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

October 27, 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: 823530**
AT&T Site ID: CT1062
580 Chapel Street, Thomaston, CT 06787
Latitude: 41° 39' 48.48"/ Longitude: -73° 4' 27.41"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 142-foot level of the existing 175-foot monopole tower at 580 Chapel Street in Thomaston, CT. The tower is owned by Crown Castle. The property is owned by the Town of Thomaston. AT&T now intends to install three (3) RRU-11s.

This facility was approved by the by the Town of Thomaston Planning and Zoning Board on November 9, 2000.
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 Mr. Edmond V. Mone, First-Selectman, Town of Thomaston, as well as the property owner, and Crown Castle is the tower owner.

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc:

Mr. Edmond V. Mone, First-Selectman
Town of Thomaston Town Hall
158 Main Street
Thomaston, CT 06787

Town of Thomaston
158 Main Street
Thomaston, CT 06787

THOMASTON ZONING BOARD OF APPEALS
TOWN HALL
THOMASTON, CT 06787

CERTIFICATE OF VARIANCE

This is to certify that the Thomaston Zoning Board of Appeals held a public hearing on July 18, 2000, at 7:45 pm in Meeting Room 1 of the Town Hall on an application from Voice Stream Wireless Corporation of 100 Filley St., Bloomfield, CT. The applicants sought a variance to permit their locating a ground mounted tower for a wireless communications facility on the west side of Chapel Street, approximately 1,000 feet distant from the intersection of Chapel Street with Prospect Street. The proposed tower is 175 feet in height. The applicants requested permission to locate the tower 201 feet from the property line. The property is owned by the Town of Thomaston and is located in an RA-40 zone.

Sec. 27.4.e of the Zoning Regulations of the Town of Thomaston provides that: "...the minimum distance from the base of any proposed ground mounted regulated facility to any property line, roadway, habitable dwelling, business or industrial use, public recreational areas, or public pathway shall be the height of the facility and mount, including any antennas or other appurtenances plus fifty per cent." Thus, 262.5 feet was the required setback.

With quorum present, the Board voted unanimously to grant the variance. The reasons were: topographic considerations; soil conditions on other parts of the site; and concerns over elevation on the site.

ATTEST: Joseph F. Wassong, Jr.

Joseph F. Wassong, Jr.

Chairman, TZBA

Town of Thomaston
Planning & Zoning Board
158 Main Street
Thomaston, Connecticut 06787

Return Receipt Requested

November 9, 2000

Voice Stream Wireless
100 Filley Street
Bloomfield, CT 06002

Re: Special Permit Approval for a Commercial Cellular Telecommunications Tower
Chapel Street, Thomaston, Conn.

Dear Sirs:

At its meeting on Wednesday, November 1, 2000, the Thomaston Planning and Zoning Commission approved your Special Permit Application to construct a commercial cellular communications tower on municipal property at the end of Chapel Street.

The application was approved with the following conditions:

1. Conduct an annual RF inspection and submit the results to the Commission.

2. Regrade the driveway as noted in Land Tech's letter dated October 6, 2000.

3. Agreed to the terms and conditions as noted in a FAX from Planimetrics dated November 1, 2000, regarding items 12-15.

4. If the Town decides not to have the tower removed, then the site plan and mylar must be revised. Any undertaking regarding the Town's tower shall be done in accordance with the conditions of the signed contract.

Sincerely,

Samuel Barto
Staff, TPZC
Land Use Officer / ZEO

Town of Thomaston

SELECTMAN'S OFFICE
TOWN HALL
158 MAIN STREET
THOMASTON, CONNECTICUT 06787
283-4421

April 25, 2000

SELECTMEN'S MEETING
MINUTES

At a meeting of the Board of Selectmen held on April 25, 2000 the following business was conducted:

The meeting opened at 4:00 p.m. with the Entire Board in attendance.

Also attending were Thomas C. Cusa of In Telecom, Inc., Sam Barto Town Planner and Attorney George Seabourne.

Selectman Brammer read a Fair Housing Resolution and a Fair Housing Policy Statement. (Copies Attached)

Selectman DuPont made a motion to adopt the Fair Housing Resolution and the Fair Housing Policy Statement seconded by Selectman O'Connell and passed unanimously by Selectman Brammer.

Selectman Brammer explained that as recipients of Small Cities Funding from the Department of Economic and Community Development we must adopt the above to reaffirm our commitment to Fair Housing. Larry Wagner the Town's Grants Coordinator has been the administrator of the Town's projects and programs and Lorraine Babb is our designated representative and is responsible for the enforcement and implementation of the Fair Housing Regulations.

Sam Barto reported to the Board of Selectmen that the roadway system in Phase III of the Highwood Farms Subdivision has been inspected by Town Engineer Bob Oley, Highway Superintendent Gerry Grohoski and by himself and it is their recommendation that it be accepted as a Town Road.

Selectman O'Connell made a motion to approve Phase III Section of the Highwood Farms Subdivision as a Town approved road seconded by Selectman DuPont and passed unanimously by Selectman Brammer.

Selectman DuPont made a motion to add Highwood Farms Subdivision--Phase V to today's Agenda seconded by Selectman O'Connell and passed unanimously by Selectman Brammer.

Selectman O'Connell made a motion to release the lots in Phase V of the Highwood Farms Subdivision in exchange for an irrevocable letter of credit in the amount of $60,000.00 seconded by Selectman DuPont and passed unanimously by Selectman Brammer.

(Copy of Irrevocable Standby Letter of Credit Attached)

Selectman Brammer reported that Representatives from the Water Company will be meeting with him at 9:30 a.m. in his office on April 27th to discuss the design of the Water Extension to upper High Street.

The Board of Selectmen briefly went over Town Attorney Rybak's suggestions for the Proposed Lease Agreement between the Town of Thomaston and Omnipoint Communications, Inc. regarding the Communications Tower on Chapel Street.

Mr. Cusa said looking over the suggested changes, they will be acceptable, however items that might involve Federal Regulations would be out of their control.

Selectman O'Connell made a motion to accept the Proposed Lease Agreement between the Town of Thomaston and Omnipoint Communications, Inc. with the suggested changes made by Attorney Rybak and subject to the approval of the Inland Wetlands Commission, Planning and Zoning Commission and Town Meeting Approval seconded by Selectman DuPont and passed unanimously by Selectman Brammer.

Selectman DuPont made a motion to approve Glenn C. Clarks request that his remaining vacation time for this year (4 days) be held past his anniversary date of July 6,2000 as he is going on a cruise in May of 2001 seconded by Selectman O'Connell and passed unanimously by Selectman Brammer.

At 4:32 p.m. Selectman DuPont made a motion to adjourn the meeting seconded by Selectman O'Connell and passed unanimously by Selectman Brammer.

Signed _____
Clifford C. Brammer, Jr.
First Selectman

Signed _____
Roger DuPont
Selectman

Signed _____
Richard A. O'Connell
Selectman

Town of Thomaston
Planning & Zoning Board
158 Main Street
Thomaston, Connecticut 06787

August 7, 2000

Voice Stream Wireless
100 Filley Street
Bloomfield, CT 06002

Attn: Mr. Rick Frazier

Re: Special Permit Application for a Commercial Telecommunications Tower and Facility

Dear Mr. Frazier:

At its meeting on August 2, 2000, the Thomaston Planning and Zoning Commission accepted your Special Permit Application. The public hearing is scheduled for Wednesday, September 6, 2000, at 7:00 p.m. The meeting will be held in the Lena Morton Art Gallery.

The Commission has scheduled an on-site inspection for Wednesday, August 30, 2000, at 6:30 p.m. In accordance with the Zoning Regulations, Section 27.7, Part L, the Commission requests that you send aloft a site identification balloon on or just prior to the day of inspection. My office will publish a legal notice prior to the raising. The site walk will be open to the public.

Please make sure to address each of the requirements in Article XXVII at the public hearing. This should insure a very thorough and informative public hearing.

If you have any questions, comments or suggestions, please feel free to call the Land Use Office at 283-8411.

Sincerely,

Samuel Barto
Land Use Officer

Please Note: The balloon shall also be raised at least 3 days prior to the public hearing.

cc: Bruce Hoben

SPECIAL PERMIT APPLICATION

Town of Thomaston, Connecticut

Date Received:

Application for a Special Permit

Applicant: VoiceStream/Omnipoint Wireless

Address: 100 Filley St Bloomfield, CT 06002

The undersigned hereby makes application to the Planning and Zoning Commission for a SPECIAL PERMIT in accordance with the provisions of Section 3.11 - Schedule A - Permitted Uses and Article IX of the Thomaston Zoning Regulations.

Signature: Bruce Holm Date: 7/24/00

Section 1. Previous Application

Has a previous Special Permit Application been filed with the Commission for the same premises? Yes: _____ No: ✓

Section 2. Placement on Agenda

In order for the Commission to consider your application, it must be received in the Planning and Zoning Office (Land-Use Office) no later than five (5) working days prior to the next regularly scheduled meeting.

Section 3. Plans and Documentation

All Special Permit applications, unless otherwise prescribed in the Zoning Regulations or directed by the Commission, must be accompanied by the following documentation:

Town of Thomaston
Planning & Zoning Board
158 Main Street
Thomaston, Connecticut 06787

August 7, 2000

Voice Stream Wireless
100 Filley Street
Bloomfield, CT 06002

Attn: Mr. Rick Frazier

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If you have any questions, comments or suggestions, please feel free to call the Land Use Office at 283-8411.

Sincerely,

Samuel Barto
Land Use Officer

Please Note: The balloon shall also be raised at least 3 days prior to the public hearing.

cc: Bruce Hoben

a. A "Statement of Use" which shall detail the proposed use of the site.

b. Site Plan and Landscaping Plan.

c. Architectural and Construction Plan

d. Flood Hazard Area Data

e. Soil Erosion and Sedimentation Control Plan

f. All other pertinent information and documentation that may be required by the Commission in order to make a decision on the application.

Section 4. Application Fees

a. Standard Application Fee: $ 150.00

b. Home Occupation Permit: $ 100.00

Section 5. Waiver of Requirements

Does the applicant request the Commission to waive any of the required documentation as specified in Sections 9.3.2, 9.3.3 or 9.3.4 of the Zoning Regulations?

Yes: _____ No: _____

If yes, please specify: _____

_____

Section 6. Extension of Review Period

Will the applicant consent to a formal extension of time in order for the Commission to take action on this application?

Yes: _____ No: _____

If yes, please specify period or date: _____

_____

Section 7. Failure to Submit

Failure by an applicant to submit any or all of the required or requested documentation under Section 3.11 or Article IX may be grounds for the Commission to consider the application as being incomplete.

Section 8. Review by Town Engineer

The applicant shall be responsible for paying all inspection and review costs incurred by the Town Engineer during the review process.

If additional on-site inspection and review is necessary and required by the Commission after the approval is granted and prior to completion of the project, the applicant shall also be responsible for these costs.

The costs shall be no more per hour than what is assessed to the Town in any given year by the Town Engineer.

Section 9. Public Hearing

The Thomaston Planning and Zoning Commission will conduct a "Public Hearing" on this application. The applicant, or their authorized agent, must be present at the hearing and should be prepared to present information showing how the proposed use of the site along with the buildings, structures, and facilities will conform to the standards as specified in these Regulations.

All standards as specified in Article IX are in addition to other requirements as contained in the Regulations which may be applicable in the District in which the Special Permit is proposed.

Section 10. Inspection of Property

The Commission is authorized by the submission of this application to inspect the premises.

Section 11. Additional Information

The Commission may obtain additional documentation and information on its own initiative but will need to rely upon data presented to it by the applicant.

Section 12. Modification of Approval

If approval is granted by the Planning and Zoning Commission, it may be subject to modifications deemed necessary to conform to specific standards of the Regulations. It may also be subject to appropriate conditions and safeguards necessary to conserve public health and safety, convenience, welfare and property values in the neighborhood.

Applicants Signature: _____

Home Phone: 860 693 2724 Business Phone: 860-677 5267

OFFICE USE

Commission date when application was received: _____

Date of initial Public Hearing: _____

Public Hearing was continued to: _____

Date of Approval: _____ Disapproval: _____

Was approval modified: Yes: _____ No: _____

If yes, give specifics: _____

_____

Land-Use Officer: _____ Date: _____

Samuel L. Barto
Staff, PZC

Thomaston, CT : Commercial Property Record Card

[Back to Search Results] [Start a New Search][Help with Printing]

Search For Properties

Account **Name** **Street Name**

CHAPEL ST

Search Reset

Account	Card	Map-Block-Lot	Location	Zoning	State Class	Acres
T0000001	1	55-03-08A	580 CHAPEL ST	RA80	508 - n/a	0.000

Living Units
0

Owner Information

T Mobile (lessee) Town Of Thomaston (lessor) Crown Castle
Pmb331 4017 Washington Rd
Mcmurray PA 15317

Property Picture

Deed Information

Book/Page: n/a
Deed Date: n/a

Building Information

Building No: 1
Year Built: 1950
No of Units: 0
Structure Type: Phone/Electric Equipment Build
Grade: B
Identical Units: 1

Valuation

Land:	$0
Building:	$473,714
Total:	$473,714
Net Assessment:	$331,600

Sales History

Book/Page	Date	Price	Type	Validity

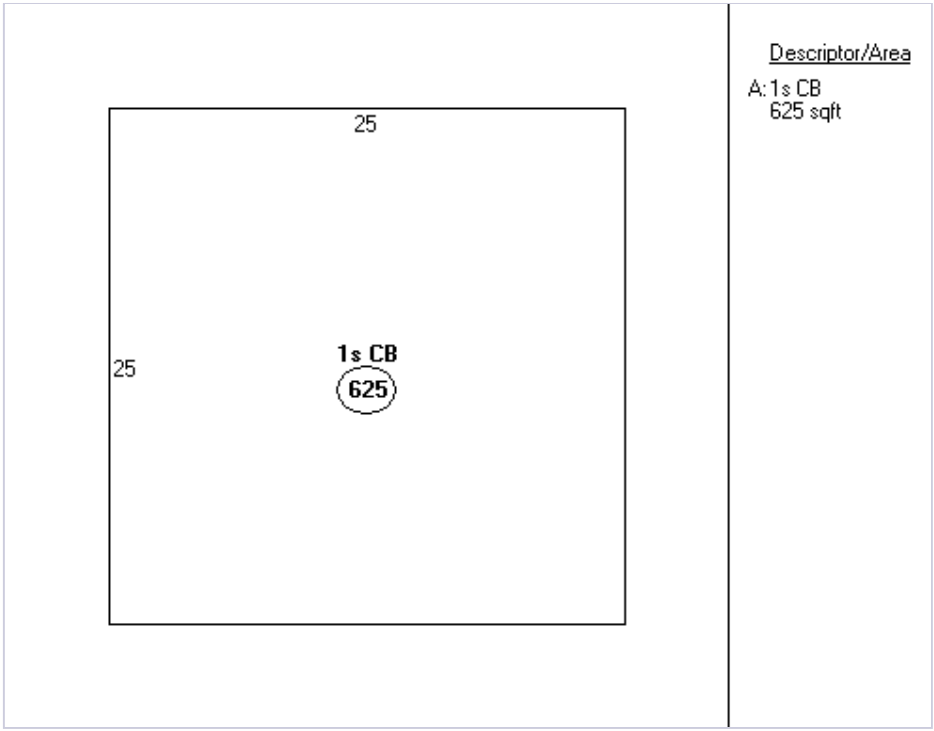
Out Building Information

Structure Code	Width	Lgth/SqFt	Year	RCNLD

Exterior/Interior Information

Levels	Size	Use Type	Ext. Walls	Const. Type	Partitions	Heating	A/C	Plumbing	Condition	Func.	Utility	Unadj. RCNLD
01-01	1x620	Multi-Use Storage	Brick/Stone	Fireproof	Normal	None	None	Normal	Good	Good		14850

Building Sketch



Notice

Tax Year 2015 Values

The information delivered through this on-line database is provided in the spirit of open access to government information and is intended as an enhanced service and convenience for citizens of Thomaston, CT.

The providers of this database: CLT, Big Room Studios, and Thomaston, CT assume no liability for any error or omission in the information provided here.

