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

April 13, 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: 842871**
AT&T Site ID: CT5101
26 South Orange Center, Orange, CT 06477
Latitude: 41° 15' 19.98" / Longitude: -73° 0' 39.2"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 177-foot level of the existing 180-foot monopole tower at 26 South Orange Center in Orange, CT. The tower is owned by Crown Castle. The property is owned by the Town of Orange. AT&T intends to replace three (3) antennas with three (3) new antennas, replace three (3) RRU-11s with three (3) new RRU-32 B2s models, install one (1) WCS filter, and remove six (6) TMAs.

The Town of Orange has not responded to a request for original zoning documents at this time.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc: Mr. James Zeoli, First-Selectman
Town of Orange
617 Orange Center Road
Orange, CT 06477

Plan & Zoning
Town of Orange
617 Orange Center Rd
Orange, CT 06477

BOSTON POST RD

Location	BOSTON POST RD	**Assessment**	$150,300
Mblu	13/ 7/ 2A/ /	**Appraisal**	$214,700
Acct#	34600	**PID**	596
Owner	ORANGE TOWN OF	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$0	$214,700	$214,700
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$0	$150,300	$150,300

Owner of Record

Owner	ORANGE TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	617 ORANGE CENTER RD ORANGE, CT 06477	**Book & Page**	270/ 121
		Sale Date	12/28/1978
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
ORANGE TOWN OF	$0		270/ 121	00	12/28/1978

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Vacant Land
Model	
Stories	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	

Building Photo

Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	
Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Stacks	
Fireplace(s)	
Gas Fireplace(s)	
Attic	
Frame	
Traffic	
Bsmt Gar(s)	
SF FBM	
Basement	
Bsmt Floor	

(http://images.vgsi.com/photos/OrangeCTPhotos//default.jpg)

Building Layout

Building Layout

Building Sub-Areas	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	520E
Description	Exempt Comm Vac
Zone	C-2
Neighborhood	C40
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	1.06
Frontage	
Depth	
Assessed Value	$150,300
Appraised Value	$214,700

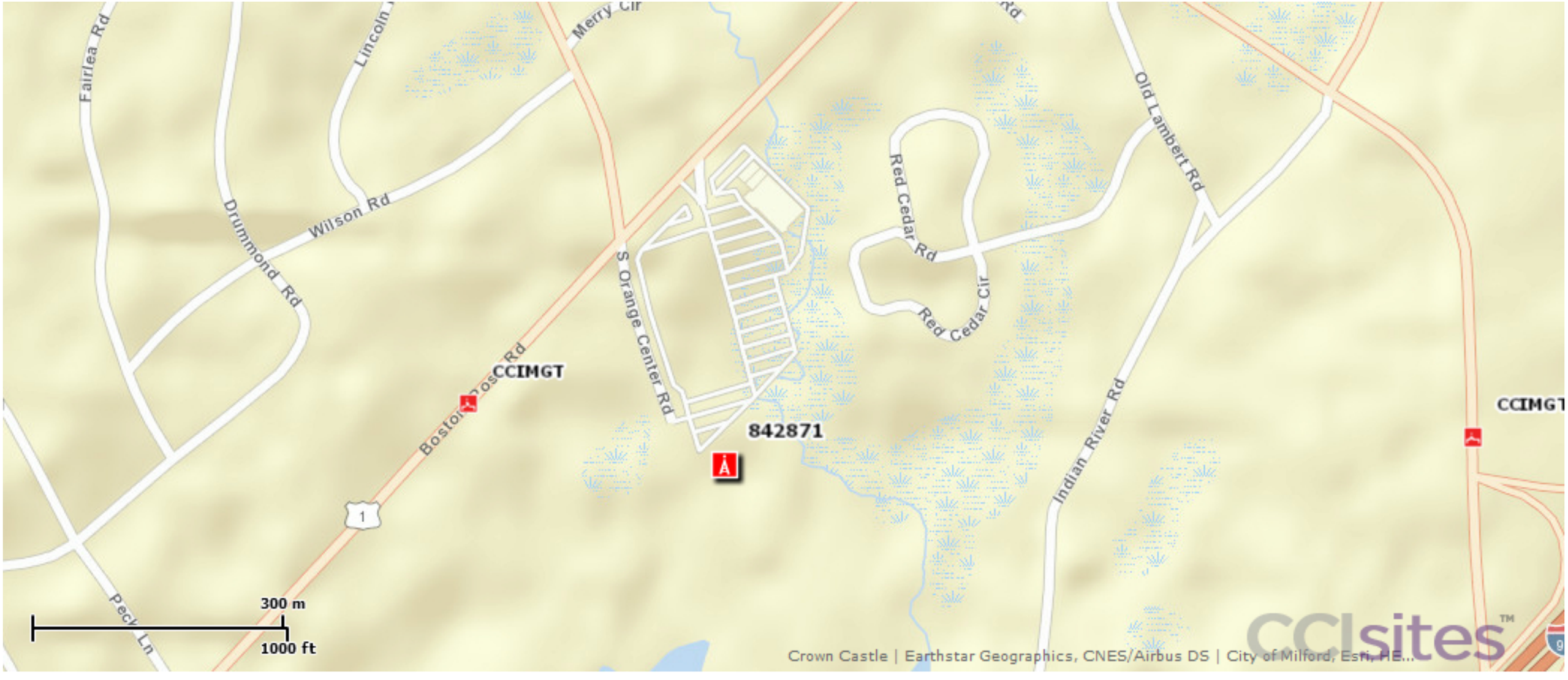
Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$0	$214,700	$214,700
2012	$0	$214,700	$214,700
2011	$0	$254,400	$254,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$0	$150,300	$150,300
2012	$0	$150,300	$150,300
2011	$0	$178,100	$178,100


Fairlea Rd
Lincoln
Merry Cir
Wilson Rd
Drummond Rd
Boston Post Rd
S Orange Center Rd
Red Cedar Rd
Red Cedar Cir
Old Lambert Rd
Indian River Rd
CCIMGT
842871
CCIMGT
1
300 m
1000 ft
Crown Castle | Earthstar Geographics, CNES/Airbus DS | City of Milford, Esri, HE...
CCIsites™

SITE NAME: ORANGE TRANSFER STATION
FA NUMBER: 10071197
SITE NUMBER: CTL05101
CROWN BU #: 842871
MULTI-CARRIER-MRCTB018877
RETROFIT-MRCTB019143
26 SOUTH ORANGE CENTER ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

CROWN CASTLE SITE NAME: ORANGE TRANSFER STATION
CROWN CASTLE SITE #: 842871

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 ROAD
CITY, STATE, ZIP: FRAMINGHAM, MA 01701
CONTACT: OMAIR MOHAMMED
E-MAIL: OM636A@ATT.COM

CONSTRUCTION MANAGER

COMPANY: SMARTLINK, LLC.
ADDRESS: 85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP: NORTH BILLERICA, MA 01862-2105
CONTACT: MARK DONNELLY
PHONE: (617) 515-2080
E-MAIL: MARK.DONNELLY@SMARTLINKLLC.COM

SITE INFORMATION

APPLICANT/LESSEE

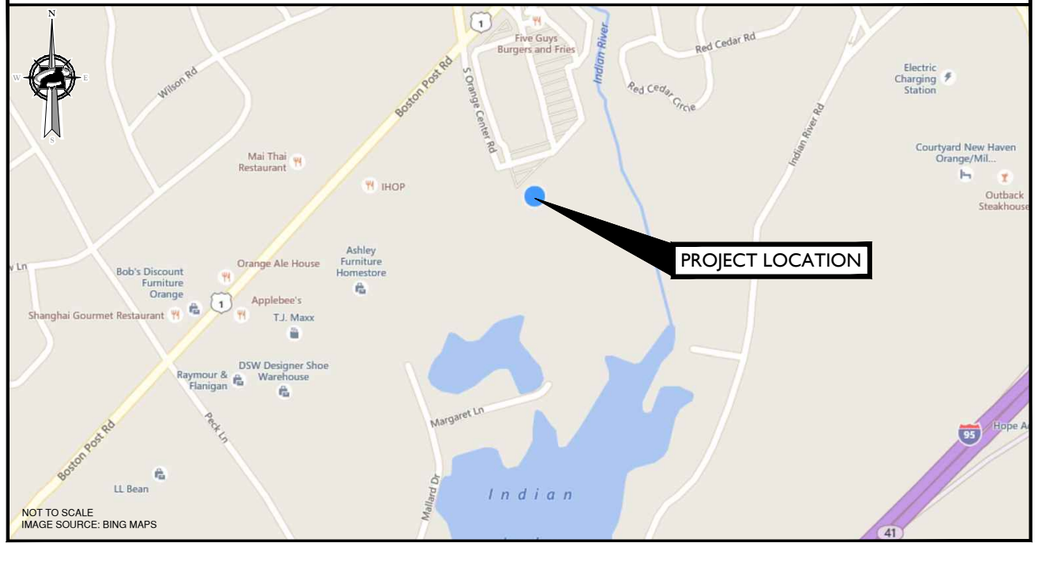
at&t

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

PROPERTY/TOWER OWNER:

NAME:	CROWN CASTLE
ADDRESS:	2000 CORPORATE DRIVE
CITY, STATE, ZIP:	CANONSBURG, PA 15317
CROWN SITE #:	842871
LATITUDE:	41.255550° N
LONGITUDE:	73.010889° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT PLATFORM AND MONOPOLE
ZONING/JURISDICTION:	CITY OF ORANGE
CURRENT USE/PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP



CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE INCORPORATING THE 2012 IBC
2. NATIONAL ELECTRIC CODE 2014
3. NATIONAL FIRE PROTECTION ASSOCIATION 70 - 2015
4. LIGHTNING PROTECTION CODE 201
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRICTION 360-10.
7. EIA/TIA-222 REVISION 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, DETAILS AND ANTENNA SCHEDULE
A-3	ANTENNA LAYOUTS
A-4	DETAILS
A-5	RF PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- (3) NEW PANEL ANTENNAS TO REPLACE (3) EXISTING PANEL ANTENNAS, (1) PER SECTOR
- (3) NEW RRUS TO REPLACE (3) EXISTING RRUS, (1) PER SECTOR
- ADD XMU AND IDL2 TO EXISTING LTE CABINET
- ADD (1) WCS FILTER (GAMMA SECTOR ONLY)

PROPOSED PROJECT SCOPE BASED ON RFDS ID # 1161729, VERSION 1.00, LAST UPDATED 04/14/16 AND RFDS ID # 706984, VERSION 5.00, LATE UPDATED 05/20/16

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85 RANGEWAY ROAD
BUILDING 3, SUITE 102
NORTH BILLERICA, CT 01862-2105
TEL: (774) 369-3613

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

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	16946019A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	03/21/17	FOR CONSTRUCTION	RA	FEP
0	01/13/17	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT
FRANK E. PAZDEN
12
LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0[illegible]

SITE NAME:
ORANGE TRANSFER STATION
FA# 10071197
SITE # CTL05101
26 SOUTH ORANGE CENTER RD.
ORANGE, CT 06477
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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BUILDING 3, SUITE 102
NORTH BILLERICA, CT 01862-2105
TEL: (774) 369-3613

at&t
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550 COCHITUATE ROAD
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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	16946019A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	03/21/17	FOR CONSTRUCTION	RA	FEP
0	01/13/17	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT · FRANK E. PASZDEN · 20 · LICENSED PROFESSIONAL ENGINEER
FRANK E. PASZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.20

SITE NAME:
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FA# 10071197
SITE # CTL05101

26 SOUTH ORANGE CENTER RD.
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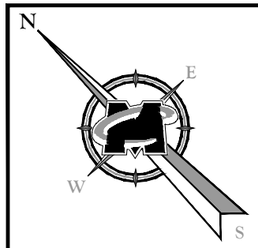
NEW HAVEN COUNTY

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



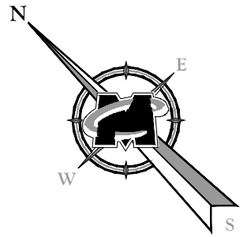
COMPOUND PLAN

GRAPHIC SCALE

5 0 2.5 5 10

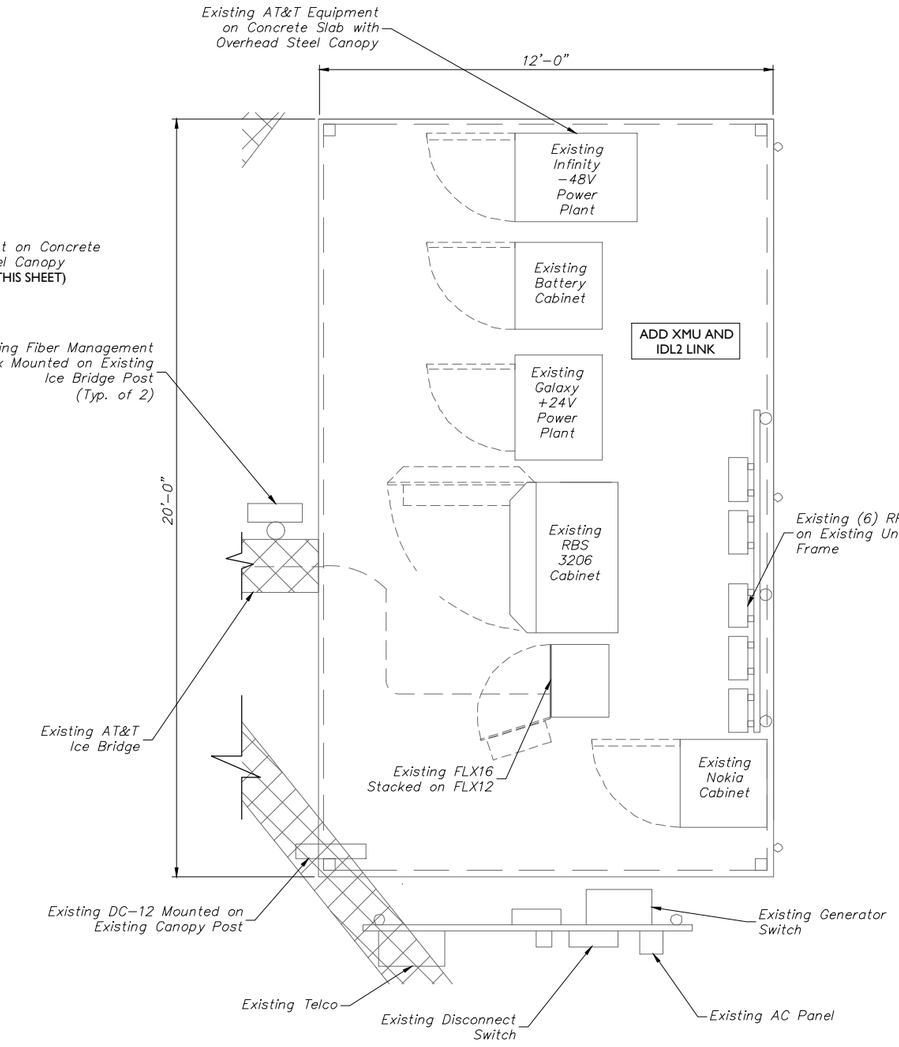
(IN FEET)

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



NOTES:

1. THE CONDUIT ROUTING IS DIAGRAMMATICALLY SHOWN ON THE PLANS AND ARE ONLY APPROXIMATIONS. THE EXACT LOCATION AND ROUTING SHALL BE FIELD VERIFIED.
2. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES, INDICATING THE CIRCUITS ORIGINATION AND ALL EQUIPMENT TERMINATIONS.
3. SUBCONTRACTOR SHALL PROVIDE ALL CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED SYSTEM AND SHALL BE IN COMPLIANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
4. ALL NEW CABLING TO BE ROUTED ON EXISTING CABLE RACKS.
5. ALL INSTALLED GROUND LUGS MUST BE INSPECTION HOLE LUGS.
6. INSTALLED GROUND LEADS MUST TERMINATE AT MGB, NOT HALO.
7. NO OVERLAPPING GROUND HARDWARE.



