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

August 17, 2016

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 876347**
AT&T Site ID: CT5307
53 Slater Street, Manchester, CT 06040
Latitude: 41° 48' 18.0"/ Longitude: -72° 32' 1.0"

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 145-foot level of the existing 155-foot monopole tower at 53 Slater Street in Manchester, CT. The tower is owned by Crown Castle. The property is owned by 121 Connecticut Avenue Associates. AT&T now intends to replace three (3) antennas with three (3) new antennas. These antennas would be installed at the 145-foot level of the tower. AT&T also intends to replace six (6) TMAs with three (3) Twin CCI TMAs, install three (3) RRU-32s, two (2) DC, one (1) Fiber, and one (1) Raycap.

This facility was approved by the by the Town of Manchester Planning and Zoning Commission on July August 17, 1998. This approval was given without conditions.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc: The Honorable Jay Moran, Mayor,
Town of Manchester
41 Center Street
Manchester, CT 06040

121 Connecticut Avenue Associates
Attn: Jean Burns
9 Lake Lane
Ellington, CT 06029

VOL 2013 PG 259

TOWN OF MANCHESTER

PLANNING AND ZONING COMMISSION

CERTIFICATE OF APPROVAL OF SPECIAL EXCEPTION

Owner of record: Raglin Associates, c/o Sullivan Tile Dist.

Property Address: 53 Slater Street

Applicant: Sprint Spectrum LP

Regulation(s) cited: Article IV, Section 19.05

SPECIAL EXCEPTION GRANTED:

with modifications and the condition that a caveat addressing co-location requirements be submitted for staff review and filed on the land records by the applicant prior to any construction.

* ALL SITE WORK APPROVED BY THIS SPECIAL EXCEPTION MUST BE COMPLETED BY AUGUST 17, 2003 (5 yrs. From approval date). FAILURE TO COMPLETE ALL WORK WITHIN THE SPECIFIED TIME PERIOD WILL RESULT IN AUTOMATIC EXPIRATION OF THE APPROVAL.

* THIS CERTIFICATE MUST BE RECORDED IN THE LAND RECORDS IN THE OFFICE OF THE TOWN CLERK BEFORE THE SPECIAL EXCEPTION IS LAWFULLY EFFECTIVE.

CERTIFIED:

Frank Daversa

Secretary
Planning and Zoning Commission

*DATE ADOPTED: August 17, 1998

FILE NO. S-147

Received for Record on
SEP 11 1998 at 2:43 P.M.
Joseph V. Camposeo

Joseph V. Camposeo, Town Clerk

TOWN OF MANCHESTER
41 CENTER STREET - P.O. BOX 191
MANCHESTER, CT 06045-0191
(860) 647-3052 FAX: (860) 647-3144

ZONING PERMIT

CERTIFICATION OF ZONING COMPLIANCE REQUEST

PERMIT/APPLICATION NBR: 99 00000638 DATE APPLIED: 10/08/98
PERMIT TYPE: ZONE APP TYPE: DISH PREPARED BY: PAT21
DATE ISSUED: 11/03/98

PROPERTY ADDRESS:
3 SLATER STREET
TENANT:

LEGAL DESCRIPTION:

OWNER NAME/ADDRESS:
AGLIN ASSOCIATES
C/O SULLIVAN TILE DIST
5 RAILROAD AVE
EST HAVEN CT 06516

CONTRACTOR NAME/ADDRESS:

OTHER:
PRINT PCS

VALUATION:
OCCUPANCY TYPE: COMMERCIAL BUIL Certificate of O-C-U-P-T: C
Dimensions of structure: 150' Plans for building: YES

DESCRIPTION OF OTHER BUILDINGS NOT SHOWN:
CONDITIONS: REMARKS:
ADDTNL APPROVAL: ADDTNL PERMITS:

MISCELLANEOUS INFO: SITE DEVELOPMENT AND COLORS OF TOWER AND EQUIPMENT CABINETS TO BE AS APPRVD BY PZC ON 8/17/98

THIS IS TO CERTIFY THAT THE ABOVE STATED INFORMATION IS A PERMITTED AND LAWFUL USE AS CONTROLLED BY THE ZONING REGULATIONS OF THE TOWN OF MANCHESTER, CONNECTICUT, UPON AUTHORIZED SIGNATURE OF THE ZONING ENFORCEMENT OFFICER.

Thomas R. O'Meara
APPROVAL SIGNATURE

11/3/98
DATE

ORIGINAL

53 SLATER STREET

Location	53 SLATER STREET	**Mblu**	56/ 5140/ 53/ /
Acct#	514000053	**Owner**	ONE HUNDRED TWENTY ONE CONN-
Assessment	$1,690,200	**Appraisal**	$2,414,500
PID	14616	**Building Count**	4

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2011	$1,689,400	$725,100	$2,414,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2011	$1,182,600	$507,600	$1,690,200

Owner of Record

Owner	ONE HUNDRED TWENTY ONE CONN-ECTICUT AVENUE ASSOCIATES LLC	**Sale Price**	$1,180,000
		Certificate	C
Address	9 LAKE LANE ELLINGTON, CT 06029	**Book & Page**	2683/ 224
		Sale Date	07/17/2003
		Instrument	33

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
ONE HUNDRED TWENTY ONE CONN-	$1,180,000	C	2683/ 224	33	07/17/2003
RAGLIN ASSOCIATES LLC	$0		2132/ 338		12/02/1999

Building Information

Building 1 : Section 1

Year Built: 1987
Living Area: 6333
Replacement Cost: $474,167
Replacement Cost Less Depreciation: $265,500

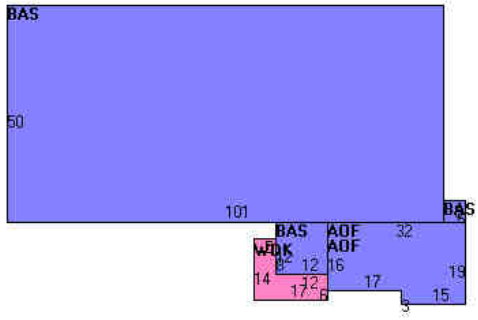
Building Attributes	
Field	**Description**
STYLE	Service Shop
MODEL	Ind/Comm

Building Photo

Grade	Average
Stories:	1
Occupancy	4
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Brick Veneer
Roof Structure	Gable/Hip
Roof Cover	Enam Mtl Shing
Interior Wall 1	Wall Brd/Wood
Interior Wall 2	Minim/Masonry
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Partial
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	Heat/AC Packag
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	14
% Comn Wall	0

(http://images.vgsi.com/photos/ManchesterCTPhotos//\00\03\43/03.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	5219	5219
AOF	Office, (Average)	1114	1114
WDK	Wood Deck	142	0
		6475	6333

Building 2 : Section 1

Year Built: 1987
Living Area: 24306
Replacement Cost: $1,082,175
Replacement Cost Less Depreciation: $606,000

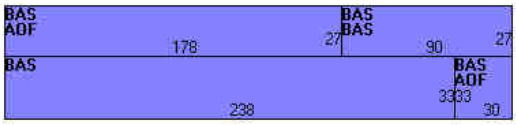
Building Photo

Building Attributes : Bldg 2 of 4	
Field	**Description**
STYLE	Pre-Eng Garage
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	4
Exterior Wall 1	Pre-finsh Metl

Exterior Wall 2	Brick Veneer
Roof Structure	Gable/Hip
Roof Cover	Enam Mtl Shing
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Partial
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	Heat AC Split
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Susp Ceil & Wl
Rooms/Prtns	Average
Wall Height	22
% Comn Wall	0

(http://images.vgsi.com/photos/ManchesterCTPhotos//\00\03\43/04.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	18510	18510
AOF	Office, (Average)	5796	5796
		24306	24306

Building 3 : Section 1

Year Built: 1987
Living Area: 10320
Replacement Cost: $433,337
Replacement Cost Less Depreciation: $242,700

Building Attributes : Bldg 3 of 4	
Field	**Description**
STYLE	Pre-Eng Garage
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	12
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Brick Veneer

Building Photo

(http://images.vgsi.com/photos/ManchesterCTPhotos//\00\03\43/05.jpg)

Roof Structure	Gable/Hip
Roof Cover	Enam Mtl Shing
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	None
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	18
% Comn Wall	0

Building Layout

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	10320	10320
		10320	10320

Building 4 : Section 1

Year Built: 2008
Living Area: 12000
Replacement Cost: $479,640
Replacement Cost Less Depreciation: $465,300

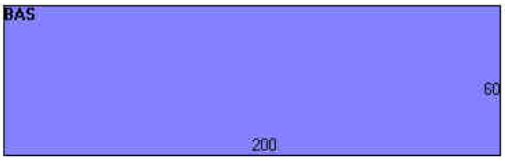
Building Attributes : Bldg 4 of 4	
Field	**Description**
STYLE	Pre-Eng Garage
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	8
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Concr/Cinder
Roof Structure	Gable/Hip
Roof Cover	Enam Mtl Shing
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas

Building Photo

(http://images.vgsi.com/photos/ManchesterCTPhotos//\00\03\43/06.jpg)

Building Layout

Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	Industrial 96
Total Rooms	00
Total Bedrms	00
Total Baths	0
1st Floor Use:	
Heat/AC	None
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	18
% Comn Wall	0



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	12000	12000
		12000	12000

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
A/C	Partial AC	5796 S.F.	$6,500	2

Land

Land Use

Use Code	300
Description	Industrial 96
Zone	IND
Neighborhood	5000
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	4.96
Frontage	0
Depth	0
Assessed Value	$507,600
Appraised Value	$725,100

Outbuildings

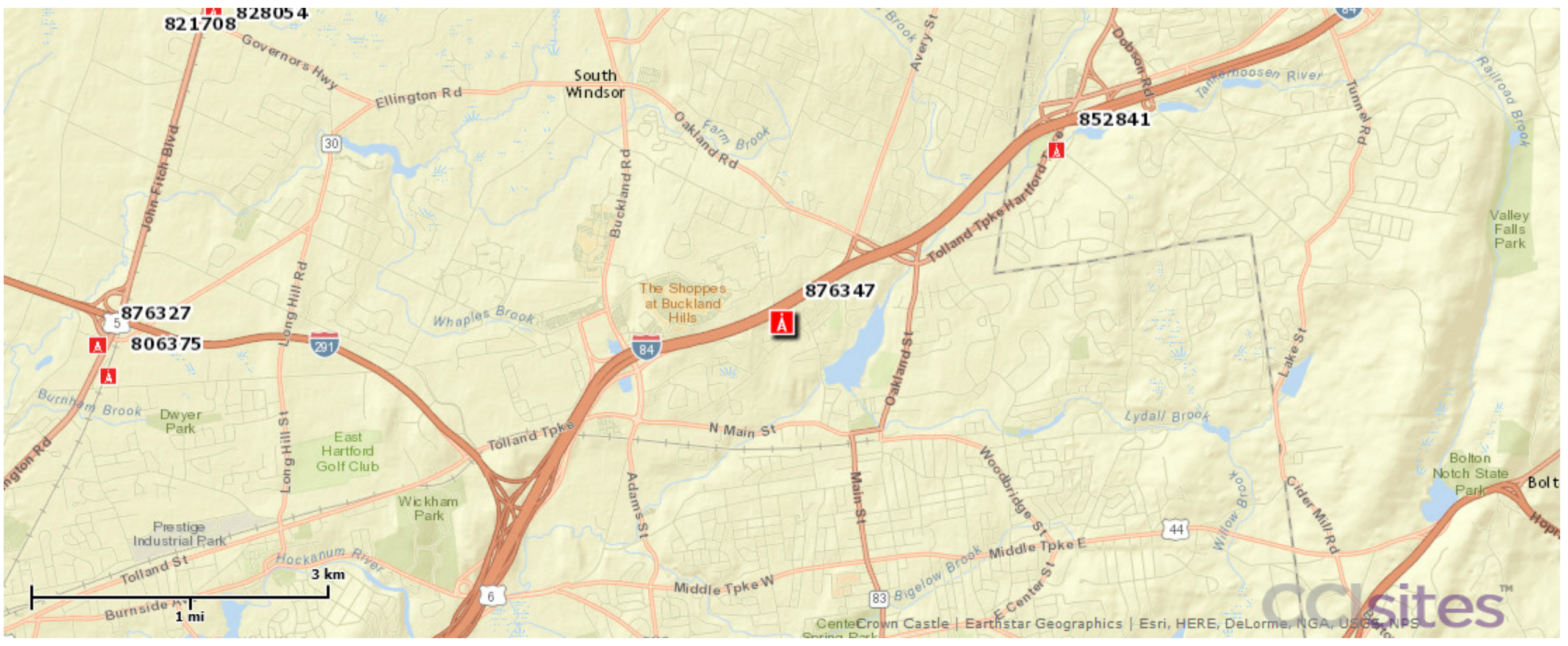
Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asphalt			13350 S.F.	$19,200	4
PAV1	Paving Asphalt			37000 S.F.	$17,800	1
FN3	Fence 6' Chain			300 L.F.	$2,000	1
PAV2	Paving Concrete			96 S.F.	$300	4
SHDT	Telephone Shed			319 S.F.	$31,600	1
FN4	Fence 8' Chain			54 L.F.	$900	1
SHDT	Telephone Shed			319 S.F.	$31,600	1

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2010	$1,766,600	$760,300	$2,526,900
2005	$871,200	$540,700	$1,411,900
2000	$1,082,500	$540,700	$1,623,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2010	$1,236,700	$532,300	$1,769,000
2005	$609,900	$378,500	$988,400
2000	$757,800	$378,500	$1,136,300


821708
828054
Governors Hwy
Ellington Rd
South Windsor
John Fitch Blvd
30
Oakland Rd
Farm Brook
Buckland Rd
Avery St
Dobson Rd
Tankerhoosen River
Railroad Brook
Tunnel Rd
852841
Tolland Tpke
Hartford Tpke
Valley Falls Park
876347
876327
806375
5
Long Hill Rd
291
Whaples Brook
The Shoppes at Buckland Hills
84
Oakland St
Lake St
Burnham Brook
Dwyer Park
East Hartford Golf Club
Long Hill St
Tolland Tpke
N Main St
Lydall Brook
Bolton Notch State Park
Wickham Park
Adams St
Main St
Woodbridge St
Willow Brook
Cider Mill Rd
Prestige Industrial Park
Tolland St
Hockanum River
44
Middle Tpke E
Middle Tpke W
Bigelow Brook
E Center St
6
83
3 km
1 mi
Crown Castle | Earthstar Geographics | Esri, HERE, DeLorme, NGA, USGS, NPS
ccisites™

SITE NAME: MANCHESTER NORTH
FA NUMBER: 10071100
SITE NUMBER: CTL05307

53-73 SLATER STREET
MANCHESTER, CT 06040
COUNTY: HARTFORD

CROWN CASTLE SITE NAME: BUCKLAND MALL
CROWN CASTLE SITE ID #: 876347

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: SMARTLINK, LLC
ADDRESS: 1362 MELLON ROAD, SUITE 140
CITY, STATE, ZIP: HANOVER, MD 21076
CONTACT: RICH WAGNER
E-MAIL: RWAGNER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY: SMARTLINK, LLC
ADDRESS: 33 BOSTON POST ROAD WEST, SUITE 210
CITY, STATE, ZIP: MARLBOROUGH, MA 01752
CONTACT: TODD OLIVER
PHONE: (774) 369-3618
E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

ENGINEER

COMPANY: MASER CONSULTING CONNECTICUT
ADDRESS: 331 NEWMAN SPRINGS RD., SUITE 203
CITY, STATE, ZIP: RED BANK, NJ 07701-5699
CONTACT: FRANK PAZDEN
PHONE: (973) 398-3110 x4505
E-MAIL: FPAZDEN@MASERCONSULTING.COM

RF ENGINEER

COMPANY: NEW CINGULAR WIRELESS PCS, LLC
ADDRESS: 550 COCHITUATE RD.
CITY, STATE, ZIP: FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
E-MAIL: CS6970@ATT.COM