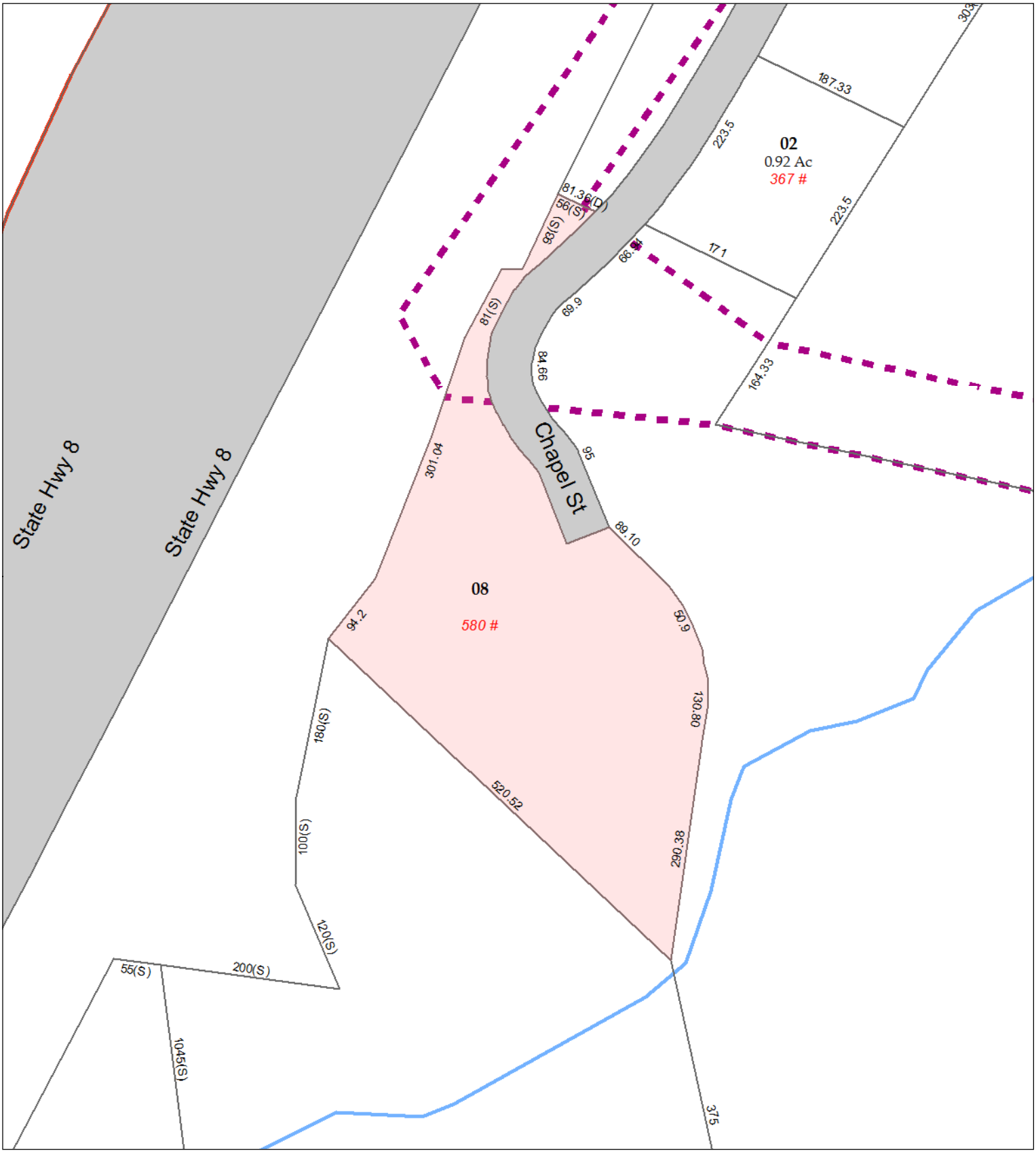
Currently All Values Have Not Been Finalized and Are Subject To Change.

Comments regarding this service should be directed to: rdudek@thomastonct.org.

BUILT BY bigRoom STUDIOS

Town of Thomaston, Connecticut - Assessment Parcel Map

Parcel: 55-03-08 **Address:** 580 CHAPEL ST



0 130 260
Feet

Approximate Scale: 1 inch = 145 feet

Map Produced March 2016

PROJECT:	LTE 2C
SITE NUMBER:	CTL01062
FA NUMBER:	10107966
PTN NUMBER:	2051A066HV
PACE NUMBER:	MRCTB018311
CROWN BU#:	823530
SITE NAME:	THOMASTON - CHAPEL STREET
SITE ADDRESS:	580 CHAPEL STREET THOMASTON, CT 06787

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

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

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

PROJECT INFORMATION

SITE NAME:	THOMASTON – CHAPEL STREET
SITE NUMBER:	CTL01062
SITE ADDRESS:	580 CHAPEL STREET THOMASTON, CT 06787
FA NUMBER:	10107966
PTN NUMBER:	2051A066HV
PACE NUMBER:	MRCTB018311
USID NUMBER:	83904
CROWN BU#:	823530
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
TOWER OWNER:	CROWN CASTLE INTERNATIONAL 12 GILL STREET, SUITE 5800 WOBURN, MA 01801
JURISDICTION:	CITY OF THOMASTON
COUNTY:	LITCHFIELD
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.663456°
LONGITUDE:	–73.074316°
GROUND ELEV.:	488'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	CAMERON SYME
PHONE:	(508) 596–7146
EMAIL:	cs6970@att.com

PROJECT CONSULTANTS

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

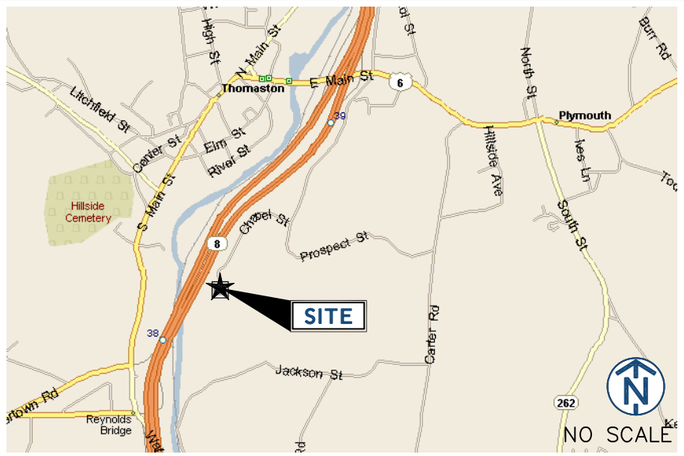
SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE Q&D.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1118683, VERSION 1.00 LAST UPDATED 03/23/2016.

- (3) NEW RRUS–11 UNITS
- (3) NEW 25 AMP BREAKERS
- (1) NEW ARGUS DC CONVERTOR MODULE
- (1) NEW HANDRAIL KIT

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

SITE LOCATION MAP



DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE
ELECTRICAL CODE:	2011 NATIONAL ELECTRIC CODE

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

DRAWING INDEX

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

REV	DATE	DESCRIPTION	BY
0	06/15/16	90% REVIEW	VV
1	09/14/16	FOR PERMIT	KC

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

SITE NAME
THOMASTON - CHAPEL STREET

SITE NUMBER:
CTL01062

SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

FEC# 2016.0200. 0002

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

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

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

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

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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REV	DATE	DESCRIPTION	BY
0	06/15/16	90% REVIEW	VV
1	09/14/16	FOR PERMIT	KC

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

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

SITE NAME
THOMASTON - CHAPEL STREET

SITE NUMBER:
CTL01062

SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

NOTICE

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

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

at&t

Ref: 47CFR 1.1307(b)

CAUTION

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

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

at&t

Ref: 47CFR 1.1307(b)

ALERTING SIGNS

WARNING!

DANGER DO NOT TOUCH TOWER!

SERIOUS "RF" BURN HAZARD!

MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES

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

at&t

ALERTING SIGN

PROPERTY OF AT&T

at&t

AUTHORIZED
PERSONNEL ONLY

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

INFO SIGN #4

INFORMATION

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

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

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

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

INFORMACION

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

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

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

Esta es la estacion base numero_____

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

at&t

INFO SIGN #1

INFORMATION

ACTIVE ANTENNAS ARE MOUNTED

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

STAY BACK A MINIMUM OF 3 FEET FROM THESE ANTENNAS

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

This is AT&T site# _____

at&t

INFO SIGN #2

STAY BACK 3 FEET FROM ANTENNA

at&t

INFO SIGN #3

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

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

NOTES FOR ROOFTOP SITES:

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

SIGNAGE GUIDELINES CHART

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

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THOMASTON - CHAPEL STREET

SITE NUMBER:
CTL01062

SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP2

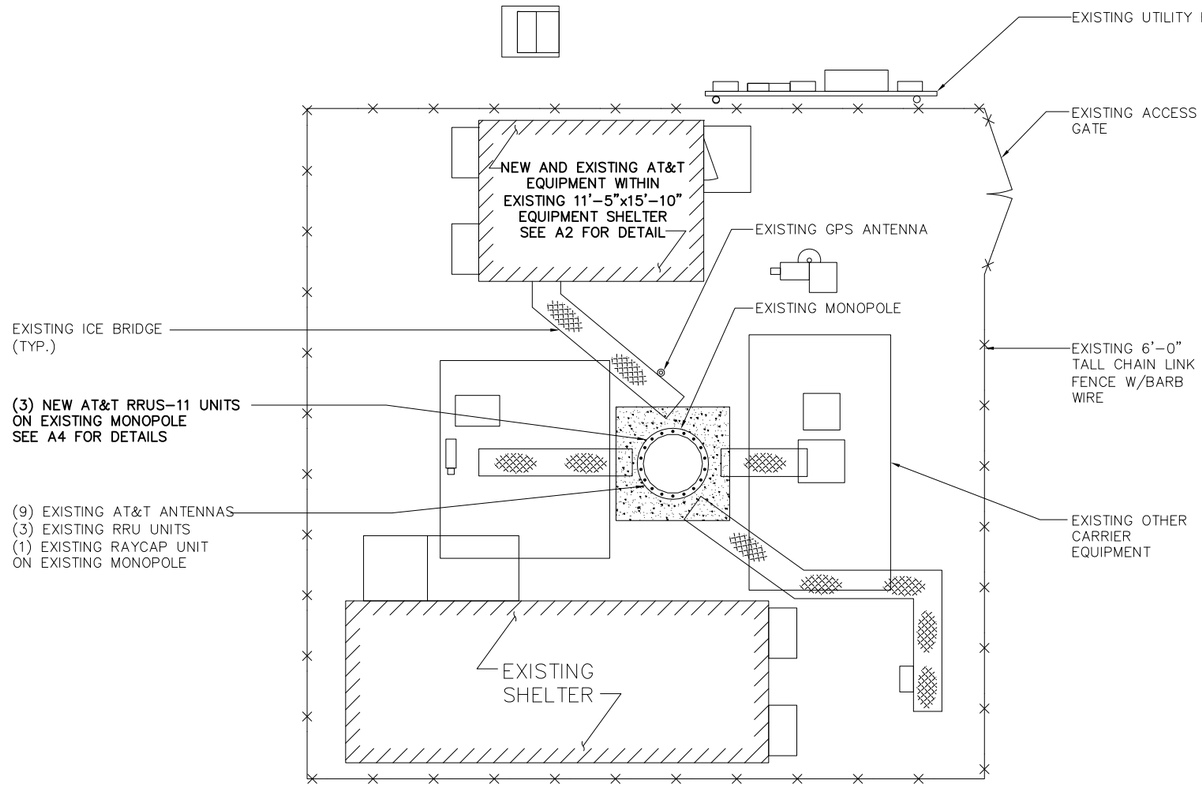
FEC# 2016.0200. 0002

ABBREVIATIONS

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

SYMBOLS

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



COMPOUND PLAN — SCALE: 3/32" = 1'-0" | 1

SITE PHOTO 1 — SCALE: N.T.S. | 2

SITE PHOTO 2 — SCALE: N.T.S. | 3

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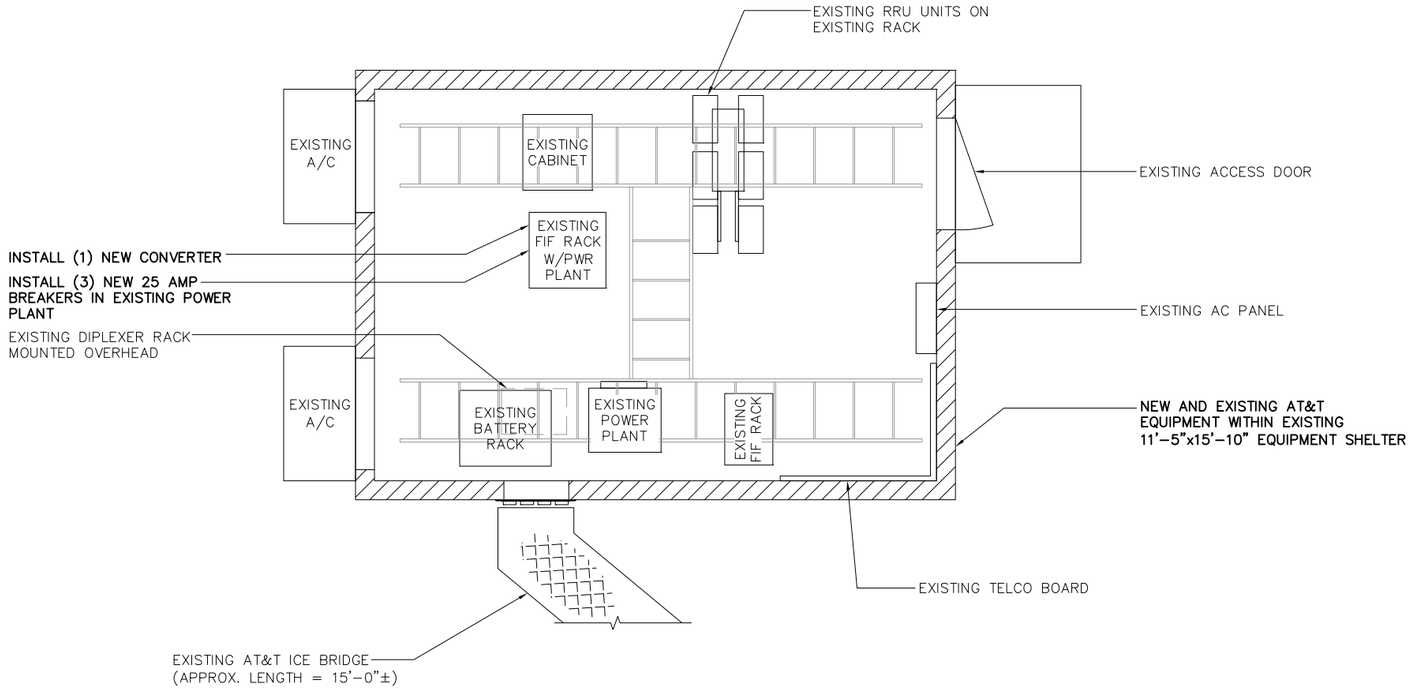

EQUIPMENT PLAN

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

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0	06/15/16	90% REVIEW	VV
1	09/14/16	FOR PERMIT	KC

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

SITE NAME
THOMASTON - CHAPEL STREET

SITE NUMBER:
CTL01062

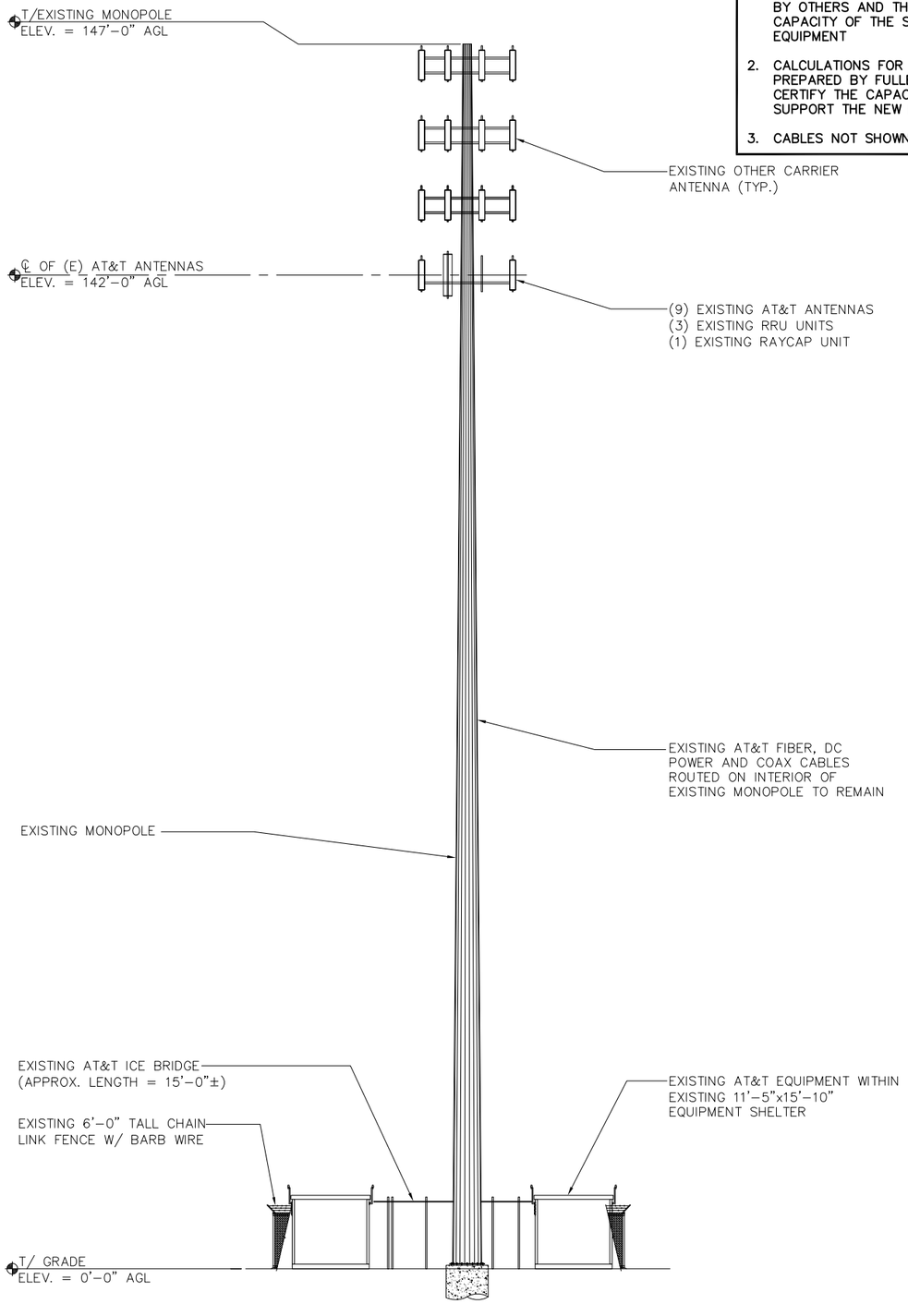
SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

