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

February 27, 2017

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 873633**
AT&T Site ID: CT2082
10 Bona Street, Milford, CT 06460
Latitude: 41° 13′ 12.27″/ Longitude: -73° 4′ 38.56″

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 136-foot level of the existing 133-foot monopole at 10 Bona Street in Milford, CT. The tower is owned by Crown Castle. The property is owned by 10 Bona Street LLC. AT&T now intends to replace three (3) antennas with three (3) Andrew antennas. These antennas would be installed at the 136-foot level of the tower. AT&T also intends to replace three (3) RRU11s with three (3) RRU32, and install two (2) filters.

A request for original zoning documents was sent to the City of Milford 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 The Honorable Benjamin G. Blake, Mayor, City of Milford, 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: The Honorable Benjamin G. Blake, Mayor
City of Milford
70 West River Street
Milford, CT 06460

Planning & Zoning
City of Milford
70 West River Street
Milford, CT 06460

10 Bona Street LLC
92 Trumblebrook Drive
Milford, CT 06460

10 BONA ST

Location	10 BONA ST	**Mblu**	53/ 304/ 70/ /
Acct#	003888	**Owner**	10 BONA STREET LLC
Assessment	$175,000	**Appraisal**	$250,000
PID	12894	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$250,000	$0	$250,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$175,000	$0	$175,000

Owner of Record

Owner 10 BONA STREET LLC
Other C/O CROWN CASTLE
Address PMB 353/SITE BU 873633
4017 WASHINGTON RD
MCMURRAY, PA 15317-2520

Sale Price $0
Certificate
Book & Page 03141/0288
Sale Date 01/03/2007

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
10 BONA STREET LLC	$0		03141/0288	01/03/2007
CLEMENTE JOSEPH N	$0		01111/0191	04/29/1981

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings

Building Photo

Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Description:	
Kitchen Descrip:	
Int Condition:	
Solar Panels	
House Generator	

(http://images.vgsi.com/photos/MilfordCTPhotos//\00\03\98/24.JPG)

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	434V
Description	CELL TOWER MDL-00
Zone	CDD1
Neighborhood	F
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.23
Frontage	100
Depth	100
Assessed Value	$0
Appraised Value	$0

Outbuildings

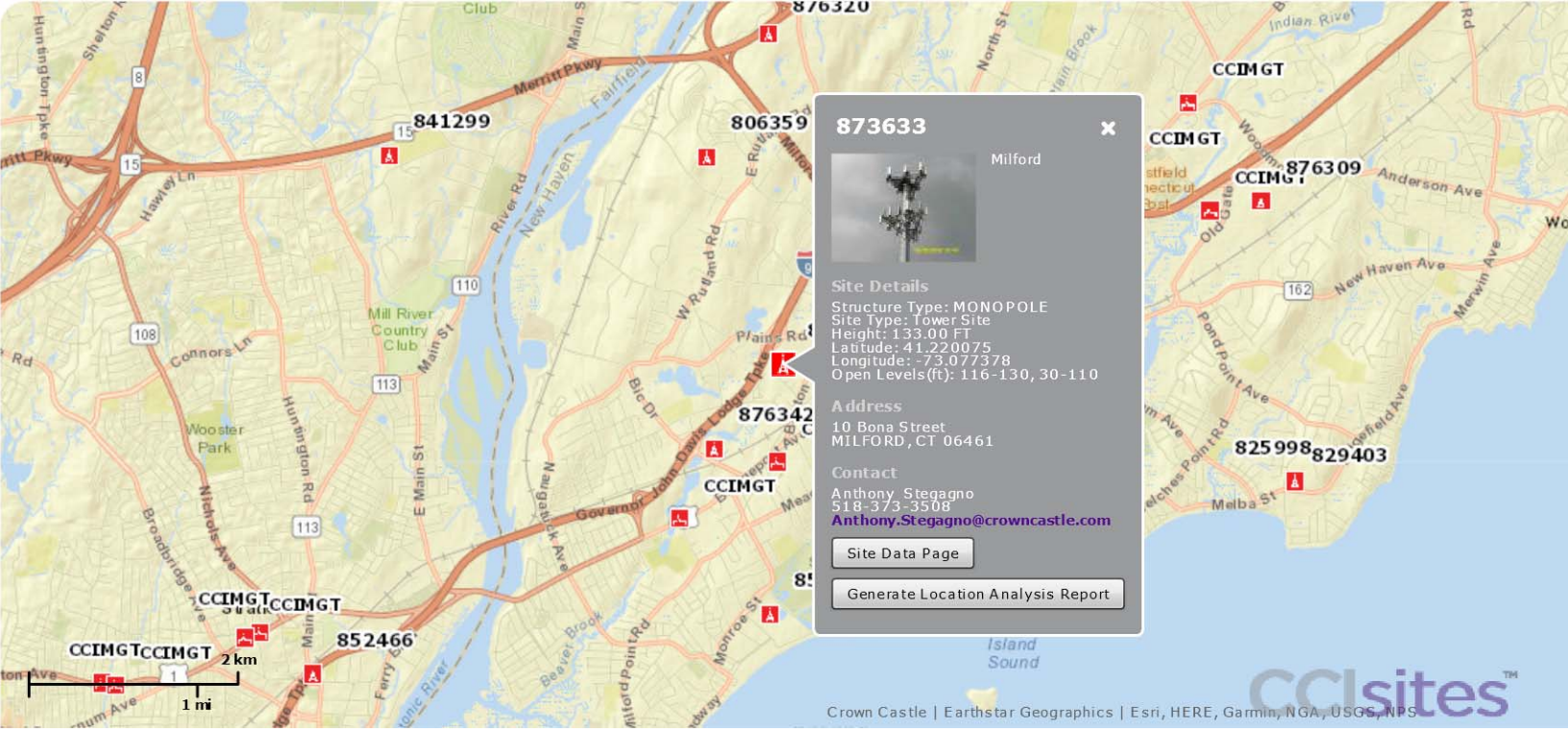
Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**

CEL1	CEL TWR SITE			1 UNITS	$250,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$250,000	$101,250	$351,250
2012	$250,000	$101,250	$351,250
2011	$250,000	$101,250	$351,250

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$175,000	$70,880	$245,880
2012	$175,000	$70,880	$245,880
2011	$175,000	$70,880	$245,880


873633
Milford
Site Details
Structure Type: MONOPOLE
Site Type: Tower Site
Height: 133.00 FT
Latitude: 41.220075
Longitude: -73.077378
Open Levels(ft): 116-130, 30-110
Address
10 Bona Street
MILFORD, CT 06461
Contact
Anthony Stegagno
518-373-3508
Anthony.Stegagno@crowncastle.com
Site Data Page
Generate Location Analysis Report
841299
806359
876320
876342
876309
825998
829403
852466
CCIMGT
2 km
1 mi
Island Sound
Crown Castle | Earthstar Geographics | Esri, HERE, Garmin, NGA, USGS, NPS
CCIsites™

SITE NAME: MILFORD - BONA ST.
FA NUMBER: 10035338
SITE NUMBER: CTL02082
MULTI-CARRIER-MRCTB018539
RETROFIT-MRCTB018061
10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

CROWN CASTLE SITE NAME: MILFORD
CROWN CASTLE SITE #: 873633

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: SMARTLINK, LLC
ADDRESS: 85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP: NORTH BILLERICA, MA 01862-2105
CONTACT: TODD OLIVER
PHONE: (774) 369-3618
E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY: SMARTLINK, LLC
ADDRESS: 85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP: NORTH BILLERICA, MA 01862-2105
CONTACT: TODD OLIVER
PHONE: (774) 369-3618
E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

ENGINEER

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

RF ENGINEER

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

CONSTRUCTION MANAGER

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

SITE INFORMATION

APPLICANT/LESSEE

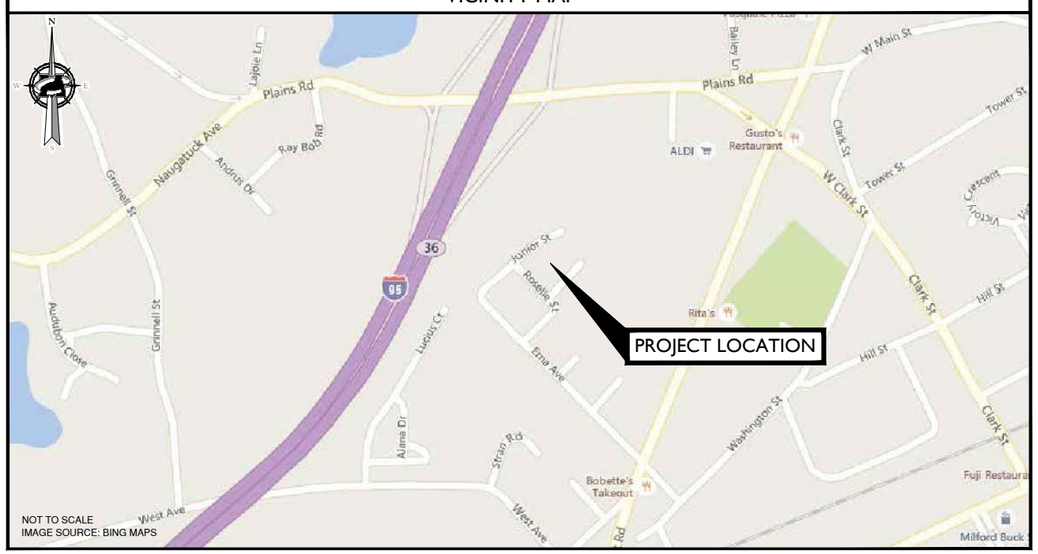
at&t

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

TOWER OWNER:

NAME:	CROWN CASTLE INTERNATIONAL
ADDRESS:	12 GILL STREET, SUITE # 5800
CITY, STATE, ZIP:	WOBURN, MA 01801
SITE ID #:	873633
LATITUDE:	41°-13'-12.36" N
LONGITUDE:	73°-04"-38.63" W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT SHELTER AND MONOPOLE
ZONING/JURISDICTION:	MILFORD
CURRENT USE:	UNMANNED TELECOMMUNICATIONS FACILITY
PROPOSED USE:	NO CHANGE
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP



CODE COMPLIANCE

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

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

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

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

GENERAL NOTES

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

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

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- ADD (2) WCS-IMFQ-AMT FILTERS
- REMOVE (3) EXISTING ANTENNAS IN POSITION 3, (1) PER SECTOR
- ADD (3) NEW ANTENNAS IN POSITION 4, (1) PER SECTOR
- RELOCATE (3) RRUS-11, (1) PER SECTOR
- (3) NEW RRUS-32 B2 TO REPLACE (3) EXISTING RRUS-11, (1) PER SECTOR
- ADD DUS AND IDL2 LINK

PROPOSED PROJECT SCOPE BASED ON RFDS ID #751467, VERSION 3.00, LAST UPDATED 10/19/16 AND RFDS ID #1189648, VERSION 1.00, LAST UPDATED 04/29/16

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

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

811 Know what's below. Call before you dig
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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	16946013A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	01/25/17	FOR CONSTRUCTION	RA	FEP
0	10/31/16	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT
FRANK E. PAZDEN
12
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER
ENGINEER LICENSE NUMBER: 30112

SITE NAME:

MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

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

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

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

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

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

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
3. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
11. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
12. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
13. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
14. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
15. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
16. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
18. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
19. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
20. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
21. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.

22. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
23. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
24. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
25. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
26. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
27. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
28. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
29. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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SCALE :	JOB NUMBER :
AS SHOWN	16946013A

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0	10/31/16	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT — FRANK E. PAZDEN — LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE / LICENSE NUMBER: PEN.0028

SITE NAME:

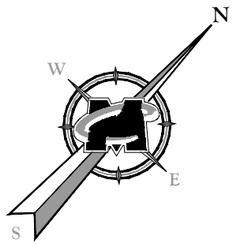
MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

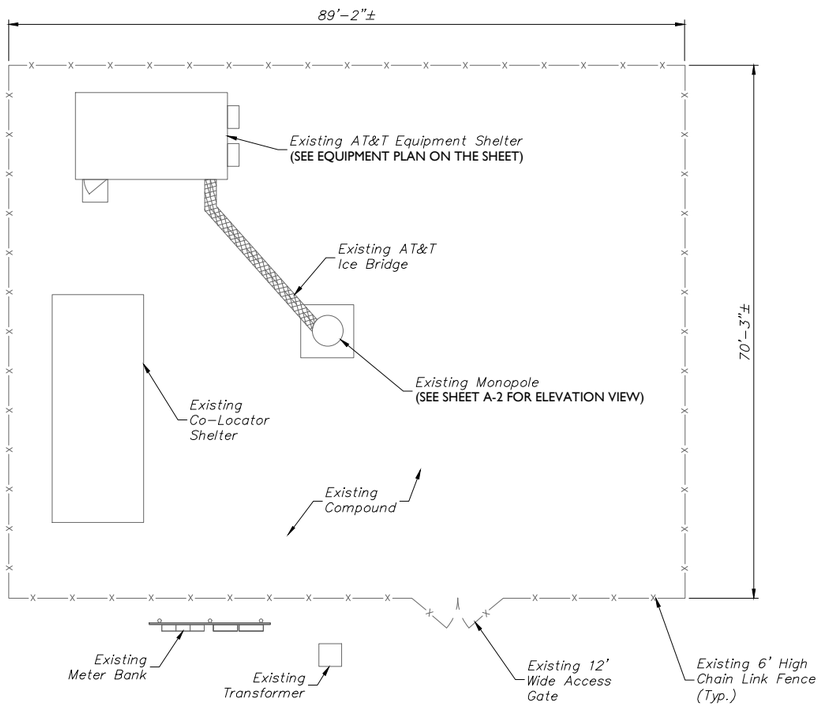
10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

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

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1





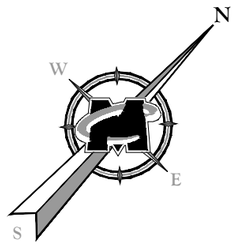
COMPOUND PLAN

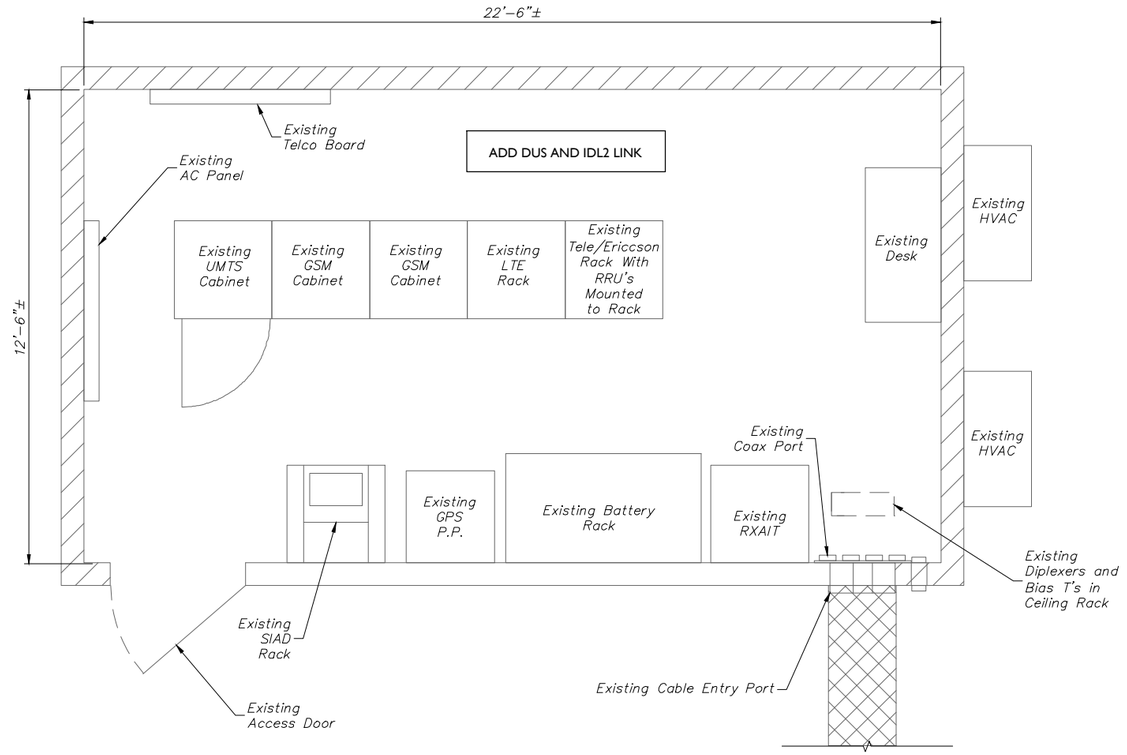
GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

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





EQUIPMENT PLAN

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

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

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SCALE: AS SHOWN

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STATE OF CONNECTICUT
FRANK E. PAZDEN
No. 21188
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE NUMBER: PEN.21188

SITE NAME:

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FA# 10035338
SITE # CTL02082

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NEW HAVEN COUNTY

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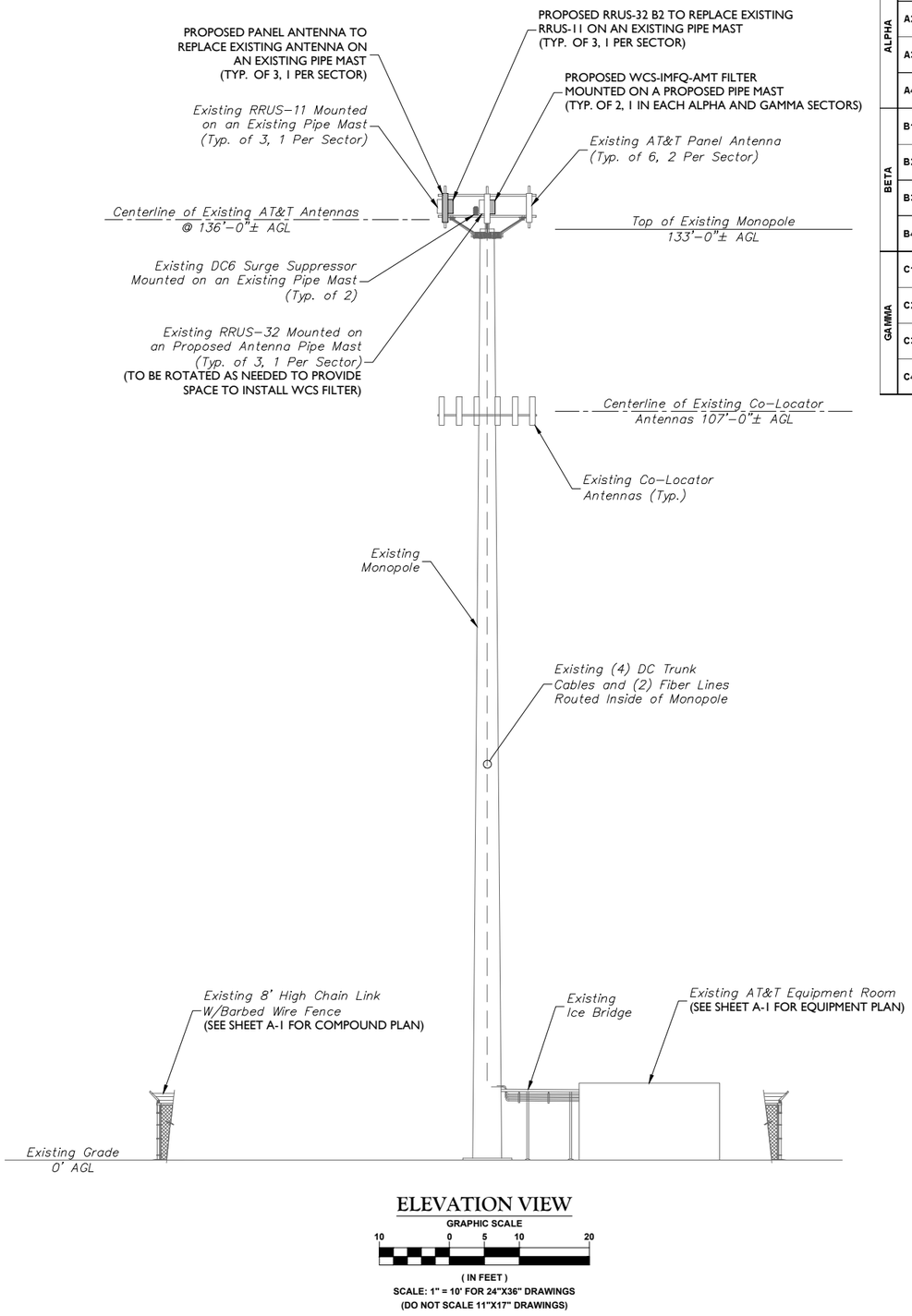
SHEET TITLE:
COMPOUND PLAN
AND EQUIPMENT PLAN

SHEET NUMBER:
A-1



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

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

PROPOSED ANTENNA AND RRUS CONFIGURATION

SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	143°	136'	-	-
	A2	CCI OPA-65R-LCUU-H4	CCI OPA-65R-LCUU-H4	WCS LTE/GSM	REMAIN	48.00	14.40	7.30	57.00	23°	136'	(1) RRUS-32 **(1) WCS FILTER**	REMAIN **NEW**
	A3	KMW AM-X-CD-14-65-OOT-RET	-		REMOVE								
	A4	-	**ANDREW SBNHH-1D65A**	**LTE**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**23°**	**136'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
BETA	B1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	263°	136'	-	-
	B2	CCI OPA-65R-LCUU-H4	CCI OPA-65R-LCUU-H4	WCS LTE/GSM	REMAIN	48.00	14.40	7.30	57.00	143°	136'	(1) RRUS-32	REMAIN
	B3	KMW AM-X-CD-14-65-OOT-RET	-		REMOVE								
	B4	-	**ANDREW SBNHH-1D65A**	**LTE**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**143°**	**136'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
GAMMA	C1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	23°	136'	-	-
	C2	CCI OPA-65R-LCUU-H4	CCI OPA-65R-LCUU-H4	WCS LTE/GSM	REMAIN	48.00	14.40	7.30	57.00	263°	136'	(1) RRUS-32 **(1) WCS FILTER**	REMAIN **NEW**
	C3	KMW AM-X-CD-14-65-OOT-RET	-		REMOVE								
	C4	-	**ANDREW SBNHH-1D65A**	**LTE**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**263°**	**136'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**

ANTENNA SCHEDULE

NOTES:

1. EXISTING BIRDS NEST ON TOWER: CONTRACTOR RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOLLOWING ALL REGULATIONS FOR WORKING AROUND NEST.
2. THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING P.A. OF RED BANK, NJ DATED 02/04/16. WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WOK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
3. ALL EQUIPMENT (ANTENNAS, LINES, ETC.) TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE

STRUCTURAL NOTES:

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

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STATE OF CONNECTICUT
FRANK E. PAZDEN
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEC.0025886-E1

SITE NAME:

MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

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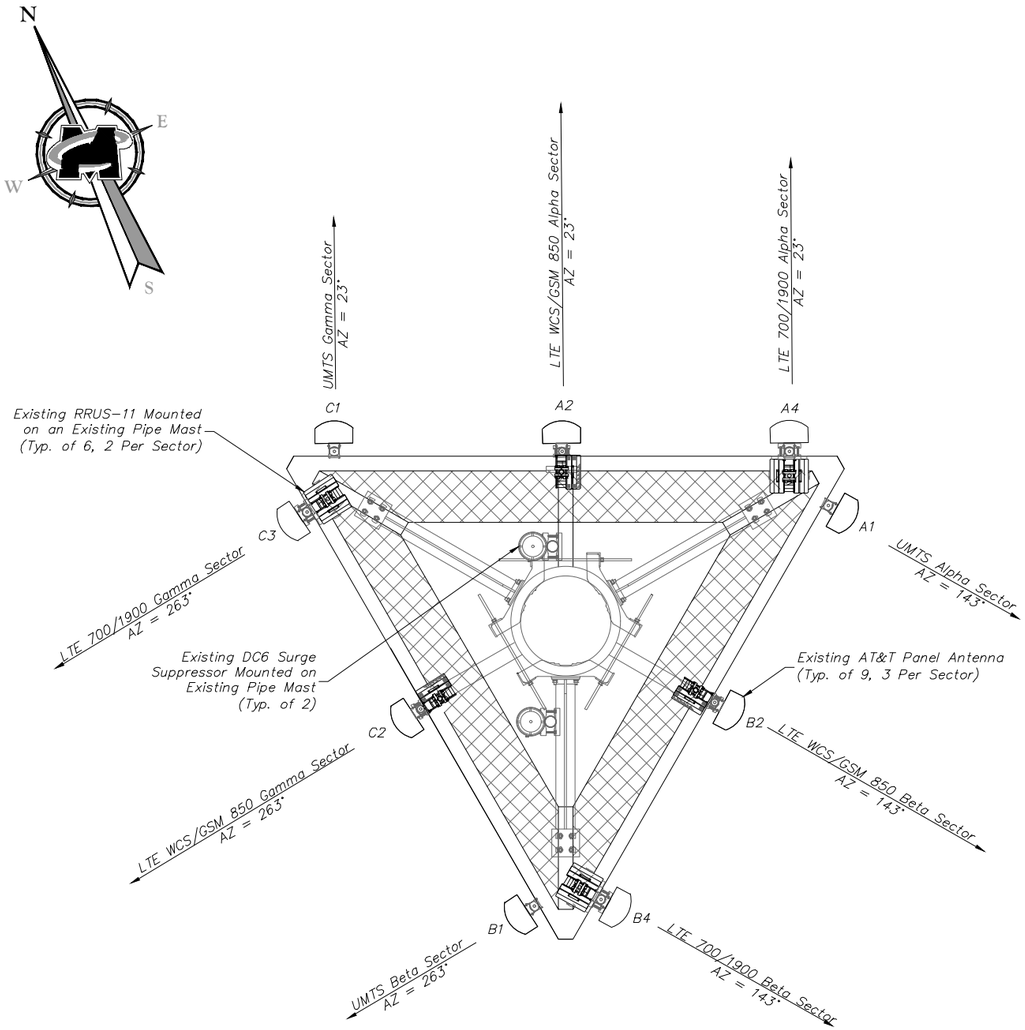
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
ELEVATION VIEW AND ANTENNA SCHEDULE

SHEET NUMBER:
A-2



EXISTING ANTENNA LAYOUT

NOT TO SCALE

NOTES:

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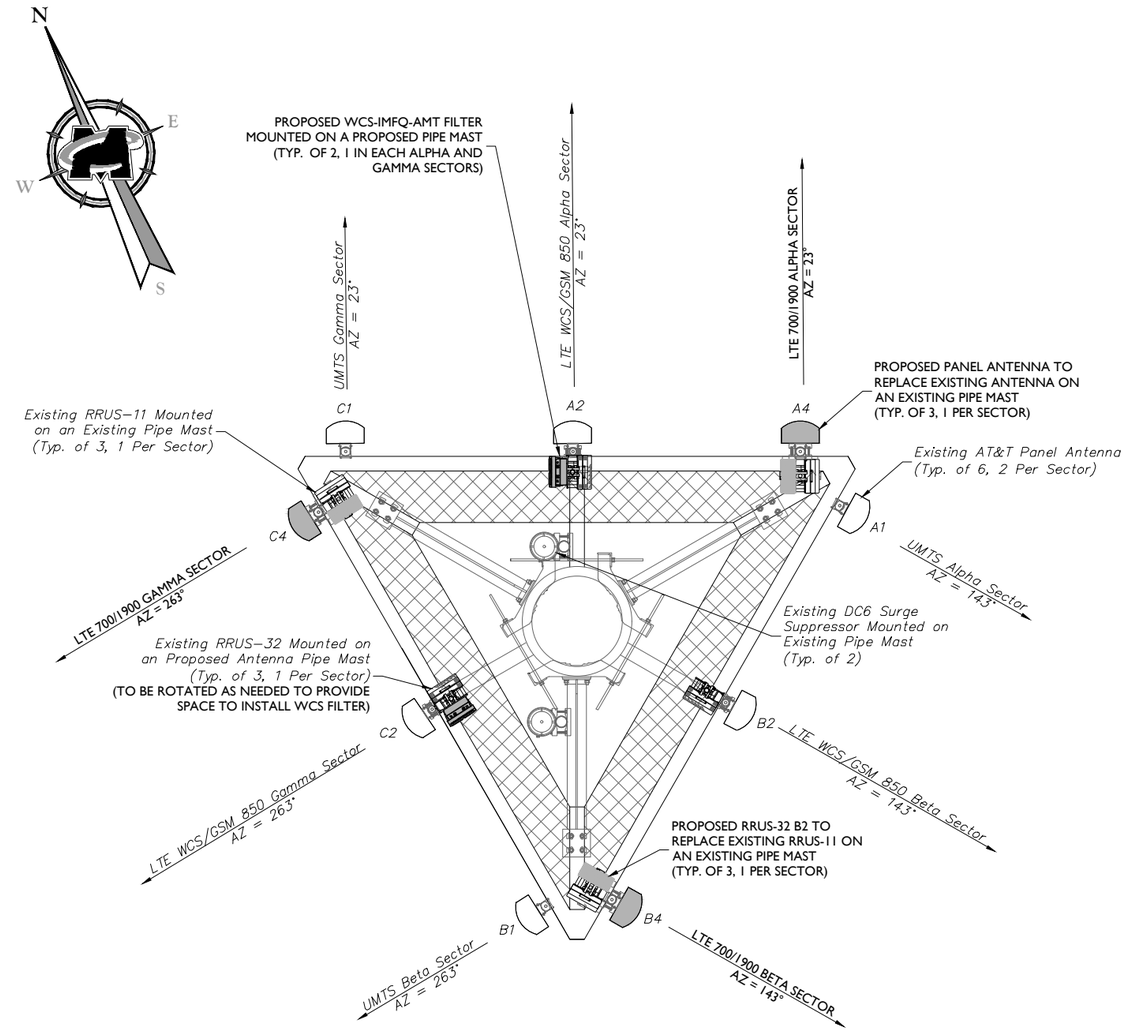

PROPOSED ANTENNA LAYOUT

NOT TO SCALE

NOTE:

CONTRACTOR TO FIELD ALTER
LOCATION OF WCS FILTER AS NEEDED

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STATE OF CONNECTICUT
FRANK E. PAZDEN
No. 21110
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE NUMBER: PEN.21110

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

SITE NAME:

MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

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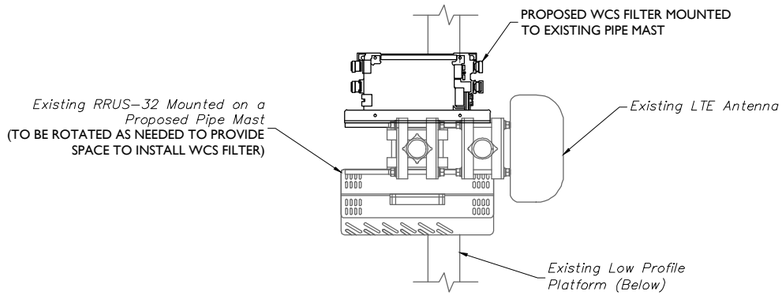
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :

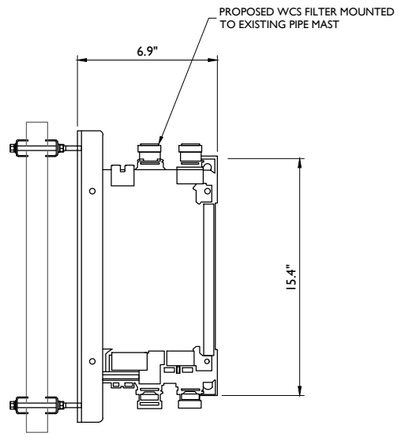
ANTENNA LAYOUT

SHEET NUMBER :

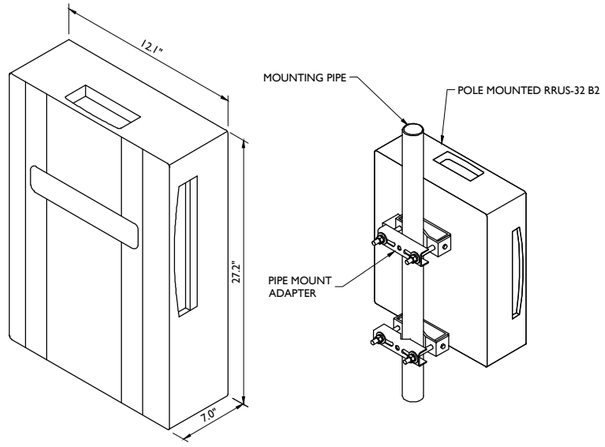
A-3



PLAN VIEW
NOT TO SCALE

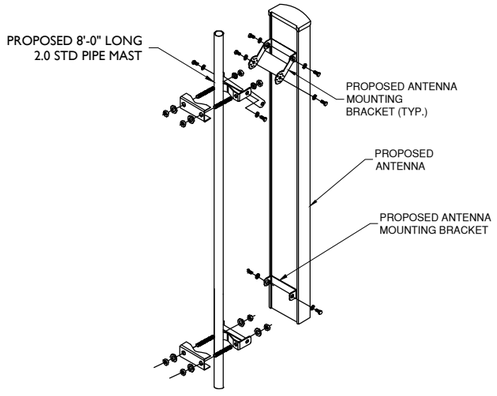


WCS - IMFQ - AMT FILTER DETAILS
NOT TO SCALE

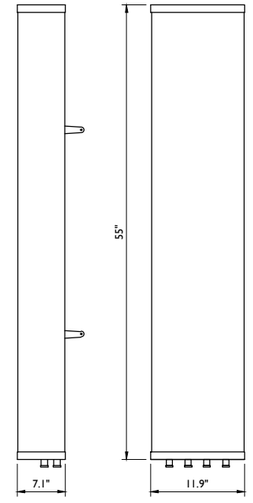


RRUS–32 B2 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 B2 DETAIL
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE



WEIGHT = 33.5 LBS

ANDREW SBNHH-1D65A

ANTENNA DETAIL
NOT TO SCALE

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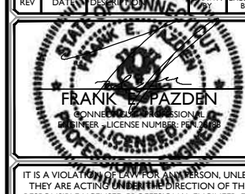

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0028

SITE NAME:

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FA# 10035338
SITE # CTL02082

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SHEET TITLE: DETAILS

SHEET NUMBER: A-4

NOTES:

1. ALL UNISTRUT CHANNELS SHALL BE P1000 UNLESS OTHERWISE NOTED.
2. ALL FIELD CUT ENDS SHALL BE FIELD GALVANIZED ACCORDING TO ATSM-A780.
3. ALL FASTENERS BETWEEN UNISTRUT CONNECTIONS ARE 1/2" Ø. ALL DRILLED HOLES SHALL BE 9/16" Ø.
4. MOUNT WCS FILTER TO UNISTRUT WITH 3/8" Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR (4) PER DEVICE, THROUGH MANUFACTURER'S MOUNTING HOLES, SUBCONTRACTOR SHALL SUPPLY. REFER TO THE MANUFACTURER'S WRITTEN SPECIFICATIONS FOR STEP-BY-STEP INSTRUCTIONS FOR SECURING FILTER TO UNISTRUT FRAMES.
5. PART NUMBERS SHOWN ARE UNISTRUT MANUFACTURER OR APPROVED EQUAL.

Electrical

WCS PATH (BTS0 - ANT0 & BTS1 - ANT1)

Passband frequency range, MHz	2305 – 2359.14
Insertion Loss for 2305.0 – 2315.0 MHz, dB	0.3 max, 0.2 typ.
Insertion Loss for 2350.0 - 2357.0 MHz, dB	0.9 max, 0.5 typ.
Insertion Loss for 2357.0 – 2358.6 MHz, dB	1.6 max, 1.0 typ.
Insertion Loss for 2358.6 – 2358.96 MHz, dB	2.2 max, 1.5 typ.
Insertion Loss for 2358.96 - 2359.14 MHz, dB	2.0 typical
Group Delay for 2305.0 – 2315.0 MHz	10 ns max
Group Delay for 2350.0 - 2358.6 MHz	250 ns max
Group Delay for 2358.6 - 2359.0 MHz	400 ns max
Return loss, dB	18 min, 20dB typ.
Rejection 2360–2395 MHz	30dB min, 35 typ.
IMD (two +43 dBm carriers)	–110 dBm max
Input power rating per port – RMS	100 W
Input power rating per port– PEP	1000 W

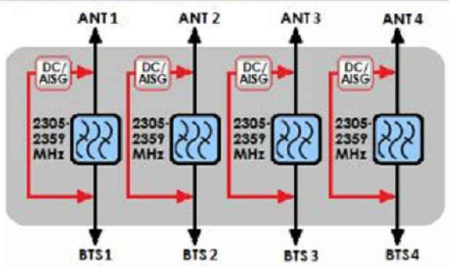
DC/AISG TRANSPARENCY

AISG Frequency	2.176 MHz
Insertion Loss (@2.176 MHz)	0.2dB max
DC Bypass Path 1 (twin & quad)	BTS1 to ANT1
DC Bypass Path 2 (twin & quad)	BTS2 to ANT2
DC Bypass Path 3 (quad)	BTS3 to ANT3
DC Bypass Path 4 (quad)	BTS4 to ANT4
DC Voltage Bypass	7 – 30 V
DC Current Single Path	3 A max

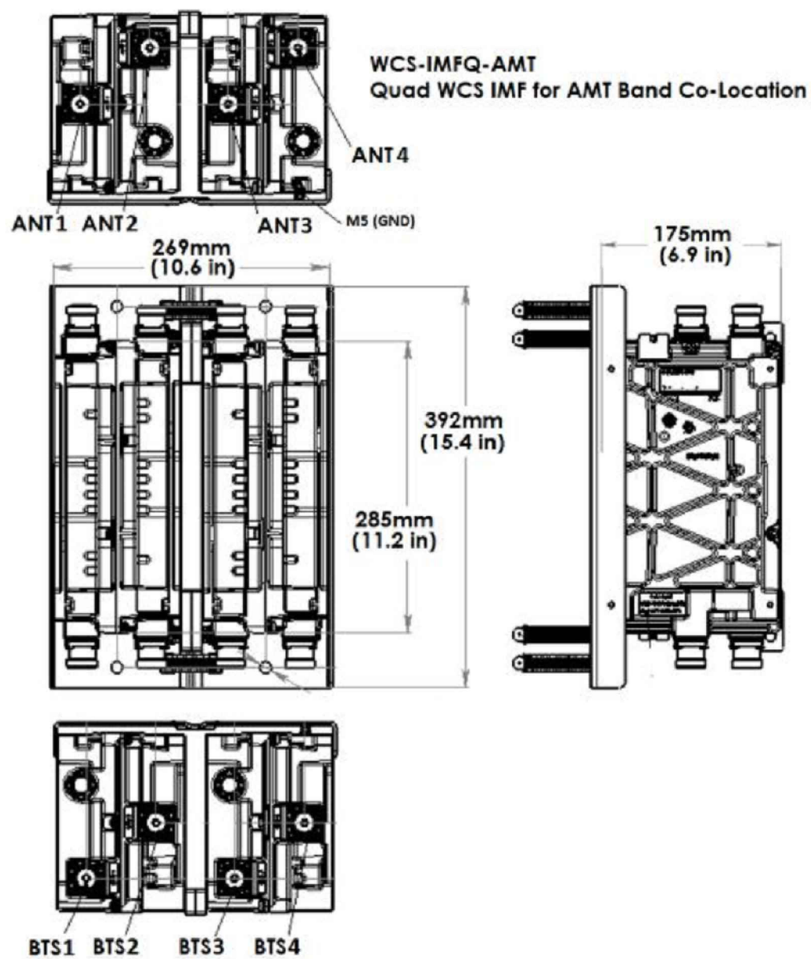
Mechanical (Quad Version)

Dimensions, mm	285x269x175 mm
Dimensions, in	11.2x 10.6 x 6.9 in
Weight, (without mounting brackets) Kg (lb)	13.4kg (29.5 lbs)
Weight, (with mounting brackets) Kg (lb)	15.7kg (34.5 lbs)
Finish	Gray paint
Connectors, RF	7-16 DIN female
Ground terminal diameter, mm (in)	5 (0.20)

Block Diagram (Quad Version)



Quad WCS IMF for AMT Band Co-Location



WCS - IMFQ - AMT FILTER DETAILS

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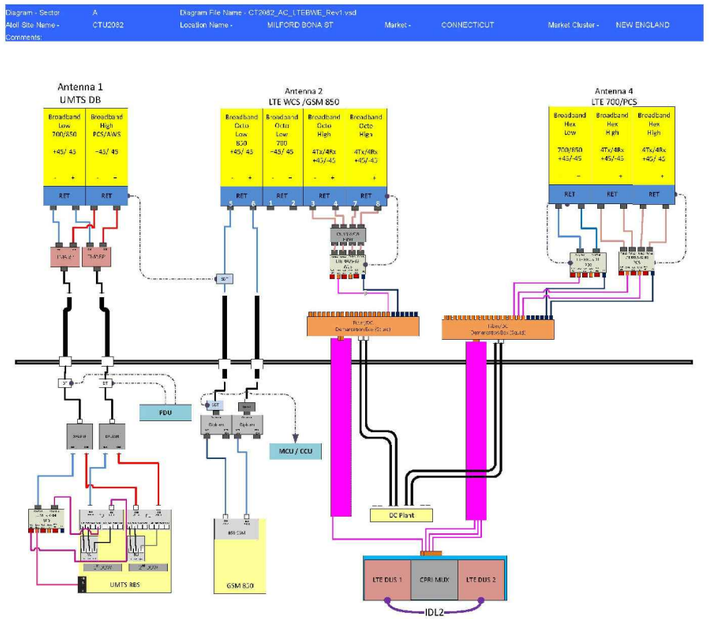
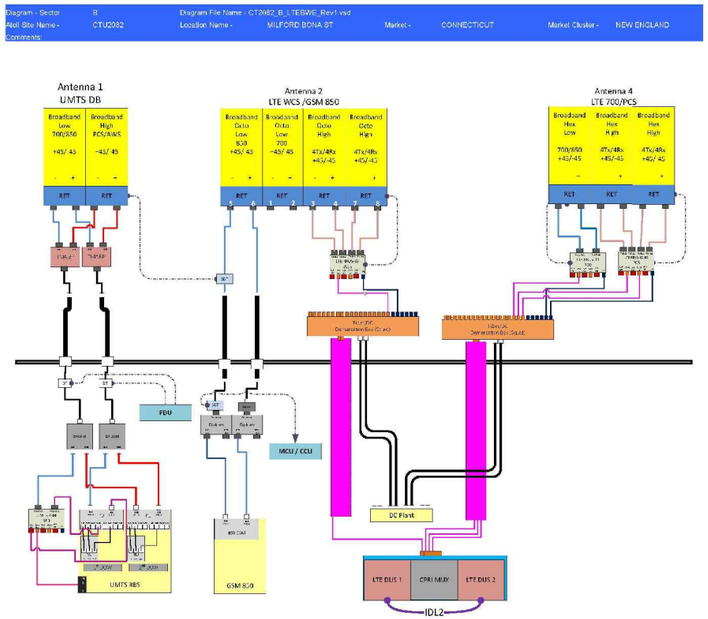
SHEET TITLE :
DETAILS

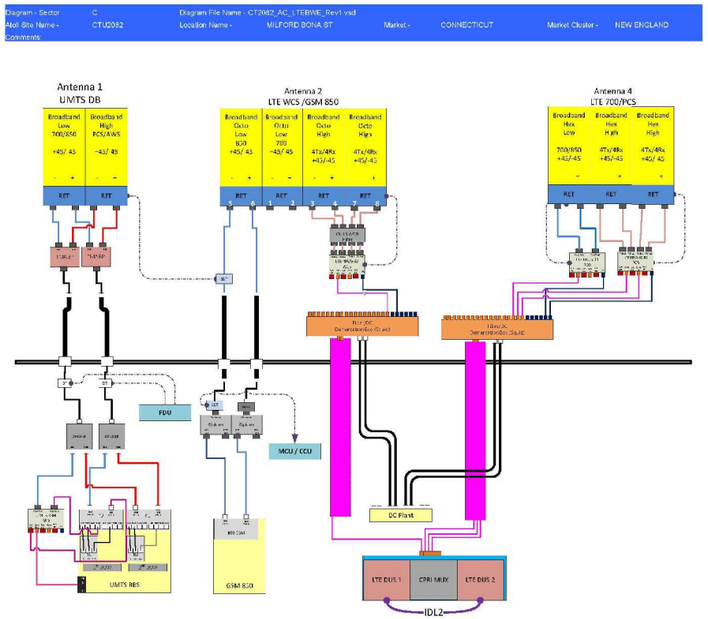
SHEET NUMBER :
A-5



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTU2082_2017-LTE-Multi-Carrier_1xBBU-RRH-Add_om636a_2051A02JYA_10035338_61172_04-28-2016_Final-Approved_v1.00"

RF PLUMBING DIAGRAMS

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REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	01/25/17	FOR CONSTRUCTION	RA	FEP
0	10/31/16	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT — FRANK E. PAZDEN — LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0028

SITE NAME:

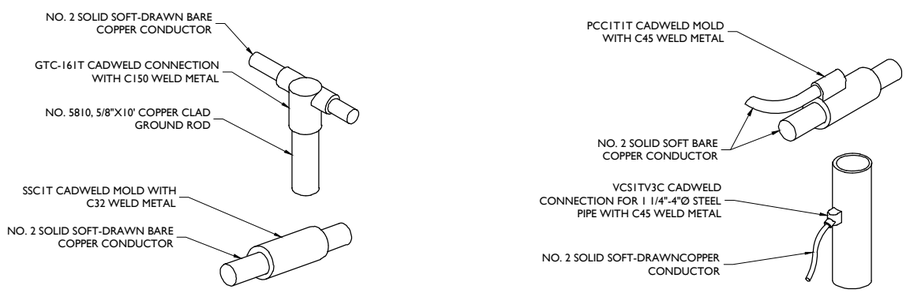
MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

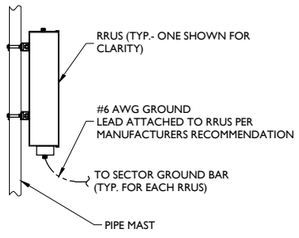
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
RF PLUMBING DIAGRAMS

SHEET NUMBER :
A-6



CADWELD DETAILS
NOT TO SCALE



RRU GROUNDING
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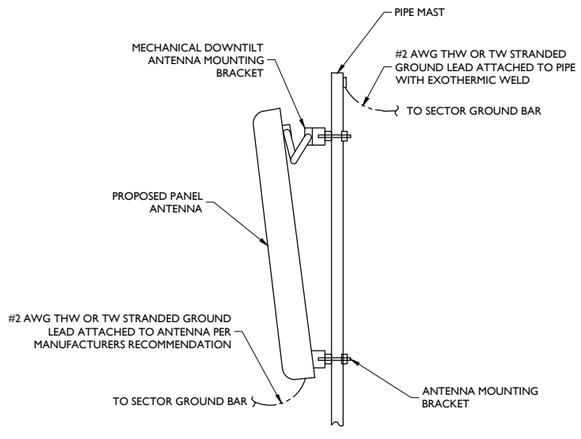

ANTENNA GROUNDING
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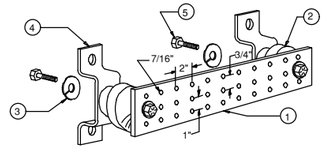


LEGEND

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

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

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

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

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

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

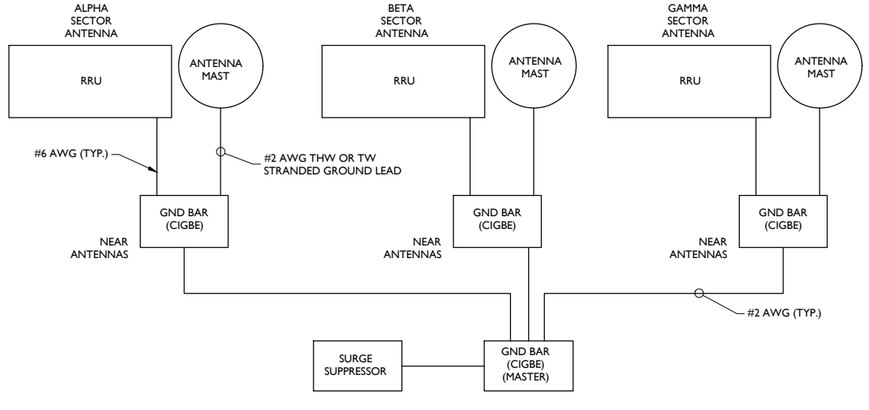
SECTION "P" - SURGE PRODUCERS

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

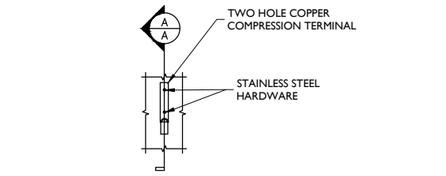
SECTION "A" - SURGE ABSORBERS

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

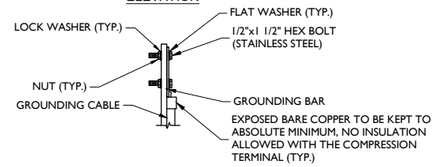
MASTER GROUND BAR
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

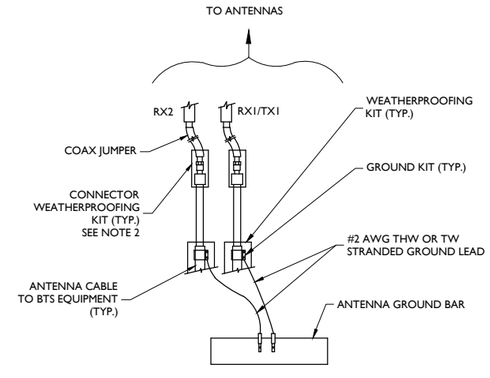


ELEVATION



SECTION A-A

TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



NOTES:

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

TYPICAL GROUND WIRE TO GROUNDING BAR
NOT TO SCALE

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

SITE NAME:

MILFORD - BONA ST.
FA# 10035338
SITE # CTL02082

10 BONA STREET
MILFORD, CT 06460
NEW HAVEN COUNTY

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

SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

Date: **February 09, 2017**

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

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
724-416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02082
	Carrier Site Name:	Milford Bona Street
Crown Castle Designation:	**Crown Castle BU Number:**	873633
	Crown Castle Site Name:	Milford
	Crown Castle JDE Job Number:	415756
	Crown Castle Work Order Number:	1358100
	Crown Castle Application Number:	374373 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1358100
Site Data:	**10 Bona Street, MILFORD, New Haven County, CT** **Latitude *41° 13' 12.27"*, Longitude *-73° 4' 38.56"*** **133 Foot - Monopole Tower**	

Dear Charles Trask,

Crown Castle 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 1358100, in accordance with application 374373, revision 0.

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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

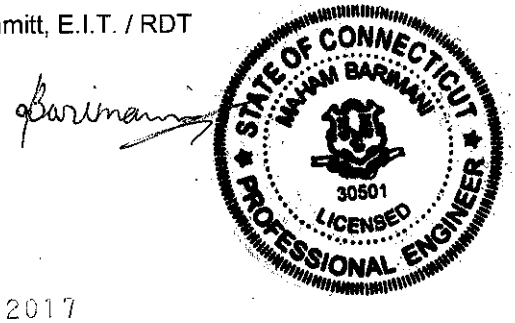
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II was/were used in this analysis.

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

We at *Crown Castle* 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.

Structural analysis prepared by: Matthew Schmitt, E.I.T. / RDT

Respectfully submitted by:



Maham Barimani, P.E.
Senior Project Engineer

tnxTower Report - version 7.0.5.1

02-09-2017

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1) INTRODUCTION

This tower is a 133 ft Monopole tower designed by SUMMIT in December of 2001. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C.

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
133.0	136.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	2 1	3/4 3/8	-
		3	cci antennas	OPA-65R-LCUU-H4 w/ Mount Pipe			
		2	commscope	WCS-IMFQ-AMT			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B30			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing 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
133.0	136.0	3	ericsson	RRUS-11	12 2 1	1-5/8 7/8 17/64	1
		1	raycap	DC6-48-60-18-8F			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		12	powerwave technologies	LGP21401			
		3	powerwave technologies	7770.00 w/ Mount Pipe	-	-	2
		3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
	133.0	3	ericsson	RRUS-11			
		1	tower mounts	Platform Mount [LP 1201-1]	-	-	1
115.0	115.0	1	rfs celwave	DB-T1-6Z-8AB-0Z	-	-	1
		1	tower mounts	Side Arm Mount [SO 201-1]			

113.0	113.0	3	alcatel lucent	9442 RRH2X40-AWS TMA	12 1	1-5/8 1-1/4	1
		3	antel	BXA-171063-8BF-2 w/ Mount Pipe			
		3	antel	BXA-171063-8BF-EDIN-4 w/ Mount Pipe			
		6	antel	LPA-80090/4CF w/ Mount Pipe			
		3	swedcom	SWCP 2x5514 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 303-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
133	133	1		5/8" Lightning Rod	-	-
		12	decibel	DB896H Panel Antenna		
		1	summit	14' L.P. Platform		
123	123	12	dapa	48000 PCS Panel Antenna	-	-
		1	summit	14' Clamp-On L.P. Platform		
113	113	12	dapa	48000 PCS Panel Antenna	-	-
		1	summit	14' Clamp-On L.P. Platform		
103	103	12	dapa	48000 PCS Panel Antenna	-	-
		1	summit	14' Clamp-On L.P. Platform		
93	93	12	dapa	48000 PCS Panel Antenna	-	-
		1	summit	14' Clamp-On L.P. Platform		
83	83	12	dapa	48000 PCS Panel Antenna	-	-
		1	summit	14' Clamp-On L.P. Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Criscuolo Shepard & Associates	1340372	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1340388	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1339622	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) It is unknown whether the foundation is a drilled shaft or pier and pad. Both designs were analyzed and determined to be sufficient.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	133 - 86.5	Pole	TP33.116x24x0.25	1	-10.81	1755.51	38.0	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.7828x0.2813	2	-19.27	2389.63	59.0	Pass
L3	39.75 - 0	Pole	TP49.01x40.1883x0.375	3	-31.90	3981.21	52.3	Pass
							Summary	
						Pole (L2)	59.0	Pass
						RATING =	59.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.2	Pass
1	Base Plate	0	44.9	Pass
1	Base Foundation	0	38.0	Pass
1	Base Foundation Soil Interaction	0	37.5	Pass

Structure Rating (max from all components) =	59.0%

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

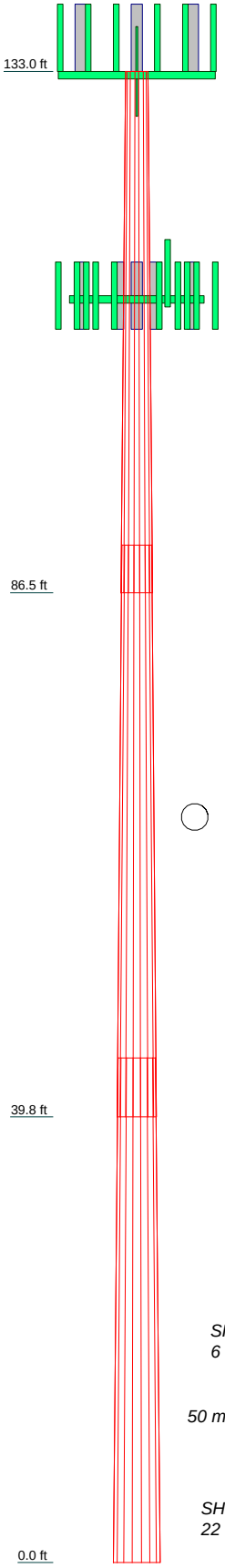
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	46.50	18	0.2500	4.25	24.0000	33.1160		3.6
2	51.00	18	0.2813	5.25	31.7828	41.7800	A607-65	5.7
3	45.00	18	0.3750		40.1883	49.0100		8.1
								17.3



ALL REACTIONS ARE FACTORED

AXIAL 51 K

SHEAR 6 K *MOMENT 595 kip-ft*

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 32 K

SHEAR 22 K *MOMENT 2049 kip-ft*

TORQUE 0 kip-ft

REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 3/4"x4'	133	(2) WCS-IMFQ-AMT	133
8'x2" Antenna Mount Pipe	133	DC6-48-60-18-8F	133
7770.00 w/ Mount Pipe	133	Platform Mount [LP 1201-1]	133
7770.00 w/ Mount Pipe	133	DB-T1-6Z-8AB-0Z	115
7770.00 w/ Mount Pipe	133	Side Arm Mount [SO 201-1]	115
(4) LGP21401	133	Platform Mount [LP 303-1]	113
(4) LGP21401	133	(2) LPA-80090/4CF w/ Mount Pipe	113
(4) LGP21401	133	(2) LPA-80090/4CF w/ Mount Pipe	113
RRUS-11	133	(2) LPA-80090/4CF w/ Mount Pipe	113
RRUS-11	133	SWCP 2x5514 w/ Mount Pipe	113
RRUS-11	133	SWCP 2x5514 w/ Mount Pipe	113
DC6-48-60-18-8F	133	SWCP 2x5514 w/ Mount Pipe	113
SBNHH-1D65A w/ Mount Pipe	133	BXA-171063-8BF-2 w/ Mount Pipe	113
SBNHH-1D65A w/ Mount Pipe	133	BXA-171063-8BF-2 w/ Mount Pipe	113
SBNHH-1D65A w/ Mount Pipe	133	BXA-171063-8BF-2 w/ Mount Pipe	113
OPA-65R-LCUU-H4 w/ Mount Pipe	133	BXA-171063-8BF-EDIN-4 w/ Mount Pipe	113
OPA-65R-LCUU-H4 w/ Mount Pipe	133		
OPA-65R-LCUU-H4 w/ Mount Pipe	133	BXA-171063-8BF-EDIN-4 w/ Mount Pipe	113
RRUS 32	133		
RRUS 32	133	BXA-171063-8BF-EDIN-4 w/ Mount Pipe	113
RRUS 32	133		
RRUS 32 B30	133	9442 RRH2X40-AWS TMA	113
RRUS 32 B30	133	9442 RRH2X40-AWS TMA	113
RRUS 32 B30	133	9442 RRH2X40-AWS TMA	113

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

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 0.00 ft
8. TOWER RATING: 59%

CROWN CASTLE
The Foundation for a Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: 724-416-2000
FAX: 724-416-4245

Job: *BU 873633*			
Project:			
Client: Crown Castle	Drawn by: Matt Schmitt		App'd:
Code: TIA-222-G	Date: 02/09/17		Scale: NTS
Path: R:\SA Models - Letters\Work Area\MSchmitt\1.0_WIP\873633 WO 1358100\873633.eri			Dwg No. E-1

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category C.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	133.00-86.50	46.50	4.25	18	24.0000	33.1160	0.2500	1.0000	A607-65 (65 ksi)
L2	86.50-39.75	51.00	5.25	18	31.7828	41.7800	0.2813	1.1252	A607-65 (65 ksi)
L3	39.75-0.00	45.00		18	40.1883	49.0100	0.3750	1.5000	A607-65 (65 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	24.3702	18.8456	1342.9976	8.4313	12.1920	110.1540	2687.7623	9.4246	3.7840	15.136
	33.6269	26.0792	3558.9750	11.6674	16.8229	211.5550	7122.6329	13.0421	5.3884	21.554
L2	33.1191	28.1260	3526.2127	11.1830	16.1457	218.3999	7057.0654	14.0657	5.0987	18.125
	42.4245	37.0520	8061.5320	14.7320	21.2242	379.8267	16133.6715	18.5295	6.8582	24.38
L3	41.8533	47.3878	9489.8522	14.1337	20.4156	464.8323	18992.1914	23.6984	6.4131	17.102
	49.7661	57.8878	17299.0559	17.2654	24.8971	694.8227	34620.8743	28.9494	7.9658	21.242

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 133.00-86.50				1	1	1			
L2 86.50-39.75				1	1	1			
L3 39.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LCF158-50A(1-5/8)	C	No	Inside Pole	133.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
6-8AWG 3 PAIR(7/8)	C	No	Inside Pole	133.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
A-DQZNB2Yn1750 N(17/64)	C	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
FB-L98B-034-XXXXXX(3/8)	C	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	133.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
561(1-5/8)	C	No	Inside Pole	113.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A(1-1/4)	C	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
*								
3" Conduit	C	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	133.00-86.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.09

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L2	86.50-39.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.49
L3	39.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.26

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	133.00-86.50	A	1.690	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.09
L2	86.50-39.75	A	1.599	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.49
L3	39.75-0.00	A	1.427	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.26

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	133.00-86.50	0.0000	0.0000	0.0000	0.0000
L2	86.50-39.75	0.0000	0.0000	0.0000	0.0000
L3	39.75-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 3/4"x4'	C	None		0.0000	133.00	No Ice	0.30	0.30	0.02
						1/2" Ice	0.71	0.71	0.02
						1" Ice	1.00	1.00	0.03
8'x2" Antenna Mount Pipe	A	None		0.0000	133.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						1" Ice	3.40	3.40	0.06

**

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(4) LGP21401	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(4) LGP21401	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(4) LGP21401	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
RRUS-11	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
DC6-48-60-18-8F	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.95 6.39 6.82	5.19 5.96 6.66	0.06 0.11 0.17
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.95 6.39 6.82	5.19 5.96 6.66	0.06 0.11 0.17
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	5.95 6.39 6.82	5.19 5.96 6.66	0.06 0.11 0.17
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.18 6.57 6.98	4.55 5.16 5.78	0.08 0.13 0.19
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.18 6.57 6.98	4.55 5.16 5.78	0.08 0.13 0.19
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.18 6.57 6.98	4.55 5.16 5.78	0.08 0.13 0.19
RRUS 32	A	From Leg	4.00	0.0000	133.00	No Ice	2.86	1.78	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 3.00			1/2" Ice 1" Ice	3.08 3.32	1.97 2.17	0.08 0.10
RRUS 32	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32 B30	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.69 2.91 3.14	1.57 1.76 1.95	0.06 0.08 0.10
RRUS 32 B30	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.69 2.91 3.14	1.57 1.76 1.95	0.06 0.08 0.10
RRUS 32 B30	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.69 2.91 3.14	1.57 1.76 1.95	0.06 0.08 0.10
(2) WCS-IMFQ-AMT	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.99 1.11 1.25	0.64 0.75 0.86	0.03 0.04 0.05
DC6-48-60-18-8F	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
Platform Mount [LP 1201-1]	A	None		0.0000	133.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
***									
DB-T1-6Z-8AB-0Z	B	From Leg	2.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
Side Arm Mount [SO 201-1]	B	None		0.0000	115.00	No Ice 1/2" Ice 1" Ice	2.96 4.10 5.24	2.11 2.93 3.75	0.10 0.12 0.14
***									
Platform Mount [LP 303-1]	A	None		0.0000	113.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
(2) LPA-80090/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	5.21 5.82 6.44	0.03 0.07 0.11
(2) LPA-80090/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	5.21 5.82 6.44	0.03 0.07 0.11
(2) LPA-80090/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	5.21 5.82 6.44	0.03 0.07 0.11
SWCP 2x5514 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	6.52 6.95 7.37	6.53 7.24 7.92	0.04 0.10 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SWCP 2x5514 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	6.52 6.95 7.37	6.53 7.24 7.92	0.04 0.10 0.17
SWCP 2x5514 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	6.52 6.95 7.37	6.53 7.24 7.92	0.04 0.10 0.17
BXA-171063-8BF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-171063-8BF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-171063-8BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.07 0.11
BXA-171063-8BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.07 0.11
BXA-171063-8BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.07 0.11
9442 RRH2X40-AWS TMA	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.51 2.75 2.99	1.59 1.80 2.01	0.04 0.06 0.08
9442 RRH2X40-AWS TMA	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.51 2.75 2.99	1.59 1.80 2.01	0.04 0.06 0.08
9442 RRH2X40-AWS TMA	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	2.51 2.75 2.99	1.59 1.80 2.01	0.04 0.06 0.08

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

Comb. No.	Description
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	133 - 86.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.79	0.54	-0.49
			Max. Mx	20	-10.81	432.33	0.66
			Max. My	14	-10.82	-0.57	-429.49
			Max. Vy	20	-13.75	432.33	0.66
			Max. Vx	14	13.66	-0.57	-429.49
			Max. Torque	14			-0.52
L2	86.5 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.71	0.54	-0.49
			Max. Mx	20	-19.27	1156.55	2.90
			Max. My	14	-19.28	-2.80	-1149.32
			Max. Vy	20	-17.88	1156.55	2.90
			Max. Vx	14	17.79	-2.80	-1149.32
			Max. Torque	22			0.33
L3	39.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.98	0.54	-0.49
			Max. Mx	20	-31.90	2047.05	5.06
			Max. My	14	-31.90	-4.97	-2035.58
			Max. Vy	20	-21.53	2047.05	5.06
			Max. Vx	14	21.44	-4.97	-2035.58
			Max. Torque	22			0.33

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	50.98	6.36	0.01
	Max. H_x	20	31.91	21.51	0.05
	Max. H_z	2	31.91	0.05	21.42
	Max. M_x	2	2035.17	0.05	21.42
	Max. M_z	8	2046.44	-21.51	-0.05
	Max. Torsion	22	0.33	18.65	10.75
	Min. Vert	5	23.93	-10.71	18.53
	Min. H_x	8	31.91	-21.51	-0.05
	Min. H_z	14	31.91	-0.05	-21.42
	Min. M_x	14	-2035.58	-0.05	-21.42
	Min. M_z	20	-2047.05	21.51	0.05
	Min. Torsion	12	-0.32	-10.80	-18.57

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	26.59	0.00	0.00	0.16	0.24	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	31.91	-0.05	-21.42	-2035.17	5.57	-0.22
0.9 Dead+1.6 Wind 0 deg - No Ice	23.93	-0.05	-21.42	-2018.35	5.45	-0.21
1.2 Dead+1.6 Wind 30 deg - No Ice	31.91	10.71	-18.53	-1759.85	-1018.52	-0.07
0.9 Dead+1.6 Wind 30 deg - No Ice	23.93	10.71	-18.53	-1745.31	-1010.15	-0.07
1.2 Dead+1.6 Wind 60 deg - No Ice	31.91	18.61	-10.67	-1012.91	-1769.61	0.09
0.9 Dead+1.6 Wind 60 deg - No Ice	23.93	18.61	-10.67	-1004.57	-1755.01	0.09
1.2 Dead+1.6 Wind 90 deg - No Ice	31.91	21.51	0.05	5.48	-2046.44	0.24
0.9 Dead+1.6 Wind 90 deg - No Ice	23.93	21.51	0.05	5.38	-2029.55	0.23
1.2 Dead+1.6 Wind 120 deg - No Ice	31.91	18.65	10.75	1022.45	-1774.87	0.32
0.9 Dead+1.6 Wind 120 deg - No Ice	23.93	18.65	10.75	1013.92	-1760.23	0.32
1.2 Dead+1.6 Wind 150 deg - No Ice	31.91	10.80	18.57	1765.52	-1027.64	0.32
0.9 Dead+1.6 Wind 150 deg - No Ice	23.93	10.80	18.57	1750.84	-1019.20	0.31
1.2 Dead+1.6 Wind 180 deg - No Ice	31.91	0.05	21.42	2035.58	-4.97	0.23
0.9 Dead+1.6 Wind 180 deg - No Ice	23.93	0.05	21.42	2018.66	-5.00	0.23
1.2 Dead+1.6 Wind 210 deg - No Ice	31.91	-10.71	18.53	1760.26	1019.12	0.08
0.9 Dead+1.6 Wind 210 deg - No Ice	23.93	-10.71	18.53	1745.62	1010.60	0.07
1.2 Dead+1.6 Wind 240 deg - No Ice	31.91	-18.61	10.67	1013.33	1770.21	-0.10
0.9 Dead+1.6 Wind 240 deg - No Ice	23.93	-18.61	10.67	1004.88	1755.46	-0.10
1.2 Dead+1.6 Wind 270 deg - No Ice	31.91	-21.51	-0.05	-5.06	2047.05	-0.25
0.9 Dead+1.6 Wind 270 deg - No Ice	23.93	-21.51	-0.05	-5.07	2030.00	-0.25
1.2 Dead+1.6 Wind 300 deg - No Ice	31.91	-18.65	-10.75	-1022.03	1775.47	-0.33
0.9 Dead+1.6 Wind 300 deg	23.93	-18.65	-10.75	-1013.62	1760.67	-0.32

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
- No Ice 1.2 Dead+1.6 Wind 330 deg	31.91	-10.80	-18.57	-1765.11	1028.24	-0.31
- No Ice 0.9 Dead+1.6 Wind 330 deg	23.93	-10.80	-18.57	-1750.53	1019.64	-0.31
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	50.98	0.00	0.00	0.49	0.54	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	50.98	-0.01	-6.34	-591.87	1.55	-0.10
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	50.98	3.17	-5.49	-512.03	-295.88	-0.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	50.98	5.50	-3.16	-294.85	-513.86	-0.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	50.98	6.36	0.01	1.49	-594.00	0.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	50.98	5.51	3.18	297.57	-514.80	0.09
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	50.98	3.19	5.50	514.06	-297.51	0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	50.98	0.01	6.34	592.96	-0.33	0.10
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	50.98	-3.17	5.49	513.12	297.10	0.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	50.98	-5.50	3.16	295.93	515.08	0.01
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	50.98	-6.36	-0.01	-0.40	595.22	-0.05
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	50.98	-5.51	-3.18	-296.48	516.03	-0.09
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	50.98	-3.19	-5.50	-512.97	298.73	-0.11
Dead+Wind 0 deg - Service	26.59	-0.01	-4.58	-433.24	1.37	-0.05
Dead+Wind 30 deg - Service	26.59	2.29	-3.96	-374.61	-216.70	-0.02
Dead+Wind 60 deg - Service	26.59	3.98	-2.28	-215.56	-376.63	0.02
Dead+Wind 90 deg - Service	26.59	4.60	0.01	1.29	-435.58	0.05
Dead+Wind 120 deg - Service	26.59	3.99	2.30	217.85	-377.75	0.07
Dead+Wind 150 deg - Service	26.59	2.31	3.97	376.08	-218.64	0.07
Dead+Wind 180 deg - Service	26.59	0.01	4.58	433.58	-0.87	0.05
Dead+Wind 210 deg - Service	26.59	-2.29	3.96	374.96	217.20	0.02
Dead+Wind 240 deg - Service	26.59	-3.98	2.28	215.90	377.13	-0.02
Dead+Wind 270 deg - Service	26.59	-4.60	-0.01	-0.95	436.09	-0.05
Dead+Wind 300 deg - Service	26.59	-3.99	-2.30	-217.51	378.26	-0.07
Dead+Wind 330 deg - Service	26.59	-2.31	-3.97	-375.73	219.14	-0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-26.59	0.00	0.00	26.59	0.00	0.000%
2	-0.05	-31.91	-21.42	0.05	31.91	21.42	0.000%
3	-0.05	-23.93	-21.42	0.05	23.93	21.42	0.000%
4	10.71	-31.91	-18.53	-10.71	31.91	18.53	0.000%
5	10.71	-23.93	-18.53	-10.71	23.93	18.53	0.000%
6	18.61	-31.91	-10.67	-18.61	31.91	10.67	0.000%
7	18.61	-23.93	-10.67	-18.61	23.93	10.67	0.000%
8	21.51	-31.91	0.05	-21.51	31.91	-0.05	0.000%
9	21.51	-23.93	0.05	-21.51	23.93	-0.05	0.000%
10	18.65	-31.91	10.75	-18.65	31.91	-10.75	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
11	18.65	-23.93	10.75	-18.65	23.93	-10.75	0.000%
12	10.80	-31.91	18.57	-10.80	31.91	-18.57	0.000%
13	10.80	-23.93	18.57	-10.80	23.93	-18.57	0.000%
14	0.05	-31.91	21.42	-0.05	31.91	-21.42	0.000%
15	0.05	-23.93	21.42	-0.05	23.93	-21.42	0.000%
16	-10.71	-31.91	18.53	10.71	31.91	-18.53	0.000%
17	-10.71	-23.93	18.53	10.71	23.93	-18.53	0.000%
18	-18.61	-31.91	10.67	18.61	31.91	-10.67	0.000%
19	-18.61	-23.93	10.67	18.61	23.93	-10.67	0.000%
20	-21.51	-31.91	-0.05	21.51	31.91	0.05	0.000%
21	-21.51	-23.93	-0.05	21.51	23.93	0.05	0.000%
22	-18.65	-31.91	-10.75	18.65	31.91	10.75	0.000%
23	-18.65	-23.93	-10.75	18.65	23.93	10.75	0.000%
24	-10.80	-31.91	-18.57	10.80	31.91	18.57	0.000%
25	-10.80	-23.93	-18.57	10.80	23.93	18.57	0.000%
26	0.00	-50.98	0.00	0.00	50.98	0.00	0.000%
27	-0.01	-50.98	-6.34	0.01	50.98	6.34	0.000%
28	3.17	-50.98	-5.49	-3.17	50.98	5.49	0.000%
29	5.50	-50.98	-3.16	-5.50	50.98	3.16	0.000%
30	6.36	-50.98	0.01	-6.36	50.98	-0.01	0.000%
31	5.51	-50.98	3.18	-5.51	50.98	-3.18	0.000%
32	3.19	-50.98	5.50	-3.19	50.98	-5.50	0.000%
33	0.01	-50.98	6.34	-0.01	50.98	-6.34	0.000%
34	-3.17	-50.98	5.49	3.17	50.98	-5.49	0.000%
35	-5.50	-50.98	3.16	5.50	50.98	-3.16	0.000%
36	-6.36	-50.98	-0.01	6.36	50.98	0.01	0.000%
37	-5.51	-50.98	-3.18	5.51	50.98	3.18	0.000%
38	-3.19	-50.98	-5.50	3.19	50.98	5.50	0.000%
39	-0.01	-26.59	-4.58	0.01	26.59	4.58	0.000%
40	2.29	-26.59	-3.96	-2.29	26.59	3.96	0.000%
41	3.98	-26.59	-2.28	-3.98	26.59	2.28	0.000%
42	4.60	-26.59	0.01	-4.60	26.59	-0.01	0.000%
43	3.99	-26.59	2.30	-3.99	26.59	-2.30	0.000%
44	2.31	-26.59	3.97	-2.31	26.59	-3.97	0.000%
45	0.01	-26.59	4.58	-0.01	26.59	-4.58	0.000%
46	-2.29	-26.59	3.96	2.29	26.59	-3.96	0.000%
47	-3.98	-26.59	2.28	3.98	26.59	-2.28	0.000%
48	-4.60	-26.59	-0.01	4.60	26.59	0.01	0.000%
49	-3.99	-26.59	-2.30	3.99	26.59	2.30	0.000%
50	-2.31	-26.59	-3.97	2.31	26.59	3.97	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00016723
3	Yes	4	0.00000001	0.00009064
4	Yes	5	0.00000001	0.00023040
5	Yes	5	0.00000001	0.00010414
6	Yes	5	0.00000001	0.00023090
7	Yes	5	0.00000001	0.00010430
8	Yes	4	0.00000001	0.00016129
9	Yes	4	0.00000001	0.00008692
10	Yes	5	0.00000001	0.00023721
11	Yes	5	0.00000001	0.00010707
12	Yes	5	0.00000001	0.00023142
13	Yes	5	0.00000001	0.00010437
14	Yes	4	0.00000001	0.00012051
15	Yes	4	0.00000001	0.00005409
16	Yes	5	0.00000001	0.00023256
17	Yes	5	0.00000001	0.00010507
18	Yes	5	0.00000001	0.00023282
19	Yes	5	0.00000001	0.00010515
20	Yes	4	0.00000001	0.00011503

21	Yes	4	0.00000001	0.00004945
22	Yes	5	0.00000001	0.00023192
23	Yes	5	0.00000001	0.00010453
24	Yes	5	0.00000001	0.00023694
25	Yes	5	0.00000001	0.00010699
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00011660
28	Yes	5	0.00000001	0.00014041
29	Yes	5	0.00000001	0.00014083
30	Yes	5	0.00000001	0.00011699
31	Yes	5	0.00000001	0.00014226
32	Yes	5	0.00000001	0.00014146
33	Yes	5	0.00000001	0.00011706
34	Yes	5	0.00000001	0.00014209
35	Yes	5	0.00000001	0.00014207
36	Yes	5	0.00000001	0.00011756
37	Yes	5	0.00000001	0.00014185
38	Yes	5	0.00000001	0.00014225
39	Yes	4	0.00000001	0.00001233
40	Yes	4	0.00000001	0.00007166
41	Yes	4	0.00000001	0.00007196
42	Yes	4	0.00000001	0.00001222
43	Yes	4	0.00000001	0.00007727
44	Yes	4	0.00000001	0.00007109
45	Yes	4	0.00000001	0.00001204
46	Yes	4	0.00000001	0.00007413
47	Yes	4	0.00000001	0.00007420
48	Yes	4	0.00000001	0.00001195
49	Yes	4	0.00000001	0.00007140
50	Yes	4	0.00000001	0.00007722

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	13.760	48	0.8908	0.0009
L2	90.75 - 39.75	6.511	49	0.6964	0.0003
L3	45 - 0	1.539	49	0.3131	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.00	Lightning Rod 3/4"x4'	48	13.760	0.8908	0.0009	62919
115.00	DB-T1-6Z-8AB-0Z	49	10.504	0.8235	0.0006	17477
113.00	Platform Mount [LP 303-1]	49	10.152	0.8152	0.0006	15729

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	64.607	22	4.1805	0.0042
L2	90.75 - 39.75	30.588	22	3.2735	0.0014
L3	45 - 0	7.231	22	1.4712	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.00	Lightning Rod 3/4"x4'	22	64.607	4.1805	0.0043	13534
115.00	DB-T1-6Z-8AB-0Z	22	49.332	3.8683	0.0029	3758
113.00	Platform Mount [LP 303-1]	22	47.680	3.8293	0.0027	3381

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	133 - 86.5 (1)	TP33.116x24x0.25	46.50	0.00	0.0	25.4180	-10.81	1755.51	0.006
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	51.00	0.00	0.0	36.1331	-19.27	2389.63	0.008
L3	39.75 - 0 (3)	TP49.01x40.1883x0.375	45.00	0.00	0.0	57.8878	-31.90	3981.21	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	133 - 86.5 (1)	TP33.116x24x0.25	432.33	1156.42	0.374	0.00	1156.42	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	1157.31	1990.42	0.581	0.00	1990.42	0.000
L3	39.75 - 0 (3)	TP49.01x40.1883x0.375	2048.63	3982.18	0.514	0.00	3982.18	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	133 - 86.5 (1)	TP33.116x24x0.25	13.75	877.76	0.016	0.25	2315.67	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	17.90	1194.82	0.015	0.33	3985.70	0.000
L3	39.75 - 0 (3)	TP49.01x40.1883x0.375	21.55	1990.61	0.011	0.33	7974.10	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	133 - 86.5 (1)	0.006	0.374	0.000	0.016	0.000	0.380	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
L2	86.5 - 39.75 (2)	0.008	0.581	0.000	0.015	0.000	0.590 ✔	1.000	4.8.2 ✔
L3	39.75 - 0 (3)	0.008	0.514	0.000	0.011	0.000	0.523 ✔	1.000	4.8.2 ✔

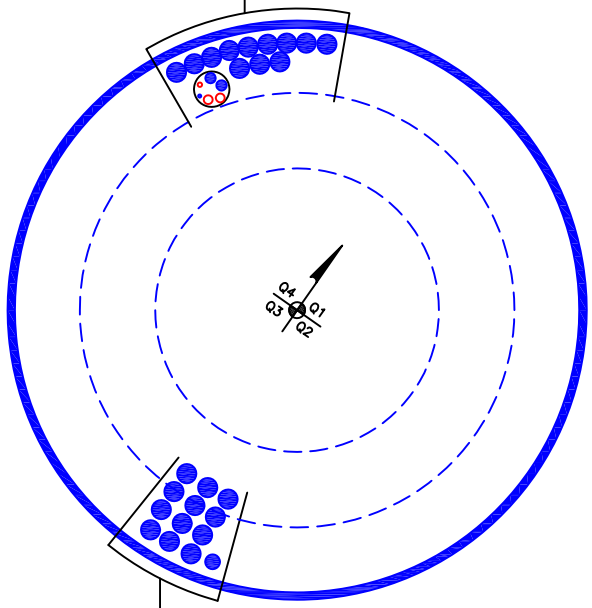
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	133 - 86.5	Pole	TP33.116x24x0.25	1	-10.81	1755.51	38.0	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.7828x0.2813	2	-19.27	2389.63	59.0	Pass
L3	39.75 - 0	Pole	TP49.01x40.1883x0.375	3	-31.90	3981.21	52.3	Pass
							Summary	
						Pole (L2)	59.0	Pass
						RATING =	**59.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

(PROPOSED–IN CONDUIT)
(1) 3/8" TO 133 FT LEVEL
(2) 3/4" TO 133 FT LEVEL
(INSTALLED–IN 3" CONDUIT)
(1) 17/64" TO 133 FT LEVEL
(2) 7/8" TO 133 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 133 FT LEVEL



(INSTALLED)
(1) 1–1/4" TO 113 FT LEVEL
(12) 1–5/8" TO 113 FT LEVEL

BUSINESS UNIT: 873633 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions:
1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *873633*
Site Name: *Milford*
App #: *374373 Rev 0*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	60	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	58	in
Thick:	3.25	in
Grade:	55	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	49.01	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	2049	ft-kips
Factored Axial, Pu:	32	kips
Factored Shear, Vu:	22	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	107.1	Kips
Axial Design Strength, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	41.2%	**Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	22.2	ksi
PL Design Bending Strength, Φ*Fy:	49.5	ksi
Base Plate Stress Ratio:	44.9%	**Pass**

PL Ref. Data
Yield Line (in):
33.01
Max PL Length:
33.01

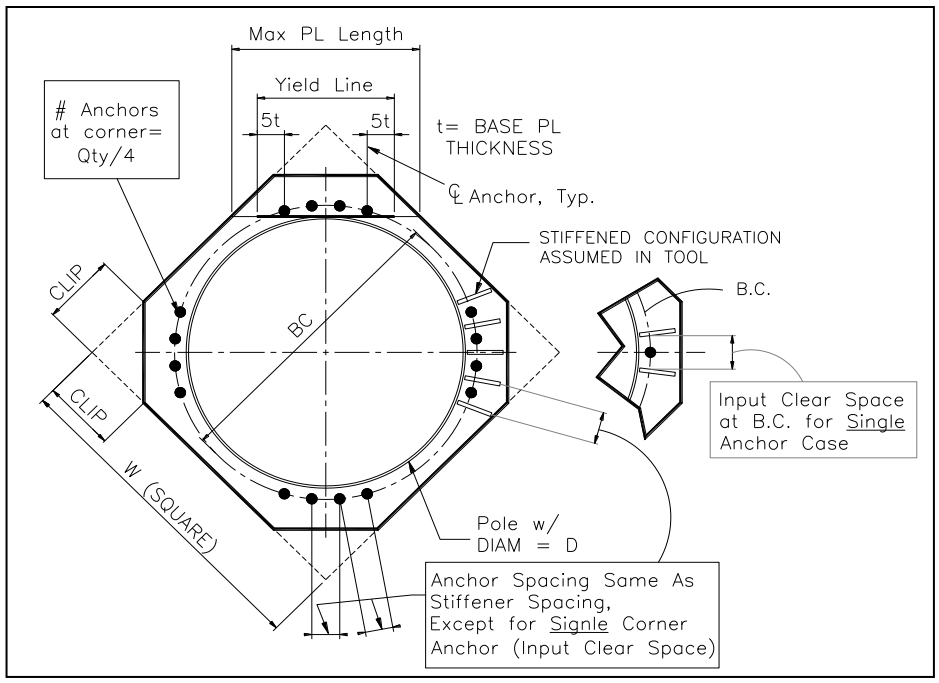
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

Monopole Pier and Pad Foundation

BU # : 873633
Site Name: Milford
App. Number: 374373 Rev 0

TIA-222 Revision: G

Design Reactions		
Shear, **S**:	22	kips
Moment, **M**:	2049	ft-kips
Tower Height, **H**:	133	ft
Tower Weight, **Wt**:	32	kips
Base Diameter, **BD**:	4.08	ft

Foundation Dimensions		
Depth, **D**:	7	ft
Pad Width, **W**:	23.5	ft
Neglected Depth, **N**:	3.33	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	7.00	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.120	kcf
Ult. Bearing Capacity, Bc:	10.0	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.45	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	11	
Pier Rebar Quanity, **mp**:	32	18
Pad Rebar Size, **Spad**:	11	
Pad Rebar Quanity, **mpad**:	24	6
Pier Tie Size, **St**:	4	4
Tie Quanity, **mt**:	12	5

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7	5.584166667	**OK**
Overturning (ft-kips)	5458.04	2049.00	**37.5%**
Shear Capacity (kips)	205.41	22.00	**10.7%**
Bearing (ksf)	7.50	1.87	**24.9%**
Pad Shear - 1-way (kips)	748.23	246.05	**32.9%**
Pad Shear - 2-way (kips)	1938.78	75.30	**3.9%**
Pad Moment Capacity (k-ft)	5177.90	673.35	**13.0%**
Pier Moment Capacity (k-ft)	7622.59	2148.00	**28.2%**

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = -32.00 kips

Pier Properties

Concrete:

Pier Diameter = 7.0 ft
Concrete Area = 5541.8 in^2

Reinforcement:

Clear Cover = 3.00 in
Cage Diameter = 6.38 ft
Bar Size = 11
Bar Diameter = 1.41 in
Bar Area = 1.56 in^2
Number of Bars = 32

Material Properties

Concrete compressive strength = 3000 psi
Reinforcement yield strength = 60000 psi
Modulus of elasticity = 29000 ksi
Reinforcement yield strain = 0.00207
Limiting compressive strain = 0.003

Seismic Properties

Seismic Zone = 1

Minimum Area of Steel

Required area of steel = 27.71 in^2
Provided area of steel = 49.92 in^2 **OK**

Axial Loading

Load factor = 1
Reduction factor = 0.9
Factored axial load = -35.5556 kips

Neutral Axis

Distance from extreme edge to neutral axis = 16.33 in
Equivalent compression zone factor = 0.85
Distance from extreme edge to equivalent compression zone factor = 13.88 in
Distance from centroid to neutral axis = 25.67 in

Compression Zone

Area of steel in compression zone = 10.92 in^2
Angle from centroid of pier to intersection of equivalent compression zone and edge of pier = 47.98 deg
Area of concrete in compression = 599.80 in^2
Force in concrete = 0.85 * f`c * Acc = 1529.50 kips
Total reinforcement forces = -1493.94 kips
Factored axial load = -35.56 kips
Force in concrete = -1529.50 kips

Sum of the forces in concrete = 0.00 kips **OK**

Maximum Moment

First moment of the concrete area in compression about the centoid = 20247.63 in^3
Distance between centroid of concrete in compression and centroid of pier = 33.76 in
Moment of concrete in compression = 51631.47 in-kips
Total reinforcement moment = 50003.08 in-kips
Nominal moment strength of column = 101634.54 in-kips
Factored moment strength of column = 91471.09 in-kips

Maximum Allowable Moment = 7622.59 ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compressi on (in^2)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-25.67	-28.12	-0.0047144	0.00	-60.00	-93.60
2	11.25	7.47	-18.20	-20.65	-0.0033421	0.00	-60.00	-93.60
3	22.50	14.65	-11.01	-13.46	-0.0020226	0.00	-58.66	-91.50
4	33.75	21.28	-4.39	-6.84	-0.0008066	0.00	-23.39	-36.49
5	45.00	27.08	1.41	-1.04	0.0002593	0.00	7.52	11.73
6	56.25	31.84	6.17	3.72	0.0011341	1.56	32.89	47.33
7	67.50	35.38	9.71	7.26	0.0017841	1.56	51.74	76.73
8	78.75	37.56	11.89	9.44	0.0021843	1.56	60.00	89.62
9	90.00	38.30	12.63	10.18	0.0023195	1.56	60.00	89.62
10	101.25	37.56	11.89	9.44	0.0021843	1.56	60.00	89.62
11	112.50	35.38	9.71	7.26	0.0017841	1.56	51.74	76.73
12	123.75	31.84	6.17	3.72	0.0011341	1.56	32.89	47.33
13	135.00	27.08	1.41	-1.04	0.0002593	0.00	7.52	11.73
14	146.25	21.28	-4.39	-6.84	-0.0008066	0.00	-23.39	-36.49
15	157.50	14.65	-11.01	-13.46	-0.0020226	0.00	-58.66	-91.50
16	168.75	7.47	-18.20	-20.65	-0.0033421	0.00	-60.00	-93.60
17	180.00	0.00	-25.67	-28.12	-0.0047144	0.00	-60.00	-93.60
18	191.25	-7.47	-33.14	-35.59	-0.0060866	0.00	-60.00	-93.60
19	202.50	-14.65	-40.32	-42.77	-0.0074061	0.00	-60.00	-93.60
20	213.75	-21.28	-46.94	-49.39	-0.0086222	0.00	-60.00	-93.60
21	225.00	-27.08	-52.75	-55.20	-0.0096881	0.00	-60.00	-93.60
22	236.25	-31.84	-57.51	-59.96	-0.0105628	0.00	-60.00	-93.60
23	247.50	-35.38	-61.05	-63.50	-0.0112128	0.00	-60.00	-93.60
24	258.75	-37.56	-63.23	-65.68	-0.0116131	0.00	-60.00	-93.60
25	270.00	-38.30	-63.96	-66.41	-0.0117483	0.00	-60.00	-93.60
26	281.25	-37.56	-63.23	-65.68	-0.0116131	0.00	-60.00	-93.60
27	292.50	-35.38	-61.05	-63.50	-0.0112128	0.00	-60.00	-93.60
28	303.75	-31.84	-57.51	-59.96	-0.0105628	0.00	-60.00	-93.60
29	315.00	-27.08	-52.75	-55.20	-0.0096881	0.00	-60.00	-93.60
30	326.25	-21.28	-46.94	-49.39	-0.0086222	0.00	-60.00	-93.60
31	337.50	-14.65	-40.32	-42.77	-0.0074061	0.00	-60.00	-93.60
32	348.75	-7.47	-33.14	-35.59	-0.0060866	0.00	-60.00	-93.60

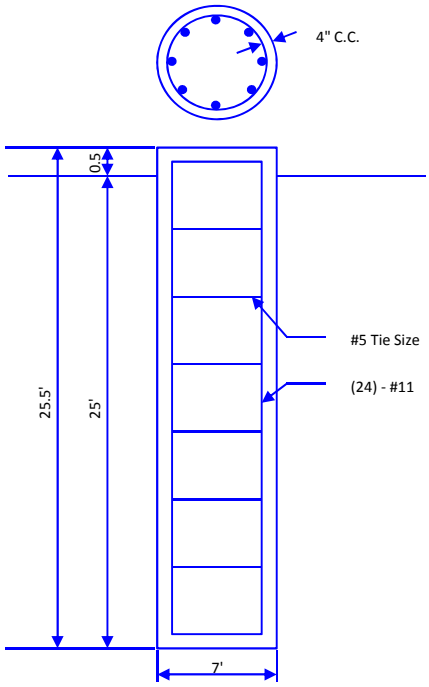
CCI Foundation Tool Suite - Monopole Pier

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 2/9/2017

BU:	873633
Site Name:	Milford
App Number:	374373 Rev 0
Work Order:	1358100

Monopole Drilled Pier

Input



Criteria

TIA Revision:	G	
ACI 318 Revision:	2005	
Seismic Category:	B	

Forces

Compression	32	kips
Shear	22	kips
Moment	2049	k-ft
Swelling Force	0	kips

Foundation Dimensions

Pier Diameter:	7	ft
Ext. above grade:	0.5	ft
Depth below grade:	25	ft

Material Properties

Number of Rebar:	24	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	4	in

Soil Profile: 1

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.5	0	3.5	120	0	0	0	0	0	
2	21.5	3.5	25	120		30			10	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	6.14	ft
Max Moment, Mu:	2191.54	k-ft
Soil Safety Factor:	4.36	
Safety Factor Req'd:	1.33	
RATING:	30.5%	

Soil Axial Capacity

Skin Friction (k):	245.06	kips
End Bearing (k):	288.63	kips
Comp. Capacity (k), ϕCn:	533.70	kips
Comp. (k), Cu:	32.00	kips
RATING:	6.0%	

Concrete/Steel Check

Mu (from soil analysis)	2191.54	k-ft
ϕMn	5766.33	k-ft
RATING:	38.0%	

rho provided	0.68	
rho required	0.33	OK

Rebar Spacing	8.19	
Spacing required	22.56	OK

Dev. Length required	18.53	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 38.0%

CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	873633
Work Order:	1358100
Application:	374373 Rev. 0

	Degrees	Minutes	Seconds		
Site Latitude =	41	13	12.27	41.2201	degrees
Site Longitude =	-73	4	38.56	-73.0774	degrees
Ground Supported Structure =	Yes				
Structure Class =	II				*(Table 2-1)*
Site Class =	D - Stiff Soil				*(Table 2-11)*

Spectral response acceleration short periods, S_S =	0.194	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.063	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.207	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.101	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-05 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-05 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-05 Tables 11.6-1 and 6-2*

SITESAFE
RF COMPLIANCE EXPERTS
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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 – 10035338
Site ID – CTU2082 (Retrofit)
USID – 61172
Site Name – Milford Bona St
Site Compliance Report

Bona Street
Milford, CT 06460

Latitude: N41-13-12.27
Longitude: W73-4-38.57
Structure Type: Monopole

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

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

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1 General Site Summary

1.1 Report Summary

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

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTU2082_2017-LTE-Multi-Carrier_1xBBU-RRH-Add_om636a_2051A02JYA_10035338_61172_04-28-2016_As-Built-In-Progress_v1.00

And

NEW-ENGLAND_CONNECTICUT_CTU2082_2016-LTE-Next-Carrier_LTE-3C_mm093q_2051A02JYA_10035338_61172_06-29-2015_Final-Approved_v3.00 RETROFIT

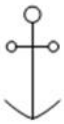
CD's: 10035338_AE201_170125_CTL02082_Rev1_MC-Retrofit CD

RF Powers Used: RFDS ERP Values

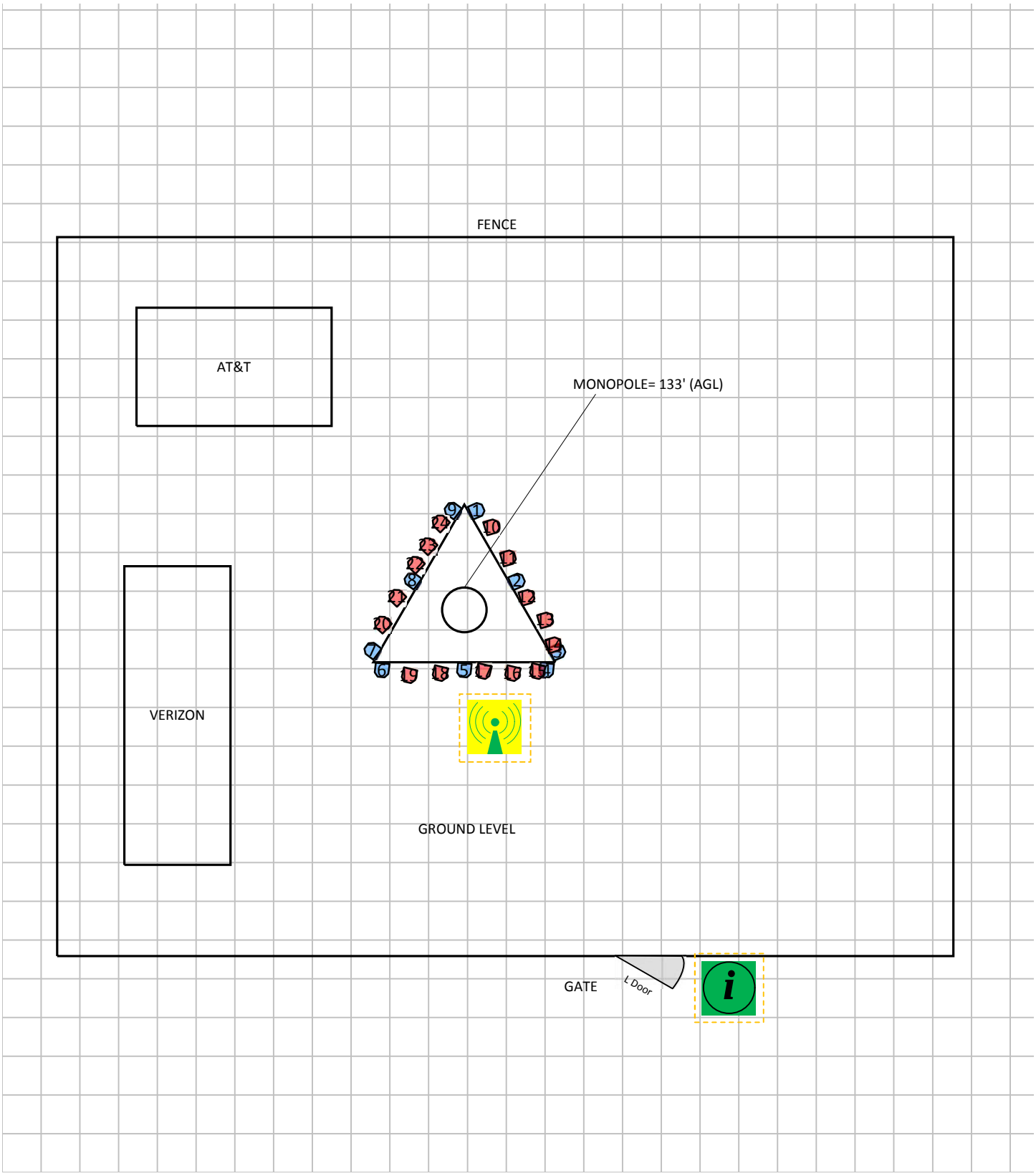
2 Scale Maps of Site

The following diagrams are included:

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

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

Site Scale Map For: Milford Bona St



(Feet)

0 6.7 13.3

www.sitesafe.com
Site Name:Milford Bona St
2/21/2017 5:06:21 PM

Carrier Identification

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

Sign Legend

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

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	23	82	4.6	11.51	0	2	0	586.2	79.5'	111.5'	133.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	23	86	4.6	13.41	0	1	0	320.6	79.5'	111.5'	133.7'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	23	60	4	11.36	1	0	0	293.1	83.4'	104.7'	134'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	23	61.1	4	14.26	0	0	1	1044.7	83.4'	104.7'	134'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	23	66	4.6	11.29	0	0	1	792.5	87.3'	97.9'	133.7'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	23	65	4.6	14.65	0	0	1	2421	87.3'	97.9'	133.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	143	82	4.6	11.51	0	2	0	586.2	86.2'	96.1'	133.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	1	0	320.6	86.2'	96.1'	133.7'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	143	60	4	11.36	1	0	0	293.1	78.3'	96.1'	134'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	143	61.1	4	14.26	0	0	1	1044.7	78.3'	96.1'	134'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	143	66	4.6	11.29	0	0	1	792.5	70.3'	96.1'	133.7'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	143	65	4.6	14.65	0	0	1	2421	70.3'	96.1'	133.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	2	0	586.2	69.4'	98'	133.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	320.6	69.4'	98'	133.7'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	263	60	4	11.36	1	0	0	293.1	73.3'	104.8'	134'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	263	61.1	4	14.26	0	0	1	1044.7	73.3'	104.8'	134'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	263	66	4.6	11.29	0	0	1	792.5	77.1'	111.6'	133.7'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	263	65	4.6	14.65	0	0	1	2421	77.1'	111.6'	133.7'
10	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	30	90	4	11.51	-	-	-	566.3	81'	110'	105'
11	VERIZON WIRELESS	Swedcom SWCP 2x5514	Panel	751	30	55	4.3	14.01	-	-	-	1510.6	82.6'	107'	104.8'
12	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	2100	30	60	4	15.31	-	-	-	2037.8	84.4'	103.2'	105'
13	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	1900	30	65	4	14.91	-	-	-	1858.5	86.2'	101'	105'
14	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	30	90	4	11.51	-	-	-	566.3	87'	98.6'	105'
15	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	150	90	4	11.51	-	-	-	566.3	85.4'	96'	105'
16	VERIZON WIRELESS	Swedcom SWCP 2x5514	Panel	751	150	55	4.3	14.01	-	-	-	1510.6	83'	95.8'	104.8'
17	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	2100	150	60	4	15.31	-	-	-	2037.8	80.2'	96'	105'
18	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	1900	150	65	4	14.91	-	-	-	1858.5	76'	95.8'	105'

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)
19	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	150	90	4	11.51	-	-	-	566.3	73'	95.6'	105'
20	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	270	90	4	11.51	-	-	-	566.3	70.4'	100.6'	105'
21	VERIZON WIRELESS	Swedcom SWCP 2x5514	Panel	751	270	55	4.3	14.01	-	-	-	1510.6	71.8'	103.2'	104.8'
22	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	2100	270	60	4	15.31	-	-	-	2037.8	73.6'	106.4'	105'
23	VERIZON WIRELESS	Antel BXA-171063-8CF	Panel	1900	270	65	4	14.91	-	-	-	1858.5	74.8'	108.2'	105'
24	VERIZON WIRELESS	Antel LPA-80090-4CF	Panel	850	270	90	4	11.51	-	-	-	566.3	76'	110.4'	105'

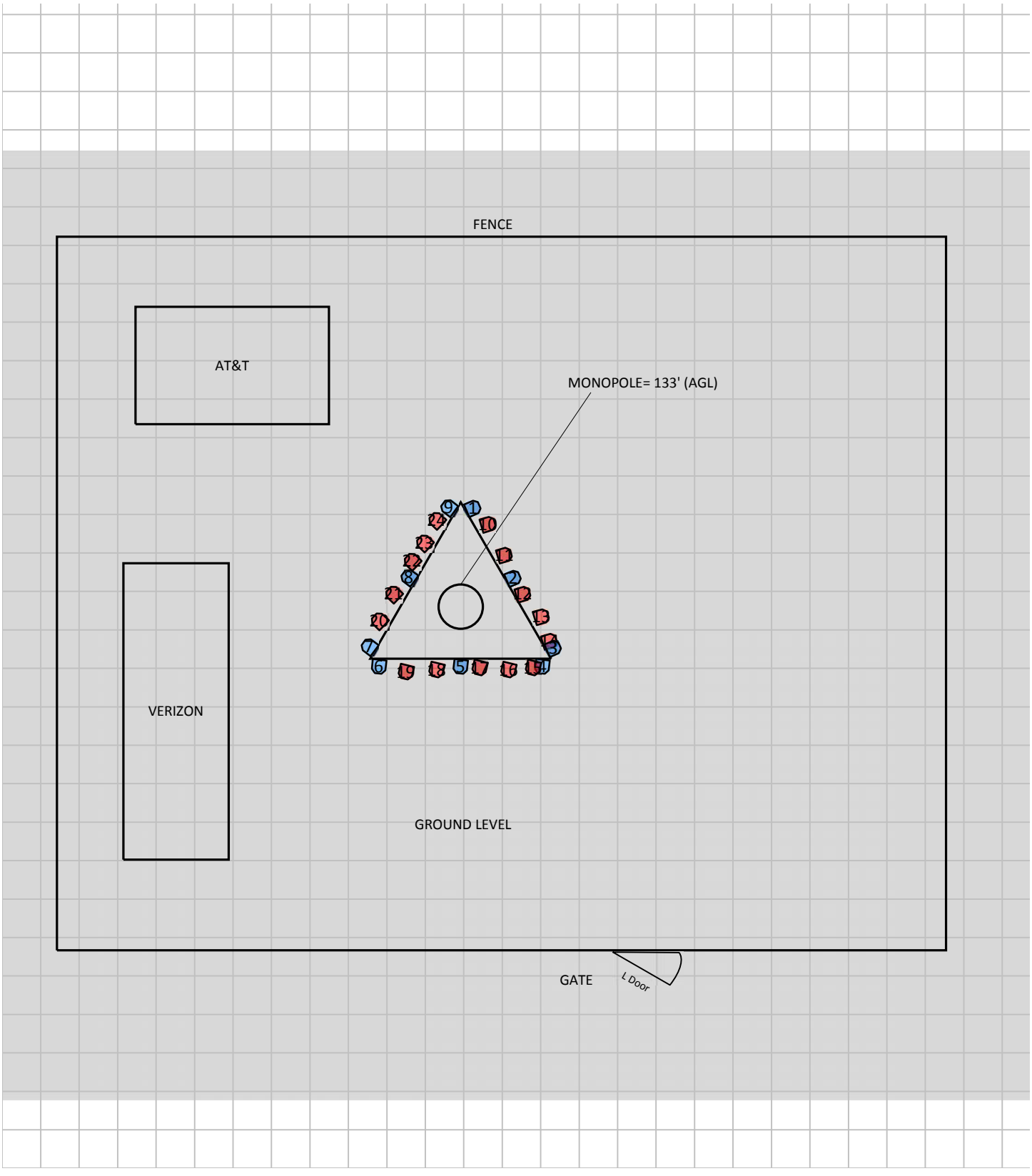
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level (AGL).** The distance to the bottom of the antenna is calculated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

4 Emission Predictions

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

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Milford Bona St



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

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

Carrier Identification

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

Sign Legend

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

Barrier

Proposed Barriers/ Signs

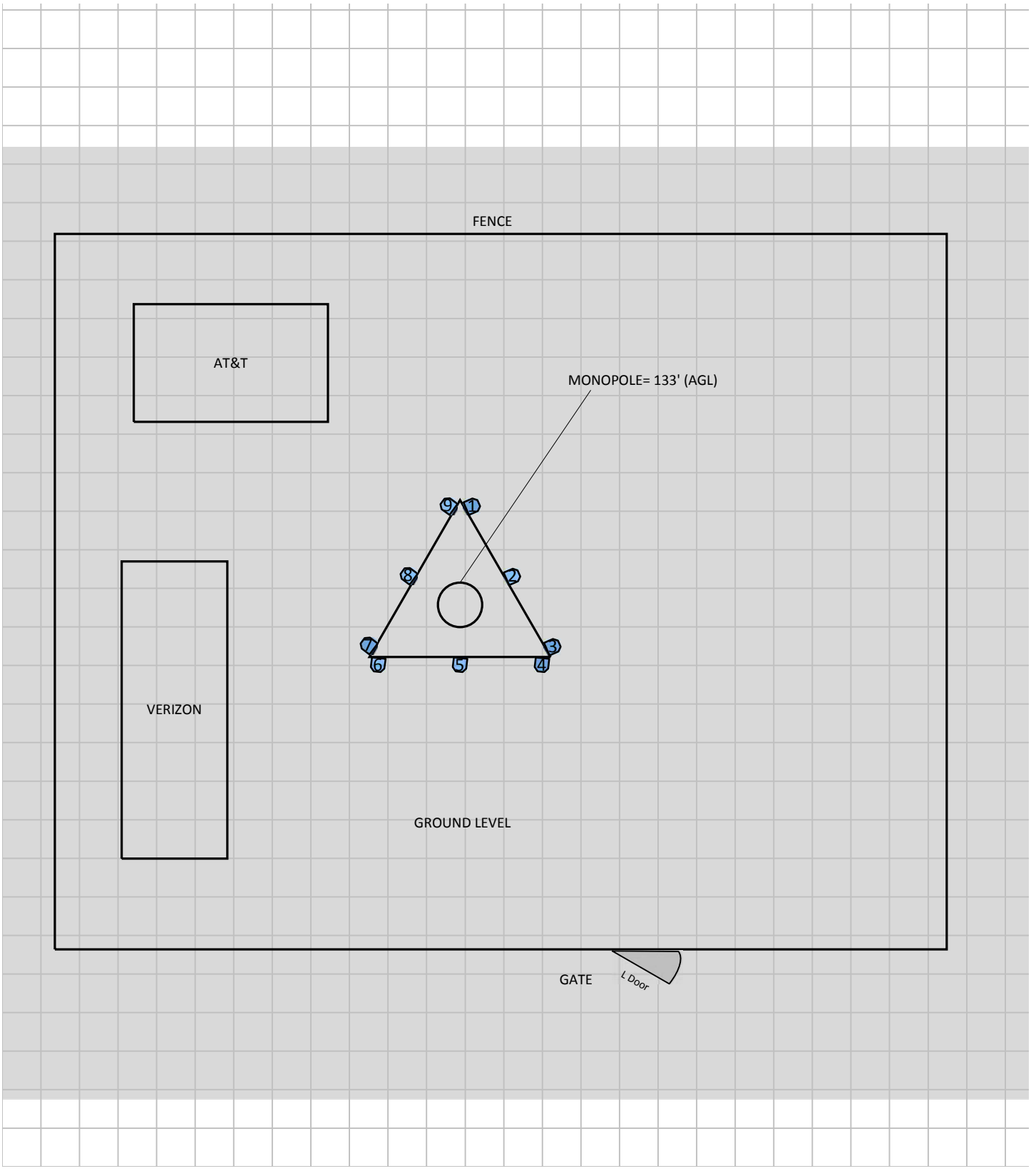
(Feet)

0 6.7 13.4

www.sitesafe.com
Site Name:Milford Bona St
2/21/2017 5:03:23 PM

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

RF Exposure Simulation For: Milford Bona St
AT&T Mobility, LLC Contribution



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

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

Carrier Identification

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

Sign Legend

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

Barrier | Proposed Barriers/ Signs

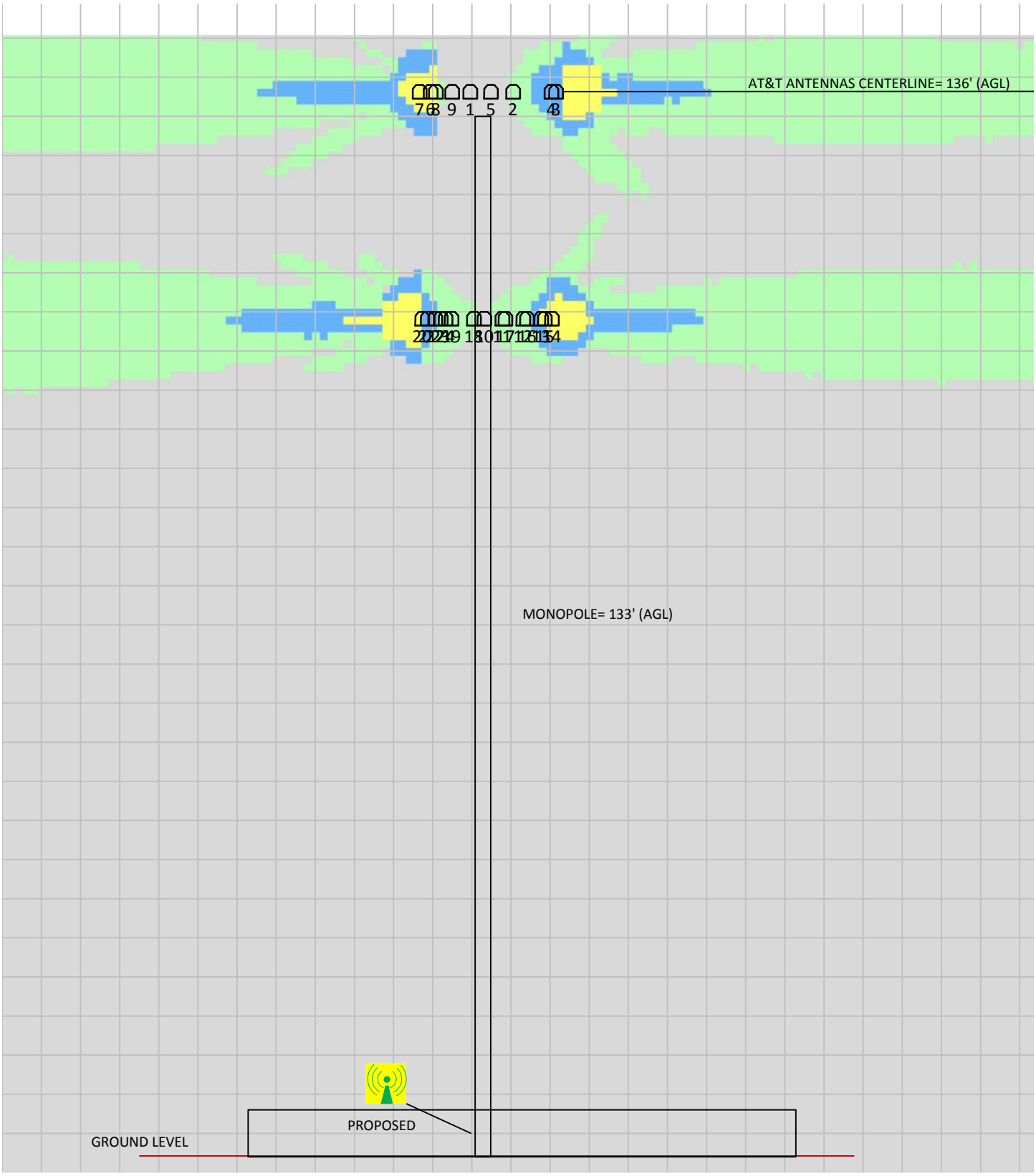
(Feet)

0 6.7 13.3

www.sitesafe.com
Site Name:Milford Bona St
2/21/2017 5:04:43 PM

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

RF Exposure Simulation For: Milford Bona St
Elevation View



% of FCC Public Exposure Limit

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

Carrier Identification

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

Sign Legend

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

Barrier · Proposed Barriers/ Signs

(Feet)

0 8.8 17.6

www.sitesafe.com
Site Name:Milford Bona St
2/21/2017 5:11:57 PM

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

5 Site Compliance

5.1 Site Compliance Statement

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

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

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

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

5.2 Actions for Site Compliance

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

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

Base of Tower

Caution 2 sign required.

Compound Gate

Information 1 sign required.

6 Reviewer Certification

The Reviewer whose signature appears below hereby certifies and affirms:

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

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

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

February 21, 2017

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

FCC Rules and Regulations

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

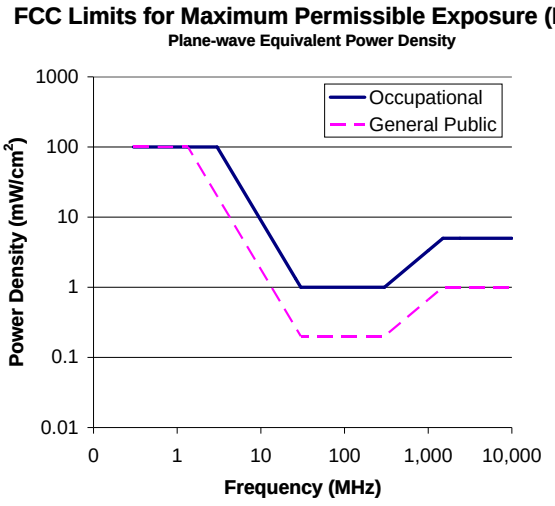
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

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

(a) Each employer –

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

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

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F – References

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

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