NOTE:

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EQUIPMENT PLAN

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS
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AS SHOWN	16946019A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	03/21/17	FOR CONSTRUCTION	RA	FEP
0	01/13/17	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT · FRANK E. PAZDEN · 20 · LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0020

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SITE # CTL05101

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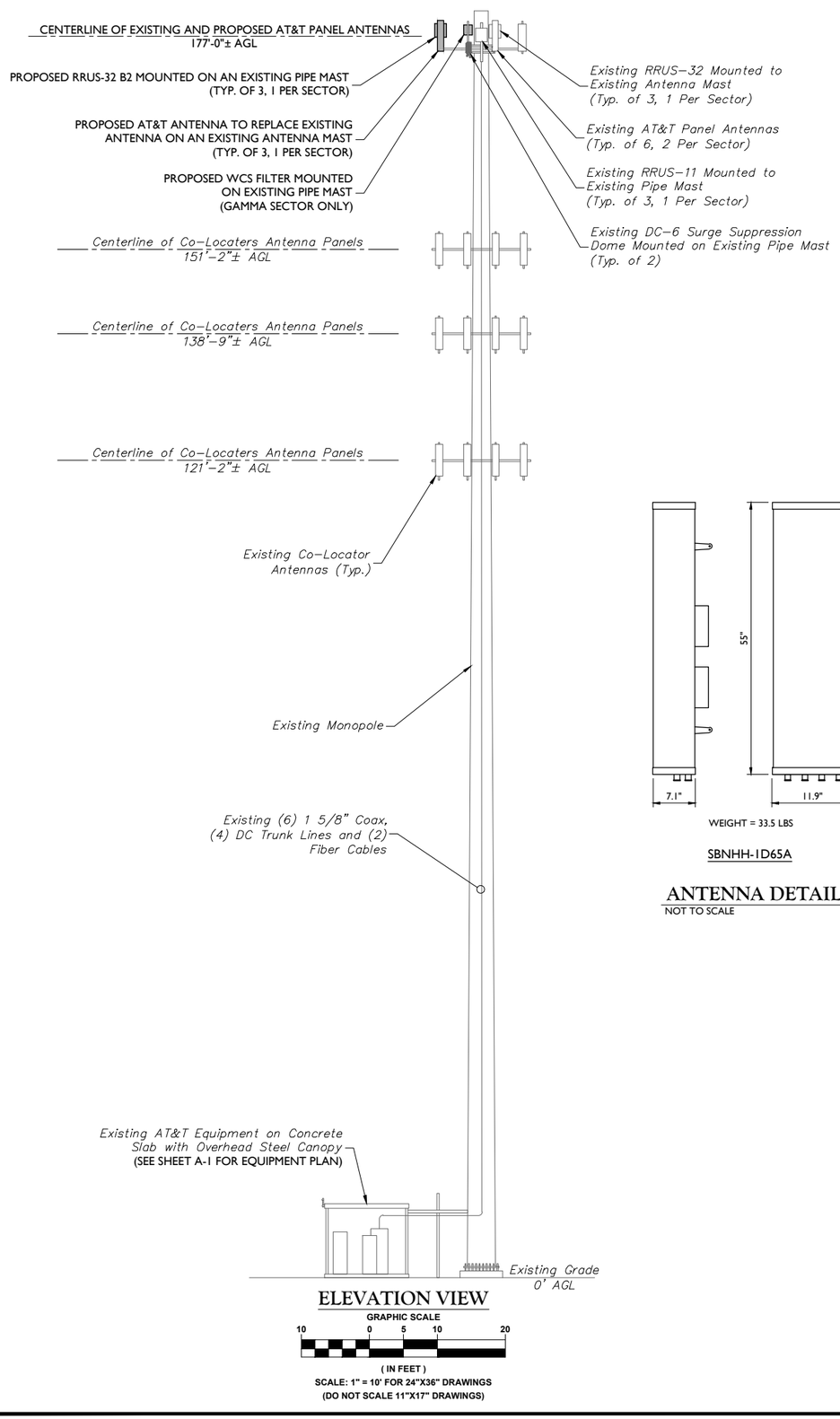
SHEET TITLE :
COMPOUND PLAN AND EQUIPMENT PLAN

SHEET NUMBER :
A-1



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

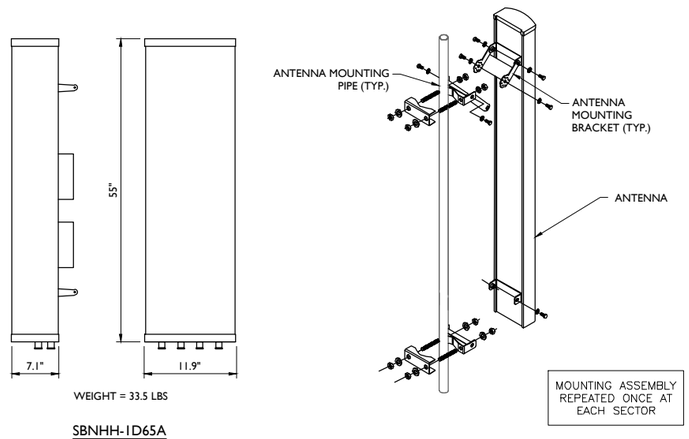
SCALE: 1" = 10' FOR 24"X36" DRAWINGS

(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 7770.00.850.00	Powerwave 7770.00.850.00	UMTS/GSM	REMAIN	55.00	11.00	5.00	35.00	20°	177'	-	-
	A2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	20°	177'	(1) RRUS-32	REMAIN
	A3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	A4	KMW AM-X-CD-14-65-OOT-RET	Andrew SBNHH-1D65A	LTE 1900	NEW	55.00	11.90	7.10	33.50	20°	177'	(1) RRUS-11 (1) RRUS-32 B2	REMAIN NEW
BETA	B1	Powerwave 7770.00.850.00	Powerwave 7770.00.850.00	UMTS/GSM	REMAIN	55.00	11.00	5.00	35.00	120°	177'	-	-
	B2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	120°	177'	(1) RRUS-32	REMAIN
	B3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	B4	KMW AM-X-CD-14-65-OOT-RET	Andrew SBNHH-1D65A	LTE 1900	NEW	55.00	11.90	7.10	33.50	120°	177'	(1) RRUS-11 (1) RRUS-32 B2	REMAIN NEW
GAMMA	C1	Powerwave 7770.00.850.00	Powerwave 7770.00.850.00	UMTS/GSM	REMAIN	55.00	11.00	5.00	35.00	230°	177'	-	-
	C2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	230°	177'	(1) RRUS-32 (1) WCS FILTER	REMAIN NEW
	C3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	C4	KMW AM-X-CD-14-65-OOT-RET	Andrew SBNHH-1D65A	LTE 1900	NEW	55.00	11.90	7.10	33.50	230°	177'	(1) RRUS-11 (1) RRUS-32 B2	REMAIN NEW

ANTENNA SCHEDULE



WEIGHT = 33.5 LBS

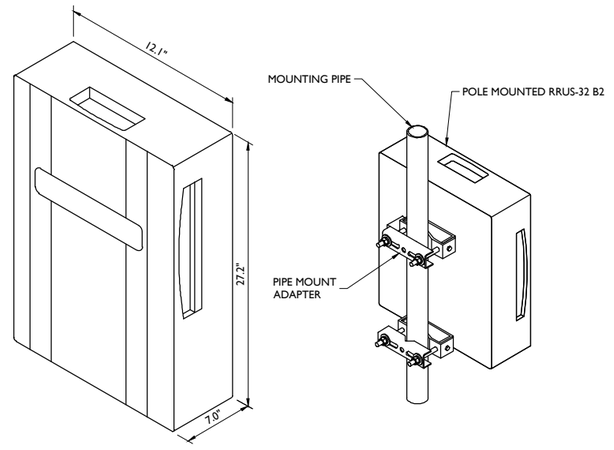
SBNHH-1D65A

ANTENNA DETAIL

NOT TO SCALE

ANTENNA MOUNTING DETAIL

NOT TO SCALE



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

RRUS-32 B2 DETAIL

NOT TO SCALE

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STRUCTURAL NOTES:

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

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0	01/13/17	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT
FRANK E. FAZZEN
FRANK E. FAZZEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0...
LICENSED PROFESSIONAL ENGINEER

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SITE # CTL05101

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SHEET TITLE:
ELEVATION VIEW, DETAILS AND ANTENNA SCHEDULE

SHEET NUMBER:
A-2

NOTE:

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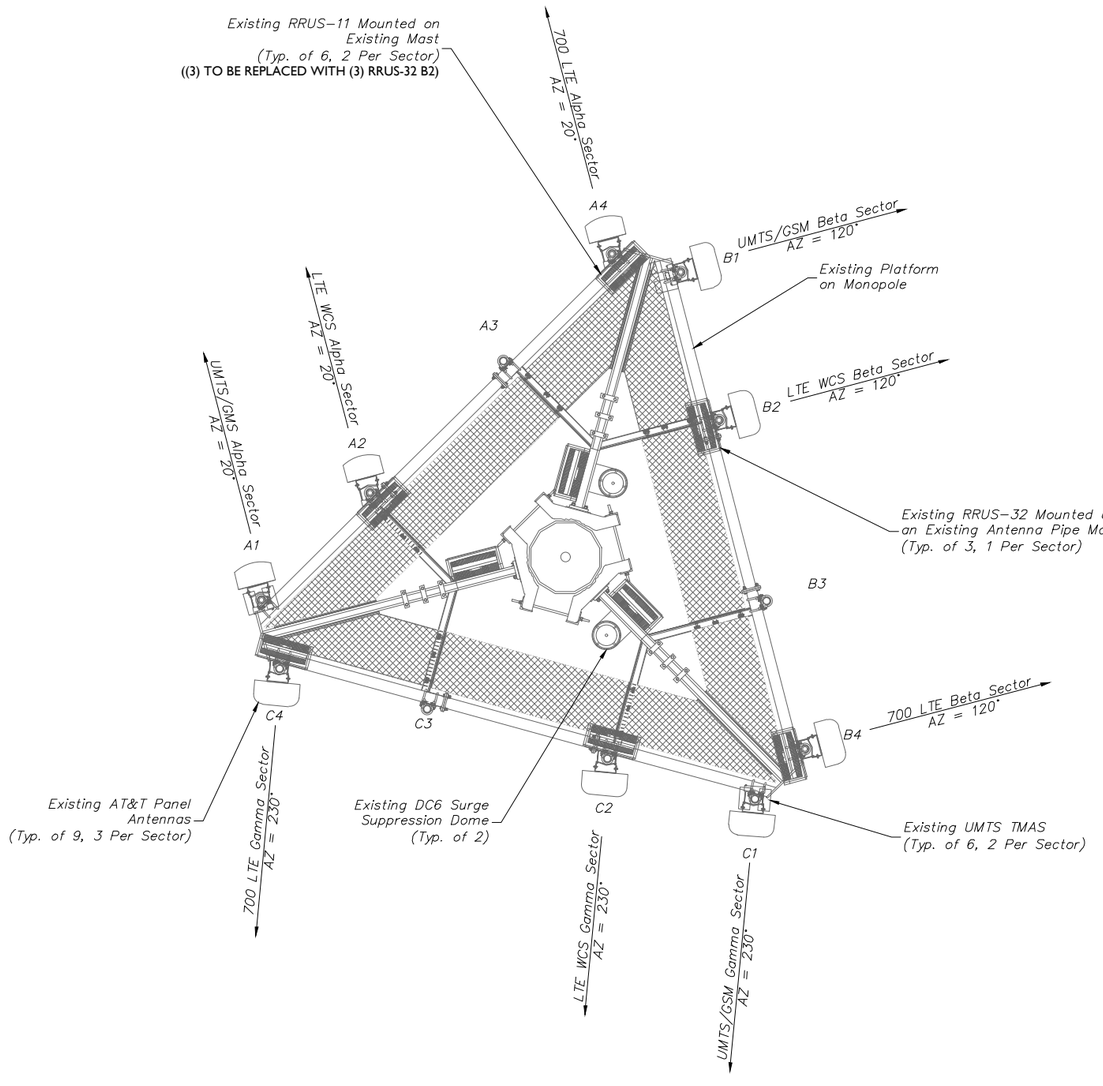
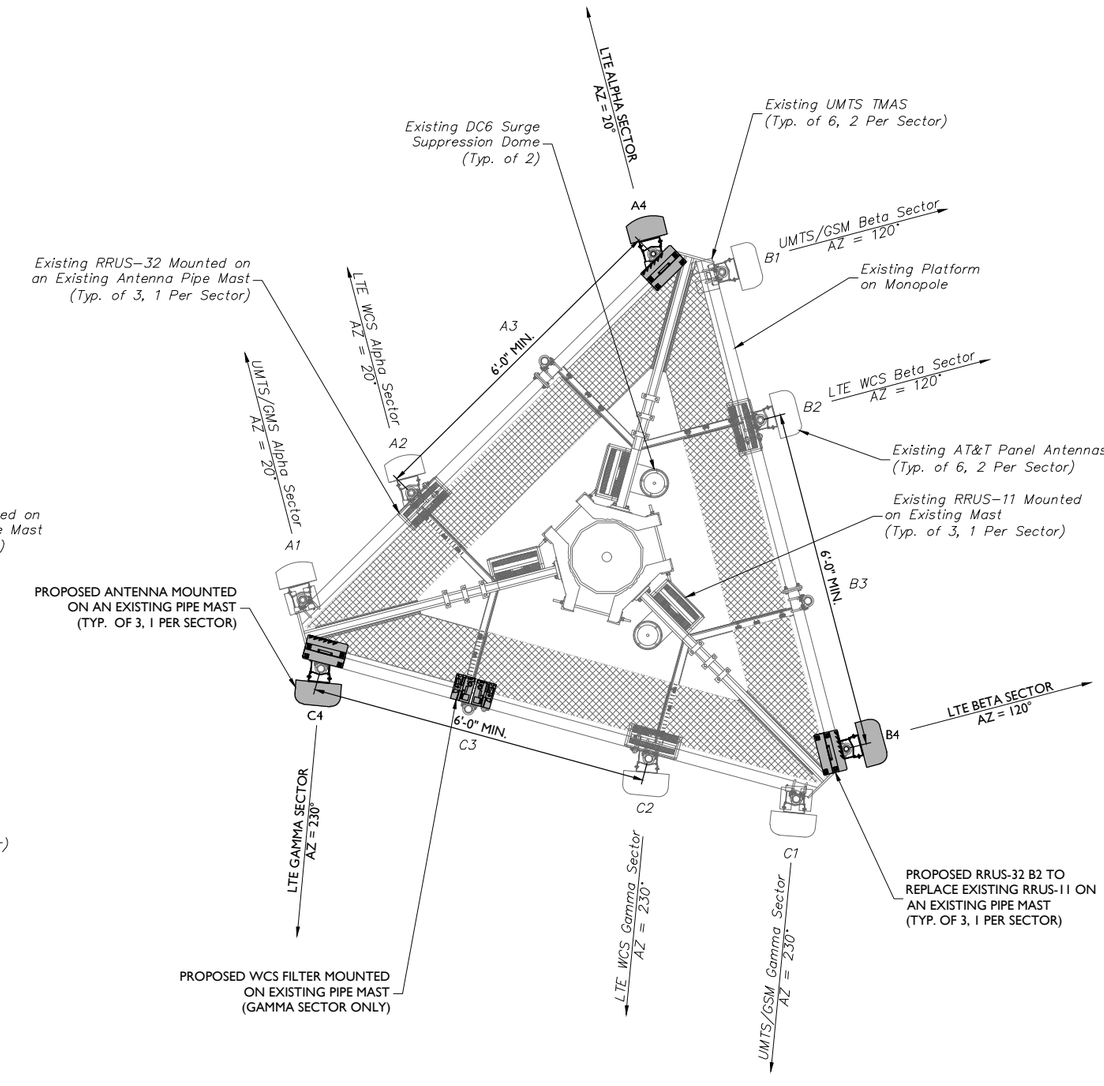


EXISTING - ANTENNA LAYOUT
NOT TO SCALE



PROPOSED - ANTENNA LAYOUT
NOT TO SCALE

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STATE OF CONNECTICUT
FRANK E. PAZDEN
10
LICENSED
PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0

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SITE # CTL05101

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email: solutions@maserconsulting.com

SHEET TITLE :
ANTENNA LAYOUTS

SHEET NUMBER :
A-3

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

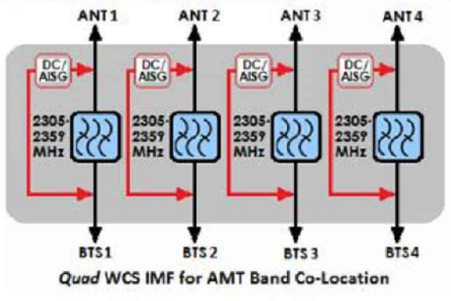
DC/AISG TRANSPARENCY

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

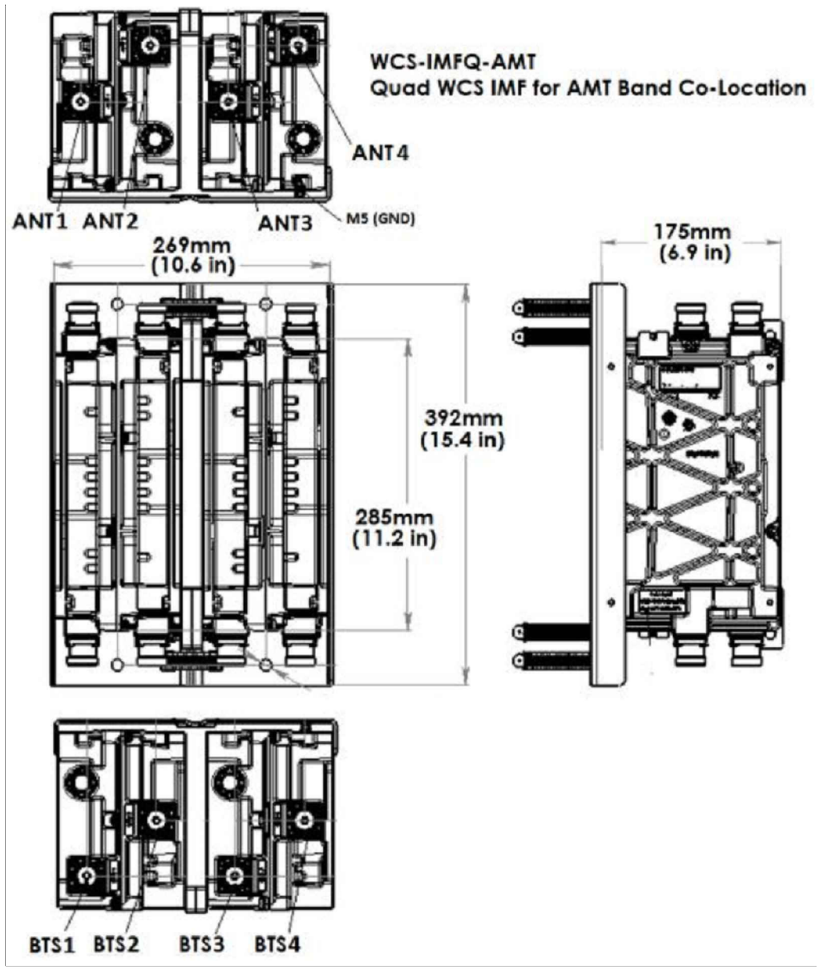
Mechanical (Quad Version)

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

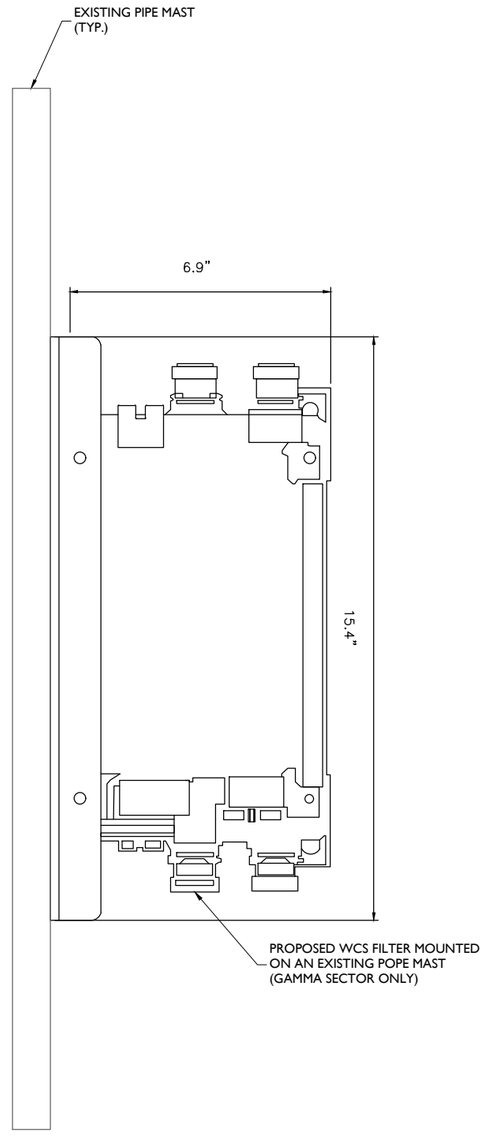


WCS - IMFQ - AMT FILTER DETAILS

NOT TO SCALE

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.



WCS - IMFQ - AMT FILTER MOUNTING DETAIL

NOT TO SCALE

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

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0[illegible]

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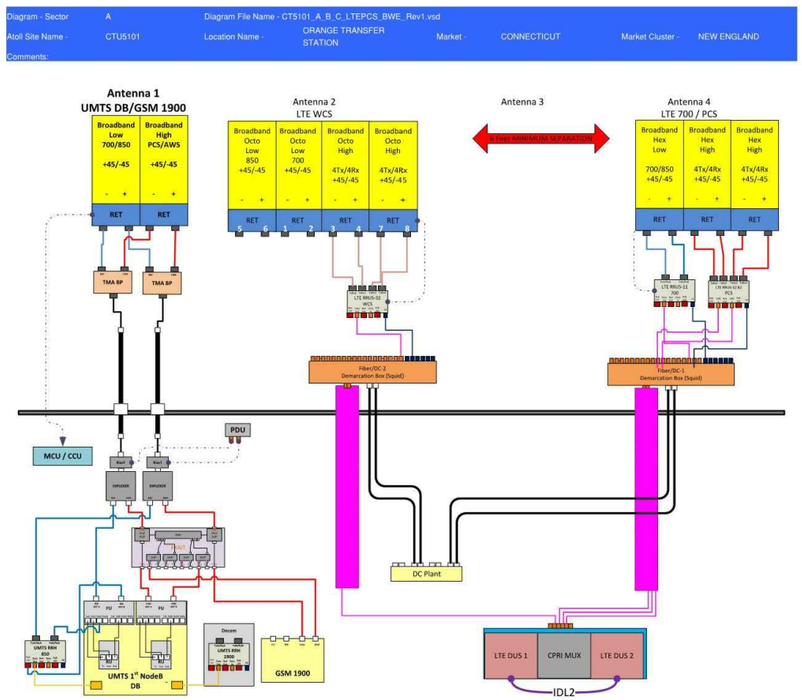
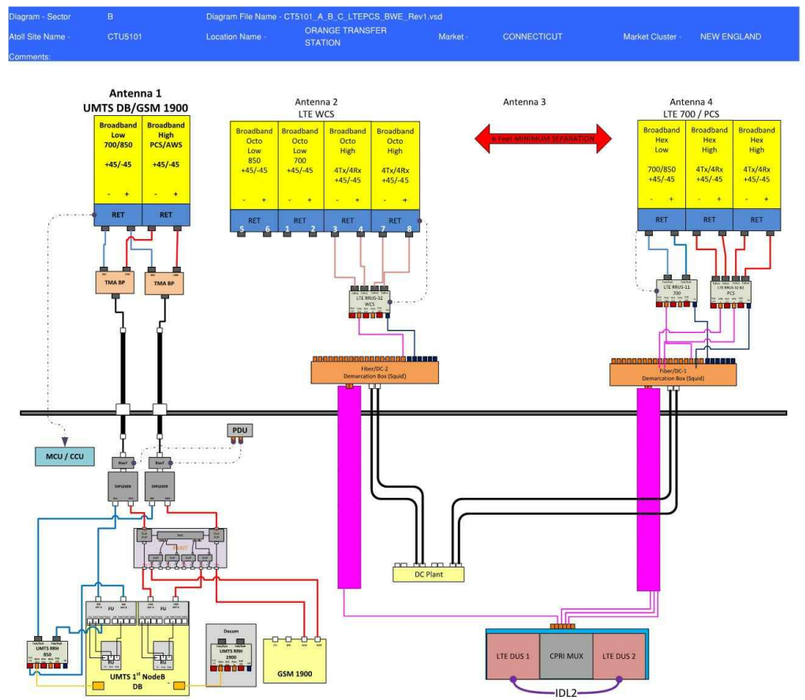
SHEET TITLE :
DETAILS

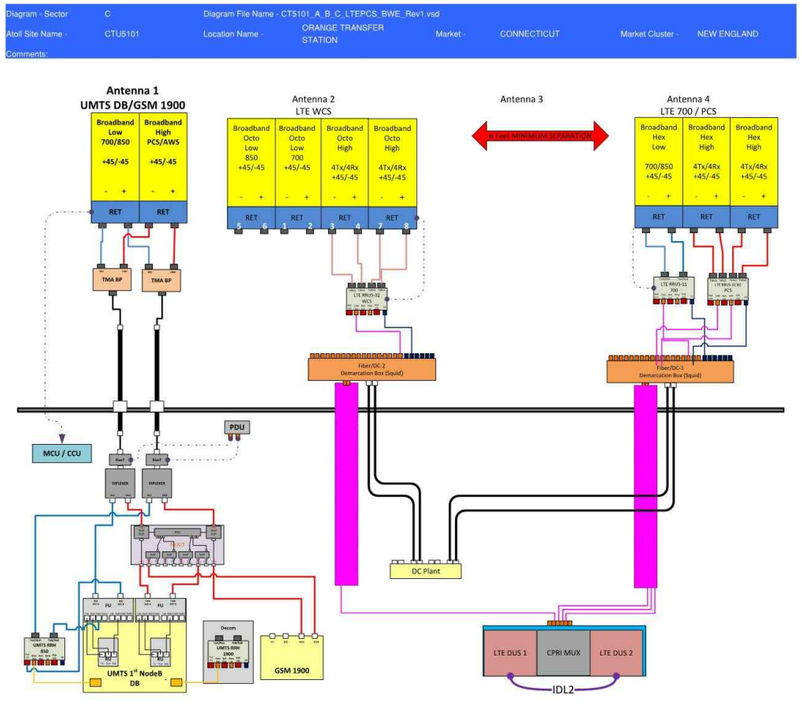
SHEET NUMBER :
A-4



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTU5101_2017-LTE-Multi-Carrier_RRH-Add_om636a_2051A02J00_10071197_16326_04-11-2016_Preliminary-Approved_v1.00"

RF PLUMBING DIAGRAM

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SCALE : AS SHOWN

JOB NUMBER : 16946019A

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STATE OF CONNECTICUT — FRANK E. FAZZEN — 30 — LICENSED PROFESSIONAL ENGINEER

FRANK E. FAZZEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0030

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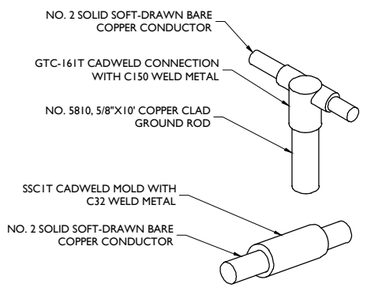
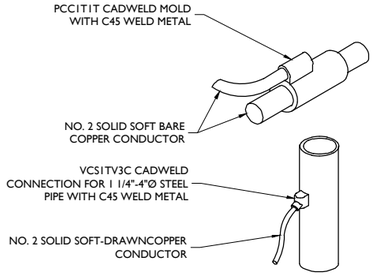
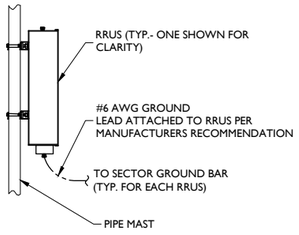
SHEET TITLE : RF PLUMBING DIAGRAMS

SHEET NUMBER : A-5

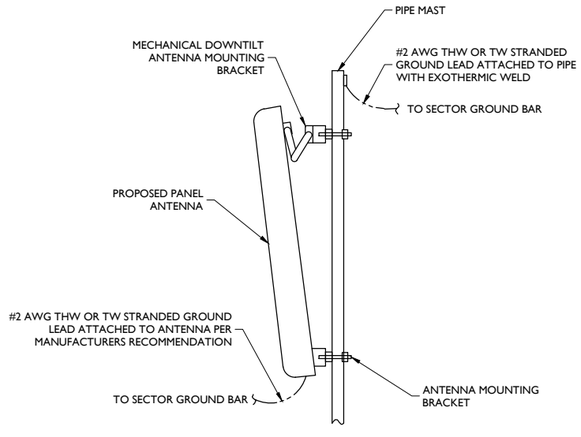




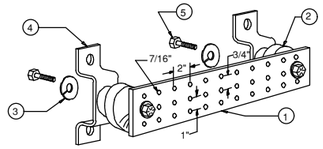
CADWELD DETAILS
NOT TO SCALE



RRH GROUNDING
NOT TO SCALE



ANTENNA GROUNDING
NOT TO SCALE



LEGEND

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

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

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

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

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

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

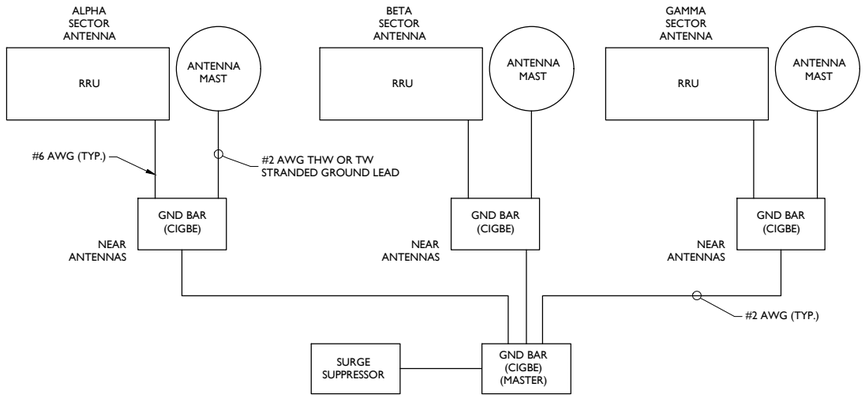
SECTION "P" - SURGE PRODUCERS

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

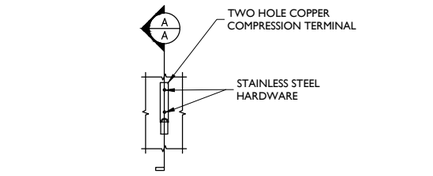
SECTION "A" - SURGE ABSORBERS

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

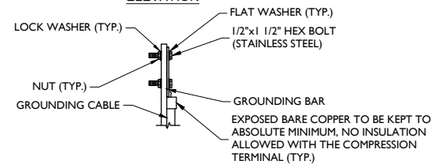
MASTER GROUND BAR
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

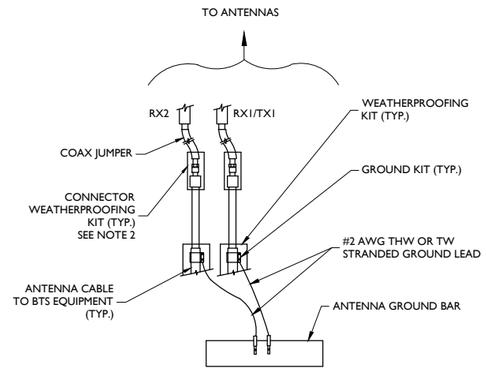


ELEVATION



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

MASER CONSULTING CONNECTICUT
Customer Loyalty *through* Client Satisfaction
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Engineers ■ Planners ■ Surveyors
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85 RANGEWAY ROAD
BUILDING 3, SUITE 102
NORTH BILLERICA, CT 01862-2105
TEL: (774) 369-3613

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

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

SCALE : AS SHOWN
JOB NUMBER : 16946019A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	03/21/17	FOR CONSTRUCTION	RA	FEP
0	01/13/17	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT — FRANK E. PAZDEN — 30 — LICENSED PROFESSIONAL ENGINEER
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0[illegible]

SITE NAME:
ORANGE TRANSFER STATION
FA# 10071197
SITE # CTL05101
26 SOUTH ORANGE CENTER RD.
ORANGE, CT 06477
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

February 14, 2017

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

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL05101
	Carrier Site Name:	Orange Transfer
Station		
Crown Castle Designation:	**Crown Castle BU Number:**	842871
	Crown Castle Site Name:	Orange Transfer Station
	Crown Castle JDE Job Number:	418185
	Crown Castle Work Order Number:	1358474
	Crown Castle Application Number:	376147 Rev. 3
Engineering Firm Designation:	**B+T Group Project Number:**	101557.003.01
Site Data:	**26 South Orange Center Road, Orange, New Haven County, CT** **Latitude *41° 15' 19.98"*, Longitude *-73° 0' 39.2"*** **180 Foot - Monopole Tower**	

Dear Charles McGuirt,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1000232, in accordance with application 376147, revision 3.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 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 were used in this analysis.

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

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

Respectfully submitted by:
B+T Engineering, Inc.

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

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

STATE OF CONNECTICUT
SCOTT S. VANCE
31627
LICENSED PROFESSIONAL ENGINEER

2/14/17

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft. Monopole tower designed by ROHN in August 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 with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
177.0	177.0	3	Andrew	SBNHH-1D65A	2 1	3/4 3/8	--
		3	Cci Antennas	OPA-65R-LCUU-H4			
		1	Commscope	WCS-IMFT-AMT			
		3	Ericsson	RRUS 11			
		3	Ericsson	RRUS 32 B2			
		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
177.0	179.0	**3**	**Kmw Comm.**	**AM-X-CW-14-65-00T-RET**	**--**	**--**	**2**
	177.0	**3**	**Ericsson**	**RRUS-11**			
		3	**Powerwave Tech.**	**7770.00**			
		6	**Powerwave Tech.**	**LGP21401**			
		6	Powerwave Tech.	7020.00	12 1 2 1	1-5/8 1/4 3/4 3/8	1
		3	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Platform Mount [LP 303-1]			
148.0	148.0	3	Ericsson	AIR 21 B2A/B4P	12 1	1-5/8 1-1/4	1
		3	Ericsson	AIR 21 B4A/B2P			
		3	Ericsson	KRY 112 144/1			
		3	Ericsson	RRUS 11 B12			
		1	--	Platform Mount [LP 303-1]			
	146.0	3	Andrew	LNX-6515DS-A1M			
134.0	134.0	3	Alcatel Lucent	800 External Notch Filter	--	--	1
		1	--	Side Arm Mount [SO 102-3]			
	132.0	3	Alcatel Lucent	TME-800MHZ RRH			
	127.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
131.0	131.0	1	--	Platform Mount [LP 602-1]	1 3	5/8 1-1/4	1
	130.0	3	Alcatel Lucent	TD-RRH8x20-25			
		9	Rfs Celwave	ACU-A20-N			
		3	Rfs Celwave	APXVSPP18-C-A20			
		3	Rfs Celwave	APXVTM14-C-120			
115.0	117.0	3	Alcatel Lucent	RRH2X40-AWS	1 18	1-1/4 1-5/8	1
		6	Antel	BXA-171063-12BF			
		3	Antel	BXA-70063/4CF			
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			
		3	Swedcom	SLCP 2x6015			
	115.0	1	--	Platform Mount [LP 1201-1]			
44.0	44.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2	1
		1	--	Side Arm Mount [SO 901-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
180	180	1	Generic	12' Low Profile Platform Mount	--	--
		4	Celwave	PD220		
		12	Swedcom	ALP-9212-N		
168	168	1	Generic	12' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
158	158	1	Generic	12' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
148	148	1	Generic	12' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
138	138	1	Generic	12' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
128	128	1	Generic	12' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate, Rev# 3	376147	CCI Sites
Tower Manufacturer Drawing	Rohn Industries, Inc., Job No. 20501-0701	4705360	CCI Sites
Foundation Mapping	WEI, Project No. 2010-1056	4529422	CCI Sites
Geotech Report	WEI, Project No. 2010-1056	4529423	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 02/07/2017	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.
5) Base plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 170.58	Pole	TP26.25x24x0.188	1	-3.298	1019.440	3.7	Pass
L2	170.58 - 126	Pole	TP36.525x25.058x0.25	2	-14.017	1861.240	32.4	Pass
L3	126 - 82.75	Pole	TP46.357x34.89x0.313	3	-26.500	2935.510	55.6	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.299x0.375	4	-39.773	4233.020	60.0	Pass
L5	40.75 - 0	Pole	TP64.75x53.283x0.438	5	-60.885	5854.040	59.4	Pass
							Summary	
						Pole (L4)	60.0	Pass
						Rating =	60.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	60.6	Pass
1,2	Base Plate	Base	60.6	Pass
1	Base Foundation (Structure)	Base	26.2	Pass
1	Base Foundation (Soil Interaction)	Base	15.9	Pass

Structure Rating (max from all components) =	60.6%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Base plate has the same capacity as their respective splice bolts.

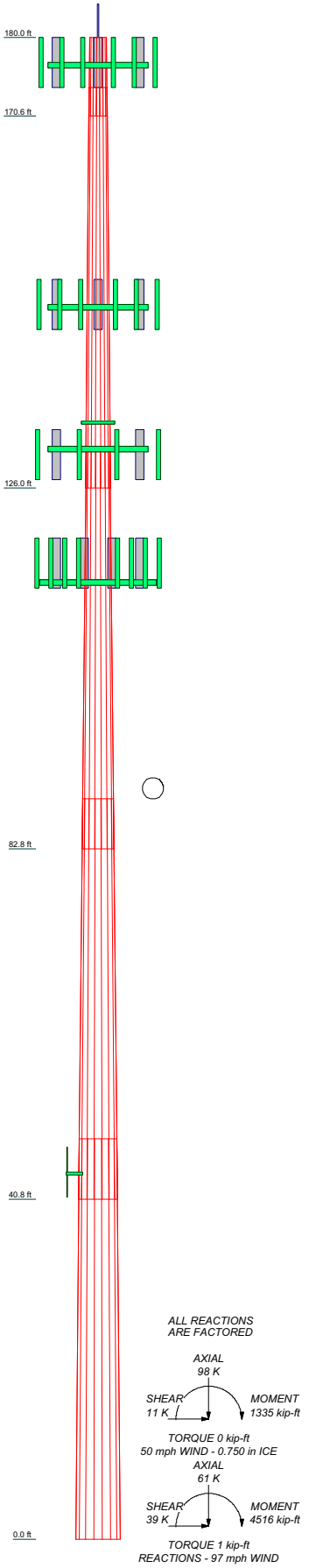
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the final load configurations. 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	9.420	18	0.188	3.420	24.000	26.250		0.5
2	48.000	18	0.250	4.750	25.058	36.525		4.0
3	48.000	18	0.313	6.000	34.890	46.357	A572-65	6.5
4	48.000	18	0.375	7.250	44.299	55.765		9.7
5	48.000	18	0.438		53.283	64.750		13.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 4' (E)	180	KRY 112 144/1 (E)	148
lightning Rod Support (E-per photo)	180	KRY 112 144/1 (E)	148
7770.00 w/ Mount Pipe (E)	177	Platform Mount [LP 303-1] (E)	148
7770.00 w/ Mount Pipe (E)	177	800 EXTERNAL NOTCH FILTER (E)	134
7770.00 w/ Mount Pipe (E)	177	800 EXTERNAL NOTCH FILTER (E)	134
(2) LGP21401 (E)	177	800 EXTERNAL NOTCH FILTER (E)	134
(2) LGP21401 (E)	177	PCS 1900MHz 4x45W-65MHz (E)	134
(2) LGP21401 (E)	177	PCS 1900MHz 4x45W-65MHz (E)	134
(2) 7020.00 (E)	177	PCS 1900MHz 4x45W-65MHz (E)	134
(2) 7020.00 (E)	177	TME-800MHZ RRH (E)	134
(2) 7020.00 (E)	177	TME-800MHZ RRH (E)	134
DC6-48-60-18-8F (E)	177	TME-800MHZ RRH (E)	134
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	177	5' x 2" Pipe Mount (E)	134
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	177	5' x 2" Pipe Mount (E)	134
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	177	5' x 2" Pipe Mount (E)	134
SBNHH-1D65A w/ Mount Pipe (P)	177	Side Arm Mount [SO 102-3] (E)	134
SBNHH-1D65A w/ Mount Pipe (P)	177	APXVSPP18-C-A20 w/ Mount Pipe (E)	131
SBNHH-1D65A w/ Mount Pipe (P)	177	APXVSPP18-C-A20 w/ Mount Pipe (E)	131
RRUS 32 B2 (P)	177	APXVSPP18-C-A20 w/ Mount Pipe (E)	131
RRUS 32 B2 (P)	177	APXVTM14-C-120 w/ Mount Pipe (E)	131
RRUS 32 B2 (P)	177	APXVTM14-C-120 w/ Mount Pipe (E)	131
RRUS 32 B30 (P)	177	APXVTM14-C-120 w/ Mount Pipe (E)	131
RRUS 32 B30 (P)	177	(3) ACU-A20-N (E)	131
RRUS 32 B30 (P)	177	(3) ACU-A20-N (E)	131
DC6-48-60-18-8F (P)	177	(3) ACU-A20-N (E)	131
RRUS 11 (P)	177	TD-RRH8x20-25 (E)	131
RRUS 11 (P)	177	TD-RRH8x20-25 (E)	131
RRUS 11 (P)	177	TD-RRH8x20-25 (E)	131
WCS-IMFT-AMT (P)	177	7' x 2" Pipe Mount (E)	131
5' x 2" Pipe Mount (E-empty)	177	(2) 7' x 2" Pipe Mount (E)	131
5' x 2" Pipe Mount (E-empty)	177	Platform Mount [LP 602-1] (E)	131
5' x 2" Pipe Mount (E-empty)	177	(2) BXA-171063-12BF w/ Mount Pipe (E)	115
6' x 2" Mount Pipe (E-TME support)	177	(2) BXA-171063-12BF w/ Mount Pipe (E)	115
6' x 2" Mount Pipe (E-TME support)	177	(2) BXA-171063-12BF w/ Mount Pipe (E)	115
6' x 2" Mount Pipe (E-TME support)	177	SLCP 2x6015 w/ Mount Pipe (E)	115
Platform Mount [LP 303-1] (E)	177	SLCP 2x6015 w/ Mount Pipe (E)	115
Side Arm Mount [SO 102-3] (E-per photo)	176	SLCP 2x6015 w/ Mount Pipe (E)	115
AIR 21 B2A/B4P w/ Mount Pipe (E)	148	BXA-70063/4CF w/ Mount Pipe (E)	115
AIR 21 B2A/B4P w/ Mount Pipe (E)	148	BXA-70063/4CF w/ Mount Pipe (E)	115
AIR 21 B2A/B4P w/ Mount Pipe (E)	148	BXA-70063/4CF w/ Mount Pipe (E)	115
LNX-6515DS-A1M w/ Mount Pipe (E)	148	RRH2X40-AWS (E)	115
LNX-6515DS-A1M w/ Mount Pipe (E)	148	RRH2X40-AWS (E)	115
LNX-6515DS-A1M w/ Mount Pipe (E)	148	RRH2X40-AWS (E)	115
AIR 21 B4A/B2P w/ Mount Pipe (E)	148	DB-T1-6Z-8AB-0Z (E)	115
AIR 21 B4A/B2P w/ Mount Pipe (E)	148	6' x 2" Mount Pipe (E)	115
AIR 21 B4A/B2P w/ Mount Pipe (E)	148	6' x 2" Mount Pipe (E)	115
RRUS 11 B12 (E)	148	6' x 2" Mount Pipe (E)	115
RRUS 11 B12 (E)	148	Platform Mount [LP 1201-1] (E)	115
RRUS 11 B12 (E)	148	GPS-TMG-HR-26NCM (E)	44
KRY 112 144/1 (E)	148	Side Arm Mount [SO 901-1] (E)	44

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	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 0.000 ft
8. TOWER RATING: 60%

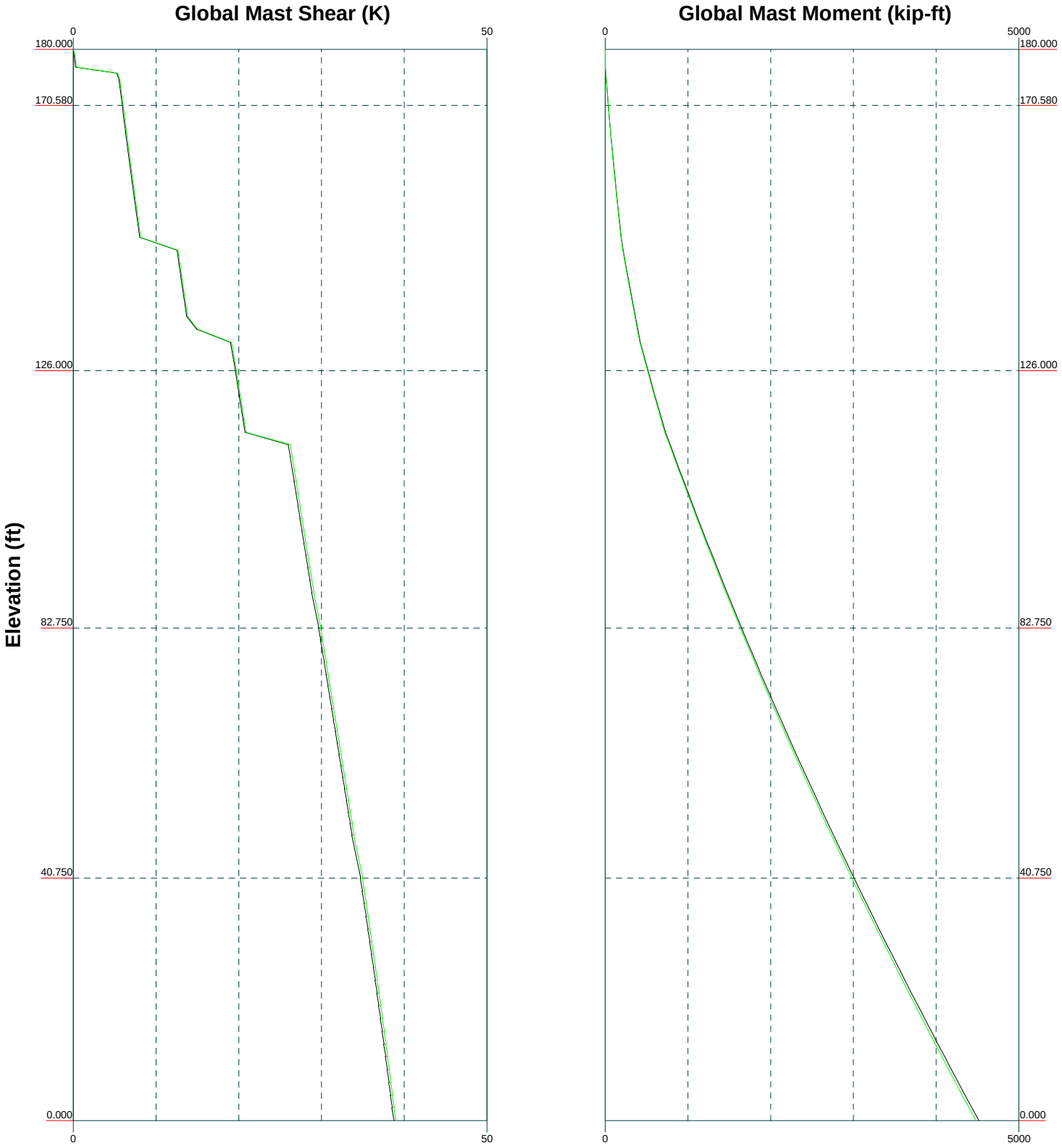
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 101557.003.01 - ORANGE TRANSFER STATION, CT (BU# 84287			
Project:			
Client: Crown Castle	Drawn by: R. Rodrigues	App'd:	
Code: TIA-222-G	Date: 02/10/17	Scale: NTS	
Path:		Dwg No. E-1	

TIA-222-G - 97 mph/50 mph 0.750 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



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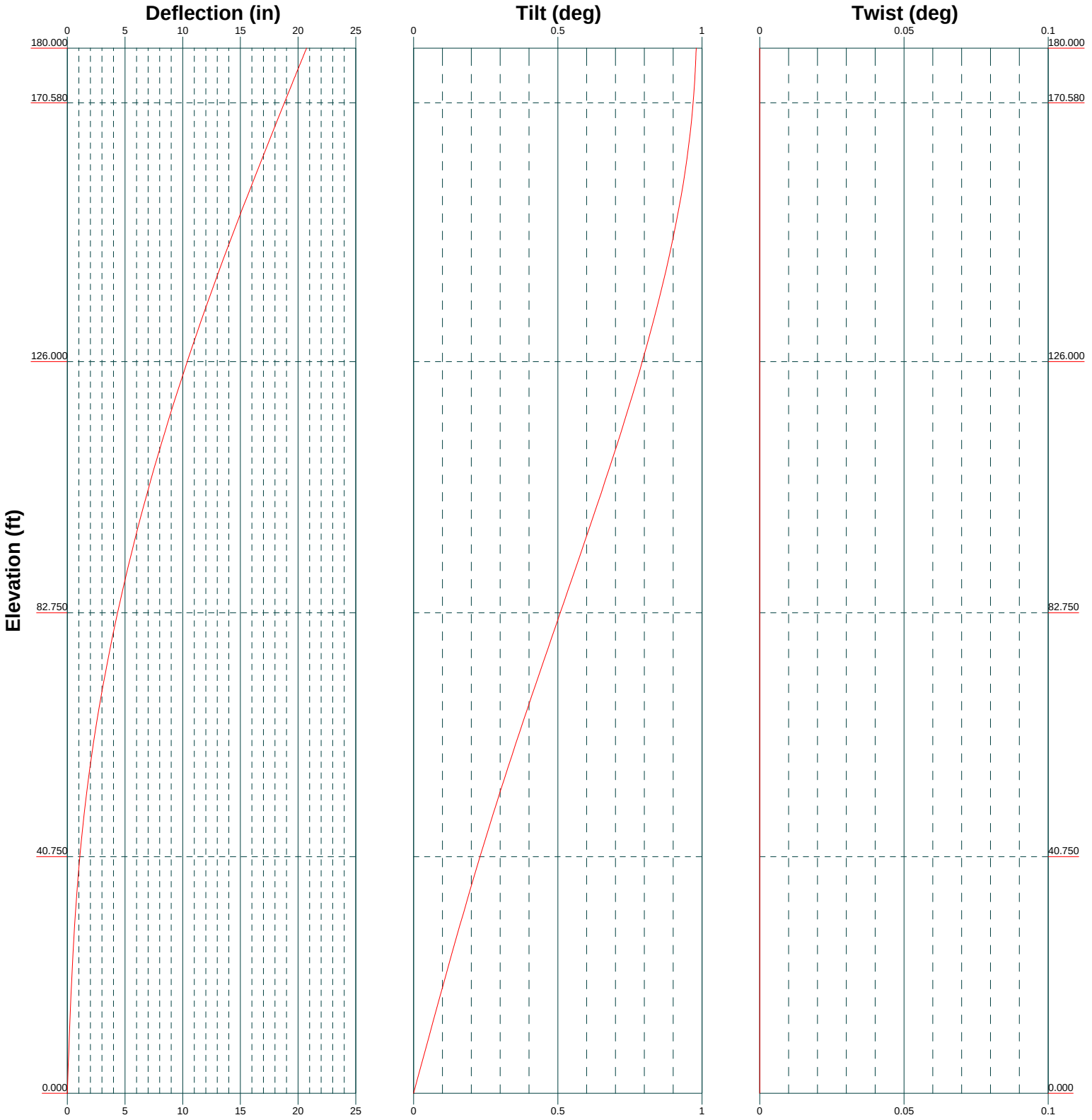
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 101557.003.01 - ORANGE TRANSFER STATION, CT (BU# 84287		
Project:		
Client: Crown Castle	Drawn by: R. Rodrigues	App'd:
Code: TIA-222-G	Date: 02/10/17	Scale: NTS
Path:		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values

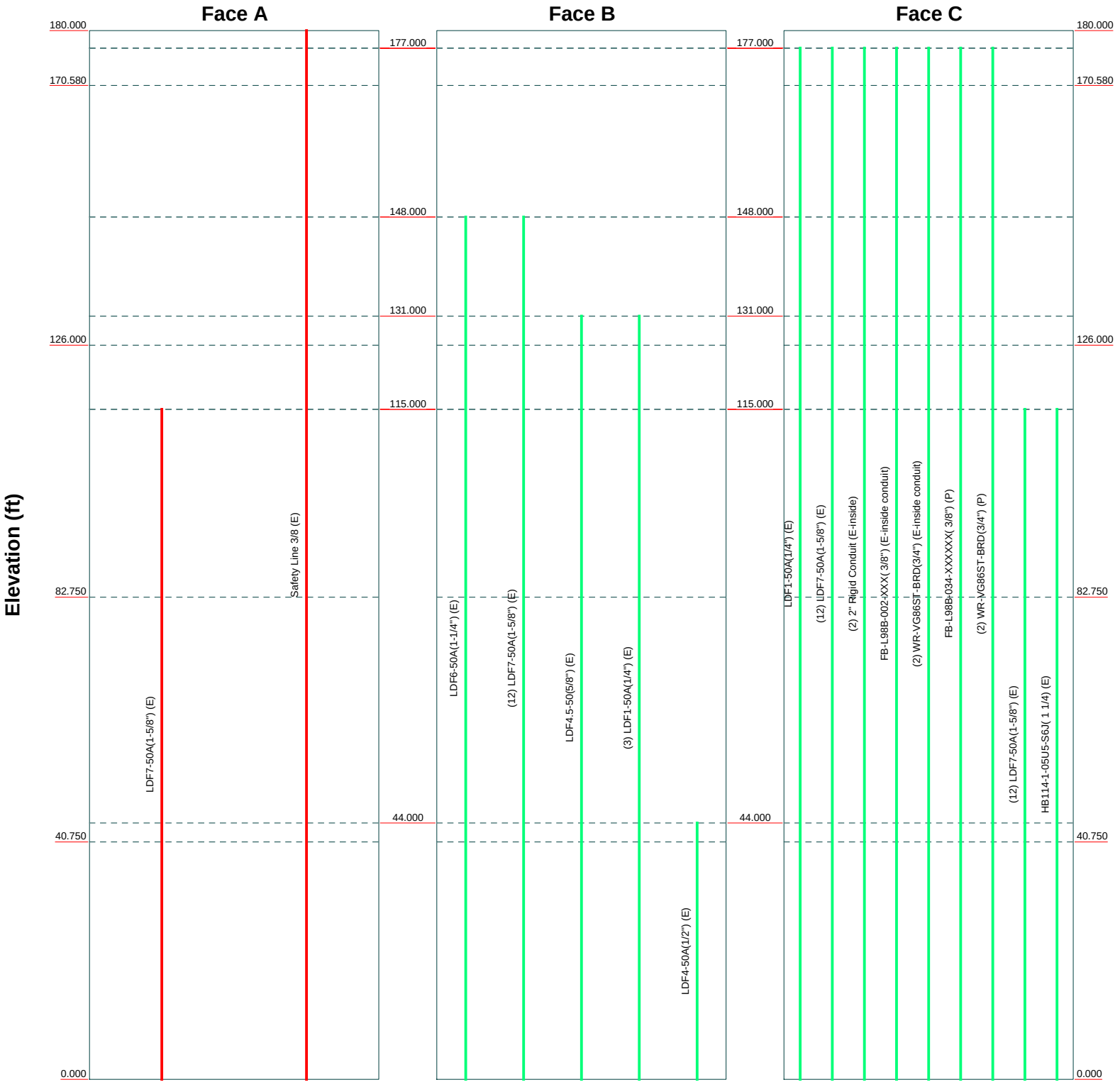


B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***101557.003.01 - ORANGE TRANSFER STATION, CT (BU# 84287***		
Project:			
Client: Crown Castle	Drawn by: R. Rodrigues	App'd:	
Code: TIA-222-G	Date: 02/10/17	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 180'

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



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Job:	***101557.003.01 - ORANGE TRANSFER STATION, CT (BU# 84287***		
Project:			
Client: Crown Castle	Drawn by: R. Rodrigues	App'd:	
Code: TIA-222-G	Date: 02/10/17	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

- Tower is located in New Haven County, Connecticut.
- Basic wind speed of 97 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.000 ft.
- Nominal ice thickness of 0.750 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ [illegible]
√ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-G Bracing Resist. Exemption
Use TIA-222-G Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets

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	180.000-170.580	9.420	3.420	18	24.000	26.250	0.188	0.750	A572-65 (65 ksi)
L2	170.580-126.000	48.000	4.750	18	25.058	36.525	0.250	1.000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	126.000-82.750	48.000	6.000	18	34.890	46.357	0.313	1.250	A572-65 (65 ksi)
L4	82.750-40.750	48.000	7.250	18	44.299	55.765	0.375	1.500	A572-65 (65 ksi)
L5	40.750-0.000	48.000		18	53.283	64.750	0.438	1.750	A572-65 (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	24.370	14.171	1015.221	8.453	12.192	83.269	2031.778	7.087	3.894	20.768
	26.655	15.510	1331.048	9.252	13.335	99.816	2663.848	7.757	4.290	22.88
L2	26.274	19.685	1530.615	8.807	12.730	120.241	3063.244	9.844	3.970	15.881
	37.088	28.784	4785.272	12.878	18.555	257.901	9576.841	14.395	5.988	23.954
L3	36.581	34.297	5180.657	12.275	17.724	292.292	10368.131	17.152	5.591	17.89
	47.072	45.670	12232.851	16.346	23.549	519.456	24481.798	22.840	7.609	24.348
L4	46.437	52.280	12742.983	15.593	22.504	566.261	25502.734	26.145	7.137	19.031
	56.625	65.928	25554.638	19.663	28.329	902.078	51142.902	32.970	9.155	24.412
L5	55.864	73.383	25891.013	18.760	27.068	956.524	51816.094	36.698	8.608	19.675
	65.749	89.306	46666.863	22.831	32.893	1418.748	93395.131	44.661	10.626	24.288

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 180.000-170.580				1	1	1			
L2 170.580-126.000				1	1	1			
L3 126.000-82.750				1	1	1			
L4 82.750-40.750				1	1	1			
L5 40.750-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
LDF7-50A(1-5/8") (E) *R*	A	Surface Ar (CaAa)	115.000 - 0.000	6	6	-0.400 -0.150	1.980		0.001
Safety Line 3/8 (E) *R*	A	Surface Ar (CaAa)	180.000 - 0.000	1	1	0.100 0.110	0.375		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF1-50A(1/4") (E)	C	No	Inside Pole	177.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	177.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
2" Rigid Conduit (E-inside)	C	No	Inside Pole	177.000 - 0.000	2	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
FB-L98B-002-XXX(3/8") (E-inside conduit)	C	No	Inside Pole	177.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG86ST-BRD(3/4") (E-inside conduit)	C	No	Inside Pole	177.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
FB-L98B-034-XXXXXX (3/8") (P)	C	No	Inside Pole	177.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG86ST-BRD(3/4") (P)	C	No	Inside Pole	177.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
R								
LDF6-50A(1-1/4") (E)	B	No	Inside Pole	148.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	148.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
R								
LDF4.5-50(5/8") (E)	B	No	Inside Pole	131.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
LDF1-50A(1/4") (E)	B	No	Inside Pole	131.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
R								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	115.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
HB114-1-05U5-S6J(1 1/4) (E)	C	No	Inside Pole	115.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
R								
LDF4-50A(1/2") (E)	B	No	Inside Pole	44.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
R								

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	180.000-170.580	A	0.000	0.000	0.353	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.115
L2	170.580-126.000	A	0.000	0.000	1.672	0.000	0.010
		B	0.000	0.000	0.000	0.000	0.233
		C	0.000	0.000	0.000	0.000	0.800
L3	126.000-82.750	A	0.000	0.000	39.935	0.000	0.168
		B	0.000	0.000	0.000	0.000	0.468
		C	0.000	0.000	0.000	0.000	1.136
L4	82.750-40.750	A	0.000	0.000	51.471	0.000	0.216
		B	0.000	0.000	0.000	0.000	0.455
		C	0.000	0.000	0.000	0.000	1.222
L5	40.750-0.000	A	0.000	0.000	49.939	0.000	0.209
		B	0.000	0.000	0.000	0.000	0.447
		C	0.000	0.000	0.000	0.000	1.185

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	180.000-170.580	A	1.773	0.000	0.000	3.693	0.000	0.046
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.115
L2	170.580-126.000	A	1.742	0.000	0.000	17.476	0.000	0.217
		B		0.000	0.000	0.000	0.000	0.233
		C		0.000	0.000	0.000	0.000	0.800
L3	126.000-82.750	A	1.682	0.000	0.000	78.625	0.000	1.104
		B		0.000	0.000	0.000	0.000	0.468
		C		0.000	0.000	0.000	0.000	1.136
L4	82.750-40.750	A	1.596	0.000	0.000	95.734	0.000	1.322
		B		0.000	0.000	0.000	0.000	0.455
		C		0.000	0.000	0.000	0.000	1.222
L5	40.750-0.000	A	1.431	0.000	0.000	91.312	0.000	1.218
		B		0.000	0.000	0.000	0.000	0.447
		C		0.000	0.000	0.000	0.000	1.185

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.000-170.580	-0.041	-0.037	-0.327	-0.301
L2	170.580-126.000	-0.041	-0.037	-0.342	-0.315
L3	126.000-82.750	-1.148	0.029	-1.545	-0.154
L4	82.750-40.750	-1.449	0.045	-1.901	-0.128
L5	40.750-0.000	-1.491	0.046	-2.010	-0.128

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	21	Safety Line 3/8	170.58 - 180.00	1.0000	1.0000
L2	17	LDF7-50A(1-5/8")	126.00 - 115.00	1.0000	1.0000
L2	21	Safety Line 3/8	126.00 - 170.58	1.0000	1.0000
L3	17	LDF7-50A(1-5/8")	82.75 - 115.00	1.0000	1.0000
L3	21	Safety Line 3/8	82.75 - 126.00	1.0000	1.0000
L4	17	LDF7-50A(1-5/8")	40.75 - 82.75	1.0000	1.0000
L4	21	Safety Line 3/8	40.75 - 82.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 4'	A	From Leg	3.000	0.000	180.000	No Ice	0.250	0.250	0.031
(E)			0.000			1/2" Ice	0.664	0.664	0.034
			2.000			1" Ice	0.973	0.973	0.039
lightning Rod Support	A	From Leg	3.000	0.000	180.000	No Ice	2.042	0.007	0.023
(E-per photo)			0.000			1/2" Ice	2.607	0.028	0.033
			0.000			1" Ice	3.180	0.059	0.050
R									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	177.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
(2) LGP21401	A	From Leg	4.000	0.000	177.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			0.000			1" Ice	1.381	0.348	0.030
(2) LGP21401	B	From Leg	4.000	0.000	177.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			0.000			1" Ice	1.381	0.348	0.030
(2) LGP21401	C	From Leg	4.000	0.000	177.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			0.000			1" Ice	1.381	0.348	0.030
(2) 7020.00	A	From Leg	4.000	0.000	177.000	No Ice	0.102	0.175	0.002
(E)			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
(2) 7020.00	B	From Leg	4.000	0.000	177.000	No Ice	0.102	0.175	0.002
(E)			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
(2) 7020.00	C	From Leg	4.000	0.000	177.000	No Ice	0.102	0.175	0.002
(E)			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
DC6-48-60-18-8F	A	From Leg	4.000	0.000	177.000	No Ice	0.917	0.917	0.019
(E)			0.000			1/2" Ice	1.458	1.458	0.037

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	1.643	1.643	0.057
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	6.175	4.548	0.075
			0.000			1/2" Ice	6.575	5.158	0.128
(P)			0.000			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	6.175	4.548	0.075
			0.000			1/2" Ice	6.575	5.158	0.128
(P)			0.000			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Leg	4.000	0.000	177.000	No Ice	6.175	4.548	0.075
			0.000			1/2" Ice	6.575	5.158	0.128
(P)			0.000			1" Ice	6.982	5.779	0.187
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	5.954	5.190	0.061
			0.000			1/2" Ice	6.390	5.961	0.114
(P)			0.000			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	5.954	5.190	0.061
			0.000			1/2" Ice	6.390	5.961	0.114
(P)			0.000			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000	0.000	177.000	No Ice	5.954	5.190	0.061
			0.000			1/2" Ice	6.390	5.961	0.114
(P)			0.000			1" Ice	6.820	6.658	0.174
RRUS 32 B2	A	From Leg	4.000	0.000	177.000	No Ice	2.731	1.668	0.053
(P)			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	B	From Leg	4.000	0.000	177.000	No Ice	2.731	1.668	0.053
(P)			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	C	From Leg	4.000	0.000	177.000	No Ice	2.731	1.668	0.053
(P)			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
RRUS 32 B30	A	From Leg	4.000	0.000	177.000	No Ice	2.692	1.573	0.060
(P)			0.000			1/2" Ice	2.912	1.756	0.080
			0.000			1" Ice	3.138	1.945	0.104
RRUS 32 B30	B	From Leg	4.000	0.000	177.000	No Ice	2.692	1.573	0.060
(P)			0.000			1/2" Ice	2.912	1.756	0.080
			0.000			1" Ice	3.138	1.945	0.104
RRUS 32 B30	C	From Leg	4.000	0.000	177.000	No Ice	2.692	1.573	0.060
(P)			0.000			1/2" Ice	2.912	1.756	0.080
			0.000			1" Ice	3.138	1.945	0.104
DC6-48-60-18-8F	A	From Leg	4.000	0.000	177.000	No Ice	0.917	0.917	0.019
(P)			0.000			1/2" Ice	1.458	1.458	0.037
			0.000			1" Ice	1.643	1.643	0.057
RRUS 11	A	From Leg	4.000	0.000	177.000	No Ice	2.784	1.187	0.048
(P)			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
RRUS 11	B	From Leg	4.000	0.000	177.000	No Ice	2.784	1.187	0.048
(P)			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
RRUS 11	C	From Leg	4.000	0.000	177.000	No Ice	2.784	1.187	0.048
(P)			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
WCS-IMFT-AMT	C	From Leg	4.000	0.000	177.000	No Ice	0.644	0.467	0.019
(P)			0.000			1/2" Ice	0.748	0.560	0.025
			0.000			1" Ice	0.860	0.661	0.033
5' x 2" Pipe Mount (E-empty)	A	From Leg	4.000	0.000	177.000	No Ice	1.000	1.000	0.029
			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E-empty)	B	From Leg	4.000	0.000	177.000	No Ice	1.000	1.000	0.029
			0.000			1/2" Ice	1.393	1.393	0.037

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E-empty)	C	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	1.000 1.393 1.703	1.000 1.393 1.703	0.029 0.037 0.048
6' x 2" Mount Pipe (E-TME support)	A	From Leg	2.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe (E-TME support)	B	From Leg	2.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe (E-TME support)	C	From Leg	2.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
Platform Mount [LP 303-1] (E)	C	None		0.000	177.000	No Ice 1/2" Ice 1" Ice	14.660 18.870 23.080	14.660 18.870 23.080	1.250 1.481 1.713
Side Arm Mount [SO 102-3] (E-per photo)	C	None		0.000	176.000	No Ice 1/2" Ice 1" Ice	3.000 3.480 3.960	3.000 3.480 3.960	0.081 0.111 0.141
R									
AIR 21 B2A/B4P w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B2A/B4P w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B2A/B4P w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
LNX-6515DS-A1M w/ Mount Pipe (E)	A	From Leg	4.000 0.000 -2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
LNX-6515DS-A1M w/ Mount Pipe (E)	B	From Leg	4.000 0.000 -2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
LNX-6515DS-A1M w/ Mount Pipe (E)	C	From Leg	4.000 0.000 -2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
AIR 21 B4A/B2P w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B4A/B2P w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B4A/B2P w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
RRUS 11 B12 (E)	A	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.833 3.043 3.259	1.182 1.330 1.485	0.051 0.072 0.095
RRUS 11 B12 (E)	B	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.833 3.043 3.259	1.182 1.330 1.485	0.051 0.072 0.095
RRUS 11 B12 (E)	C	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.833 3.043 3.259	1.182 1.330 1.485	0.051 0.072 0.095
KRY 112 144/1	A	From Leg	4.000	0.000	148.000	No Ice	0.350	0.175	0.011

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
KRY 112 144/1	B	From Leg	4.000	0.000	148.000	No Ice	0.350	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
KRY 112 144/1	C	From Leg	4.000	0.000	148.000	No Ice	0.350	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
Platform Mount [LP 303-1]	C	None		0.000	148.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
R									
800 EXTERNAL NOTCH FILTER	A	From Leg	1.000	0.000	134.000	No Ice	0.660	0.321	0.011
			0.000			1/2" Ice	0.763	0.398	0.017
(E)			0.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH FILTER	B	From Leg	1.000	0.000	134.000	No Ice	0.660	0.321	0.011
			0.000			1/2" Ice	0.763	0.398	0.017
(E)			0.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH FILTER	C	From Leg	1.000	0.000	134.000	No Ice	0.660	0.321	0.011
			0.000			1/2" Ice	0.763	0.398	0.017
(E)			0.000			1" Ice	0.873	0.483	0.024
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.000	0.000	134.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
(E)			-7.000			1" Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.000	0.000	134.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
(E)			-7.000			1" Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.000	0.000	134.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
(E)			-7.000			1" Ice	2.739	2.651	0.110
TME-800MHZ RRH	A	From Leg	1.000	0.000	134.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			-2.000			1" Ice	2.512	2.127	0.098
TME-800MHZ RRH	B	From Leg	1.000	0.000	134.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			-2.000			1" Ice	2.512	2.127	0.098
TME-800MHZ RRH	C	From Leg	1.000	0.000	134.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			-2.000			1" Ice	2.512	2.127	0.098
5' x 2" Pipe Mount	A	From Leg	1.000	0.000	134.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount	A	From Leg	1.000	0.000	134.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount	C	From Leg	1.000	0.000	134.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
Side Arm Mount [SO 102-3]	C	None		0.000	134.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
R									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	131.000	No Ice	8.262	6.946	0.083
			0.000			1/2" Ice	8.822	8.127	0.151
(E)			-1.000			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	131.000	No Ice	8.262	6.946	0.083
			0.000			1/2" Ice	8.822	8.127	0.151

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
(E)			-1.000			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	131.000	No Ice	8.262	6.946	0.083
Mount Pipe			0.000			1/2" Ice	8.822	8.127	0.151
(E)			-1.000			1" Ice	9.346	9.021	0.227
APXVTM14-C-120 w/	A	From Leg	4.000	0.000	131.000	No Ice	6.580	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.031	5.754	0.131
(E)			-1.000			1" Ice	7.473	6.472	0.193
APXVTM14-C-120 w/	B	From Leg	4.000	0.000	131.000	No Ice	6.580	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.031	5.754	0.131
(E)			-1.000			1" Ice	7.473	6.472	0.193
APXVTM14-C-120 w/	C	From Leg	4.000	0.000	131.000	No Ice	6.580	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.031	5.754	0.131
(E)			-1.000			1" Ice	7.473	6.472	0.193
(3) ACU-A20-N	A	From Leg	4.000	0.000	131.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			-1.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	B	From Leg	4.000	0.000	131.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			-1.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	C	From Leg	4.000	0.000	131.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			-1.000			1" Ice	0.148	0.215	0.004
TD-RRH8x20-25	A	From Leg	4.000	0.000	131.000	No Ice	4.045	1.535	0.070
(E)			0.000			1/2" Ice	4.298	1.714	0.097
			-1.000			1" Ice	4.557	1.901	0.128
TD-RRH8x20-25	B	From Leg	4.000	0.000	131.000	No Ice	4.045	1.535	0.070
(E)			0.000			1/2" Ice	4.298	1.714	0.097
			-1.000			1" Ice	4.557	1.901	0.128
TD-RRH8x20-25	C	From Leg	4.000	0.000	131.000	No Ice	4.045	1.535	0.070
(E)			0.000			1/2" Ice	4.298	1.714	0.097
			-1.000			1" Ice	4.557	1.901	0.128
7' x 2" Pipe Mount	A	From Leg	4.000	0.000	131.000	No Ice	1.663	1.663	0.026
(E)			0.000			1/2" Ice	2.391	2.391	0.038
			0.000			1" Ice	2.825	2.825	0.055
(2) 7' x 2" Pipe Mount	B	From Leg	4.000	0.000	131.000	No Ice	1.663	1.663	0.026
(E)			0.000			1/2" Ice	2.391	2.391	0.038
			0.000			1" Ice	2.825	2.825	0.055
Platform Mount [LP 602-1]	C	None		0.000	131.000	No Ice	32.030	32.030	1.343
(E)						1/2" Ice	38.710	38.710	1.800
						1" Ice	45.390	45.390	2.257
R									
(2) BXA-171063-12BF w/	A	From Leg	4.000	0.000	115.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.086
(E)			2.000			1" Ice	6.036	7.261	0.139
(2) BXA-171063-12BF w/	B	From Leg	4.000	0.000	115.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.086
(E)			2.000			1" Ice	6.036	7.261	0.139
(2) BXA-171063-12BF w/	C	From Leg	4.000	0.000	115.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.086
(E)			2.000			1" Ice	6.036	7.261	0.139
SLCP 2x6015 w/ Mount Pipe	A	From Leg	4.000	0.000	115.000	No Ice	10.219	9.996	0.057
(E)			0.000			1/2" Ice	10.817	11.245	0.147
			2.000			1" Ice	11.389	12.259	0.246
SLCP 2x6015 w/ Mount Pipe	B	From Leg	4.000	0.000	115.000	No Ice	10.219	9.996	0.057
(E)			0.000			1/2" Ice	10.817	11.245	0.147
			2.000			1" Ice	11.389	12.259	0.246
SLCP 2x6015 w/ Mount Pipe	C	From Leg	4.000	0.000	115.000	No Ice	10.219	9.996	0.057

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000				1/2" Ice	10.817	11.245	0.147
			2.000				1" Ice	11.389	12.259	0.246
BXA-70063/4CF w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	115.000	No Ice	4.945	3.616	0.028
			0.000				1/2" Ice	5.324	4.217	0.070
(E)			2.000				1" Ice	5.712	4.834	0.118
BXA-70063/4CF w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	115.000	No Ice	4.945	3.616	0.028
			0.000				1/2" Ice	5.324	4.217	0.070
(E)			2.000				1" Ice	5.712	4.834	0.118
BXA-70063/4CF w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	115.000	No Ice	4.945	3.616	0.028
			0.000				1/2" Ice	5.324	4.217	0.070
(E)			2.000				1" Ice	5.712	4.834	0.118
RRH2X40-AWS	A	From Leg	4.000	0.000	0.000	115.000	No Ice	2.161	1.420	0.044
(E)			0.000				1/2" Ice	2.360	1.590	0.061
			2.000				1" Ice	2.565	1.768	0.082
RRH2X40-AWS	B	From Leg	4.000	0.000	0.000	115.000	No Ice	2.161	1.420	0.044
(E)			0.000				1/2" Ice	2.360	1.590	0.061
			2.000				1" Ice	2.565	1.768	0.082
RRH2X40-AWS	C	From Leg	4.000	0.000	0.000	115.000	No Ice	2.161	1.420	0.044
(E)			0.000				1/2" Ice	2.360	1.590	0.061
			2.000				1" Ice	2.565	1.768	0.082
DB-T1-6Z-8AB-0Z	A	From Leg	3.000	0.000	0.000	115.000	No Ice	4.800	2.000	0.044
(E)			0.000				1/2" Ice	5.070	2.193	0.080
			2.000				1" Ice	5.348	2.393	0.120
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	0.000	115.000	No Ice	1.425	1.425	0.022
(E)			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	0.000	115.000	No Ice	1.425	1.425	0.022
(E)			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	0.000	115.000	No Ice	1.425	1.425	0.022
(E)			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
Platform Mount [LP 1201-1]	C	None			0.000	115.000	No Ice	23.100	23.100	2.100
(E)							1/2" Ice	26.800	26.800	2.500
							1" Ice	30.500	30.500	2.900
R										
GPS-TMG-HR-26NCM	C	From Leg	2.000	0.000	0.000	44.000	No Ice	0.133	0.133	0.001
(E)			0.000				1/2" Ice	0.183	0.183	0.002
			0.000				1" Ice	0.239	0.239	0.005
Side Arm Mount [SO 901-1]	C	From Leg	1.000	0.000	0.000	44.000	No Ice	0.500	0.880	0.105
(E)			0.000				1/2" Ice	0.680	1.130	0.110
			0.000				1" Ice	0.860	1.380	0.115
R										

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 170.58	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-8.687	0.259	1.498
			Max. Mx	20	-3.312	16.783	0.390
			Max. My	2	-3.298	0.082	17.814
			Max. Vy	20	-5.596	16.783	0.390
			Max. Vx	2	-5.712	0.082	17.814
			Max. Torque	20			-0.462
L2	170.58 - 126	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.798	-0.217	2.091

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-14.038	-419.098	0.732
			Max. My	2	-14.017	-0.250	425.385
			Max. Vy	20	-19.017	418.889	0.395
			Max. Vx	2	-19.139	-0.250	425.385
			Max. Torque	22			-0.782
L3	126 - 82.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.946	1.643	3.281
			Max. Mx	20	-26.659	1457.392	0.502
			Max. My	2	-26.636	-0.090	1472.339
			Max. Vy	20	-28.861	1457.392	0.502
			Max. Vx	2	-29.103	-0.090	1472.339
			Max. Torque	10			1.115
L4	82.75 - 40.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-72.667	4.300	3.415
			Max. Mx	20	-40.114	2734.386	0.362
			Max. My	2	-40.102	0.287	2758.617
			Max. Vy	20	-33.718	2734.386	0.362
			Max. Vx	2	-33.956	0.287	2758.617
			Max. Torque	10			1.113
L5	40.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-100.430	8.356	3.322
			Max. Mx	20	-61.451	4482.376	0.280
			Max. My	2	-61.450	1.533	4516.961
			Max. Vy	20	-38.759	4482.376	0.280
			Max. Vx	2	-38.998	1.533	4516.961
			Max. Torque	10			0.987

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	100.430	0.001	11.420
	Max. H_x	20	61.471	38.727	0.004
	Max. H_z	2	61.471	0.004	38.967
	Max. M_x	2	4516.961	0.004	38.967
	Max. M_z	8	4478.643	-38.727	-0.004
	Max. Torsion	10	0.986	-33.540	-19.486
	Min. Vert	7	46.103	-33.537	19.480
	Min. H_x	8	61.471	-38.727	-0.004
	Min. H_z	14	61.471	-0.004	-38.967
	Min. M_x	14	-4515.720	-0.004	-38.967
	Min. M_z	20	-4482.376	38.727	0.004
	Min. Torsion	22	-0.983	33.540	19.486

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	51.225	0.000	0.000	-0.478	1.518	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	61.471	-0.004	-38.967	-4516.961	1.533	0.370

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
0.9 Dead+1.6 Wind 0 deg - No Ice	46.103	-0.004	-38.967	-4477.380	1.062	0.368
1.2 Dead+1.6 Wind 30 deg - No Ice	61.471	19.361	-33.744	-3912.081	-2238.657	-0.140
0.9 Dead+1.6 Wind 30 deg - No Ice	46.103	19.361	-33.744	-3877.769	-2219.591	-0.138
1.2 Dead+1.6 Wind 60 deg - No Ice	61.471	33.537	-19.480	-2259.115	-3878.530	-0.614
0.9 Dead+1.6 Wind 60 deg - No Ice	46.103	33.537	-19.480	-2239.232	-3845.164	-0.608
1.2 Dead+1.6 Wind 90 deg - No Ice	61.471	38.727	0.004	-0.956	-4478.643	-0.924
0.9 Dead+1.6 Wind 90 deg - No Ice	46.103	38.727	0.004	-0.785	-4440.051	-0.917
1.2 Dead+1.6 Wind 120 deg - No Ice	61.471	33.540	19.486	2257.295	-3878.192	-0.986
0.9 Dead+1.6 Wind 120 deg - No Ice	46.103	33.540	19.486	2237.751	-3844.832	-0.979
1.2 Dead+1.6 Wind 150 deg - No Ice	61.471	19.367	33.748	3910.505	-2238.070	-0.783
0.9 Dead+1.6 Wind 150 deg - No Ice	46.103	19.367	33.748	3876.530	-2219.016	-0.779
1.2 Dead+1.6 Wind 180 deg - No Ice	61.471	0.004	38.967	4515.720	2.209	-0.369
0.9 Dead+1.6 Wind 180 deg - No Ice	46.103	0.004	38.967	4476.469	1.726	-0.368
1.2 Dead+1.6 Wind 210 deg - No Ice	61.471	-19.361	33.744	3910.837	2242.395	0.143
0.9 Dead+1.6 Wind 210 deg - No Ice	46.103	-19.361	33.744	3876.856	2222.376	0.141
1.2 Dead+1.6 Wind 240 deg - No Ice	61.471	-33.537	19.480	2257.875	3882.264	0.617
0.9 Dead+1.6 Wind 240 deg - No Ice	46.103	-33.537	19.480	2238.321	3847.945	0.611
1.2 Dead+1.6 Wind 270 deg - No Ice	61.471	-38.727	-0.004	-0.280	4482.376	0.924
0.9 Dead+1.6 Wind 270 deg - No Ice	46.103	-38.727	-0.004	-0.122	4442.832	0.917
1.2 Dead+1.6 Wind 300 deg - No Ice	61.471	-33.540	-19.486	-2258.527	3881.930	0.983
0.9 Dead+1.6 Wind 300 deg - No Ice	46.103	-33.540	-19.486	-2238.655	3847.617	0.976
1.2 Dead+1.6 Wind 330 deg - No Ice	61.471	-19.367	-33.748	-3911.741	2241.813	0.780
0.9 Dead+1.6 Wind 330 deg - No Ice	46.103	-19.367	-33.748	-3877.436	2221.804	0.776
1.2 Dead+1.0 Ice+1.0 Temp	100.430	-0.000	-0.000	-3.322	8.356	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	100.430	-0.001	-11.420	-1335.875	8.576	0.137
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	100.430	5.679	-9.889	-1157.397	-652.575	-0.051
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	100.430	9.837	-5.709	-669.730	-1136.559	-0.225
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	100.430	11.359	0.001	-3.542	-1313.689	-0.339
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	100.430	9.838	5.711	662.660	-1136.504	-0.362
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	100.430	5.681	9.891	1150.367	-652.481	-0.288
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	100.430	0.001	11.420	1328.899	8.685	-0.137

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
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	100.430	-5.679	9.889	1150.420	669.836	0.051
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	100.430	-9.837	5.709	662.753	1153.817	0.226
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	100.430	-11.359	-0.001	-3.433	1330.947	0.340
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	100.430	-9.838	-5.711	-669.634	1153.763	0.362
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	100.430	-5.681	-9.891	-1157.341	669.742	0.288
Dead+Wind 0 deg - Service	51.225	-0.001	-8.337	-961.963	1.480	0.079
Dead+Wind 30 deg - Service	51.225	4.142	-7.220	-833.189	-475.417	-0.030
Dead+Wind 60 deg - Service	51.225	7.176	-4.168	-481.300	-824.510	-0.132
Dead+Wind 90 deg - Service	51.225	8.286	0.001	-0.584	-952.261	-0.198
Dead+Wind 120 deg - Service	51.225	7.176	4.169	480.151	-824.438	-0.211
Dead+Wind 150 deg - Service	51.225	4.144	7.221	832.092	-475.293	-0.168
Dead+Wind 180 deg - Service	51.225	0.001	8.337	960.937	1.623	-0.079
Dead+Wind 210 deg - Service	51.225	-4.142	7.220	832.163	478.519	0.030
Dead+Wind 240 deg - Service	51.225	-7.176	4.168	480.274	827.612	0.132
Dead+Wind 270 deg - Service	51.225	-8.286	-0.001	-0.441	955.363	0.198
Dead+Wind 300 deg - Service	51.225	-7.176	-4.169	-481.176	827.541	0.211
Dead+Wind 330 deg - Service	51.225	-4.144	-7.221	-833.118	478.395	0.168

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-51.225	0.000	0.000	51.225	0.000	0.000%
2	-0.004	-61.471	-38.967	0.004	61.471	38.967	0.000%
3	-0.004	-46.103	-38.967	0.004	46.103	38.967	0.000%
4	19.361	-61.471	-33.744	-19.361	61.471	33.744	0.000%
5	19.361	-46.103	-33.744	-19.361	46.103	33.744	0.000%
6	33.537	-61.471	-19.480	-33.537	61.471	19.480	0.000%
7	33.537	-46.103	-19.480	-33.537	46.103	19.480	0.000%
8	38.727	-61.471	0.004	-38.727	61.471	-0.004	0.000%
9	38.727	-46.103	0.004	-38.727	46.103	-0.004	0.000%
10	33.540	-61.471	19.486	-33.540	61.471	-19.486	0.000%
11	33.540	-46.103	19.486	-33.540	46.103	-19.486	0.000%
12	19.367	-61.471	33.748	-19.367	61.471	-33.748	0.000%
13	19.367	-46.103	33.748	-19.367	46.103	-33.748	0.000%
14	0.004	-61.471	38.967	-0.004	61.471	-38.967	0.000%
15	0.004	-46.103	38.967	-0.004	46.103	-38.967	0.000%
16	-19.361	-61.471	33.744	19.361	61.471	-33.744	0.000%
17	-19.361	-46.103	33.744	19.361	46.103	-33.744	0.000%
18	-33.537	-61.471	19.480	33.537	61.471	-19.480	0.000%
19	-33.537	-46.103	19.480	33.537	46.103	-19.480	0.000%
20	-38.727	-61.471	-0.004	38.727	61.471	0.004	0.000%
21	-38.727	-46.103	-0.004	38.727	46.103	0.004	0.000%
22	-33.540	-61.471	-19.486	33.540	61.471	19.486	0.000%
23	-33.540	-46.103	-19.486	33.540	46.103	19.486	0.000%
24	-19.367	-61.471	-33.748	19.367	61.471	33.748	0.000%
25	-19.367	-46.103	-33.748	19.367	46.103	33.748	0.000%
26	0.000	-100.430	0.000	0.000	100.430	0.000	0.000%
27	-0.001	-100.430	-11.420	0.001	100.430	11.420	0.000%
28	5.679	-100.430	-9.889	-5.679	100.430	9.889	0.000%
29	9.837	-100.430	-5.709	-9.837	100.430	5.709	0.000%
30	11.359	-100.430	0.001	-11.359	100.430	-0.001	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
31	9.838	-100.430	5.711	-9.838	100.430	-5.711	0.000%
32	5.681	-100.430	9.891	-5.681	100.430	-9.891	0.000%
33	0.001	-100.430	11.420	-0.001	100.430	-11.420	0.000%
34	-5.679	-100.430	9.889	5.679	100.430	-9.889	0.000%
35	-9.837	-100.430	5.709	9.837	100.430	-5.709	0.000%
36	-11.359	-100.430	-0.001	11.359	100.430	0.001	0.000%
37	-9.838	-100.430	-5.711	9.838	100.430	5.711	0.000%
38	-5.681	-100.430	-9.891	5.681	100.430	9.891	0.000%
39	-0.001	-51.225	-8.337	0.001	51.225	8.337	0.000%
40	4.142	-51.225	-7.220	-4.142	51.225	7.220	0.000%
41	7.176	-51.225	-4.168	-7.176	51.225	4.168	0.000%
42	8.286	-51.225	0.001	-8.286	51.225	-0.001	0.000%
43	7.176	-51.225	4.169	-7.176	51.225	-4.169	0.000%
44	4.144	-51.225	7.221	-4.144	51.225	-7.221	0.000%
45	0.001	-51.225	8.337	-0.001	51.225	-8.337	0.000%
46	-4.142	-51.225	7.220	4.142	51.225	-7.220	0.000%
47	-7.176	-51.225	4.168	7.176	51.225	-4.168	0.000%
48	-8.286	-51.225	-0.001	8.286	51.225	0.001	0.000%
49	-7.176	-51.225	-4.169	7.176	51.225	4.169	0.000%
50	-4.144	-51.225	-7.221	4.144	51.225	7.221	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	0.00021470
3	Yes	4	0.00000001	0.00010880
4	Yes	5	0.00000001	0.00049016
5	Yes	5	0.00000001	0.00022183
6	Yes	5	0.00000001	0.00049668
7	Yes	5	0.00000001	0.00022517
8	Yes	4	0.00000001	0.00043055
9	Yes	4	0.00000001	0.00026164
10	Yes	5	0.00000001	0.00048076
11	Yes	5	0.00000001	0.00021762
12	Yes	5	0.00000001	0.00049748
13	Yes	5	0.00000001	0.00022560
14	Yes	4	0.00000001	0.00021040
15	Yes	4	0.00000001	0.00010528
16	Yes	5	0.00000001	0.00049395
17	Yes	5	0.00000001	0.00022370
18	Yes	5	0.00000001	0.00048413
19	Yes	5	0.00000001	0.00021917
20	Yes	4	0.00000001	0.00042287
21	Yes	4	0.00000001	0.00025646
22	Yes	5	0.00000001	0.00049935
23	Yes	5	0.00000001	0.00022645
24	Yes	5	0.00000001	0.00048592
25	Yes	5	0.00000001	0.00021967
26	Yes	4	0.00000001	0.00002084
27	Yes	5	0.00000001	0.00025568
28	Yes	5	0.00000001	0.00031250
29	Yes	5	0.00000001	0.00031307
30	Yes	5	0.00000001	0.00025088
31	Yes	5	0.00000001	0.00030652

32	Yes	5	0.00000001	0.00030992
33	Yes	5	0.00000001	0.00025268
34	Yes	5	0.00000001	0.00031262
35	Yes	5	0.00000001	0.00031010
36	Yes	5	0.00000001	0.00025345
37	Yes	5	0.00000001	0.00031671
38	Yes	5	0.00000001	0.00031516
39	Yes	4	0.00000001	0.00003200
40	Yes	4	0.00000001	0.00014797
41	Yes	4	0.00000001	0.00015576
42	Yes	4	0.00000001	0.00003684
43	Yes	4	0.00000001	0.00014068
44	Yes	4	0.00000001	0.00015557
45	Yes	4	0.00000001	0.00003188
46	Yes	4	0.00000001	0.00015164
47	Yes	4	0.00000001	0.00014337
48	Yes	4	0.00000001	0.00003687
49	Yes	4	0.00000001	0.00015914
50	Yes	4	0.00000001	0.00014465

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.58	20.734	39	0.978	0.001
L2	174 - 126	19.506	39	0.976	0.001
L3	130.75 - 82.75	11.201	39	0.821	0.001
L4	88.75 - 40.75	5.040	39	0.548	0.000
L5	48 - 0	1.451	39	0.275	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.000	Lightning Rod 5/8" x 4'	39	20.734	0.978	0.001	59394
177.000	7770.00 w/ Mount Pipe	39	20.119	0.977	0.001	59394
176.000	Side Arm Mount [SO 102-3]	39	19.915	0.977	0.001	59394
148.000	AIR 21 B2A/B4P w/ Mount Pipe	39	14.345	0.908	0.001	14811
134.000	800 EXTERNAL NOTCH FILTER	39	11.770	0.839	0.001	10814
131.000	APXVSPP18-C-A20 w/ Mount Pipe	39	11.244	0.822	0.001	10315
115.000	(2) BXA-171063-12BF w/ Mount Pipe	39	8.623	0.725	0.001	9435
44.000	GPS-TMG-HR-26NCM	39	1.239	0.250	0.000	8047

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.58	97.353	2	4.589	0.006
L2	174 - 126	91.594	2	4.582	0.005
L3	130.75 - 82.75	52.617	2	3.857	0.003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	88.75 - 40.75	23.679	2	2.576	0.001
L5	48 - 0	6.819	2	1.291	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.000	Lightning Rod 5/8" x 4'	2	97.353	4.589	0.006	13277
177.000	7770.00 w/ Mount Pipe	2	94.471	4.587	0.006	13277
176.000	Side Arm Mount [SO 102-3]	2	93.511	4.586	0.006	13277
148.000	AIR 21 B2A/B4P w/ Mount Pipe	2	67.382	4.265	0.004	3202
134.000	800 EXTERNAL NOTCH FILTER	2	55.289	3.942	0.003	2325
131.000	APXVSPP18-C-A20 w/ Mount Pipe	2	52.820	3.864	0.003	2216
115.000	(2) BXA-171063-12BF w/ Mount Pipe	2	40.512	3.408	0.002	2022
44.000	GPS-TMG-HR-26NCM	2	5.821	1.174	0.000	1713

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	180 - 170.58 (1)	TP26.25x24x0.188	9.420	0.000	0.0	15.024	-3.298	1019.440	0.003
L2	170.58 - 126 (2)	TP36.525x25.058x0.25	48.000	0.000	0.0	27.884	-14.017	1861.240	0.008
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	48.000	0.000	0.0	44.249	-26.636	2935.510	0.009
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	48.000	0.000	0.0	63.867	-40.102	4233.020	0.009
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	48.000	0.000	0.0	89.306	-61.450	5854.040	0.010

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	180 - 170.58 (1)	TP26.25x24x0.188	17.814	529.450	0.034	0.000	529.450	0.000
L2	170.58 - 126 (2)	TP36.525x25.058x0.25	425.385	1345.925	0.316	0.000	1345.925	0.000
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	1472.342	2695.175	0.546	0.000	2695.175	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	2758.617	4674.700	0.590	0.000	4674.700	0.000
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	4516.958	7749.950	0.583	0.000	7749.950	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$

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	180 - 170.58 (1)	TP26.25x24x0.188	5.712	509.718	0.011	0.101	1060.192	0.000
L2	170.58 - 126 (2)	TP36.525x25.058x0.25	19.139	930.621	0.021	0.496	2695.150	0.000
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	29.103	1457.940	0.020	0.495	5396.950	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	33.956	2105.570	0.016	0.495	9360.833	0.000
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	38.999	2927.020	0.013	0.370	15518.833	0.000

Pole Interaction Design Data

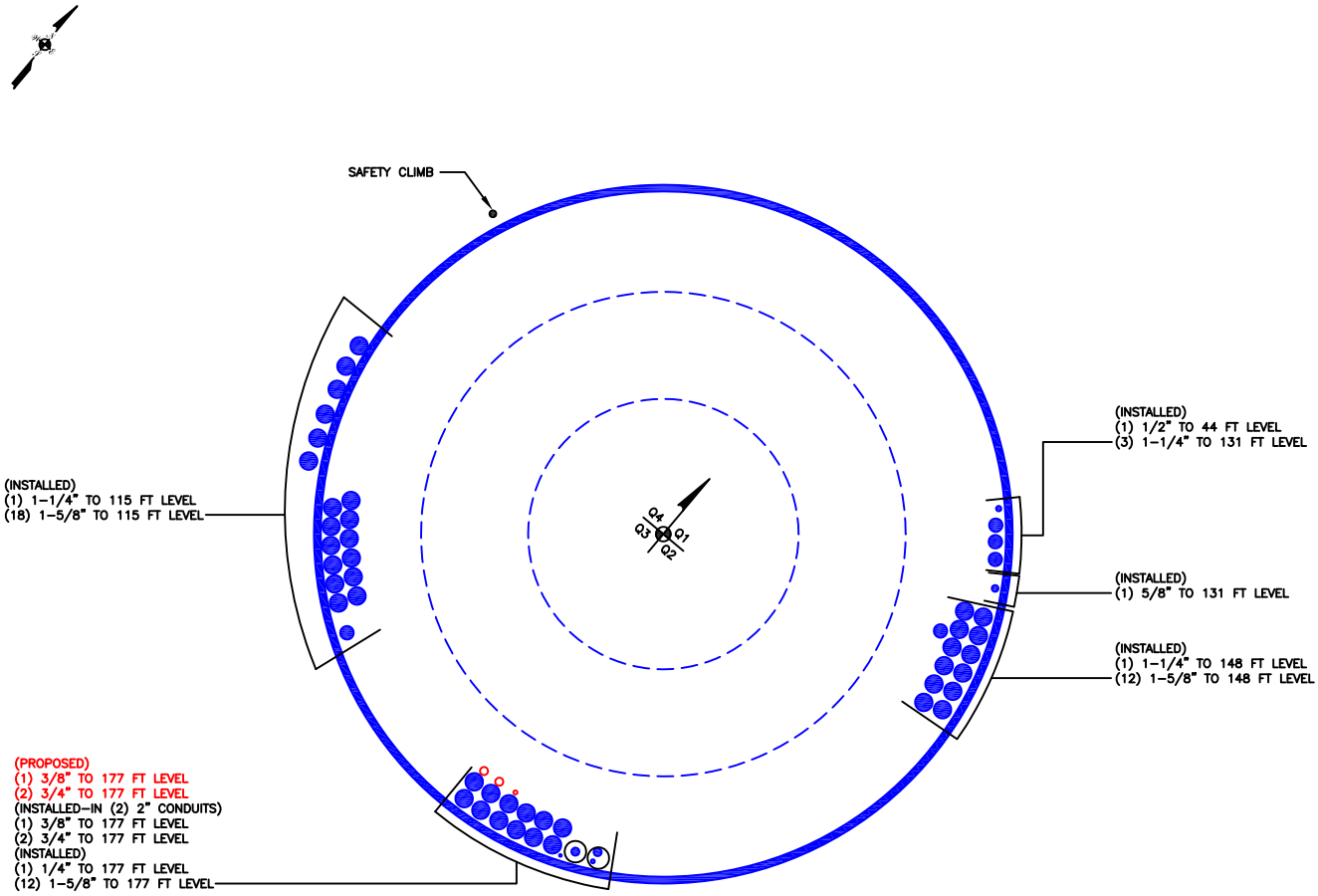
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 170.58 (1)	0.003	0.034	0.000	0.011	0.000	0.037 ✔	1.000	4.8.2 ✔
L2	170.58 - 126 (2)	0.008	0.316	0.000	0.021	0.000	0.324 ✔	1.000	4.8.2 ✔
L3	126 - 82.75 (3)	0.009	0.546	0.000	0.020	0.000	0.556 ✔	1.000	4.8.2 ✔
L4	82.75 - 40.75 (4)	0.009	0.590	0.000	0.016	0.000	0.600 ✔	1.000	4.8.2 ✔
L5	40.75 - 0 (5)	0.010	0.583	0.000	0.013	0.000	0.594 ✔	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	180 - 170.58	Pole	TP26.25x24x0.188	1	-3.298	1019.440	3.7	Pass
L2	170.58 - 126	Pole	TP36.525x25.058x0.25	2	-14.017	1861.240	32.4	Pass
L3	126 - 82.75	Pole	TP46.357x34.89x0.313	3	-26.636	2935.510	55.6	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.299x0.375	4	-40.102	4233.020	60.0	Pass
L5	40.75 - 0	Pole	TP64.75x53.283x0.438	5	-61.450	5854.040	59.4	Pass
							Summary	
						Pole (L4)	60.0	Pass
						RATING =	**60.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT:842871

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data	
BU#:	*842871*
Site Name:	*ORANGE TRANSFER STATION, C*
App #:	*376147 Revision # 3*
Pole Manufacturer:	*Rohn*

Reactions		
Mu:	4516	ft-kips
Axial, Pu:	61	kips
Shear, Vu:	39	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	72	in

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ń):	157.5 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	60.6% **Pass**	

Plate Data		
Diam:	77.25	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.28	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	Rohn/Pirod, OK	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 31.49

Stiffener Data (Welding at both sides)		
Config:	0	*
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

n/a

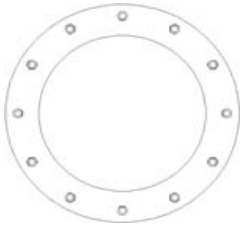
Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check:	N/A

Pole Data		
Diam:	64.75	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

PROJECT	**842871 - ORANGE TRANSFER STATION, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**02-10-17**	PAGE	1	OF	1

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

Monopole Pad & Pier Foundation Analysis

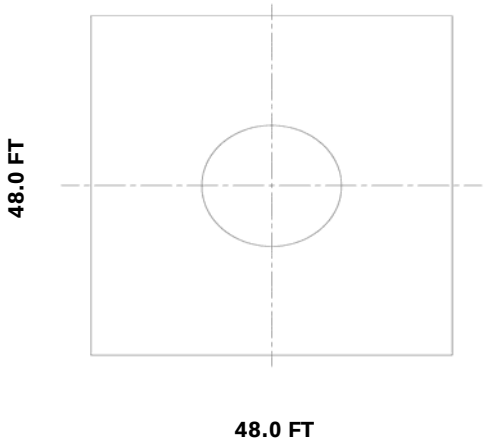
Rev. Type: G

Design Loads:

	Input factored loads	
Shear:	39.0	kips
Moment:	4,516.0	ft-kips
Tower Height:	180.0	ft
Tower Weight:	61.0	kips

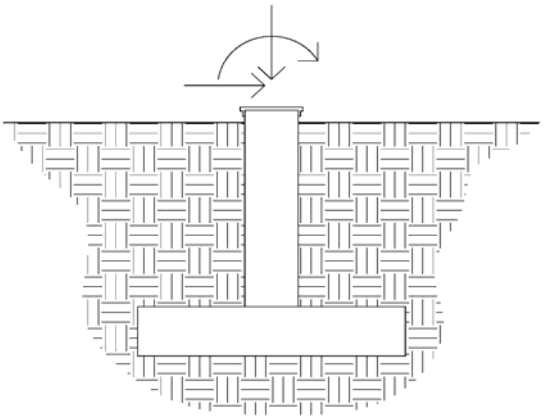
Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	64.75	in
Bearing Depth:	7.0	ft
Pad Width:	48.0	ft
Neglected Depth:	3.0	ft
Thickness:	6.0	ft
Pier Diameter:	8.0	ft
Pier Height Above Grade:	1.0	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in



Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf

Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	12.000	ksf
Angle of Friction:	32.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.350	

** Notes:

The steel reinforcement has not been analyzed.

Summary of Results

Req'd Pier Diam.	OK
Overturning	9.7%
Shear Capacity	6.1%
Bearing	15.9%
Pad Shear - 1-way	26.2%
Pad Shear - 2-way	2.1%

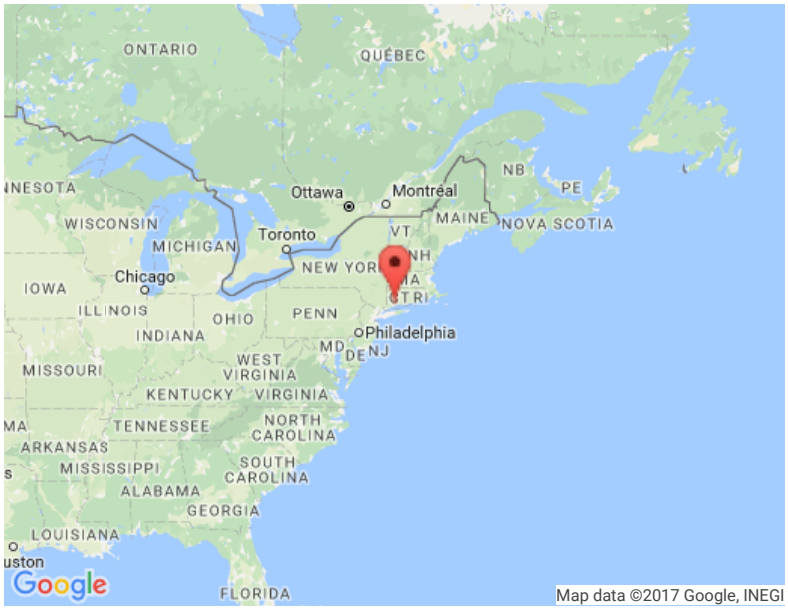
Search Results

Query Date: Fri Feb 10 2017
Latitude: 41.2556
Longitude: -73.0109

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 114
Risk Category II: 125
Risk Category III-IV: 135
MRI 10-Year:** 77
MRI 25-Year:** 87
MRI 50-Year:** 94
MRI 100-Year:** 100

ASCE 7-05 Windspeed:
111 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
82 (fastest mile in mph)



*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Print your results

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SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

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

SmartLink, LLC on behalf of AT&T Mobility, LLC
Site FA – 10071197
Site ID – CT5101 (MC-RF)
Site Name – Orange Transfer Station
Site Compliance Report

617 South Orange Center Road
Orange, CT 06477

Latitude: N41-15-19.98
Longitude: W73-0-39.17
Structure Type: Monopole

Report generated date: April 7, 2017
Report by: Michelle Stone
Customer Contact: Kristen Smith

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Unknown
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at Ground Level
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_CTU5101_2017-LTE-Multi-Carrier_RRH-Add_om636a_2051A02J00_10071197_16326_04-11-2016_Preliminary-Approved_v1.00

CD's: 10071197_AE201_170321_CTL05101_Rev1_Retrofit-MC CD

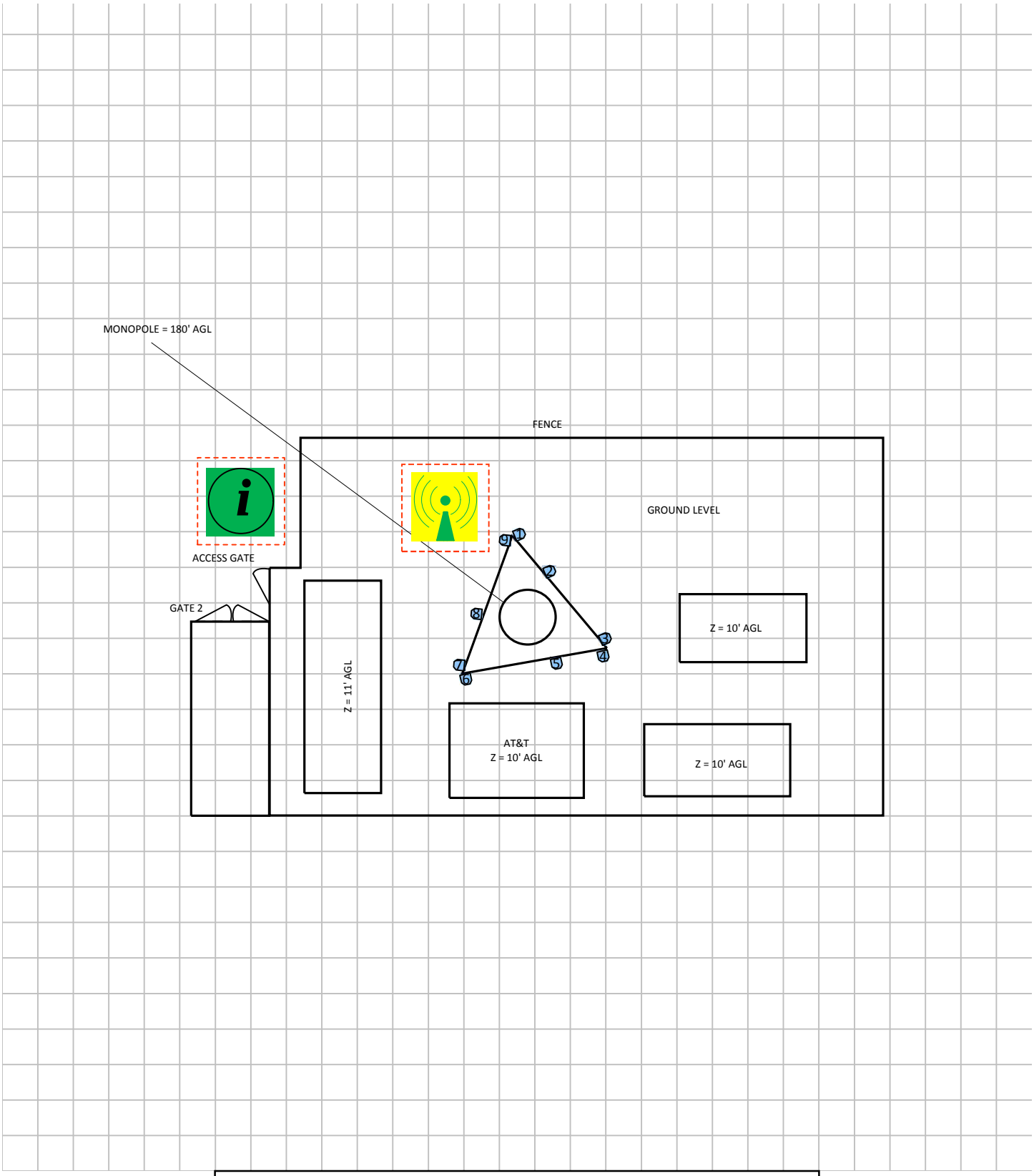
RF Powers Used: AT&T Engineering Defaults

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

Site Scale Map For: Orange Transfer Station



(Feet)

0 9.7 19.3

www.sitesafe.com
Site Name:Orange Transfer Station
4/7/2017 11:07:21 AM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

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	20	82	4.6	11.51	0	1	0	1132.6	95.8'	172.5'	174.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	20	86	4.6	13.41	0	1	0	1754.2	95.8'	172.5'	174.7'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	20	61.1	4	14.26	0	0	1	1600.1	100.1'	167.3'	175'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	20	66	4.6	11.29	0	0	1	807.5	107.9'	157.8'	174.7'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	20	65	4.6	14.65	0	0	1	1750.5	107.9'	157.8'	174.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	120	82	4.6	11.51	0	1	0	1132.6	107.7'	155.4'	174.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	120	86	4.6	13.41	0	1	0	1754.2	107.7'	155.4'	174.7'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	120	61.1	4	14.26	0	0	1	1600.1	101.1'	154.3'	175'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	120	67	4	11.66	0	0	1	879.3	88.3'	152.1'	175'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	120	65	4	13.86	0	0	1	1459.3	88.3'	152.1'	175'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	230	82	4.6	11.51	0	1	0	1132.6	87.3'	154.1'	174.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	230	86	4.6	13.41	0	1	0	1754.2	87.3'	154.1'	174.7'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	230	61.1	4	14.26	0	0	1	1600.1	89.8'	161.3'	175'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	230	67	4	11.66	0	0	1	879.3	93.8'	171.7'	175'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	230	65	4	13.86	0	0	1	1459.3	93.8'	171.7'	175'

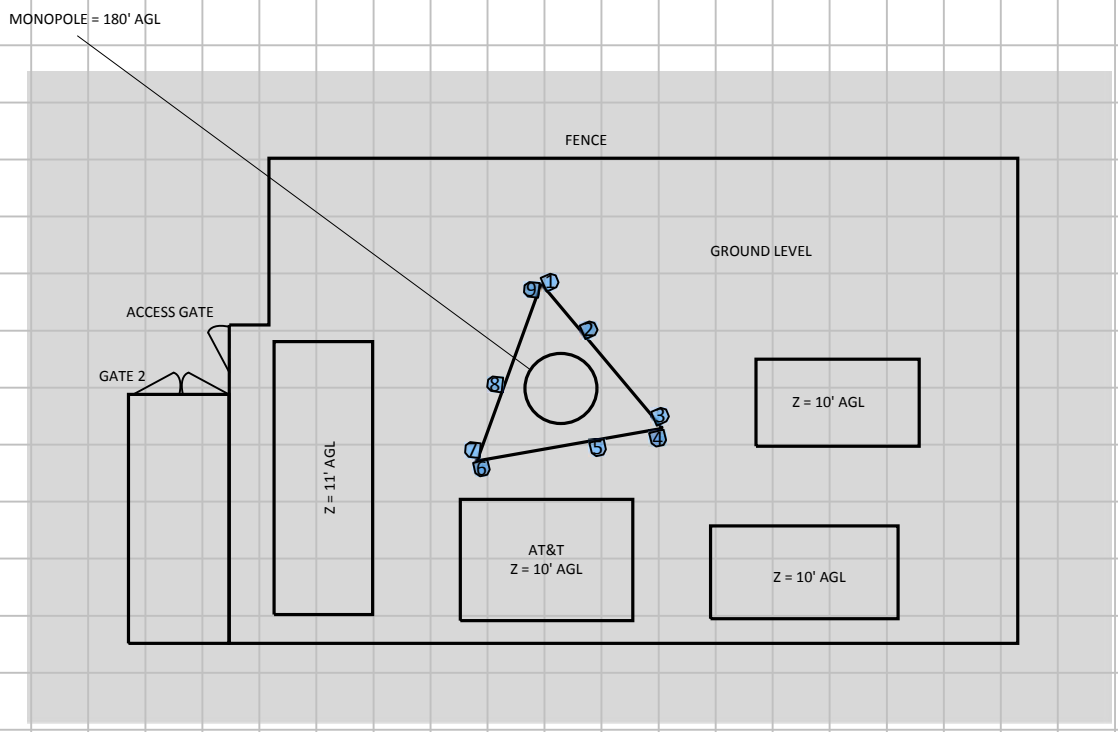
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom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

4 Emission Predictions

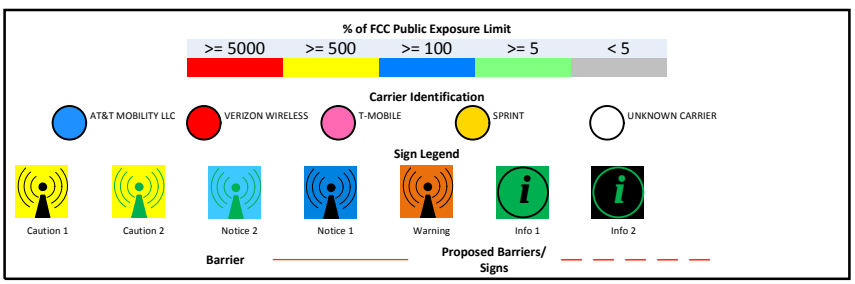
In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main 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: Orange Transfer Station



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



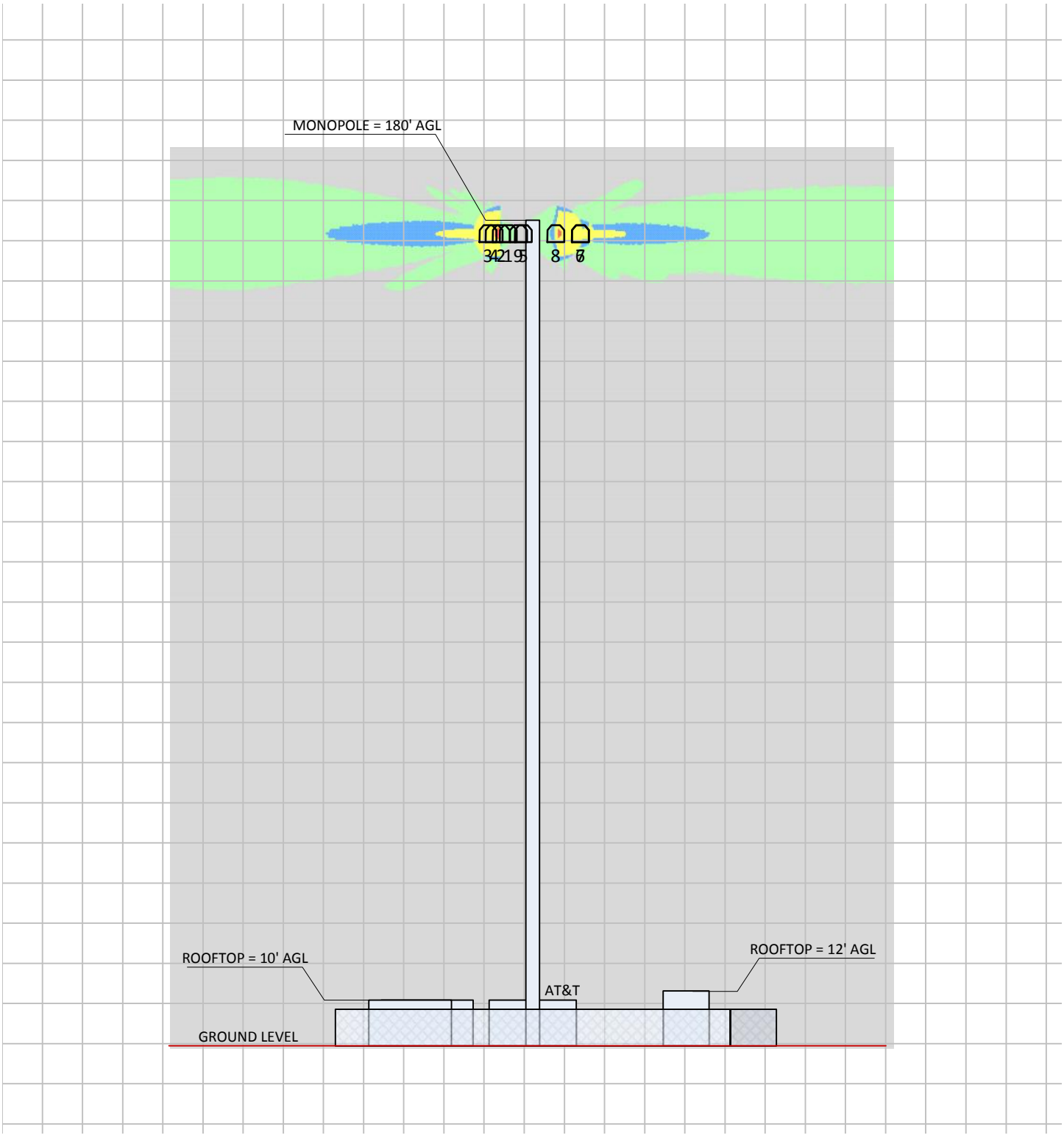
(Feet)

0 10.5 21

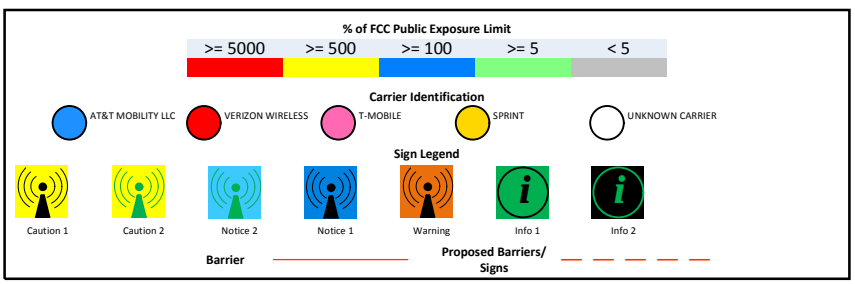
www.sitesafe.com
Site Name:Orange Transfer Station
4/7/2017 11:08:27 AM

SitesafeTC Version:1.0.0.0 - 0.0.0.259
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Orange Transfer Station
Elevation View



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



(Feet)
0 16.4 32.7
www.sitesafe.com
Site Name:Orange Transfer Station
4/11/2017 12:04:18 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.259
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 SmartLink, LLC's proposed deployment plan could result in the site being rendered non-compliant.

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

5.2 Actions for Site Compliance

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

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

Site Access Gate

Information 1 sign required.

Monopole Base

Yellow Caution 2 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 Michelle Stone.

April 7, 2017

Samuel Cosgrove

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.

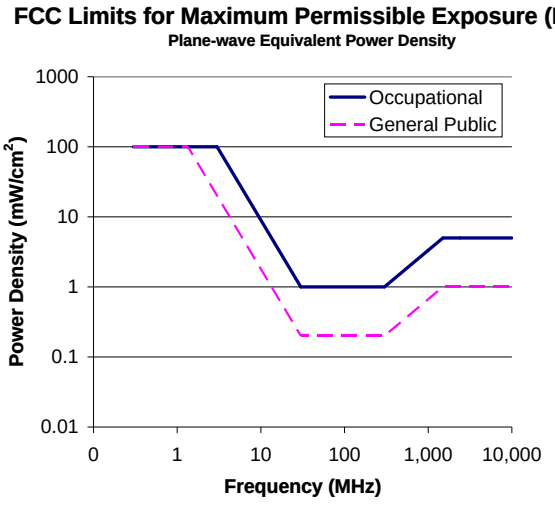
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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