site Name
Description: Description
Owner: Owner
Engineer: RMK

Asymmetric Anchor Rod Analysis

Moment =	2069	k-ft	TIA Ref.	G	Location =	Base Plate		
Axial =	45.0	kips	ASIF =	N/A	η =	0.50	for BP, Rev. G Sect. 4.9.9	
Shear =	26.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	18							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
2	2.250	#18J A615 Gr 75	75	100	30.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
3	2.250	#18J A615 Gr 75	75	100	60.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
4	2.250	#18J A615 Gr 75	75	100	90.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
5	2.250	#18J A615 Gr 75	75	100	120.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
6	2.250	#18J A615 Gr 75	75	100	150.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
7	2.250	#18J A615 Gr 75	75	100	180.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
8	2.250	#18J A615 Gr 75	75	100	210.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
9	2.250	#18J A615 Gr 75	75	100	240.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
10	2.250	#18J A615 Gr 75	75	100	270.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
11	2.250	#18J A615 Gr 75	75	100	300.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
12	2.250	#18J A615 Gr 75	75	100	330.0	48.22	0.00	3.98	110.32	104.97	113.42	0.00	260.00	43.6%
13	1.750	A193 Gr B7	105	125	105.0	58.72	0.00	2.41	80.84	77.60	82.71	0.00	190.00	43.5%
14	1.750	A193 Gr B7	105	125	225.0	58.72	0.00	2.41	80.84	77.60	82.71	0.00	190.00	43.5%
15	1.750	A193 Gr B7	105	125	345.0	58.72	0.00	2.41	80.84	77.60	82.71	0.00	190.00	43.5%
16	2.250	A193 Gr B7	105	125	15.0	58.72	0.00	3.98	133.63	128.28	136.72	0.00	325.00	42.1%
17	2.250	A193 Gr B7	105	125	135.0	58.72	0.00	3.98	133.63	128.28	136.72	0.00	325.00	42.1%
18	2.250	A193 Gr B7	105	125	255.0	58.72	0.00	3.98	133.63	128.28	136.72	0.00	325.00	42.1%
								66.90						

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

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

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

Reactions		
Mu:	1297.7	ft-kips
Axial, Pu:	32.1	kips
Shear, Vu:	18.6	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	48.22	in

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

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	113.4	Kips
Allowable Axial, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	43.6%	**Pass**

Rigid
AISC LRFD
φ*Tn

Plate Data		
Diam:	54.22	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	10.80	in

Base Plate Results Flexural Check

Base Plate Stress:	16.2	ksi
Allowable Plate Stress:	54.0	ksi
Base Plate Stress Ratio:	30.0%	**Pass**

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 26.48

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

n/a

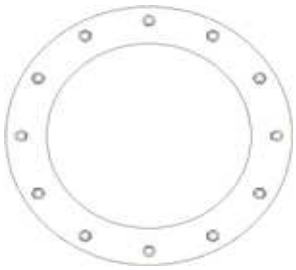
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	40.3	in
Thick:	0.34375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

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Job Number:	37516-0051.003.7805	**Page:**	1
Site Number:	806352	**By:**	RMK
Site Name:	BRG 302 943052	**Date:**	1/25/2017

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	2069.0		k-ft
Shear, Vu =	26.0		kips
Axial Load, Pu1 =	45.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	33.8	0.0	kips (from 0.9D + 1.6W)**
OTMu =	2074.2	0.0	k-ft @ Ground

***Axial Load, Pu1 will be used for Soil Compression Analysis.**

****Axial Load, Pu2 will be used for Steel Analysis.**

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-05
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

Drilled Pier Parameters

Diameter =	6.5 ft
Height Above Grade =	0.2 ft
Depth Below Grade =	16.4 ft
fc' =	3 ksi
εc =	0.003 in/in
L / D Ratio =	2.55
Mat Ftdn. Cap Width =	ft
Mat Ftdn. Cap Length =	ft
Depth Below Grade =	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-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Steel Parameters

Number of Bars =	22
Rebar Size =	#10
Rebar Fy =	60 ksi
Rebar MOE =	29000 ksi
Tie Size =	#6
Side Clear Cover to Ties =	5 in

Soil Parameters

Water Table Depth =	99.00 ft
Depth to Ignore Soil =	4.00 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%

Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

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	4	115		30	Sand				4
2	2	120		39	Sand	23000	420		6
3	5	135		45	Sand	30900	2150		11
4	5.4	155	14000		Clay	36900	4740		16.4
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	13.29	ft, from Grade	
Bending Moment, Mu =	2419.81	k-ft, from COR	
Resisting Moment, ΦMn =	6683.54	k-ft, from COR	
MOMENT RATIO =	**36.2%**	**OK**	
Shear, Vu =	26.00	kips	
Resisting Shear, ΦVn =	71.81	kips	
SHEAR RATIO =	**36.2%**	**OK**	

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	74.36	kips
UPLIFT RATIO =	**0.0%**	**OK**

Soil Results: Compression

Compression, Cu =	45.00	kips
Comp. Capacity, ΦCn =	1476.79	kips
COMPRESSION RATIO =	**3.0%**	**OK**

Steel Results (ACI 318-05):

Minimum Steel Area =	15.93	sq in
Actual Steel Area =	27.94	sq in
Axial, ΦPn (min) =	-1508.76	kips, Where ΦMn = 0 k-ft
Axial, ΦPn (max) =	7170.79	kips, Where ΦMn = 0 k-ft
Axial Load, Pu =	58.27	kips @ 5.75 ft Below Grade
Moment, Mu =	2204.81	k-ft @ 5.75 ft Below Grade
Moment, ΦMn =	4061.51	k-ft
MOMENT RATIO =	**54.3%**	**OK**

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *806352*
Site Name: *BRG 302 943052*
App #:

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	6.5	ft
Concrete Area =	4778.4	in^2

Reinforcement:

Clear Cover to **Tie**=	5.00	in
Horiz. **Tie** Bar Size=	6	
Vert. Cage Diameter =	5.44	ft
Vert. Cage Diameter =	65.23	in
Vertical Bar Size =	10	
Bar Diameter =	1.27	in
Bar Area =	1.27	in^2
Number of Bars =	22	
As Total=	27.94	in^2
A s/ Aconc, Rho:	0.0058	0.58%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.58%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	7170.79	kips
at Mu=(ϕ=0.65)Mn=	3988.84	ft-kips
Max Tu, (φ=0.9) Tn =	1508.76	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	2204.81	ft-kips **(* Note)**
Max. Factored Shaft Pu:	58.27	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	2204.81	ft-kips
1.00	Pu:	58.27	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2005

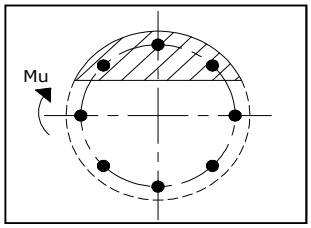
Seismic Properties

Seismic Design Category =	D
Seismic Risk =	**High**

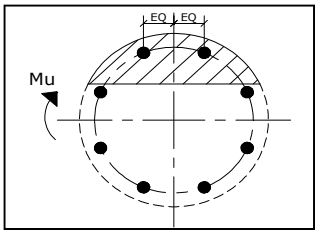
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **1**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**13.42**	in
Extreme Steel Strain, ϵt:	**0.0130**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	58.27	kips
Drilled Shaft Moment Capacity, φMn:	**4061.51**	ft-kips
Drilled Shaft Superimposed Mu:	**2204.81**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**54.3%**

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

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703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

Smartlink LLC on behalf of AT&T Mobility, LLC
Site FA – 10035058
Site ID – CT2104 (Multi-Carrier)
USID – 60391
Site Name – Darien
Site Compliance Report

50 Ledge Road
Darien, CT 06820

Latitude: N41-4-20.75
Longitude: W73-28-41.38
Structure Type: Monopole

Report generated date: February 21, 2017
Report by: Leo Romero
Customer Contact: Kristen Smith

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	No
RF Sign(s) @ antennas	No
Barrier(s) @ sectors	No
Max cumulative simulated RFE level on the Ground Level	<1% General Public Limit at AT&T Mobility, LLC Alpha, Beta and Gamma Sectors
FCC & AT&T Compliant?	will be compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CT2104_2017-Antenna-Modifications_4TXRX_mm093q_2051A0494S_10035058_60391_12-22-2015_Final-Approved_v3.00

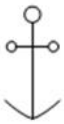
CD's: 10035058_AE201_170214_CTL02104_Rev1_MC CD_S&S

RF Powers Used: RFDS ERP Values

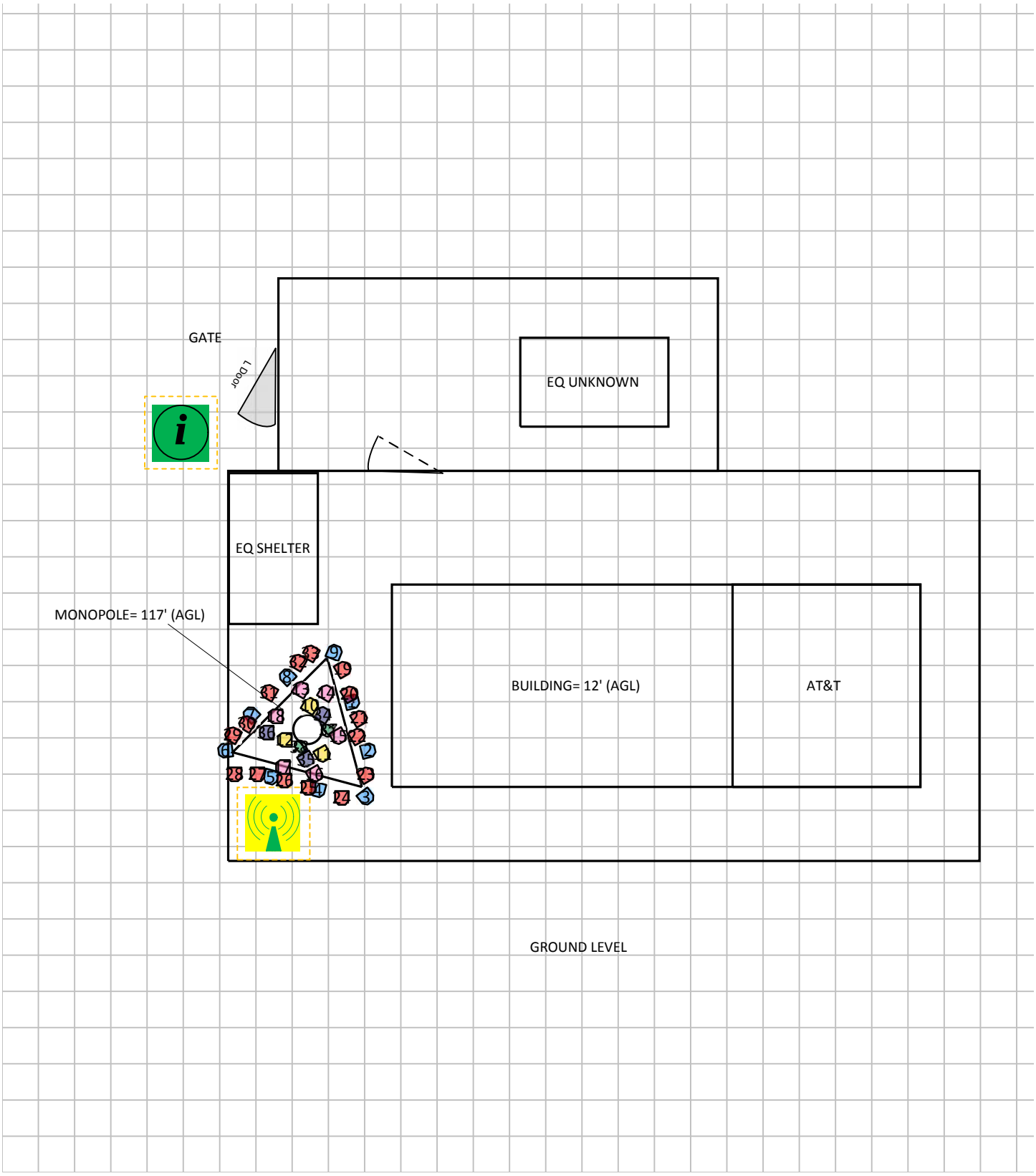
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- AT&T Mobility, LLC Contribution
- Elevation View

Scale Map Key		
 Existing Sign	Proposed Barrier	GPS Reading
 Proposed Sign	Existing Barrier	 Anchor Point

Site Scale Map For: Darien



(Feet)

0 4.7 9.5

www.sitesafe.com
Site Name:Darien
2/21/2017 4:11:45 PM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | METROPCS | CRICKET COMM. | CLEARWIRE | SPRINT

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	737	75	69	6	11.46	0	0	1	1475.7	65.7'	90.7'	86'
1	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	75	68	6	14.16	0	0	1	3664.4	65.7'	90.7'	86'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	850	75	61	6	12.46	1	0	0	159.9	66.9'	87.4'	86'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	2300	75	60	6	15.46	0	0	1	1227.4	66.9'	87.4'	86'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	142	82	4.6	11.51	0	2	0	594.3	66.7'	84.2'	86.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	142	86	4.6	13.41	0	2	0	1172.3	66.7'	84.2'	86.7'
4	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	737	195	69	6	11.46	0	0	1	1475.7	63.4'	84.7'	86'
4	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	195	68	6	14.16	0	0	1	3664.4	63.4'	84.7'	86'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	850	195	61	6	12.46	1	0	0	159.9	60.1'	85.5'	86'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	2300	195	60	6	15.46	0	0	1	1227.4	60.1'	85.5'	86'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	262	82	4.6	11.51	0	2	0	594.3	57'	87.4'	86.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	262	86	4.6	13.41	0	2	0	1172.3	57'	87.4'	86.7'
7	AT&T MOBILITY LLC (Proposed)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	737	315	61.9	8	13.56	0	0	1	1475.7	58.8'	89.8'	85'
7	AT&T MOBILITY LLC (Proposed)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	1900	315	68.2	8	13.86	0	0	1	3664.4	58.8'	89.8'	85'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H8	Panel	850	315	59.2	7.7	13.86	1	0	0	71.4	61.3'	92.5'	85.1'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H8	Panel	2300	315	63.7	7.7	14.66	0	0	1	1145.5	61.3'	92.5'	85.1'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	22	82	4.6	11.51	0	2	0	594.3	64.5'	94.2'	86.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	22	86	4.6	13.41	0	2	0	1172.3	64.5'	94.2'	86.7'
10	SPRINT	RFS APXVSPP18-C-A20	Panel	862	30	65	6	13.37	-	-	-	869.1	62.8'	90.5'	117'
10	SPRINT	RFS APXVSPP18-C-A20	Panel	1900	30	65	6	16.27	-	-	-	2541.9	62.8'	90.5'	117'
11	SPRINT	RFS APXVSPP18-C-A20	Panel	862	150	65	6	13.37	-	-	-	869.1	63.7'	87.1'	117'
11	SPRINT	RFS APXVSPP18-C-A20	Panel	1900	150	65	6	16.27	-	-	-	2541.9	63.7'	87.1'	117'
12	SPRINT	RFS APXVSPP18-C-A20	Panel	862	270	65	6	13.37	-	-	-	869.1	61.1'	88.1'	117'
12	SPRINT	RFS APXVSPP18-C-A20	Panel	1900	270	65	6	16.27	-	-	-	2541.9	61.1'	88.1'	117'
13	T-MOBILE	Ericsson AIR 21 B2A B4P	Panel	1900	30	65	4.7	15.37	-	-	-	2066.1	62.2'	91.6'	107.7'
14	T-MOBILE	Ericsson B2A/B5P/B12P	Panel	2100	30	65	4.5	14.87	-	-	-	1841.4	64'	91.3'	107.8'
15	T-MOBILE	Ericsson AIR 21 B2A B4P	Panel	1900	150	65	4.7	15.37	-	-	-	2066.1	64.8'	88.3'	107.7'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
16	T-MOBILE	Ericsson B2A/B5P/B12P	Panel	2100	150	65	4.5	14.87	-	-	-	1841.4	63.2'	85.7'	107.8'
17	T-MOBILE	Ericsson AIR 21 B2A B4P	Panel	1900	270	65	4.7	15.37	-	-	-	2066.1	61'	86.2'	107.7'
18	T-MOBILE	Ericsson B2A/B5P/B12P	Panel	2100	270	65	4.5	14.87	-	-	-	1841.4	60.5'	89.7'	107.8'
19	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	60	65	4	13.47	-	-	-	889.3	65.1'	93'	98'
20	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	2100	60	63	4.2	15.56	-	-	-	2158.5	65.6'	91.3'	97.9'
21	VERIZON WIRELESS	Kathrein-Scala 800-10735	Panel	751	60	67	6.3	13.05	-	-	-	1211	66.3'	89.6'	96.8'
22	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	1900	60	65	4.2	14.93	-	-	-	1867	66.1'	88.4'	97.9'
23	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	60	65	4	13.47	-	-	-	889.3	66.7'	85.7'	98'
24	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	180	65	4	13.47	-	-	-	889.3	65'	84.1'	98'
25	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	2100	180	63	4.2	15.56	-	-	-	2158.5	62.8'	84.8'	97.9'
26	VERIZON WIRELESS	Kathrein-Scala 800-10735	Panel	751	180	67	6.3	13.05	-	-	-	1211	61.1'	85.3'	96.8'
27	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	1900	180	65	4.2	14.93	-	-	-	1867	59.2'	85.7'	97.9'
28	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	180	65	4	13.47	-	-	-	889.3	57.6'	85.7'	98'
29	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	300	65	4	13.47	-	-	-	889.3	57.5'	88.4'	98'
30	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	2100	300	63	4.2	15.56	-	-	-	2158.5	58.5'	89.2'	97.9'
31	VERIZON WIRELESS	Kathrein-Scala 800-10735	Panel	751	300	67	6.3	13.05	-	-	-	1211	60'	91.4'	96.8'
32	VERIZON WIRELESS	Andrew HBXX-6516DS-VTM	Panel	1900	300	65	4.2	14.93	-	-	-	1867	62'	93.5'	97.9'
33	VERIZON WIRELESS	Andrew DB844G65ZAXY	Panel	850	300	65	4	13.47	-	-	-	889.3	62.9'	94.1'	98'
34	METROPCS (Decommissioned)	Kathrein-Scala 800-10504	Panel	1900	30	63.3	4.5	15.78	-	-	-	0	63.7'	89.8'	78.7'
35	METROPCS (Decommissioned)	Kathrein-Scala 800-10504	Panel	1900	150	63.3	4.5	15.78	-	-	-	0	62.6'	86.7'	78.7'
36	METROPCS (Decommissioned)	Kathrein-Scala 800-10504	Panel	1900	270	63.3	4.5	15.78	-	-	-	0	59.8'	88.6'	78.7'
37	CLEARWIRE	Generic Microwave	Aperture	11585	47.6	2	2	31.16	-	-	-	59.1	64.1'	88.8'	93'
38	CLEARWIRE	Generic Microwave	Aperture	11345	237.9	2	2	31.16	-	-	-	43.9	62.1'	87.6'	93'

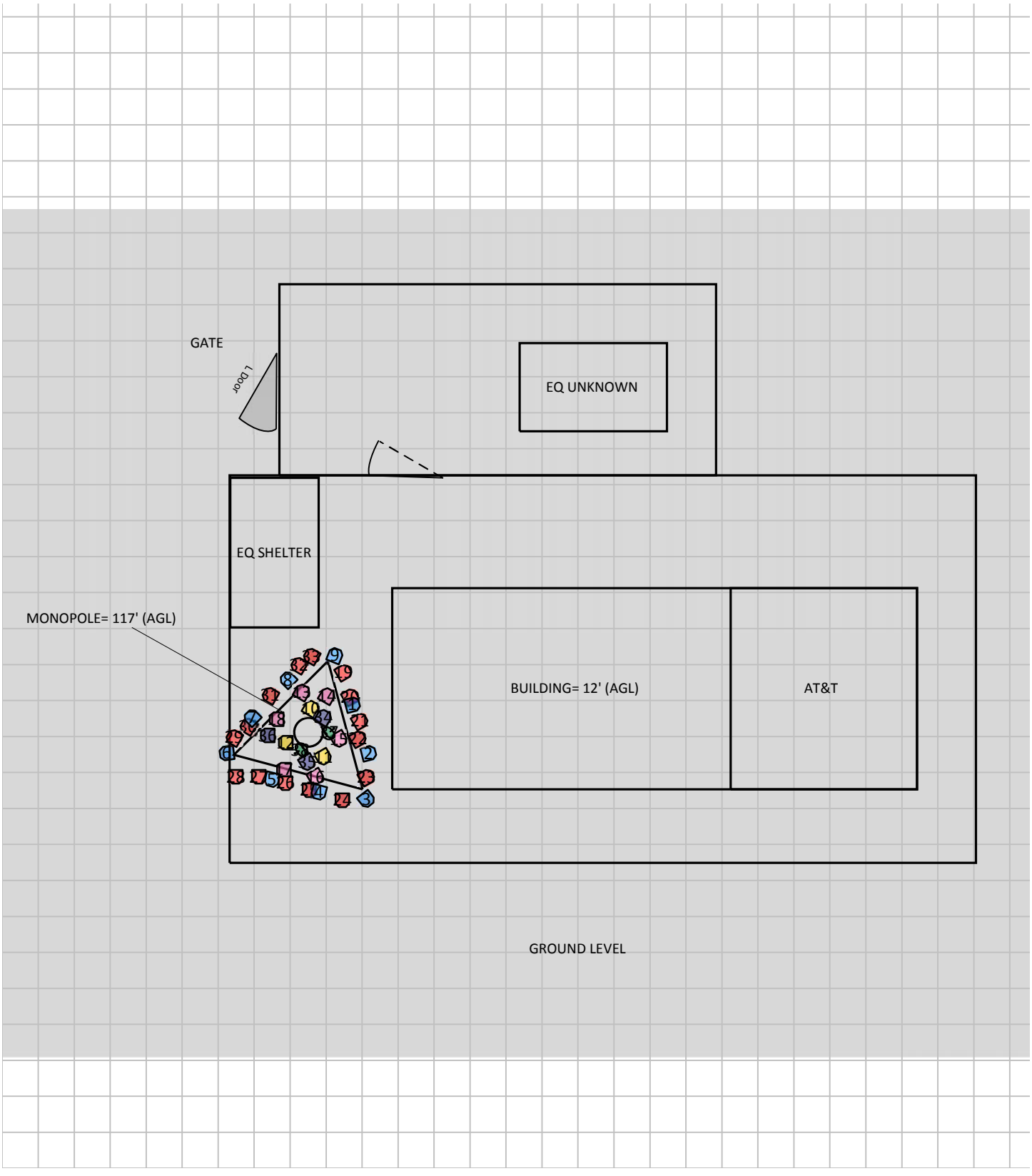
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level (AGL).** The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Darien



% of FCC Public Exposure Limit Spatial average 0' - 6'

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC · VERIZON WIRELESS · T-MOBILE · METROPCS · CRICKET COMM. · CLEARWIRE · SPRINT

Sign Legend

Caution 1 · Caution 2 · Notice 2 · Notice 1 · Warning · Info 1 · Info 2

Barrier · Proposed Barriers/ Signs

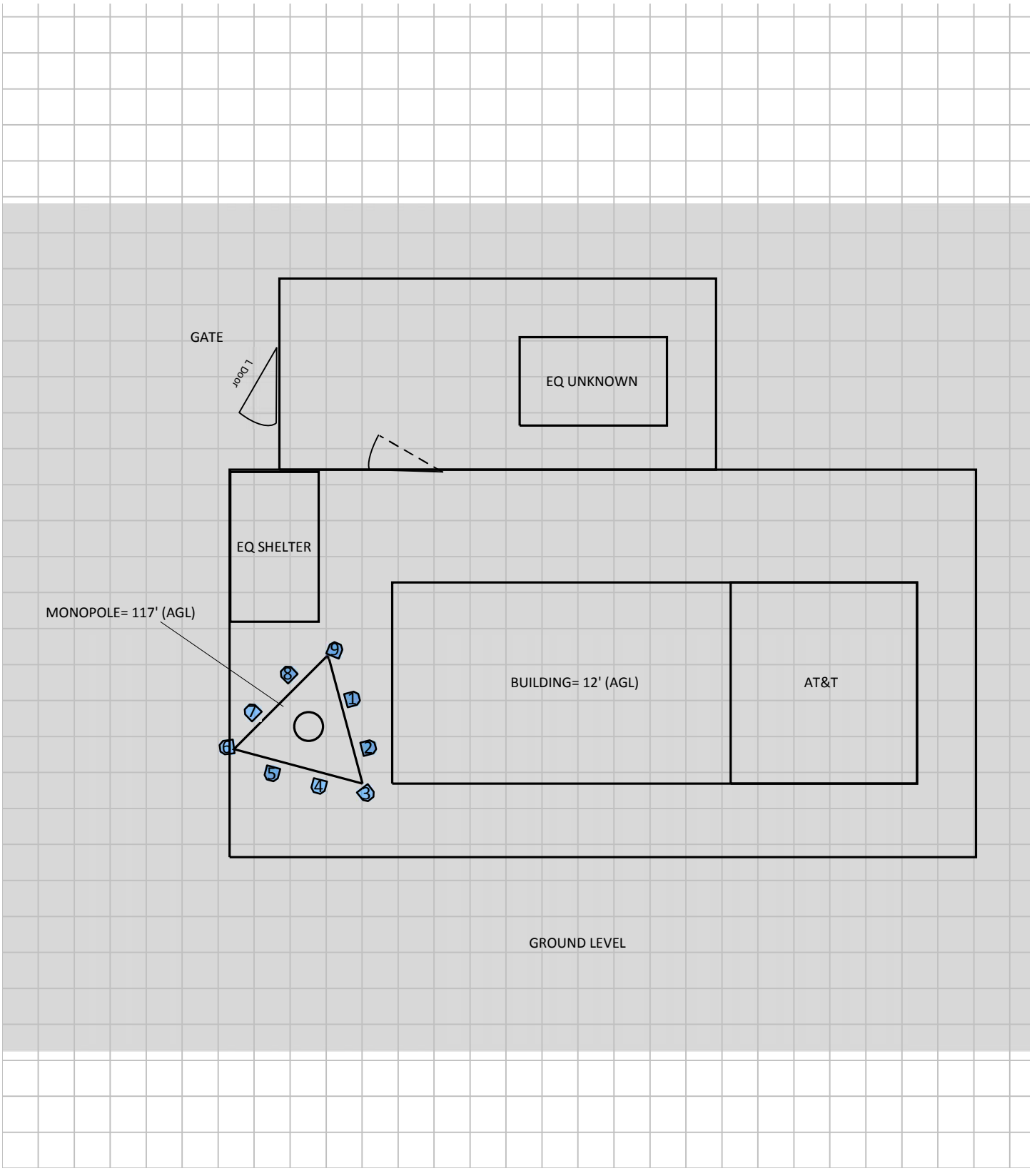
(Feet)

0 4.8 9.5

www.sitesafe.com
Site Name:Darien
2/21/2017 4:06:59 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.256
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Darien
AT&T Mobility, LLC Contribution



% of FCC Public Exposure Limit Spatial average 0' - 6'

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC · VERIZON WIRELESS · T-MOBILE · METROPCS · CRICKET COMM. · CLEARWIRE · SPRINT

Sign Legend

Caution 1 · Caution 2 · Notice 2 · Notice 1 · Warning · Info 1 · Info 2

Barrier

Proposed Barriers/ Signs

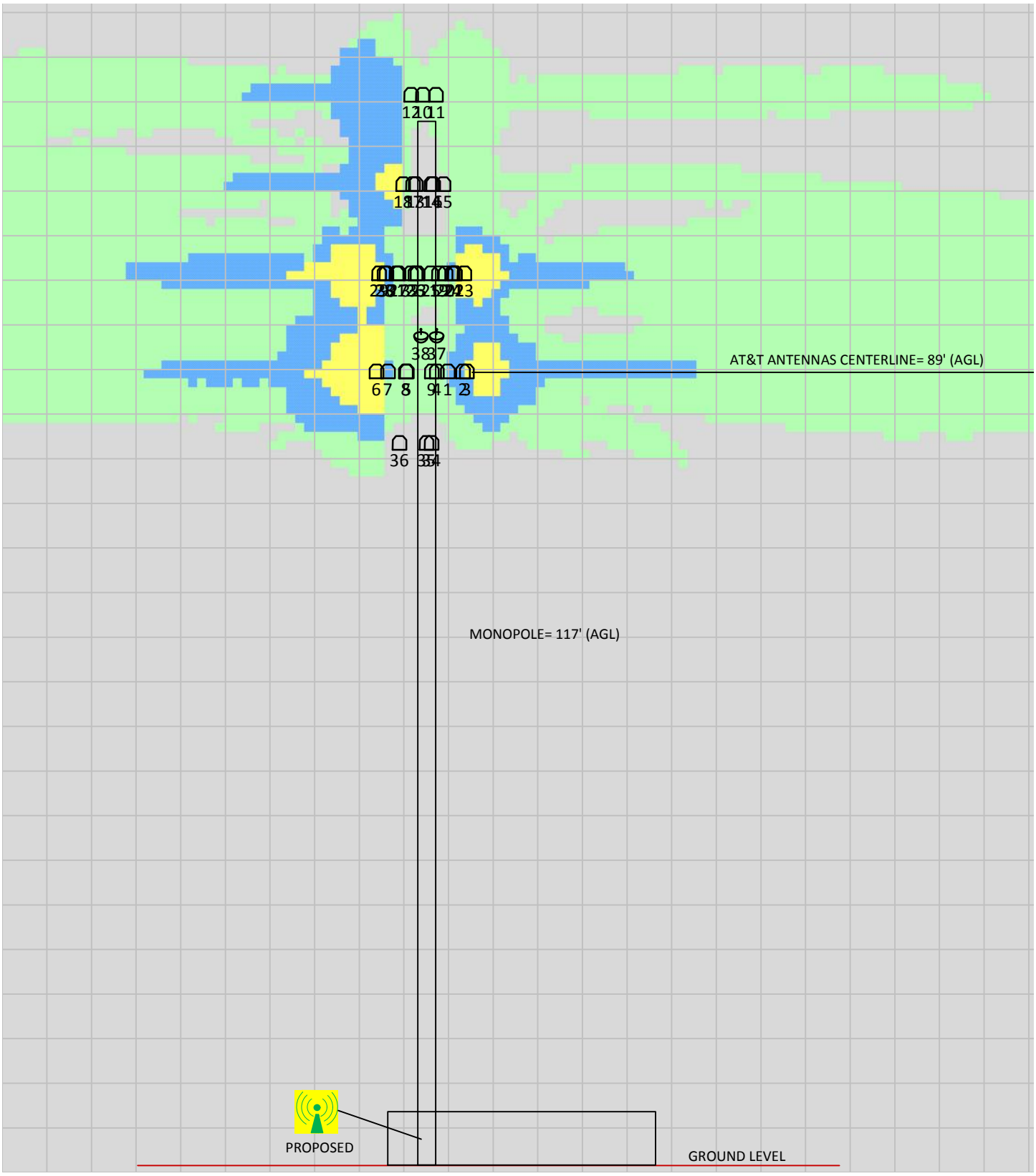
(Feet)

0 4.8 9.5

www.sitesafe.com
Site Name:Darien
2/21/2017 4:10:01 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.256
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Darien
Elevation View



% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | METROPCS | CRICKET COMM. | CLEARWIRE | SPRINT

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier

Proposed Barriers/ Signs

(Feet)

0 7.7 15.4

www.sitesafe.com
Site Name:Darien
2/21/2017 4:16:54 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.256
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Single Level (0)

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Base of Tower

Caution 2 sign required.

Compound Gate

Information 1 sign required.

6 Reviewer Certification

The Reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Leo Romero.

February 21, 2017

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

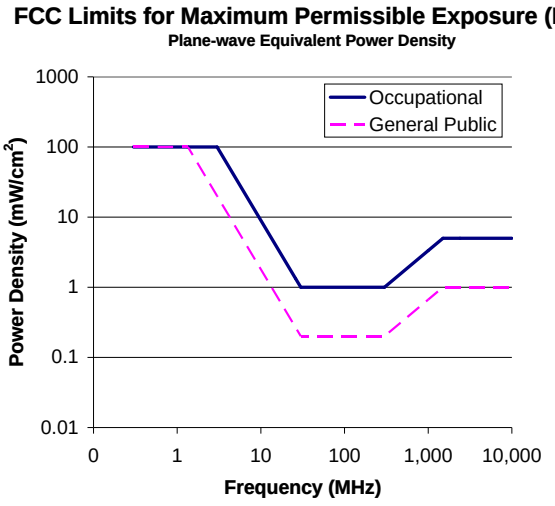
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels**.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
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