CONSTRUCTION MANAGER

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

SITE INFORMATION

APPLICANT/LESSEE

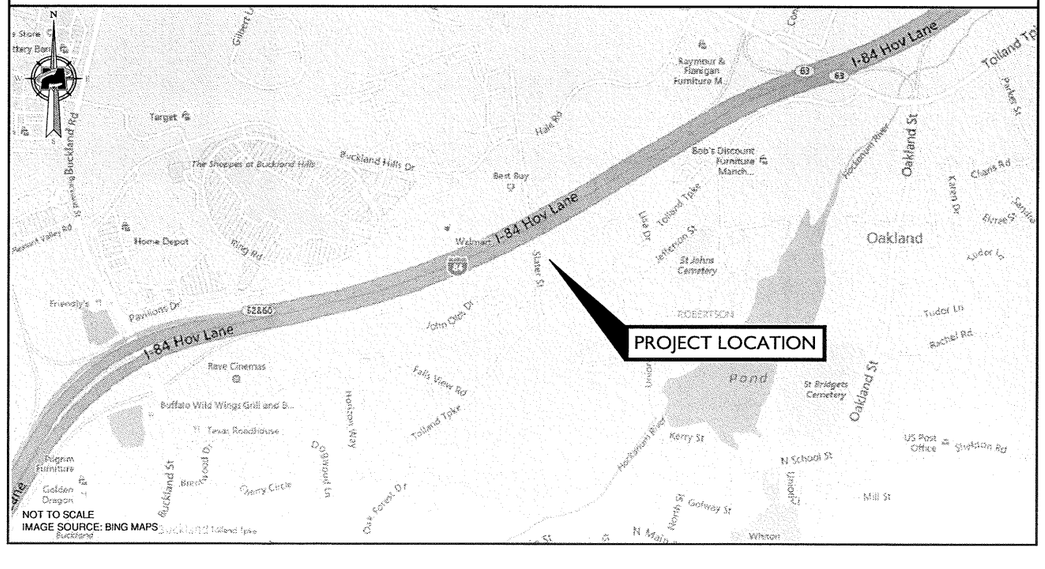
at&t

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

PROPERTY/TOWER OWNER:

NAME:	CROWN CASTLE
ADDRESS:	12 GILL STREET, SUITE 5800
CITY, STATE, ZIP:	WOBURN, MA 01801
SITE ID #:	876347
LATITUDE:	41.8049919° N
LONGITUDE:	72.5335989° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT AND MONOPOLE
ZONING/JURISDICTION:	CITY OF MANCHESTER
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



NOT TO SCALE
IMAGE SOURCE: BING MAPS

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. CONNECTICUT STATE BUILDING CODE (2005) & ALL SUBSEQUENT AMENDMENTS
2. NATIONAL ELECTRIC CODE 2011
3. NATIONAL FIRE PROTECTION ASSOCIATION 70 - 2011
4. LIGHTNING PROTECTION CODE 201
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRICTION 14 ED.
7. EIA/TIA-222 REVISION F
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275 12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

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

GENERAL NOTES

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

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN AND EQUIPMENT PLAN
A-2	ELEVATION VIEW AND ANTENNA SCHEDULE
A-3	ANTENNA LAYOUTS
A-4	DETAILS - 1
A-5	DETAILS - 2
A-6	RF PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS

PROJECT DESCRIPTION/SCOPE OF WORK

LTE WCS WILL BE 3C AT THE SITE - BRONZE STANDARD CONFIGURATION.

PROPOSED PROJECT SCOPE HEREIN BASED ON 3C RF-CONFIG PROVIDED BY SMARTLINK 06/27/16. THIS PROJECT WILL BE COMPRISED OF:

- (3) NEW ANTENNAS, (1) PER SECTOR
- (3) NEW LTE RRUS-32, (1) PER SECTOR
- REMOVE (6) EXISTING TMA'S
- (3) NEW TMA'S TO REPLACE EXISTING
- ADD (1) NEW DC-6 SURGE SUPPRESSION DOME
- ADD (1) FIBER CABLE
- ADD (2) DC TRUNK LINES
- ADD (1) DC-12 BOX AT GRADE

MASER CONSULTING — CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076
TEL: (410) 582-8043 FAX: (443) 221-2962

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

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

SCALE:	JOB NUMBER:
AS SHOWN	15946037A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
4	07/11/16	REVISED RF CONFIG.	JRF	FEP
3	04/13/16	REVISED PER COMMENTS	RA	MPC
2	02/18/16	REVISED PER SMARTLINK'S COMMENTS	JRF	FEP
1	02/02/16	ISSUED FOR REVIEW	JRF	FEP
0	12/16/15	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT
FRANK E. PAZDEN
28186
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER PEN.28186

SITE NAME:
MANCHESTER NORTH
FA# 10071100
SITE # CTL05307
53-73 SLATER STREET
MANCHESTER, CT 06040
COUNTY OF HARTFORD
CROWN SITE ID #: 876347

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
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 50 HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.

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

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

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

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4	07/11/16	REVISED RF CONFIG.	JRF	FEP
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1	02/02/16	ISSUED AS FINAL	JRF	FEP
0	12/14/15	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT
FRANK E. PAZDEN
FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE NUMBER: PEN.28188
PROFESSIONAL ENGINEER

SITE NAME:

MANCHESTER NORTH
FA# 10071100
SITE # CTL05307

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COUNTY OF HARTFORD
CROWN SITE ID #: 876347

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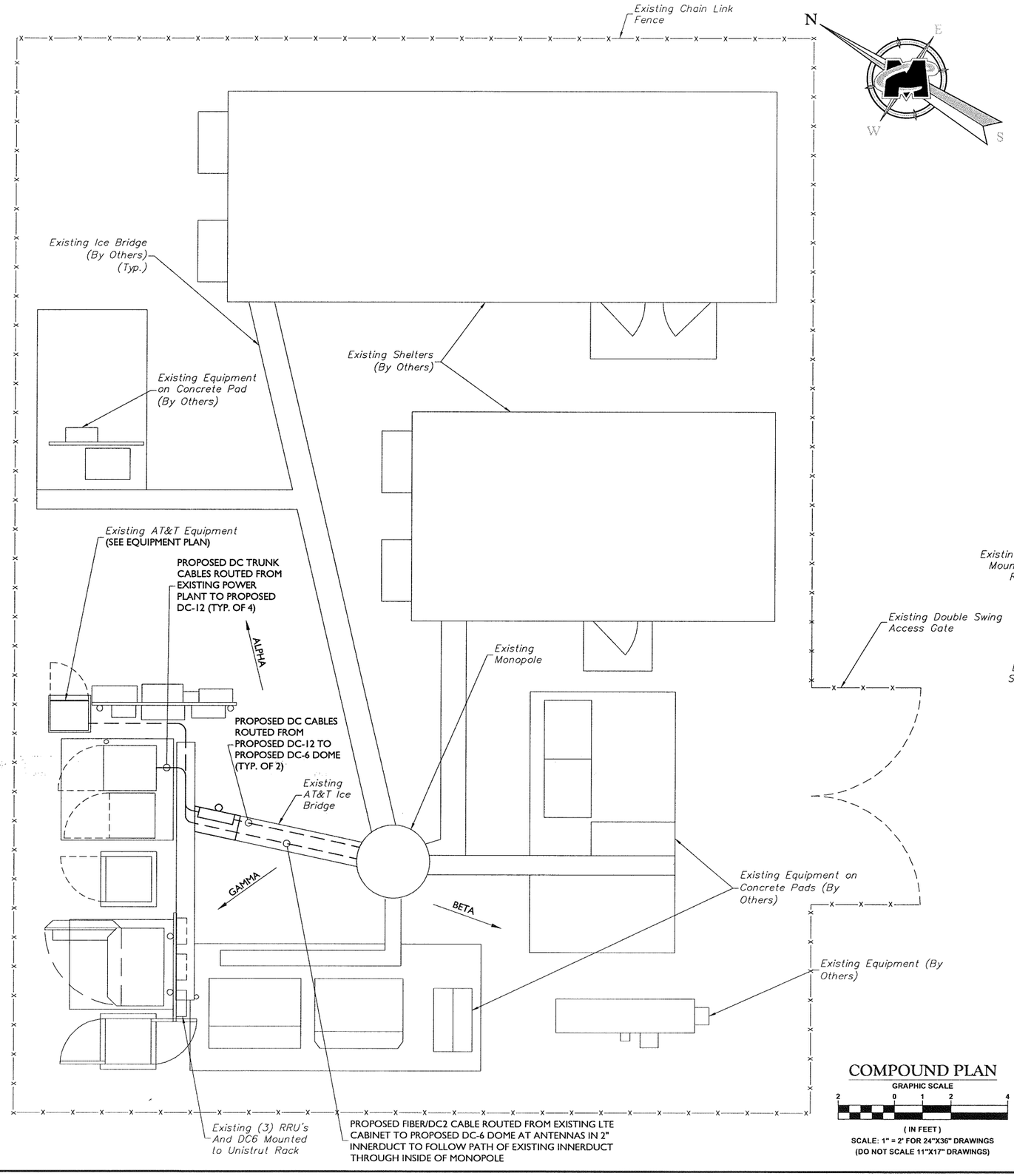
SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
GN-1



COMPOUND PLAN

GRAPHIC SCALE

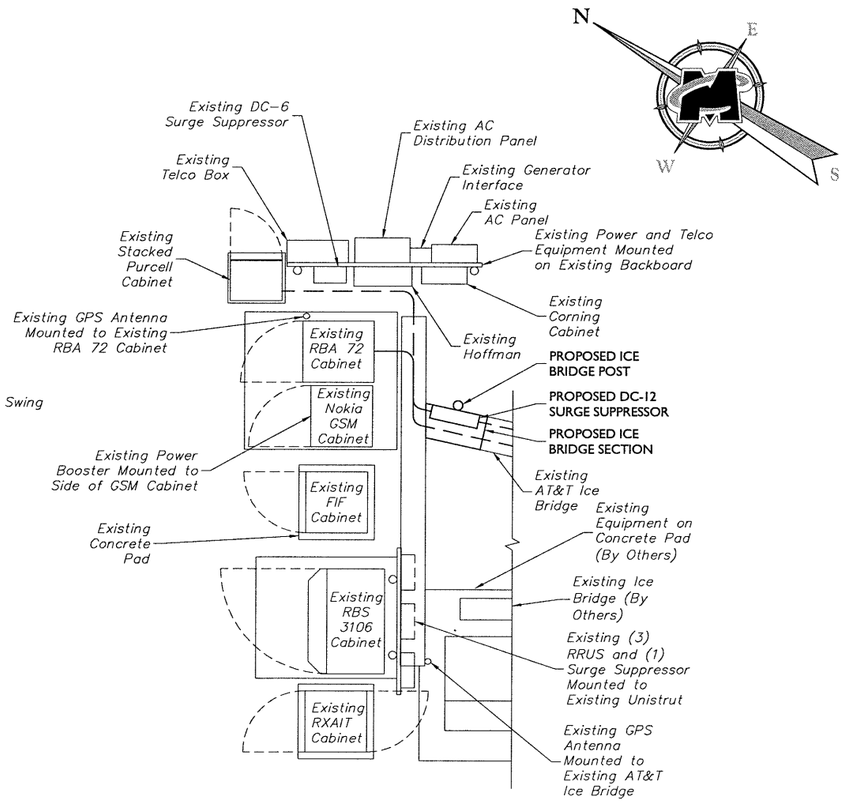
2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' 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.



EQUIPMENT PLAN

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS
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NOTE:
EXISTING DC CABLES TO EXISTING DC-6 TO BE RE-ROUTED TO PROPOSED DC-12

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1	02/02/16	[illegible]	JRF	FEP
0	12/[illegible]	[illegible]	[illegible]	FEP

STATE OF CONNECTICUT
FRANK P. BAZDEN
No. 21880
REGISTERED PROFESSIONAL ENGINEER

SITE NAME:

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FA# 10071100
SITE # CTL05307

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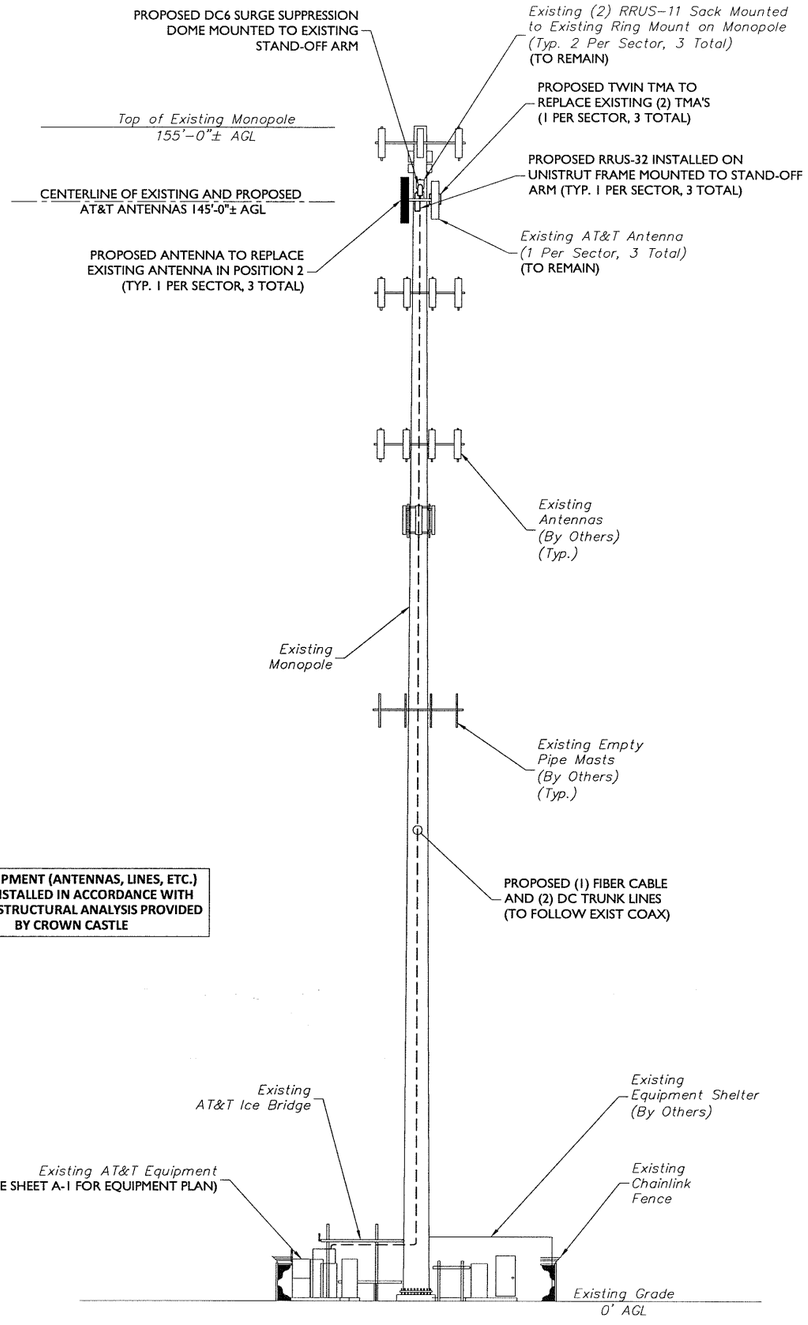
SHEET TITLE:
COMPOUND PLAN AND EQUIPMENT PLAN

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. C.L. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Kathrein 80010121	Kathrein 80010121	UMTS/GSM	REMAIN	54.50	10.30	5.90	44.10	50°	145'	-	-
	A2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE 700/PCS/WCS	RELOCATED	72.00	12.00	9.60	111.00	50°	145'	(2) RRUS-11 (1) LTE RRUS-32	REMAIN NEW
BETA	B1	Kathrein 80010121	Kathrein 80010121	UMTS/GSM	RELOCATED	54.50	10.30	5.90	44.10	170°	145'	-	-
	B2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE 700/PCS/WCS	RELOCATED	72.00	12.00	9.60	111.00	170°	145'	(2) RRUS-11 (1) LTE RRUS-32	REMAIN NEW
GAMMA	C1	Kathrein 80010121	Kathrein 80010121	UMTS/GSM	RELOCATED	54.50	10.30	5.90	44.10	290°	145'	-	-
	C2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE 700/PCS/WCS	RELOCATED	72.00	12.00	9.60	111.00	290°	145'	(2) RRUS-11 (1) LTE RRUS-32	REMAIN NEW

ANTENNA SCHEDULE

STRUCTURAL NOTES:

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

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FRANK E. PAZDEN
LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
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LICENSE NUMBER: PEN.28188

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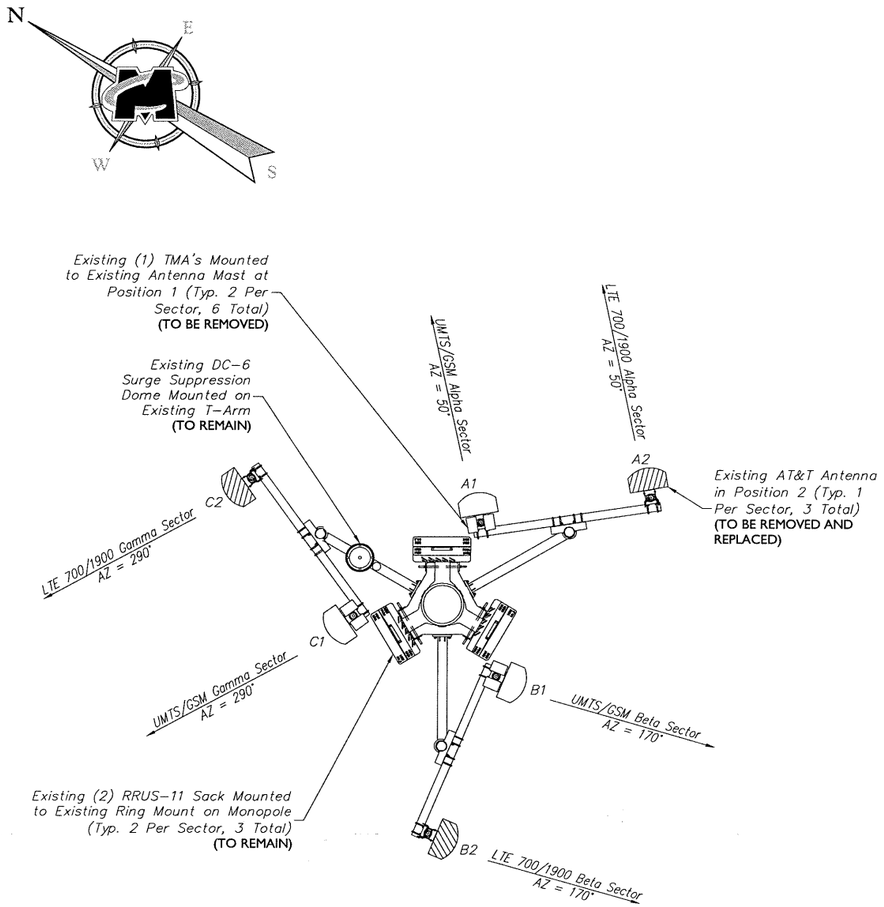
SHEET TITLE:

ELEVATION VIEW AND ANTENNA SCHEDULE

SHEET NUMBER:

A-2



EXISTING - ANTENNA LAYOUT
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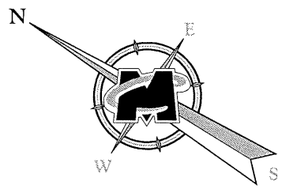

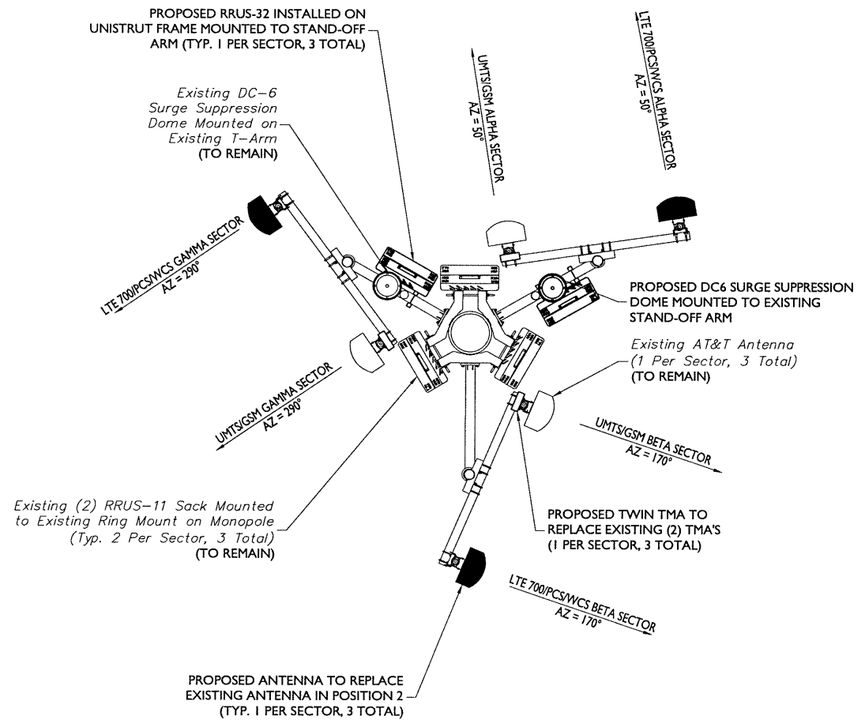

PROPOSED - ANTENNA LAYOUT
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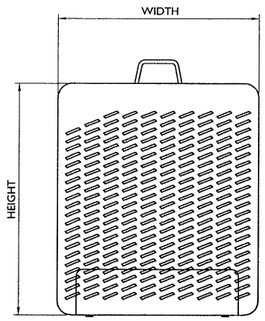
SHEET TITLE:
ANTENNA LAYOUTS

SHEET NUMBER:
A-3



RRUS FRONT VIEW

SIZE AND WEIGHT TABLE

RRUS	WIDTH	DEPTH	HEIGHT	WEIGHT W/O BRACKET
RRUS-32 4X40-1900 (WITH SOLAR SHIELD)	-	-	-	-
RRUS-32 4X40-1900 (WITHOUT SOLAR SHIELD)	17"	7.2"	19.7"	50.7

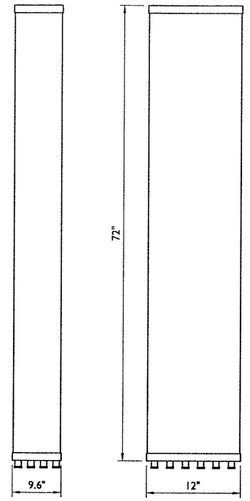
MINIMUM CLEARANCE TABLE

RRUS CABINET	CLEARANCES (INCHES)	COMMENTS
FRONT	-	INSTALLATION ACCESS
REAR	-	ZERO REAR CLEARANCE IS ALLOWED USING SUPPLIED MOUNTING BRACKETS
RIGHT	-	AIR FLOW
LEFT	-	AIR FLOW
TOP	-	AIR FLOW
BOTTOM	-	CONDUIT ROUTING

NOTE:

USE 1/2" COAXIAL CABLE W/7/16 DIN MALE CONNECTORS ON BOTH ENDS.

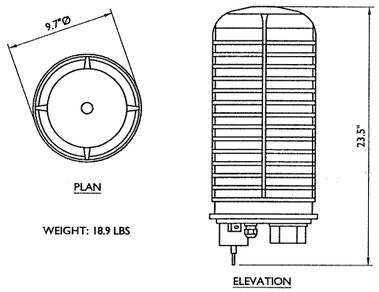
RRUS DETAIL
NOT TO SCALE



WEIGHT = 73 LBS

QUINTEL QS665212-2

ANTENNA DETAIL
NOT TO SCALE

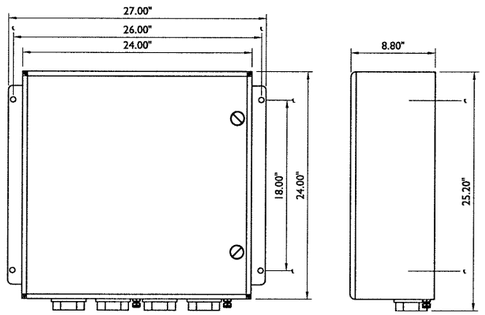


PLAN

WEIGHT: 18.9 LBS

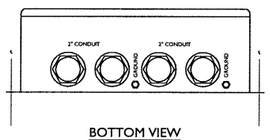
ELEVATION

RAYCAP DC6-48-60-18-8F SURGE SUPPRESSOR
NOT TO SCALE



FRONT VIEW

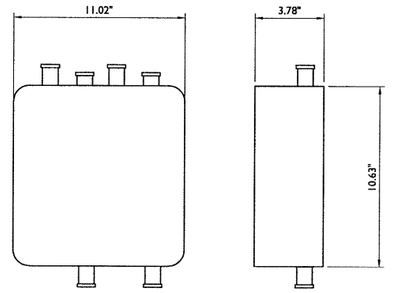
RIGHT SIDE VIEW



WEIGHT = 56.3lbs

BOTTOM VIEW

DC12-48-60-25E OVERVOLTAGE PROTECTION & POWER MANAGEMENT JUNCTION BOX
NOT TO SCALE



MODEL: DTMABP7819VG12A
WEIGHT = 19.18 LBS

TMA DETAIL
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JOB NUMBER: 15946037A

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3	04/13/16	REVISED PER COMMENTS	RA	MPC
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0	[illegible]	ISSUED FOR [illegible]	DTS	FEP
NO.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY

STATE OF CONNECTICUT FRANK E. PAZDEN LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER LICENSE NUMBER 28188

SITE NAME:

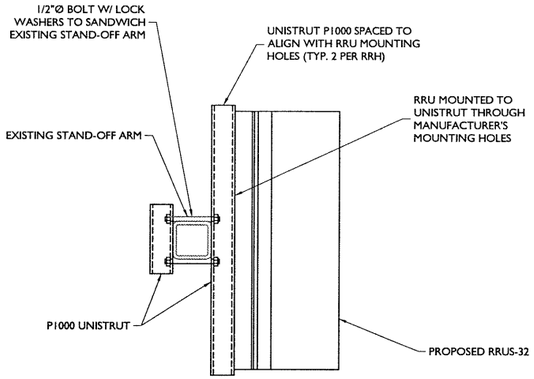
MANCHESTER NORTH
FA# 10071100
SITE # CTL05307

53-73 SLATER STREET
MANCHESTER, CT 06040
COUNTY OF HARTFORD
CROWN SITE ID #: 876347

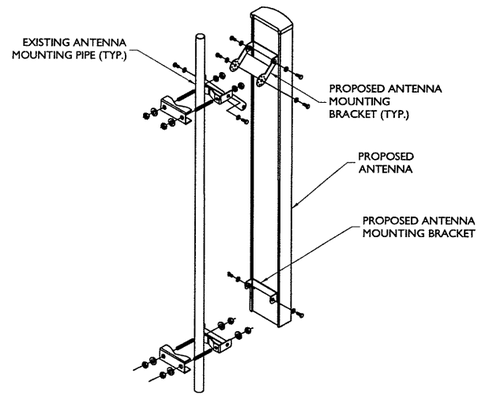
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: DETAILS

SHEET NUMBER: A-4



RRU MOUNTING DETAIL
NOT TO SCALE



ANTENNA MOUNTING DETAIL
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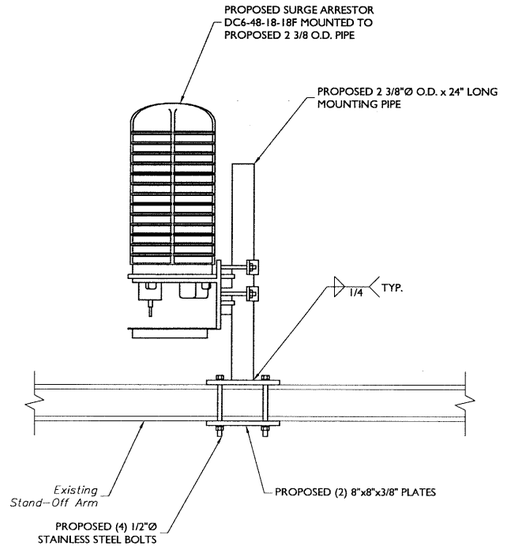
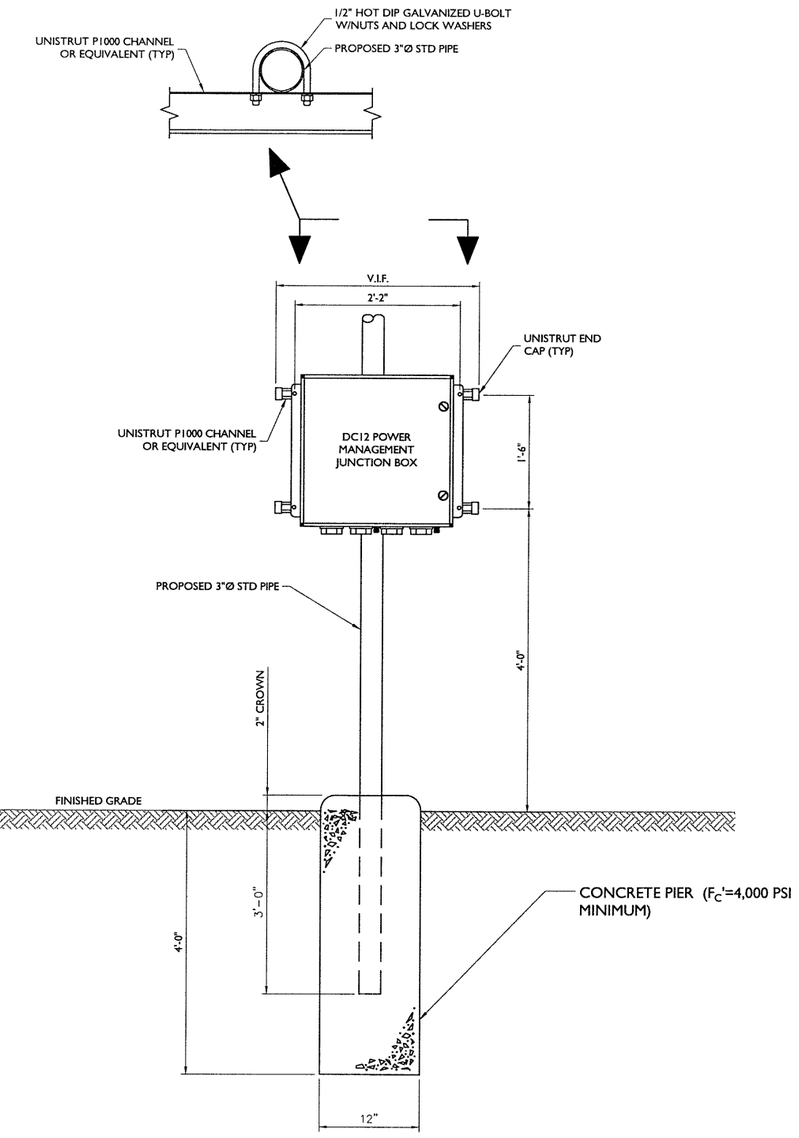


SURGE ARRESTOR MOUNTING DETAIL
NOT TO SCALE



NOTES:

1. SUBCONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS AND POST.
2. SUBCONTRACTOR SHALL SUPPLY 3/8"Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER DC12. SUBCONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.

DC12-48-60-25E POST MOUNT W/CONCRETE PIER (ON GRADE)
NOT TO SCALE

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2	02/18/16	REVISED PER SMARTLINK'S COMMENTS	JRF	FEP
1	02/02/16	ISSUED AS FINAL	JRF	FEP
0	12/14/15	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT · FRANK E. PAZDEN · 28188 · LICENSED PROFESSIONAL ENGINEER

FRANK E. PAZDEN
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28188

SITE NAME:

MANCHESTER NORTH
FA# 10071100
SITE # CTL05307

53-73 SLATER STREET
MANCHESTER, CT 06040
COUNTY OF HARTFORD
CROWN SITE ID #: 876347

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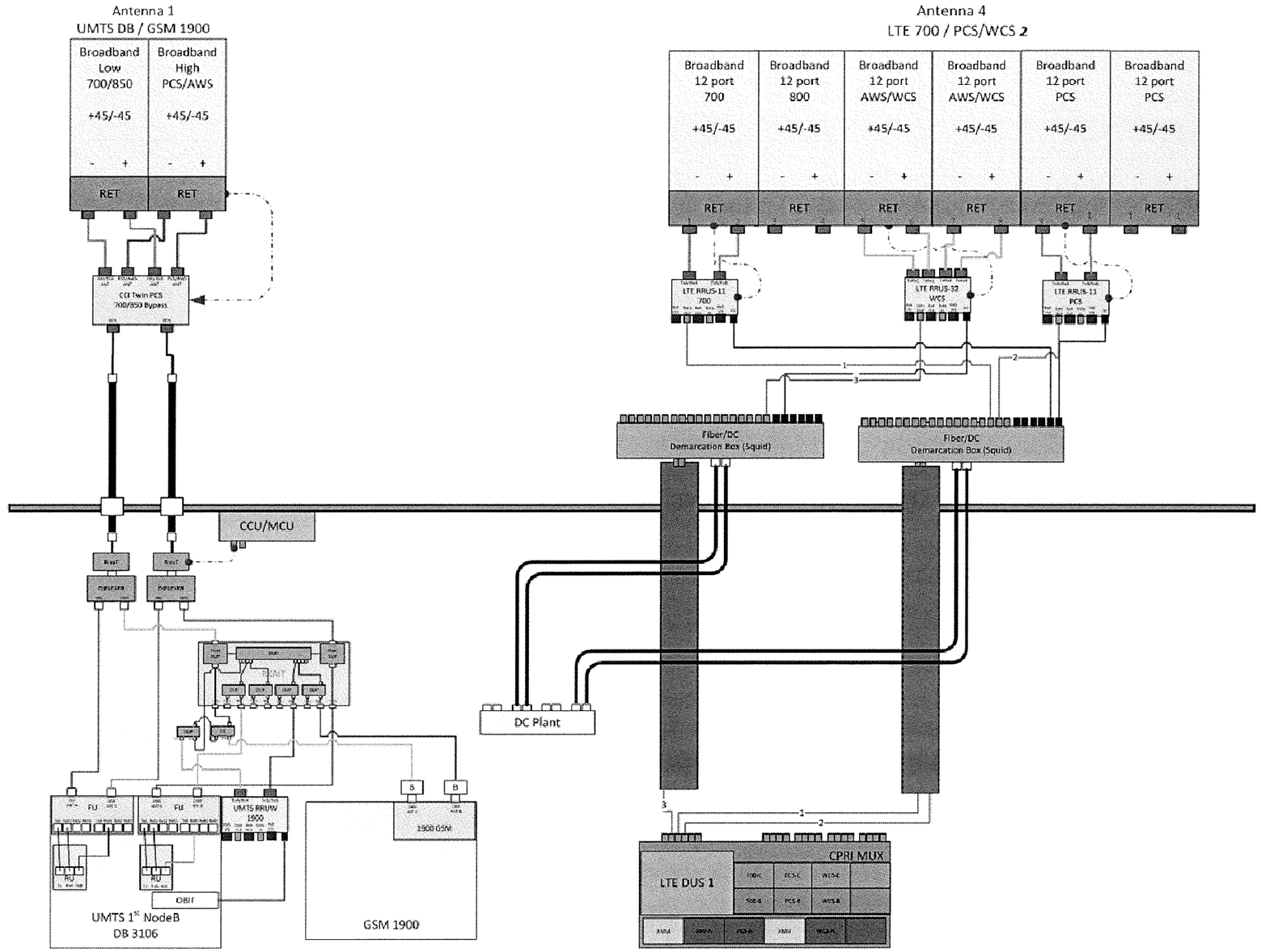
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: DETAILS

SHEET NUMBER: A-5



ALL SECTORS

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTV5307_2016-LTE-Next-Carrier_LTE-3C_om636a_2051A02J05_10071100_25942_06-25-2015_Final-Approved_v2.00"

RF PLUMBING DIAGRAMS

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SCALE : AS SHOWN

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0	12/14/15	ISSUED FOR REVIEW	DTS	FEP

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

SITE NAME:

MANCHESTER NORTH
FA# 10071100
SITE # CTL05307

53-73 SLATER STREET
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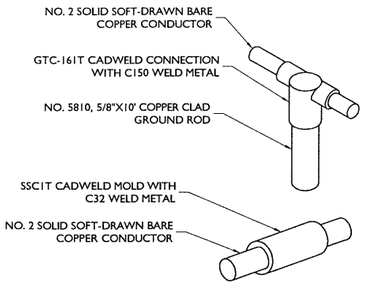
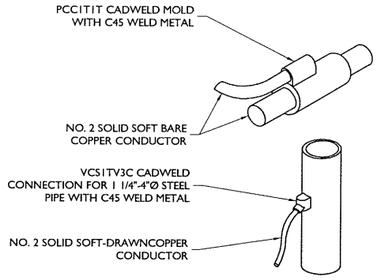
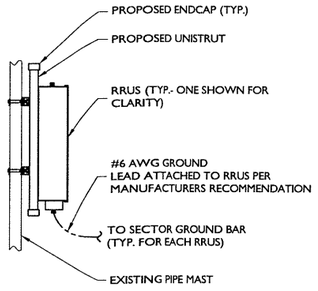
SHEET TITLE : RF PLUMBING DIAGRAMS

SHEET NUMBER : A-6





CADWELD DETAILS
NOT TO SCALE



RRH GROUNDING
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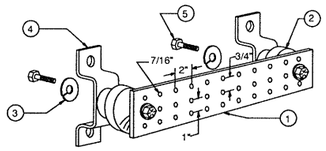


LEGEND

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

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

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

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

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

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

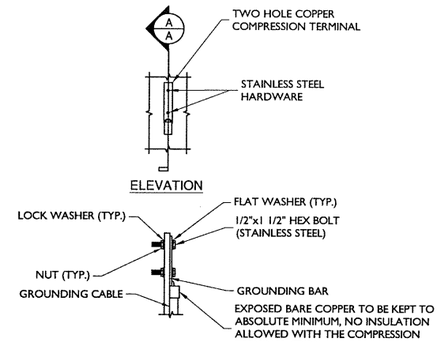
SECTION "P" - SURGE PRODUCERS

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

SECTION "A" - SURGE ABSORBERS

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

MASTER GROUND BAR
NOT TO SCALE



TYPICAL GROUND BAR CONNECTION DETAIL
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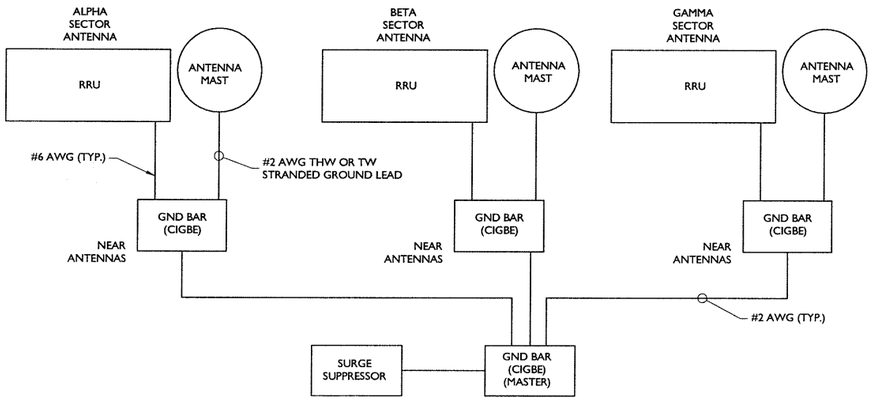
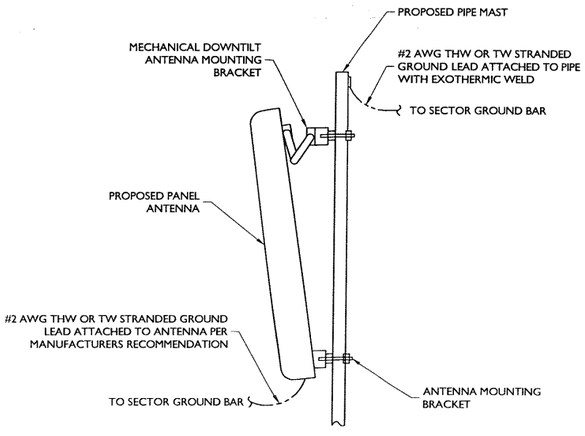


SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE



ANTENNA GROUNDING
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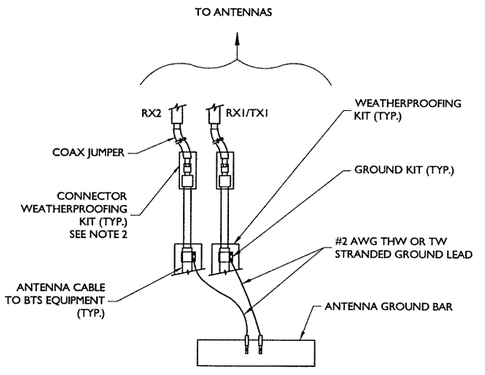

NOTES:

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

TYPICAL GROUND WIRE TO GROUNDING BAR
NOT TO SCALE

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1	02/02/16	ISSUED FOR REVIEW	JRF	FEP
0	12/16/15	ISSUED FOR REVIEW	JRF	FEP

STATE OF CONNECTICUT
FRANK E. PAZDERA
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER PENDING
LICENSED PROFESSIONAL ENGINEER

SITE NAME:

MANCHESTER NORTH
FA# 10071100
SITE # CTL05307

53-73 SLATER STREET
MANCHESTER, CT 06040
COUNTY OF HARTFORD
CROWN SITE ID #: 876347

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

PJF PAUL J. FORD & COMPANY

Date: **May 25, 2016**

Rebecca Klein
Crown Castle
525 Alderman Lane
Fort Mill, SC 29715
704.405.5625

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL05307
	Carrier Site Name:	Manchester North
Crown Castle Designation:	**Crown Castle BU Number:**	876347
	Crown Castle Site Name:	BUCKLAND MALL
	Crown Castle JDE Job Number:	351390
	Crown Castle Work Order Number:	1241070
	Crown Castle Application Number:	315907 Rev. 3
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0064.003.7805
Site Data:	**53 Slater Street, MANCHESTER, Hartford County, CT**	
	Latitude *41° 48' 18"*, Longitude *-72° 32' 1"*	
	155 Foot - Monopole Tower	

Dear Rebecca Klein,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 906476, in accordance with application 315907, 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:

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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

5-25-16

tnxTower Report - version 7.0.5.1

Date: **May 25, 2016**

Rebecca Klein
Crown Castle
525 Alderman Lane
Fort Mill, SC 29715
704.405.5625

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL05307
	Carrier Site Name:	Manchester North
Crown Castle Designation:	**Crown Castle BU Number:**	876347
	Crown Castle Site Name:	BUCKLAND MALL
	Crown Castle JDE Job Number:	351390
	Crown Castle Work Order Number:	1241070
	Crown Castle Application Number:	315907 Rev. 3
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0064.003.7805
Site Data:	**53 Slater Street, MANCHESTER, Hartford County, CT** **Latitude *41° 48' 18"*, Longitude *-72° 32' 1"*** **155 Foot - Monopole Tower**	

Dear Rebecca Klein,

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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:

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

Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 155 ft. monopole tower designed by Summit in February of 2002. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	3	cci antennas	DTMABP7819VG12A	1 2	3/8 3/4	--
		3	ericsson	RRUS 32 B30			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
155.0	155.0	3	alcatel lucent	TD-RRH8x20-25	3 5 1 1 3	5/16 1/2 5/8 3/4 1-1/4	1
		3	argus technologies	LPX310R w/ Mount Pipe			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Platform Mount [LP 713-1]			
	151.0	1	andrew	VHLP1-23			
		1	andrew	VHLP2-11			
		1	andrew	VHLP2.5-18			
		3	dragonwave	HORIZON COMPACT			
153.0	153.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	--	--	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Pipe Mount [PM 601-3]			
145.0	147.0	3	ericsson	RRUS 11	--	--	1
	145.0	1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	3	ericsson	RRUS-11	1 2 6	3/8 3/4 1-1/4	1
		3	kathrein	800 10121 w/ Mount Pipe			
		6	kathrein	860 10025			
		1	raycap	DC6-48-60-18-8F			
	143.0	1	tower mounts	T-Arm Mount [TA 702-3]			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	--	--	3
		6	powerwave technologies	LGP21401			
133.0	133.0	3	ericsson	KRC 118 057/1 w/ Mount Pipe	--	--	2
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 6	1-1/4 1-5/8	1
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 403-1]			
113.0	113.0	3	alcatel lucent	RRH2X60-AWS	1	1-5/8	2
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		6	commscope	SBNHH-1D65B w/ Mount Pipe			
		3	andrew	LNX-6512DS-T0M w/ Mount Pipe	13	1-5/8	1
		3	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Platform Mount [LP 1201-1]			
78.0	78.0	1	tower mounts	Platform Mount [LP 303-1]	--	--	3
60.0	60.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	3

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1204605EG1, 06/12/2012	1533476	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 3960/29298-597, 09/11/1998	1615406	CCISITES
4-TOWER MANUFACTURER DRAWINGS	SEA/PJF, A02-T0021, 02/18/2002	2068033	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	155 - 115.5	Pole	TP29.31x22x0.25	1	-8.73	1080.07	62.9	Pass
L2	115.5 - 79.25	Pole	TP35.51x28.11x0.31	2	-17.06	1772.22	92.9	Pass
L3	79.25 - 43.75	Pole	TP41.46x34.06x0.38	3	-24.67	2481.90	99.6	Pass
L4	43.75 - 0	Pole	TP48.8x39.73x0.44	4	-38.45	3491.31	97.9	Pass
							Summary	
						Pole (L3)	99.6	Pass
						Rating =	99.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.0	Pass
1	Base Plate	0	78.1	Pass
1	Base Foundation Structural Steel	0	53.8	Pass
1	Base Foundation Soil Interaction	0	85.3	Pass

Structure Rating (max from all components) =	99.6%

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

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80.0 mph.
3) Nominal ice thickness of 1.00 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 37.6 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50.0 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* ft	*Section Length* ft	*Splice Length* ft	*Number of Sides*	*Top Diameter* in	*Bottom Diameter* in	*Wall Thickness* in	*Bend Radius* in	*Pole Grade*
L1	155.00-115.50	39.50	3.75	18	22.00	29.31	0.25	1.00	A607-60 (60 ksi)
L2	115.50-79.25	40.00	4.50	18	28.11	35.51	0.31	1.25	A607-65 (65 ksi)
L3	79.25-43.75	40.00	5.25	18	34.06	41.46	0.38	1.50	A607-65 (65 ksi)
L4	43.75-0.00	49.00		18	39.73	48.80	0.44	1.75	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.34	17.26	1031.48	7.72	11.18	92.29	2064.32	8.63	3.43	13.728
	29.76	23.06	2459.70	10.32	14.89	165.21	4922.63	11.53	4.72	18.873
L2	29.25	27.58	2692.83	9.87	14.28	188.55	5389.20	13.79	4.40	14.074
	36.06	34.92	5466.10	12.50	18.04	302.98	10939.40	17.46	5.70	18.241
L3	35.43	40.09	5745.80	11.96	17.30	332.11	11499.17	20.05	5.33	14.224
	42.10	48.90	10425.54	14.58	21.06	495.05	20864.80	24.45	6.64	17.697
L4	41.33	54.57	10646.61	13.95	20.19	527.44	21307.22	27.29	6.22	14.225
	49.55	67.16	19844.89	17.17	24.79	800.51	39715.89	33.59	7.82	17.872

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 155.00-115.50				1	1	1			
L2 115.50-79.25				1	1	1			
L3 79.25-43.75				1	1	1			
L4 43.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
ATCB-B01-005(5/16)	C	No	Inside Pole	155.00 - 0.00	3	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
						2" Ice	0.00	0.07
						4" Ice	0.00	0.07
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	155.00 - 0.00	5	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
2" Conduit	C	No	CaAa (Out Of Face)	155.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	2.53
						1" Ice	0.00	4.51
						2" Ice	0.00	10.30
						4" Ice	0.00	29.21
2" Conduit	C	No	CaAa (Out Of Face)	155.00 - 0.00	1	No Ice	0.17	1.16
						1/2" Ice	0.27	2.53
						1" Ice	0.37	4.51
						2" Ice	0.57	10.30
						4" Ice	0.97	29.21
9776(3/4")	C	No	Inside Pole	155.00 - 0.00	1	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
						2" Ice	0.00	0.31
						4" Ice	0.00	0.31
HB058-M12-XXXF(5/8")	C	No	Inside Pole	155.00 - 0.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	0.24
						1" Ice	0.00	0.24
						2" Ice	0.00	0.24
						4" Ice	0.00	0.24
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	155.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	143.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
FB-L98B-002-75000(3/8")	C	No	Inside Pole	143.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	143.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
2" Conduit	C	No	Inside Pole	143.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
						2" Ice	0.00	1.16
						4" Ice	0.00	1.16
FB-L98B-034-XXXXXX(3/8)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	No Ice	0.00	0.05
						1/2" Ice	0.00	0.60
						1" Ice	0.00	1.75
						2" Ice	0.00	5.90
						4" Ice	0.00	21.52
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	No Ice	0.00	0.59
						1/2" Ice	0.00	1.37
						1" Ice	0.00	2.76
						2" Ice	0.00	7.37
						4" Ice	0.00	23.92
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	No Ice	0.08	0.59
						1/2" Ice	0.18	1.37
						1" Ice	0.28	2.76
						2" Ice	0.48	7.37
						4" Ice	0.88	23.92
***								
HB114-21U3M12-XXXF(1-1/4")	C	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22
						4" Ice	0.00	1.22
LCF158-50JA-A0(1 5/8")	C	No	Inside Pole	133.00 - 0.00	6	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
***								
561(1-5/8")	C	No	Inside Pole	113.00 - 0.00	12	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
						2" Ice	0.00	1.35
						4" Ice	0.00	1.35
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
***								
***								

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	155.00-115.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.002	0.52
L2	115.50-79.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.113	1.23
L3	79.25-43.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.925	1.25
L4	43.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.999	1.54

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	155.00-115.50	A	1.184	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.863	1.62
L2	115.50-79.25	A	1.138	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	26.277	2.33
L3	79.25-43.75	A	1.077	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	25.086	2.26
L4	43.75-0.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	29.851	2.66

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	155.00-115.50	-0.27	0.16	-0.60	0.35
L2	115.50-79.25	-0.30	0.17	-0.70	0.40
L3	79.25-43.75	-0.30	0.17	-0.72	0.41
L4	43.75-0.00	-0.31	0.18	-0.72	0.42

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.31 2.64 2.99 3.77 5.50	2.34 2.87 3.41 4.56 7.24	0.03 0.05 0.08 0.16 0.40
LPX310R w/ Mount Pipe	B	From Leg	4.00 0.00	0.000	155.00	No Ice 1/2"	2.31 2.64	2.34 2.87	0.03 0.05

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
			0.00			Ice	2.99	3.41	0.08
						1" Ice	3.77	4.56	0.16
						2" Ice	5.50	7.24	0.40
						4" Ice			
LPX310R w/ Mount Pipe	C	From Leg	4.00	0.000	155.00	No Ice	2.31	2.34	0.03
			0.00			1/2"	2.64	2.87	0.05
			0.00			Ice	2.99	3.41	0.08
						1" Ice	3.77	4.56	0.16
						2" Ice	5.50	7.24	0.40
						4" Ice			
HORIZON COMPACT	A	From Leg	4.00	0.000	155.00	No Ice	0.84	0.43	0.01
			0.00			1/2"	0.97	0.52	0.02
			-4.00			Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
HORIZON COMPACT	B	From Leg	4.00	0.000	155.00	No Ice	0.84	0.43	0.01
			0.00			1/2"	0.97	0.52	0.02
			-4.00			Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
HORIZON COMPACT	C	From Leg	4.00	0.000	155.00	No Ice	0.84	0.43	0.01
			0.00			1/2"	0.97	0.52	0.02
			-4.00			Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
WIMAX DAP HEAD	A	From Leg	4.00	0.000	155.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			0.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	B	From Leg	4.00	0.000	155.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			0.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Leg	4.00	0.000	155.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			0.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.000	155.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.000	155.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.000	155.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVTM14-C-120 w/	A	From Leg	4.00	0.000	155.00	No Ice	7.13	4.96	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment ° °	Placement ft ft		C_AA_A Front ft^2 ft^2	C_AA_A Side ft^2 ft^2	Weight K K
Mount Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.66 8.18 9.26 11.53	5.75 6.47 8.01 11.41	0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Platform Mount [LP 713-1]	C	None		0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
***									
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00 0.00 0.00	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
Pipe Mount [PM 601-3]	C	None		0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
***									
RRUS 11	A	From Leg	1.00 0.00 2.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	B	From Leg	1.00 0.00 2.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
RRUS 11	C	From Leg	1.00 0.00 2.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.26 3.50 3.75 4.28 5.44	1.38 1.56 1.74 2.15 3.05	0.05 0.07 0.10 0.15 0.31
Pipe Mount [PM 601-3]	C	None		0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
***									
800 10121 w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.000	143.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.03 6.71 7.30 8.50 11.04	4.95 6.02 6.81 8.46 12.10	0.07 0.12 0.18 0.32 0.73
800 10121 w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.000	143.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.03 6.71 7.30 8.50 11.04	4.95 6.02 6.81 8.46 12.10	0.07 0.12 0.18 0.32 0.73
800 10121 w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.000	143.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.03 6.71 7.30 8.50 11.04	4.95 6.02 6.81 8.46 12.10	0.07 0.12 0.18 0.32 0.73
(2) 860 10025	A	From Leg	3.00 0.00	0.000	143.00	No Ice 1/2"	0.16 0.22	0.13 0.19	0.00 0.00

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
			2.00				Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
(2) 860 10025	B	From Leg	3.00		0.000	143.00	No Ice	0.16	0.13	0.00
			0.00				1/2"	0.22	0.19	0.00
			2.00				Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
(2) 860 10025	C	From Leg	3.00		0.000	143.00	No Ice	0.16	0.13	0.00
			0.00				1/2"	0.22	0.19	0.00
			2.00				Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
RRUS-11	A	From Leg	3.00		0.000	143.00	No Ice	3.26	1.38	0.05
			0.00				1/2"	3.50	1.56	0.07
			2.00				Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
RRUS-11	B	From Leg	3.00		0.000	143.00	No Ice	3.26	1.38	0.05
			0.00				1/2"	3.50	1.56	0.07
			2.00				Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
RRUS-11	C	From Leg	3.00		0.000	143.00	No Ice	3.26	1.38	0.05
			0.00				1/2"	3.50	1.56	0.07
			2.00				Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
DC6-48-60-18-8F	A	From Leg	3.00		0.000	143.00	No Ice	1.47	1.47	0.02
			0.00				1/2"	1.67	1.67	0.04
			2.00				Ice	1.88	1.88	0.06
							1" Ice	2.33	2.33	0.11
							2" Ice	3.38	3.38	0.24
							4" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	3.00		0.000	143.00	No Ice	8.64	8.46	0.14
			0.00				1/2"	9.29	9.66	0.21
			2.00				Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	3.00		0.000	143.00	No Ice	8.64	8.46	0.14
			0.00				1/2"	9.29	9.66	0.21
			2.00				Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	3.00		0.000	143.00	No Ice	8.64	8.46	0.14
			0.00				1/2"	9.29	9.66	0.21
			2.00				Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
DTMABP7819VG12A	A	From Leg	3.00		0.000	143.00	No Ice	1.14	0.39	0.02
			0.00				1/2"	1.28	0.49	0.03
			2.00				Ice	1.44	0.59	0.04
							1" Ice	1.77	0.83	0.06
							2" Ice	2.54	1.41	0.14
							4" Ice			
DTMABP7819VG12A	B	From Leg	3.00		0.000	143.00	No Ice	1.14	0.39	0.02

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
			0.00			1/2"	1.28	0.49	0.03
			2.00			Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
						2" Ice	2.54	1.41	0.14
						4" Ice			
DTMABP7819VG12A	C	From Leg	3.00	0.000	143.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			2.00			Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
						2" Ice	2.54	1.41	0.14
						4" Ice			
RRUS 32 B30	A	From Leg	3.00	0.000	143.00	No Ice	3.87	2.76	0.08
			0.00			1/2"	4.15	3.02	0.10
			2.00			Ice	4.44	3.29	0.14
						1" Ice	5.06	3.85	0.21
						2" Ice	6.38	5.08	0.41
						4" Ice			
RRUS 32 B30	B	From Leg	3.00	0.000	143.00	No Ice	3.87	2.76	0.08
			0.00			1/2"	4.15	3.02	0.10
			2.00			Ice	4.44	3.29	0.14
						1" Ice	5.06	3.85	0.21
						2" Ice	6.38	5.08	0.41
						4" Ice			
RRUS 32 B30	C	From Leg	3.00	0.000	143.00	No Ice	3.87	2.76	0.08
			0.00			1/2"	4.15	3.02	0.10
			2.00			Ice	4.44	3.29	0.14
						1" Ice	5.06	3.85	0.21
						2" Ice	6.38	5.08	0.41
						4" Ice			
DC6-48-60-18-8F	A	From Leg	3.00	0.000	143.00	No Ice	1.47	1.47	0.02
			0.00			1/2"	1.67	1.67	0.04
			2.00			Ice	1.88	1.88	0.06
						1" Ice	2.33	2.33	0.11
						2" Ice	3.38	3.38	0.24
						4" Ice			
T-Arm Mount [TA 702-3]	C	None		0.000	143.00	No Ice	5.64	5.64	0.34
						1/2"	6.55	6.55	0.43
						Ice	7.46	7.46	0.52
						1" Ice	9.28	9.28	0.70
						2" Ice	12.92	12.92	1.06
						4" Ice			
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.000	133.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.000	133.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.000	133.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
KRY 112 144/1	A	From Leg	4.00	0.000	133.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			0.00			Ice	0.59	0.35	0.02
						1" Ice	0.81	0.53	0.03
						2" Ice	1.36	1.00	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRC 118 057/1 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.75 10.29 10.84 11.96 14.31	7.94 8.83 9.65 11.36 14.98	0.16 0.24 0.33 0.52 1.05
KRC 118 057/1 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.75 10.29 10.84 11.96 14.31	7.94 8.83 9.65 11.36 14.98	0.16 0.24 0.33 0.52 1.05
KRC 118 057/1 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.75 10.29 10.84 11.96 14.31	7.94 8.83 9.65 11.36 14.98	0.16 0.24 0.33 0.52 1.05
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
(2) 2.375" OD x 5' Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.19 1.50 1.81 2.46 3.92	1.19 1.50 1.81 2.46 3.92	0.02 0.03 0.04 0.08 0.20
(2) 2.375" OD x 5' Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.19 1.50 1.81 2.46 3.92	1.19 1.50 1.81 2.46 3.92	0.02 0.03 0.04 0.08 0.20
(2) 2.375" OD x 5' Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	133.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81 2.46	1.19 1.50 1.81 2.46	0.02 0.03 0.04 0.08

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
							2" Ice	3.92	3.92	0.20
							4" Ice			
Platform Mount [LP 403-1]	C	None			0.000	133.00	No Ice	18.85	18.85	1.50
							1/2" Ice	24.30	24.30	1.80
							1" Ice	29.75	29.75	2.09
							2" Ice	40.65	40.65	2.69
							4" Ice	62.45	62.45	3.87
***										
BXA-70063/6CFx2 w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	No Ice	7.97	5.40	0.04
			0.00				1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
BXA-70063/6CFx2 w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	No Ice	7.97	5.40	0.04
			0.00				1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
BXA-70063/6CFx2 w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	No Ice	7.97	5.40	0.04
			0.00				1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
LNX-6512DS-T0M w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	No Ice	5.85	4.55	0.05
			0.00				1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
LNX-6512DS-T0M w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	No Ice	5.85	4.55	0.05
			0.00				1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
LNX-6512DS-T0M w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	No Ice	5.85	4.55	0.05
			0.00				1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.00	0.000	113.00	No Ice	5.60	2.33	0.04
			0.00				1/2" Ice	5.92	2.56	0.08
							1" Ice	6.24	2.79	0.12
							2" Ice	6.91	3.28	0.21
							4" Ice	8.37	4.37	0.45
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	No Ice	8.64	7.07	0.07
			0.00				1/2" Ice	9.30	8.26	0.14
							1" Ice	9.92	9.18	0.21
							2" Ice	11.20	11.01	0.39
							4" Ice	13.86	15.05	0.90
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	No Ice	8.64	7.07	0.07
			0.00				1/2" Ice	9.30	8.26	0.14
							1" Ice	9.92	9.18	0.21
							2" Ice	11.20	11.01	0.39
							4" Ice	13.86	15.05	0.90
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	No Ice	8.64	7.07	0.07
							1/2"	9.30	8.26	0.14

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
			0.00			Ice	9.92	9.18	0.21
						1" Ice	11.20	11.01	0.39
						2" Ice	13.86	15.05	0.90
						4" Ice			
RRH2X60-AWS	A	From Leg	4.00	0.000	113.00	No Ice	2.19	1.43	0.04
			0.00			1/2"	2.40	1.61	0.06
			0.00			Ice	2.61	1.80	0.08
						1" Ice	3.07	2.21	0.13
						2" Ice	4.09	3.13	0.26
						4" Ice			
RRH2X60-AWS	B	From Leg	4.00	0.000	113.00	No Ice	2.19	1.43	0.04
			0.00			1/2"	2.40	1.61	0.06
			0.00			Ice	2.61	1.80	0.08
						1" Ice	3.07	2.21	0.13
						2" Ice	4.09	3.13	0.26
						4" Ice			
RRH2X60-AWS	C	From Leg	4.00	0.000	113.00	No Ice	2.19	1.43	0.04
			0.00			1/2"	2.40	1.61	0.06
			0.00			Ice	2.61	1.80	0.08
						1" Ice	3.07	2.21	0.13
						2" Ice	4.09	3.13	0.26
						4" Ice			
RRH2X60-PCS	A	From Leg	4.00	0.000	113.00	No Ice	2.57	2.01	0.06
			0.00			1/2"	2.79	2.22	0.08
			0.00			Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
RRH2X60-PCS	B	From Leg	4.00	0.000	113.00	No Ice	2.57	2.01	0.06
			0.00			1/2"	2.79	2.22	0.08
			0.00			Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
RRH2X60-PCS	C	From Leg	4.00	0.000	113.00	No Ice	2.57	2.01	0.06
			0.00			1/2"	2.79	2.22	0.08
			0.00			Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
RRH2x60-700	A	From Leg	4.00	0.000	113.00	No Ice	3.96	1.82	0.06
			0.00			1/2"	4.27	2.08	0.08
			0.00			Ice	4.60	2.36	0.11
						1" Ice	5.27	2.96	0.17
						2" Ice	6.72	4.25	0.35
						4" Ice			
RRH2x60-700	B	From Leg	4.00	0.000	113.00	No Ice	3.96	1.82	0.06
			0.00			1/2"	4.27	2.08	0.08
			0.00			Ice	4.60	2.36	0.11
						1" Ice	5.27	2.96	0.17
						2" Ice	6.72	4.25	0.35
						4" Ice			
RRH2x60-700	C	From Leg	4.00	0.000	113.00	No Ice	3.96	1.82	0.06
			0.00			1/2"	4.27	2.08	0.08
			0.00			Ice	4.60	2.36	0.11
						1" Ice	5.27	2.96	0.17
						2" Ice	6.72	4.25	0.35
						4" Ice			
Platform Mount [LP 1201-1]	C	None		0.000	113.00	No Ice	23.10	23.10	2.10
						1/2"	26.80	26.80	2.50
						Ice	30.50	30.50	2.90
						1" Ice	37.90	37.90	3.70
						2" Ice	52.70	52.70	5.30
						4" Ice			

***

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***								
***								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-23	A	Paraboloid w/o Radome	From Leg	4.00 0.00 -4.00	0.000		155.00	1.27	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.28 1.45 1.62 1.97 2.66	0.01 0.02 0.03 0.04 0.07
VHLP2.5-18	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 -4.00	0.000		155.00	2.92	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.68 7.07 7.46 8.23 9.78	0.05 0.08 0.12 0.19 0.34
VHLP2-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 -4.00	0.000		155.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 155.00-115.50	134.52	1.494	24	84.444	A	0.000	84.444	84.444	100.00	0.000	0.000
					B	0.000	84.444		100.00	0.000	0.000
					C	0.000	84.444		100.00	0.000	9.002
L2 115.50-79.25	96.99	1.361	22	97.153	A	0.000	97.153	97.153	100.00	0.000	0.000
					B	0.000	97.153		100.00	0.000	0.000
					C	0.000	97.153		100.00	0.000	9.113
L3 79.25-43.75	61.36	1.194	19	112.927	A	0.000	112.927	112.927	100.00	0.000	0.000
					B	0.000	112.927		100.00	0.000	0.000
					C	0.000	112.927		100.00	0.000	8.925
L4 43.75-0.00	21.22	1	16	163.162	A	0.000	163.162	163.162	100.00	0.000	0.000
					B	0.000	163.162		100.00	0.000	0.000
					C	0.000	163.162		100.00	0.000	10.999

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 155.00-115.50	134.52	1.494	5	1.18	92.237	A	0.000	92.237	92.237	100.00	0.000	0.000
						B	0.000	92.237		100.00	0.000	0.000
						C	0.000	92.237		100.00	0.000	24.863
L2 115.50-79.25	96.99	1.361	5	1.14	104.304	A	0.000	104.304	104.304	100.00	0.000	0.000
						B	0.000	104.304		100.00	0.000	0.000
						C	0.000	104.304		100.00	0.000	26.277
L3 79.25-43.75	61.36	1.194	4	1.08	119.661	A	0.000	119.661	119.661	100.00	0.000	0.000
						B	0.000	119.661		100.00	0.000	0.000
						C	0.000	119.661		100.00	0.000	25.086
L4 43.75-0.00	21.22	1	4	1.00	171.017	A	0.000	171.017	171.017	100.00	0.000	0.000
						B	0.000	171.017		100.00	0.000	0.000
						C	0.000	171.017		100.00	0.000	29.851

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 155.00-115.50	134.52	1.494	10	84.444	A	0.000	84.444	84.444	100.00	0.000	0.000
					B	0.000	84.444		100.00	0.000	0.000
					C	0.000	84.444		100.00	0.000	9.002
L2 115.50-79.25	96.99	1.361	9	97.153	A	0.000	97.153	97.153	100.00	0.000	0.000
					B	0.000	97.153		100.00	0.000	0.000
					C	0.000	97.153		100.00	0.000	9.113
L3 79.25-43.75	61.36	1.194	8	112.927	A	0.000	112.927	112.927	100.00	0.000	0.000
					B	0.000	112.927		100.00	0.000	0.000
					C	0.000	112.927		100.00	0.000	8.925
L4 43.75-0.00	21.22	1	6	163.162	A	0.000	163.162	163.162	100.00	0.000	0.000
					B	0.000	163.162		100.00	0.000	0.000
					C	0.000	163.162		100.00	0.000	10.999

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	155 - 115.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-20.14	1	0
			Max. Mx	11	-8.74	390	4
			Max. My	2	-8.74	-1	388
			Max. Vy	5	15.54	-390	1
			Max. Vx	2	-15.50	-1	388
			Max. Torque	3			-1
L2	115.5 - 79.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-34.80	2	-1
			Max. Mx	11	-17.07	1147	8
			Max. My	2	-17.06	-2	1148
			Max. Vy	5	23.59	-1147	3
			Max. Vx	2	-23.68	-2	1148
			Max. Torque	5			1
L3	79.25 - 43.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-44.76	4	-2
			Max. Mx	11	-24.67	2010	12
			Max. My	2	-24.67	-2	2014
			Max. Vy	5	25.95	-2009	4
			Max. Vx	2	-26.04	-2	2014
			Max. Torque	5			1
L4	43.75 - 0	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-61.80	6	-3
			Max. Mx	11	-38.45	3349	17
			Max. My	2	-38.45	-3	3356
			Max. Vy	5	28.57	-3347	5
			Max. Vx	2	-28.66	-3	3356
			Max. Torque	5			1

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	61.80	-0.00	0.00
	Max. H_x	11	38.48	28.53	0.11
	Max. H_z	2	38.48	-0.03	28.62
	Max. M_x	2	3356	-0.03	28.62
	Max. M_z	5	3347	-28.54	0.04
	Max. Torsion	5	1	-28.54	0.04

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	2	38.48	-0.03	28.62
	Min. H_x	5	38.48	-28.54	0.04
	Min. H_z	8	38.48	-0.09	-28.57
	Min. M_x	8	-3348	-0.09	-28.57
	Min. M_z	11	-3349	28.53	0.11
	Min. Torsion	10	0	24.73	-14.22

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	38.48	-0.00	0.00	0	1	0
Dead+Wind 0 deg - No Ice	38.48	0.03	-28.62	-3356	-3	0
Dead+Wind 30 deg - No Ice	38.48	14.38	-24.70	-2893	-1691	0
Dead+Wind 60 deg - No Ice	38.48	24.77	-14.24	-1667	-2907	0
Dead+Wind 90 deg - No Ice	38.48	28.54	-0.04	-5	-3347	-1
Dead+Wind 120 deg - No Ice	38.48	24.80	14.23	1665	-2913	0
Dead+Wind 150 deg - No Ice	38.48	14.26	24.71	2896	-1672	0
Dead+Wind 180 deg - No Ice	38.48	0.09	28.57	3348	-13	0
Dead+Wind 210 deg - No Ice	38.48	-14.16	24.77	2905	1658	0
Dead+Wind 240 deg - No Ice	38.48	-24.73	14.22	1664	2904	0
Dead+Wind 270 deg - No Ice	38.48	-28.53	-0.11	-17	3349	0
Dead+Wind 300 deg - No Ice	38.48	-24.73	-14.32	-1679	2902	0
Dead+Wind 330 deg - No Ice	38.48	-14.34	-24.72	-2896	1686	0
Dead+Ice+Temp	61.80	0.00	-0.00	3	6	0
Dead+Wind 0 deg+Ice+Temp	61.80	0.01	-8.23	-1021	5	0
Dead+Wind 30 deg+Ice+Temp	61.80	4.13	-7.10	-880	-509	0
Dead+Wind 60 deg+Ice+Temp	61.80	7.12	-4.10	-506	-880	0
Dead+Wind 90 deg+Ice+Temp	61.80	8.21	-0.01	1	-1015	0
Dead+Wind 120 deg+Ice+Temp	61.80	7.13	4.09	511	-882	0
Dead+Wind 150 deg+Ice+Temp	61.80	4.10	7.11	887	-504	0
Dead+Wind 180 deg+Ice+Temp	61.80	0.02	8.22	1025	3	0
Dead+Wind 210 deg+Ice+Temp	61.80	-4.08	7.12	889	513	0
Dead+Wind 240 deg+Ice+Temp	61.80	-7.11	4.09	511	892	0
Dead+Wind 270 deg+Ice+Temp	61.80	-8.21	-0.03	-2	1028	0
Dead+Wind 300 deg+Ice+Temp	61.80	-7.11	-4.12	-509	892	0
Dead+Wind 330 deg+Ice+Temp	61.80	-4.12	-7.11	-881	521	0
Dead+Wind 0 deg - Service	38.48	0.01	-11.18	-1313	-1	0
Dead+Wind 30 deg - Service	38.48	5.62	-9.65	-1132	-661	0
Dead+Wind 60 deg - Service	38.48	9.67	-5.56	-652	-1137	0
Dead+Wind 90 deg - Service	38.48	11.15	-0.01	-2	-1310	0
Dead+Wind 120 deg - Service	38.48	9.69	5.56	652	-1140	0
Dead+Wind 150 deg - Service	38.48	5.57	9.65	1133	-654	0
Dead+Wind 180 deg - Service	38.48	0.03	11.16	1311	-5	0
Dead+Wind 210 deg - Service	38.48	-5.53	9.68	1137	649	0
Dead+Wind 240 deg - Service	38.48	-9.66	5.55	651	1137	0
Dead+Wind 270 deg -	38.48	-11.15	-0.04	-6	1311	0

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 300 deg - Service	38.48	-9.66	-5.59	-657	1136	0
Dead+Wind 330 deg - Service	38.48	-5.60	-9.66	-1133	660	0

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-38.48	0.00	0.00	38.48	0.00	0.000%
2	0.03	-38.48	-28.62	-0.03	38.48	28.62	0.007%
3	14.38	-38.48	-24.70	-14.38	38.48	24.70	0.000%
4	24.77	-38.48	-14.24	-24.77	38.48	14.24	0.000%
5	28.54	-38.48	-0.04	-28.54	38.48	0.04	0.007%
6	24.80	-38.48	14.23	-24.80	38.48	-14.23	0.000%
7	14.26	-38.48	24.71	-14.26	38.48	-24.71	0.000%
8	0.09	-38.48	28.57	-0.09	38.48	-28.57	0.007%
9	-14.16	-38.48	24.77	14.16	38.48	-24.77	0.000%
10	-24.73	-38.48	14.22	24.73	38.48	-14.22	0.000%
11	-28.54	-38.48	-0.11	28.53	38.48	0.11	0.007%
12	-24.73	-38.48	-14.32	24.73	38.48	14.32	0.000%
13	-14.34	-38.48	-24.72	14.34	38.48	24.72	0.000%
14	0.00	-61.80	0.00	-0.00	61.80	0.00	0.002%
15	0.01	-61.80	-8.23	-0.01	61.80	8.23	0.002%
16	4.13	-61.80	-7.11	-4.13	61.80	7.10	0.001%
17	7.12	-61.80	-4.10	-7.12	61.80	4.10	0.001%
18	8.21	-61.80	-0.01	-8.21	61.80	0.01	0.002%
19	7.13	-61.80	4.09	-7.13	61.80	-4.09	0.001%
20	4.10	-61.80	7.11	-4.10	61.80	-7.11	0.001%
21	0.02	-61.80	8.22	-0.02	61.80	-8.22	0.002%
22	-4.08	-61.80	7.12	4.08	61.80	-7.12	0.001%
23	-7.11	-61.80	4.09	7.11	61.80	-4.09	0.001%
24	-8.21	-61.80	-0.03	8.21	61.80	0.03	0.002%
25	-7.11	-61.80	-4.12	7.11	61.80	4.12	0.001%
26	-4.12	-61.80	-7.11	4.12	61.80	7.11	0.001%
27	0.01	-38.48	-11.18	-0.01	38.48	11.18	0.004%
28	5.62	-38.48	-9.65	-5.62	38.48	9.65	0.002%
29	9.67	-38.48	-5.56	-9.67	38.48	5.56	0.002%
30	11.15	-38.48	-0.01	-11.15	38.48	0.01	0.004%
31	9.69	-38.48	5.56	-9.69	38.48	-5.56	0.002%
32	5.57	-38.48	9.65	-5.57	38.48	-9.65	0.002%
33	0.03	-38.48	11.16	-0.03	38.48	-11.16	0.004%
34	-5.53	-38.48	9.68	5.53	38.48	-9.68	0.002%
35	-9.66	-38.48	5.55	9.66	38.48	-5.55	0.002%
36	-11.15	-38.48	-0.04	11.15	38.48	0.04	0.004%
37	-9.66	-38.48	-5.59	9.66	38.48	5.59	0.002%
38	-5.60	-38.48	-9.66	5.60	38.48	9.66	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00007344	0.00010318
3	Yes	20	0.00000001	0.00007583
4	Yes	20	0.00000001	0.00007512
5	Yes	15	0.00007346	0.00012216
6	Yes	20	0.00000001	0.00007453
7	Yes	20	0.00000001	0.00007483
8	Yes	15	0.00007348	0.00011208

9	Yes	20	0.00000001	0.00007409
10	Yes	20	0.00000001	0.00007431
11	Yes	15	0.00007345	0.00012363
12	Yes	20	0.00000001	0.00007570
13	Yes	20	0.00000001	0.00007505
14	Yes	9	0.00000001	0.00001430
15	Yes	16	0.00010751	0.00012727
16	Yes	17	0.00000001	0.00011588
17	Yes	17	0.00000001	0.00011542
18	Yes	16	0.00010753	0.00012661
19	Yes	17	0.00000001	0.00011593
20	Yes	17	0.00000001	0.00011534
21	Yes	16	0.00010749	0.00012757
22	Yes	17	0.00000001	0.00011757
23	Yes	17	0.00000001	0.00011747
24	Yes	16	0.00010751	0.00012826
25	Yes	17	0.00000001	0.00011776
26	Yes	17	0.00000001	0.00011791
27	Yes	15	0.00007933	0.00005309
28	Yes	16	0.00000001	0.00014873
29	Yes	16	0.00000001	0.00014676
30	Yes	15	0.00007935	0.00005441
31	Yes	16	0.00000001	0.00014356
32	Yes	16	0.00000001	0.00014605
33	Yes	15	0.00007933	0.00005308
34	Yes	16	0.00000001	0.00014367
35	Yes	16	0.00000001	0.00014364
36	Yes	15	0.00007934	0.00005361
37	Yes	16	0.00000001	0.00014869
38	Yes	16	0.00000001	0.00014517

Maximum Tower Deflections - Service Wind

Section No.	*Elevation* ft	*Horz. Deflection* in	*Gov. Load Comb.*	*Tilt* °	*Twist* °
L1	155 - 115.5	49.97	31	2.762	0.003
L2	119.25 - 79.25	30.15	27	2.417	0.001
L3	83.75 - 43.75	14.61	27	1.684	0.000
L4	49 - 0	4.92	27	0.931	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	*Appurtenance*	*Gov. Load Comb.*	*Deflection* in	*Tilt* °	*Twist* °	*Radius of Curvature* ft
155.00	LPX310R w/ Mount Pipe	31	49.97	2.762	0.003	22714
153.00	800MHz 2X50W RRH W/FILTER	31	48.82	2.749	0.003	22714
151.00	VHLP1-23	31	47.66	2.735	0.002	22714
145.00	RRUS 11	31	44.22	2.692	0.002	11356
143.00	800 10121 w/ Mount Pipe	31	43.08	2.677	0.002	9463
133.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	37.46	2.589	0.002	5161
113.00	BXA-70063/6CFx2 w/ Mount Pipe	27	27.05	2.313	0.001	3073

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 115.5	127.31	2	7.045	0.006
L2	119.25 - 79.25	76.89	2	6.167	0.003
L3	83.75 - 43.75	37.28	2	4.300	0.001
L4	49 - 0	12.57	2	2.378	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.00	LPX310R w/ Mount Pipe	2	127.31	7.045	0.006	9152
153.00	800MHz 2X50W RRH W/FILTER	2	124.37	7.010	0.006	9152
151.00	VHLP1-23	2	121.44	6.976	0.005	9152
145.00	RRUS 11	2	112.68	6.866	0.005	4574
143.00	800 10121 w/ Mount Pipe	2	109.78	6.827	0.005	3811
133.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	95.50	6.604	0.004	2076
113.00	BXA-70063/6CFx2 w/ Mount Pipe	2	68.98	5.901	0.004	1230

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	155 - 115.5 (1)	TP29.31x22x0.25	39.50	0.00	0.0	36.00	22.51	-8.73	810.25	0.011
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	40.00	0.00	0.0	39.00	34.09	-17.06	1329.50	0.013
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	40.00	0.00	0.0	39.00	47.74	-24.67	1861.89	0.013
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	49.00	0.00	0.0	39.00	67.16	-38.45	2619.14	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	155 - 115.5 (1)	TP29.31x22x0.25	390	29.76	36.00	0.827	0	0.00	36.00	0.000
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	1150	47.77	39.00	1.225	0	0.00	39.00	0.000
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	2014	51.22	39.00	1.313	0	0.00	39.00	0.000
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	3356	50.31	39.00	1.290	0	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	155 - 115.5 (1)	TP29.31x22x0.25	15.57	0.69	24.00	0.058	0	0.01	24.00	0.000
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	23.65	0.69	26.00	0.053	1	0.01	26.00	0.000
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	26.01	0.54	26.00	0.042	1	0.01	26.00	0.000
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	28.66	0.43	26.00	0.033	0	0.00	26.00	0.000

Pole Interaction Design Data

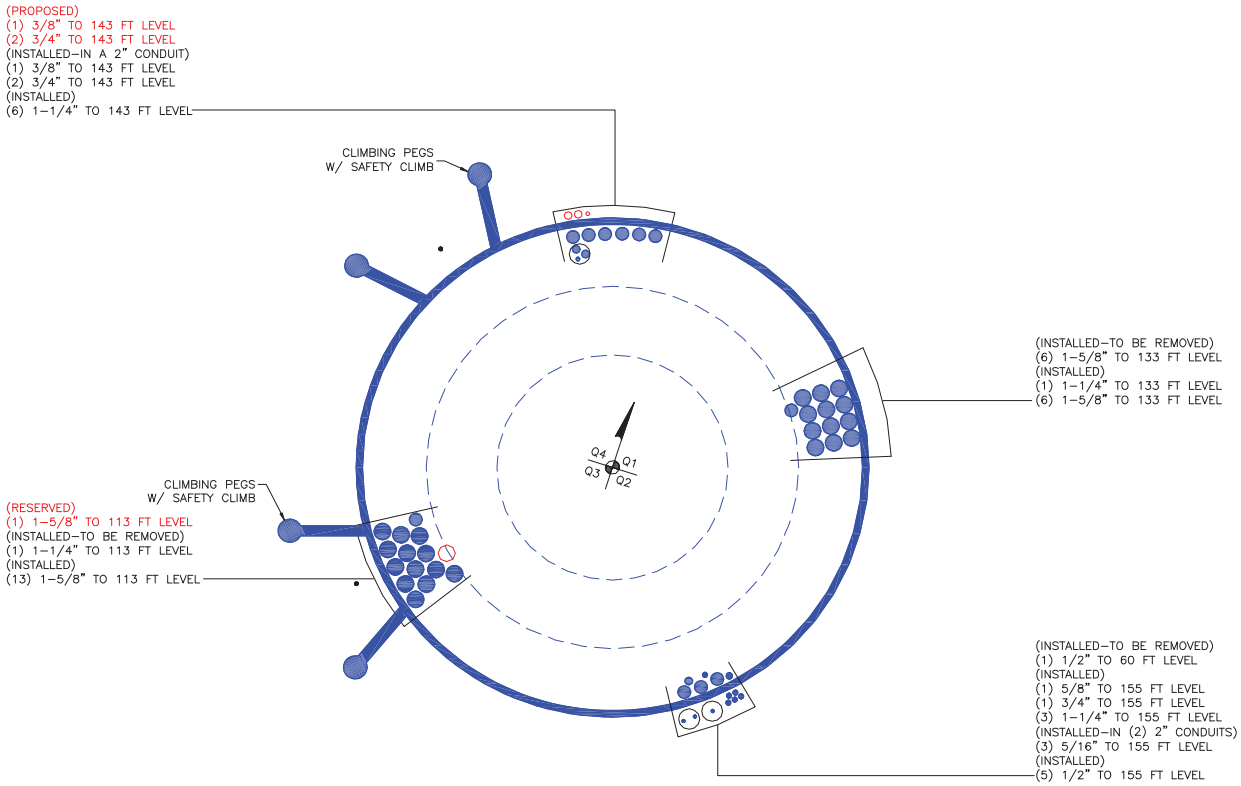
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	155 - 115.5 (1)	0.011	0.827	0.000	0.058	0.000	0.838 ✔	1.333	H1-3+VT ✔
L2	115.5 - 79.25 (2)	0.013	1.225	0.000	0.053	0.000	1.238 ✔	1.333	H1-3+VT ✔
L3	79.25 - 43.75 (3)	0.013	1.313	0.000	0.042	0.000	1.327 ✔	1.333	H1-3+VT ✔
L4	43.75 - 0 (4)	0.015	1.290	0.000	0.033	0.000	1.305 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	155 - 115.5	Pole	TP29.31x22x0.25	1	-8.73	1080.07	62.9	Pass
L2	115.5 - 79.25	Pole	TP35.51x28.11x0.31	2	-17.06	1772.22	92.9	Pass
L3	79.25 - 43.75	Pole	TP41.46x34.06x0.38	3	-24.67	2481.90	99.6	Pass
L4	43.75 - 0	Pole	TP48.8x39.73x0.44	4	-38.45	3491.31	97.9	Pass
							Summary	
						Pole (L3)	99.6	Pass
						RATING =	**99.6**	**Pass**

APPENDIX B

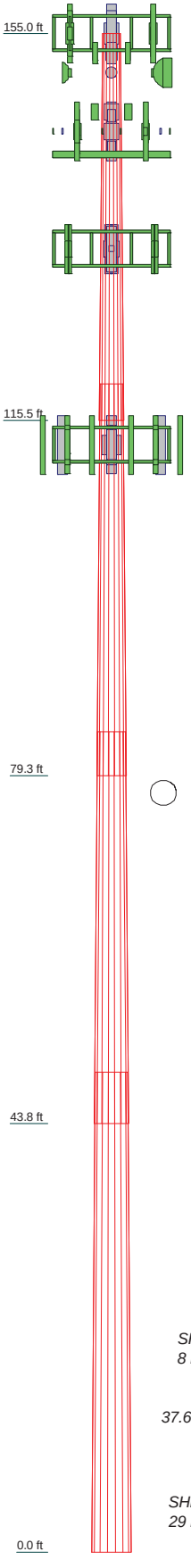
BASE LEVEL DRAWING


(PROPOSED)
(1) 3/8" TO 143 FT LEVEL
(2) 3/4" TO 143 FT LEVEL
(INSTALLED-IN A 2" CONDUIT)
(1) 3/8" TO 143 FT LEVEL
(2) 3/4" TO 143 FT LEVEL
(INSTALLED)
(6) 1-1/4" TO 143 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 133 FT LEVEL
(INSTALLED)
(1) 1-1/4" TO 133 FT LEVEL
(6) 1-5/8" TO 133 FT LEVEL
Q4
Q1
Q3
Q2
CLIMBING PEGS
W/ SAFETY CLIMB
(RESERVED)
(1) 1-5/8" TO 113 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1-1/4" TO 113 FT LEVEL
(INSTALLED)
(13) 1-5/8" TO 113 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1/2" TO 60 FT LEVEL
(INSTALLED)
(1) 5/8" TO 155 FT LEVEL
(1) 3/4" TO 155 FT LEVEL
(3) 1-1/4" TO 155 FT LEVEL
(INSTALLED-IN (2) 2" CONDUITS)
(3) 5/16" TO 155 FT LEVEL
(INSTALLED)
(5) 1/2" TO 155 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	39.50	18	0.25	3.75	22.00	29.31	A607-60	2.7
2	40.00	18	0.31	4.50	28.11	35.51	A607-60	4.3
3	40.00	18	0.38	5.25	34.06	41.46	A607-65	6.1
4	49.00	18	0.44		39.73	48.80		10.1
								23.2



AXIAL
62 K

SHEAR
8 K

MOMENT
1029 kip-ft

TORQUE 0 kip-ft
37.6 mph WIND - 1.00 in ICE

AXIAL
38 K

SHEAR
29 K

MOMENT
3356 kip-ft

TORQUE 1 kip-ft
REACTIONS - 80.0 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LPX310R w/ Mount Pipe	155	RRUS 32 B30	143
LPX310R w/ Mount Pipe	155	RRUS 32 B30	143
LPX310R w/ Mount Pipe	155	DC6-48-60-18-8F	143
HORIZON COMPACT	155	T-Arm Mount [TA 702-3]	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	KRY 112 144/1	133
WIMAX DAP HEAD	155	KRY 112 144/1	133
APXVSPP18-C-A20 w/ Mount Pipe	155	KRY 112 144/1	133
APXVSPP18-C-A20 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVSPP18-C-A20 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	RRUS 11 B12	133
APXVTM14-C-120 w/ Mount Pipe	155	RRUS 11 B12	133
TD-RRH8x20-25	155	RRUS 11 B12	133
TD-RRH8x20-25	155	(2) 2.375" OD x 5' Mount Pipe	133
TD-RRH8x20-25	155	(2) 2.375" OD x 5' Mount Pipe	133
Platform Mount [LP 713-1]	155	(2) 2.375" OD x 5' Mount Pipe	133
VHLP1-23	155	Platform Mount [LP 403-1]	133
VHLP2.5-18	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
VHLP2-11	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
PCS 1900MHz 4x45W-65MHz	153	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
PCS 1900MHz 4x45W-65MHz	153	LNX-6512DS-T0M w/ Mount Pipe	113
PCS 1900MHz 4x45W-65MHz	153	LNX-6512DS-T0M w/ Mount Pipe	113
Pipe Mount [PM 601-3]	153	LNX-6512DS-T0M w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	DB-T1-6Z-8AB-0Z	113
800MHz 2X50W RRH W/FILTER	153	(2) SBNHH-1D65B w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	(2) SBNHH-1D65B w/ Mount Pipe	113
Pipe Mount [PM 601-3]	145	(2) SBNHH-1D65B w/ Mount Pipe	113
RRUS 11	145	RRH2X60-AWS	113
RRUS 11	145	RRH2X60-AWS	113
RRUS 11	145	RRH2X60-AWS	113
(2) 860 10025	143	RRH2X60-PCS	113
(2) 860 10025	143	RRH2X60-PCS	113
(2) 860 10025	143	RRH2X60-PCS	113
RRUS-11	143	RRH2x60-700	113
RRUS-11	143	RRH2x60-700	113
RRUS-11	143	RRH2x60-700	113
DC6-48-60-18-8F	143	Platform Mount [LP 1201-1]	113
QS66512-2 w/ Mount Pipe	143	BXA-70063/6CFx2 w/ Mount Pipe	113
QS66512-2 w/ Mount Pipe	143	BXA-70063/6CFx2 w/ Mount Pipe	113
QS66512-2 w/ Mount Pipe	143	BXA-70063/6CFx2 w/ Mount Pipe	113
DTMABP7819VG12A	143		
DTMABP7819VG12A	143		
DTMABP7819VG12A	143		
RRUS 32 B30	143		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.6 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 99.6%

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

Job: 155 ft Monopole / Buckland Mall			
Project: PJF 37516-0064 / BU 876347			
Client: Crown Castle	Drawn by: Joey Meinerding	App'd:	
Code: TIA/EIA-222-F	Date: 05/25/16	Scale: NTS	
Path: T:\375_Crown_Castle\2016\37516-0064_876347_BUCKLAND MALL\37516-0064.003.7805_SA_1241\37516-0064.003.7805.eri		Dwg No. E-1	

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

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

Site Data

BU#: *876347*
Site Name: *Buckland Mall*
App #:

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	56	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	55	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	10	in

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

Pole Data		
Diam:	48.8	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3356	ft-kips
Unfactored Axial, P:	38	kips
Unfactored Shear, V:	29	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	177.4 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	91.0% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	39.1 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	78.1% **Pass**

PL Ref. Data
Yield Line (in):
28.98
Max PL Length:
28.98

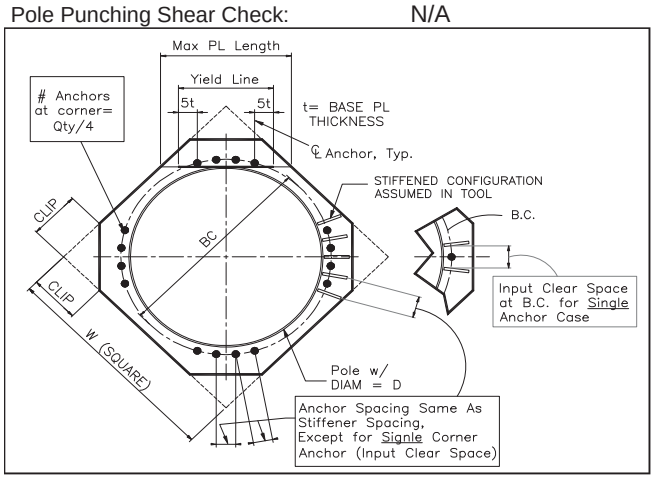
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Foundation Loads:

Pole weight or tower leg compression =	**38**	(kips)
Horizontal load at top of pier =	**29**	(kips)
Overturning moment at top of pier=	**3356**	(ft-kips)

Design criteria:

Safety factor against overturning =	**2**	

Soil Properties:

Soil density =	**105**	(pcf)
Allowable soil bearing =	**15**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**10**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**23**	(ft)
Footing length =	**23**	(ft)

Concrete:

Concrete strength =	**3**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

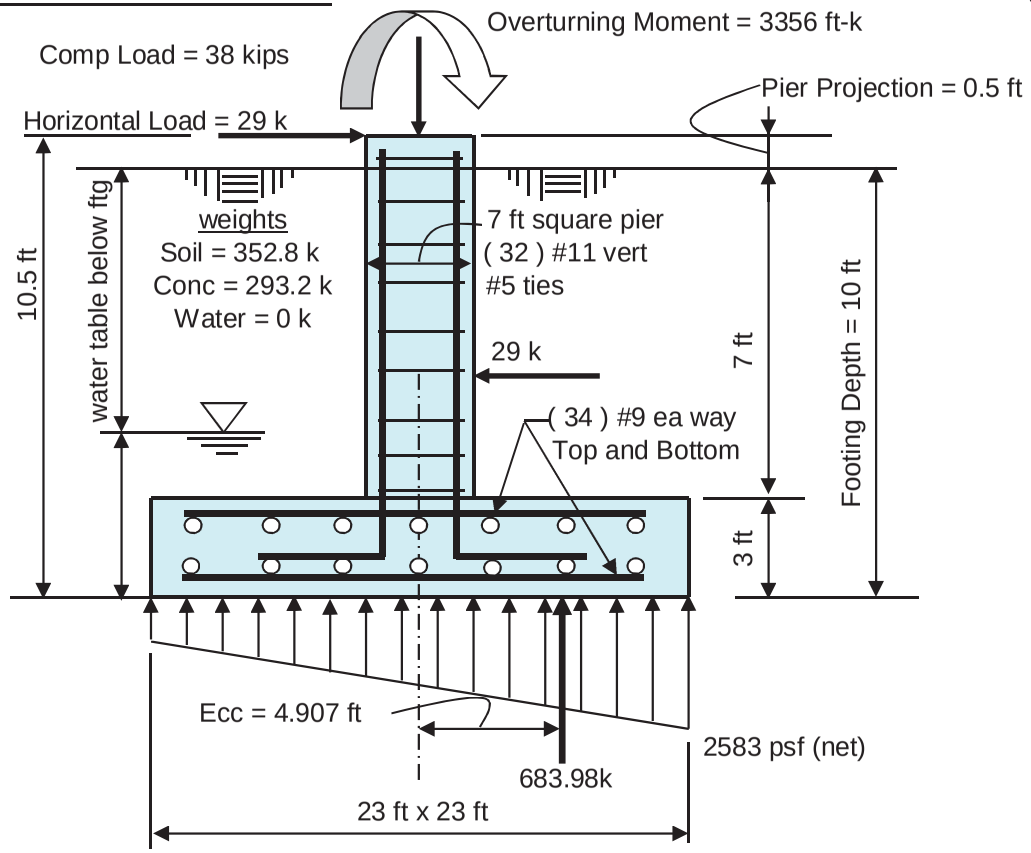
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#9**	bar
quantity of pad rebar =	**34**	(ea direction)

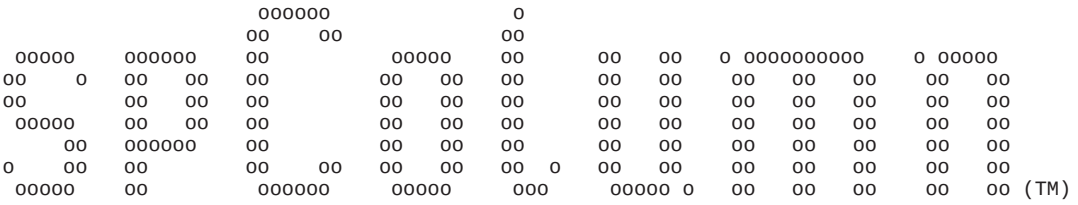
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#11**	bar
vertical rebar quantity =	**32**	
size of pier ties =	**#5**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 72.4 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.583 ksf Allowable Net Soil Bearing = 15 ksf **Soil Bearing Stress Ratio = 0.17 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 36 psi **Bending Shear Stress Ratio = 0.33 Okay**
Ftg Overturning Resistance = 7866 ft-kips Overturning Moment = 3356 ft-kips Required Overturning Safety Factor = 2 Overturning Safety Factor = 2.344 **Ratio = 0.85 Okay**	Pad Bending Moment Capacity= 4569 ft-k Pad Bending Moment = 1355 ft-k **Bending Moment Stress Ratio = 0.3 OK**



==========

spColumn v5.00 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

==========

General Information:
==========
File Name: T:\375_Crown_Castle\2016\37516-0064_876347_BUCKLAND MALL\37516...\37516-0064.003.7805.col
Project: 37516-0064.003.7805
Column: Engineer: JWM
Code: ACI 318-02 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
Concrete: Standard Steel: Standard
f'c = 3 ksi fy = 60 ksi
Ec = 3122.02 ksi Es = 29000 ksi
fc = 2.55 ksi Eps_yt = 0.00206897 in/in
Eps_u = 0.003 in/in
Beta1 = 0.85

Section:
==========
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #5 ties with #11 bars, #5 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Rectangular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 49.92 in^2 at rho = 0.71% (Note: rho < 1.0%)
Minimum clear spacing = 8.01 in

32 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	38.00	4645.55	8634.73	1.859	8.71	79.67	0.02444	0.900

*** End of output ***

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 – 10071100
Site ID – CT5307
USID – 25942
Site Name – MANCHESTER NORTH
Site Compliance Report

53-73 SLATER STREET
MANCHESTER, CT 06040

Latitude: N41-48-17.97
Longitude: W72-32-00.96
Structure Type: Monopole

Report generated date: August 15, 2016
Report by: Michelle Stone
Customer Contact: David Barbagallo

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)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated Radio Frequency Exposure (RFE) level on Ground	<1% of General Public limit
FCC & AT&T Compliant?	Will Be Compliant

Note: Data regarding all other carriers on site was unavailable and not included in the report.

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

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTV5307_2016-LTE-Next-Carrier_LTE-3C_om636a_2051A02J05_10071100_25942_06-25-2015_Final-Approved_v3.00- descope

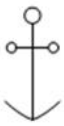
CD's: 10071100_AE201_160711_CTL05307.Rev4.CD.S&S

RF Configuration Datasheet: CT_33 sites with power density form

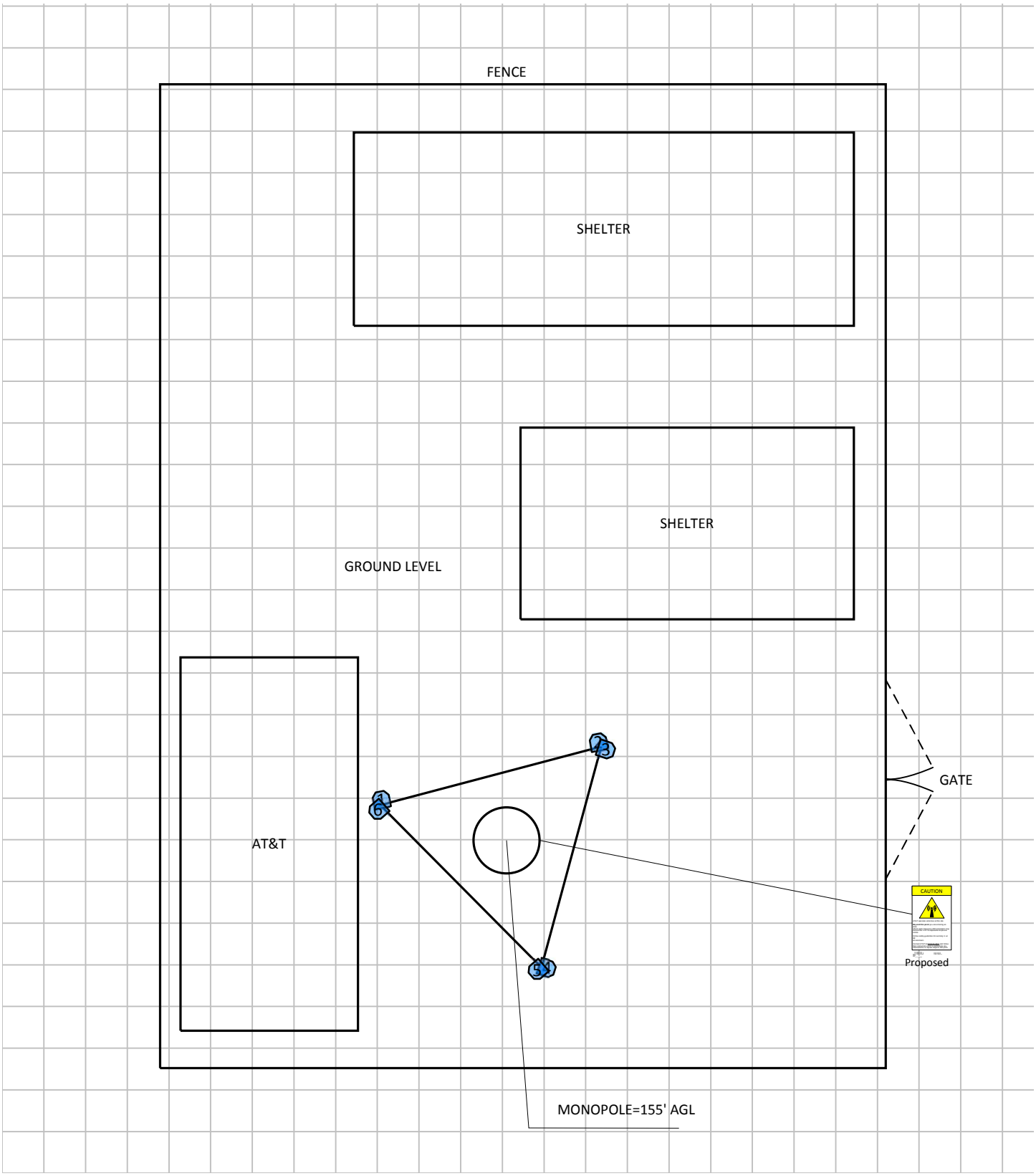
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

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

Site Scale Map For: MANCHESTER NORTH



(Feet)

0 4.1 8.3

www.sitesafe.com
Site Name:MANCHESTER NORTH
8/15/2016 10:44:39 AM

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

3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z AGL
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	50	87.6	4.5	11.35	0	1	0	145.9	25.2'	30.2'	142.7'
1	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	1900	50	85.7	4.5	14.32	0	1	0	0	25.2'	30.2'	142.7'
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	50	85.7	4.5	14.32	0	1	0	459.4	25.2'	30.2'	142.7'
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	50	85.7	4.5	14.32	1	0	0	459.4	25.2'	30.2'	142.7'
2	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	737	50	69	6	11.46	0	0	1	682.6	38.2'	33.6'	142'
2	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	50	68	6	14.16	0	0	1	1330.9	38.2'	33.6'	142'
2	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	50	64	6	14.56	0	0	1	748.4	38.2'	33.6'	142'
3	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	170	87.6	4.5	11.35	0	1	0	145.6	38.6'	33.2'	142.7'
3	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	1900	170	85.7	4.5	14.32	0	1	0	0	38.6'	33.2'	142.7'
3	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	170	85.7	4.5	14.32	0	1	0	448.9	38.6'	33.2'	142.7'
3	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	170	85.7	4.5	14.32	1	0	0	448.9	38.6'	33.2'	142.7'
4	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	737	170	69	6	11.46	0	0	1	682.6	35.1'	20.1'	142'
4	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	170	68	6	14.16	0	0	1	1330.9	35.1'	20.1'	142'
4	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	170	64	6	14.56	0	0	1	748.4	35.1'	20.1'	142'
5	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	290	87.6	4.5	11.35	0	1	0	145.3	34.5'	19.9'	142.7'
5	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	1900	290	85.7	4.5	14.32	0	1	0	0	34.5'	19.9'	142.7'
5	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	290	85.7	4.5	14.32	0	1	0	418.9	34.5'	19.9'	142.7'
5	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	290	85.7	4.5	14.32	1	0	0	418.9	34.5'	19.9'	142.7'
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	737	290	69	6	11.46	0	0	1	682.6	25'	29.5'	142'
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	290	68	6	14.16	0	0	1	1330.9	25'	29.5'	142'
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	290	64	6	14.56	0	0	1	748.4	25'	29.5'	142'

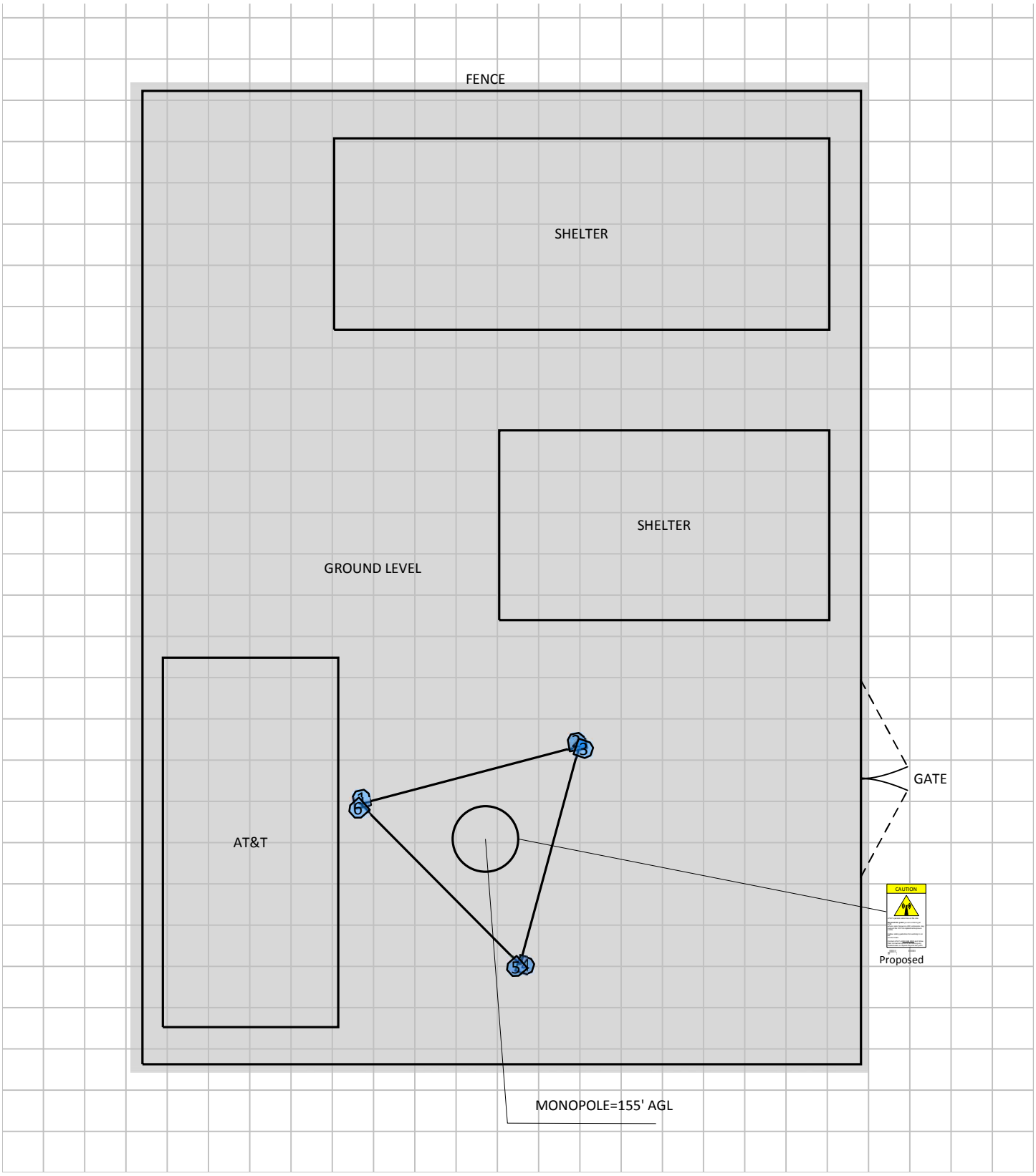
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom 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 Monopole cases this is the height of the main Monopole and in other cases this can be ground level. Each different height area, Monopole, 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: MANCHESTER NORTH



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

(Feet)

0 4.2 8.3

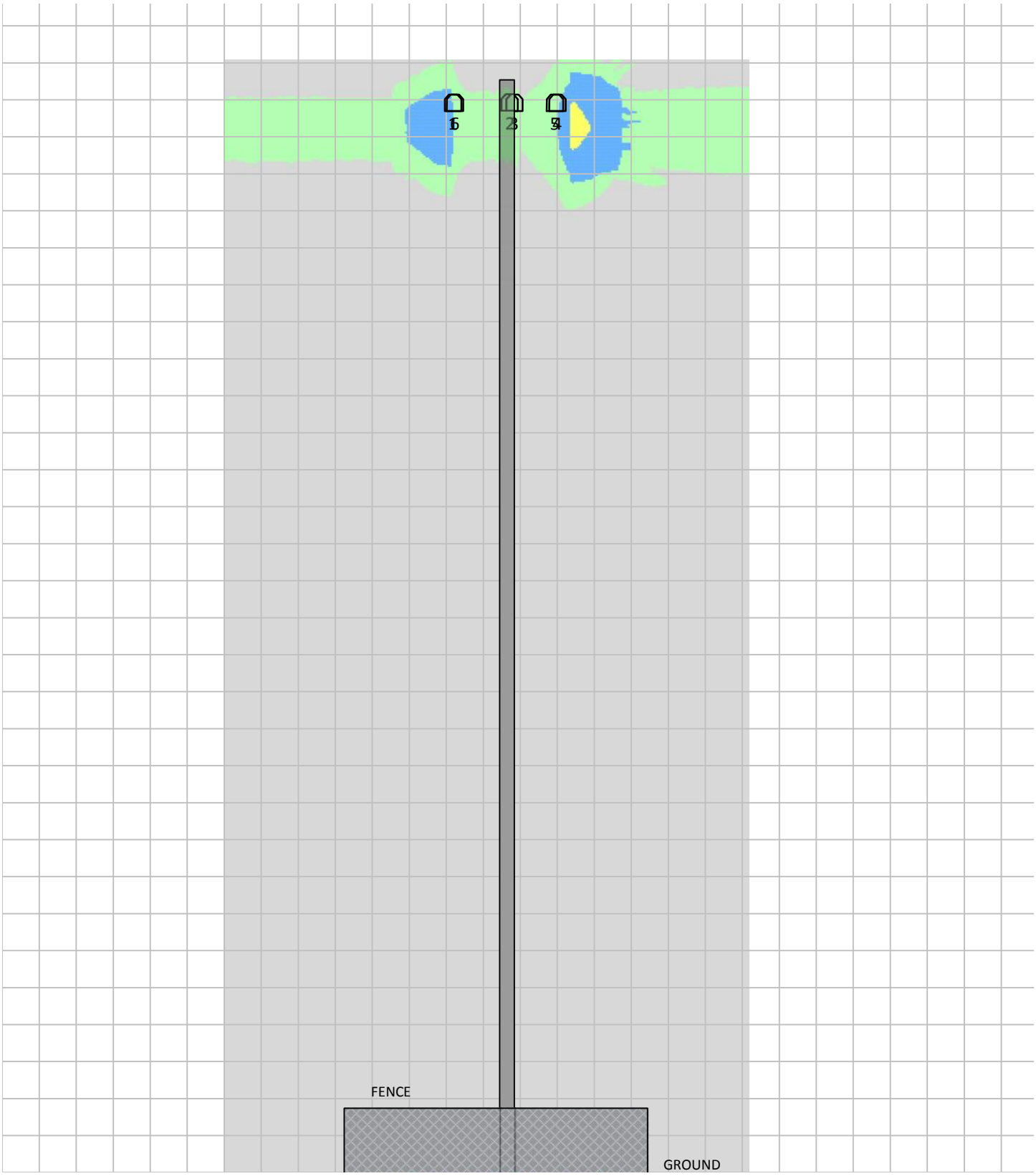
www.sitesafe.com
Site Name:MANCHESTER NORTH
8/15/2016 10:45:58 AM

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

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

SitesafeTC Version:1.0.0.0 - 0.0.0.248
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: MANCHESTER NORTH
Elevation View



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

(Feet)
0 9.3 18.6

www.sitesafe.com
Site Name:MANCHESTER NORTH
8/15/2016 10:49:41 AM

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

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

SitesafeTC Version:1.0.0.0 - 0.0.0.248
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

5 Site Compliance

5.1 Site Compliance Statement

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

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

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

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

5.2 Actions for Site Compliance

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

The site will be made compliant if the following changes are implemented:

Monopole Base

Yellow caution 2 sign required.

6 Engineer Certification

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

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

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

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

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

August 15, 2016

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

FCC Rules and Regulations

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

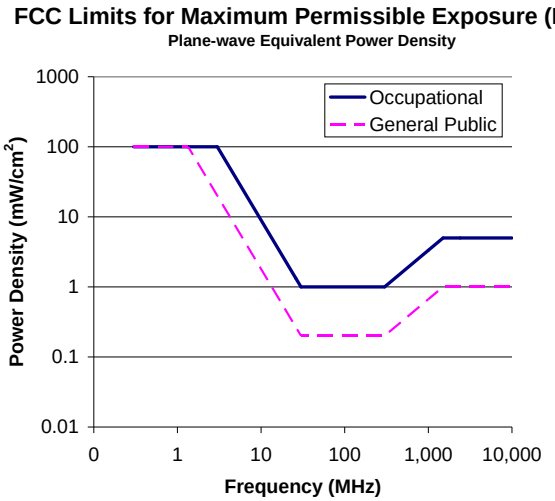
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

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

(a) Each employer –

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

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

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F – References

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

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf