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

March 15, 2019

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

RE: **Notice of Exempt Modification for Crown Site BU: 873633**
AT&T Site ID: 10035338
10 Bona Street, Milford, CT 06461
Latitude: 41° 13′ 12.27″/ Longitude: -73° 4′ 38.56″

Dear Ms. Bachman:

AT&T currently maintains (9) antennas at the 136-foot level of the existing 133-foot monopole at 10 Bona Street in Milford, Connecticut. The tower is owned by Crown Castle. The property is owned by 10 Bona Street LLC. AT&T intends to add (3) antennas, remove (6) TMAs, swap (6) RRUs, add (1) DC6 and (2) DC power cables.

The facility was approved by the City of Milford Planning and Zoning Commission on August 21, 2001. This approval included in the condition that the applicant will be required to pave 200+ of Bona Street from Erna Avenue to City standards for acceptance. This modification complies with those conditions.

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

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

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

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

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

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

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

For the foregoing reasons, Sprint 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: Anne Marie Zsamba.

Sincerely,

Anne Marie Zsamba, Esq.
Real Estate Specialist
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
(201) 236-9224
annemarie.zsamba@crowncastle.com

Attachments:

Exhibit-A: Compound Plan and Elevation Depicting the Planned Changes
Exhibit-B: Structural Modification Report
Exhibit-C: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Benjamin G. Blake, Mayor
City of Milford
70 West River Street
Milford, CT 06460

David B. Sulkis, City Planner
Planning & Zoning
70 West River Street
Milford, CT 06460

10 Bona Street LLC
92 Tumblebrook Drive
Milford, CT 06460

ORIGIN ID:GFLA (518) 373-3523
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15MAR19
ACTWGT: 3.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE
NEW BRITAIN CT 06051
(860) 827-2951
INV:
PO:
REF: 1765 6680
DEPT:

565J1/46D3/23AD

J19101901070 1uv

FedEx Express

MON - 18 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7747 1292 3260**

SE BDLA

06051
BDL
CT-US

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ORIGIN ID:GFLA (518) 373-3523
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15MAR19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **THE HONORABLE BENJAMIN G. BLAKE**

CITY OF MILFORD
70 WEST RIVER STREET
MILFORD CT 06460
(201) 236-9224

REF: 1734.7680
INV:
PO:
DEPT:

565J1/46D3/23AD

J191019010701uv

FedEx Express

MON - 18 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7747 1293 8344**

SE OXCA

06460
BDL
CT-US

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ORIGIN ID:GFLA (518) 373-3523
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15MAR19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **DAVID SULKIS, CITY PLANNER**

PLANNING AND ZONING DEPARTMENT
70 WEST RIVER STREET
MILFORD CT 06460

(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J146D323AD

FedEx Express

J19019010701uv

MON - 18 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7747 1295 1514**

SE OXCA

06460
CT-US **BDL**

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WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15MAR19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **10 BONA STREET LLC**

92 TUMBLEBROOK DRIVE

MILFORD CT 06460

(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J146D3023AD

FedEx Express

J191019010701uu

MON - 18 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7747 1296 5750**

SE OXCA

06460
CT-US **BDL**

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City of Milford, CT

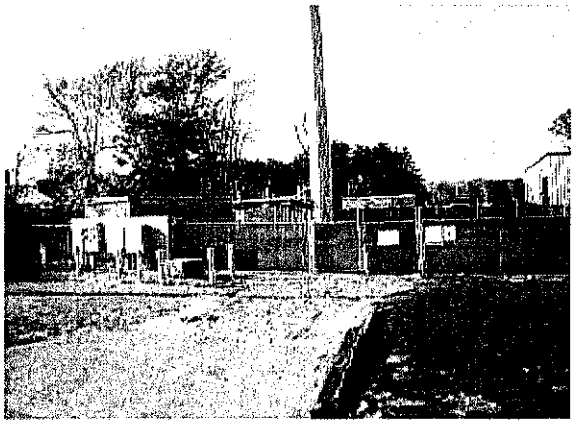
Property Listing Report | Map Block Lot 053 304 70 | Account 003888

Property Information

Property Location	10 BONA ST
Owner	10 BONA STREET LLC
Co-Owner	C/O CROWN CASTLE
Mailing Address	PMB 353/SITE BU 873633 MCMURRAY PA 15317-2520
Land Use	434V CELL TOWER MDL-00
Land Class	I
Zoning Code	CDD1
Census Tract	1506

Neighborhood	F
Acreage	0.23
Utilities	All Public,Public Sewer
Lot Setting/Desc	Level
Additional Info	

Photo



Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	
Total Living Area	

Report Created On 3/15/2019

City of Milford, CT

Property Listing Report | Map Block Lot 053 304 70 | Account 003888

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras	0	
Improvements		
Outbuildings	250000	175000
Land	101250	70880
Total	351250	245880

Outbuilding and Extra Items

Type	Description
CEL TWR SITE	1 UNITS

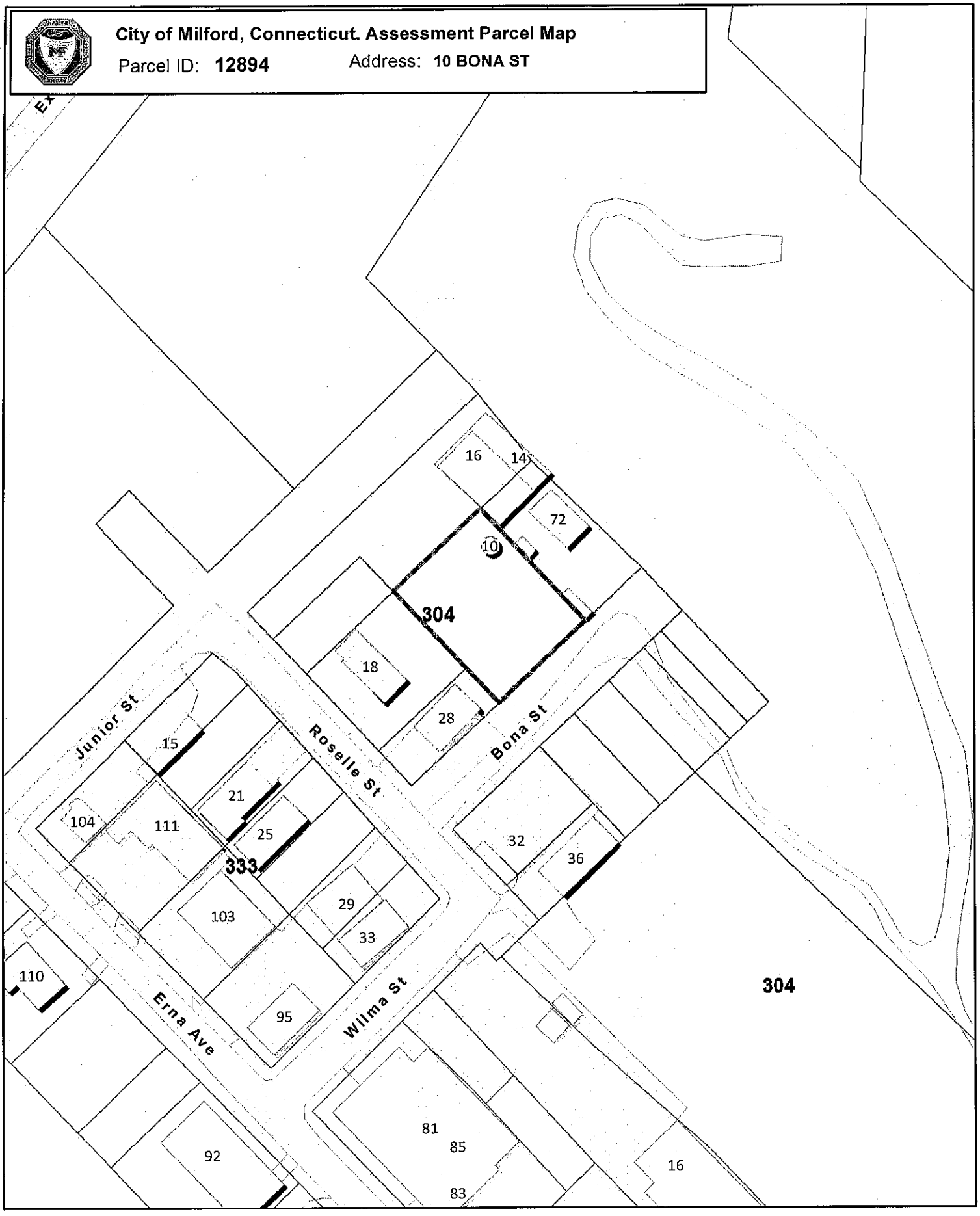
Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
10 BONA STREET LLC	03141/0288	1/3/2007	
CLEMENTE JOSEPH N	01111/0191	4/29/1981	0

Report Created On 3/15/2019


City of Milford, Connecticut. Assessment Parcel Map
Parcel ID: 12894
Address: 10 BONA ST
Ex
16
14
72
10
304
18
28
Junior St
Roselle St
Bona St
15
21
104
111
25
333
32
36
103
29
33
110
Erna Ave
Wilma St
95
304
81
85
92
16
83
1 inch = 100 feet
0
50
100
150
200
Feet
Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The City of Milford and its mapping contractors assume no legal responsibility for the information contained herein.
Map Produced: July 2016

009585 VOL 2501 PG 379

City of Milford, Connecticut

Founded 1639

ZONING BOARD OF APPEALS

70 West River Street
Milford, CT 06460-3317
Telephone (203) 783-3245
Fax (203) 783-3303

THIS IS TO CERTIFY THAT, Integrated Mobile Services, Inc., was granted a variance by the Zoning Board of Appeals on March 13, 2001, for the property located at: **10 Bona Street,** Assessor's Map **43 & 53 ,** Block **304 ,** Parcel **69, 70, 71 & 72,** in the City of Milford, County of New Haven, State of Connecticut, of which, Joseph N. Clemente, 10 Bona Street, Milford, CT, is the owner.

A VARIANCE WAS GRANTED TO:

Vary Section 4.1.13 exceptions to height requirements to allow 150 ft. high monopole where 50 ft. is permitted.

"NO VARIANCE, SPECIAL PERMIT OR SPECIAL EXCEPTION GRANTED PURSUANT TO CHAPTER 124 OF ANY SPECIAL ACT SHALL BE EFFECTIVE UNTIL A COPY THEREOF...IS RECORDED IN THE LAND RECORDS OF THE TOWN IN WHICH SUCH PREMISES ARE LOCATED." P.A. 75-317

RECORDED: _____ **ZONING BOARD OF APPEALS**
DATE

CITY CLERK REC. NO. _____ **BY:** Errol Van Hise 1879
Errol Van Hise, Chairman

Received for record AUG 21 2001
at 9:20:56 AM and recorded by me.
Milford City Clerk

VOL 2501 PG 381

009587

CITY OF MILFORD, CONNECTICUT

THIS IS TO CERTIFY THAT INTEGRATED MOBILE SERVICES, LLC

WAS GRANTED A SPECIAL PERMIT BY THE

MILFORD PLANNING & ZONING BOARD ON AUGUST 7, 2001 FOR

PROPERTY LOCATED AT 10 BONA STREET

MAP 43 & 53 BLOCK 304 PARCEL 69-72

IN THE CITY OF MILFORD, COUNTY OF NEW HAVEN, STATE OF

CONNECTICUT FOR WHICH JOSEPH N. CLEMENTE IS THE OWNER.

THE SPECIAL PERMIT WAS GRANTED:

To construct a 150' monopole communication tower with up to 4 equipment buildings (up to 12' x 26' size). A variance was granted March 13, 2001 by the ZBA to increase the allowable height from 50' to 150' in a GI zone. All construction shall be in accordance with plans as follows:

SHEET	ENTITLED	DATED
Title Sheet	Integrated Mobile Services, LLC	11/22/99
C-1	Site Plan	11//22/99; revised to 2/21/00
C-2	Site Details	11/10/99; revised to 2/21/00
C-3	Compound Plan & Elevation	11/10/99; revised to 2/21/00

The following city department reports apply: Letter from B. C. Kolwicz dated February 2, 2000; Police Department memo from Sgt. P. Ellsworth dated December 8, 1999. The applicant will be required to pave 200± of Bona Street from Erna Avenue to city standards for acceptance.

"NO VARIANCE, SPECIAL PERMIT OR SPECIAL EXCEPTION GRANTED PURSUANT TO CHAPTER 124 OF ANY SPECIAL ACT SHALL BE EFFECTIVE UNTIL A COPY THEREOF...IS RECORDED IN THE LAND RECORDS OF THE TOWN IN WHICH SUCH PREMISES ARE LOCATED."
P.A. 75-317
PLANNING & ZONING BOARD

RECORDED _____

CITY CLERK REC. NO._____

BY:

WADE E. PIERCE
EXECUTIVE SECRETARY

Received for record AUG 21 2001
at 9:42:19 AM and recorded by me.
Alan H. Jepson
Milford City Clerk

01 AUG21 AM 9:42 199

OFFICE OF:
TOWN-CITY CLERK

City of Milford, Connecticut

To: Mayor James Richetelli
Michele Collins, Chmn.
Bd. of Aldermen
Chief Louis LaVecchia, Fire Dept.
Chief Thomas Flaherty, Police Dept.
Bruce Kolwicz, Public Wks. Dir.
Anthony Pinto
Marilyn Lipton, City Attorney
William Gaffney, Assessor
John Casey, City Engineer
Wade Pierce, City Planner

From: Alan Jepson
City Clerk

Date: March 5, 2003

Subject: Board of Alderman Referral Items No. 8a New Business

At the Regular Meeting of the Board of Aldermen held on March 3, 2003, the following action was taken:

8. New Business
   a. Board of Aldermen approval is requested for the acceptance of Bona Street (for the length paved) as a City street per the recommendation of the Planning and Zoning Board.

   Approved unanimously.

70 West River Street, Milford, CT 06460-3364 Tel 203-783-3210 FAX 203-783-3362

City of Milford, Connecticut
- Founded 1639 -
70 West River Street - Milford, CT 06460-3317
Tel 203-783-3245 FAX 203-783-3303

Planning and Zoning
Office

February 5, 2003

Mr. Carlos Centore
63-2 North Branford Road
Branford, CT 06405

RE: 10 BONA STREET – STREET ACCEPTANCE

Dear Mr. Centore:

At its meeting held on Tuesday, February 4, 2003 the Milford Planning & Zoning Board moved to recommend to the Board of Aldermen that Bona Street (for the length paved) be accepted as a city street; (in conjunction with CGS 8-24 municipal improvements). Letter of recommendation from the Director of Public Works Bruce Kolwicz dated January 24, 2003 is attached.

Very truly yours,

Peter W. Ashton for WEP

WADE E. PIERCE
Executive Secretary to the
Planning & Zoning Board

WEP/cv

C: Michele Collins, Chair
Board of Aldermen

Marilyn Lipton, City Attorney

Mayor James Richetelli, Jr.

City of Milford, Connecticut

OFFICE OF:
BRUCE C. KOLWICZ
DIRECTOR OF PUBLIC WORKS

Date: January 24, 2003

To: Peter Crabtree, Planning & Zoning

From: Bruce C. Kolwicz, P.W. Director

Re: 10 Bona Street

This street can be accepted as a public street.

BCK:kh

83 FORD STREET MILFORD, CONNECTICUT 06460 (203) 783-3265

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE REMOVED FROM EXISTING TOWER & ON GROUND:

- REMOVE (6) RRH's

- INSTALL AT&T ANTENNA (800-10964) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 4449 B5/B12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 8843 B2/B66A (AWS/PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 1).
- INSTALL (2) DC TRUNK CABLES.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- SWAP BB WITH 5216.
- ADD 2ND XMU.
- ADD RBS 6630.

ITEMS TO REMAIN:

- (9) ANTENNAS, (3) RRUS, (6) TMAS, (2) SURGE SUPPRESSOR, (12) COAX CABLES, (3) BIAS TEES, (2) FILTERS, (2) FIBER TRUNK CABLES AND (4) DC TRUNK CABLES.

SITE ADDRESS:	10 BONA STREET MILFORD, CT 06461
LATITUDE (NAD 83):	N 41° 13' 12.27"
LONGITUDE (NAD 83):	W 73° 04' 38.56"
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
TYPE OF SITE:	MONOPOLE/INDOOR
TOWER HEIGHT:	133'
RAD CENTER:	136'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT2082

FA LOCATION CODE: 10035338

SITE NAME: MILFORD BONA ST

CROWN SITE NAME: MILFORD

PROJECT: LTE 4C/LTE 5C/4TX4RX SOFTWARE RETROFIT

PACE ID: MRCTB033598, MRCTB033681, MRCTB033703

BU#: 873633

NOTE:

ALL CONSTRUCTION ACTIVITIES ARE TO BE COMPLETED DIRECTLY THROUGH CROWN. CONTRACTOR MUST HAVE CONSTRUCTION PO AND NTP FROM CROWN DIRECT IN ORDER TO BEGIN. PRE-APPROVAL TO ENTER THE PROPERTY MUST BE OBTAINED. FOR ACCESS AUTHORIZATION, PLEASE CONTACT CROWN.

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

0	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST
10 BONA STREET
MILFORD, CT 06461

TITLE SHEET

T-1

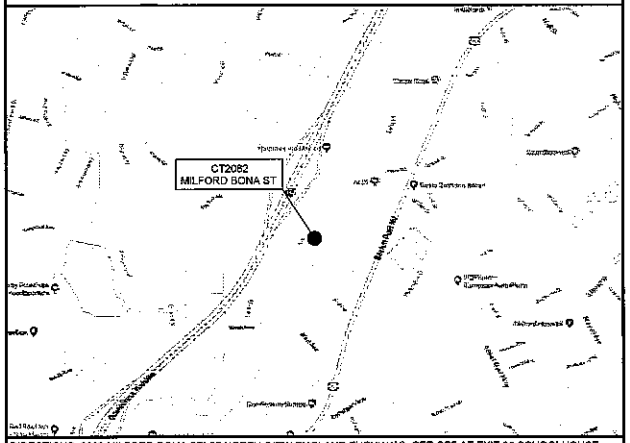
DRAWING INDEX

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

ENGINEERING

2018 CONNECTICUT STATE BUILDING CODE
2018 AMENDMENT WITH 2015 INTERNATIONAL BUILDING CODE
2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE (NFPA 70 2017)
ANSI/TIA-222-G

VICINITY MAP



DIRECTIONS: 2082 MILFORD BONA ST-I-95 NORTH (NEW ENGLAND THRUWAY), GET OFF AT EXIT 35 SCHOOLHOUSE ROAD TAKE A RIGHT OFF EXIT AND THEN TURN LEFT INTO RT 1 BOSTON POST ROAD FOLLW TO EMA AVE .TURN LEFT ON EMA ST FOLLOW TO WILMA ST TURN RIGHT NEXT LEFT ON ROSELLE ST ON TURN ON BONA ST SITE LOCATED AT 66 BONA ST. MONOPOLE IS LOCATED BEHIND BUILDING.

GENERAL NOTES

1. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

811

UNDERGROUND SERVICE ALERT

THE LAW REQUIRES
TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES.
DIAL 811

PART 1 - GENERAL

1.1 GENERAL CONDITIONS:

A. CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.

B. THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION PERFORMANCE FOR THE WORK UNDER THIS SECTION.

C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWING SHALL NOT BE SCALED TO DETERMINE DIMENSIONS

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.

1.3 REFERENCES:

A. THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE. THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.

1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
2. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
3. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
4. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
5. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
6. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
7. UL (UNDERWRITERS LABORATORIES INC.)
8. AT&T GROUNDING AND BONDING STANDARDS TP-76416

1.4 SCOPE OF WORK

A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.

B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.

D. THE CONTRACTOR SHALL FURNISH TO THE OWNER WITH CERTIFICATES OF A FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.

E. THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PART 2 - PRODUCTS

2.1 GENERAL:

A. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.

B. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.

C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

1. RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
2. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.
3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE. GROUNDING BUSHINGS WITH INSULATED THROATS SHALL BE INSTALLED ON ALL CONDUIT TERMINATIONS.
4. NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.

B. CONDUCTORS AND CABLE:

1. CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR USED.
2. #10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
3. SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.
4. STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURER'S RECOMMENDATIONS.
5. ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).

C. DISCONNECT SWITCHES:

1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.

D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:

1. INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES KZ-(*)CS OR KZL-(*)CS (*) LENGTH AS REQUIRED.
2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID NUMBERING, AND THE ELECTRICAL POWER SOURCE.
3. BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.

E. SYSTEM GROUNDING:

1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
2. GROUNDING BUSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS IMGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.

F. OTHER MATERIALS:

8. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.
7. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.

G. PANELS AND LOAD CENTERS:

1. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

PART 3 - EXECUTION

3.1 GENERAL:

A. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

3.2 LABOR AND WORKMANSHIP:

A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.

B. ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.

C. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

3.3 COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

3.4 INSTALLATION:

A. CONDUIT:

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH TRADE SIZE.
2. PROVIDE RIGID PVC SCHEDULE 80 CONDUITS FOR ALL RISERS, RMC OTHERWISE NOTED. EMT MAY BE INSTALLED FOR EXTERIOR CONDUITS WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
3. INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2017 NEC, TABLE 300.5).
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
5. A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE QUARTER-BENDS. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
6. FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
7. PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
9. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUCTORS OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
10. INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
11. INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
12. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
13. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.

B. CONDUCTORS AND CABLE:

1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	208/240/120 VOLT SYSTEMS
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUNDING	GREEN

2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.
3. PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES & EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-30136, AND THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT, AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL, COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
15. IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
16. CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.

3.5 ACCEPTANCE TESTING:

A. CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.

B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.

C. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1,000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
125 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

0	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2062
MILFORD BONA ST

10 BONA STREET
MILFORD, CT 06461

GENERAL NOTES I

GN-1

ANTENNA MOUNTING

1. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.
2. 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.
3. 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.
4. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
5. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURERS RECOMMENDATIONS.
6. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
7. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
8. 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.
9. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATIONS IN EACH SECTOR.
10. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
11. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

12. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
13. 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.
    C. ALL 8M ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB-FT (12 NM).
14. ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB-FT (58 NM).
15. ALL GROUNDING HARDWARE SHALL BE TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUNDING HARDWARE IS NO LONGER LOOSE.
16. ALL DIN TYPE CONNECTIONS SHALL BE TIGHTENED TO 16-22 LB-FT (24.4 - 29.8 NM).
17. ALL N TYPE CONNECTIONS SHALL BE TIGHTENED TO 15-20 LB-IN (1.7 - 2.3 NM).

FIBER & POWER CABLE MOUNTING

18. 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.
19. 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.
20. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC-ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

21. 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.
22. CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
23. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION. REFER TO "ANTENNA SYSTEM LABELING STANDARD" ND-00027 LATEST VERSION.
24. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 8'-0".
25. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" O.C.
26. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
27. CONTRACTOR SHALL WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF AMALGAMATING TAPE. WEATHERPROOFING SHALL BE COMPLETED IN STRICT ACCORDANCE WITH AT&T STANDARDS.
28. 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.
29. 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.
30. 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

31. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
32. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
33. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
34. ALL OUTDOOR RF CONNECTORS/DISCONNECTIONS 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.
35. 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.
36. 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.
37. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND
38. BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
39. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANTENNA AND THE COAX CONFIGURATION IS THE CORRECT MAKE AND MODELS, PRIOR TO INSTALLATION.
40. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.
41. ANTENNA CONTRACTOR SHALL FURNISH AND INSTALL A 12'-0" T-BOOM SECTOR ANTENNA MOUNT, IF APPLICABLE, INCLUDING ALL HARDWARE.

GROUNDING NOTES

42. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
43. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND AT&T GROUNDING AND BONDING REQUIREMENTS (ATT-TP-76416) AND MANUFACTURER'S SPECIFICATIONS.
44. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.
45. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUNDING KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200', 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.
46. ALL PROPOSED GROUNDING BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUNDING BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUNDING BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
EXOTHERMIC WITH INSPECTION SLEEVE
GROUNDING BAR
SHELTER GROUNDING BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE
SINGLE POLE SWITCH
DUPLEX RECEPTACLE
DUPLEX GFCI RECEPTACLE
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
EXISTING SMOKE DETECTION (DC)
EXISTING EMERGENCY LIGHTING (DC)
SECURITY LIGHT W/PHOTOCELL LITHONIA ALDW LED-1-25A400/51K-SR4-120-PE-DDBTXD
EXISTING UTILITY POLE
EXISTING CHAIN LINK FENCE
EXISTING WOOD/WROUGHT IRON FENCE
EXISTING WALL STRUCTURE
LEASE AREA
PROPERTY LINE (PL)
SETBACKS
PROPOSED/EXISTING ICE BRIDGE
PROPOSED/EXISTING CABLE TRAY
EXISTING WATER LINE
PROPOSED UNDERGROUND POWER
PROPOSED UNDERGROUND TELCO
PROPOSED OVERHEAD POWER
PROPOSED OVERHEAD TELCO
PROPOSED OVERHEAD UTILITIES
PROPOSED ABOVE GROUND POWER
PROPOSED ABOVE GROUND TELCO

CALLOUT REFERENCE
REVISION REFERENCE
WORKPOINT
SECTION REFERENCE
DETAIL REFERENCE
ELEVATION REFERENCE

THESE DOCUMENTS ARE IN COMPLIANCE WITH AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOW CODES AND STANDARDS AS APPLICABLE: 2018 CONNECTICUT STATE BUILDING CODE. 2017 NATIONAL ELECTRIC CODE OR LATEST EDITION.

AB	ANCHOR BOLT	COL	COLUMN	FIN	FINISH(ED)	MAS	MASONRY	QTY	QUANTITY	TOF	TOP OF FOUNDATION
ABV	ABOVE	COMM	COMMON	FLR	FLOOR	MAX	MAXIMUM	RAD	RADIUS	TOP	TOP OF PLATE (PARAPET)
AC	ALTERNATING CURRENT	CONC	CONCRETE	FDN	FOUNDATION	MB	MACHINE BOLT	RECT	RECTIFIER	TOS	TOP OF STEEL
ADDL	ADDITIONAL	CONSTR	CONSTRUCTION	FOC	FACE OF CONCRETE	MECH	MECHANICAL	REF	REFERENCE	TOW	TOP OF WALL
AFF	ABOVE FINISHED FLOOR	DBL	DOUBLE	FOM	FACE OF MASONRY	MFR	MANUFACTURER	REINF	REINFORCEMENT	TVSS	TRANSIENT VOLTAGE SUPPRESSION
AFG	ABOVE FINISHED GRADE	DC	DIRECT CURRENT	FOS	FACE OF STUD	MGB	MASTER GROUND BAR	REQ'D	REQUIRED		SYSTEM
AIC	AMPERAGE INTERRUPTION CAPACITY	DEPT	DEPARTMENT	FOW	FACE OF WALL	MIN	MINIMUM	RET	REMOTE ELECTRIC TILT	TYP	TYPICAL
ALUM	ALUMINUM	DF	DOUGLAS FIR	FS	FINISH SURFACE	MISC	MISCELLANEOUS	RMC	RIGID METALLIC CONDUIT	UG	UNDERGROUND
ALT	ALTERNATE	DIA	DIAMETER	FT	FOOT	MTL	METAL	RRH	REMOTE RADIO HEAD	UL	UNDERWRITERS LABORATORY
ANT	ANTENNA	DIAG	DIAGONAL	FTG	FOOTING	MTS	MANUAL TRANSFER SWITCH	RRU	REMOTE RADIO UNIT	UNO	UNLESS NOTED OTHERWISE
APPROX	APPROXIMATE	DIM	DIMENSION	GA	GAUGE	MW	MICROWAVE	RWY	RACEWAY	UMTS	UNIVERSAL MOBILE
ARCH	ARCHITECTURAL	DWG	DRAWING	GEN	GENERATOR	(N)	NEW	SCH	SCHEDULE		TELECOMMUNICATIONS SYSTEM
ATS	AUTOMATIC TRANSFER SWITCH	DWL	DOWEL	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NEC	NATIONAL ELECTRIC CODE	SHT	SHEET	UPS	UNINTERRUPTIBLE POWER SYSTEM
AWG	AMERICAN WIRE GAUGE	(E)	EXISTING	GLB	GLUE LAMINATED BEAM	NO.(#)	NUMBER	SIAD	SMART INTEGRATED DEVICE		(DC POWER PLANT)
BATT	BATTERY	EA	EACH	GLV	GALVANIZED	NTS	NOT TO SCALE	SIM	SIMILAR	VIF	VERIFIED IN FIELD
BLDG	BUILDING	EC	ELECTRICAL CONDUCTOR	GPS	GLOBAL POSITIONING SYSTEM	OC	ON CENTER	SPEC	SPECIFICATION	W	WIDE
BLK	BLOCK	EL	ELEVATION	GND	GROUND	OPNG	OPENING	SQ	SQUARE	W/	WITH
BLKG	BLOCKING	ELEC	ELECTRICAL	GSM	GLOBAL SYSTEM FOR MOBILE	(P)	PROPOSED	SS	STAINLESS STEEL	WD	WOOD
BM	BEAM	EMT	ELECTRICAL METALLIC TUBING	HDR	HEADER	PC	PRECAST CONCRETE	STD	STANDARD	W.P.	WORK POINT
BTC	BARE TINNED COPPER CONDUCTOR	ENG	ENGINEER	HGR	HANGER	PCS	PERSONAL COMMUNICATION SERVICES	STL	STEEL	WP	WEATHERPROOF
BOF	BOTTOM OF FOOTING	EQ	EQUAL	HVAC	HEAT/VENTILATION/AIR CONDITIONING	PCU	PRIMARY CONTROL UNIT	STRUCT	STRUCTURAL	WT	WEIGHT
CAB	CABINET	EXP	EXPANSION	HT	HEIGHT	PRC	PRIMARY RADIO CABINET	TEMP	TEMPORARY		
CANT	CANTILEVERED	EXT	EXTERIOR	IGR	INTERIOR GROUND RING	PP	POLARIZING PRESERVING	THK	THICKNESS		
CEC	CALIFORNIA ELECTRIC CODE	FAB	FABRICATION	IN	INCH	PSF	POUNDS PER SQUARE FOOT	TMA	TOWER MOUNTED AMPLIFIER		
CHG	CHARGING	FF	FINISH FLOOR	INT	INTERIOR	PSI	POUNDS PER SQUARE INCH	TN	TOE NAIL		
CLG	CEILING	FG	FINISH GRADE	LB(S)	POUND(S)	PT	PRESSURE TREATED	TOA	TOP OF ANTENNA		
CLR	CLEAR	FIF	FACILITY INTERFACE FRAME	LF	LINEAR FEET	PWR	POWER CABINET	TOC	TOP OF CURB		

at&t
5641 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
129 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: ERCC0094
DRAWN BY: DAP
CHECKED BY: CAT

SUBMITTALS

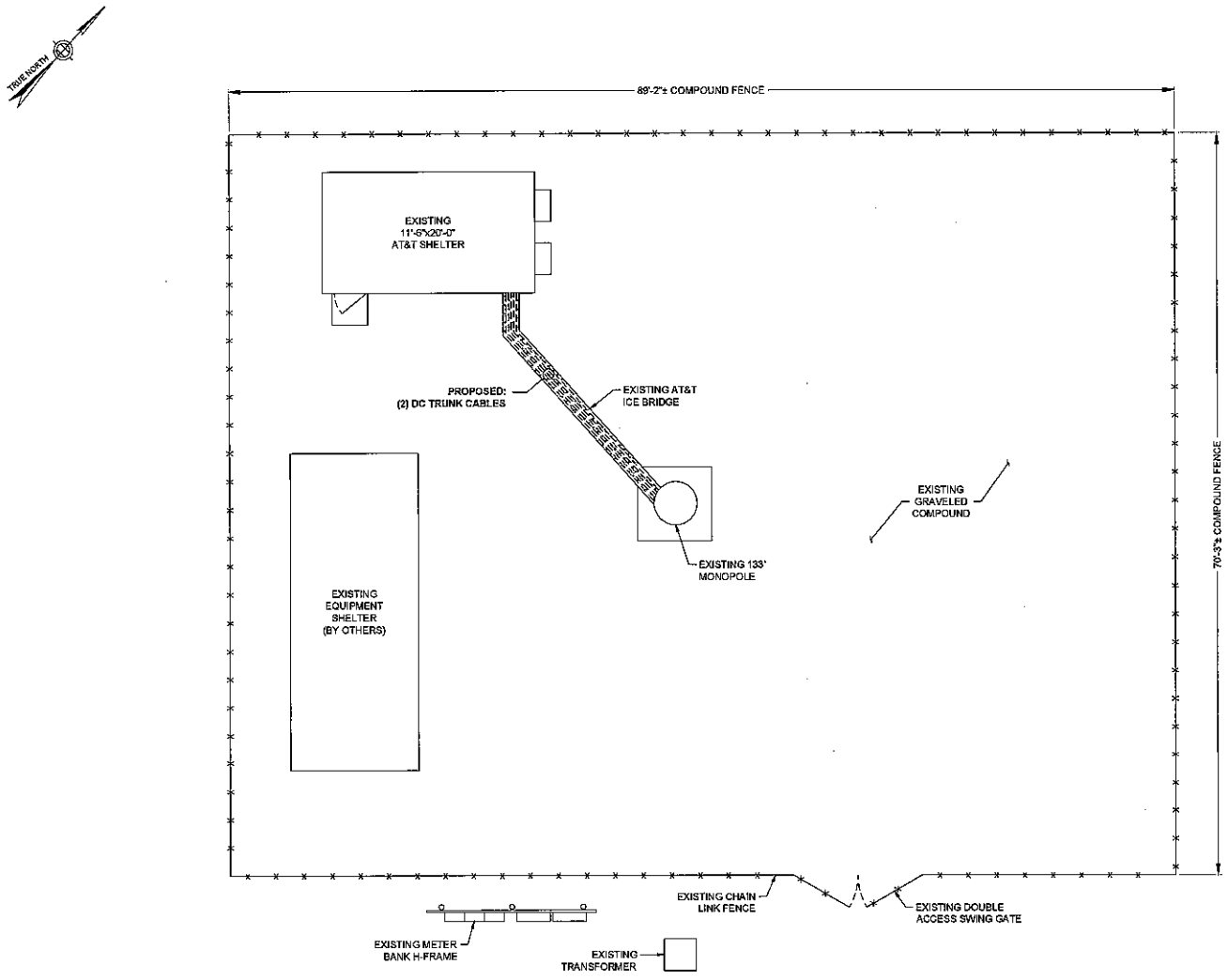
9	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST

10 BONA STREET
MILFORD, CT 06461

GENERAL NOTES II

GN-2



NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY MASER CONSULTING ON 01/25/17. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

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

at&t
5641 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
126 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

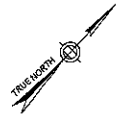
0	05/08/18	ISSUED FOR PERMITTING

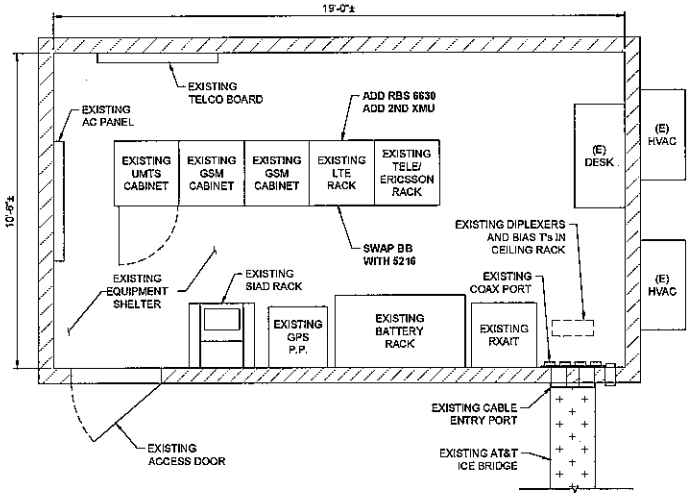
FA# 10035338
SITE# CT2082
MILFORD BONA ST

18 BONA STREET
MILFORD, CT 06461

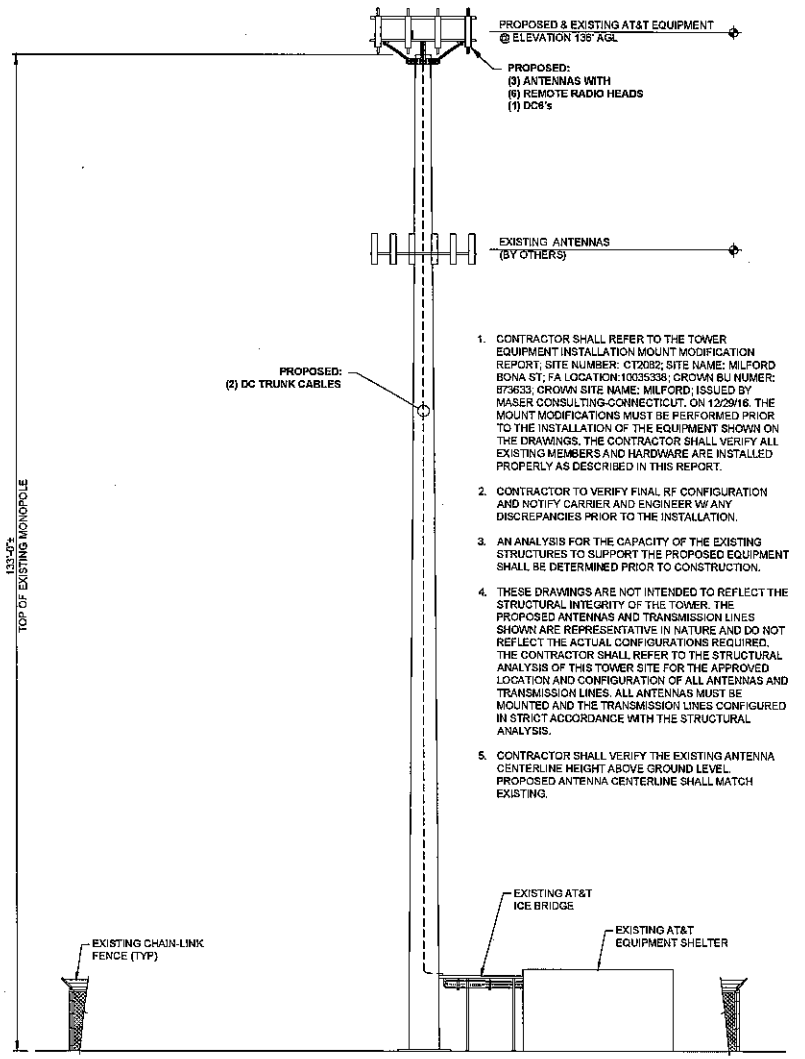
SITE PLAN

C-1





1 EQUIPMENT LAYOUT SCALE: 1/2" = 1'-0"



1. CONTRACTOR SHALL REFER TO THE TOWER EQUIPMENT INSTALLATION MOUNT MODIFICATION REPORT; SITE NUMBER: CT2082; SITE NAME: MILFORD BONA ST; FA LOCATION:10035338; CROWN BU NUMER: 873633; CROWN SITE NAME: MILFORD; ISSUED BY MASER CONSULTING-CONNECTICUT. ON 12/29/16. THE MOUNT MODIFICATIONS MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
4. THESE DRAWINGS ARE NOT INTENDED TO REFLECT THE STRUCTURAL INTEGRITY OF THE TOWER. THE PROPOSED ANTENNAS AND TRANSMISSION LINES SHOWN ARE REPRESENTATIVE IN NATURE AND DO NOT REFLECT THE ACTUAL CONFIGURATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS OF THIS TOWER SITE FOR THE APPROVED LOCATION AND CONFIGURATION OF ALL ANTENNAS AND TRANSMISSION LINES. ALL ANTENNAS MUST BE MOUNTED AND THE TRANSMISSION LINES CONFIGURED IN STRICT ACCORDANCE WITH THE STRUCTURAL ANALYSIS.
5. CONTRACTOR SHALL VERIFY THE EXISTING ANTENNA CENTERLINE HEIGHT ABOVE GROUND LEVEL. PROPOSED ANTENNA CENTERLINE SHALL MATCH EXISTING.

2 TOWER ELEVATION SCALE: 1/8" = 1'-0"

at&t
5941 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
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125 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

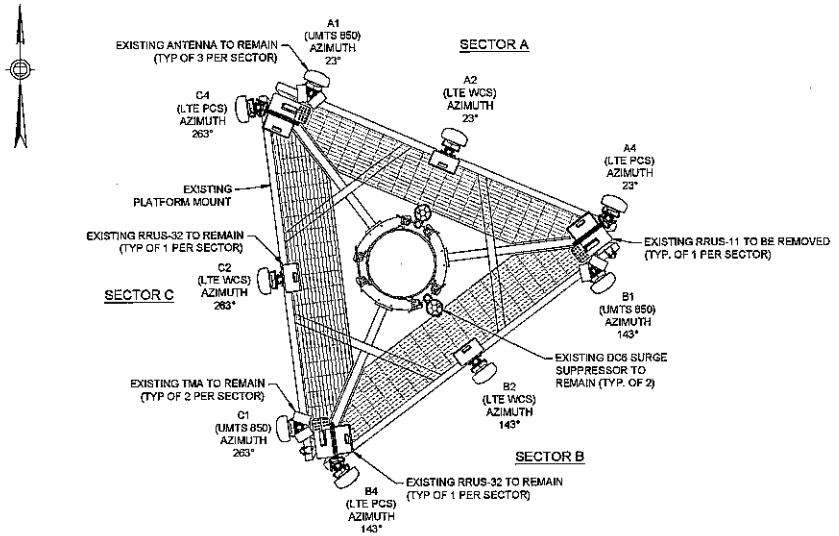
0	03/09/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST

10 BONA STREET
MILFORD, CT 06461

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

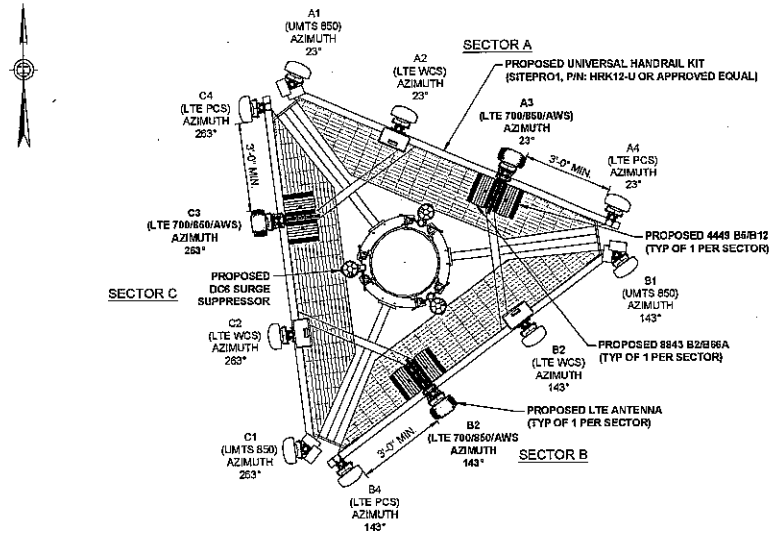
C-2



ELEVATION 136'

1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



ELEVATION 136'

2 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

STRUCTURAL NOTE:

1. CONTRACTOR SHALL REFER TO THE TOWER EQUIPMENT INSTALLATION MOUNT MODIFICATION REPORT; SITE NUMBER: CT2082; SITE NAME: MILFORD BONA ST; FA LOCATION:10035338; CROWN BU NUMER: 873633; CROWN SITE NAME: MILFORD; ISSUED BY MASER CONSULTING-CONNECTICUT, ON 12/29/16. THE MOUNT MODIFICATIONS MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.
4. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.

at&t
5841 BRIDGE STREET
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129 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004
DRAWN BY: DAP
CHECKED BY: CAT

SUBMITTALS

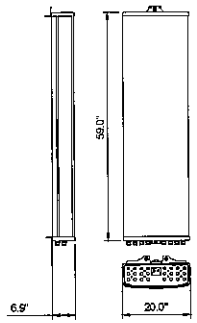
0	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST
19 BONA STREET
MILFORD, CT 06461

EXISTING & PROPOSED
ANTENNA LAYOUT

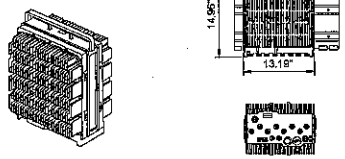
C-3

MANUFACTURER:	KATHREIN
MODEL NO.:	800-10964
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	59.0" x 20.0" x 6.9" 1499mm x 508mm x 175mm
WEIGHT (lbs):	83.8
CONNECTOR:	8 x 4.3-10 FEMALE
FRONT WIND LOAD:	188 LBF @ 93 MPH 835 N @ 150 KM/H
SIDE WIND LOAD:	188 LBF @ 93 MPH 840 N @ 150 KM/H
WIND SPEED MAX.:	>150 MPH (>241 KM/H)



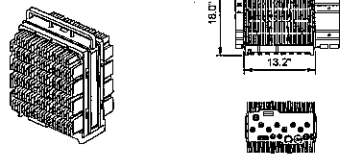
1 ANTENNA SPECIFICATIONS SCALE: N.T.S.

MANUFACTURER:	ERICSSON
MODEL NO.:	RRUS-4449 B5 & B12
TECHNOLOGY:	DUAL BAND
DIMENSIONS (HxWxD):	14.96" x 13.19" x 10.43"
WEIGHT (lbs):	73.0
POWER SUPPLY:	-48V
TEMPERATURE:	-40 °C TO 55°C



2 RRUS SPECIFICATIONS SCALE: N.T.S.

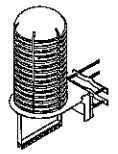
MANUFACTURER:	ERICSSON
MODEL NO.:	RRUS-8843 B2/B66A
	PCS/AWS
DIMENSIONS (HxWxD):	18.0" x 13.2" x 11.3"
WEIGHT (lbs):	75.0
POWER SUPPLY:	-48V
TEMPERATURE:	-40 °C TO 55°C

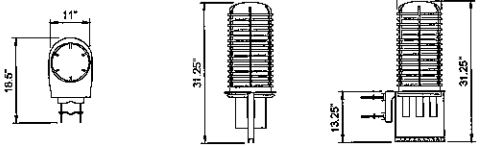


3 RRUS SPECIFICATIONS SCALE: N.T.S.

RAYCAP DC6-48-60-18-8F

DIMENSIONS (HxWxD):	31.25" x 11.0" x 18.5"
TOTAL WEIGHT (lbs):	32.8
NOMINAL OPERATING VOLTAGE:	48 VDC
NOMINAL DISCHARGE VOLTAGE:	20 kA 8/20 s/s
MAXIMUM DISCHARGE CURRENT:	60 kA 8/20 s/s
MAX. CONT. OPERATING CURRENT:	75 VDC
VOLTAGE PROTECTION RATING:	400 V
WIND LOADING:	150 MPH (SUSTAINED) 195 MPH (GUST)

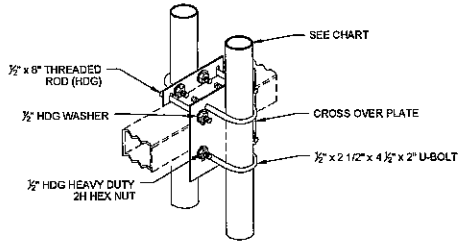




CONTRACTOR TO USE "THREAD LUBRICANT" ON MOUNTING BOLTS DURING INSTALLATION

4 DC FIBER/DC DISTRIBUTION SYSTEM DETAIL SCALE: N.T.S.

PART #	PIPE SIZE	STAND-OFF ARM
BBPM-K1	2-3/8"	3-1/2" - 4-1/2"
BBPM-K2	2-7/8"	3-1/2" - 4-1/2"
BBPM-K3	2-3/8"	3-1/2" - 5"
BBPM-U	2-3/8" - 4-1/2"	2-3/8" - 4-1/2"

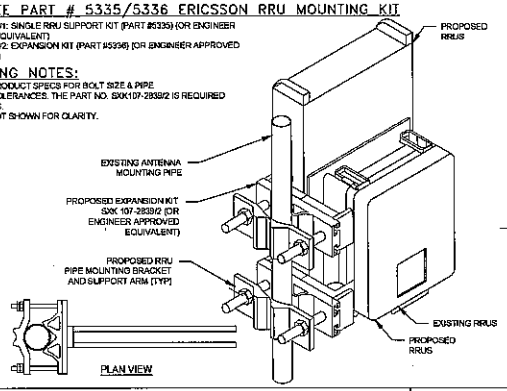


5 DC6 MOUNTING DETAIL SCALE: N.T.S.

CUE DEF PART # 5335/5336 ERICSSON RRU MOUNTING KIT

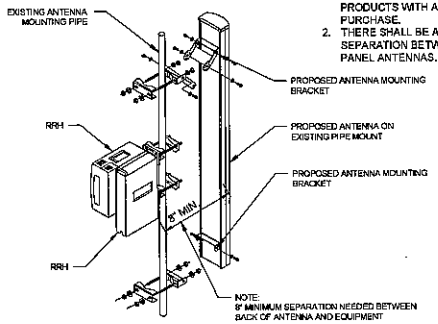
SOK 107 2639/1: SINGLE RRU SUPPORT KIT (PART #5335) (OR ENGINEER APPROVED EQUIVALENT)
SOK 107 2639/2: EXPANSION KIT (PART #5336) (OR ENGINEER APPROVED EQUIVALENT)

MOUNTING NOTES:
REFER TO PRODUCT SPECS FOR BOLT SIZE & PIPE DIAMETER TOLERANCES. THE PART NO. SOK107-2639/2 IS REQUIRED FOR (2) RRUS.
ANTENNA NOT SHOWN FOR CLARITY.



6 RRU MOUNTING DETAIL SCALE: N.T.S.

NOTES:
1. MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE.
2. THERE SHALL BE A MINIMUM 3'-0" SEPARATION BETWEEN ALL LTE PANEL ANTENNAS.



7 ANTENNA MOUNTING DETAIL SCALE: N.T.S.

DETAIL NOT USED

DETAIL NOT USED

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
2 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
126 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

0	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST
10 BONA STREET
MILFORD, CT 06461

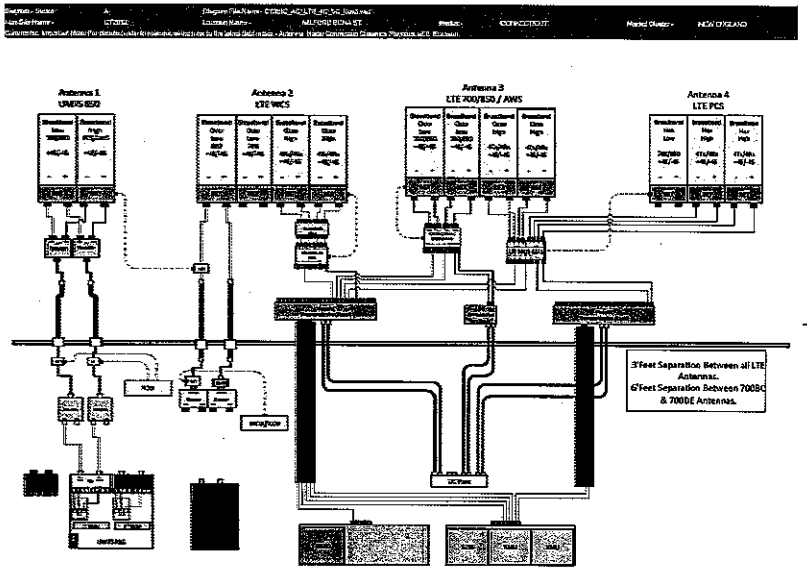
EQUIPMENT DETAILS

C-4

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's	RRH's	FEEDER	RAYCAP
A1	7770 (55"x11"x5")	UMTS 850	23°	136'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 180')	(1) RAYCAP DC6-48-60-18-8F
A2	OPA-65R-LCUU-H4 (48"x14.4"x7.3")	LTE WCS	23°	136'	-	(1) RRUS-32 (WCS)	(4) DC TRUNKS (2) FIBER (LENGTH @ 180')	
A3	**800-10964 (59"x20"x6.9")**	**LTE 700 B/C LTE 850 LTE AWS**	23°	136'	-	**(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)**	**(2) DC TRUNKS** (LENGTH @ 180')	(2) RAYCAP DC6-48-60-18-8F
A4	SBNHH-1D65A (55"x11.9"x7.1")	LTE PCS	23°	136'	-	-	-	
B1	7770 (55"x11"x5")	UMTS 850	143°	136'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 180')	
B2	OPA-65R-LCUU-H4 (48"x14.4"x7.3")	LTE WCS	143°	136'	-	(1) RRUS-32 (WCS)	-	
B3	**800-10964 (59"x20"x6.9")**	**LTE 700 B/C LTE 850 LTE AWS**	**143°**	136'	-	**(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)**	-	
B4	SBNHH-1D65A (55"x11.9"x7.1")	LTE PCS	143°	136'	-	-	-	
G1	7770 (55"x11"x5")	UMTS 850	263°	136'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 180')	
G2	OPA-65R-LCUU-H4 (48"x14.4"x7.3")	LTE WCS	263°	136'	-	(1) RRUS-32 (WCS)	-	
G3	**800-10964 (59"x20"x6.9")**	**LTE 700 B/C LTE 850 LTE AWS**	263°	136'	-	**(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)**	-	
G4	SBNHH-1D65A (55"x11.9"x7.1")	LTE PCS	263°	136'	-	-	-	

*EQUIPMENT LISTED IN **BOLD**, DELINEATES THAT THE EQUIPMENT IS PROPOSED

1 ANTENNA INFORMATION CHART — SCALE: NONE



2 RF EQUIPMENT SCHEMATIC — SCALE: NONE

at&t
5941 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
155 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004
DRAWN BY: DAP
CHECKED BY: CAT

SUBMITTALS

0	03/08/19	ISSUED FOR PERMITTING

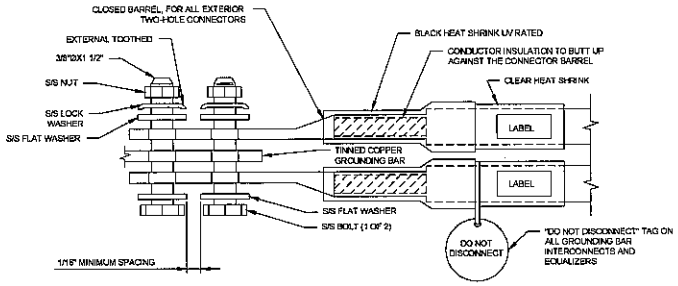
FA# 10035338
SITE# CT2082
MILFORD BONA ST
10 BONA STREET
MILFORD, CT 06461

ANTENNA CHART & RF EQUIPMENT SCHEMATIC

RF-1

NOTES:

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL GROUNDING BARS SHALL BE STAMPED IN TO THE METAL "IF STOLEN DO NOT RECYCLE." THE CONTRACTOR SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.
3. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUNDING CONDUCTOR DOWN TO GROUNDING BUS.
6. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION, ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
7. SUPPLIED AND INSTALLED BY CONTRACTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



1 EXTERIOR TWO HOLE LUG DETAIL — SCALE: NONE

GENERAL NOTES:

1. CONTRACTOR SHALL HAVE A COMPLETE UNDERSTANDING OF THE CONTENTS OF AT&T STANDARD TP-76416.
2. ALL INSTALLATIONS SHALL BE FIELD VERIFIED.
3. ALL GROUND CONNECTIONS FOR ALL RELOCATED EQUIPMENT SHALL BE RE-ESTABLISHED BY THE CONTRACTOR. CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED

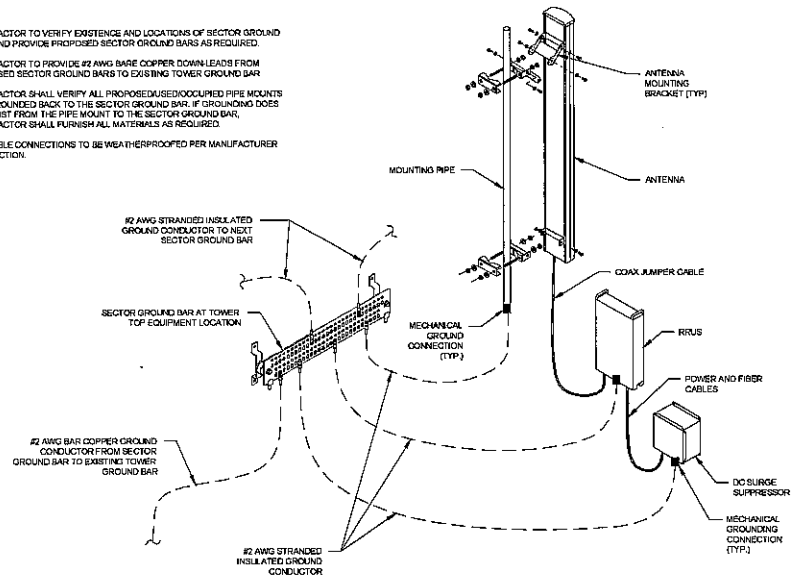
GROUNDING NOTES:

1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUND RING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #351546. INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE.
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAT 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

2 GROUNDING BAR DETAIL — SCALE: NONE

NOTES:

1. CONTRACTOR TO VERIFY EXISTENCE AND LOCATIONS OF SECTOR GROUND BARS AND PROVIDE PROPOSED SECTOR GROUND BARS AS REQUIRED.
2. CONTRACTOR TO PROVIDE #2 AWG BARE COPPER DOWN-LEADS FROM PROPOSED SECTOR GROUND BARS TO EXISTING TOWER GROUND BAR.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED/USED/OCCUPIED PIPE MOUNTS ARE GROUNDED BACK TO THE SECTOR GROUND BAR. IF GROUNDING DOES NOT EXIST FROM THE PIPE MOUNT TO THE SECTOR GROUND BAR, CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.
4. ALL CABLE CONNECTIONS TO BE WEATHERPROOFED PER MANUFACTURER INSTRUCTION.



3 TYPICAL ANTENNA GROUNDING SCHEMATIC — SCALE: NONE

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
129 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERC0904
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

0	03/08/19	ISSUED FOR PERMITTING

FA# 10035338
SITE# CT2082
MILFORD BONA ST
19 BONA STREET
MILFORD, CT 06461

GROUNDING DETAILS

G-1

Date: **February 04, 2019**

Chanhdara Ratsavong
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10035338
	Carrier Site Name:	MILFORD BONA ST
Crown Castle Designation:	**Crown Castle BU Number:**	873633
	Crown Castle Site Name:	Milford
	Crown Castle JDE Job Number:	531061
	Crown Castle Work Order Number:	1690342
	Crown Castle Order Number:	459065 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1690342
Site Data:	**10 Bona Street, MILFORD, New Haven County, CT** **Latitude *41° 13' 12.27"*, Longitude *-73° 4' 38.56"*** **133 Foot - Monopole Tower**	

Dear Chanhdara Ratsavong,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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

LC5: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Emma McCarty / M.B

Respectfully submitted by:

Maham Barimani, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 133 ft Monopole tower designed by SUMMIT.

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
133.0	136.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	12 2 1 4 1 2	1-5/8 7/8 17/64 3/4 3/8 Conduit
		3	cci antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		2	commscope	WCS-IMFQ-AMT		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A		
		3	kathrein	80010964 w/ Mount Pipe		
		3	powerwave technologies	1001940		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	raycap	DC6-48-60-18-8F		
	133.0	1	tower mounts	Miscellaneous [NA 509-3]		
		1	tower mounts	Platform Mount [LP 1201-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
115.0	115.0	1	rfs celwave	DB-T1-6Z-8AB-0Z	-	-
		1	tower mounts	Side Arm Mount [SO 201-1]		
113.0	113.0	3	alcatel lucent	9442 RRH2X40-AWS	1 12	1-1/4 1-5/8
		3	amphenol	BXA-171063-8BF-EDIN-4 w/ Mount Pipe		
		3	antel	BXA-171063-8BF-2 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)
		6	antel	LPA-80090/4CF w/ Mount Pipe		
		3	swedcom	SWCP 2X5514 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Criscuolo Shepard & Associates	1340372	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1340388	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1339622	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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 and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	133 - 86.5	Pole	TP33.116x24x0.25	1	-11.61	1561.31	43.4	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.7828x0.2813	2	-20.40	2219.08	65.6	Pass
L3	39.75 - 0	Pole	TP49.01x40.1884x0.375	3	-33.38	3555.76	57.5	Pass
							Summary	
						Pole (L2)	65.6	Pass
						Rating =	65.6	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	46.4	Pass
1	Base Plate	0	48.6	Pass
1,2	Drilled Pier Base Foundation Structure	0	40.0	Pass
1,2	Drilled Pier Base Foundation Soil Interaction	0	31.2	Pass
1,2	Pier and Pad Base Foundation Structure	0	30.8	Pass
1,2	Pier and Pad Base Foundation Soil Interaction	0	44.7	Pass

Structure Rating (max from all components) =	65.6%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) It is unknown whether the foundation is a drilled shaft or pier and pad. Both designs were analyzed and determined to be sufficient.

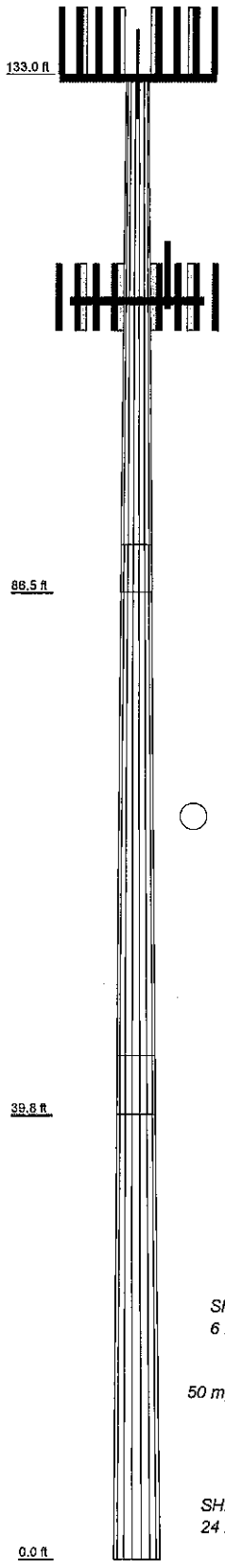
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	46.50	51.00	45.00
Number of Sides	18	18	18
Thickness (in)	0.2500	0.2813	0.3750
Socket Length (ft)	4.25	5.25	
Top Dia (in)	24.0000	31.7828	40.1884
Bot Dia (in)	33.1160	41.7800	49.0100
Grade		A607-65	
Weight (K) 17.3	3.6	5.7	8.1



ALL REACTIONS ARE FACTORED

AXIAL 50 K
SHEAR 6 K
MOMENT 605 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 33 K
SHEAR 24 K
MOMENT 2333 kip-ft
TORQUE 0 kip-ft
REACTIONS - 125 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 65.6%

CROWN CASTLE
The Pathway to Possible

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

Job: *BU 873633*			
Project:			
Client: Crown Castle	Drawn by: emccarty		App'd:
Code: TIA-222-H	Date: 02/04/19		Scale: NT
Path: R:\SA Models - Letters\Work Area\EMcCarty\WIP\873633 WO1693421\873633.eri			Dwg No. E-

Tower Input Data

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

3) Tower is located in New Haven County, Connecticut.
4) Tower base elevation above sea level: 69.00 ft.
5) Basic wind speed of 125 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.00 ft.
11) Nominal ice thickness of 1.5000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56 pcf.
14) A wind speed of 50 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) TIA-222-H Annex S .
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in pole design is 1.05.
21) Tower analysis based on target reliabilities in accordance with Annex S.
22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
23) 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-H Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H 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	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

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

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	133.00-86.50	46.50	4.25	18	24.0000	33.1160	0.2500	1.0000	A607-65 (65 ksi)
L2	86.50-39.75	51.00	5.25	18	31.7828	41.7800	0.2813	1.1250	A607-65 (65 ksi)
L3	39.75-0.00	45.00		18	40.1884	49.0100	0.3750	1.5000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3317	18.8456	1342.9976	8.4313	12.1920	110.1540	2687.7623	9.4246	3.7840	15.136
	33.5883	26.0792	3558.9750	11.6674	16.8229	211.5550	7122.6329	13.0421	5.3884	21.554
L2	33.0757	28.1211	3525.6028	11.1831	16.1457	218.3621	7055.8447	14.0632	5.0988	18.129
	42.3811	37.0454	8060.1282	14.7321	21.2242	379.7605	16130.8621	18.5262	6.8583	24.385
L3	41.7956	47.3879	9489.9239	14.1337	20.4157	464.8347	18992.3349	23.6984	6.4132	17.102
	49.7082	57.8878	17299.0559	17.2654	24.8971	694.8227	34620.8743	28.9494	7.9658	21.242

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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
******** ***											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
133									
LCF158-50A(1-5/8)	A	No	No	Inside Pole	133.00 - 0.00	12	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
6-8AWG 3 PAIR(7/8)	A	No	No	Inside Pole	133.00 - 0.00	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
A-	A	No	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
DQZNB2YN1750 N(17/64)							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
FB-L98B-034-XXXXXX(3/8)	A	No	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
WR-VG86ST-BRD(3/4)	A	No	No	Inside Pole	133.00 - 0.00	4	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
2" Rigid Conduit	A	No	No	Inside Pole	133.00 - 0.00	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
113 561(1-5/8)	C	No	No	Inside Pole	113.00 - 0.00	12	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
LDF6-50A(1-1/4)	C	No	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
******** ***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	133.00-86.50	A	0.000	0.000	0.000	0.000	0.88
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.45
L2	86.50-39.75	A	0.000	0.000	0.000	0.000	0.89
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.79
L3	39.75-0.00	A	0.000	0.000	0.000	0.000	0.75
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.67

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	133.00-86.50	A	1.437	0.000	0.000	0.000	0.000	0.88
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.45
L2	86.50-39.75	A	1.359	0.000	0.000	0.000	0.000	0.89
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.79
L3	39.75-0.00	A	1.213	0.000	0.000	0.000	0.000	0.75
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.67

Feed Line Center of Pressure

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

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 4'	C	None		0.0000	133.00	No Ice	0.30	0.30	0.03
						1/2" Ice	0.71	0.71	0.03
						1" Ice	1.00	1.00	0.04
						2" Ice	1.52	1.52	0.06
8'x2" Antenna Mount Pipe	A	None		0.0000	133.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
133									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) LGP21401	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice	1.10	0.21	0.01
						1/2" Ice	1.24	0.27	0.02
						1" Ice	1.38	0.35	0.03
						2" Ice	1.69	0.52	0.05
(2) LGP21401	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice	1.10	0.21	0.01
						1/2" Ice	1.24	0.27	0.02
						1" Ice	1.38	0.35	0.03
						2" Ice	1.69	0.52	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21401	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
DC6-48-60-18-8F	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.79 1.27 1.45 1.83	0.79 1.27 1.45 1.83	0.02 0.04 0.05 0.10
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.18 6.57 6.98 7.82	4.55 5.16 5.78 7.07	0.08 0.13 0.19 0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.18 6.57 6.98 7.82	4.55 5.16 5.78 7.07	0.08 0.13 0.19 0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.18 6.57 6.98 7.82	4.55 5.16 5.78 7.07	0.08 0.13 0.19 0.33
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.95 6.39 6.82 7.71	5.19 5.96 6.66 8.09	0.06 0.11 0.17 0.32
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.95 6.39 6.82 7.71	5.19 5.96 6.66 8.09	0.06 0.11 0.17 0.32
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.95 6.39 6.82 7.71	5.19 5.96 6.66 8.09	0.06 0.11 0.17 0.32
80010964 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
80010964 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
80010964 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
RRUS 32	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16
RRUS 32	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16

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
RRUS 32	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16
1001940	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
1001940	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
1001940	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
RRUS 8843 B2/B66A	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
WCS-IMFQ-AMT	A	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.99 1.11 1.25 1.53	0.64 0.75 0.86 1.11	0.03 0.04 0.05 0.08
WCS-IMFQ-AMT	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.99 1.11 1.25 1.53	0.64 0.75 0.86 1.11	0.03 0.04 0.05 0.08
DC6-48-60-18-8F	B	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.79 1.27 1.45 1.83	0.79 1.27 1.45 1.83	0.02 0.04 0.05 0.10

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
DC6-48-60-18-8F	C	From Leg	4.00 0.00 3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.79 1.27 1.45 1.83	0.79 1.27 1.45 1.83	0.02 0.04 0.05 0.10
Platform Mount [LP 1201-1]	C	None		0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	23.10 26.80 30.50 37.90	23.10 26.80 30.50 37.90	2.10 2.50 2.90 3.70
Miscellaneous [NA 509-3]	C	None		0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.84 16.96 22.08 32.32	11.84 16.96 22.08 32.32	0.28 0.30 0.32 0.36
115 DB-T1-6Z-8AB-0Z	B	From Leg	2.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
Side Arm Mount [SO 201-1]	B	None		0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.96 4.10 5.24 7.52	2.11 2.93 3.75 5.39	0.10 0.12 0.14 0.18
113 BXA-171063-8BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
(2) LPA-80090/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.22 3.59 4.34	5.21 5.82 6.44 7.74	0.03 0.07 0.11 0.22
(2) LPA-80090/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice	2.86 3.22 3.59	5.21 5.82 6.44	0.03 0.07 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	4.34	7.74	0.22
							2" Ice			
(2) LPA-80090/4CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	113.00	No Ice	2.86	5.21	0.03
			0.00				1/2"	3.22	5.82	0.07
			0.00				Ice	3.59	6.44	0.11
							1" Ice	4.34	7.74	0.22
							2" Ice			
SWCP 2X5514 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	113.00	No Ice	6.52	6.53	0.04
			0.00				1/2"	6.95	7.24	0.10
			0.00				Ice	7.37	7.92	0.17
							1" Ice	8.25	9.33	0.34
							2" Ice			
SWCP 2X5514 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	113.00	No Ice	6.52	6.53	0.04
			0.00				1/2"	6.95	7.24	0.10
			0.00				Ice	7.37	7.92	0.17
							1" Ice	8.25	9.33	0.34
							2" Ice			
SWCP 2X5514 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	113.00	No Ice	6.52	6.53	0.04
			0.00				1/2"	6.95	7.24	0.10
			0.00				Ice	7.37	7.92	0.17
							1" Ice	8.25	9.33	0.34
							2" Ice			
9442 RRH2X40-AWS	A	From Leg	4.00	0.00	0.0000	113.00	No Ice	2.16	1.42	0.04
			0.00				1/2"	2.35	1.59	0.06
			0.00				Ice	2.56	1.77	0.08
							1" Ice	2.99	2.14	0.13
							2" Ice			
9442 RRH2X40-AWS	B	From Leg	4.00	0.00	0.0000	113.00	No Ice	2.16	1.42	0.04
			0.00				1/2"	2.35	1.59	0.06
			0.00				Ice	2.56	1.77	0.08
							1" Ice	2.99	2.14	0.13
							2" Ice			
9442 RRH2X40-AWS	C	From Leg	4.00	0.00	0.0000	113.00	No Ice	2.16	1.42	0.04
			0.00				1/2"	2.35	1.59	0.06
			0.00				Ice	2.56	1.77	0.08
							1" Ice	2.99	2.14	0.13
							2" Ice			
Platform Mount [LP 303-1]	A	None			0.0000	113.00	No Ice	14.66	14.66	1.25
							1/2"	18.87	18.87	1.48
							Ice	23.08	23.08	1.71
							1" Ice	31.50	31.50	2.18
							2" Ice			
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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	133 - 86.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.61	-0.77	-0.09
			Max. Mx	8	-11.62	-508.10	-1.97
			Max. My	2	-11.62	1.70	506.41
			Max. Vy	8	15.62	-508.10	-1.97
			Max. Vx	2	-15.56	1.70	506.41
			Max. Torque	2			-0.45
L2	86.5 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.17	-0.77	-0.09
			Max. Mx	8	-20.40	-1327.10	-5.34
			Max. My	2	-20.41	5.05	1322.41
			Max. Vy	8	20.15	-1327.10	-5.34
			Max. Vx	2	-20.08	5.05	1322.41
			Max. Torque	2			-0.45
L3	39.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.02	-0.77	-0.09
			Max. Mx	8	-33.38	-2327.13	-8.58
			Max. My	2	-33.38	8.29	2319.55
			Max. Vy	8	24.12	-2327.13	-8.58
			Max. Vx	2	-24.05	8.29	2319.55
			Max. Torque	2			-0.45

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	50.02	-5.43	-3.14
	Max. H_x	20	33.39	24.09	0.07
	Max. H_z	2	33.39	0.07	24.03
	Max. M_x	2	2319.55	0.07	24.03
	Max. M_z	8	2327.13	-24.09	-0.07
	Max. Torsion	14	0.44	-0.07	-24.03
	Min. Vert	17	25.04	11.98	-20.77
	Min. H_x	8	33.39	-24.09	-0.07
	Min. H_z	14	33.39	-0.07	-24.03
	Min. M_x	14	-2319.52	-0.07	-24.03
	Min. M_z	20	-2326.52	24.09	0.07
	Min. Torsion	2	-0.45	0.07	24.03

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	27.83	0.00	0.00	-0.01	-0.24	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	33.39	-0.07	-24.03	-2319.55	8.29	0.45
0.9 Dead+1.0 Wind 0 deg - No Ice	25.04	-0.07	-24.03	-2298.41	8.29	0.44
1.2 Dead+1.0 Wind 30 deg - No Ice	33.39	11.98	-20.77	-2004.51	-1156.29	0.42
0.9 Dead+1.0 Wind 30 deg - No Ice	25.04	11.98	-20.77	-1986.24	-1145.68	0.42
1.2 Dead+1.0 Wind 60 deg - No Ice	33.39	20.83	-11.95	-1152.34	-2011.12	0.28
0.9 Dead+1.0 Wind 60 deg - No Ice	25.04	20.83	-11.95	-1141.84	-1992.72	0.28
1.2 Dead+1.0 Wind 90 deg - No Ice	33.39	24.09	0.07	8.58	-2327.13	0.07
0.9 Dead+1.0 Wind 90 deg - No Ice	25.04	24.09	0.07	8.50	-2305.86	0.07
1.2 Dead+1.0 Wind 120 deg - No Ice	33.39	20.90	12.08	1167.18	-2019.69	-0.16
0.9 Dead+1.0 Wind 120 deg - No Ice	25.04	20.90	12.08	1156.55	-2001.21	-0.16
1.2 Dead+1.0 Wind 150 deg - No Ice	33.39	12.11	20.85	2013.04	-1171.16	-0.34
0.9 Dead+1.0 Wind 150 deg - No Ice	25.04	12.11	20.85	1994.71	-1160.41	-0.34
1.2 Dead+1.0 Wind 180 deg - No Ice	33.39	0.07	24.03	2319.52	-8.90	-0.44
0.9 Dead+1.0 Wind 180 deg - No Ice	25.04	0.07	24.03	2298.39	-8.74	-0.44
1.2 Dead+1.0 Wind 210 deg - No Ice	33.39	-11.98	20.77	2004.48	1155.68	-0.42
0.9 Dead+1.0 Wind 210 deg - No Ice	25.04	-11.98	20.77	1986.22	1145.23	-0.42
1.2 Dead+1.0 Wind 240 deg - No Ice	33.39	-20.83	11.95	1152.31	2010.51	-0.29
0.9 Dead+1.0 Wind 240 deg - No Ice	25.04	-20.83	11.95	1141.82	1992.27	-0.29

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 270 deg - No Ice	33.39	-24.09	-0.07	-8.61	2326.52	-0.07
0.9 Dead+1.0 Wind 270 deg - No Ice	25.04	-24.09	-0.07	-8.53	2305.40	-0.08
1.2 Dead+1.0 Wind 300 deg - No Ice	33.39	-20.90	-12.08	-1167.21	2019.08	0.16
0.9 Dead+1.0 Wind 300 deg - No Ice	25.04	-20.90	-12.08	-1156.57	2000.76	0.16
1.2 Dead+1.0 Wind 330 deg - No Ice	33.39	-12.11	-20.85	-2013.07	1170.55	0.35
0.9 Dead+1.0 Wind 330 deg - No Ice	25.04	-12.11	-20.85	-1994.73	1159.96	0.35
1.2 Dead+1.0 Ice+1.0 Temp	50.02	0.00	0.00	0.09	-0.77	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	50.02	-0.01	-6.26	-601.69	0.68	0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	50.02	3.12	-5.41	-520.29	-301.06	0.10
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	50.02	5.42	-3.12	-299.45	-522.37	0.06
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	50.02	6.27	0.01	1.65	-603.94	0.01
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	50.02	5.43	3.14	302.34	-523.92	-0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	50.02	3.14	5.42	522.04	-303.75	-0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	50.02	0.01	6.26	601.89	-2.42	-0.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	50.02	-3.12	5.41	520.49	299.32	-0.10
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	50.02	-5.42	3.12	299.65	520.63	-0.06
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	50.02	-6.27	-0.01	-1.45	602.20	-0.01
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	50.02	-5.43	-3.14	-302.14	522.18	0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	50.02	-3.14	-5.42	-521.84	302.01	0.09
Dead+Wind 0 deg - Service	27.83	-0.02	-5.21	-500.80	1.60	0.10
Dead+Wind 30 deg - Service	27.83	2.60	-4.51	-432.78	-249.83	0.09
Dead+Wind 60 deg - Service	27.83	4.52	-2.59	-248.80	-434.39	0.06
Dead+Wind 90 deg - Service	27.83	5.23	0.02	1.84	-502.62	0.02
Dead+Wind 120 deg - Service	27.83	4.54	2.62	251.99	-436.24	-0.03
Dead+Wind 150 deg - Service	27.83	2.63	4.52	434.61	-253.04	-0.08
Dead+Wind 180 deg - Service	27.83	0.02	5.21	500.78	-2.11	-0.10
Dead+Wind 210 deg - Service	27.83	-2.60	4.51	432.76	249.32	-0.09
Dead+Wind 240 deg - Service	27.83	-4.52	2.59	248.77	433.88	-0.06
Dead+Wind 270 deg - Service	27.83	-5.23	-0.02	-1.87	502.11	-0.02
Dead+Wind 300 deg - Service	27.83	-4.54	-2.62	-252.01	435.74	0.03
Dead+Wind 330 deg - Service	27.83	-2.63	-4.52	-434.64	252.54	0.08

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-27.83	0.00	0.00	27.83	0.00	0.000%
2	-0.07	-33.39	-24.03	0.07	33.39	24.03	0.000%
3	-0.07	-25.04	-24.03	0.07	25.04	24.03	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
4	11.98	-33.39	-20.77	-11.98	33.39	20.77	0.000%
5	11.98	-25.04	-20.77	-11.98	25.04	20.77	0.000%
6	20.83	-33.39	-11.95	-20.83	33.39	11.95	0.000%
7	20.83	-25.04	-11.95	-20.83	25.04	11.95	0.000%
8	24.09	-33.39	0.07	-24.09	33.39	-0.07	0.000%
9	24.09	-25.04	0.07	-24.09	25.04	-0.07	0.000%
10	20.90	-33.39	12.08	-20.90	33.39	-12.08	0.000%
11	20.90	-25.04	12.08	-20.90	25.04	-12.08	0.000%
12	12.11	-33.39	20.85	-12.11	33.39	-20.85	0.000%
13	12.11	-25.04	20.85	-12.11	25.04	-20.85	0.000%
14	0.07	-33.39	24.03	-0.07	33.39	-24.03	0.000%
15	0.07	-25.04	24.03	-0.07	25.04	-24.03	0.000%
16	-11.98	-33.39	20.77	11.98	33.39	-20.77	0.000%
17	-11.98	-25.04	20.77	11.98	25.04	-20.77	0.000%
18	-20.83	-33.39	11.95	20.83	33.39	-11.95	0.000%
19	-20.83	-25.04	11.95	20.83	25.04	-11.95	0.000%
20	-24.09	-33.39	-0.07	24.09	33.39	0.07	0.000%
21	-24.09	-25.04	-0.07	24.09	25.04	0.07	0.000%
22	-20.90	-33.39	-12.08	20.90	33.39	12.08	0.000%
23	-20.90	-25.04	-12.08	20.90	25.04	12.08	0.000%
24	-12.11	-33.39	-20.85	12.11	33.39	20.85	0.000%
25	-12.11	-25.04	-20.85	12.11	25.04	20.85	0.000%
26	0.00	-50.02	0.00	0.00	50.02	0.00	0.000%
27	-0.01	-50.02	-6.26	0.01	50.02	6.26	0.000%
28	3.12	-50.02	-5.41	-3.12	50.02	5.41	0.000%
29	5.42	-50.02	-3.12	-5.42	50.02	3.12	0.000%
30	6.27	-50.02	0.01	-6.27	50.02	-0.01	0.000%
31	5.43	-50.02	3.14	-5.43	50.02	-3.14	0.000%
32	3.14	-50.02	5.42	-3.14	50.02	-5.42	0.000%
33	0.01	-50.02	6.26	-0.01	50.02	-6.26	0.000%
34	-3.12	-50.02	5.41	3.12	50.02	-5.41	0.000%
35	-5.42	-50.02	3.12	5.42	50.02	-3.12	0.000%
36	-6.27	-50.02	-0.01	6.27	50.02	0.01	0.000%
37	-5.43	-50.02	-3.14	5.43	50.02	3.14	0.000%
38	-3.14	-50.02	-5.42	3.14	50.02	5.42	0.000%
39	-0.02	-27.83	-5.21	0.02	27.83	5.21	0.000%
40	2.60	-27.83	-4.51	-2.60	27.83	4.51	0.000%
41	4.52	-27.83	-2.59	-4.52	27.83	2.59	0.000%
42	5.23	-27.83	0.02	-5.23	27.83	-0.02	0.000%
43	4.54	-27.83	2.62	-4.54	27.83	-2.62	0.000%
44	2.63	-27.83	4.52	-2.63	27.83	-4.52	0.000%
45	0.02	-27.83	5.21	-0.02	27.83	-5.21	0.000%
46	-2.60	-27.83	4.51	2.60	27.83	-4.51	0.000%
47	-4.52	-27.83	2.59	4.52	27.83	-2.59	0.000%
48	-5.23	-27.83	-0.02	5.23	27.83	0.02	0.000%
49	-4.54	-27.83	-2.62	4.54	27.83	2.62	0.000%
50	-2.63	-27.83	-4.52	2.63	27.83	4.52	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00020756
3	Yes	4	0.00000001	0.00009271
4	Yes	5	0.00000001	0.00041661
5	Yes	5	0.00000001	0.00018349
6	Yes	5	0.00000001	0.00040907
7	Yes	5	0.00000001	0.00017982
8	Yes	4	0.00000001	0.00020720
9	Yes	4	0.00000001	0.00009188
10	Yes	5	0.00000001	0.00041752
11	Yes	5	0.00000001	0.00018315
12	Yes	5	0.00000001	0.00042304
13	Yes	5	0.00000001	0.00018582

14	Yes	4	0.00000001	0.00034725
15	Yes	4	0.00000001	0.00019680
16	Yes	5	0.00000001	0.00040681
17	Yes	5	0.00000001	0.00017889
18	Yes	5	0.00000001	0.00041476
19	Yes	5	0.00000001	0.00018264
20	Yes	4	0.00000001	0.00017925
21	Yes	4	0.00000001	0.00006401
22	Yes	5	0.00000001	0.00042077
23	Yes	5	0.00000001	0.00018475
24	Yes	5	0.00000001	0.00041483
25	Yes	5	0.00000001	0.00018200
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00012412
28	Yes	5	0.00000001	0.00015307
29	Yes	5	0.00000001	0.00015267
30	Yes	5	0.00000001	0.00012479
31	Yes	5	0.00000001	0.00015399
32	Yes	5	0.00000001	0.00015432
33	Yes	5	0.00000001	0.00012422
34	Yes	5	0.00000001	0.00015155
35	Yes	5	0.00000001	0.00015216
36	Yes	5	0.00000001	0.00012400
37	Yes	5	0.00000001	0.00015317
38	Yes	5	0.00000001	0.00015265
39	Yes	4	0.00000001	0.00001920
40	Yes	4	0.00000001	0.00013502
41	Yes	4	0.00000001	0.00012646
42	Yes	4	0.00000001	0.00001623
43	Yes	4	0.00000001	0.00013077
44	Yes	4	0.00000001	0.00013712
45	Yes	4	0.00000001	0.00002050
46	Yes	4	0.00000001	0.00012413
47	Yes	4	0.00000001	0.00013263
48	Yes	4	0.00000001	0.00001596
49	Yes	4	0.00000001	0.00013424
50	Yes	4	0.00000001	0.00012793

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	16.099	43	1.0518	0.0009
L2	90.75 - 39.75	7.573	43	0.8139	0.0004
L3	45 - 0	1.782	43	0.3630	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.00	Lighting Rod 3/4" x 4'	43	16.099	1.0518	0.0009	52152
115.00	DB-T1-6Z-8AB-0Z	43	12.265	0.9681	0.0007	14486
113.00	BXA-171063-8BF-EDIN-4 w/ Mount Pipe	43	11.850	0.9578	0.0006	13038

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	74.526	10	4.8736	0.0040
L2	90.75 - 39.75	35.076	10	3.7727	0.0019
L3	45 - 0	8.256	10	1.6821	0.0005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.00	Lighting Rod 3/4" x 4'	10	74.526	4.8736	0.0041	11416
115.00	DB-T1-6Z-8AB-0Z	10	56.788	4.4869	0.0031	3169
113.00	BXA-171063-8BF-EDIN-4 w/ Mount Pipe	10	54.871	4.4391	0.0030	2852

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	133 - 86.5 (1)	TP33.116x24x0.25	46.50	0.00	0.0	25.4180	-11.61	1486.96	0.008
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	51.00	0.00	0.0	36.1267	-20.40	2113.41	0.010
L3	39.75 - 0 (3)	TP49.01x40.1884x0.375	45.00	0.00	0.0	57.8878	-33.38	3386.44	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	133 - 86.5 (1)	TP33.116x24x0.25	509.41	1140.83	0.447	0.00	1140.83	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	1330.58	1961.90	0.678	0.00	1961.90	0.000
L3	39.75 - 0 (3)	TP49.01x40.1884x0.375	2332.69	3928.24	0.594	0.00	3928.24	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	133 - 86.5 (1)	TP33.116x24x0.25	15.67	446.09	0.035	0.16	1251.39	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.7828x0.2813	20.19	634.02	0.032	0.16	2247.06	0.000
L3	39.75 - 0 (3)	TP49.01x40.1884x0.375	24.16	1015.93	0.024	0.16	4327.06	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	133 - 86.5 (1)	0.008	0.447	0.000	0.035	0.000	0.456	1.050	4.8.2
L2	86.5 - 39.75 (2)	0.010	0.678	0.000	0.032	0.000	0.689	1.050	4.8.2
L3	39.75 - 0 (3)	0.010	0.594	0.000	0.024	0.000	0.604	1.050	4.8.2

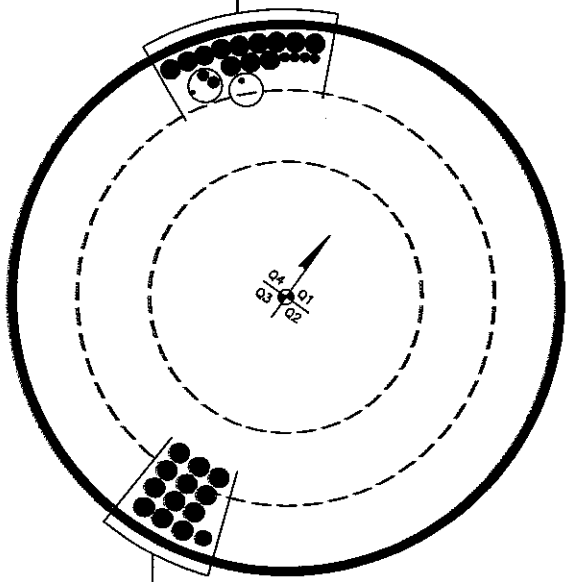
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	133 - 86.5	Pole	TP33.116x24x0.25	1	-11.61	1561.31	43.4	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.7828x0.2813	2	-20.40	2219.08	65.6	Pass
L3	39.75 - 0	Pole	TP49.01x40.1884x0.375	3	-33.38	3555.76	57.5	Pass
							Summary	
						Pole (L2)	65.6	Pass
						RATING =	**65.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

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



(OTHER CONSIDERED EQUIPMENT)
(1) 1–1/4" TO 113 FT LEVEL
(12) 1–5/8" TO 113 FT LEVEL

BUSINESS UNIT: 873633 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

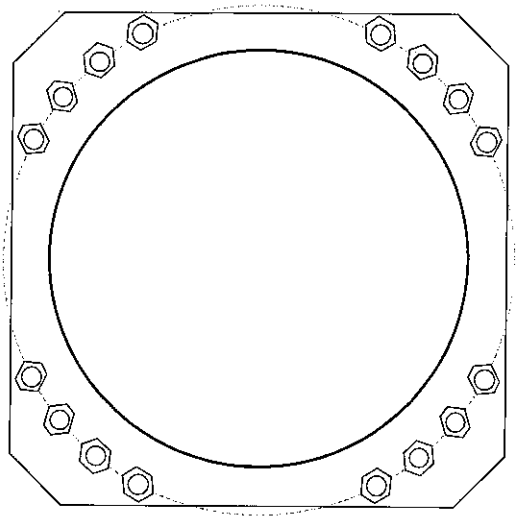
Monopole Base Plate Connection

Site Info	
BU #	873633
Site Name	Milford
Order #	459065 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	2332.69
Axial Force (kips)	33.38
Shear Force (kips)	24.16

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 60" BC

Base Plate Data

58" OD x 3.25" Plate (A572-55; Fy=55 ksi, Fu=70 ksi)

Stiffener Data

N/A

Pole Data

49.01" x 0.375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 118.65	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.51	ϕVn = 73.13	**46.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	25.28	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**48.6%**	**Pass**

Drilled Pier Foundation

BU # :	873633
Site Name:	Milford
Order Number:	459065 Rev. 1

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2333	
Axial Force (kips)	33	
Shear Force (kips)	24	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 25' below grade		
Pier Diameter	7	ft
Rebar Quantity	24	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.01	-
Soil Safety Factor	4.06	-
Max Moment (kip-ft)	2439.77	-
Rating*	*31.2%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	600.55	-
End Bearing (kips)	288.63	-
Weight of Concrete (kips)	176.64	-
Total Capacity (kips)	889.18	-
Axial (kips)	209.64	-
Rating*	*22.5%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.13	-
Critical Moment (kip-ft)	2439.69	-
Critical Moment Capacity	5801.63	-
Rating*	*40.0%*	-

Soil Interaction Rating*	**31.2%**
Structural Foundation Rating*	**40.0%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑

Soil Profile				
Groundwater Depth	n/a	ft	# of Layers	2

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	120	150	0	19	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	25	21.5	120	150	0	30	1.694	1.694			10	19	Cohesionless

Pier and Pad Foundation

BU # :	873633
Site Name:	Milford
App. Number:	459065 Rev. 1

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	33	kips
Base Shear, Vu_comp:	24	kips
Moment, M_u:	2333	ft-kips
Tower Height, H:	133	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, dpier:	7	ft
Ext. Above Grade, E:	0.5	ft
Pier Rebar Size, Sc:	11	
Pier Rebar Quantity, mc:	32	
Pier Tie/Spiral Size, St:	4	
Pier Tie/Spiral Quantity, mt:	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, D:	7	ft
Pad Width, W:	23.5	ft
Pad Thickness, T:	3	ft
Pad Rebar Size (Bottom), Sp:	11	
Pad Rebar Quantity (Bottom), mp:	24	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, Fy:	60000	psi
Concrete Compressive Strength, F'c:	3000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Net Bearing, Qnet:	10.000	ksf
Cohesion, Cu:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	19	
Base Friction, μ:	0.45	
Neglected Depth, N:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating***	**Check**
Lateral (Sliding) (kips)	275.50	24.00	**8.3%**	**Pass**
Bearing Pressure (ksf)	8.13	2.01	**23.5%**	**Pass**
*Overturning (kip*ft)*	5630.74	2519.00	**44.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	7552.24	2441.00	**30.8%**	**Pass**
Pier Compression (kip)	23390.64	72.69	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	4940.35	785.18	**15.1%**	**Pass**
Pad Shear - 1-way (kips)	715.56	129.72	**17.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.025	**14.7%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	6626.53	1464.60	**21.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**44.7%**
Structural Rating*:	**30.8%**

Version 3.1.1

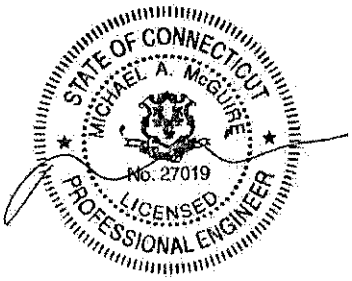
RF EMISSIONS COMPLIANCE REPORT

Crown Castle on Behalf of AT&T Mobility, LLC

Site: Milford
Crown Castle Site ID: 873633
App ID: 459065
10 Bona Street
MILFORD, CT
2/25/2019

Report Status:

AT&T Mobility, LLC Is Compliant



sealed 26feb2019 mike@h2dc.com
H2DC PLLC CT CoA#: 0001714

Prepared By:

Sitesafe, LLC

8618 Westwood Center Drive,
Suite 315

Vienna, VA 22182

Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
AT&T Mobility, LLC
MILFORD, CT

My signature on the cover of this document indicates:

That I, Michael A McGuire, am currently and actively licensed to provide (in this state/jurisdiction as indicated within the professional electrical engineering seal on the cover of this document) professional electrical engineering services, as an employee of Hurricane Hill Development Company, PLLC , a duly authorized/registered engineering firm (in this state, as applicable) on behalf of SiteSafe, LLC; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by AT&T Mobility, LLC (See attached Site Summary and Carrier documents), and that AT&T Mobility, LLC's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "Milford" ("the site"); and

That AT&T Mobility, LLC proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by AT&T Mobility, LLC and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of AT&T Mobility, LLC's operating frequency as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is no more than 1.575% of the maximum in any accessible area on the ground and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 3.121% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that AT&T Mobility, LLC's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

AT&T Mobility, LLC
Milford
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC (Proposed)	0.274 %
AT&T Mobility, LLC (Proposed)	0.213 %
AT&T Mobility, LLC (Proposed)	0.27 %
AT&T Mobility, LLC (Proposed)	0.464 %
AT&T Mobility, LLC (Proposed)	0.265 %
AT&T Mobility, LLC	0.089 %
Verizon Wireless	0.649 %
Verizon Wireless	0.327 %
Verizon Wireless	0.569 %
Composite Site MPE:	3.121 %

AT&T Mobility, LLC (Proposed)
Milford
Carrier Summary

Frequency:	1930	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.74165	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.27416	%

					On Axis		Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density (µW/cm^2)	Percent of MPE	Max Power Density (µW/cm^2)	Percent of MPE
Kathrein-Scala	800-10964	136	23	5154	1.253456	0.125346	2.601504	0.26015
Kathrein-Scala	800-10964	136	143	5154	1.252498	0.12525	2.601504	0.26015
Kathrein-Scala	800-10964	136	263	5154	1.252498	0.12525	2.601504	0.26015

AT&T Mobility, LLC (Proposed)
Milford
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.20756	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.2131	%

					On Axis		Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density (µW/cm^2)	Percent of MPE	Max Power Density (µW/cm^2)	Percent of MPE
Kathrein-Scala	800-10964	136	23	2631	0.845074	0.149131	1.017042	0.179478
Kathrein-Scala	800-10964	136	143	2631	0.843138	0.148789	1.017042	0.179478
Kathrein-Scala	800-10964	136	263	2631	0.845074	0.149131	1.017042	0.179478

AT&T Mobility, LLC (Proposed)
Milford
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.69813	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.26981	%

					On Axis		Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density (µW/cm^2)	Percent of MPE	Max Power Density (µW/cm^2)	Percent of MPE
ANDREW	SBNHH-1D65A	136	23	2685	1.696196	0.16962	2.691885	0.269188
ANDREW	SBNHH-1D65A	136	143	2685	1.6846	0.16846	2.691885	0.269189
ANDREW	SBNHH-1D65A	136	263	2685	1.6846	0.16846	2.691885	0.269189

AT&T Mobility, LLC (Proposed)
Milford
Carrier Summary

Frequency:	2110	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	4.64339	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.46434	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	OPA-65R-LCUU-H4	136	23	4257	3.283655	0.328366	4.599884	0.459988
CCI Antennas	OPA-65R-LCUU-H4	136	143	4257	3.283656	0.328366	4.599883	0.459988
CCI Antennas	OPA-65R-LCUU-H4	136	263	4257	3.339784	0.333978	4.599884	0.459988

AT&T Mobility, LLC (Proposed)
Milford
Carrier Summary

Frequency:	734	MHz
Maximum Permissible Exposure (MPE):	489.33	µW/cm^2
Maximum power density at ground level:	1.29787	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.26523	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	OPA-65R-LCUU-H4	136	23	1902	1.234788	0.252341	1.285713	0.262748
CCI Antennas	OPA-65R-LCUU-H4	136	143	1902	1.235891	0.252566	1.285713	0.262748
CCI Antennas	OPA-65R-LCUU-H4	136	263	1902	1.234789	0.252341	1.285713	0.262748

AT&T Mobility, LLC
Milford
Carrier Summary

Frequency:	869	MHz
Maximum Permissible Exposure (MPE):	579.33	µW/cm^2
Maximum power density at ground level:	0.51694	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.08923	%

					On Axis		Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density (µW/cm^2)	Percent of MPE	Max Power Density (µW/cm^2)	Percent of MPE
Powerwave	7770	136	23	547	0.288052	0.049721	0.443001	0.076467
Powerwave	7770	136	143	547	0.288052	0.049721	0.443001	0.076467
Powerwave	7770	136	263	547	0.287685	0.049658	0.443001	0.076467

Verizon Wireless
Milford
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	6.48932	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.64893	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-171063-8BF	113	30	3708	2.606999	0.2607	2.900977	0.290098
Antel	BXA-171063-8BF	113	150	3708	2.610039	0.261004	2.900977	0.290098
Antel	BXA-171063-8BF	113	270	3708	2.610039	0.261004	2.900977	0.290098
Antel	BXA-171063-8BF	113	30	3708	3.669449	0.366945	3.66947	0.366947
Antel	BXA-171063-8BF	113	150	3708	3.669449	0.366945	3.66947	0.366947
Antel	BXA-171063-8BF	113	270	3708	3.669449	0.366945	3.66947	0.366947

Verizon Wireless
Milford
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	1.63879	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.32732	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
SWEDCOM	SWCP 2X5514	113	30	2530	1.577105	0.315001	1.637968	0.327157
SWEDCOM	SWCP 2X5514	113	150	2530	1.575096	0.3146	1.637968	0.327157
SWEDCOM	SWCP 2X5514	113	270	2530	1.577105	0.315001	1.637968	0.327157

Verizon Wireless
Milford
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	3.22623	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.56933	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	LPA-80090-4CF	113	30	1423	1.118911	0.197455	1.177164	0.207735
Antel	LPA-80090-4CF	113	150	1423	1.118911	0.197455	1.177165	0.207735
Antel	LPA-80090-4CF	113	270	1423	1.118911	0.197455	1.177165	0.207735
Antel	LPA-80090-4CF	113	30	1423	1.118911	0.197455	1.177164	0.207735
Antel	LPA-80090-4CF	113	150	1423	1.118911	0.197455	1.177165	0.207735
Antel	LPA-80090-4CF	113	270	1423	1.118911	0.197455	1.177165	0.207735