NOTES:

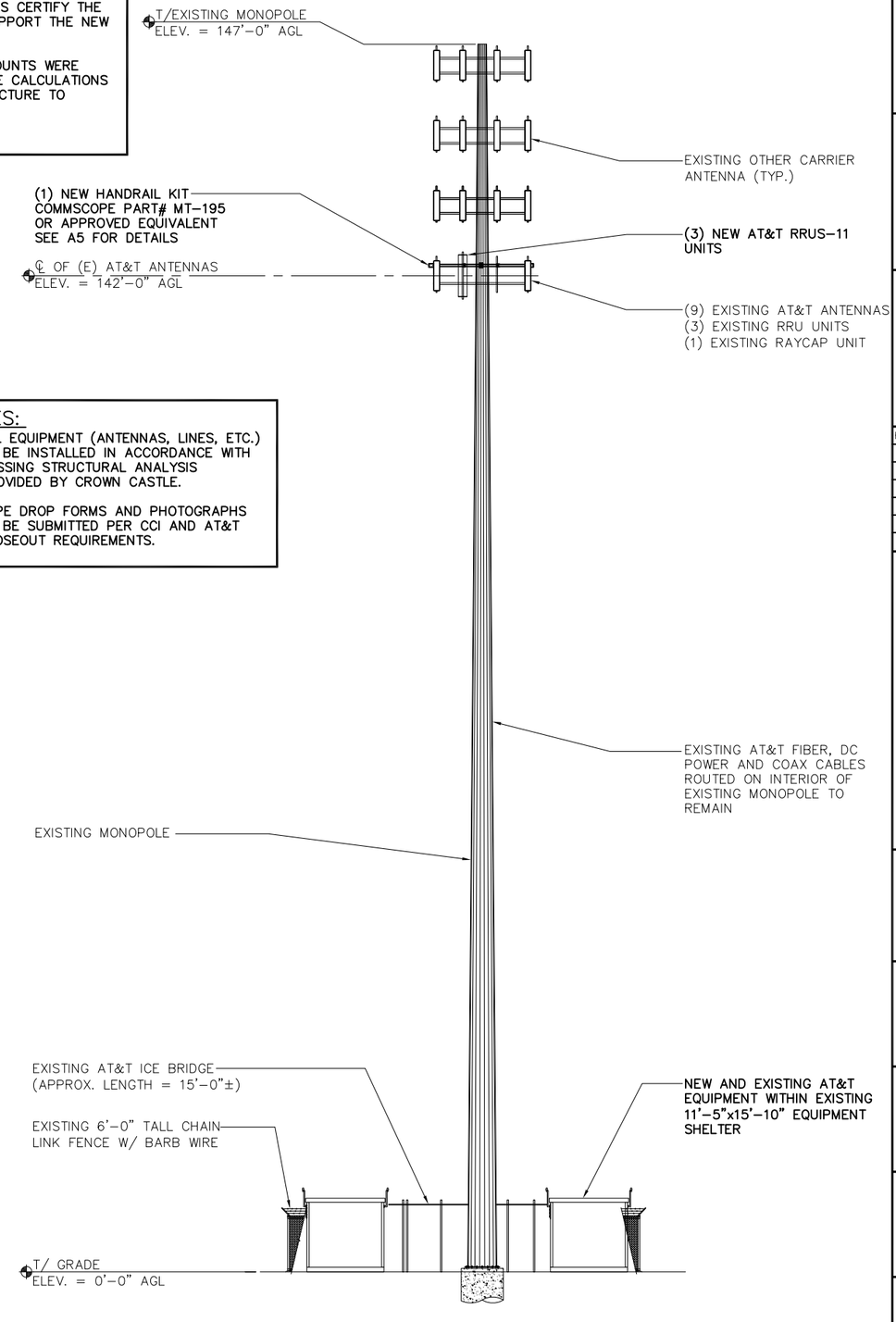
1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT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



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

NOTES:

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



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

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

smartlink
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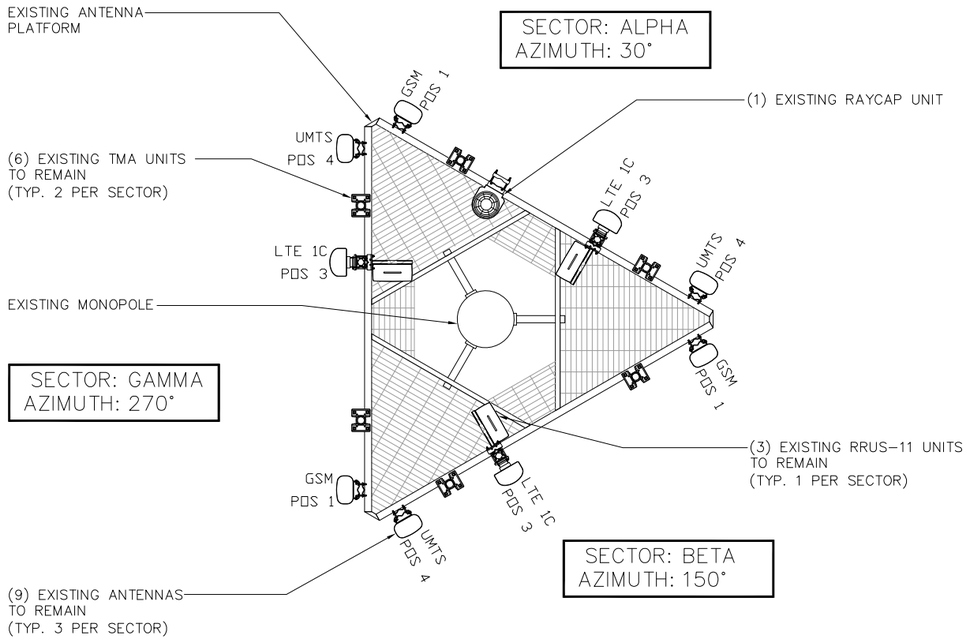
THOMASTON, CT 06787

SHEET NAME
ELEVATIONS

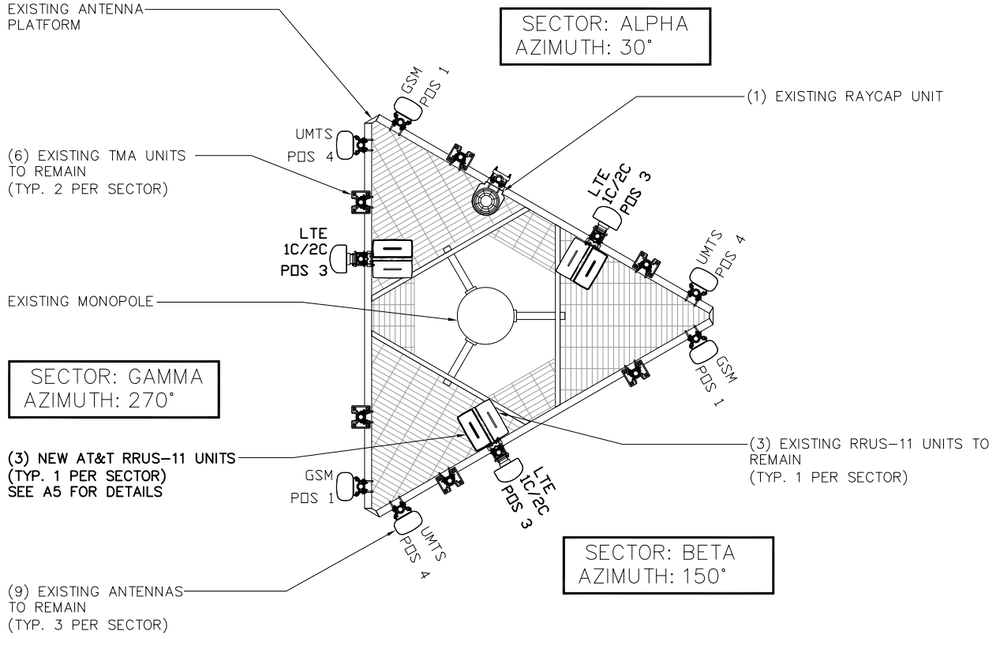
SHEET NUMBER
A3

FEC# 2016.0200. 0002



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 1



FINAL ANTENNA PLAN

SCALE: 1/4" = 1'-0" | 2

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HENRY M. BELLAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

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CTL01062

SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

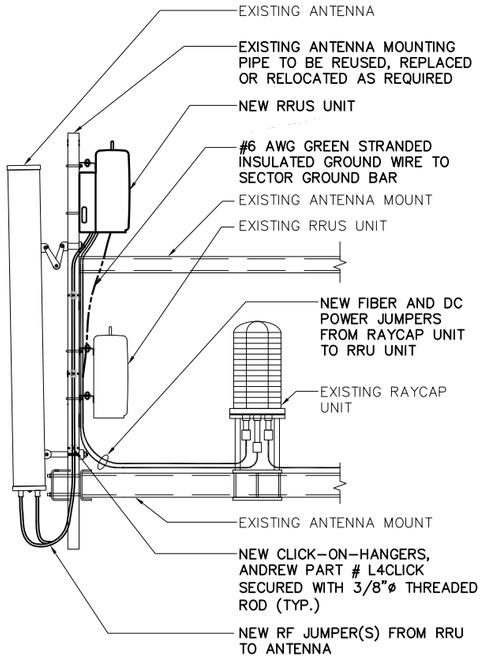
SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

FEC# 2016.0200. 0002

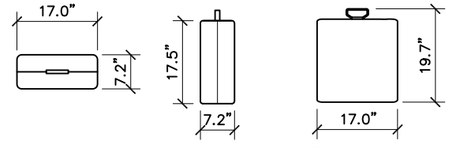
NOT USED SCALE: N.T.S. 1

NOT USED SCALE: N.T.S. 2



ANTENNA SCHEMATIC SCALE: N.T.S. 3

NOT USED SCALE: N.T.S. 4

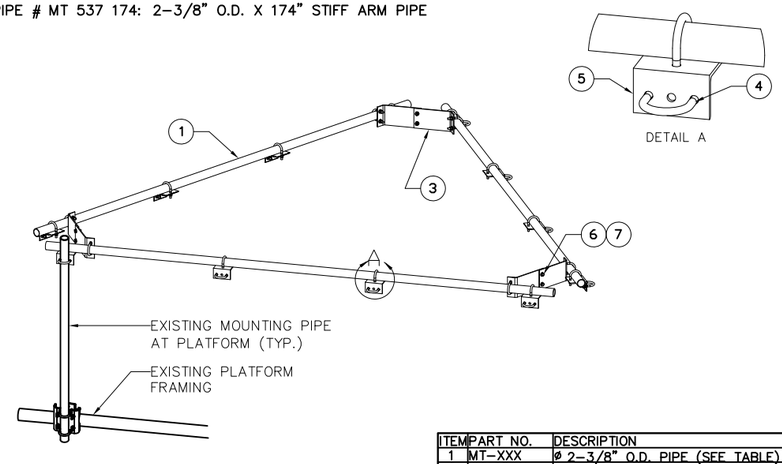


ERICSSON – RRUS 11
WITH SOLAR SHIELD
UNIT WEIGHT 50 Lbs

RRU SPEC SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

PRODUCT INFORMATION:
MFR: COMMSCOPE
P/N: MT-195 SERIES OR APPROVED EQUIVALENT
PRODUCT:
1. MT195 12
   – PIPE # MT 651 150: 2-3/8" O.D. X 150" STIFF ARM PIPE
2. MT195 14
   – PIPE # MT 537 174: 2-3/8" O.D. X 174" STIFF ARM PIPE



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MT-XXX	ø 2-3/8" O.D. PIPE (SEE TABLE)	3	–
2	MT195HK	HARDWARE KIT (ITEMS 3-7)	1	–
3	MT195.03	END PLATE	6	5.63 LBS
4	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT KIT	30	0.56 LBS
5	XA2020.01	CROSS OVER ANGLE	12	2.66 LBS
6	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	6	0.13 LBS
7	GWF-04	1/2" GALV FLAT WASHER	12	0.02 LBS

HANDRAIL DETAIL SCALE: N.T.S. 7

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LICENSED PROFESSIONAL ENGINEER

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THOMASTON, CT 06787

SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

FEC# 2016.0200. 0002

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (03/23/16), VERSION 1.00

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	30°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	(1) E DC6-48-60-18-8F UNIT
								1-5/8"ø LDF7-50A	180'-0"	
	A-2	-	-	-	-	-	-	-		
	A-3	**(N) LTE1C/2C ANTENNA**	AM-X-CD-16-65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-11 UNIT**	30°	142'-0"	(1) EXISTING FIBER CABLE	180'-0"	
								(2) EXISTING DC POWER CABLES	180'-0"	
	A-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	30°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	
								1-5/8"ø LDF7-50A	180'-0"	
BETA	B-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	150°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	
								1-5/8"ø LDF7-50A	180'-0"	
	B-2	-	-	-	-	-	-	-		
	B-3	**(N) LTE1C/2C ANTENNA**	AM-X-CD-14-65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-11 UNIT**	150°	142'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	B-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	150°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	
								1-5/8"ø LDF7-50A	180'-0"	
GAMMA	C-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	270°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	
								1-5/8"ø LDF7-50A	180'-0"	
	C-2	-	-	-	-	-	-	-		
	C-3	**(N) LTE1C/2C ANTENNA**	AM-X-CD-16-65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT **AND (1) NEW RRUS-11 UNIT**	270°	142'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	C-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	270°	142'-0"	1-5/8"ø LDF7-50A	180'-0"	
								1-5/8"ø LDF7-50A	180'-0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S. | 1

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

SITE NAME
THOMASTON - CHAPEL STREET

SITE NUMBER:
CTL01062

SITE ADDRESS
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

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

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

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

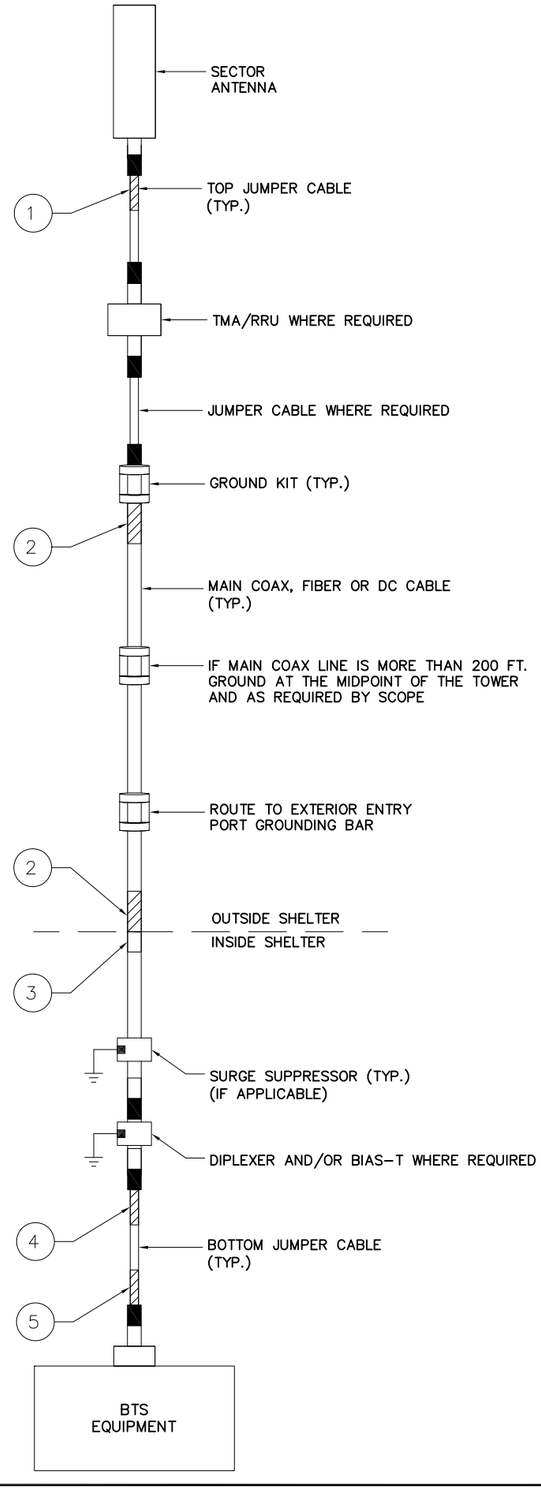
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

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

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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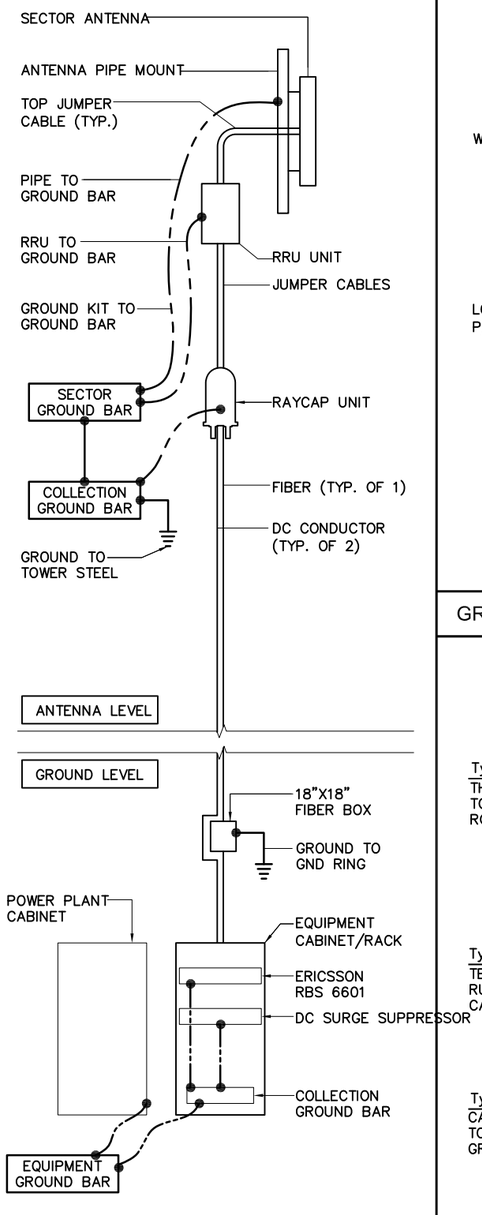
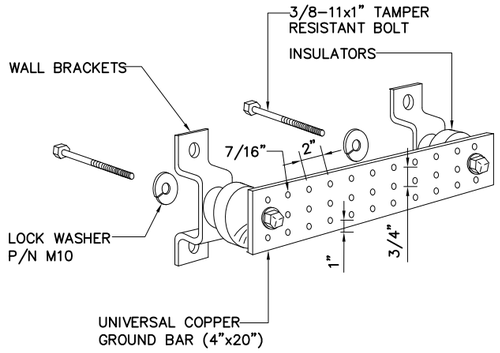
580 CHAPEL STREET
THOMASTON, CT 06787

SHEET NAME
CABLE NOTES AND COLOR CODING

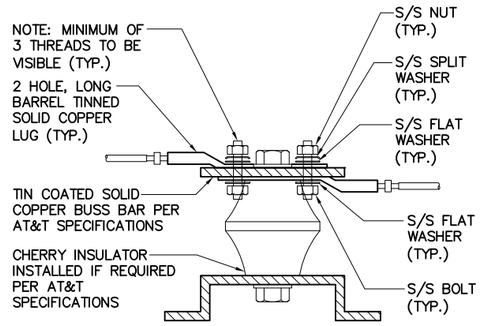
SHEET NUMBER
A7



GROUNDING SCHEMATIC SCALE: N.T.S. 1



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

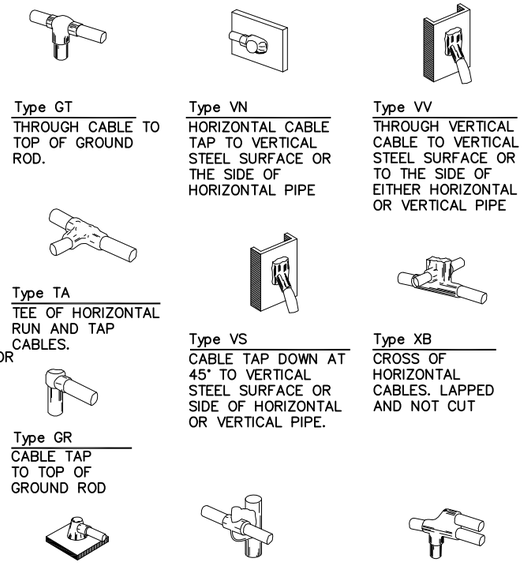


NOTES:

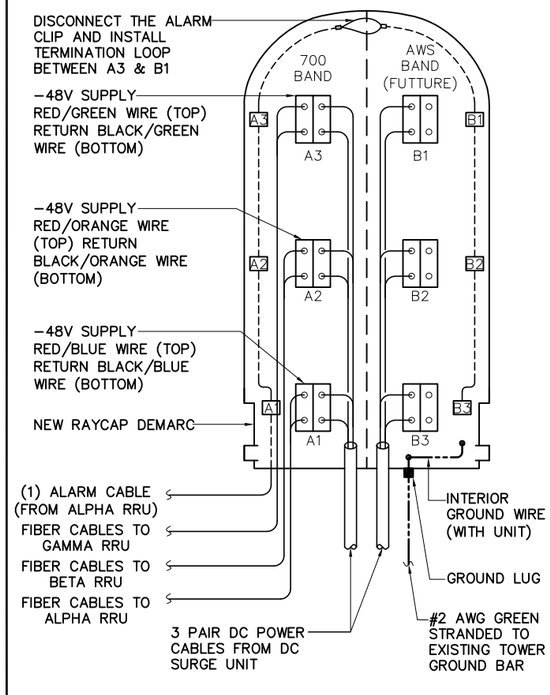
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3

GROUNDING SCHEMATIC SCALE: N.T.S. 1



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



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

NOT USED SCALE: N.T.S. 6

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SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

FEC# 2016.0200. 0002

Date: **October 25, 2016**

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

Black & Veatch Corp.
6800 W. 115th Street, Suite 2292
Overland Park, KS 66211
(913) 458-7245

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL01062
	Carrier Site Name:	Thomaston
Crown Castle Designation:	**Crown Castle BU Number:**	823530
	Crown Castle Site Name:	CT364/Chapel St. Monopole
	Crown Castle JDE Job Number:	402686
	Crown Castle Work Order Number:	1313169
	Crown Castle Application Number:	365856 Rev. 0
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	182896
Site Data:	**580 Chapel Street, Thomaston, Litchfield County, CT** **Latitude *41° 39' 48.48"*, Longitude *-73° 4' 27.41"*** **175 Foot - Monopole Tower**	

Dear Charles McGuirt,

Black & Veatch Corp. 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 958141, in accordance with application 365856, revision 0.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis. Seismic forces have been evaluated based on site class D with spectral response factors S_s of 0.186g and S_1 of 0.064g.

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

Structural analysis prepared by: Deepika Pegu / Josh Riley

Respectfully submitted by:

Ping Jiang, P.E.
Professional Engineer

10/25/2016

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 175 ft Monopole tower designed by PiROD Inc. in October 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 TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas using a 3-second gust wind speed of 93 mph with no ice, 40 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet. Seismic forces have been evaluated based on site class D with spectral response factors S_s of 0.186g and S_1 of 0.064g.

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
142.0	143.0	3	ericsson	RRUS 11	-	-	1
	142.0	1	cci tower mounts	Miscellaneous [NA 507-1]			

Notes:
1) The addition of the proposed handrail will change the MCL from 142 ft. to 144 ft.

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
172.0	175.0	2	andrew	VHLP2.6	12 3	1 5/8 7/8	1
	172.0	1	andrew	ATJB200-A01-007			
		2	andrew	ETW190VS12UB			
		1	cci tower mounts	Platform Mount [LP 701-1]			
		3	commscope	ATBT-BOTTOM-24V			
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
	168.0	1	bird technologies group	OA20-67-DIN			
		1	lone star electronics	LS-230C			
168.0	171.0	1	lone star electronics	LS-230C	6	7/8	1
	168.0	1	cci tower mounts	Side Arm Mount [SO 701-1]			
162.0	162.0	3	alcatel lucent	FD-RRH-2X50-800 W/FILTER	3	1 1/4	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	cci tower mounts	Platform Mount [LP 712-1]			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
152.0	152.0	3	antel	BXA-171085-12BF w/ Mount Pipe	18	1 5/8	1
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	antel	LPA-80080/4CF W/Mount Pipe			
		1	cci tower mounts	Platform Mount [LP 403-1]			
		3	kathrein	742 213 w/ Mount Pipe	1	1 5/8	2
		3	alcatel lucent	RRH2x40-AWS			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
142.0	143.0	3	ericsson	RRUS 11 B12	-	-	3
		1	andrew	APTDC-BDFDM-DB	12 1 2	1 5/8 3/8 5/8	1,4
		3	ericsson	RRUS 11 B12			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
	142.0	1	crown mounts	Platform Mount [LP 303-1]			
115.0	115.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1 5/8	1
50.0	50.0	1	crown mounts	Side Arm Mount [SO 701-1]	1	1/2	1
		1	pctel	GPS-TMG-HR-26NCM			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not Considered In This Analysis
4) The addition of the proposed handrail will change the MCL from 142 ft. to 144 ft.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
172	172	12	andrew	RR65-19-00XP	12	1-5/8
162	162	12	andrew	RR65-19-00XP	12	1-5/8
152	152	12	andrew	RR65-19-00XP	12	1-5/8
142	142	12	andrew	RR65-19-00XP	12	1-5/8
125	125	3	unknown	Whip Antennas	3	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	3462674	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiROD, Inc.	3464631	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiROD, Inc.	3462695	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Black & Veatch Corp.	6361844	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The wind loading Exposure Category/Topographic Category for this site have been analyzed and determined by the tower owner. Black & Veatch does not assume any responsibility for its accuracy.
5) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. The existing/proposed loading on the structure is based on CAD level drawings and carrier applications provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

4.1) Wind Results

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	175 - 164.25	Pole	TP26x22x0.25	1	-4.20	1453.99	4.5	Pass
L2	164.25 - 129.67	Pole	TP34.0625x24.4135x0.3125	2	-16.81	2385.49	29.3	Pass
L3	129.67 - 96	Pole	TP41.75x32.452x0.375	3	-25.14	3492.32	39.5	Pass
L4	96 - 63.17	Pole	TP49.0625x39.8421x0.375	4	-34.92	3911.19	49.7	Pass
L5	63.17 - 31.17	Pole	TP56.125x46.9602x0.375	5	-46.07	4259.45	56.9	Pass
L6	31.17 - 0	Pole	TP62.9375x53.8475x0.375	6	-60.46	4606.06	63.5	Pass
							Summary	
						Pole (L6)	63.5	Pass
						Rating =	63.5	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.1	Pass
2	Base Plate	0	-	Pass
1	Base Foundation	0	61.5	Pass
1	Base Foundation Soil Interaction		54.9	Pass

4.2) Seismic Results

Tower and foundation have been analyzed based on the seismic criteria outlined in section 2 of this report. Based on the analysis, seismic loading is not governing the tower and foundation stress. Wind loading governing the tower and foundation stress.

Structure Rating (max from all components) =	63.5%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) For a PiRod monopole, the governing stress of the connection will be the connection bolts unless the tower section or connection bolts fail.

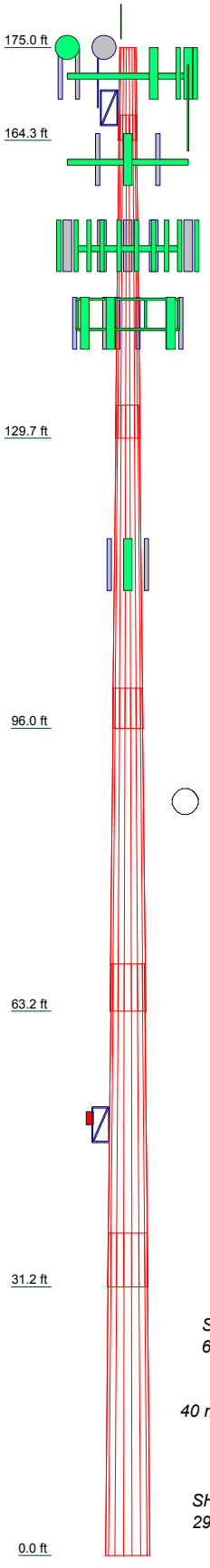
4.3) Recommendations

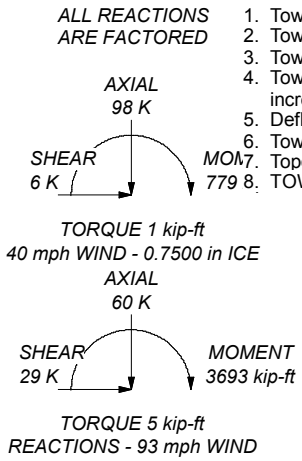
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	10.75	18	0.2500	2.92	22.0000	26.0000		0.7
2	37.50	18	0.3125	3.83	24.4135	34.0625		3.7
3	37.50	18	0.3750	4.67	32.4520	41.7500		5.6
4	37.50	18	0.3750	5.50	39.8421	49.0625		6.7
5	37.50	18	0.3750	6.25	46.9602	56.1250		7.8
6	37.42	18	0.3750		53.8475	62.9375		8.8
							A572-65	33.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8"x6'	175	BXA-171085-12BF w/ Mount Pipe	152
Platform Mount [LP 701-1]	172	BXA-171085-12BF w/ Mount Pipe	152
RR90-17-02DP w/ Mount Pipe	172	BXA-171085-12BF w/ Mount Pipe	152
RR90-17-02DP w/ Mount Pipe	172	742 213 w/ Mount Pipe	152
RR90-17-02DP w/ Mount Pipe	172	742 213 w/ Mount Pipe	152
LNX-6515DS-VTM w/ Mount Pipe	172	742 213 w/ Mount Pipe	152
LNX-6515DS-VTM w/ Mount Pipe	172	RRH2x40-AWS	152
LNX-6515DS-VTM w/ Mount Pipe	172	RRH2x40-AWS	152
4'x2" Mount Pipe	172	RRH2x40-AWS	152
4'x2" Mount Pipe	172	DB-T1-6Z-8AB-0Z	152
OA20-67-DIN	172	Platform Mount [LP 403-1]	152
LS-230C	172	BXA-70063-6CF-2 w/ Mount Pipe	152
ATBT-BOTTOM-24V	172	(2) 7770.00 w/ Mount Pipe	144
ATBT-BOTTOM-24V	172	(2) 7770.00 w/ Mount Pipe	144
ATBT-BOTTOM-24V	172	(2) 7770.00 w/ Mount Pipe	144
ATJB200-A01-007	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	144
ETW190VS12UB	172		
ETW190VS12UB	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	144
VHLP2.6	172		
VHLP2.6	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	144
Side Arm Mount [SO 701-1]	168		
LS-230C	168	(2) LGP2140X	144
APXVSPP18-C-A20 w/ Mount Pipe	162	(2) LGP2140X	144
APXVSPP18-C-A20 w/ Mount Pipe	162	(2) LGP2140X	144
(2) 6'x2" Mount Pipe	162	RRUS 11	144
(2) 6'x2" Mount Pipe	162	RRUS 11	144
(2) 6'x2" Mount Pipe	162	RRUS 11	144
4'x2" Mount Pipe	162	RRUS 11 B12	144
4'x2" Mount Pipe	162	RRUS 11 B12	144
4'x2" Mount Pipe	162	RRUS 11 B12	144
FD-RRH-2X50-800 W/FILTER	162	APTDC-BDFDM-DB	144
FD-RRH-2X50-800 W/FILTER	162	DC6-48-60-18-8F	144
FD-RRH-2X50-800 W/FILTER	162	6'x2" Mount Pipe	144
PCS 1900MHz 4x45W-65MHz	162	6'x2" Mount Pipe	144
PCS 1900MHz 4x45W-65MHz	162	6'x2" Mount Pipe	144
PCS 1900MHz 4x45W-65MHz	162	6'x2" Mount Pipe	144
Platform Mount [LP 712-1]	162	6'x2" Mount Pipe	144
APXVSPP18-C-A20 w/ Mount Pipe	162	6'x2" Mount Pipe	144
BXA-70063-6CF-2 w/ Mount Pipe	152	Platform Mount [LP 303-1]	144
BXA-70063-6CF-2 w/ Mount Pipe	152	Miscellaneous [NA 507-1]	144
LPA-80080/4CF W/Mount Pipe	152	APXV18-206517S-C w/ Mount Pipe	115
LPA-80080/4CF W/Mount Pipe	152	APXV18-206517S-C w/ Mount Pipe	115
LPA-80080/4CF W/Mount Pipe	152	APXV18-206517S-C w/ Mount Pipe	115
LPA-80080/4CF W/Mount Pipe	152	GPS-TMG-HR-26NCM	50
LPA-80080/4CF W/Mount Pipe	152	Side Arm Mount [SO 701-1]	50
LPA-80080/4CF W/Mount Pipe	152		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 63.5%

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Job: ***CT364/Chapel St. Monopole (BU# 823530)***			
Project: ***182896 (823530.1313169)***			
Client: Crown Castle	Drawn by: Josh Riley	App'd:	
Code: TIA-222-G	Date: 10/18/16	Scale: NTS	
Path: C:\Users\vil68982\Desktop\823530.1313169 (VER)\823530.1313169 Structural Analysis.dri		Dwg No. E-1	

Tower Input Data

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

1) Tower is located in Litchfield County, Connecticut.
2) Basic wind speed of 93 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 40 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	175.00-164.25	10.75	2.92	18	22.0000	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	164.25-129.67	37.50	3.83	18	24.4135	34.0625	0.3125	1.2500	A572-65 (65 ksi)
L3	129.67-96.00	37.50	4.67	18	32.4520	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	96.00-63.17	37.50	5.50	18	39.8421	49.0625	0.3750	1.5000	A572-65 (65 ksi)
L5	63.17-31.17	37.50	6.25	18	46.9602	56.1250	0.3750	1.5000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	31.17-0.00	37.42		18	53.8475	62.9375	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.5530	23.9052	1754.2802	8.5559	12.4021	141.4508	3510.8687	11.9549	3.7468	11.99
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.4450	17.424
L3	33.9169	38.1797	4963.1506	11.3873	16.4856	301.0593	9932.8318	19.0935	5.0516	13.471
	42.3941	49.2466	10650.9822	14.6881	21.2090	502.1916	21315.9793	24.6280	6.6880	17.835
L4	41.6227	46.9757	9244.4481	14.0108	20.2398	456.7464	18501.0602	23.4923	6.3522	16.939
	49.8194	57.9503	17355.1378	17.2841	24.9238	696.3293	34733.1119	28.9807	7.9750	21.267
L5	49.0495	55.4480	15202.6322	16.5377	23.8558	637.2728	30425.2683	27.7293	7.6050	20.28
	56.9908	66.3564	26056.1506	19.7913	28.5115	913.8821	52146.5865	33.1845	9.2180	24.581
L6	56.2199	63.6457	22991.5268	18.9827	27.3545	840.5012	46013.3064	31.8289	8.8172	23.512
	63.9084	74.4650	36822.8946	22.2097	31.9722	1151.7142	73694.2417	37.2396	10.4170	27.779

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 175.00-164.25				1	1	1			
L2 164.25-129.67				1	1	1			
L3 129.67-96.00				1	1	1			
L4 96.00-63.17				1	1	1			
L5 63.17-31.17				1	1	1			
L6 31.17-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8 ***	A	Surface Ar (CaAa)	175.00 - 8.00	1	1	0.000 0.000	0.3750		0.22
LDF7-50A(1-5/8") ***	B	Surface Ar (CaAa)	115.00 - 8.00	6	6	0.217 0.450	1.9800		0.82
LDF4-50A(1/2")	B	Surface Ar (CaAa)	50.00 - 8.00	1	1	0.000 0.011	0.6300		0.15

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
***								
AVA5-50(7/8")	C	No	Inside Pole	172.00 - 8.00	3	No Ice	0.00	0.30
						1/2" Ice	0.00	0.30
						1" Ice	0.00	0.30
LDF7-50A(1-5/8")	C	No	Inside Pole	172.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
***								
LDF5-50A(7/8")	A	No	Inside Pole	168.00 - 8.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
***								
HB114-1-08U4-M5J(1-1/4")	B	No	Inside Pole	162.00 - 8.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	152.00 - 8.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	152.00 - 8.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
***								
2" innerduct conduit	A	No	Inside Pole	144.00 - 8.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20
LDF7-50A(1-5/8")	A	No	Inside Pole	144.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
AMR-S304(5/8)	A	No	Inside Pole	144.00 - 8.00	2	No Ice	0.00	0.24
						1/2" Ice	0.00	0.24
						1" Ice	0.00	0.24
FB-L98-002-XXX(3/8")	A	No	Inside Pole	144.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06

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	175.00-164.25	A	0.000	0.000	0.403	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.08
L2	164.25-129.67	A	0.000	0.000	1.297	0.000	0.23
		B	0.000	0.000	0.000	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.73
L3	129.67-96.00	A	0.000	0.000	1.263	0.000	0.43
		B	0.000	0.000	22.572	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.90
L4	96.00-63.17	A	0.000	0.000	1.231	0.000	0.42
		B	0.000	0.000	39.002	0.000	0.27
		C	0.000	0.000	0.000	0.000	0.88
L5	63.17-31.17	A	0.000	0.000	1.200	0.000	0.41
		B	0.000	0.000	39.202	0.000	0.26
		C	0.000	0.000	0.000	0.000	0.86
L6	31.17-0.00	A	0.000	0.000	0.869	0.000	0.30
		B	0.000	0.000	28.986	0.000	0.19
		C	0.000	0.000	0.000	0.000	0.62

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	175.00-164.25	A	1.767	0.000	0.000	4.201	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.08
L2	164.25-129.67	A	1.741	0.000	0.000	13.515	0.000	0.39
		B		0.000	0.000	0.000	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.73
L3	129.67-96.00	A	1.696	0.000	0.000	12.985	0.000	0.58
		B		0.000	0.000	36.484	0.000	0.64
		C		0.000	0.000	0.000	0.000	0.90
L4	96.00-63.17	A	1.638	0.000	0.000	12.364	0.000	0.56
		B		0.000	0.000	62.669	0.000	1.00
		C		0.000	0.000	0.000	0.000	0.88
L5	63.17-31.17	A	1.555	0.000	0.000	11.680	0.000	0.54
		B		0.000	0.000	67.973	0.000	1.04
		C		0.000	0.000	0.000	0.000	0.86
L6	31.17-0.00	A	1.389	0.000	0.000	8.073	0.000	0.38
		B		0.000	0.000	52.075	0.000	0.76
		C		0.000	0.000	0.000	0.000	0.62

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	175.00-164.25	-0.0478	-0.0276	-0.3797	-0.2192
L2	164.25-129.67	-0.0479	-0.0276	-0.3976	-0.2296
L3	129.67-96.00	0.8386	0.1323	0.7389	0.0113
L4	96.00-63.17	1.3285	0.2201	1.3042	0.1252
L5	63.17-31.17	1.3962	0.2030	1.5213	0.0340
L6	31.17-0.00	1.1174	0.1484	1.3634	-0.0165

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	164.25 - 175.00	1.0000	1.0000
L2	1	Safety Line 3/8	129.67 - 164.25	1.0000	1.0000
L2	18	LDF7-50A(1-5/8")	129.67 - 115.00	1.0000	1.0000
L3	1	Safety Line 3/8	96.00 - 129.67	1.0000	1.0000
L3	18	LDF7-50A(1-5/8")	96.00 - 115.00	1.0000	1.0000
L4	1	Safety Line 3/8	63.17 - 96.00	1.0000	1.0000
L4	18	LDF7-50A(1-5/8")	63.17 - 96.00	1.0000	1.0000
L4	20	LDF4-50A(1/2")	63.17 - 50.00	1.0000	1.0000
L5	1	Safety Line 3/8	31.17 - 63.17	1.0000	1.0000
L5	18	LDF7-50A(1-5/8")	31.17 - 63.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L5	20	LDF4-50A(1/2")	31.17 - 50.00	1.0000	1.0000

Discrete Tower Loads

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
Lightning Rod 5/8"x6'	C	From Leg	0.00 0.00 3.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	0.38 0.99 1.62	0.38 0.99 1.62	0.01 0.01 0.02
Platform Mount [LP 701-1]	C	None		0.0000	172.00	No Ice 1/2" Ice 1" Ice	59.15 71.12 83.09	59.15 71.12 83.09	2.75 3.42 4.10
RR90-17-02DP w/ Mount Pipe	A	From Face	4.00 -7.00 0.00	10.0000	172.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.00 -7.00 0.00	10.0000	172.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
RR90-17-02DP w/ Mount Pipe	C	From Face	4.00 -3.00 0.00	40.0000	172.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.00 -3.00 0.00	10.0000	172.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 -3.00 0.00	10.0000	172.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.00 -7.00 0.00	40.0000	172.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
4'x2" Mount Pipe	A	From Face	4.00 3.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	0.87 1.11 1.36	0.87 1.11 1.36	0.01 0.02 0.03
4'x2" Mount Pipe	C	From Face	4.00 7.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	0.87 1.11 1.36	0.87 1.11 1.36	0.01 0.02 0.03
OA20-67-DIN	C	From Face	4.00 -7.00 -4.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	2.00 3.03 4.06	2.00 3.03 4.06	0.01 0.02 0.03
LS-230C	C	From Face	4.00 -7.00 -4.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.61 2.34 2.80	1.61 2.34 2.80	0.01 0.02 0.04
ATBT-BOTTOM-24V	A	From Face	4.00 0.00	10.0000	172.00	No Ice 1/2"	0.10 0.15	0.06 0.10	0.00 0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	B	From Leg	4.00	10.0000	172.00	No Ice	0.10	0.06	0.00
			0.00			1/2"	0.15	0.10	0.00
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	C	From Face	4.00	40.0000	172.00	No Ice	0.10	0.06	0.00
			0.00			1/2"	0.15	0.10	0.00
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
ATJB200-A01-007	A	From Face	4.00	10.0000	172.00	No Ice	0.38	0.13	0.00
			0.00			1/2"	0.46	0.18	0.01
			0.00			Ice	0.54	0.24	0.01
						1" Ice			
ETW190VS12UB	B	From Leg	4.00	10.0000	172.00	No Ice	0.57	0.32	0.01
			0.00			1/2"	0.67	0.40	0.02
			0.00			Ice	0.77	0.48	0.03
						1" Ice			
ETW190VS12UB	C	From Face	4.00	40.0000	172.00	No Ice	0.57	0.32	0.01
			0.00			1/2"	0.67	0.40	0.02
			0.00			Ice	0.77	0.48	0.03
						1" Ice			
***									
Side Arm Mount [SO 701-1]	A	From Face	1.50	0.0000	168.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
						1" Ice			
LS-230C	A	From Face	3.00	0.0000	168.00	No Ice	1.61	1.61	0.01
			0.00			1/2"	2.34	2.34	0.02
			3.00			Ice	2.80	2.80	0.04
						1" Ice			
***									
Platform Mount [LP 712-1]	C	None		0.0000	162.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						Ice	35.35	35.35	1.96
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	3.00	-20.0000	162.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			0.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	3.00	-10.0000	162.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			0.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	3.00	-20.0000	162.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			0.00			Ice	9.35	9.02	0.23
						1" Ice			
(2) 6'x2" Mount Pipe	A	From Face	3.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
(2) 6'x2" Mount Pipe	B	From Face	3.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
(2) 6'x2" Mount Pipe	C	From Face	3.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
4'x2" Mount Pipe	A	From Face	0.50	0.0000	162.00	No Ice	0.87	0.87	0.01
			0.00			1/2"	1.11	1.11	0.02
			0.00			Ice	1.36	1.36	0.03
						1" Ice			
4'x2" Mount Pipe	B	From Face	0.50	0.0000	162.00	No Ice	0.87	0.87	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	1.11	1.11	0.02
			0.00				1" Ice	1.36	1.36	0.03
4'x2" Mount Pipe	C	From Face	0.50		0.0000	162.00	No Ice	0.87	0.87	0.01
			0.00				1/2" Ice	1.11	1.11	0.02
			0.00				1" Ice	1.36	1.36	0.03
FD-RRH-2X50-800 W/FILTER	A	From Face	0.50		-20.0000	162.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			0.00				1" Ice	2.43	2.29	0.11
FD-RRH-2X50-800 W/FILTER	B	From Face	0.50		-10.0000	162.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			0.00				1" Ice	2.43	2.29	0.11
FD-RRH-2X50-800 W/FILTER	C	From Face	0.50		-20.0000	162.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			0.00				1" Ice	2.43	2.29	0.11
PCS 1900MHz 4x45W-65MHz	A	From Face	0.50		-20.0000	162.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			0.00				1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	B	From Face	0.50		-10.0000	162.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			0.00				1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	C	From Face	0.50		-20.0000	162.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			0.00				1" Ice	2.74	2.65	0.11
**										
Platform Mount [LP 403-1]	C	None			0.0000	152.00	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
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00		-20.0000	152.00	No Ice	7.81	5.80	0.04
			3.00				1/2" Ice	8.36	6.95	0.10
			0.00				1" Ice	8.87	7.82	0.17
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00		10.0000	152.00	No Ice	7.81	5.80	0.04
			-7.00				1/2" Ice	8.36	6.95	0.10
			0.00				1" Ice	8.87	7.82	0.17
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00		-10.0000	152.00	No Ice	7.81	5.80	0.04
			-7.00				1/2" Ice	8.36	6.95	0.10
			0.00				1" Ice	8.87	7.82	0.17
LPA-80080/4CF W/Mount Pipe	A	From Leg	4.00		-20.0000	152.00	No Ice	2.62	6.06	0.01
			-7.00				1/2" Ice	2.92	6.45	0.05
			0.00				1" Ice	3.23	6.86	0.08
LPA-80080/4CF W/Mount Pipe	B	From Leg	4.00		10.0000	152.00	No Ice	2.62	6.06	0.01
			-3.00				1/2" Ice	2.92	6.45	0.05
			0.00				1" Ice	3.23	6.86	0.08
LPA-80080/4CF W/Mount Pipe	C	From Leg	4.00		-10.0000	152.00	No Ice	2.62	6.06	0.01
			-3.00				1/2" Ice	2.92	6.45	0.05
			0.00				1" Ice	3.23	6.86	0.08
LPA-80080/4CF W/Mount Pipe	A	From Leg	4.00		-20.0000	152.00	No Ice	2.62	6.06	0.01
			-3.00				1/2" Ice	2.92	6.45	0.05
			0.00				1" Ice	3.23	6.86	0.08
LPA-80080/4CF W/Mount	B	From Leg	4.00		10.0000	152.00	No Ice	2.62	6.06	0.01

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
Pipe			0.00 0.00			1/2" Ice 1" Ice	2.92 3.23	6.45 6.86	0.05 0.08
LPA-80080/4CF W/Mount Pipe	C	From Leg	4.00 0.00 0.00	-10.0000	152.00	No Ice 1/2" Ice 1" Ice	2.62 2.92 3.23	6.06 6.45 6.86	0.01 0.05 0.08
BXA-171085-12BF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	-20.0000	152.00	No Ice 1/2" Ice 1" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.09 0.14
BXA-171085-12BF w/ Mount Pipe	B	From Leg	4.00 3.00 0.00	10.0000	152.00	No Ice 1/2" Ice 1" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.09 0.14
BXA-171085-12BF w/ Mount Pipe	C	From Leg	4.00 3.00 0.00	-10.0000	152.00	No Ice 1/2" Ice 1" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.09 0.14
742 213 w/ Mount Pipe	A	From Leg	4.00 7.00 0.00	-20.0000	152.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
742 213 w/ Mount Pipe	B	From Leg	4.00 7.00 0.00	10.0000	152.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
742 213 w/ Mount Pipe	C	From Leg	4.00 7.00 0.00	-10.0000	152.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
RRH2x40-AWS	A	From Leg	4.00 0.00 0.00	-20.0000	152.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	0.04 0.06 0.08
RRH2x40-AWS	B	From Leg	4.00 0.00 0.00	10.0000	152.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	0.04 0.06 0.08
RRH2x40-AWS	C	From Leg	4.00 0.00 0.00	-10.0000	152.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	0.04 0.06 0.08
DB-T1-6Z-8AB-0Z	A	From Leg	1.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
**									
Platform Mount [LP 303-1]	C	None		0.0000	144.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
Miscellaneous [NA 507-1]	C	None		0.0000	144.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
(2) 7770.00 w/ Mount Pipe	A	From Face	3.00 0.00 -1.00	30.0000	144.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Face	3.00 0.00 -1.00	30.0000	144.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Face	3.00	30.0000	144.00	No Ice	5.75	4.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2"	6.18	5.01	0.10
			-1.00			Ice	6.61	5.71	0.16
						1" Ice			
AM-X-CD-16-65-00T-RET	A	From Face	3.00	30.0000	144.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			2.00			1/2"	8.82	7.48	0.14
			-1.00			Ice	9.35	8.37	0.21
						1" Ice			
AM-X-CD-16-65-00T-RET	B	From Face	3.00	30.0000	144.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			2.00			1/2"	8.82	7.48	0.14
			-1.00			Ice	9.35	8.37	0.21
						1" Ice			
AM-X-CD-16-65-00T-RET	C	From Face	3.00	30.0000	144.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			2.00			1/2"	8.82	7.48	0.14
			-1.00			Ice	9.35	8.37	0.21
						1" Ice			
(2) LGP2140X	A	From Face	3.00	30.0000	144.00	No Ice	1.08	0.36	0.01
			0.00			1/2"	1.21	0.45	0.02
			-1.00			Ice	1.35	0.56	0.03
						1" Ice			
(2) LGP2140X	B	From Face	3.00	30.0000	144.00	No Ice	1.08	0.36	0.01
			0.00			1/2"	1.21	0.45	0.02
			-1.00			Ice	1.35	0.56	0.03
						1" Ice			
(2) LGP2140X	C	From Face	3.00	30.0000	144.00	No Ice	1.08	0.36	0.01
			0.00			1/2"	1.21	0.45	0.02
			-1.00			Ice	1.35	0.56	0.03
						1" Ice			
RRUS 11	A	From Face	3.00	30.0000	144.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			-1.00			Ice	3.21	1.49	0.10
						1" Ice			
RRUS 11	B	From Face	3.00	30.0000	144.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			-1.00			Ice	3.21	1.49	0.10
						1" Ice			
RRUS 11	C	From Face	3.00	30.0000	144.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			-1.00			Ice	3.21	1.49	0.10
						1" Ice			
RRUS 11 B12	A	From Face	3.00	30.0000	144.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			-1.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	B	From Face	3.00	30.0000	144.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			-1.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	C	From Face	3.00	30.0000	144.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			-1.00			Ice	3.26	1.48	0.10
						1" Ice			
APTDC-BDFDM-DB	C	From Face	3.00	30.0000	144.00	No Ice	0.05	0.10	0.00
			0.00			1/2"	0.08	0.14	0.00
			-1.00			Ice	0.12	0.19	0.00
						1" Ice			
DC6-48-60-18-8F	C	From Face	1.00	0.0000	144.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			-1.00			Ice	1.64	1.64	0.06
						1" Ice			
6'x2" Mount Pipe	A	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
6'x2" Mount Pipe	B	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
6'x2" Mount Pipe	C	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			-2.00			1/2"	1.92	1.92	0.03
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
6'x2" Mount Pipe	A	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
6'x2" Mount Pipe	B	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
6'x2" Mount Pipe	C	From Face	3.00	0.0000	144.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			-1.00			Ice	2.29	2.29	0.05
						1" Ice			
***									
APXV18-206517S-C w/ Mount Pipe	A	From Face	1.00	-30.0000	115.00	No Ice	5.40	4.70	0.05
			0.00			1/2"	5.96	5.86	0.10
			0.00			Ice	6.48	6.73	0.15
						1" Ice			
APXV18-206517S-C w/ Mount Pipe	B	From Face	1.00	30.0000	115.00	No Ice	5.40	4.70	0.05
			0.00			1/2"	5.96	5.86	0.10
			0.00			Ice	6.48	6.73	0.15
						1" Ice			
APXV18-206517S-C w/ Mount Pipe	C	From Face	1.00	30.0000	115.00	No Ice	5.40	4.70	0.05
			0.00			1/2"	5.96	5.86	0.10
			0.00			Ice	6.48	6.73	0.15
						1" Ice			
**									
GPS-TMG-HR-26NCM	A	From Face	3.00	0.0000	50.00	No Ice	0.13	0.13	0.00
			0.00			1/2"	0.18	0.18	0.00
			0.00			Ice	0.24	0.24	0.01
						1" Ice			
Side Arm Mount [SO 701-1]	A	From Face	1.50	0.0000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
						1" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2.6	A	Paraboloid w/Shroud (HP)	From Face	4.00	-6.0000		172.00	2.92	No Ice	6.68	0.05
				3.00					1/2" Ice	7.07	0.08
				3.00					1" Ice	7.46	0.12
VHLP2.6	C	Paraboloid w/Shroud (HP)	From Face	4.00	90.0000		172.00	2.92	No Ice	6.68	0.05
				7.00					1/2" Ice	7.07	0.08
				3.00					1" Ice	7.46	0.12
**											

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	175 - 164.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.85	-1.95	-3.99
			Max. Mx	8	-4.20	-30.16	-1.45
			Max. My	14	-4.24	-1.08	-28.19
			Max. Vy	8	6.03	-30.16	-1.45
			Max. Vx	14	5.70	-1.08	-28.19
			Max. Torque	7			-5.10
L2	164.25 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	129.67						
			Max. Compression	26	-37.18	-3.24	-3.94
			Max. Mx	8	-16.81	-458.06	-5.68
			Max. My	14	-16.86	-6.61	-444.44
			Max. Vy	8	18.57	-458.06	-5.68
			Max. Vx	14	18.24	-6.61	-444.44
			Max. Torque	5			-5.39
L3	129.67 - 96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.42	-4.10	-4.17
			Max. Mx	8	-25.14	-1118.66	-9.22
			Max. My	14	-25.18	-11.38	-1093.62
			Max. Vy	8	21.72	-1118.66	-9.22
			Max. Vx	14	21.35	-11.38	-1093.62
			Max. Torque	5			-5.39
L4	96 - 63.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.13	-5.70	-4.47
			Max. Mx	8	-34.92	-1856.04	-12.47
			Max. My	14	-34.94	-15.98	-1819.15
			Max. Vy	8	24.29	-1856.04	-12.47
			Max. Vx	14	23.93	-15.98	-1819.15
			Max. Torque	5			-5.38
L5	63.17 - 31.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.61	-7.07	-4.35
			Max. Mx	8	-46.07	-2652.91	-15.30
			Max. My	14	-46.08	-20.07	-2604.81
			Max. Vy	8	26.60	-2652.91	-15.30
			Max. Vx	14	26.26	-20.07	-2604.81
			Max. Torque	5			-5.37
L6	31.17 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-97.88	-8.95	-4.40
			Max. Mx	8	-60.46	-3693.32	-18.45
			Max. My	14	-60.46	-24.77	-3632.37
			Max. Vy	8	28.92	-3693.32	-18.45
			Max. Vx	14	28.59	-24.77	-3632.37
			Max. Torque	5			-5.17

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	97.88	-0.00	-0.00
	Max. H_x	20	60.47	28.75	0.06
	Max. H_z	2	60.47	0.12	28.56
	Max. M_x	2	3630.04	0.12	28.56
	Max. M_z	8	3693.32	-28.89	-0.08
	Max. Torsion	19	4.49	24.94	-14.15
	Min. Vert	17	45.35	14.44	-24.67
	Min. H_x	8	60.47	-28.89	-0.08
	Min. H_z	14	60.47	-0.11	-28.57
	Min. M_x	14	-3632.37	-0.11	-28.57
	Min. M_z	20	-3663.79	28.75	0.06
	Min. Torsion	5	-5.17	-14.48	24.66

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	50.39	0.00	0.00	0.59	-1.08	0.00

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
1.2 Dead+1.6 Wind 0 deg - No Ice	60.47	-0.12	-28.56	-3630.04	23.99	3.05
0.9 Dead+1.6 Wind 0 deg - No Ice	45.35	-0.12	-28.56	-3586.26	23.96	3.07
1.2 Dead+1.6 Wind 30 deg - No Ice	60.47	14.48	-24.66	-3128.39	-1850.11	5.15
0.9 Dead+1.6 Wind 30 deg - No Ice	45.35	14.48	-24.66	-3090.72	-1827.32	5.17
1.2 Dead+1.6 Wind 60 deg - No Ice	60.47	25.07	-14.14	-1785.10	-3206.11	4.73
0.9 Dead+1.6 Wind 60 deg - No Ice	45.35	25.07	-14.14	-1763.74	-3166.82	4.74
1.2 Dead+1.6 Wind 90 deg - No Ice	60.47	28.89	0.08	18.45	-3693.32	3.27
0.9 Dead+1.6 Wind 90 deg - No Ice	45.35	28.89	0.08	17.98	-3648.11	3.28
1.2 Dead+1.6 Wind 120 deg - No Ice	60.47	25.07	14.31	1824.13	-3209.68	1.15
0.9 Dead+1.6 Wind 120 deg - No Ice	45.35	25.07	14.31	1801.80	-3170.32	1.15
1.2 Dead+1.6 Wind 150 deg - No Ice	60.47	14.63	24.71	3142.29	-1884.02	-1.39
0.9 Dead+1.6 Wind 150 deg - No Ice	45.35	14.63	24.71	3104.02	-1860.71	-1.40
1.2 Dead+1.6 Wind 180 deg - No Ice	60.47	0.11	28.57	3632.37	-24.77	-3.70
0.9 Dead+1.6 Wind 180 deg - No Ice	45.35	0.11	28.57	3588.17	-24.07	-3.71
1.2 Dead+1.6 Wind 210 deg - No Ice	60.47	-14.44	24.67	3131.40	1841.58	-4.42
0.9 Dead+1.6 Wind 210 deg - No Ice	45.35	-14.44	24.67	3093.31	1819.55	-4.44
1.2 Dead+1.6 Wind 240 deg - No Ice	60.47	-24.94	14.15	1790.04	3179.60	-4.48
0.9 Dead+1.6 Wind 240 deg - No Ice	45.35	-24.94	14.15	1768.23	3141.34	-4.49
1.2 Dead+1.6 Wind 270 deg - No Ice	60.47	-28.75	-0.06	-13.11	3663.79	-3.16
0.9 Dead+1.6 Wind 270 deg - No Ice	45.35	-28.75	-0.06	-13.09	3619.67	-3.17
1.2 Dead+1.6 Wind 300 deg - No Ice	60.47	-24.93	-14.27	-1813.97	3181.07	-1.06
0.9 Dead+1.6 Wind 300 deg - No Ice	45.35	-24.93	-14.27	-1792.17	3142.78	-1.05
1.2 Dead+1.6 Wind 330 deg - No Ice	60.47	-14.51	-24.69	-3136.81	1858.70	1.21
0.9 Dead+1.6 Wind 330 deg - No Ice	45.35	-14.51	-24.69	-3099.01	1836.41	1.23
1.2 Dead+1.0 Ice+1.0 Temp	97.88	0.00	0.00	4.40	-8.95	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	97.88	-0.00	-5.91	-757.37	-8.21	0.40
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	97.88	2.99	-5.11	-654.45	-396.77	0.77
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	97.88	5.16	-2.95	-374.49	-678.13	0.77
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	97.88	5.94	-0.00	4.34	-778.76	0.61
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	97.88	5.15	2.94	384.23	-675.88	0.30
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	97.88	2.98	5.11	662.53	-396.95	-0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	97.88	-0.00	5.91	766.52	-9.82	-0.49
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	97.88	-2.98	5.12	663.70	377.60	-0.66
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	97.88	-5.14	2.95	384.02	656.31	-0.74
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	97.88	-5.92	0.01	5.25	756.50	-0.59

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
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	97.88	-5.13	-2.94	-373.93	653.76	-0.29
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	97.88	-2.97	-5.10	-652.92	375.31	0.07
Dead+Wind 0 deg - Service	50.39	-0.03	-6.65	-838.34	4.72	0.72
Dead+Wind 30 deg - Service	50.39	3.37	-5.74	-722.42	-428.32	1.21
Dead+Wind 60 deg - Service	50.39	5.84	-3.29	-412.04	-741.66	1.11
Dead+Wind 90 deg - Service	50.39	6.73	0.02	4.72	-854.25	0.77
Dead+Wind 120 deg - Service	50.39	5.84	3.33	421.98	-742.49	0.27
Dead+Wind 150 deg - Service	50.39	3.41	5.75	726.57	-436.15	-0.33
Dead+Wind 180 deg - Service	50.39	0.03	6.65	839.80	-6.53	-0.87
Dead+Wind 210 deg - Service	50.39	-3.36	5.74	724.05	424.71	-1.04
Dead+Wind 240 deg - Service	50.39	-5.81	3.29	414.11	733.90	-1.05
Dead+Wind 270 deg - Service	50.39	-6.69	-0.01	-2.56	845.79	-0.74
Dead+Wind 300 deg - Service	50.39	-5.80	-3.32	-418.70	734.25	-0.25
Dead+Wind 330 deg - Service	50.39	-3.38	-5.75	-724.38	428.67	0.29

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	-50.39	0.00	0.00	50.39	0.00	0.000%
2	-0.12	-60.47	-28.56	0.12	60.47	28.56	0.000%
3	-0.12	-45.35	-28.56	0.12	45.35	28.56	0.000%
4	14.48	-60.47	-24.66	-14.48	60.47	24.66	0.000%
5	14.48	-45.35	-24.66	-14.48	45.35	24.66	0.000%
6	25.07	-60.47	-14.14	-25.07	60.47	14.14	0.000%
7	25.07	-45.35	-14.14	-25.07	45.35	14.14	0.000%
8	28.89	-60.47	0.08	-28.89	60.47	-0.08	0.000%
9	28.89	-45.35	0.08	-28.89	45.35	-0.08	0.000%
10	25.07	-60.47	14.31	-25.07	60.47	-14.31	0.000%
11	25.07	-45.35	14.31	-25.07	45.35	-14.31	0.000%
12	14.63	-60.47	24.71	-14.63	60.47	-24.71	0.000%
13	14.63	-45.35	24.71	-14.63	45.35	-24.71	0.000%
14	0.11	-60.47	28.57	-0.11	60.47	-28.57	0.000%
15	0.11	-45.35	28.57	-0.11	45.35	-28.57	0.000%
16	-14.44	-60.47	24.67	14.44	60.47	-24.67	0.000%
17	-14.44	-45.35	24.67	14.44	45.35	-24.67	0.000%
18	-24.94	-60.47	14.15	24.94	60.47	-14.15	0.000%
19	-24.94	-45.35	14.15	24.94	45.35	-14.15	0.000%
20	-28.75	-60.47	-0.06	28.75	60.47	0.06	0.000%
21	-28.75	-45.35	-0.06	28.75	45.35	0.06	0.000%
22	-24.93	-60.47	-14.27	24.93	60.47	14.27	0.000%
23	-24.93	-45.35	-14.27	24.93	45.35	14.27	0.000%
24	-14.51	-60.47	-24.69	14.51	60.47	24.69	0.000%
25	-14.51	-45.35	-24.69	14.51	45.35	24.69	0.000%
26	0.00	-97.88	0.00	-0.00	97.88	-0.00	0.000%
27	-0.00	-97.88	-5.91	0.00	97.88	5.91	0.000%
28	2.99	-97.88	-5.11	-2.99	97.88	5.11	0.000%
29	5.16	-97.88	-2.95	-5.16	97.88	2.95	0.000%
30	5.94	-97.88	-0.00	-5.94	97.88	0.00	0.000%
31	5.15	-97.88	2.94	-5.15	97.88	-2.94	0.000%
32	2.98	-97.88	5.11	-2.98	97.88	-5.11	0.000%
33	-0.00	-97.88	5.91	0.00	97.88	-5.91	0.000%
34	-2.98	-97.88	5.11	2.98	97.88	-5.12	0.000%
35	-5.14	-97.88	2.95	5.14	97.88	-2.95	0.000%
36	-5.92	-97.88	0.01	5.92	97.88	-0.01	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
37	-5.13	-97.88	-2.94	5.13	97.88	2.94	0.000%
38	-2.97	-97.88	-5.10	2.97	97.88	5.10	0.000%
39	-0.03	-50.39	-6.65	0.03	50.39	6.65	0.000%
40	3.37	-50.39	-5.74	-3.37	50.39	5.74	0.000%
41	5.84	-50.39	-3.29	-5.84	50.39	3.29	0.000%
42	6.73	-50.39	0.02	-6.73	50.39	-0.02	0.000%
43	5.84	-50.39	3.33	-5.84	50.39	-3.33	0.000%
44	3.41	-50.39	5.75	-3.41	50.39	-5.75	0.000%
45	0.03	-50.39	6.65	-0.03	50.39	-6.65	0.000%
46	-3.36	-50.39	5.74	3.36	50.39	-5.74	0.000%
47	-5.81	-50.39	3.29	5.81	50.39	-3.29	0.000%
48	-6.69	-50.39	-0.01	6.69	50.39	0.01	0.000%
49	-5.80	-50.39	-3.32	5.80	50.39	3.32	0.000%
50	-3.38	-50.39	-5.75	3.38	50.39	5.75	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00015527
3	Yes	5	0.00000001	0.00007828
4	Yes	6	0.00000001	0.00009985
5	Yes	5	0.00000001	0.00086244
6	Yes	6	0.00000001	0.00008196
7	Yes	5	0.00000001	0.00070319
8	Yes	5	0.00000001	0.00023084
9	Yes	5	0.00000001	0.00011488
10	Yes	6	0.00000001	0.00009465
11	Yes	5	0.00000001	0.00081385
12	Yes	6	0.00000001	0.00009495
13	Yes	5	0.00000001	0.00081715
14	Yes	5	0.00000001	0.00025206
15	Yes	5	0.00000001	0.00012624
16	Yes	6	0.00000001	0.00008322
17	Yes	5	0.00000001	0.00071479
18	Yes	6	0.00000001	0.00009823
19	Yes	5	0.00000001	0.00084770
20	Yes	5	0.00000001	0.00018383
21	Yes	5	0.00000001	0.00009203
22	Yes	6	0.00000001	0.00008843
23	Yes	5	0.00000001	0.00076027
24	Yes	6	0.00000001	0.00008900
25	Yes	5	0.00000001	0.00076531
26	Yes	4	0.00000001	0.00010317
27	Yes	5	0.00000001	0.00055577
28	Yes	5	0.00000001	0.00062325
29	Yes	5	0.00000001	0.00062372
30	Yes	5	0.00000001	0.00057998
31	Yes	5	0.00000001	0.00063743
32	Yes	5	0.00000001	0.00063417
33	Yes	5	0.00000001	0.00057089
34	Yes	5	0.00000001	0.00061743
35	Yes	5	0.00000001	0.00062008
36	Yes	5	0.00000001	0.00055850
37	Yes	5	0.00000001	0.00060093
38	Yes	5	0.00000001	0.00060095
39	Yes	4	0.00000001	0.00020224
40	Yes	4	0.00000001	0.00062459
41	Yes	4	0.00000001	0.00040502
42	Yes	4	0.00000001	0.00023531
43	Yes	4	0.00000001	0.00049268
44	Yes	4	0.00000001	0.00049460
45	Yes	4	0.00000001	0.00024758
46	Yes	4	0.00000001	0.00041241

47	Yes	4	0.00000001	0.00060135
48	Yes	4	0.00000001	0.00021916
49	Yes	4	0.00000001	0.00041852
50	Yes	4	0.00000001	0.00042209

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 164.25	21.546	43	1.0520	0.0106
L2	167.17 - 129.67	19.822	43	1.0480	0.0092
L3	133.5 - 96	12.795	43	0.9107	0.0043
L4	100.67 - 63.17	7.232	42	0.6904	0.0023
L5	68.67 - 31.17	3.335	42	0.4579	0.0012
L6	37.42 - 0	0.999	42	0.2411	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	VHLP2.6	43	21.546	1.0520	0.0106	64427
172.00	Platform Mount [LP 701-1]	43	20.884	1.0513	0.0101	64427
168.00	Side Arm Mount [SO 701-1]	43	20.004	1.0489	0.0093	46497
162.00	Platform Mount [LP 712-1]	43	18.692	1.0392	0.0083	26679
152.00	Platform Mount [LP 403-1]	43	16.545	1.0069	0.0066	15911
144.00	Platform Mount [LP 303-1]	43	14.881	0.9698	0.0055	12027
115.00	APXV18-206517S-C w/ Mount Pipe	43	9.471	0.7911	0.0029	8362
50.00	GPS-TMG-HR-26NCM	42	1.751	0.3265	0.0007	7369

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 164.25	93.188	8	4.5507	0.0448
L2	167.17 - 129.67	85.745	8	4.5339	0.0387
L3	133.5 - 96	55.374	8	3.9424	0.0182
L4	100.67 - 63.17	31.300	8	2.9894	0.0097
L5	68.67 - 31.17	14.432	8	1.9825	0.0050
L6	37.42 - 0	4.323	8	1.0435	0.0022

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	VHLP2.6	8	93.188	4.5507	0.0448	15540
172.00	Platform Mount [LP 701-1]	8	90.332	4.5477	0.0425	15540
168.00	Side Arm Mount [SO 701-1]	8	86.532	4.5375	0.0393	11195
162.00	Platform Mount [LP 712-1]	8	80.866	4.4960	0.0348	6351
152.00	Platform Mount [LP 403-1]	8	71.589	4.3575	0.0280	3749
144.00	Platform Mount [LP 303-1]	8	64.392	4.1976	0.0233	2822
115.00	APXV18-206517S-C w/ Mount	8	40.992	3.4254	0.0125	1947

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					
50.00	GPS-TMG-HR-26NCM	8	7.577	1.4130	0.0032	1704

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	175 - 164.25 (1)	TP26x22x0.25	10.75	0.00	0.0	19.5705	-4.20	1453.99	0.003
L2	164.25 - 129.67 (2)	TP34.0625x24.4135x0.3125	37.50	0.00	0.0	32.4983	-16.81	2385.49	0.007
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	37.50	0.00	0.0	47.8684	-25.14	3492.32	0.007
L4	96 - 63.17 (4)	TP49.0625x39.8421x0.375	37.50	0.00	0.0	56.3407	-34.92	3911.19	0.009
L5	63.17 - 31.17 (5)	TP56.125x46.9602x0.375	37.50	0.00	0.0	64.5384	-46.07	4259.45	0.011
L6	31.17 - 0 (6)	TP62.9375x53.8475x0.375	37.42	0.00	0.0	74.4650	-60.46	4606.06	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	175 - 164.25 (1)	TP26x22x0.25	30.64	735.75	0.042	0.00	735.75	0.000
L2	164.25 - 129.67 (2)	TP34.0625x24.4135x0.3125	458.86	1604.54	0.286	0.00	1604.54	0.000
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	1119.22	2883.94	0.388	0.00	2883.94	0.000
L4	96 - 63.17 (4)	TP49.0625x39.8421x0.375	1856.08	3806.78	0.488	0.00	3806.78	0.000
L5	63.17 - 31.17 (5)	TP56.125x46.9602x0.375	2652.96	4753.71	0.558	0.00	4753.71	0.000
L6	31.17 - 0 (6)	TP62.9375x53.8475x0.375	3693.36	5936.64	0.622	0.00	5936.64	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 164.25 (1)	TP26x22x0.25	6.06	726.99	0.008	2.02	1473.29	0.001
L2	164.25 - 129.67 (2)	TP34.0625x24.4135x0.3125	18.57	1192.75	0.016	1.20	3213.02	0.000
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	21.70	1746.16	0.012	1.16	5774.93	0.000
L4	96 - 63.17 (4)	TP49.0625x39.8421x0.375	24.29	1955.60	0.012	3.38	7622.88	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L5	63.17 - 31.17 (5)	TP56.125x46.9602x0.375	26.60	2129.72	0.012	3.28	9519.08	0.000
L6	31.17 - 0 (6)	TP62.9375x53.8475x0.375	28.92	2303.03	0.013	3.27	11887.83	0.000

Pole Interaction Design Data

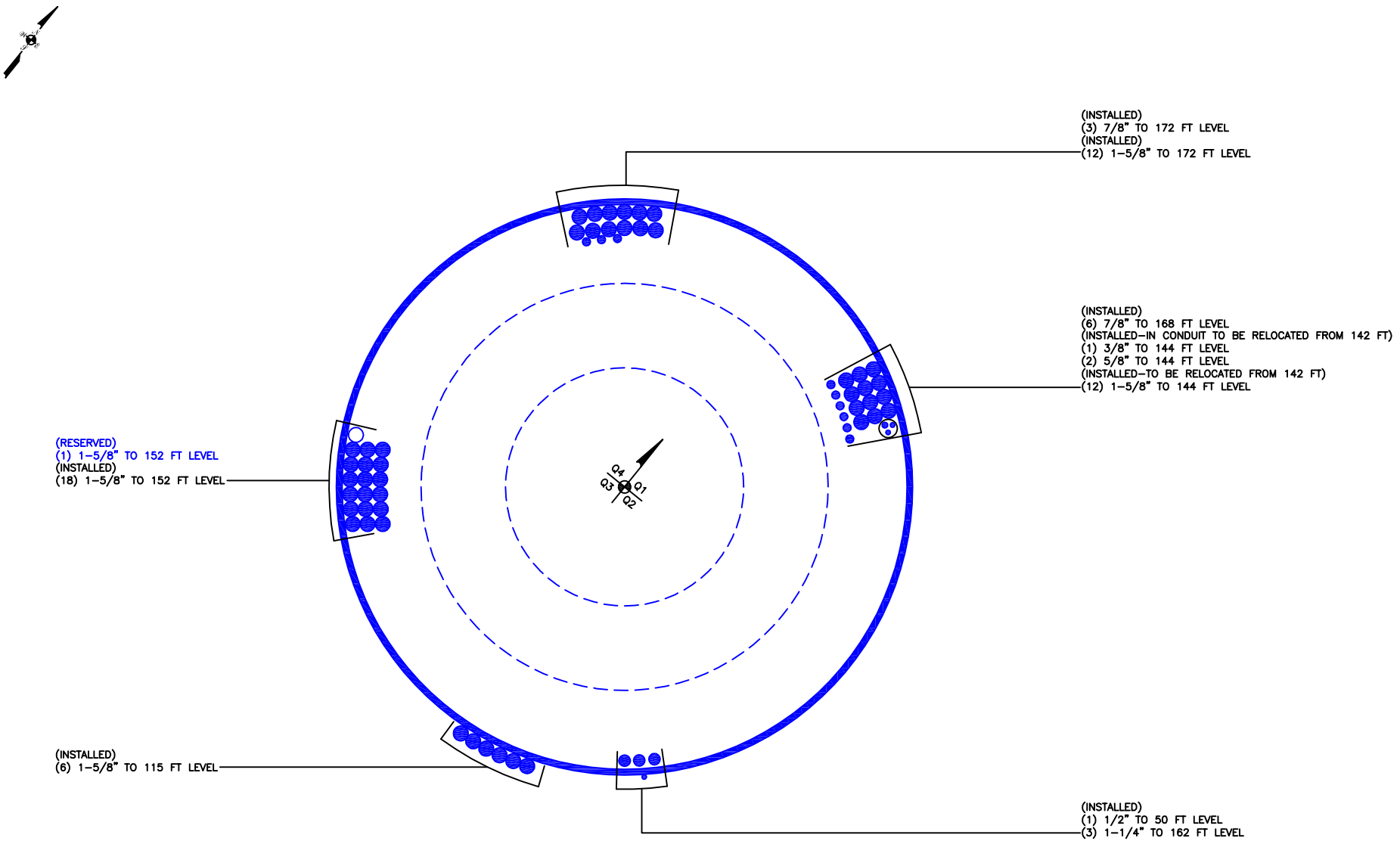
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 164.25 (1)	0.003	0.042	0.000	0.008	0.001	0.045 ✔	1.000	4.8.2 ✔
L2	164.25 - 129.67 (2)	0.007	0.286	0.000	0.016	0.000	0.293 ✔	1.000	4.8.2 ✔
L3	129.67 - 96 (3)	0.007	0.388	0.000	0.012	0.000	0.395 ✔	1.000	4.8.2 ✔
L4	96 - 63.17 (4)	0.009	0.488	0.000	0.012	0.000	0.497 ✔	1.000	4.8.2 ✔
L5	63.17 - 31.17 (5)	0.011	0.558	0.000	0.012	0.000	0.569 ✔	1.000	4.8.2 ✔
L6	31.17 - 0 (6)	0.013	0.622	0.000	0.013	0.000	0.635 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	175 - 164.25	Pole	TP26x22x0.25	1	-4.20	1453.99	4.5	Pass
L2	164.25 - 129.67	Pole	TP34.0625x24.4135x0.3125	2	-16.81	2385.49	29.3	Pass
L3	129.67 - 96	Pole	TP41.75x32.452x0.375	3	-25.14	3492.32	39.5	Pass
L4	96 - 63.17	Pole	TP49.0625x39.8421x0.375	4	-34.92	3911.19	49.7	Pass
L5	63.17 - 31.17	Pole	TP56.125x46.9602x0.375	5	-46.07	4259.45	56.9	Pass
L6	31.17 - 0	Pole	TP62.9375x53.8475x0.375	6	-60.46	4606.06	63.5	Pass
							Summary	
						Pole (L6)	63.5	Pass
						RATING =	**63.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 823530 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *823530*
Site Name: *CT364/Chapel St. Monopole*
App #: *365856 Rev. 0*

Pole Manufacturer:	*Pirod*

Reactions		
Mu:	3693	ft-kips
Axial, Pu:	60	kips
Shear, Vu:	29	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	45	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	68	in

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ń):	60.6 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	116.3 Kips	φ*Tn
Anchor Rod Stress Ratio:	52.1% **Pass**	

Plate Data		
Diam:	71	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.44	in

Base Plate Results Shear Check Only

		Stiffened
Base Plate Stress:	Rohn/Pirod, OK	AISC LRFD
Allowable Plate Stress:	27.0 ksi	φ*Fy
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.25	in
Width:	4	in
Height:	12	in
Thick:	1	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

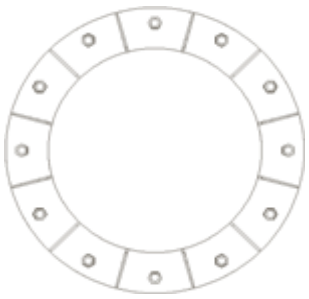
Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check:	N/A

Pole Data		
Diam:	62.9375	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Pier and Pad Foundation

BU # : 823530
Site Name: CT364/Chapel St. Monopole
App. Number: 365856 Rev.0

TIA-222 Revision: G

Design Reactions		
Shear, **S**:	29	kips
Moment, **M**:	3693	ft-kips
Tower Height, **H**:	175	ft
Tower Weight, **Wt**:	60	kips
Base Diameter, **BD**:	5.24	ft

Foundation Dimensions		
Depth, **D**:	8	ft
Pad Width, **W**:	22.5	ft
Neglected Depth, **N**:	3.3	ft
Thickness, **T**:	2.75	ft
Pier Diameter, **Pd**:	7.50	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	2.5	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.121	kcf
Ult. Bearing Capacity, Bc:	30.9	ksf
Angle of Friction, **Φ**:	37	deg
Cohesion, **Co**:		ksf
Passive Pressure, **Pp**:	4.100	ksf
Base Friction, **μ**:	0.45	

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

Rebar Properties		
Pier Rebar Size, **Sp**:	9	
Pier Rebar Quanity, **mp**:	36	32
Pad Rebar Size, **Spad**:	9	
Pad Rebar Quanity, **mpad**:	23	9
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	10	6

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7.5	7.24	**OK**
Overturning (ft-kips)	6725.09	3693.00	**54.9%**
Shear Capacity (kips)	435.56	29.00	**6.7%**
Bearing (ksf)	23.18	3.28	**14.1%**
Pad Shear - 1-way (kips)	627.95	364.49	**58.0%**
Pad Shear - 2-way (kips)	1728.84	116.33	**6.7%**
Pad Moment Capacity (k-ft)	2826.15	1169.95	**41.4%**
Pier Moment Capacity (k-ft)	6280.44	3859.75	**61.5%**

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *823530*
Site Name: *CT364/Chapel St. Monopole*
App #: *365856 Rev.0*

Loads Already Factored		
For P (DL)	1.2	<----Disregard
For P,V, and M (WL)	1.35	<----Disregard

Pad & Pier Data		
Base PL Dist. Above Pier:	2.5	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	8	ft
Pad Thickness, T:	2.75	ft
Pad Width=Length, L:	22.5	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7.50	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	44.18	ft^2
Pier Height:	5.75	ft
Soil (above pad) Height:	5.25	ft

Soil Parameters		
Unit Weight, γ:	121.0	pcf
Ultimate Bearing Capacity, qn:	30.90	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	37.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	23.18	ksf
Passive Pres. Coeff., Kp	4.02	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	29.0	kips
Pad Force Location Above D:	1.28	ft
ϕ(Passive Pressure Moment):	37.12	ft-kips
Factored O.T. M(WL), "1.6W":	3945.5	ft-kips
Factored OT (MW-Msoil), M1	3908.43	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	3.96	ft
Sum of Soil Wedges Wt:	63.67	kips
Soil Wedges ecc, K1:	9.40	ft
Ftg+Soil above Pad wt:	540.5	kips
Unfactored (Total ftg-soil Wt):	604.13	kips
1.2D. **No Soil Wedges**.	708.56	kips
0.9D. **With Soil Wedges**	588.72	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	G	<--Pull Down
Factored DL Axial, PDu:	60	kips
Factored WL Axial, PWu:	0	kips
Factored WL Shear, Vu:	29	kips
Factored WL Moment, Mu:	3693	ft-kips

Load Factor	Shaft Factored Loads		
1.00	1.2D+1.6W, Pu:	60	kips
0.90	0.9D+1.6W, Pu:	45	kips
1.00	Vu:	29	kips
	Mu:	3693	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	708.56	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	3908.43	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	5.52	ft
Orthogonal qu=	2.77	ksf
qu/ϕ*qn Ratio=	**11.96%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	3.90	ft
Diagonal qu=	3.28	ksf
qu/ϕ*qn Ratio=	**14.15%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	588.72	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	3369.56	ft-kips

Orthogonal ecc3 = M2/P2 =	5.72	ft
Ortho Non Bearing Length,NBL=	11.45	ft
Orthogonal qu=	2.37	ksf
Diagonal qu=	2.84	ksf

Max Reaction Moment (ft-kips) so that qu=ϕ*qn = 100% Capacity Rating			
Actual M:	3693.00		
M Orthogonal:	6725.09	**54.91%**	**Pass**
M Diagonal:	6725.09	**54.91%**	**Pass**

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RF COMPLIANCE EXPERTS
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Smartlink LLC on behalf of AT&T Mobility, LLC
Site FA – 10107966
Site ID – CTV1062 (2C)
USID – 83904
Site Name – Thomaston-Chapel Street
Site Compliance Report

580 Chapel Street
Thomaston, CT 06787

Latitude: N41-39-48.44
Longitude: W73-4-27.54
Structure Type: Monopole

Report generated date: October 10, 2016
Report by: Kevin Bernstetter
Customer Contact: Kristen Smith

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Unknown
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at Ground Level
FCC & AT&T Compliant?	Will be compliant

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

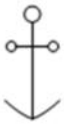
RFDS: NEW-ENGLAND_CONNECTICUT_CTV1062_2017-LTE-Next-Carrier_LTE-2C_om636a_PTN_...

CD's: 10107966_AE201_160615_CTL01062_REV0 -JW RLs 6-21-16 KES to Crown

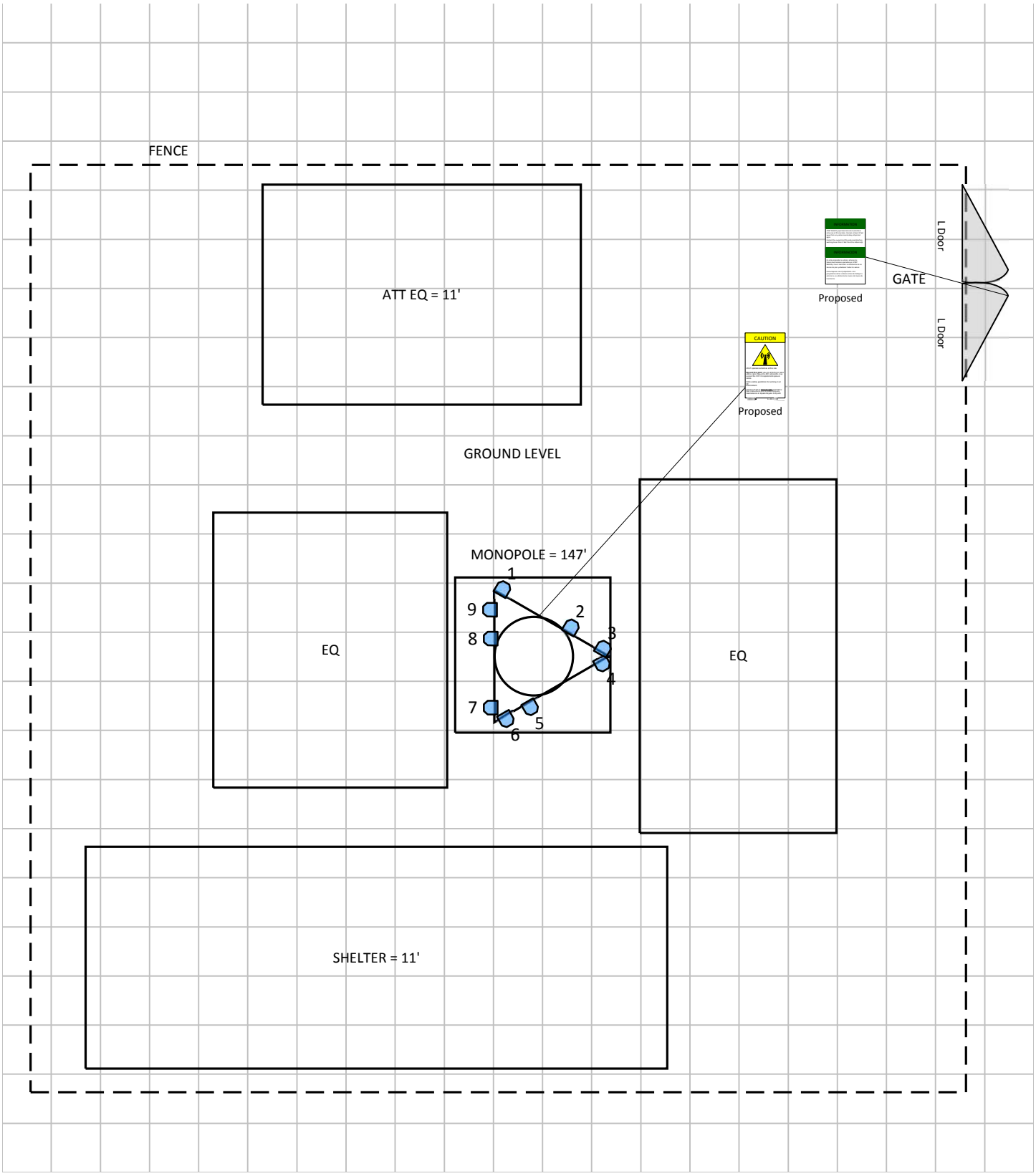
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

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

Site Scale Map For: Thomaston-Chapel Street



(Feet)

0 3.5 7

www.sitesafe.com
Site Name:Thomaston-Chapel Street
10/10/2016 7:27:25 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
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	30	82	4.6	11.51	0	1	0	297.2	29.2'	37.6'	138.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	30	86	4.6	13.41	0	1	0	586.1	29.2'	37.6'	138.7'
2	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	30	65	6	13.36	0	0	1	1119.4	32.7'	35.7'	138'
2	AT&T MOBILITY LLC (Proposed)	KMW AM-X-CD-16-65-00T	Panel	2100	30	69	6	14.96	0	0	1	2084.5	32.7'	35.7'	138'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	30	82	4.6	11.51	1	0	0	134.9	34.3'	34.6'	138.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	150	82	4.6	11.51	0	1	0	297.2	34.3'	33.8'	138.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	150	86	4.6	13.41	0	1	0	586.1	34.3'	33.8'	138.7'
5	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	737	150	67	4	11.66	0	0	1	1475.7	30.6'	31.6'	139'
5	AT&T MOBILITY LLC (Proposed)	KMW AM-X-CD-14-65-00T	Panel	2100	150	62	4	14.36	0	0	1	2535.1	30.6'	31.6'	139'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	150	82	4.6	11.51	1	0	0	134.9	29.4'	31'	138.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	270	82	4.6	11.51	0	1	0	297.2	28.6'	31.6'	138.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	270	86	4.6	13.41	0	1	0	586.1	28.6'	31.6'	138.7'
8	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	270	65	6	13.36	0	0	1	1119.4	28.6'	35.1'	138'
8	AT&T MOBILITY LLC (Proposed)	KMW AM-X-CD-16-65-00T	Panel	2100	270	69	6	14.96	0	0	1	2084.5	28.6'	35.1'	138'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	270	82	4.6	11.51	1	0	0	134.9	28.6'	36.6'	138.7'

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.

Note: The 2100 MHz LTE technology is being added to an existing antenna.

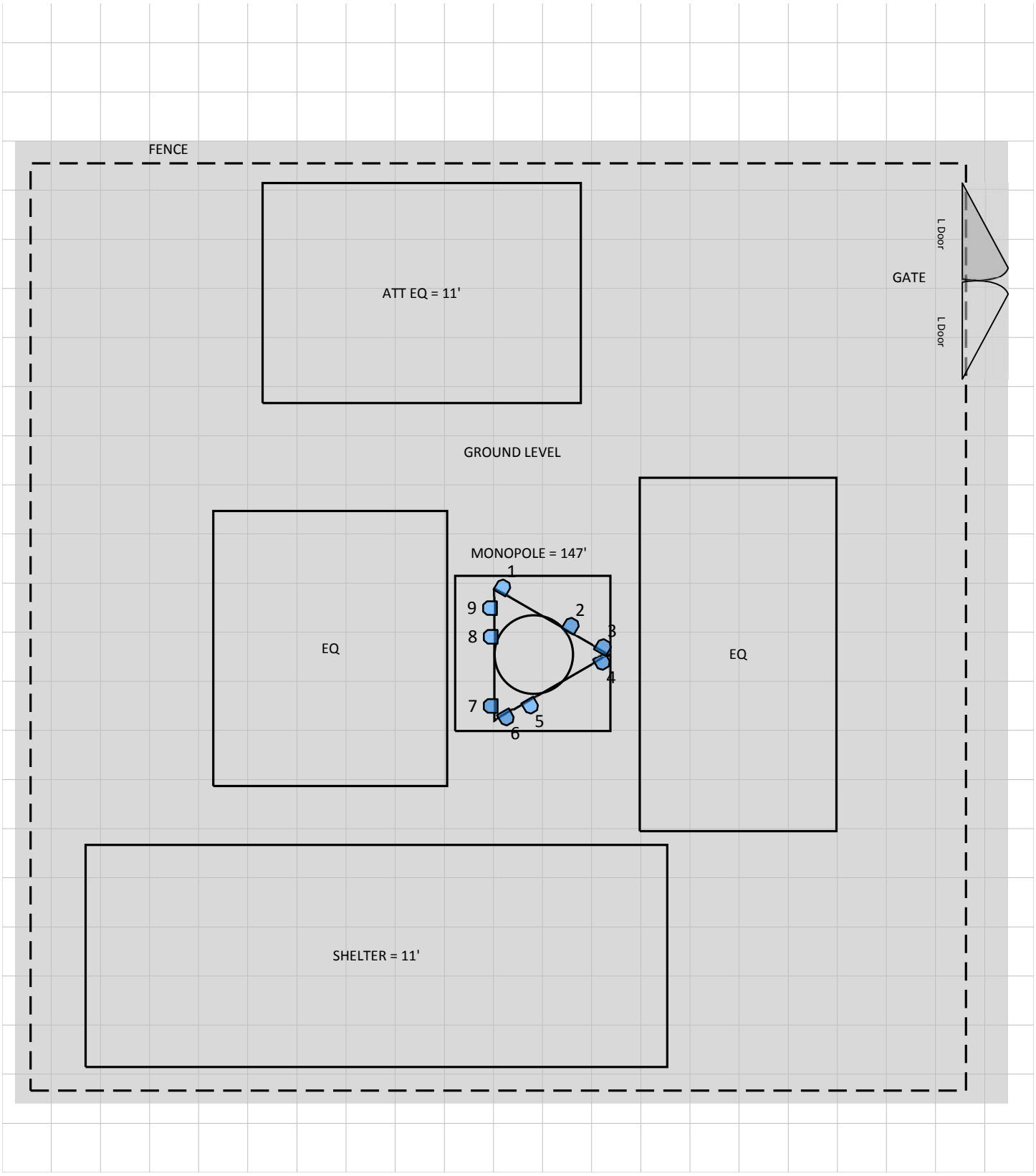
Note: Other carriers exist on site but were not considered for this modeling as SiteSafe had no data on them.

4 Emission Predictions

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

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Thomaston-Chapel Street



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

(Feet)

0 3.5 7

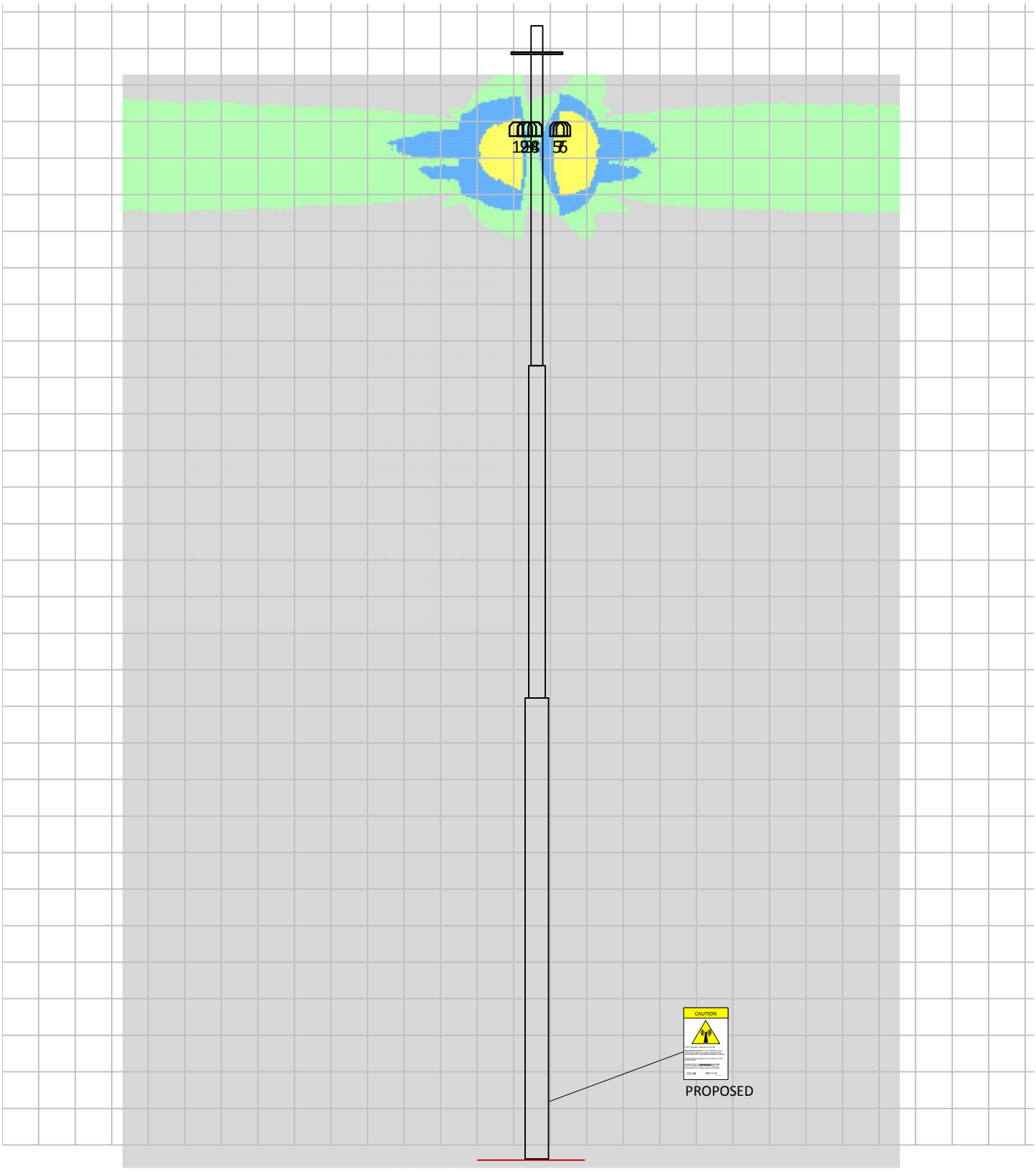
www.sitesafe.com
Site Name:Thomaston-Chapel Street
10/10/2016 7:23:03 AM

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

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

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

RF Exposure Simulation For: Thomaston-Chapel Street
Elevation View



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

(Feet)

0 9.4 18.8

www.sitesafe.com
Site Name:Thomaston-Chapel Street
10/10/2016 7:26:13 AM

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

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

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

5 Site Compliance

5.1 Site Compliance Statement

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

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

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

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

5.2 Actions for Site Compliance

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

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

Site Access Location

Yellow caution 2 sign required.

Gate Location

Information 1 sign required.

Note: Signage may already exist on site. SiteSafe is recommending as a worst case scenario.

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 Kevin Bernstetter.

October 10, 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.

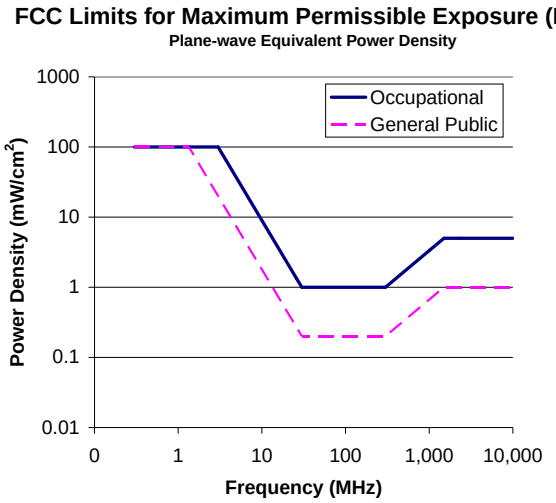
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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