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

December 21, 2016

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: 876362**
AT&T Site ID: CT2090
338 Oxford Road, Oxford, CT 06478
Latitude: 41° 25′ 40.77″/ Longitude: -73° 6′ 30.75″

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 137-foot level of the existing 150-foot monopole tower at 338 Oxford Road in Oxford, CT. The tower is owned by Crown Castle. The property is owned by the William and Ellen Fritz. AT&T now intends to replace three (3) RR11s with three (3) RRU12s, and remove six (6) diplexers.

A request for original zoning documents was sent to the Town of Oxford but has not been answered.

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 Mr. George Temple, First-Selectman, Town of Oxford, 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: Mr. George Temple, First-Selectman
Town of Oxford
486 Oxford Road
Oxford, CT 06478

William and Ellen Fritz
338 Oxford Road
Oxford, CT 06478

Town of Oxford
Property Listing Report

Parcel ID 34/9/34A/CELL

Account T1234567

Property Information

Owner	CROWN CASTLE USA INC
Address	338 OXFORD RD
Mailing Address	PMB 331 MCMURRAY , PA 15317
Land Use	- Cell Tower
Land Class	I

Census Tract	
Neighborhood	
Zoning	
Acreage	0
Utilities	
Lot Setting/ Desc	/

Photo

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

	Appraised	Assessed
Buildings	0	0
Outbuildings	691200	483800
Improvements	691200	483800
Extras	0	0
Land	0	0
Total	691200	483800
Previous		

Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Total Rooms	
Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Flat
Roof Cover	Concrete Tile

EXTERIOR WALLS:	
Primary	MASONRY
Secondary	Stone/Masonry
INTERIOR WALLS:	
Primary	Minim/Masonry
Secondary	
FLOORS:	
Primary	Concr-Finished
Secondary	
HEATING/AC:	
Heating Type	None
Heating Fuel	Coal or Wood
AC Type	None

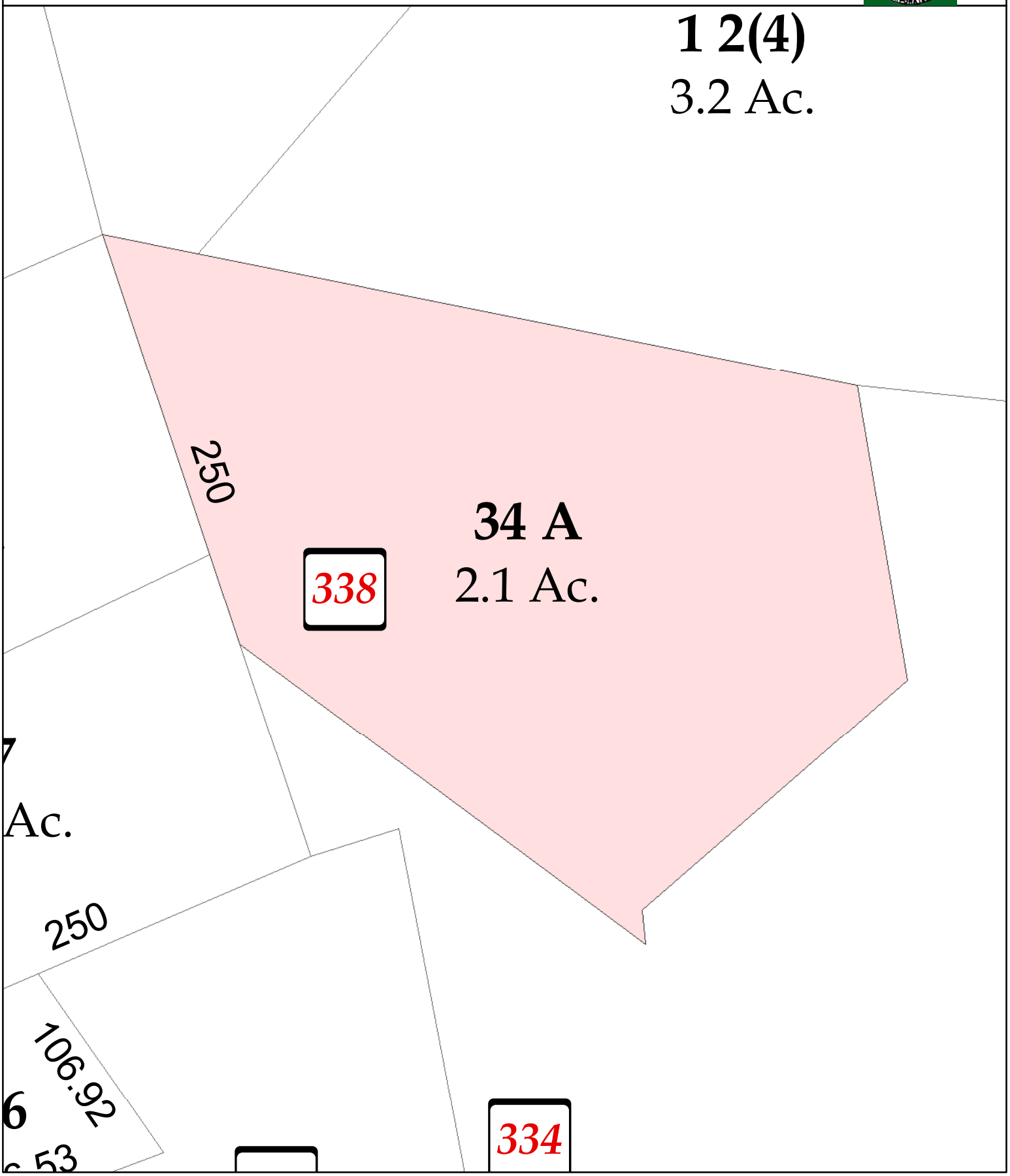
BUILDING AREA:	
Effective Building Area	
Gross Building Area	
Total Living Area	

SALES HISTORY:	
Sale Date	10/1/2010
Sale Price	0
Book/ Page	000/ 000

Report Created On 12/21/2016

Town of Oxford, Connecticut - Assessment Parcel Map

Parcel: 34-9-34-A **Location:** 338 OXFORD RD



Approximate Scale: 1 inch = 71 feet

0 30 60 90 120 Feet

Map Produced: December 2015

at&t

PROJECT:	LTE MULTI-CARRIER
SITE NUMBER:	CTL02090
FA NUMBER:	10035376
PTN NUMBER:	-
PACE NUMBER:	MRCTB018546
CROWN BU#:	876362
SITE NAME:	OXFORD-EAST
SITE ADDRESS:	338 OXFORD ROAD
	OXFORD, CT 06478

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

PROJECT INFORMATION

SITE NAME:	OXFORD-EAST
SITE NUMBER:	CTL02090
SITE ADDRESS:	338 OXFORD ROAD OXFORD, CT 06478
FA NUMBER:	10035376
PTN NUMBER:	-
PACE NUMBER:	MRCTB018546
USID NUMBER:	27032
CROWN BU#:	876362
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
TOWER OWNER:	CROWN CASTLE INTERNATIONAL 12 GILL STREET, SUITE 5800 WOBURN, MA 01801
JURISDICTION:	TOWN OF OXFORD
COUNTY:	NEW HAVEN
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.4280200°
LONGITUDE:	-73.1085550°
GROUND ELEV.:	378'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	CAMERON SYME
PHONE:	(508) 596-7146
EMAIL:	cs6970@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	RYAN BURGDORFER (508) 665-8005
EMAIL:	Ryan.Burgdorfer@Smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@Smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@fullertonengineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

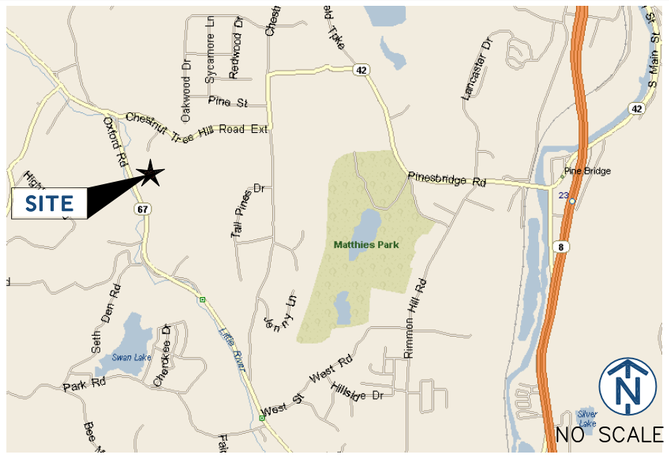
SCOPE OF WORK

LTE MULTI-CARRIER PROPOSED PROJECT SCOPE HEREIN BASED ON RFDS ID # 1189645, VERSION 2.00 LAST UPDATED 07/01/16.

- (3) NEW RRUS-12 UNITS TO REPLACE (3) EXISTING RRUS-11 UNITS
- (1) NEW XMU CARD

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP



DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

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.

BUILDING CODE:	2012 INTERNATIONAL BUILDING CODE
ELECTRICAL CODE:	2011 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

REV	DATE	DESCRIPTION	BY
0	08/10/16	90% REVIEW	KC
1	11/30/16	FOR PERMIT	KC

I HEREBY CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
OXFORD-EAST

SITE NUMBER:
CTL02090

SITE ADDRESS
338 OXFORD ROAD
OXFORD, CT 06478

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

FEC# 2016.02000089

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.

3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF 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. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.

10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.

11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.

12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.

13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.

14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.

15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.

16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.

19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.

21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.

22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.

23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED 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.

24. 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.

25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.

26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.

28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.

29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.

30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.

31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).

33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.

34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.

35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.

36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.

37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.

38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.

41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.

42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.

43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.

45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.

46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.

47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.

48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.

49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.

50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.

52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
   A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
   B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.

54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.

55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.

63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.

64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.

65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".

66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.

67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.

68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.

69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.

72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.

73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.

74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.

75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
   A. TEMPERATURE SHALL BE ABOVE 50° F.
   B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
   C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
   D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS

76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
   A. GROUNDING AT THE ANTENNA LEVEL.
   B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
   C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
   D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
   E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.

77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
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TEL: 847-908-8400
COA# PEC.0001444
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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
OXFORD-EAST

SITE NUMBER:
CTL02090

SITE ADDRESS
338 OXFORD ROAD
OXFORD, CT 06478

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

NOTICE

Beyond This Point you are entering a controlled area where RF emissions *may exceed* the FCC General Population Exposure Limits.

Follow all posted signs and site guidelines for working in a RF environment.

at&t

Ref: 47CFR 1.1307(b)

CAUTION

Beyond This Point you are entering a controlled area where RF emissions *may exceed* the FCC Occupational Exposure Limits.

Obey all posted signs and site guidelines for working in a RF environment.

at&t

Ref: 47CFR 1.1307(b)

ALERTING SIGNS

WARNING!

DANGER DO NOT TOUCH TOWER!

SERIOUS "RF" BURN HAZARD!

MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES

FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN A RADIO FREQUENCY ENVIRONMENT COULD RESULT IN SERIOUS INJURY. CONTACT CURRENT MAY EXCEED LIMITS PRESCRIBED IN ANSI/EEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.

at&t

ALERTING SIGN

PROPERTY OF AT&T

at&t

AUTHORIZED
PERSONNEL ONLY

IN CASE OF EMERGENCY, OR PRIOR TO PERFORMING MAINTENANCE ON THIS SITE, CALL 800-638-2822 AND REFERENCE CELL SITE NUMBER_____

INFO SIGN #4

INFORMATION

AT&T operates telecommunications antennas at this location. Remain at least 3 feet away from any antenna and obey all posted signs.

Contact the owner(s) of the antenna(s) before working closer than 3 feet from the antenna.

Contact AT&T at _____ prior to performing any maintenance or repairs near AT&T antennas. This is Site#_____

Contact the management office if this door/hatch/gate is found unlocked.

INFORMACION

En esta propiedad se ubican antenas de telecomunicationes operadas por AT&T. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.

Comuniquese con el propietario o los propicetarios de las antenas antes de trabajar o caminar a una distancia de menos de 3 pies de la antena.

Comuniquese con AT&T, _____ antes de realizar cualquier mantenimiento o reparaciones cerca de la antenas de AT&T.

Esta es la estacion base numero_____

Favor comunicarse con la oficina de la administracion del edificio si esta puerta o compuerta se encuentra sin candado.

at&t

INFO SIGN #1

INFORMATION

ACTIVE ANTENNAS ARE MOUNTED

- ☐ ON THE OUTSIDE OF THIS BUILDING
- ☐ BEHIND THIS PANEL
- ☐ ON THIS STRUCTURE

STAY BACK A MINIMUM OF 3 FEET FROM THESE ANTENNAS

Contact AT&T at _____ and follow their instructions prior to performing any maintenance or repairs closer than 3 feet from the antennas.

This is AT&T site# _____

at&t

INFO SIGN #2

STAY BACK 3 FEET FROM ANTENNA

at&t

INFO SIGN #3

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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25358
LICENSED PROFESSIONAL ENGINEER

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SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP2

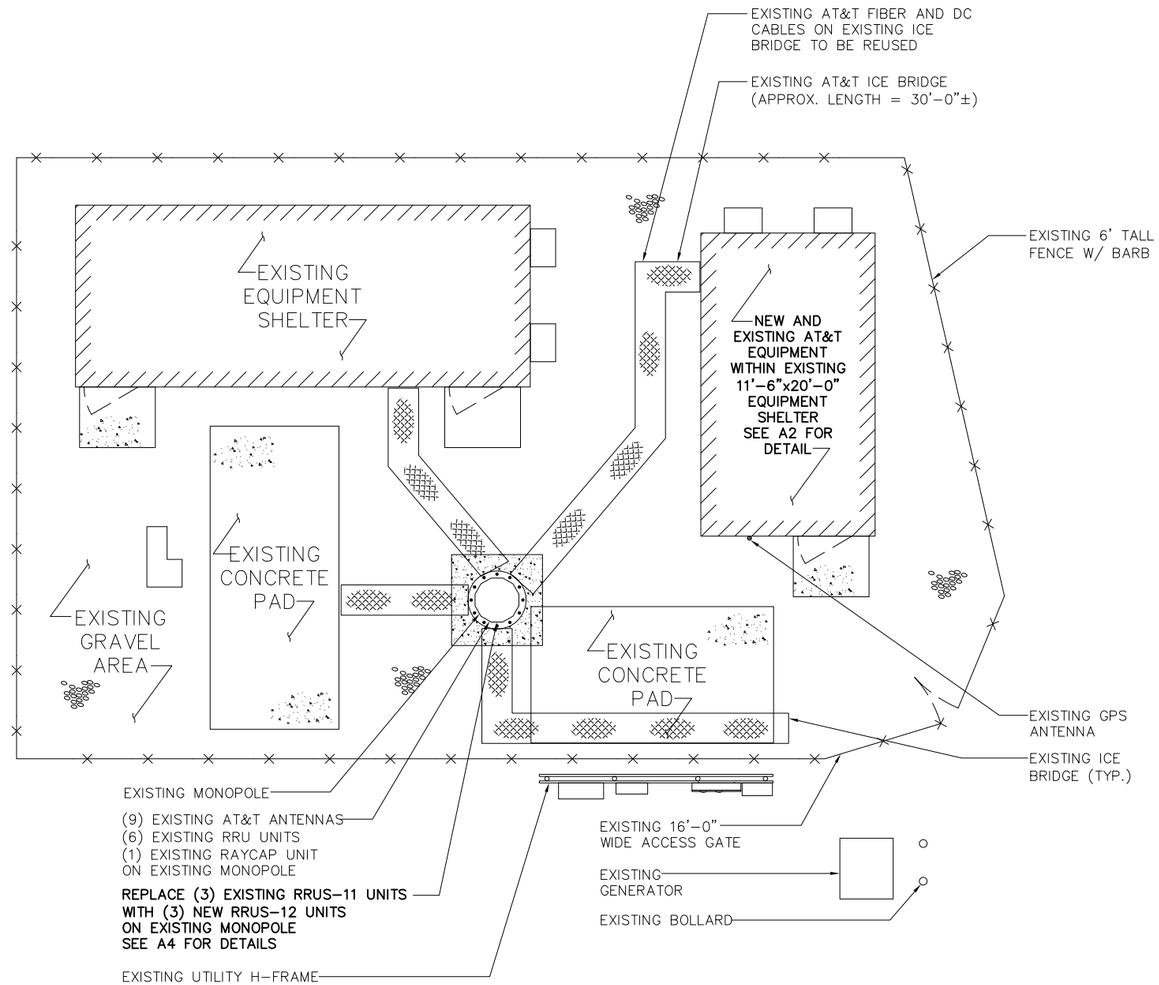
FEC# 2016.02000089

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE (A / S-1 / A)



COMPOUND PLAN — SCALE 1" = 10'-0" | 1

SITE PHOTO 1 — SCALE: N.T.S. | 2

SITE PHOTO 2 — SCALE: N.T.S. | 3

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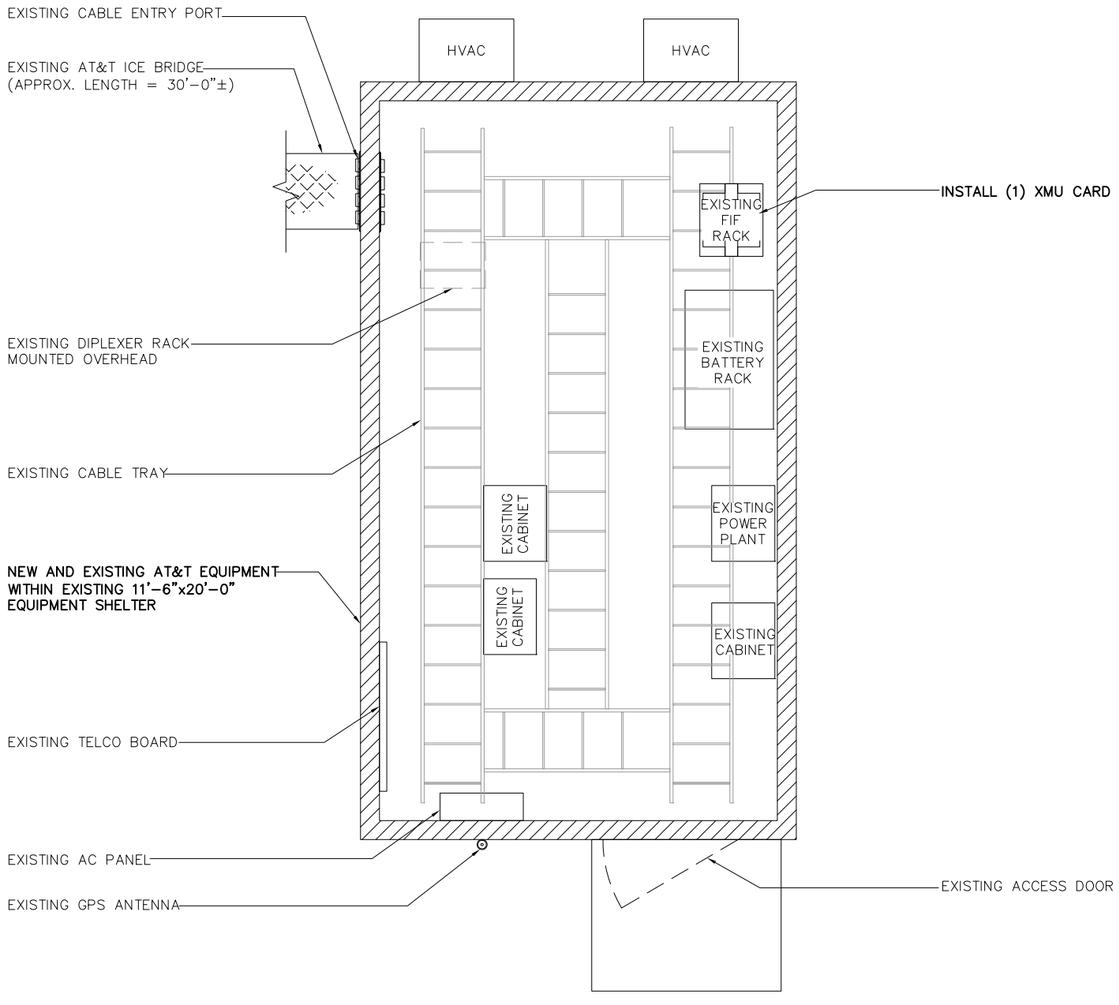
OXFORD, CT 06478

SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

FEC# 2016.02000089



EQUIPMENT PLAN

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

1

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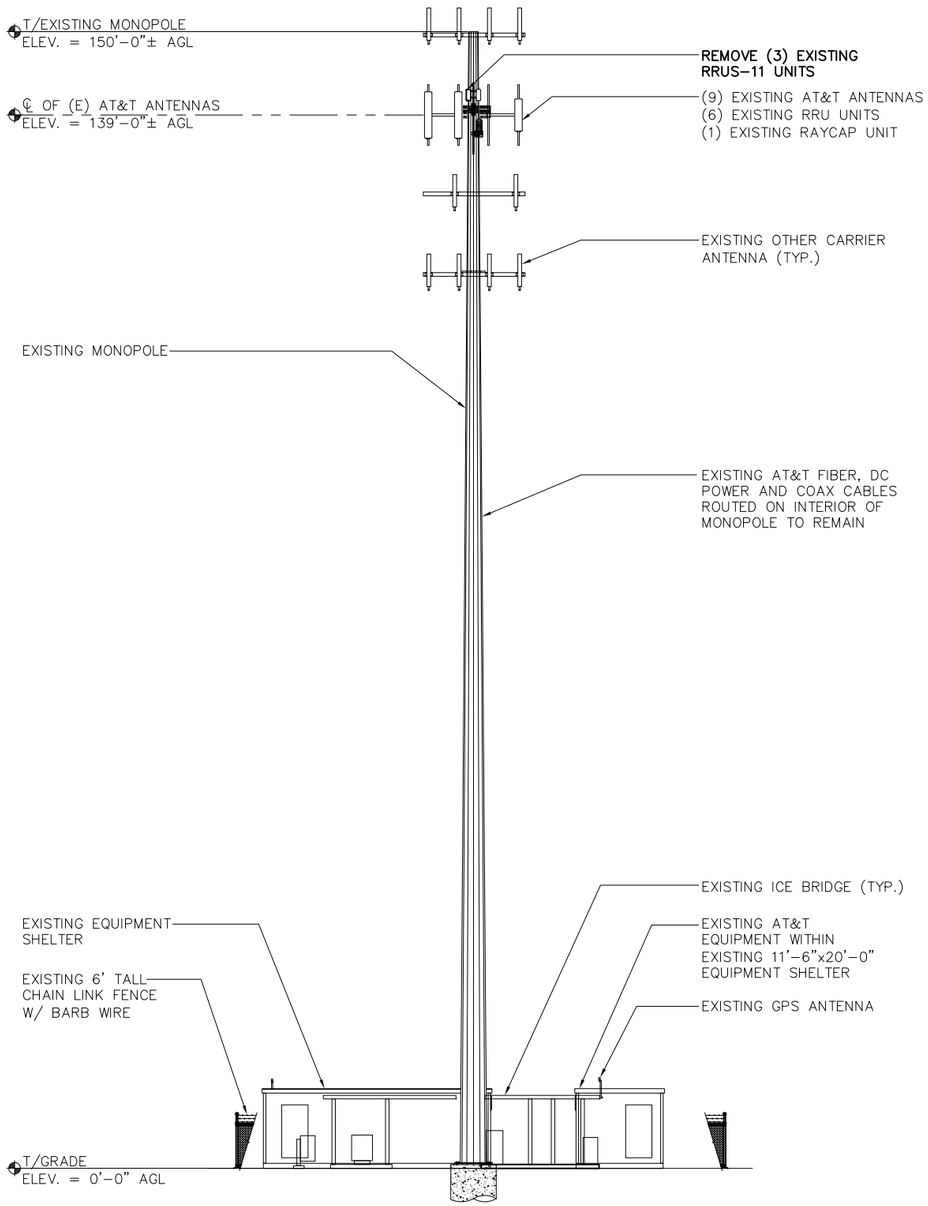
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

FEC# 2016.02000089

NOTES:

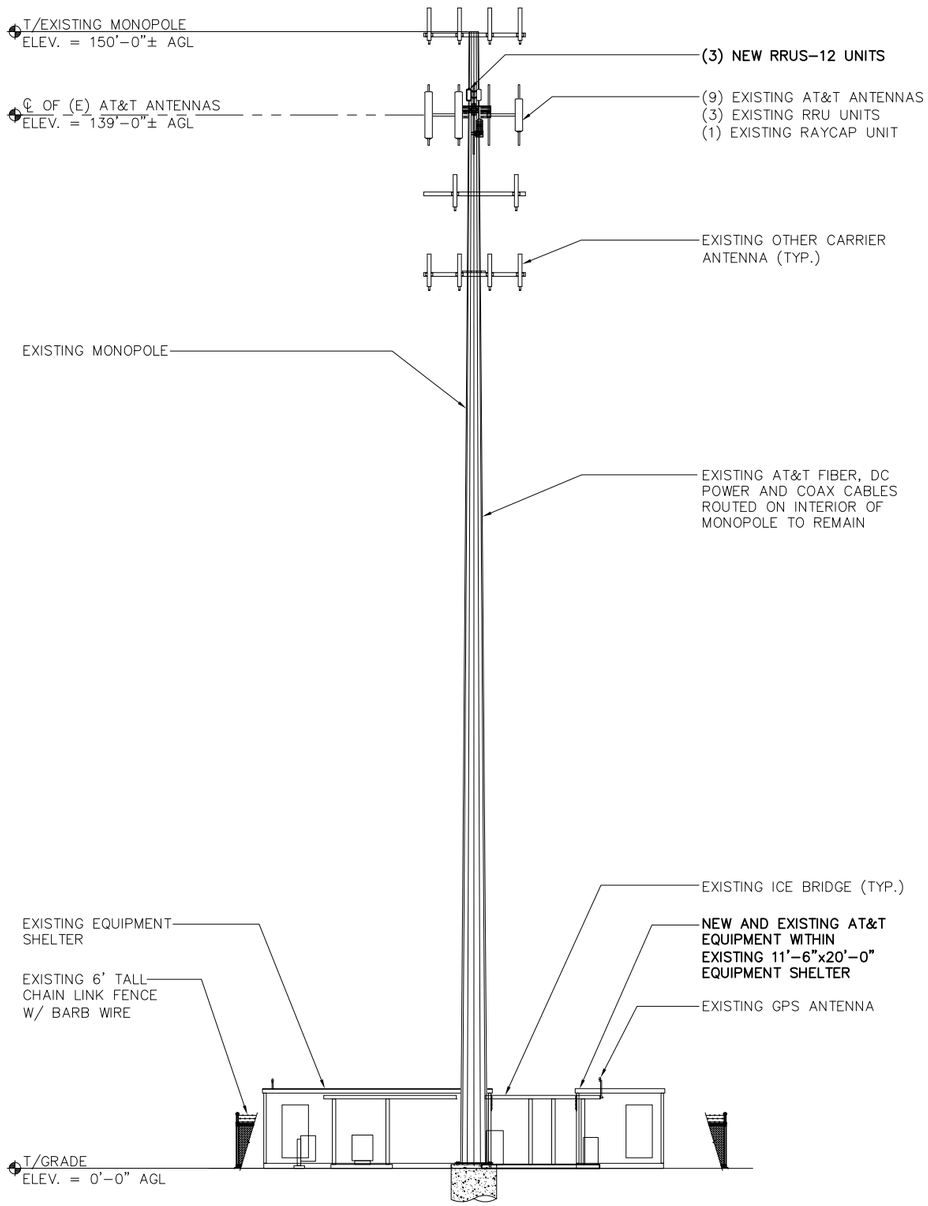
1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
3. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION — SCALE: 1" = 20'-0" — 1

NOTES:

1. ALL EQUIPMENT (ANTENNAS, LINES, ETC.) TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.
2. TAPE DROP FORMS AND PHOTOGRAPHS TO BE SUBMITTED PER CCI AND AT&T CLOSEOUT REQUIREMENTS.



NEW ELEVATION — SCALE: 1" = 20'-0" — 2

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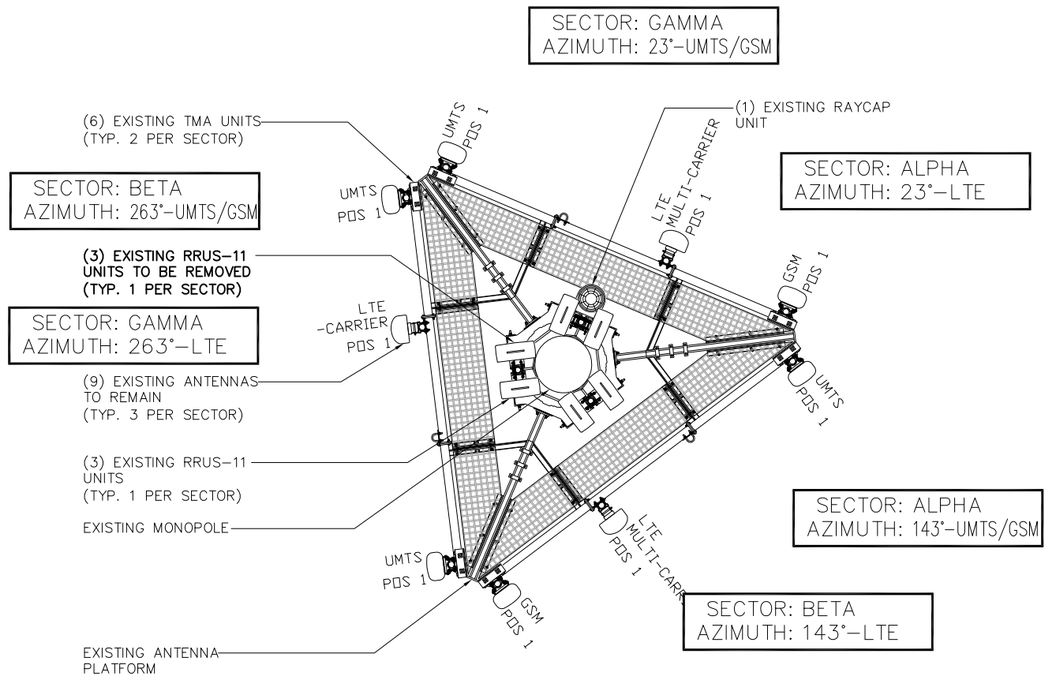
SHEET NAME
ELEVATIONS

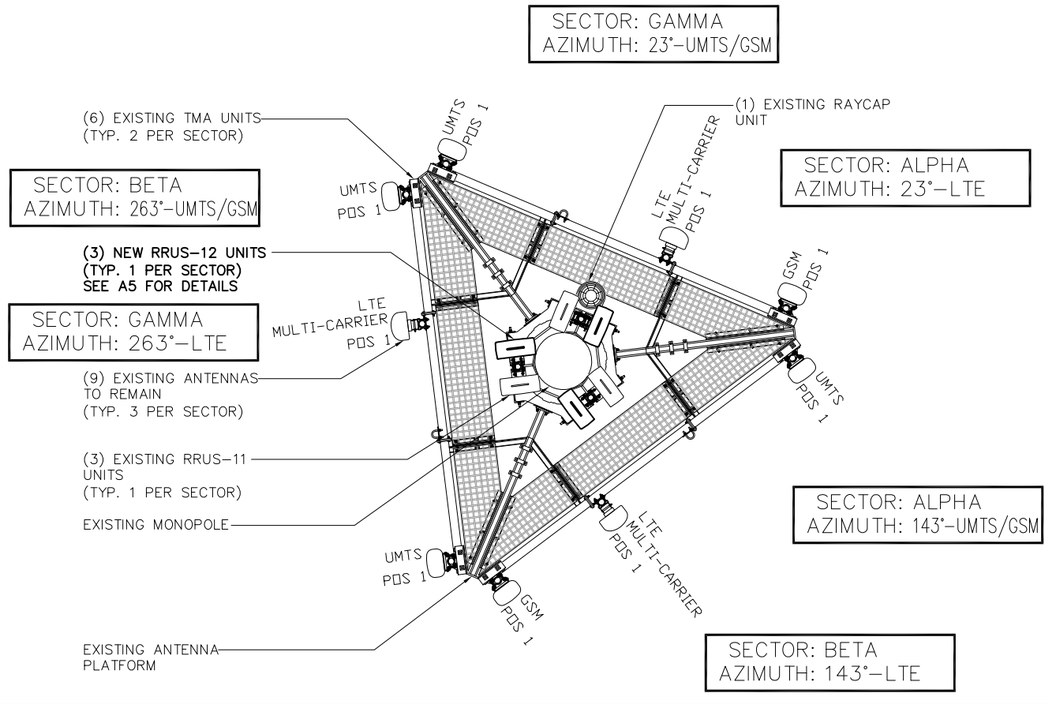
SHEET NUMBER
A3

FEC# 2016.02000089



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 1



FINAL ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 2

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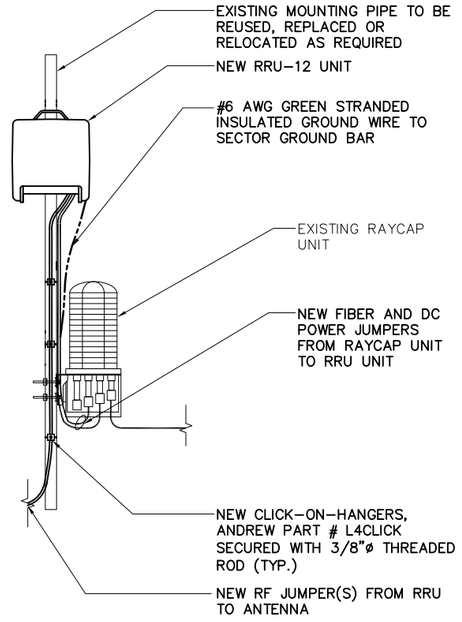
SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

FEC# 2016.02000089

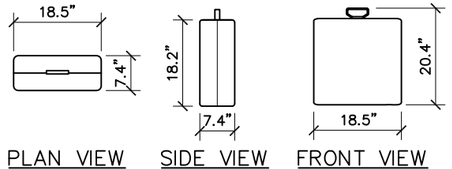
NOT USED SCALE: N.T.S. 1

NOT USED SCALE: N.T.S. 2



RRU SCHEMATIC SCALE: N.T.S. 3

NOT USED SCALE: N.T.S. 4



PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 12
WITH SOLAR SHIELD

UNIT WEIGHT 52.2 Lbs

RRU SPEC SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

NOT USED SCALE: N.T.S. 7

NOT USED SCALE: N.T.S. 8

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SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

FEC# 2016.02000089

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (07/01/16)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT	143°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	(1) (E) DC6-48-60-18-8F UNIT
								1-1/4"ø LDF6-50A	175'-0"	
	A-2	-	-	-	-	-	-	-		
	A-3	(E) LTE MULTI-CARRIER ANTENNA	SBNH-1D6565C	COMMSCOPE	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-12 UNIT**	23°	139'-0"	(1) EXISTING FIBER CABLE	175'-0"	
								(2) EXISTING DC POWER CABLES	175'-0"	
	A-4	(E) GSM ANTENNA	SBNH-1D6565C	COMMSCOPE	(1) EXISTING TMA UNIT	143°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	
BETA	B-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT	263°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	
								1-1/4"ø LDF6-50A	175'-0"	
	B-2	-	-	-	-	-	-	-		
	B-3	(E) LTE MULTI-CARRIER ANTENNA	SBNH-1D6565C	COMMSCOPE	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-12 UNIT**	143°	139'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	B-4	(E) GSM ANTENNA	AM-X-CD-16 -65-00T-RET	KMW	(1) EXISTING TMA UNIT	263°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	
GAMMA	C-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT	23°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	
								1-1/4"ø LDF6-50A	175'-0"	
	C-2	-	-	-	-	-	-	-		
	C-3	(E) LTE MULTI-CARRIER ANTENNA	AM-X-CD-16 -65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-12 UNIT**	263°	139'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	C-4	(E) GSM ANTENNA	SBNH-1D6565C	COMMSCOPE	(1) EXISTING TMA UNIT	23°	139'-0"	1-1/4"ø LDF6-50A	175'-0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S. | 1

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COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	08/10/16	90% REVIEW	KC
1	11/30/16	FOR PERMIT	KC

I HEREBY CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
OXFORD-EAST

SITE NUMBER:
CTL02090

SITE ADDRESS
338 OXFORD ROAD
OXFORD, CT 06478

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

FEC# 2016.02000089

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

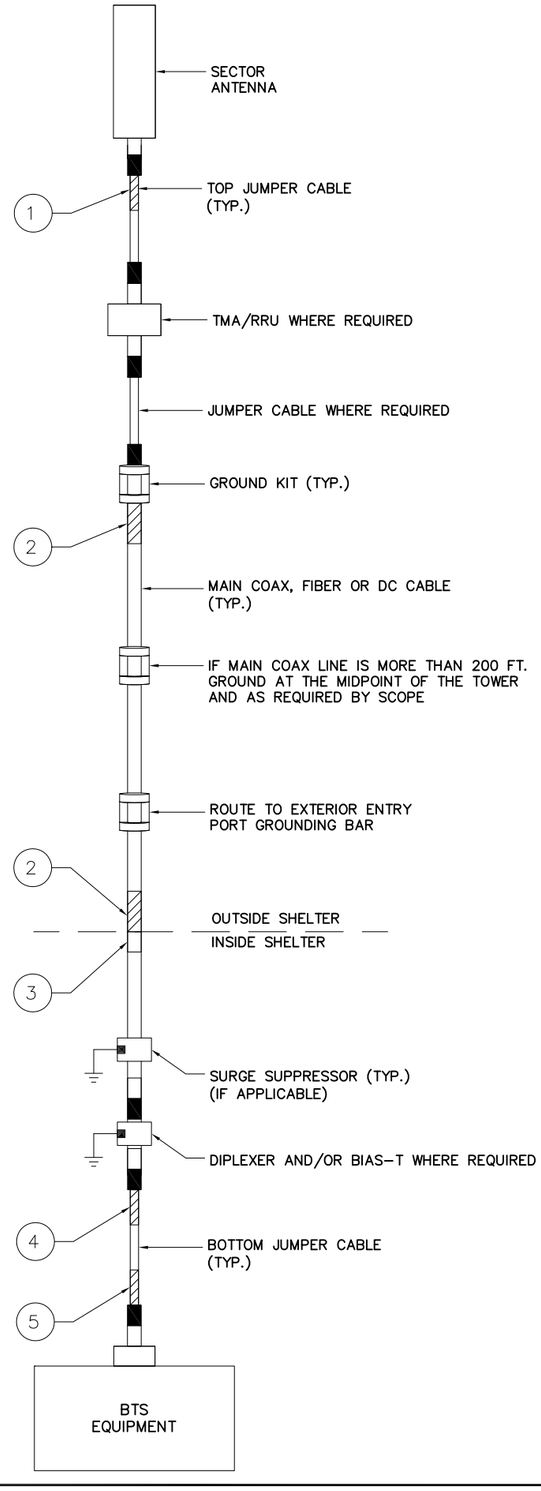
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON ENGINEERING · DESIGN
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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
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SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

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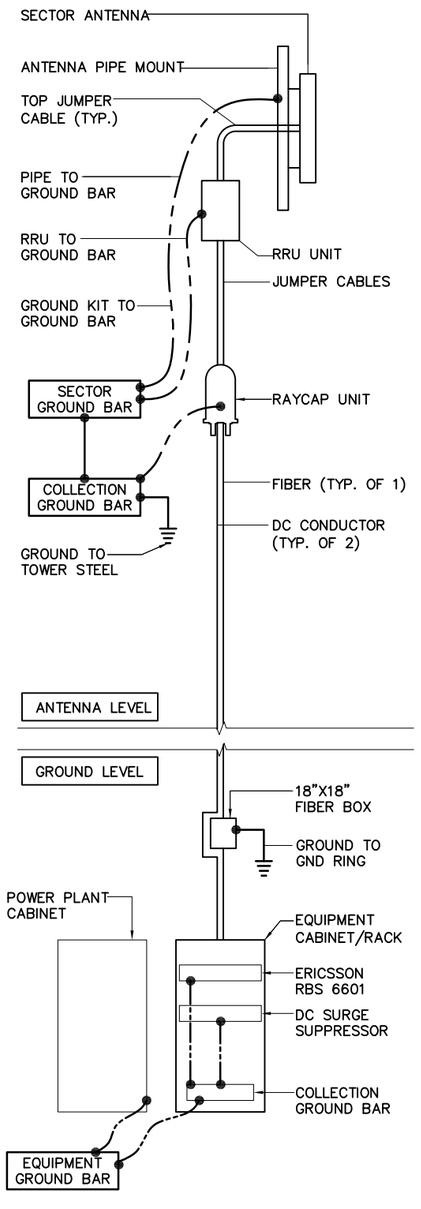
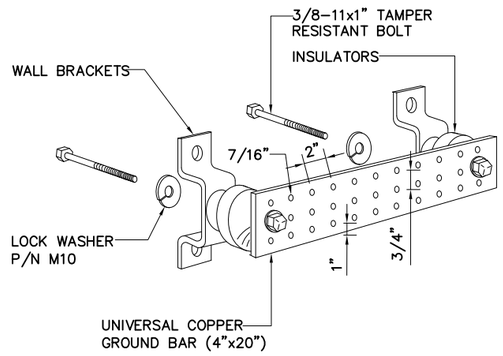
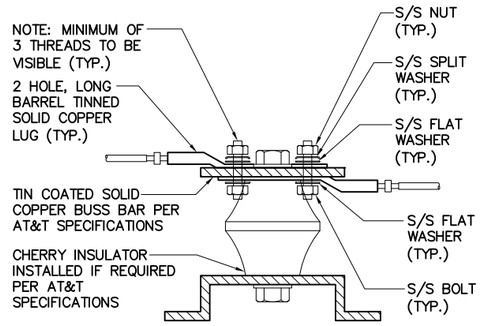


GROUNDING SCHEMATIC SCALE: N.T.S. 1



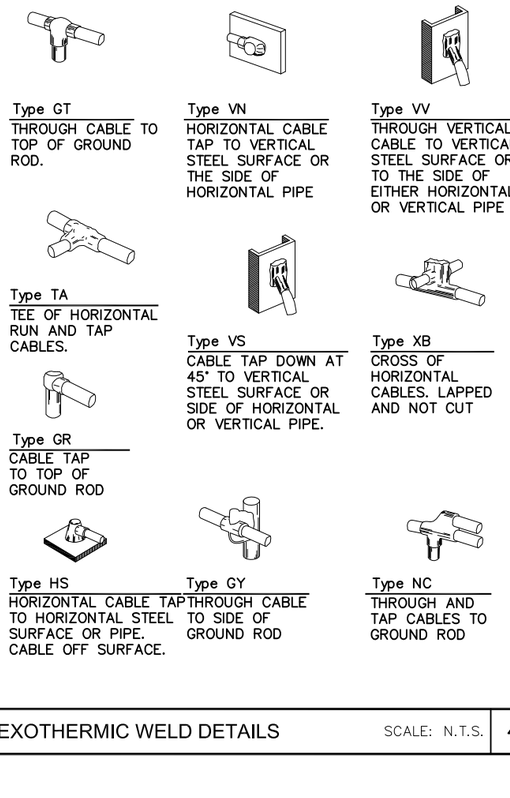
GROUND BAR DETAIL SCALE: N.T.S. 2



NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



Type GT
THROUGH CABLE TO TOP OF GROUND ROD.

Type VN
HORIZONTAL CABLE TAP TO VERTICAL STEEL SURFACE OR THE SIDE OF HORIZONTAL PIPE

Type VV
THROUGH VERTICAL CABLE TO VERTICAL STEEL SURFACE OR TO THE SIDE OF EITHER HORIZONTAL OR VERTICAL PIPE

Type TA
TEE OF HORIZONTAL RUN AND TAP CABLES.

Type VS
CABLE TAP DOWN AT 45° TO VERTICAL STEEL SURFACE OR SIDE OF HORIZONTAL OR VERTICAL PIPE.

Type XB
CROSS OF HORIZONTAL CABLES. LAPPED AND NOT CUT

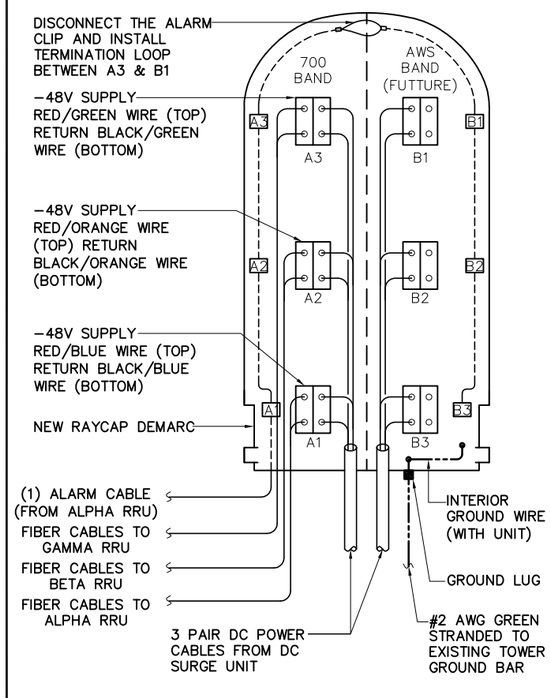
Type GR
CABLE TAP TO TOP OF GROUND ROD

Type HS
HORIZONTAL CABLE TAP TO HORIZONTAL STEEL SURFACE OR PIPE. CABLE OFF SURFACE.

Type GY
THROUGH CABLE TO SIDE OF GROUND ROD

Type NC
THROUGH AND TAP CABLES TO GROUND ROD

EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

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SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

FEC# 2016.02000089

PJF PAUL J. FORD & COMPANY

Date: **December 16, 2016**

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

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02090
	Carrier Site Name:	Oxford-Sprint
Crown Castle Designation:	**Crown Castle BU Number:**	876362
	Crown Castle Site Name:	Oxford / Fritz Property
	Crown Castle JDE Job Number:	385789
	Crown Castle Work Order Number:	1336037
	Crown Castle Application Number:	354071 Rev. 5
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-3838.001.7805
Site Data:	**338 Oxford Rd., OXFORD, New Haven County, CT**	
	Latitude *41° 25' 40.77"*, Longitude *-73° 6' 30.75"*	
	150 Foot - Monopole Tower	

Dear Sean Dempsey,

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 980804, in accordance with application 354071, 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 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 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:

Thomas J. Dehnke, EI
Project Designer
tdehnke@pjfweb.com

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

tnxTower Report - version 7.0.5.1

DEC 19 2016

Date: **December 16, 2016**

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

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679

Subject: **Structural Analysis Report**

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	Carrier Site Number:	CTL02090
	Carrier Site Name:	Oxford-Sprint
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Respectfully submitted by:

Thomas J. Dehnke, EI
Project Designer
tdehnke@pjfweb.com

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in September of 1999. The tower was originally designed for a wind speed of 89.25 mph per TIA/EIA-222-F.

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 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, “Structural Standard for Antenna Supporting Structures and Antennas”, with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 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
137.0	139.0	3	ericsson	RRUS 12	--	--	--

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
152.0	152.0	1	tower mounts	Platform Mount [LP 601-1]	3 (I)	1-1/4	1
	150.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ MP			
150.0	151.0	3	alcatel lucent	TME-800MHz RRH	--	--	1
	150.0	1	tower mounts	Side Arm Mount [SO 102-3]			
	149.0	3	alcatel lucent	TME-1900MHz RRH (65 MHz)			
137.0	139.0	3	ericsson	RRUS 11	--	--	3
		4	andrew	SBNH-1D6565C w/ MP	1 (I)* 2 (I)* 12 (I)	3/8 3/4 1-1/4	1
		2	kmw	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	137.0	6	comm comp.	DTMABP7819VG12A			
		3	powerwave	7020.00			
		1	tower mounts	Platform Mount [LP 712-1]			
		6	adc	DD1900 FULL BAND w/850 BY-PASS MASTHEAD	--	--	3
		6	powerwave	LGP21901			
136.0	137.0	3	ericsson	RRUS 11	--	--	3
		3	ericsson	RRUS 11	--	--	1
	136.0	1	tower mounts	Side Arm Mount [SO 102-3]			
	135.0	1	raycap	DC6-48-60-18-8F			
127.0	130.0	1	gps	GPS_A	--	--	1
	129.0	3	alcatel lucent	RRH2X60-AWS	1 (I)	1-5/8	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	commscope	HBXX-6517DS-A2M w/ MP			
		3	alcatel lucent	RRH2X60-PCS			
		1	antel	BXA-70040/4CF w/ MP			
		2	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe	1 (I) 12 (I)	1/2 1-5/8	1
		6	rfs celwave	APL866513-42T0 w/ MP			
		6	rfs celwave	FD9R6004/2C-3L			
	127.0	1	tower mounts	Platform Mount [LP 712-1]			
117.0	117.0	3	andrew	HBX-6516DS-VTM w/ MP	1 (I) 6 (I)	3/8 1-5/8	1
		1	tower mounts	T-Arm Mount [TA 601-3]			
75.0	76.0	1	kathrein	OG-860/1920/GPS-A	1 (E)	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed
(E) Coax mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax mounted internally and shielded from the wind. See coax layout in Appendix B.
*Coax installed internal to a 2” conduit.

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc, 09/14/1999	1531939	CCISITES
4-POST-MODIFICATION INSPECTION	VSI, 080876.07 Rev0, 12/01/2008	2364903	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 41712-0018, 05/18/2012	3192205	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 127765, 05/15/2013	3872724	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25611.19662, 09/18/2014	5301920	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 155891, 02/26/2016	6119183	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 5724, 12/09/1999	1440552	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI, 99-1188, 09/21/1999	1441271	CCISITES

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) For existing modifications: monopole was modified 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 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.42	Pole	TP20.74x15x0.1875	1	-8.16	865.46	60.8	Pass
L2	123.42 - 122.25	Pole	TP20.6033x19.6804x0.25	2	-8.75	1199.89	59.0	Pass
L3	122.25 - 120.25	Pole	TP21.0285x20.6033x0.4075	3	-9.07	1066.86	74.3	Pass
L4	120.25 - 115.5	Pole	TP22.0386x21.0285x0.5544	4	-10.95	1515.85	64.5	Pass
L5	115.5 - 115	Pole	TP22.1449x22.0386x0.3981	5	-11.04	1101.74	89.2	Pass
L6	115 - 105.25	Pole	TP24.2182x22.1449x0.5205	6	-13.04	1573.21	84.6	Pass
L7	105.25 - 101.9	Pole	TP24.9305x24.2182x0.7142	7	-13.95	1977.02	73.9	Pass
L8	101.9 - 85.96	Pole	TP28.32x24.9305x0.6884	8	-17.27	2281.23	79.4	Pass
L9	85.96 - 82	Pole	TP28.6653x26.0757x0.734	9	-19.48	2426.96	82.5	Pass
L10	82 - 77.25	Pole	TP29.6773x28.6653x0.8956	10	-22.50	3201.80	69.5	Pass
L11	77.25 - 75.5	Pole	TP30.0502x29.6773x0.7716	11	-23.10	2808.72	80.1	Pass
L12	75.5 - 75	Pole	TP30.1567x30.0502x0.8838	12	-23.31	3214.68	71.0	Pass
L13	75 - 72.15	Pole	TP30.7639x30.1567x0.8087	13	-24.41	3011.84	77.7	Pass
L14	72.15 - 71.25	Pole	TP30.9556x30.7639x0.8229	14	-24.75	3182.74	74.3	Pass
L15	71.25 - 42.41	Pole	TP37.1x30.9556x0.8326	15	-34.38	3822.95	76.3	Pass
L16	42.41 - 36.25	Pole	TP37.7849x34.3333x0.7102	16	-38.28	3704.48	84.0	Pass
L17	36.25 - 31.25	Pole	TP38.849x37.7849x0.7627	17	-42.83	4367.96	75.6	Pass
L18	31.25 - 18.5	Pole	TP41.5626x38.849x0.7328	18	-48.38	4509.09	78.7	Pass
L19	18.5 - 15	Pole	TP42.3075x41.5626x0.6608	19	-49.84	4185.48	86.1	Pass
L20	15 - 0	Pole	TP45.5x42.3075x0.6294	20	-51.09	4002.03	91.3	Pass
							Summary	
						Pole (L20)	91.3	Pass
						Rating =	91.3	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	60.7	Pass
1	Base Plate	0	63.3	Pass
1	Base Foundation Soil Interaction	0	54.8	Pass
1	Base Foundation Structural Steel	0	59.7	Pass

Structure Rating (max from all components) =	91.3%

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

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.0000 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.0000-123.4200	26.5800	3.17	18	15.0000	20.7400	0.1875	0.7500	A572-65 (65 ksi)
L2	123.4200-122.2500	4.3400	0.00	18	19.6804	20.6033	0.2500	1.0000	A572-65 (65 ksi)
L3	122.2500-120.2500	2.0000	0.00	18	20.6033	21.0285	0.4074	1.6298	Reinf 35.05 ksi (35 ksi)
L4	120.2500-115.5000	4.7500	0.00	18	21.0285	22.0386	0.5544	2.2176	Reinf 35.08 ksi (35 ksi)
L5	115.5000-115.0000	0.5000	0.00	18	22.0386	22.1449	0.3981	1.5923	Reinf 35.08 ksi (35 ksi)
L6	115.0000-105.2500	9.7500	0.00	18	22.1449	24.2182	0.5204	2.0818	Reinf 35.16 ksi (35 ksi)
L7	105.2500-101.9000	3.3500	0.00	18	24.2182	24.9305	0.7142	2.8567	Reinf 31.51 ksi (32 ksi)
L8	101.9000-85.9600	15.9400	4.08	18	24.9305	28.3200	0.6884	2.7535	Reinf 34.13 ksi (34 ksi)
L9	85.9600-	8.0400	0.00	18	26.0757	28.6653	0.7340	2.9362	Reinf 34.19 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
	82.0000								(34 ksi)
L10	82.0000-77.2500	4.7500	0.00	18	28.6653	29.6773	0.8955	3.5822	Reinf 34.24 ksi (34 ksi)
L11	77.2500-75.5000	1.7500	0.00	18	29.6773	30.0502	0.7716	3.0864	Reinf 34.27 ksi (34 ksi)
L12	75.5000-75.0000	0.5000	0.00	18	30.0502	30.1567	0.8838	3.5352	Reinf 34.25 ksi (34 ksi)
L13	75.0000-72.1500	2.8500	0.00	18	30.1567	30.7639	0.8087	3.2348	Reinf 34.27 ksi (34 ksi)
L14	72.1500-71.2500	0.9000	0.00	18	30.7639	30.9556	0.8229	3.2916	Reinf 35.38 ksi (35 ksi)
L15	71.2500-42.4100	28.8400	5.17	18	30.9556	37.1000	0.8326	3.3304	Reinf 35.99 ksi (36 ksi)
L16	42.4100-36.2500	11.3300	0.00	18	34.3333	37.7849	0.7102	2.8407	Reinf 40.85 ksi (41 ksi)
L17	36.2500-31.2500	5.0000	0.00	18	37.7849	38.8490	0.7627	3.0506	Reinf 41.45 ksi (41 ksi)
L18	31.2500-18.5000	12.7500	0.00	18	38.8490	41.5626	0.7328	2.9312	Reinf 41.54 ksi (42 ksi)
L19	18.5000-15.0000	3.5000	0.00	18	41.5626	42.3075	0.6608	2.6433	Reinf 41.92 ksi (42 ksi)
L20	15.0000-0.0000	15.0000		18	42.3075	45.5000	0.6294	2.5175	Reinf 41.42 ksi (41 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	15.2314	8.8153	244.3603	5.2584	7.6200	32.0683	489.0422	4.4085	2.3100	12.32
	21.0599	12.2313	652.7391	7.2961	10.5359	61.9537	1306.3371	6.1168	3.3202	17.708
L2	20.6685	15.4180	735.4135	6.8978	9.9977	73.5586	1471.7947	7.7105	3.0238	12.095
	20.9211	16.1503	845.2522	7.2254	10.4665	80.7582	1691.6167	8.0767	3.1862	12.745
L3	20.9211	26.1182	1345.8682	7.1695	10.4665	128.5887	2693.5073	13.0616	2.9091	7.14
	21.3529	26.6681	1432.6943	7.3205	10.6825	134.1160	2867.2739	13.3366	2.9839	7.323
L4	21.3529	36.0276	1908.0274	7.2683	10.6825	178.6125	3818.5654	18.0172	2.7253	4.916
	22.3786	37.8050	2204.5733	7.6269	11.1956	196.9142	4412.0475	18.9061	2.9030	5.236
L5	22.3786	27.3429	1617.7716	7.6824	11.1956	144.5006	3237.6719	13.6741	3.1782	7.984
	22.4865	27.4772	1641.7333	7.7201	11.2496	145.9369	3285.6269	13.7412	3.1969	8.031
L6	22.4865	35.7216	2110.3729	7.6767	11.2496	187.5951	4223.5227	17.8642	2.9815	5.729
	24.5918	39.1464	2777.4262	8.4127	12.3028	225.7552	5558.5070	19.5769	3.3464	6.43
L7	24.5918	53.2783	3718.5254	8.3439	12.3028	302.2497	7441.9438	26.6442	3.0055	4.208
	25.3151	54.8930	4066.9699	8.5968	12.6647	321.1266	8139.2911	27.4517	3.1308	4.384
L8	25.3151	52.9670	3932.6419	8.6060	12.6647	310.5201	7870.4586	26.4886	3.1762	4.614
	28.7569	60.3728	5823.6016	9.8092	14.3866	404.7946	11654.8661	30.1922	3.7728	5.481
L9	27.8124	59.0420	4790.3497	8.9963	13.2464	361.6331	9587.0027	29.5266	3.2974	4.492
	29.1075	65.0755	6414.1200	9.9156	14.5620	440.4701	12836.6799	32.5439	3.7532	5.113
L10	29.1075	78.9349	7690.4460	9.8583	14.5620	528.1179	15391.0113	39.4750	3.4689	3.874
	30.1351	81.8115	8562.2264	10.2175	15.0761	567.9346	17135.7191	40.9135	3.6470	4.072
L11	30.1351	70.7918	7472.8793	10.2615	15.0761	495.6779	14955.5916	35.4026	3.8652	5.009
	30.5137	71.7049	7765.7916	10.3939	15.2655	508.7158	15541.8016	35.8593	3.9308	5.094
L12	30.5137	81.8178	8793.2523	10.3541	15.2655	576.0219	17598.0749	40.9167	3.7333	4.224
	30.6219	82.1166	8889.9475	10.3919	15.3196	580.2992	17791.5926	41.0661	3.7521	4.245
L13	30.6219	75.3317	8197.3105	10.4185	15.3196	535.0867	16405.4072	37.6730	3.8842	4.803
	31.2385	76.8903	8716.7091	10.6341	15.6281	557.7605	17444.8878	38.4525	3.9911	4.935
L14	31.2385	78.2033	8857.1563	10.6290	15.6281	566.7473	17725.9672	39.1091	3.9661	4.82
	31.4332	78.7041	9028.4103	10.6971	15.7255	574.1271	18068.7004	39.3595	3.9999	4.861
L15	31.4332	79.6062	9126.0132	10.6937	15.7255	580.3338	18264.034	39.8107	3.9828	4.784

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
							7			
	37.6723	95.8440	15927.0338	12.8749	18.8468	845.0789	31875.0249	47.9311	5.0642	6.082
L16	36.4622	75.7892	10824.8404	11.9362	17.4413	620.6434	21663.9244	37.9018	4.7928	6.749
	38.3678	83.5693	14512.4248	13.1615	19.1947	756.0634	29043.9455	41.7926	5.4002	7.604
L17	38.3678	89.6191	15518.9636	13.1429	19.1947	808.5017	31058.3474	44.8180	5.3079	6.96
	39.4483	92.1950	16896.0073	13.5207	19.7353	856.1309	33814.2468	46.1063	5.4951	7.205
L18	39.4483	88.6560	16272.9105	13.5313	19.7353	824.5583	32567.2332	44.3364	5.5477	7.57
	42.2038	94.9677	20001.7574	14.4946	21.1138	947.3303	40029.8337	47.4929	6.0253	8.222
L19	42.2038	85.7905	18132.6545	14.5201	21.1138	858.8052	36289.1683	42.9034	6.1520	9.309
	42.9602	87.3529	19141.4973	14.7846	21.4922	890.6243	38308.1815	43.6847	6.2831	9.508
L20	42.9602	83.2571	18271.5766	14.7957	21.4922	850.1482	36567.1954	41.6365	6.3384	10.071
	46.2019	89.6345	22800.1084	15.9291	23.1140	986.4198	45630.2178	44.8258	6.9003	10.964

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
Aero MP3-05	C	No	CaAa (Out Of Face)	46.2500 - 0.0000	1	No Ice	0.3478	0.00
						1/2" Ice	0.4001	0.00
						1" Ice	0.6566	0.00
Aero MP3-03	C	No	CaAa (Out Of Face)	116.2500 - 46.2500	1	No Ice	0.2625	0.00
						1/2" Ice	0.3736	0.00
						1" Ice	0.4847	0.00
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	36.2500 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	71.2500 - 36.2500	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)	121.2500 - 71.2500	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00
**								
HB114-1-0813U4-M5J(1-1/4)	C	No	Inside Pole	150.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
**								
LDF6-50A(1-1/4)	C	No	Inside Pole	137.0000 - 0.0000	12	No Ice	0.0000	0.60
						1/2" Ice	0.0000	0.60
						1" Ice	0.0000	0.60
FB-L98B-002-75000(3/8)	C	No	Inside Pole	137.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	137.0000 - 0.0000	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
2 1/2" (Nominal) Conduit	C	No	Inside Pole	137.0000 - 0.0000	1	No Ice	0.0000	7.75
						1/2" Ice	0.0000	7.75
						1" Ice	0.0000	7.75
**								
AVA7-50(1-5/8)	C	No	Inside Pole	127.0000 - 0.0000	12	No Ice	0.0000	0.70
						1/2" Ice	0.0000	0.70
						1" Ice	0.0000	0.70
LDF4-50A(1/2)	C	No	Inside Pole	127.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	127.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	1.30

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.0000	1.30
**								
FXL-1873(1-5/8)	C	No	Inside Pole	117.0000 - 0.0000	6	No Ice	0.0000	0.67
						1/2" Ice	0.0000	0.67
						1" Ice	0.0000	0.67
860 10033(3/8)	C	No	Inside Pole	117.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
**								
LDF4-50A(1/2)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.0625	0.15
						1/2" Ice	0.1625	0.84
						1" Ice	0.2625	2.14

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 -2.00	0.00	152.0000	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 -2.00	0.00	152.0000	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 -2.00	0.00	152.0000	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
(3) ACU-A20-N	A	From Face	4.0000 0.00 -2.00	0.00	152.0000	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 -2.00	0.00	152.0000	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 -2.00	0.00	152.0000	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
800 EXTERNAL NOTCH FILTER	A	From Face	4.0000 0.00 -2.00	0.00	152.0000	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	B	From Face	4.0000 0.00 -2.00	0.00	152.0000	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 -2.00	0.00	152.0000	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
Platform Mount [LP 601-1]	C	None		0.00	152.0000	No Ice 1/2" Ice 1" Ice	28.4700 33.5900 38.7100	28.4700 33.5900 38.7100	1.12 1.51 1.91
(2) 2.375" OD x 6' Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.03 0.04 0.05
(2) 2.375" OD x 6' Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	152.0000	No Ice 1/2" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.03 0.04 0.05

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			
(2) 2.375" OD x 6' Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.03 0.04 0.05
8-ft Ladder	C	From Face	2.0000 0.00 -2.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice	7.0700 9.7300 11.1900	7.0700 9.7300 11.1900	0.04 0.07 0.08
****									
TME-1900MHz RRH (65 MHz)	A	From Face	2.0000 0.00 -1.00	0.00	150.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
TME-1900MHz RRH (65 MHz)	B	From Face	2.0000 0.00 -1.00	0.00	150.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
TME-1900MHz RRH (65 MHz)	C	From Face	2.0000 0.00 -1.00	0.00	150.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
TME-800MHz RRH	A	From Face	2.0000 0.00 1.00	0.00	150.0000	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 1.00	0.00	150.0000	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 1.00	0.00	150.0000	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	150.0000	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
**									
7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	5.8076 6.2677 6.6966	4.5982 5.5082 6.2127	0.09 0.14 0.21
7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	5.8076 6.2677 6.6966	4.5982 5.5082 6.2127	0.09 0.14 0.21
7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	5.8076 6.2677 6.6966	4.5982 5.5082 6.2127	0.09 0.14 0.21
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	11.5561 12.2227 12.8929	9.7151 11.1857 12.5942	0.10 0.19 0.28
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	11.5561 12.2227 12.8929	9.7151 11.1857 12.5942	0.10 0.19 0.28
(2) SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	11.5561 12.2227 12.8929	9.7151 11.1857 12.5942	0.10 0.19 0.28
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.3042 7.4790 8.3676	0.07 0.14 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
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.3042 7.4790 8.3676	0.07 0.14 0.21
7020.00	A	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.1021 0.1469 0.1991	0.1750 0.2393 0.3109	0.00 0.01 0.01
7020.00	B	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.1021 0.1469 0.1991	0.1750 0.2393 0.3109	0.00 0.01 0.01
7020.00	C	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.1021 0.1469 0.1991	0.1750 0.2393 0.3109	0.00 0.01 0.01
(2) DTMABP7819VG12A	A	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.9762 1.1002 1.2316	0.3387 0.4192 0.5098	0.02 0.03 0.04
(2) DTMABP7819VG12A	B	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.9762 1.1002 1.2316	0.3387 0.4192 0.5098	0.02 0.03 0.04
(2) DTMABP7819VG12A	C	From Leg	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	0.9762 1.1002 1.2316	0.3387 0.4192 0.5098	0.02 0.03 0.04
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 2.00	0.00	137.0000	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
RRUS 12	A	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	3.1450 3.3648 3.5920	1.2854 1.4379 1.5998	0.06 0.08 0.11
RRUS 12	B	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	3.1450 3.3648 3.5920	1.2854 1.4379 1.5998	0.06 0.08 0.11
RRUS 12	C	From Leg	4.0000 0.00 2.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	3.1450 3.3648 3.5920	1.2854 1.4379 1.5998	0.06 0.08 0.11
2.375" OD x 5' Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
2.375" OD x 5' Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
2.375" OD x 5' Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	137.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
Platform Mount [LP 712-1]	C	None		0.00	137.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
**									
RRUS 11	A	From Face	2.0000 0.00 1.00	0.00	136.0000	No Ice 1/2" Ice 1" Ice	2.7908 2.9984 3.2134	1.1923 1.3395 1.4957	0.05 0.07 0.10
RRUS 11	B	From Face	2.0000 0.00	0.00	136.0000	No Ice 1/2"	2.7908 2.9984	1.1923 1.3395	0.05 0.07

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	3.2134	1.4957	0.10
						1" Ice			
RRUS 11	C	From Face	2.0000	0.00	136.0000	No Ice	2.7908	1.1923	0.05
			0.00			1/2"	2.9984	1.3395	0.07
			1.00			Ice	3.2134	1.4957	0.10
						1" Ice			
DC6-48-60-18-8F	B	From Face	2.0000	0.00	136.0000	No Ice	0.9167	0.9167	0.02
			0.00			1/2"	1.4583	1.4583	0.04
			-1.00			Ice	1.6431	1.6431	0.06
						1" Ice			
Side Arm Mount [SO 102-3]	C	None		0.00	136.0000	No Ice	3.0000	3.0000	0.08
						1/2"	3.4800	3.4800	0.11
						Ice	3.9600	3.9600	0.14
						1" Ice			
**									
(2) APL866513-42T0 w/ Mount Pipe	A	From Leg	4.0000	0.00	127.0000	No Ice	4.2879	4.8023	0.03
			0.00			1/2"	4.6611	5.4160	0.08
			2.00			Ice	5.0420	6.0401	0.13
						1" Ice			
(2) APL866513-42T0 w/ Mount Pipe	B	From Leg	4.0000	0.00	127.0000	No Ice	4.2879	4.8023	0.03
			0.00			1/2"	4.6611	5.4160	0.08
			2.00			Ice	5.0420	6.0401	0.13
						1" Ice			
(2) APL866513-42T0 w/ Mount Pipe	C	From Leg	4.0000	0.00	127.0000	No Ice	4.2879	4.8023	0.03
			0.00			1/2"	4.6611	5.4160	0.08
			2.00			Ice	5.0420	6.0401	0.13
						1" Ice			
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000	0.00	127.0000	No Ice	4.9453	3.6927	0.03
			0.00			1/2"	5.3243	4.2947	0.07
			2.00			Ice	5.7120	4.9133	0.12
						1" Ice			
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000	0.00	127.0000	No Ice	4.9453	3.6927	0.03
			0.00			1/2"	5.3243	4.2947	0.07
			2.00			Ice	5.7120	4.9133	0.12
						1" Ice			
GPS_A	B	From Leg	4.0000	0.00	127.0000	No Ice	0.2550	0.2550	0.00
			0.00			1/2"	0.3205	0.3205	0.00
			3.00			Ice	0.3934	0.3934	0.01
						1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.00	127.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			2.00			Ice	0.4656	0.1685	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.0000	0.00	127.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			2.00			Ice	0.4656	0.1685	0.01
						1" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.00	127.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2"	0.3862	0.1189	0.01
			2.00			Ice	0.4656	0.1685	0.01
						1" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000	0.00	127.0000	No Ice	8.7655	6.9629	0.07
			0.00			1/2"	9.3417	8.1817	0.14
			2.00			Ice	9.8885	9.1436	0.21
						1" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000	0.00	127.0000	No Ice	8.7655	6.9629	0.07
			0.00			1/2"	9.3417	8.1817	0.14
			2.00			Ice	9.8885	9.1436	0.21
						1" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000	0.00	127.0000	No Ice	8.7655	6.9629	0.07
			0.00			1/2"	9.3417	8.1817	0.14
			2.00			Ice	9.8885	9.1436	0.21
						1" Ice			
BXA-70040/4CF w/ Mount Pipe	A	From Leg	4.0000	0.00	127.0000	No Ice	9.6378	4.6773	0.04
			0.00			1/2"	10.0970	5.2764	0.11
			2.00			Ice	10.5655	5.8919	0.19
						1" Ice			

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
RRH2X60-AWS	A	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	1.8775 2.0551 2.2401	1.2359 1.3858 1.5441	0.04 0.06 0.08
RRH2X60-AWS	B	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	1.8775 2.0551 2.2401	1.2359 1.3858 1.5441	0.04 0.06 0.08
RRH2X60-AWS	C	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	1.8775 2.0551 2.2401	1.2359 1.3858 1.5441	0.04 0.06 0.08
RRH2X60-PCS	A	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
RRH2X60-PCS	C	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000 0.00 2.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice	4.8000 5.0704 5.3481	2.0000 2.1926 2.3926	0.04 0.08 0.12
Platform Mount [LP 712-1]	C	None		0.00	127.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
**									
HBX-6516DS-VTM w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	3.5975 3.9981 4.3890	3.2406 3.9135 4.5638	0.03 0.06 0.10
HBX-6516DS-VTM w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	3.5975 3.9981 4.3890	3.2406 3.9135 4.5638	0.03 0.06 0.10
HBX-6516DS-VTM w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	3.5975 3.9981 4.3890	3.2406 3.9135 4.5638	0.03 0.06 0.10
2.375" OD x 5' Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
2.375" OD x 5' Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
2.375" OD x 5' Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
T-Arm Mount [TA 601-3]	C	None		0.00	117.0000	No Ice 1/2" Ice 1" Ice	10.9000 14.6500 18.4000	10.9000 14.6500 18.4000	0.73 0.93 1.13
**									
OG-860/1920/GPS-A	C	From Face	4.0000 0.00 1.00	0.00	75.0000	No Ice 1/2" Ice 1" Ice	0.3077 0.3952 0.4897	0.3667 0.4572 0.5548	0.00 0.01 0.01
Side Arm Mount [SO 701-	C	None		0.00	75.0000	No Ice	0.8500	1.6700	0.07

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]						1/2" Ice 1" Ice	1.1400 1.4300	2.3400 3.0100	0.08 0.09

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.0000-123.4200	135.9985	1.35	0.03	40.193	A	0.000	40.193	40.193	100.00	0.000	0.000
					B	0.000	40.193		100.00	0.000	0.000
					C	0.000	40.193		100.00	0.000	0.000
L2 123.4200-122.2500	122.8338	1.322	0.03	2.027	A	0.000	2.027	2.027	100.00	0.000	0.000
					B	0.000	2.027		100.00	0.000	0.000
					C	0.000	2.027		100.00	0.000	0.000
L3 122.2500-120.2500	121.2466	1.318	0.03	3.523	A	0.000	3.523	3.523	100.00	0.000	0.000
					B	0.000	3.523		100.00	0.000	0.000
					C	0.000	3.523		100.00	0.000	0.125
L4 120.2500-115.5000	117.8564	1.31	0.03	8.655	A	0.000	8.655	8.655	100.00	0.000	0.000
					B	0.000	8.655		100.00	0.000	0.000
					C	0.000	8.655		100.00	0.000	0.791
L5 115.5000-115.0000	115.2498	1.304	0.03	0.935	A	0.000	0.935	0.935	100.00	0.000	0.000
					B	0.000	0.935		100.00	0.000	0.000
					C	0.000	0.935		100.00	0.000	0.194
L6 115.0000-105.2500	110.0523	1.291	0.03	19.126	A	0.000	19.126	19.126	100.00	0.000	0.000
					B	0.000	19.126		100.00	0.000	0.000
					C	0.000	19.126		100.00	0.000	3.778
L7 105.2500-101.9000	103.5669	1.275	0.03	6.966	A	0.000	6.966	6.966	100.00	0.000	0.000
					B	0.000	6.966		100.00	0.000	0.000
					C	0.000	6.966		100.00	0.000	1.298
L8 101.9000-85.9600	93.7609	1.249	0.03	35.913	A	0.000	35.913	35.913	100.00	0.000	0.000
					B	0.000	35.913		100.00	0.000	0.000
					C	0.000	35.913		100.00	0.000	6.176
L9 85.9600-82.0000	83.9650	1.22	0.03	9.392	A	0.000	9.392	9.392	100.00	0.000	0.000
					B	0.000	9.392		100.00	0.000	0.000
					C	0.000	9.392		100.00	0.000	1.534
L10 82.0000-77.2500	79.6113	1.206	0.03	11.725	A	0.000	11.725	11.725	100.00	0.000	0.000
					B	0.000	11.725		100.00	0.000	0.000
					C	0.000	11.725		100.00	0.000	1.840
L11 77.2500-75.5000	76.3732	1.196	0.03	4.422	A	0.000	4.422	4.422	100.00	0.000	0.000
					B	0.000	4.422		100.00	0.000	0.000
					C	0.000	4.422		100.00	0.000	0.678
L12 75.5000-75.0000	75.2499	1.192	0.03	1.274	A	0.000	1.274	1.274	100.00	0.000	0.000
					B	0.000	1.274		100.00	0.000	0.000
					C	0.000	1.274		100.00	0.000	0.194
L13 75.0000-72.1500	73.5703	1.186	0.03	7.346	A	0.000	7.346	7.346	100.00	0.000	0.000
					B	0.000	7.346		100.00	0.000	0.000
					C	0.000	7.346		100.00	0.000	1.282
L14 72.1500-71.2500	71.6995	1.18	0.03	2.350	A	0.000	2.350	2.350	100.00	0.000	0.000
					B	0.000	2.350		100.00	0.000	0.000
					C	0.000	2.350		100.00	0.000	0.405
L15 71.2500-42.4100	56.3960	1.122	0.03	83.042	A	0.000	83.042	83.042	100.00	0.000	0.000
					B	0.000	83.042		100.00	0.000	0.000
					C	0.000	83.042		100.00	0.000	14.506
L16 42.4100-36.2500	39.3039	1.04	0.02	19.206	A	0.000	19.206	19.206	100.00	0.000	0.000
					B	0.000	19.206		100.00	0.000	0.000
					C	0.000	19.206		100.00	0.000	3.554
L17 36.2500-31.2500	33.7384	1.007	0.02	16.212	A	0.000	16.212	16.212	100.00	0.000	0.000
					B	0.000	16.212		100.00	0.000	0.000
					C	0.000	16.212		100.00	0.000	3.093
L18 31.2500-18.5000	24.8033	0.944	0.02	43.378	A	0.000	43.378	43.378	100.00	0.000	0.000
					B	0.000	43.378		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	43.378		100.00	0.000	7.888
L19 18.5000-15.0000	16.7448	0.869	0.02	12.420	A	0.000	12.420	12.420	100.00	0.000	0.000
					B	0.000	12.420		100.00	0.000	0.000
					C	0.000	12.420		100.00	0.000	2.165
L20 15.0000-0.0000	7.4091	0.85	0.02	55.726	A	0.000	55.726	55.726	100.00	0.000	0.000
					B	0.000	55.726		100.00	0.000	0.000
					C	0.000	55.726		100.00	0.000	9.279

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-123.4200	135.9985	1.35	0.01	1.7282	47.849	A	0.000	47.849	47.849	100.00	0.000	0.000
						B	0.000	47.849		100.00	0.000	0.000
						C	0.000	47.849		100.00	0.000	0.000
L2 123.4200-122.2500	122.8338	1.322	0.01	1.7107	2.364	A	0.000	2.364	2.364	100.00	0.000	0.000
						B	0.000	2.364		100.00	0.000	0.000
						C	0.000	2.364		100.00	0.000	0.000
L3 122.2500-120.2500	121.2466	1.318	0.01	1.7085	4.092	A	0.000	4.092	4.092	100.00	0.000	0.000
						B	0.000	4.092		100.00	0.000	0.000
						C	0.000	4.092		100.00	0.000	0.505
L4 120.2500-115.5000	117.8564	1.31	0.01	1.7036	10.004	A	0.000	10.004	10.004	100.00	0.000	0.000
						B	0.000	10.004		100.00	0.000	0.000
						C	0.000	10.004		100.00	0.000	2.873
L5 115.5000-115.0000	115.2498	1.304	0.01	1.6998	1.076	A	0.000	1.076	1.076	100.00	0.000	0.000
						B	0.000	1.076		100.00	0.000	0.000
						C	0.000	1.076		100.00	0.000	0.571
L6 115.0000-105.2500	110.0523	1.291	0.01	1.6920	21.875	A	0.000	21.875	21.875	100.00	0.000	0.000
						B	0.000	21.875		100.00	0.000	0.000
						C	0.000	21.875		100.00	0.000	11.110
L7 105.2500-101.9000	103.5669	1.275	0.01	1.6818	7.905	A	0.000	7.905	7.905	100.00	0.000	0.000
						B	0.000	7.905		100.00	0.000	0.000
						C	0.000	7.905		100.00	0.000	3.802
L8 101.9000-85.9600	93.7609	1.249	0.01	1.6651	40.336	A	0.000	40.336	40.336	100.00	0.000	0.000
						B	0.000	40.336		100.00	0.000	0.000
						C	0.000	40.336		100.00	0.000	17.973
L9 85.9600-82.0000	83.9650	1.22	0.01	1.6468	10.491	A	0.000	10.491	10.491	100.00	0.000	0.000
						B	0.000	10.491		100.00	0.000	0.000
						C	0.000	10.491		100.00	0.000	4.465
L10 82.0000-77.2500	79.6113	1.206	0.01	1.6381	13.022	A	0.000	13.022	13.022	100.00	0.000	0.000
						B	0.000	13.022		100.00	0.000	0.000
						C	0.000	13.022		100.00	0.000	5.299
L11 77.2500-75.5000	76.3732	1.196	0.01	1.6313	4.898	A	0.000	4.898	4.898	100.00	0.000	0.000
						B	0.000	4.898		100.00	0.000	0.000
						C	0.000	4.898		100.00	0.000	1.947
L12 75.5000-75.0000	75.2499	1.192	0.01	1.6289	1.409	A	0.000	1.409	1.409	100.00	0.000	0.000
						B	0.000	1.409		100.00	0.000	0.000
						C	0.000	1.409		100.00	0.000	0.556
L13 75.0000-72.1500	73.5703	1.186	0.01	1.6252	8.118	A	0.000	8.118	8.118	100.00	0.000	0.000
						B	0.000	8.118		100.00	0.000	0.000
						C	0.000	8.118		100.00	0.000	4.267
L14 72.1500-71.2500	71.6995	1.18	0.01	1.6210	2.593	A	0.000	2.593	2.593	100.00	0.000	0.000
						B	0.000	2.593		100.00	0.000	0.000
						C	0.000	2.593		100.00	0.000	1.345
L15 71.2500-42.4100	56.3960	1.122	0.01	1.5826	90.649	A	0.000	90.649	90.649	100.00	0.000	0.000
						B	0.000	90.649		100.00	0.000	0.000
						C	0.000	90.649		100.00	0.000	44.252
L16 42.4100-36.2500	39.3039	1.04	0.01	1.5265	20.831	A	0.000	20.831	20.831	100.00	0.000	0.000
						B	0.000	20.831		100.00	0.000	0.000
						C	0.000	20.831		100.00	0.000	10.370
L17 36.2500-31.2500	33.7384	1.007	0.01	1.5033	17.464	A	0.000	17.464	17.464	100.00	0.000	0.000
						B	0.000	17.464		100.00	0.000	0.000
						C	0.000	17.464		100.00	0.000	8.370
L18 31.2500-	24.8033	0.944	0.01	1.4578	46.475	A	0.000	46.475	46.475	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
18.5000						B	0.000	46.475		100.00	0.000	0.000
						C	0.000	46.475		100.00	0.000	20.969
L19 18.5000-15.0000	16.7448	0.869	0.01	1.4016	13.237	A	0.000	13.237	13.237	100.00	0.000	0.000
						B	0.000	13.237		100.00	0.000	0.000
						C	0.000	13.237		100.00	0.000	5.629
L20 15.0000-0.0000	7.4091	0.85	0.01	1.2919	58.956	A	0.000	58.956	58.956	100.00	0.000	0.000
						B	0.000	58.956		100.00	0.000	0.000
						C	0.000	58.956		100.00	0.000	23.066

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-123.4200	135.9985	1.35	0.01	40.193	A	0.000	40.193	40.193	100.00	0.000	0.000
					B	0.000	40.193		100.00	0.000	0.000
					C	0.000	40.193		100.00	0.000	0.000
L2 123.4200-122.2500	122.8338	1.322	0.01	2.027	A	0.000	2.027	2.027	100.00	0.000	0.000
					B	0.000	2.027		100.00	0.000	0.000
					C	0.000	2.027		100.00	0.000	0.000
L3 122.2500-120.2500	121.2466	1.318	0.01	3.523	A	0.000	3.523	3.523	100.00	0.000	0.000
					B	0.000	3.523		100.00	0.000	0.000
					C	0.000	3.523		100.00	0.000	0.125
L4 120.2500-115.5000	117.8564	1.31	0.01	8.655	A	0.000	8.655	8.655	100.00	0.000	0.000
					B	0.000	8.655		100.00	0.000	0.000
					C	0.000	8.655		100.00	0.000	0.791
L5 115.5000-115.0000	115.2498	1.304	0.01	0.935	A	0.000	0.935	0.935	100.00	0.000	0.000
					B	0.000	0.935		100.00	0.000	0.000
					C	0.000	0.935		100.00	0.000	0.194
L6 115.0000-105.2500	110.0523	1.291	0.01	19.126	A	0.000	19.126	19.126	100.00	0.000	0.000
					B	0.000	19.126		100.00	0.000	0.000
					C	0.000	19.126		100.00	0.000	3.778
L7 105.2500-101.9000	103.5669	1.275	0.01	6.966	A	0.000	6.966	6.966	100.00	0.000	0.000
					B	0.000	6.966		100.00	0.000	0.000
					C	0.000	6.966		100.00	0.000	1.298
L8 101.9000-85.9600	93.7609	1.249	0.01	35.913	A	0.000	35.913	35.913	100.00	0.000	0.000
					B	0.000	35.913		100.00	0.000	0.000
					C	0.000	35.913		100.00	0.000	6.176
L9 85.9600-82.0000	83.9650	1.22	0.01	9.392	A	0.000	9.392	9.392	100.00	0.000	0.000
					B	0.000	9.392		100.00	0.000	0.000
					C	0.000	9.392		100.00	0.000	1.534
L10 82.0000-77.2500	79.6113	1.206	0.01	11.725	A	0.000	11.725	11.725	100.00	0.000	0.000
					B	0.000	11.725		100.00	0.000	0.000
					C	0.000	11.725		100.00	0.000	1.840
L11 77.2500-75.5000	76.3732	1.196	0.01	4.422	A	0.000	4.422	4.422	100.00	0.000	0.000
					B	0.000	4.422		100.00	0.000	0.000
					C	0.000	4.422		100.00	0.000	0.678
L12 75.5000-75.0000	75.2499	1.192	0.01	1.274	A	0.000	1.274	1.274	100.00	0.000	0.000
					B	0.000	1.274		100.00	0.000	0.000
					C	0.000	1.274		100.00	0.000	0.194
L13 75.0000-72.1500	73.5703	1.186	0.01	7.346	A	0.000	7.346	7.346	100.00	0.000	0.000
					B	0.000	7.346		100.00	0.000	0.000
					C	0.000	7.346		100.00	0.000	1.282
L14 72.1500-71.2500	71.6995	1.18	0.01	2.350	A	0.000	2.350	2.350	100.00	0.000	0.000
					B	0.000	2.350		100.00	0.000	0.000
					C	0.000	2.350		100.00	0.000	0.405
L15 71.2500-42.4100	56.3960	1.122	0.01	83.042	A	0.000	83.042	83.042	100.00	0.000	0.000
					B	0.000	83.042		100.00	0.000	0.000
					C	0.000	83.042		100.00	0.000	14.506
L16 42.4100-36.2500	39.3039	1.04	0.01	19.206	A	0.000	19.206	19.206	100.00	0.000	0.000
					B	0.000	19.206		100.00	0.000	0.000
					C	0.000	19.206		100.00	0.000	3.554
L17 36.2500-31.2500	33.7384	1.007	0.01	16.212	A	0.000	16.212	16.212	100.00	0.000	0.000
					B	0.000	16.212		100.00	0.000	0.000
					C	0.000	16.212		100.00	0.000	3.093

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L18 31.2500-18.5000	24.8033	0.944	0.01	43.378	A	0.000	43.378	43.378	100.00	0.000	0.000
					B	0.000	43.378		100.00	0.000	0.000
					C	0.000	43.378		100.00	0.000	7.888
L19 18.5000-15.0000	16.7448	0.869	0.01	12.420	A	0.000	12.420	12.420	100.00	0.000	0.000
					B	0.000	12.420		100.00	0.000	0.000
					C	0.000	12.420		100.00	0.000	2.165
L20 15.0000-0.0000	7.4091	0.85	0.01	55.726	A	0.000	55.726	55.726	100.00	0.000	0.000
					B	0.000	55.726		100.00	0.000	0.000
					C	0.000	55.726		100.00	0.000	9.279

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	150 - 123.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.46	0.18	1.51
			Max. Mx	20	-8.21	209.82	0.29
			Max. My	2	-8.16	0.10	210.77
			Max. Vy	20	-17.99	209.82	0.29
			Max. Vx	2	-18.28	0.10	210.77
			Max. Torque	22			1.34
L2	123.42 - 122.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.32	0.19	1.53
			Max. Mx	20	-8.79	288.48	0.30
			Max. My	2	-8.75	0.12	290.68
			Max. Vy	20	-18.26	288.48	0.30
			Max. Vx	2	-18.56	0.12	290.68
			Max. Torque	22			0.73
L3	122.25 - 120.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.70	0.19	1.53
			Max. Mx	20	-9.12	325.13	0.30
			Max. My	2	-9.07	0.12	327.91
			Max. Vy	20	-18.40	325.13	0.30
			Max. Vx	2	-18.69	0.12	327.91
			Max. Torque	22			0.73
L4	120.25 - 115.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.11	0.19	1.54
			Max. Mx	20	-10.99	415.25	0.31
			Max. My	2	-10.95	0.14	419.42
			Max. Vy	20	-20.02	415.25	0.31
			Max. Vx	2	-20.32	0.14	419.42
			Max. Torque	22			0.76
L5	115.5 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.22	0.19	1.55
			Max. Mx	20	-11.08	425.27	0.30
			Max. My	2	-11.04	0.15	429.59
			Max. Vy	20	-20.07	425.27	0.30
			Max. Vx	2	-20.36	0.15	429.59
			Max. Torque	22			0.77
L6	115 - 105.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.61	0.19	1.54
			Max. Mx	20	-13.09	625.73	0.32
			Max. My	2	-13.04	0.17	632.91
			Max. Vy	20	-21.07	625.73	0.32
			Max. Vx	2	-21.36	0.17	632.91
			Max. Torque	22			0.93
L7	105.25 - 101.9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.66	0.19	1.54
			Max. Mx	20	-13.99	696.90	0.33
			Max. My	2	-13.95	0.18	705.06
			Max. Vy	20	-21.44	696.90	0.33
			Max. Vx	2	-21.73	0.18	705.06
			Max. Torque	24			0.99
L8	101.9 - 85.96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.53	0.19	1.53
			Max. Mx	20	-17.31	958.42	0.35
			Max. My	2	-17.27	0.22	970.08
			Max. Vy	20	-22.69	958.42	0.35
			Max. Vx	2	-22.99	0.22	970.08
			Max. Torque	24			1.24
L9	85.96 - 82	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.61	0.18	1.53
			Max. Mx	20	-20.73	1144.85	0.37
			Max. My	2	-20.69	0.24	1158.89
			Max. Vy	20	-23.65	1144.85	0.37
			Max. Vx	2	-23.94	0.24	1158.89
			Max. Torque	24			1.42
L10	82 - 77.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.65	0.18	1.52
			Max. Mx	20	-22.53	1258.34	0.38

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-22.50	0.25	1273.79
			Max. Vy	20	-24.16	1258.34	0.38
			Max. Vx	2	-24.46	0.25	1273.79
			Max. Torque	24			1.53
L11	77.25 - 75.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.34	0.18	1.52
			Max. Mx	20	-23.13	1300.77	0.38
			Max. My	2	-23.10	0.25	1316.74
			Max. Vy	20	-24.35	1300.77	0.38
			Max. Vx	2	-24.65	0.25	1316.74
			Max. Torque	24			1.57
L12	75.5 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.56	0.18	1.52
			Max. Mx	20	-23.34	1312.95	0.38
			Max. My	2	-23.31	0.26	1329.07
			Max. Vy	20	-24.40	1312.95	0.38
			Max. Vx	2	-24.70	0.26	1329.07
			Max. Torque	24			1.58
L13	75 - 72.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.90	0.20	1.41
			Max. Mx	20	-24.44	1383.22	0.39
			Max. My	2	-24.41	0.26	1400.17
			Max. Vy	20	-24.83	1383.22	0.39
			Max. Vx	2	-25.12	0.26	1400.17
			Max. Torque	24			1.71
L14	72.15 - 71.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.29	0.20	1.40
			Max. Mx	20	-24.78	1405.60	0.39
			Max. My	2	-24.75	0.27	1422.81
			Max. Vy	20	-24.92	1405.60	0.39
			Max. Vx	2	-25.22	0.27	1422.81
			Max. Torque	24			1.73
L15	71.25 - 42.41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.34	0.34	1.30
			Max. Mx	20	-34.40	2026.34	0.44
			Max. My	2	-34.38	0.32	2050.50
			Max. Vy	20	-27.59	2026.34	0.44
			Max. Vx	2	-27.88	0.32	2050.50
			Max. Torque	24			2.48
L16	42.41 - 36.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.71	0.40	1.25
			Max. Mx	20	-40.69	2346.86	0.47
			Max. My	2	-40.68	0.35	2374.34
			Max. Vy	20	-28.93	2346.86	0.47
			Max. Vx	2	-29.22	0.35	2374.34
			Max. Torque	24			2.88
L17	36.25 - 31.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.16	0.43	1.23
			Max. Mx	20	-42.85	2492.71	0.48
			Max. My	2	-42.83	0.36	2521.65
			Max. Vy	20	-29.45	2492.71	0.48
			Max. Vx	2	-29.74	0.36	2521.65
			Max. Torque	24			3.08
L18	31.25 - 18.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.47	0.51	1.17
			Max. Mx	20	-48.39	2875.67	0.51
			Max. My	2	-48.38	0.38	2908.29
			Max. Vy	20	-30.66	2875.67	0.51
			Max. Vx	2	-30.95	0.38	2908.29
			Max. Torque	24			3.58
L19	18.5 - 15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.12	0.53	1.16
			Max. Mx	20	-49.85	2983.41	0.52
			Max. My	2	-49.84	0.39	3017.03
			Max. Vy	20	-30.95	2983.41	0.52
			Max. Vx	2	-31.23	0.39	3017.03
			Max. Torque	24			3.72

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L20	15 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.15	0.61	1.10
			Max. Mx	20	-56.11	3455.60	0.56
			Max. My	2	-56.11	0.42	3493.46
			Max. Vy	20	-32.06	3455.60	0.56
			Max. Vx	2	-32.34	0.42	3493.46
			Max. Torque	24			4.30

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.42	22.51	39	1.50	0.01
L2	126.59 - 122.25	15.57	39	1.25	0.00
L3	122.25 - 120.25	14.46	39	1.19	0.00
L4	120.25 - 115.5	13.97	39	1.16	0.00
L5	115.5 - 115	12.83	39	1.11	0.00
L6	115 - 105.25	12.72	39	1.10	0.00
L7	105.25 - 101.9	10.59	39	0.98	0.00
L8	101.9 - 85.96	9.92	39	0.94	0.00
L9	90.04 - 82	7.74	39	0.81	0.00
L10	82 - 77.25	6.43	39	0.74	0.00
L11	77.25 - 75.5	5.71	39	0.70	0.00
L12	75.5 - 75	5.46	39	0.68	0.00
L13	75 - 72.15	5.39	39	0.68	0.00
L14	72.15 - 71.25	4.99	39	0.65	0.00
L15	71.25 - 42.41	4.87	39	0.64	0.00
L16	47.58 - 36.25	2.23	39	0.43	0.00
L17	36.25 - 31.25	1.30	39	0.34	0.00
L18	31.25 - 18.5	0.97	39	0.29	0.00
L19	18.5 - 15	0.34	39	0.18	0.00
L20	15 - 0	0.22	39	0.14	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	APXVSPP18-C-A20 w/ Mount Pipe	39	22.51	1.50	0.01	13785
150.0000	TME-1900MHz RRH (65 MHz)	39	22.51	1.50	0.01	13785
137.0000	7770.00 w/ Mount Pipe	39	18.51	1.37	0.00	5302
136.0000	RRUS 11	39	18.22	1.36	0.00	4923
127.0000	(2) APL866513-42T0 w/ Mount Pipe	39	15.68	1.25	0.00	3237
117.0000	HBX-6516DS-VTM w/ Mount Pipe	39	13.19	1.13	0.00	4802
75.0000	OG-860/1920/GPS-A	39	5.39	0.68	0.00	5952

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.42	105.68	2	7.06	0.03
L2	126.59 - 122.25	73.17	2	5.87	0.01
L3	122.25 - 120.25	67.95	2	5.60	0.01
L4	120.25 - 115.5	65.63	2	5.47	0.01
L5	115.5 - 115	60.32	2	5.23	0.01
L6	115 - 105.25	59.77	2	5.19	0.01
L7	105.25 - 101.9	49.79	2	4.59	0.01
L8	101.9 - 85.96	46.63	2	4.42	0.01
L9	90.04 - 82	36.41	2	3.81	0.01

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L10	82 - 77.25	30.22	2	3.49	0.01
L11	77.25 - 75.5	26.85	2	3.29	0.01
L12	75.5 - 75	25.66	2	3.21	0.01
L13	75 - 72.15	25.33	2	3.18	0.00
L14	72.15 - 71.25	23.47	2	3.05	0.00
L15	71.25 - 42.41	22.90	2	3.01	0.00
L16	47.58 - 36.25	10.49	2	2.01	0.00
L17	36.25 - 31.25	6.12	2	1.60	0.00
L18	31.25 - 18.5	4.56	2	1.38	0.00
L19	18.5 - 15	1.61	2	0.84	0.00
L20	15 - 0	1.05	2	0.68	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	APXVSPP18-C-A20 w/ Mount Pipe	2	105.68	7.06	0.03	3023
150.0000	TME-1900MHz RRH (65 MHz)	2	105.68	7.06	0.03	3023
137.0000	7770.00 w/ Mount Pipe	2	86.96	6.43	0.02	1161
136.0000	RRUS 11	2	85.57	6.38	0.02	1077
127.0000	(2) APL866513-42T0 w/ Mount Pipe	2	73.68	5.89	0.01	705
117.0000	HBX-6516DS-VTM w/ Mount Pipe	2	61.97	5.32	0.01	1041
75.0000	OG-860/1920/GPS-A	2	25.33	3.18	0.01	1274

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	150 - 123.42 (1)	TP20.74x15x0.1875	26.5800	0.0000	0.0	11.8239	-8.16	865.46	0.009
L2	123.42 - 122.25 (2)	TP20.6033x19.6804x0.25	4.3400	0.0000	0.0	16.1503	-8.75	1199.89	0.007
L3	122.25 - 120.25 (3)	TP21.0285x20.6033x0.4075	2.0000	0.0000	0.0	26.6681	-9.07	1066.86	0.008
L4	120.25 - 115.5 (4)	TP22.0386x21.0285x0.5544	4.7500	0.0000	0.0	37.8050	-10.95	1515.85	0.007
L5	115.5 - 115 (5)	TP22.1449x22.0386x0.3981	0.5000	0.0000	0.0	27.4772	-11.04	1101.74	0.010
L6	115 - 105.25 (6)	TP24.2182x22.1449x0.5205	9.7500	0.0000	0.0	39.1464	-13.04	1573.21	0.008
L7	105.25 - 101.9 (7)	TP24.9305x24.2182x0.7142	3.3500	0.0000	0.0	54.8930	-13.95	1977.02	0.007
L8	101.9 - 85.96 (8)	TP28.32x24.9305x0.6884	15.9400	0.0000	0.0	58.4772	-17.27	2281.23	0.008
L9	85.96 - 82 (9)	TP28.6653x26.0757x0.734	8.0400	0.0000	0.0	62.1038	-19.48	2426.96	0.008
L10	82 - 77.25 (10)	TP29.6773x28.6653x0.8956	4.7500	0.0000	0.0	81.8115	-22.50	3201.80	0.007
L11	77.25 - 75.5 (11)	TP30.0502x29.6773x0.7716	1.7500	0.0000	0.0	71.7049	-23.10	2808.72	0.008
L12	75.5 - 75 (12)	TP30.1567x30.0502x0.8838	0.5000	0.0000	0.0	82.1166	-23.31	3214.68	0.007
L13	75 - 72.15 (13)	TP30.7639x30.1567x0.8087	2.8500	0.0000	0.0	76.8903	-24.41	3011.84	0.008
L14	72.15 - 71.25 (14)	TP30.9556x30.7639x0.8229	0.9000	0.0000	0.0	78.7041	-24.75	3182.74	0.008
L15	71.25 - 42.41 (15)	TP37.1x30.9556x0.8326	28.8400	0.0000	0.0	92.9331	-34.38	3822.95	0.009
L16	42.41 - 36.25 (16)	TP37.7849x34.3333x0.7102	11.3300	0.0000	0.0	79.3394	-38.28	3704.48	0.010
L17	36.25 - 31.25	TP38.849x37.7849x0.762	5.0000	0.0000	0.0	92.195	-42.83	4367.96	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	(17)	7				0			
L18	31.25 - 18.5 (18)	TP41.5626x38.849x0.732 8	12.750 0	0.0000	0.0	94.967 7	-48.38	4509.09	0.011
L19	18.5 - 15 (19)	TP42.3075x41.5626x0.66 08	3.5000	0.0000	0.0	87.352 9	-49.84	4185.48	0.012
L20	15 - 0 (20)	TP45.5x42.3075x0.6294	15.000 0	0.0000	0.0	84.532 6	-51.09	4002.03	0.013

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	150 - 123.42 (1)	TP20.74x15x0.1875	210.77	353.03	0.597	0.00	353.03	0.000
L2	123.42 - 122.25 (2)	TP20.6033x19.6804x0.25	290.68	499.99	0.581	0.00	499.99	0.000
L3	122.25 - 120.25 (3)	TP21.0285x20.6033x0.40 75	327.91	447.11	0.733	0.00	447.11	0.000
L4	120.25 - 115.5 (4)	TP22.0386x21.0285x0.55 44	419.42	657.96	0.637	0.00	657.96	0.000
L5	115.5 - 115 (5)	TP22.1449x22.0386x0.39 81	429.59	487.63	0.881	0.00	487.63	0.000
L6	115 - 105.25 (6)	TP24.2182x22.1449x0.52 05	632.91	756.05	0.837	0.00	756.05	0.000
L7	105.25 - 101.9 (7)	TP24.9305x24.2182x0.71 42	705.06	963.81	0.732	0.00	963.81	0.000
L8	101.9 - 85.96 (8)	TP28.32x24.9305x0.6884	970.08	1233.63	0.786	0.00	1233.63	0.000
L9	85.96 - 82 (9)	TP28.6653x26.0757x0.73 4	1064.94	1304.82	0.816	0.00	1304.82	0.000
L10	82 - 77.25 (10)	TP29.6773x28.6653x0.89 56	1273.79	1852.24	0.688	0.00	1852.24	0.000
L11	77.25 - 75.5 (11)	TP30.0502x29.6773x0.77 16	1316.74	1660.56	0.793	0.00	1660.56	0.000
L12	75.5 - 75 (12)	TP30.1567x30.0502x0.88 38	1329.07	1893.12	0.702	0.00	1893.12	0.000
L13	75 - 72.15 (13)	TP30.7639x30.1567x0.80 87	1400.17	1820.65	0.769	0.00	1820.65	0.000
L14	72.15 - 71.25 (14)	TP30.9556x30.7639x0.82 29	1422.81	1934.78	0.735	0.00	1934.78	0.000
L15	71.25 - 42.41 (15)	TP37.1x30.9556x0.8326	2050.50	2721.77	0.753	0.00	2721.77	0.000
L16	42.41 - 36.25 (16)	TP37.7849x34.3333x0.71 02	2196.40	2648.89	0.829	0.00	2648.89	0.000
L17	36.25 - 31.25 (17)	TP38.849x37.7849x0.762 7	2521.65	3380.10	0.746	0.00	3380.10	0.000
L18	31.25 - 18.5 (18)	TP41.5626x38.849x0.732 8	2908.29	3748.29	0.776	0.00	3748.29	0.000
L19	18.5 - 15 (19)	TP42.3075x41.5626x0.66 08	3017.03	3556.16	0.848	0.00	3556.16	0.000
L20	15 - 0 (20)	TP45.5x42.3075x0.6294	3110.99	3458.38	0.900	0.00	3458.38	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	150 - 123.42 (1)	TP20.74x15x0.1875	18.28	432.73	0.042	0.51	706.92	0.001
L2	123.42 - 122.25 (2)	TP20.6033x19.6804x0.25	18.56	599.94	0.031	0.46	1001.21	0.000
L3	122.25 - 120.25 (3)	TP21.0285x20.6033x0.40 75	18.69	533.43	0.035	0.47	895.31	0.001
L4	120.25 -	TP22.0386x21.0285x0.55	20.32	757.92	0.027	0.50	1317.53	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	115.5 (4)	44						
L5	115.5 - 115 (5)	TP22.1449x22.0386x0.3981	20.36	550.87	0.037	0.51	976.45	0.001
L6	115 - 105.25 (6)	TP24.2182x22.1449x0.5205	21.36	786.61	0.027	0.67	1513.95	0.000
L7	105.25 - 101.9 (7)	TP24.9305x24.2182x0.7142	21.73	988.51	0.022	0.73	1929.97	0.000
L8	101.9 - 85.96 (8)	TP28.32x24.9305x0.6884	22.99	1140.62	0.020	0.94	2470.28	0.000
L9	85.96 - 82 (9)	TP28.6653x26.0757x0.734	23.67	1232.84	0.019	1.05	2612.82	0.000
L10	82 - 77.25 (10)	TP29.6773x28.6653x0.8956	24.46	1600.90	0.015	1.19	3709.01	0.000
L11	77.25 - 75.5 (11)	TP30.0502x29.6773x0.7716	24.65	1404.36	0.018	1.23	3325.18	0.000
L12	75.5 - 75 (12)	TP30.1567x30.0502x0.8838	24.70	1607.34	0.015	1.24	3790.87	0.000
L13	75 - 72.15 (13)	TP30.7639x30.1567x0.8087	25.12	1505.92	0.017	1.30	3645.76	0.000
L14	72.15 - 71.25 (14)	TP30.9556x30.7639x0.8229	25.22	1591.37	0.016	1.32	3874.28	0.000
L15	71.25 - 42.41 (15)	TP37.1x30.9556x0.8326	27.88	1911.47	0.015	1.97	5450.18	0.000
L16	42.41 - 36.25 (16)	TP37.7849x34.3333x0.7102	28.70	1868.70	0.015	2.16	5304.26	0.000
L17	36.25 - 31.25 (17)	TP38.849x37.7849x0.7627	29.74	2183.98	0.014	2.50	6768.47	0.000
L18	31.25 - 18.5 (18)	TP41.5626x38.849x0.7328	30.95	2254.54	0.014	2.93	7505.74	0.000
L19	18.5 - 15 (19)	TP42.3075x41.5626x0.6608	31.23	2092.74	0.015	3.04	7121.01	0.000
L20	15 - 0 (20)	TP45.5x42.3075x0.6294	31.52	2011.08	0.016	3.17	6925.22	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	150 - 123.42 (1)	0.009	0.597	0.000	0.042	0.001	0.608 ✔	1.000	4.8.2 ✔
L2	123.42 - 122.25 (2)	0.007	0.581	0.000	0.031	0.000	0.590 ✔	1.000	4.8.2 ✔
L3	122.25 - 120.25 (3)	0.008	0.733	0.000	0.035	0.001	0.743 ✔	1.000	4.8.2 ✔
L4	120.25 - 115.5 (4)	0.007	0.637	0.000	0.027	0.000	0.645 ✔	1.000	4.8.2 ✔
L5	115.5 - 115 (5)	0.010	0.881	0.000	0.037	0.001	0.892 ✔	1.000	4.8.2 ✔
L6	115 - 105.25 (6)	0.008	0.837	0.000	0.027	0.000	0.846 ✔	1.000	4.8.2 ✔
L7	105.25 - 101.9 (7)	0.007	0.732	0.000	0.022	0.000	0.739 ✔	1.000	4.8.2 ✔
L8	101.9 - 85.96 (8)	0.008	0.786	0.000	0.020	0.000	0.794 ✔	1.000	4.8.2 ✔
L9	85.96 - 82 (9)	0.008	0.816	0.000	0.019	0.000	0.825 ✔	1.000	4.8.2 ✔
L10	82 - 77.25 (10)	0.007	0.688	0.000	0.015	0.000	0.695 ✔	1.000	4.8.2 ✔
L11	77.25 - 75.5 (11)	0.008	0.793	0.000	0.018	0.000	0.801 ✔	1.000	4.8.2 ✔
L12	75.5 - 75 (12)	0.007	0.702	0.000	0.015	0.000	0.710 ✔	1.000	4.8.2 ✔
L13	75 - 72.15 (13)	0.008	0.769	0.000	0.017	0.000	0.777 ✔	1.000	4.8.2 ✔

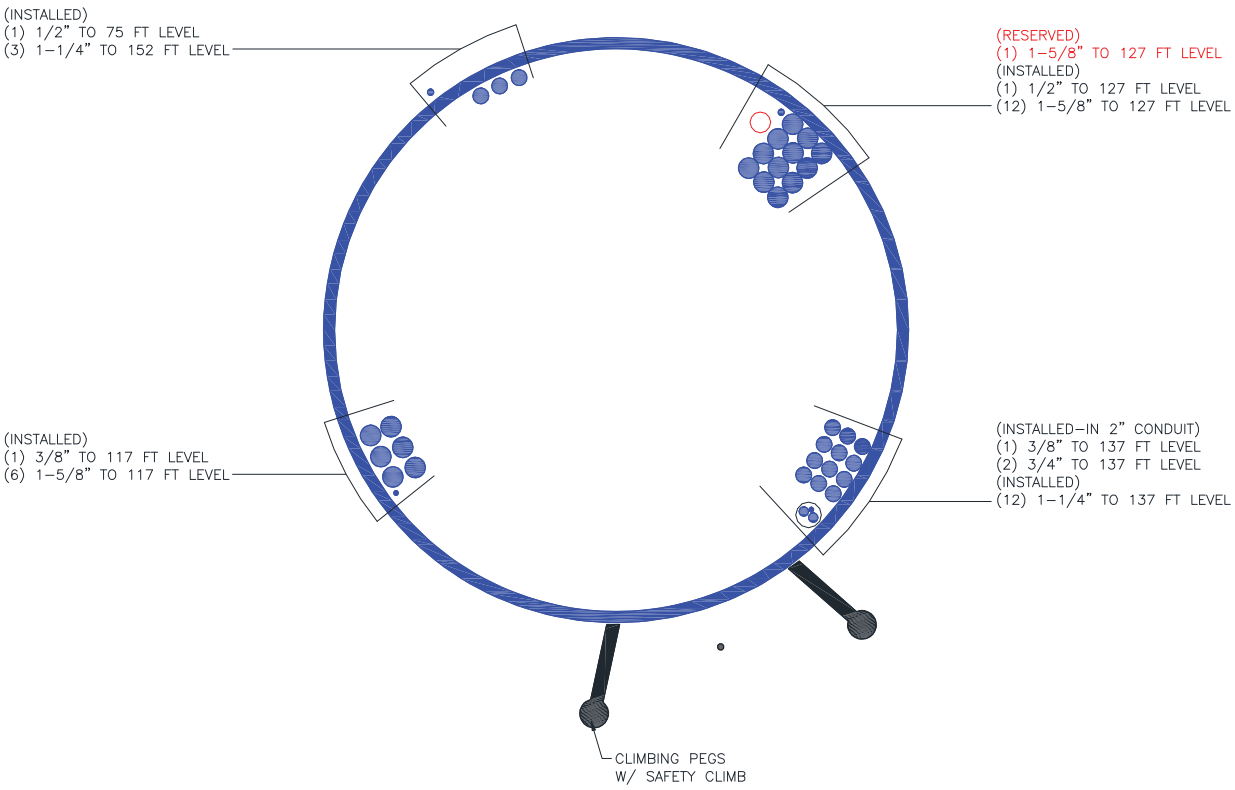
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L14	72.15 - 71.25 (14)	0.008	0.735	0.000	0.016	0.000	0.743 ✔	1.000	4.8.2 ✔
L15	71.25 - 42.41 (15)	0.009	0.753	0.000	0.015	0.000	0.763 ✔	1.000	4.8.2 ✔
L16	42.41 - 36.25 (16)	0.010	0.829	0.000	0.015	0.000	0.840 ✔	1.000	4.8.2 ✔
L17	36.25 - 31.25 (17)	0.010	0.746	0.000	0.014	0.000	0.756 ✔	1.000	4.8.2 ✔
L18	31.25 - 18.5 (18)	0.011	0.776	0.000	0.014	0.000	0.787 ✔	1.000	4.8.2 ✔
L19	18.5 - 15 (19)	0.012	0.848	0.000	0.015	0.000	0.861 ✔	1.000	4.8.2 ✔
L20	15 - 0 (20)	0.013	0.900	0.000	0.016	0.000	0.913 ✔	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	150 - 123.42	Pole	TP20.74x15x0.1875	1	-8.16	865.46	60.8	Pass
L2	123.42 - 122.25	Pole	TP20.6033x19.6804x0.25	2	-8.75	1199.89	59.0	Pass
L3	122.25 - 120.25	Pole	TP21.0285x20.6033x0.4075	3	-9.07	1066.86	74.3	Pass
L4	120.25 - 115.5	Pole	TP22.0386x21.0285x0.5544	4	-10.95	1515.85	64.5	Pass
L5	115.5 - 115	Pole	TP22.1449x22.0386x0.3981	5	-11.04	1101.74	89.2	Pass
L6	115 - 105.25	Pole	TP24.2182x22.1449x0.5205	6	-13.04	1573.21	84.6	Pass
L7	105.25 - 101.9	Pole	TP24.9305x24.2182x0.7142	7	-13.95	1977.02	73.9	Pass
L8	101.9 - 85.96	Pole	TP28.32x24.9305x0.6884	8	-17.27	2281.23	79.4	Pass
L9	85.96 - 82	Pole	TP28.6653x26.0757x0.734	9	-19.48	2426.96	82.5	Pass
L10	82 - 77.25	Pole	TP29.6773x28.6653x0.8956	10	-22.50	3201.80	69.5	Pass
L11	77.25 - 75.5	Pole	TP30.0502x29.6773x0.7716	11	-23.10	2808.72	80.1	Pass
L12	75.5 - 75	Pole	TP30.1567x30.0502x0.8838	12	-23.31	3214.68	71.0	Pass
L13	75 - 72.15	Pole	TP30.7639x30.1567x0.8087	13	-24.41	3011.84	77.7	Pass
L14	72.15 - 71.25	Pole	TP30.9556x30.7639x0.8229	14	-24.75	3182.74	74.3	Pass
L15	71.25 - 42.41	Pole	TP37.1x30.9556x0.8326	15	-34.38	3822.95	76.3	Pass
L16	42.41 - 36.25	Pole	TP37.7849x34.3333x0.7102	16	-38.28	3704.48	84.0	Pass
L17	36.25 - 31.25	Pole	TP38.849x37.7849x0.7627	17	-42.83	4367.96	75.6	Pass
L18	31.25 - 18.5	Pole	TP41.5626x38.849x0.7328	18	-48.38	4509.09	78.7	Pass
L19	18.5 - 15	Pole	TP42.3075x41.5626x0.6608	19	-49.84	4185.48	86.1	Pass
L20	15 - 0	Pole	TP45.5x42.3075x0.6294	20	-51.09	4002.03	91.3	Pass
							Summary	
						Pole (L20)	91.3	Pass
						RATING =	**91.3**	**Pass**

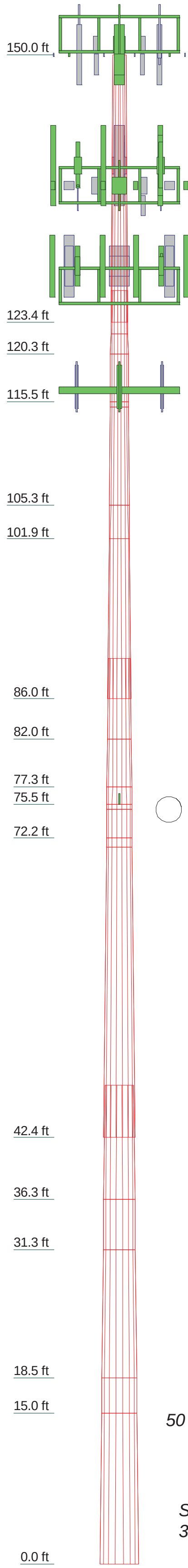
APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(1) 1/2" TO 75 FT LEVEL
(3) 1-1/4" TO 152 FT LEVEL
(RESERVED)
(1) 1-5/8" TO 127 FT LEVEL
(INSTALLED)
(1) 1/2" TO 127 FT LEVEL
(12) 1-5/8" TO 127 FT LEVEL
(INSTALLED)
(1) 3/8" TO 117 FT LEVEL
(6) 1-5/8" TO 117 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(1) 3/8" TO 137 FT LEVEL
(2) 3/4" TO 137 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 137 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	26.5800	18	0.1875	3.1700	15.0000	20.7400	A572-65	1.0
2	[illegible]	18	[illegible]		[illegible]	[illegible]	Reinf 35.05 ksi	0.2
3	[illegible]	18	[illegible]		[illegible]	[illegible]	[illegible]	0.2
4	[illegible]	18	[illegible]		[illegible]	[illegible]	[illegible]	0.6
5	0.5000	18	[illegible]		[illegible]	[illegible]	[illegible]	0.0
6	9.7500	18	0.5204		22.1449	24.2182	Reinf 35.16 ksi	1.2
7	3.3500	18	0.7142		24.2182	24.9305	Reinf 31.51 ksi	0.6
8	15.9400	18	0.6884	4.0800	24.9305	28.3200	Reinf 34.13 ksi	3.1
9	8.0400	18	0.7340		26.0757	28.6653	Reinf 34.19 ksi	1.7
10	[illegible]	18	0.8955		[illegible]	[illegible]	[illegible]	1.3
11	[illegible]	18	[illegible]		[illegible]	[illegible]	[illegible]	0.4
12	[illegible]	18	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	18	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	18	[illegible]		[illegible]	[illegible]	Reinf 35.38 ksi	[illegible]
15	28.8400	18	0.8326	5.1700	30.9556	37.1000	Reinf 35.99 ksi	8.6
16	11.3300	18	0.7102		34.3333	37.7849	Reinf 40.85 ksi	3.1
17	5.0000	18	0.7627		37.7849	38.8490	Reinf 41.45 ksi	1.5
18	12.7500	18	0.7328		38.8490	41.5626	Reinf 41.54 ksi	4.0
19	3.5000	18	0.6608		41.5626	42.3075	Reinf 41.92 ksi	1.0
20	15.0000	18	0.6294		42.3075	45.5000	Reinf 41.42 ksi	4.4
								34.1

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	152	2.375" OD x 5' Mount Pipe	137
APXVSPP18-C-A20 w/ Mount Pipe	152	2.375" OD x 5' Mount Pipe	137
APXVSPP18-C-A20 w/ Mount Pipe	152	2.375" OD x 5' Mount Pipe	137
(3) ACU-A20-N	152	Platform Mount [LP 712-1]	137
(3) ACU-A20-N	152	RRUS 11	136
(3) ACU-A20-N	152	RRUS 11	136
800 EXTERNAL NOTCH FILTER	152	RRUS 11	136
800 EXTERNAL NOTCH FILTER	152	DC6-48-60-18-8F	136
800 EXTERNAL NOTCH FILTER	152	Side Arm Mount [SO 102-3]	136
Platform Mount [LP 601-1]	152	(2) APL866513-42T0 w/ Mount Pipe	127
(2) 2.375" OD x 6' Mount Pipe	152	(2) APL866513-42T0 w/ Mount Pipe	127
(2) 2.375" OD x 6' Mount Pipe	152	(2) APL866513-42T0 w/ Mount Pipe	127
(2) 2.375" OD x 6' Mount Pipe	152	BXA-70063-4CF-EDIN-X w/ Mount Pipe	127
8-ft Ladder	152		
TME-1900MHz RRH (65 MHz)	150	BXA-70063-4CF-EDIN-X w/ Mount Pipe	127
TME-1900MHz RRH (65 MHz)	150		
TME-1900MHz RRH (65 MHz)	150	GPS_A	127
TME-800MHz RRH	150	(2) FD9R6004/2C-3L	127
TME-800MHz RRH	150	(2) FD9R6004/2C-3L	127
TME-800MHz RRH	150	(2) FD9R6004/2C-3L	127
Side Arm Mount [SO 102-3]	150	(2) HBXX-6517DS-A2M w/ Mount Pipe	127
7770.00 w/ Mount Pipe	137	(2) HBXX-6517DS-A2M w/ Mount Pipe	127
7770.00 w/ Mount Pipe	137	(2) HBXX-6517DS-A2M w/ Mount Pipe	127
7770.00 w/ Mount Pipe	137	BXA-70040/4CF w/ Mount Pipe	127
SBNH-1D6565C w/ Mount Pipe	137	RRH2X60-AWS	127
SBNH-1D6565C w/ Mount Pipe	137	RRH2X60-AWS	127
(2) SBNH-1D6565C w/ Mount Pipe	137	RRH2X60-AWS	127
AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	RRH2X60-PCS	127
		RRH2X60-PCS	127
AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	RRH2X60-PCS	127
		DB-T1-6Z-8AB-0Z	127
7020.00	137	Platform Mount [LP 712-1]	127
7020.00	137	HBX-6516DS-VTM w/ Mount Pipe	117
7020.00	137	HBX-6516DS-VTM w/ Mount Pipe	117
(2) DTMABP7819VG12A	137	HBX-6516DS-VTM w/ Mount Pipe	117
(2) DTMABP7819VG12A	137	2.375" OD x 5' Mount Pipe	117
(2) DTMABP7819VG12A	137	2.375" OD x 5' Mount Pipe	117
DC6-48-60-18-8F	137	2.375" OD x 5' Mount Pipe	117
RRUS 12	137	T-Arm Mount [TA 601-3]	117
RRUS 12	137	OG-860/1920/GPS-A	75
RRUS 12	137	Side Arm Mount [SO 701-1]	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 34.25 ksi	34 ksi	43 ksi
Reinf 35.05 ksi	35 ksi	44 ksi	Reinf 35.38 ksi	35 ksi	45 ksi
Reinf 35.08 ksi	35 ksi	44 ksi	Reinf 35.99 ksi	36 ksi	45 ksi
Reinf 35.16 ksi	35 ksi	44 ksi	Reinf 40.85 ksi	41 ksi	52 ksi
Reinf 31.51 ksi	32 ksi	40 ksi	Reinf 41.45 ksi	41 ksi	52 ksi
Reinf 34.13 ksi	34 ksi	43 ksi	Reinf 41.54 ksi	42 ksi	52 ksi
Reinf 34.19 ksi	34 ksi	43 ksi	Reinf 41.92 ksi	42 ksi	53 ksi
Reinf 34.24 ksi	34 ksi	43 ksi	Reinf 41.42 ksi	41 ksi	52 ksi
Reinf 34.27 ksi	34 ksi	43 ksi			

ALL REACTIONS ARE FACTORED

AXIAL 81 K

SHEAR 9 K

MOMENT 1020 kip-ft

TORQUE 2 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 56 K

SHEAR 32 K

MOMENT 3493 kip-ft

TORQUE 4 kip-ft

REACTIONS - 97 mph WIND

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 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: 91.3%

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX:

Job: ***150' Monopole / Oxford/Fritz Property***		
Project: ***PJF 37515-0074 / BU 876362***		
Client: Crown Castle	Drawn by: TDehnke	App'd:
Code: TIA-222-G	Date: 12/16/16	Scale: NTS
Path:		Dwg No. E-1

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

v4.4 - Effective 7-12-13

Date: 12/16/2016
PJF Project: 37516-3838.001.7805
Client Ref. # BU 876362
Site Name:
Description:
Owner:
Engineer:

Asymmetric Anchor Rod Analysis

Moment =	3493	k-ft	TIA Ref.	G	Location =	Base Plate		
Axial =	56.0	kips	ASIF =	N/A	η =	0.50	for BP, Rev. G Sect. 4.9.9	
Shear =	32.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	24							

**** 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	54.00	0.00	3.98	153.34	146.92	157.01	0.00	260.00	60.4%
2	2.250	#18J A615 Gr 75	75	100	30.0	54.00	0.00	3.98	151.85	145.42	155.52	0.00	260.00	59.8%
3	2.250	#18J A615 Gr 75	75	100	60.0	54.00	0.00	3.98	150.54	144.12	154.21	0.00	260.00	59.3%
4	2.250	#18J A615 Gr 75	75	100	90.0	54.00	0.00	3.98	150.01	143.59	153.68	0.00	260.00	59.1%
5	2.250	#18J A615 Gr 75	75	100	120.0	54.00	0.00	3.98	150.22	143.80	153.89	0.00	260.00	59.2%
6	2.250	#18J A615 Gr 75	75	100	150.0	54.00	0.00	3.98	150.73	144.30	154.40	0.00	260.00	59.4%
7	2.250	#18J A615 Gr 75	75	100	180.0	54.00	0.00	3.98	151.15	144.73	154.82	0.00	260.00	59.5%
8	2.250	#18J A615 Gr 75	75	100	210.0	54.00	0.00	3.98	151.57	145.15	155.24	0.00	260.00	59.7%
9	2.250	#18J A615 Gr 75	75	100	240.0	54.00	0.00	3.98	152.26	145.84	155.93	0.00	260.00	60.0%
10	2.250	#18J A615 Gr 75	75	100	270.0	54.00	0.00	3.98	153.26	146.83	156.93	0.00	260.00	60.4%
11	2.250	#18J A615 Gr 75	75	100	300.0	54.00	0.00	3.98	154.12	147.70	157.79	0.00	260.00	60.7%
12	2.250	#18J A615 Gr 75	75	100	330.0	54.00	0.00	3.98	154.23	147.81	157.90	0.00	260.00	60.7%
13								0.00	0.00	0.00	0.00		0.00	0.0%
14	1.750	A193 Gr B7	105	125	100.0	69.00	0.00	2.41	115.60	111.72	117.82	0.00	190.00	62.0%
15	1.750	A193 Gr B7	105	125	220.0	69.00	0.00	2.41	116.61	112.73	118.83	0.00	190.00	62.5%
16	1.750	A193 Gr B7	105	125	340.0	69.00	0.00	2.41	118.15	114.27	120.36	0.00	190.00	63.3%
17								0.00	0.00	0.00	0.00		0.00	0.0%
18	1.750	A193 Gr B7	105	125	50.0	69.00	0.00	2.41	116.08	112.20	118.30	0.00	190.00	62.3%
19	1.750	A193 Gr B7	105	125	158.0	69.00	0.00	2.41	116.22	112.34	118.44	0.00	190.00	62.3%
20	1.750	A193 Gr B7	105	125	290.0	69.00	0.00	2.41	117.98	114.10	120.19	0.00	190.00	63.3%
21								0.00	0.00	0.00	0.00		0.00	0.0%
22	1.750	A193 Gr B7	105	125	25.0	69.00	0.00	2.41	116.86	112.98	119.08	0.00	190.00	62.7%
23	1.750	A193 Gr B7	105	125	145.0	69.00	0.00	2.41	116.09	112.21	118.31	0.00	190.00	62.3%
24	1.750	A193 Gr B7	105	125	252.0	69.00	0.00	2.41	117.12	113.24	119.34	0.00	190.00	62.8%
								69.41						

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:	1996.65	ft-kips
Axial, Pu:	56	kips
Shear, Vu:	32	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	54	in

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	157.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	60.7% **Pass**	

Plate Data		
Diam:	60	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.03	in

Base Plate Results Flexural Check

		Stiffened
Base Plate Stress:	33.7 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	62.4% **Pass**	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	6.75	in
Height:	13.75	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi
Clear Space between Stiffeners (b):	7.5	in

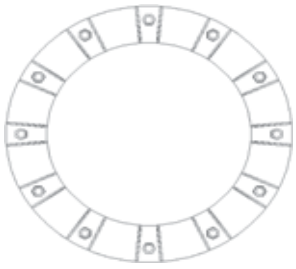
Stiffener Results

Horizontal Weld :	49.9% **Pass**
Vertical Weld:	25.4% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	21.3% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	43.3% **Pass**
Plate Comp. (AISC Bracket):	56.0% **Pass**

Pole Results

Pole Punching Shear Check:	11.3% **Pass**

Pole Data		
Diam:	45.5	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

PAUL J. FORD & COMPANY

37516-3433.001.78058
BU# 806578

Reactions at Pole Base*		
Moment	3493	k*ft
Axial	56	k
Shear	32	k

*From tnxTower

Number of anchors:	4	Water	99	Ft
		Soil Weight:	0	pcf

Foundation Dimensions					
Pier			Mat		
Width	6	ft	Width	22	ft
Height	1.5	ft	Thickness	4.5	ft
Projection	1	ft	Fdn Depth	5	ft

Foundation Weight			Factored Weights			
			1.2 *Dead		0.9 *Dead	
Pier	8.10	k	9.72	k	7.29	k
Soil	0.00	k	0.00	k	0.00	k
Pole*	56	k	56	k	42	k
Mat	326.70	k	392.04	k	294.03	k
Total			457.76	k	343.32	k

*From TNXtower. Contains 1.2 factors from output

1.2*Dead - Tension/Compression

$$T = \frac{MY}{I} - \frac{1.2 * W_F}{N} - \frac{A_{POLE}}{N}$$

$$C = \frac{MY}{I} + \frac{1.2 * W_F}{N} + \frac{A_{POLE}}{N}$$

0.9*Dead - Tension/Compression

$$T = \frac{MY}{I} - \frac{0.9 * W_F}{N} - \frac{.9\left(\frac{A_{POLE}}{1.2}\right)}{N}$$

$$C = \frac{MY}{I} + \frac{0.9 * W_F}{N} + \frac{.9\left(\frac{A_{POLE}}{1.2}\right)}{N}$$

	Load	Distance	Moment	
Moment	3493		3493	k*ft
Shear	32	6	192	k*ft
	Total Induced Moment		3685	k*ft

Check assuming wind into the corner

Group #	# Anchors	ybar (in)	ny^2	
1	1	135.8	18432.00	
2	1	131.5	17298.01	
		Total	35730.01	in2

1.2 Axial Load Factor
Anchor Loads:

				T (kips)	C (kips)
1	(MY)/I	168.02	k	53.58	282.46
2	(MY)/I	162.77	k	48.33	277.21

0.9 Axial Load Factor
Anchor Loads:

				T (kips)	C (kips)
1	(MY)/I	168.02	k	82.19	253.85
2	(MY)/I	162.77	k	76.94	248.60

Bending Moment in Foundation - 1.2*D

	T (k*ft)	C (k*ft)
1	303.12	1597.86
2	264.87	1519.15
Total	567.99	3117.01

Bearing - 1.2*D

	C (kips)
1	282.464
2	277.21
Total	559.678

Bending Moment in Foundation - 0.9*D

	T (k*ft)	C (k*ft)
1	464.96	1436.02
2	421.66	1362.37
Total	886.62	2798.38

Bearing - 0.9*D

	C (kips)
1	126.93
2	124.30
Total	251.23

Bearing Capacity

Bearing Area	7374.52	in^2
Bearing Area	51.21	ft^2

Ultimate Bearing Capacity	30	ksf
Factored Bearing Capacity	22.50	ksf

Max Load in Anchors		
Tension	82.19	k
Compression	10.93	k

Ultimate Capacities		
Tension	150	k*
Compression	22.50	ksf

*Based on 150 kips load test

Stress. Ratios	
Tension	54.8%
Compression	48.6%

Check assuming wind into the Side

Group #	# Anchors	ybar (in)	ny^2	
1	3	96	27648.00	
2	1	90.00	8100.00	
		Total	35748.00	in2

1.2 Axial Load Factor
Anchor Loads:

				T (kips)	C (kips)
1	(MY)/I	118.751	k	4.31	233.19
2	(MY)/I	111.329	k	-3.11	225.77

0.9 Axial Load Factor
Anchor Loads:

				T (kips)	C (kips)
1	(MY)/I	118.75	k	32.92	204.58
2	(MY)/I	111.33	k	25.50	197.16

Bending Moment in Foundation - 1.2*D

	T (k*ft)	C (k*ft)
1	51.7351	2798.3
2	-11.6651	846.635
Total	40.07	3644.93

Bearing - 1.2*D

	C (kips)
1	349.787
2	112.885
Total	462.672

Bending Moment in Foundation - 0.9*D

	T (k*ft)	C (k*ft)
1	395.055	2454.98
2	95.6224	739.347
Total	490.678	3194.32

Bearing - 0.9*D

	C (kips)
1	306.872
2	98.5797
Total	405.452

Bearing Capacity

Bearing Area	22113.00	in^2
Bearing Area	153.56	ft^2

Ultimate Bearing Capacity	30	ksf
Factored Bearing Capacity	22.50	ksf

Max Load in Anchors

Tension	32.92	k
Compression	3.01	k

Ultimate Capacities

Tension	150	k*
Compression	22.50	ksf

*Based on 150 kips load test

Stress. Ratios

Tension	22.0%
Compression	13.4%

Max Foundation Bending

Pier	3541	k*ft
Mat (Tension)	886.62	k*ft
Mat (Compression)	3644.93	k*ft

Ultimate Capacities*

Pier	5930.03	k*ft
Mat (Tension)	5545.55	k*ft
Mat (Compression)	5545.55	k*ft

*Obtained From SPColumn

Foundation Reinforcing Ratios

Pier	59.7%
Mat (Tension)	16.0%
Mat (Compression)	65.7%

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

SmartLink, LLC on behalf of AT&T Mobility, LLC
Site FA – 10035376
Site ID – CT2090
(Multi Carrier-BWE)
USID – 27032
Site Name – Oxford - East
Site Compliance Report

338 Oxford Road
Oxford, CT 06478

Latitude: N41-25-40.87
Longitude: W73-6-30.80
Structure Type: Monopole

Report generated date: October 12, 2016
Report by: Sam Cosgrove
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)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground Level	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant

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

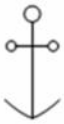
RFDS: NEW-ENGLAND_CONNECTICUT_CTV2090_2017-LTE-Multi-Carrier_1xBBU-RRH-Add_om636a_PTN_10035376_27032_04-28-2016_Final-Approved_v2.00

CD's: 10035376_AE201_160810_CTL02090_REV0

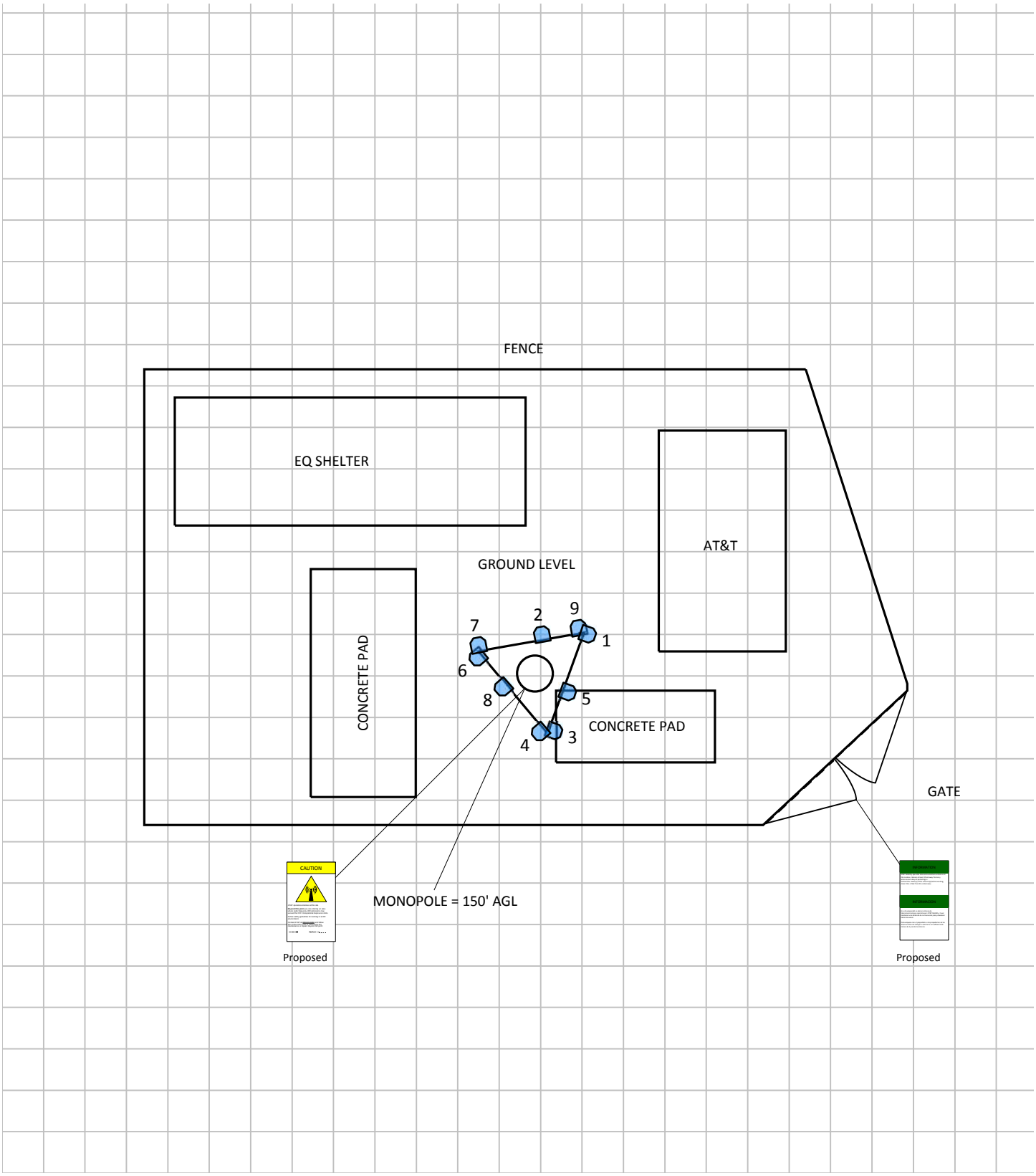
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

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

Site Scale Map For: Oxford - East



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

(Feet)

0 6.2 12.5

www.sitesafe.com
Site Name:Oxford - East
10/12/2016 11:54:03 AM

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

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	Powerwave 7770	Panel	850	143	82	4.6	11.51	0	1	0	263.6	68.4'	83.5'	136.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	1	0	360.6	68.4'	83.5'	136.7'
2	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	23	71	8	13.733	0	0	1	1475.7	64.3'	83.6'	135'
2	AT&T MOBILITY LLC (PROPOSED)	Andrew SBNH-1D6565C	Panel	1900	23	57	8	15.504	0	0	1	3664.4	64.3'	83.6'	135'
3	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	850	143	67	8	13.868	1	0	0	233.9	65.4'	74.8'	135'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	1	0	263.6	64.1'	74.7'	136.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	360.6	64.1'	74.7'	136.7'
5	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	143	71	8	13.733	0	0	1	1475.7	66.6'	78.3'	135'
5	AT&T MOBILITY LLC (PROPOSED)	Andrew SBNH-1D6565C	Panel	1900	143	57	8	15.504	0	0	1	3664.4	66.6'	78.3'	135'
6	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	850	263	67	8	13.868	1	0	0	228.6	58.4'	81.5'	135'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	23	82	4.6	11.51	0	1	0	263.6	58.5'	82.6'	136.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	23	86	4.6	13.41	0	1	0	360.6	58.5'	82.6'	136.7'
8	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	263	71	8	13.733	0	0	1	1475.7	60.7'	78.7'	135'
8	AT&T MOBILITY LLC (PROPOSED)	Andrew SBNH-1D6565C	Panel	1900	263	57	8	15.504	0	0	1	3664.4	60.7'	78.7'	135'
9	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	850	23	67	8	13.868	1	0	0	233.9	67.6'	84.1'	135'

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 the main site level unless otherwise indicated. 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.

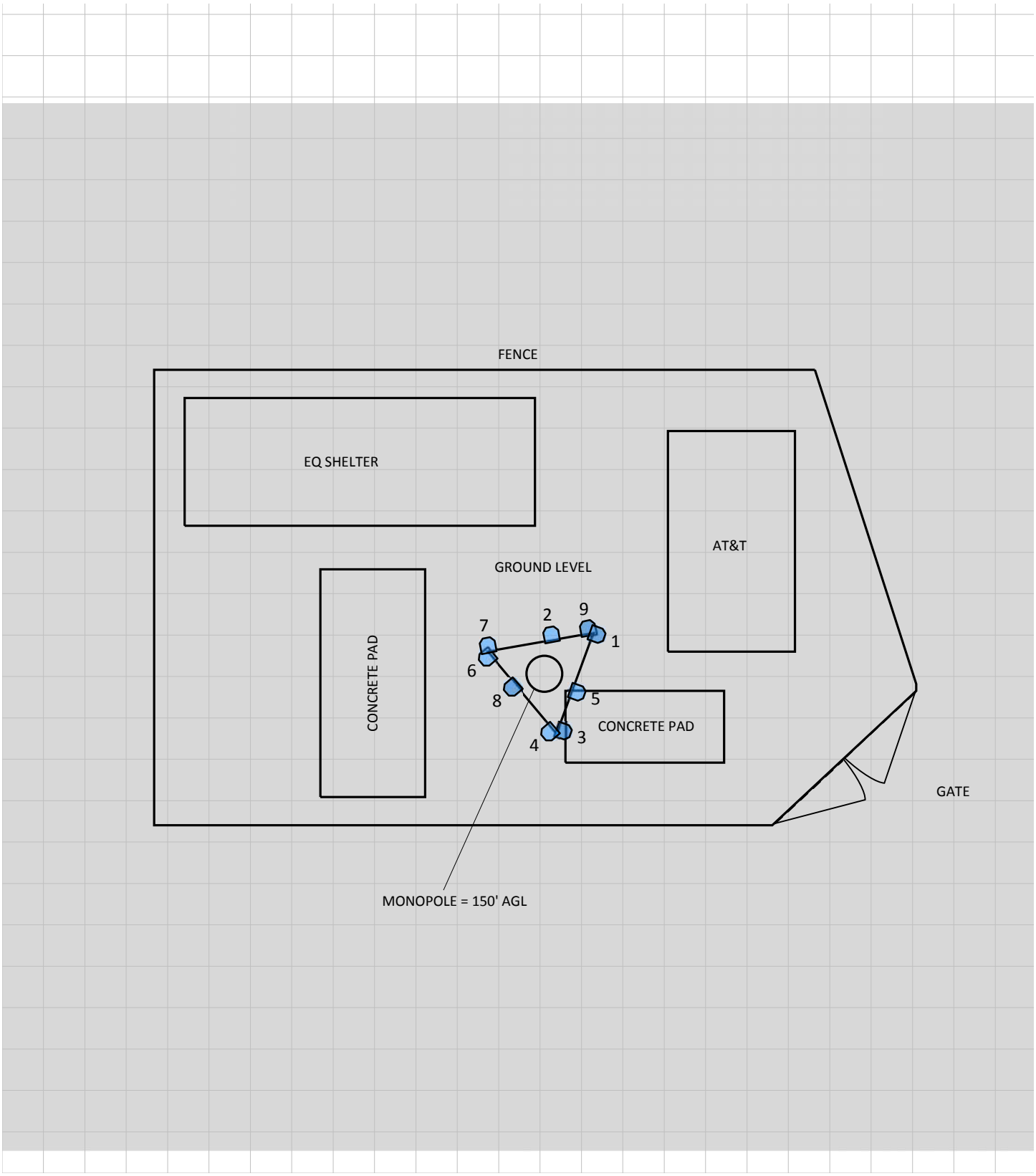
Note: The 1900MHz LTE technology is being added to an existing antenna.

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: Oxford - East



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

(Feet)

0 6.2 12.5

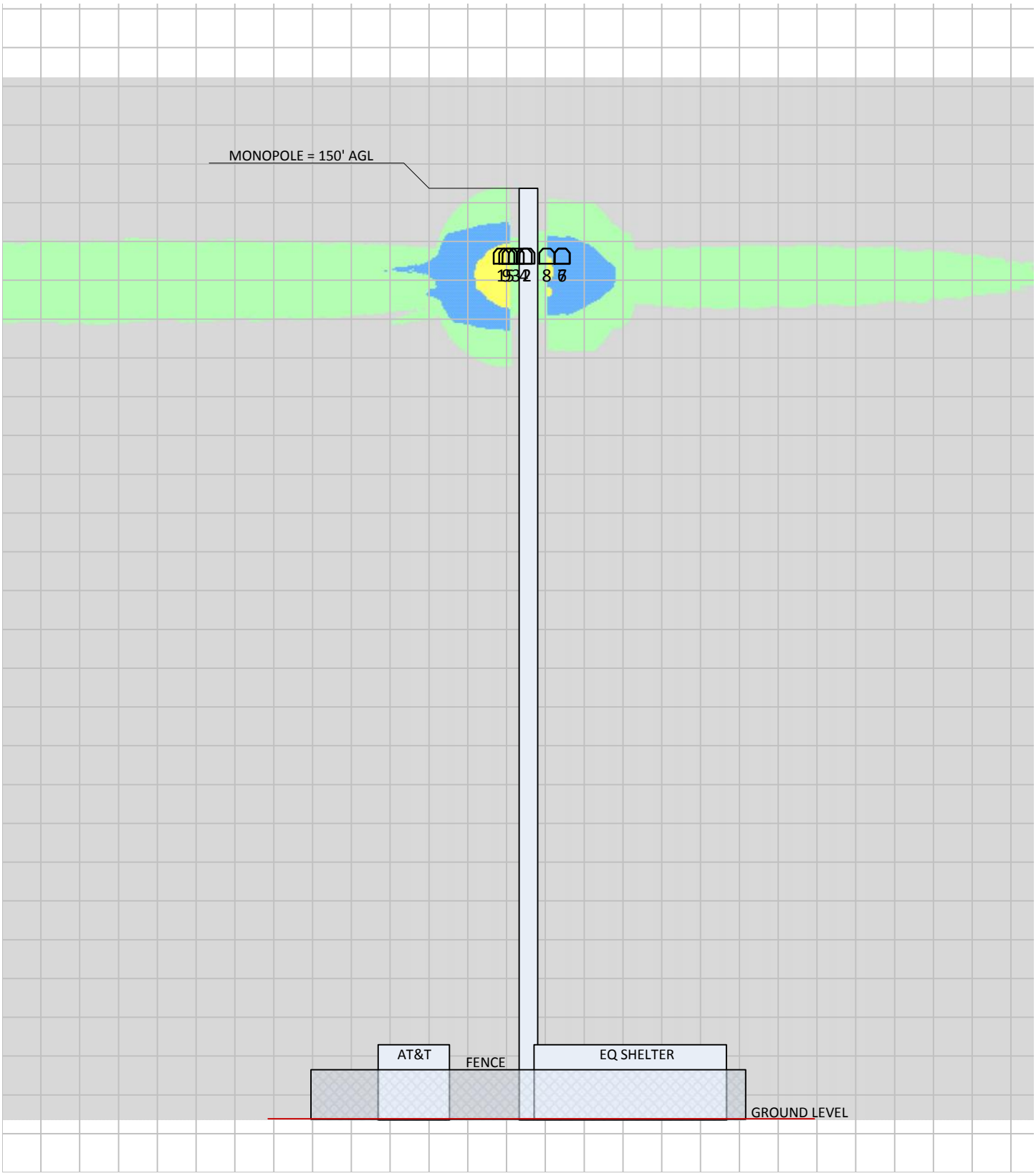
www.sitesafe.com
Site Name:Oxford - East
10/12/2016 11:46:29 AM

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

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.249
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Oxford – East
Elevation View



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

(Feet)
0 11.1 22.2

www.sitesafe.com
Site Name:Oxford - East
10/12/2016 11:53:14 AM

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

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.249
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

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:

Site Access Locations

Information Sign 1 required at the Gate.
Yellow caution 2 sign required at the Monopole Base.

6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

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 Sam Cosgrove.

October 12, 2016

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.

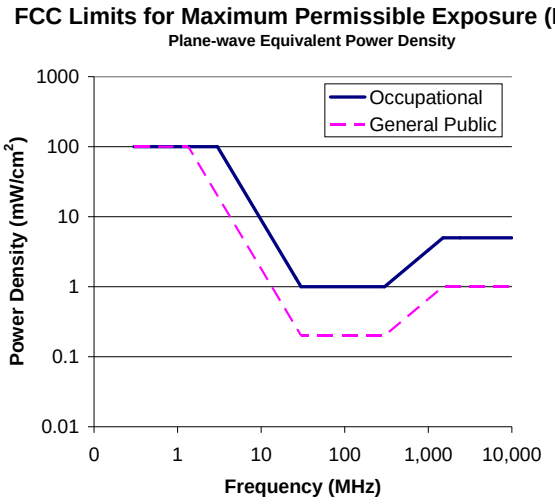
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf