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

May 16, 2018

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

RE: **Request of Sigfox NIP LLC for an Order to Approve the Shared Use of an Existing Tower at 200 Stanley Street, New Britain, CT 06053**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, Sigfox NIP LLC ("Sigfox") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by Sigfox of an existing telecommunication tower at 200 Stanley Street, New Britain, CT 06053 (the "Property"). The existing 192-foot monopole is owned by Crown Atlantic Company LLC ("Crown Castle"), the underlying property is owned by Downes Investment LLc. Sigfox requests that the Council find that the proposed shared use of the Crown Castle tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared us. A copy of this filing is being mailed to the land owner, Downes Investment LLC, Mayor Erin E Stewart, and Sergio Lupo, Director of Health/Director of Licenses, Permits, and Inspections

Background

The existing Crown Castle facility consists of a 192-foot monopole tower on a 2.18 Acre parcel northwest of the intersection of Stanely Street and Konstin Place. AT&T maintains the 197 foot level. Equipment associated with the AT&T antennas is located northwest of the tower. Metro-PCS maintains equipment at the 186-foot level. Equipment associated with the Metro-PCS antennas is located west of the tower. Clearwire maintains antennas at the 175-foot level. Equipment associated with the Clearwire antennas is located north of the tower. Verizon maintains antennas at the 103-foot level. Equipment associated with the Verizon antennas is located south of the tower.

Sigfox is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. Sigfox and Crown Castle have agreed to the proposed shared use of the 300 Governors Highway tower pursuant to mutually acceptable terms and conditions. Likewise, Sigfox and Crown Castle have agreed to the proposed installation of equipment cabinets on the ground on the southeast side of the tower. Crown Castle has authorized Sigfox to apply for all necessary permits and approvals that may be required to share the existing tower. (See Owner's authorization letter).

Sigfox proposes add one (1) omni antenna, one (1) line of coaxial cable; one (1) filter, and one (1) TMA on the existing tower at 161 feet above ground level. They propose to add one (1) equipment cabinet within the existing ground space.Included in the Construction Drawings are Sigfox's project specifications for locations of all proposed site improvements.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that het proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." Sigfox respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing Crown Castle tower is structurally capable of supporting Sigfox's proposed improvements. The prosed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support Sigfox's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the Crown Castle tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the Crown Castle tower would have a minimal environmental effect for the following reasons:

1. The proposed installation of one (1) omni antenna, one (1) line of coaxial cable; one (1) filter, and one (1) TMA on the existing tower at 161 feet above ground level, would have no visual impact on the area of the tower. Sigfox's cabinet will be installed within the facility compound. Sigfox's shared use of this tower therefore, does not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Operation of Sigfox's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that Sigfox's proposed facility will operate well within the FCC RF emissions safety standards.

3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the Crown Castle facility other than periodic maintenance. The proposed shared use of the Crown Castle tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, Sigfox has entered into an agreement with Crown Castle for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible. (Please see included authorization.)

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Sigfox's full array of one (1) omni antenna, one (1) line of coaxial cable; one (1) filter, and one (1) TMA and all related equipment. Sigfox is not aware of any public safety concerns relative to the proposed sharing of the existing Crown Castle tower.

Conclusion

For the reasons discussed above, the proposed shared use of the existing Crown Castle tower at 300 Governors Highway satisfies the criteria state in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the prosed shared use.

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive
Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

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

Copies to:

Honorable Erin E Stewart
Mayor
27 West Main Street
New Britain, CT 06051

Sergio Lupo
Director of Health/Director of Licenses, Permits, and Inspections
27 West Main Street
Room 404
New Britain, CT 06051

Crown Castle (Tower Owner)
3 Corporate Park Dr, Suite 101
Clifton Park, NY 12065

Downes Investment LLC
PO Box 1508
New Britain, CT 06050

Petition No. 544
Crown Atlantic Company, LLC
New Britain, Connecticut
Staff Report
February 11, 2002

On February 11, 2002, Connecticut Siting Council (Council) member Gerald J. Heffernan with Robert Mercier of Council staff met Crown Atlantic Company LLC (Crown) representatives Kenneth Baldwin, Robert Stanford, and Shane Newhart for an inspection of an existing 195-foot monopole owned and operated by Crown and located at 200 Stanley Street in New Britain, Connecticut. Crown proposes to allow tower sharing for three wireless communications service providers; AT&T Wireless (AT&T), Northcoast Communications (Northcoast) and Verizon Wireless (Verizon) and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the tower share request.

The petition was filed to address the Council's concerns that the tower was built without a Certificate. Crown filed for a City of New Britain (City) building permit in May of 2001. A building permit was issued on June 8, 2001. The Council denied a tower share request (TS-NORTHCOAST-089-011031) at the Council's November 29, 2001 meeting since the City approved the tower after Judge Covello's US District Court decision dated January 9, 2001.

The tower is located on a commercial lot in an industrial zone. Commercial properties abut the site to the north and south. Route 9 is located west of the site. Residential properties are located to the east. A fenced, graveled compound measuring 50' x 70 with one vacant equipment shelter exists at the site.

AT&T proposes to install six panel antennas at the 195-foot level and install equipment cabinets at the base of the tower. Northcoast proposes to install six panel antennas and three two-foot dishes at the 185-foot level and install a 10x20-foot equipment shelter at the base of the tower. Verizon proposes to install 12 panel antennas at the 100-foot level and install radio equipment in the existing building at the base of the tower.

The cumulative worst-case power density for the telecommunications operations at the site has been calculated to be 13.54% of the applicable standard for uncontrolled environments.

Crown contends that the proposed shared use of the existing tower and associated building compound would not cause a substantial adverse environmental effect.

Detailed Parcel Information

GIS ID
2102-11

Parcel ID
B10B 11

Unique ID
1486

Owner
DOWNES INVESTMENTS LLC

Location
200 STANLEY ST

MAILING ADDRESS
PO BOX 1508
NEW BRITAIN CT 06050-1508

Quick Links: **Quick Map** **VISION Card** **Summary Card**

Scroll Down For Complete Property Detail

PARCEL VALUATIONS

	Appraised Value	Assessed Value
Buildings	541500	379050
Land	168400	117880
TOTAL:	795000	556500

PROPERTY INFORMATION

Total Acres	2.18
Land Use	Office Bld MDL-94
Land Class Code	C
Zoning	I2
Census Tract	
Neighborhood	107H
Lot Description	
Lot Utilities	All Public

SALE INFORMATION

Sale Date	10/17/2011
Sale Price	327818
Book / Page	1827/ 193

BUILDING AREA

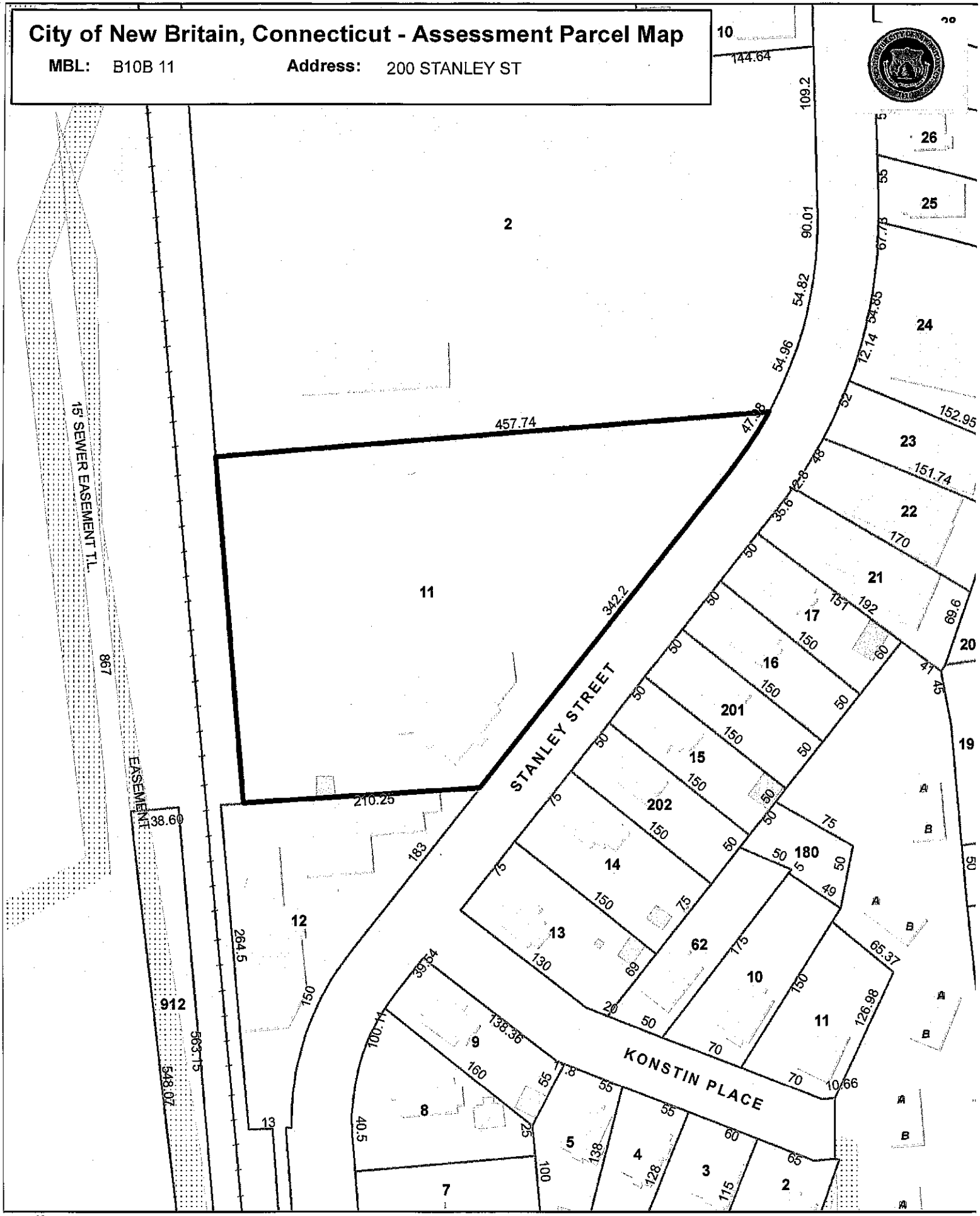
Building Gross - sqft	13283
Living Area - sqft	11912

CONSTRUCTION DETAILS

Building Style	Office
Building Condition	C
Number of Rooms	
Number of Bedrooms	0
Number of Bathrooms	0
Stories	1
Roof Structure	Flat
Primary Exterior Wall Type	Block/Concrete
Heating/Cooling Type	99
AC_Type	Central
Heating Fuel	Yes

City of New Britain, Connecticut - Assessment Parcel Map

MBL: B10B 11 **Address:** 200 STANLEY ST



Approximate Scale:

1 inch = 100 feet

Disclaimer:
This map is for informational purposes only.
All information is subject to verification by any user.
The City of New Britain and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced Feb 2017

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

Crown Castle, does hereby authorize **Sigfox** and its authorized contractors/agents to act as "Applicant" in the processing of all applications, permits, research and other related activities associated with the processing, planning, design review, permitting, entitlement and construction of additional equipment, antennas and site improvements for the Crown Castle existing wireless communications facility described as follows:

Customer Site Name:	**CT8611**	**Crown Castle Site ID Number:**	**803843**
Site Address:	**200 Stanley Street**	**Crown Castle Site Name:**	**CT NEW BRITAIN 4 CAC**

This authorization is fully contingent upon **Sigfox** authorized contractors/agents' compliance with the following conditions:

1. Crown Castle must review the application prior to submittal. Crown Castle must be provided all applications, narratives, drawings and attachments at least 72 hours in advance of their submittal to the locality. Use of email and electronic attachments is encouraged. A Crown Castle Zoning Subject Matter Expert (SME) will review and provide written comment to the customer within 48 hours of receipt of a complete set of application materials. If Crown Castle indicates that changes are required, submissions shall be altered in accordance with Crown Castle comments prior to submission to the locality. Verification of corrections should also be accomplished via emails and attachments.
2. In no event may **Sigfox** encourage, suggest, participate in, or permit the imposition of any restrictions or additional obligations whatsoever on the tower site or Crown Castle's current or future use or ability to license space at the tower site as part of or in exchange for obtaining any approval, permit, exception or variance.
3. A copy of the final permit and/or a written summary of the zoning/entitlement decision rendered by the locality and any/all conditions placed on that decision shall be communicated in detail to Crown Castle well within the appeal period provided by the locality (typically 10-15 days).
4. All conditions of approval pertinent to the construction of the proposed project must be included in the construction drawings for the project. The conditions of approval pertinent to the construction of the project shall be copied verbatim from the zoning permit approval language, and shall be present in the drawings prior to submission for building permits and contractor bidding. Crown Castle shall verify the inclusion of appropriate conditions of approval in the construction drawing redline process.
5. Crown Castle will provide a Notice To Proceed (NTP) to construction to the customer upon receipt of the final approved zoning permit and the approved Building Permit.

By Crown Castle

Signature:
Printed Name: **William Stone**

Title: **Real Estate Specialist**

Date: **May 16, 2018**

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SIGFOX SITE NUMBER: CT8611
SIGFOX SITE NAME: CT NEW BRITAIN 4 CAC
SITE TYPE: MONOPOLE
TOWER HEIGHT: 193'-0"

CROWN CASTLE BU #: 803843
SITE ADDRESS: 200 STANLEY STREET NEW BRITAIN, CT 06053
COUNTY: HARTFORD
JURISDICTION: CITY OF NEW BRITAIN

SIGFOX PHASE 1

SITE INFORMATION

CROWN CASTLE SITE NAME:	CT NEW BRITAIN 4 CAC 803843
SITE ADDRESS:	200 STANLEY STREET NEW BRITAIN, CT 06053
COUNTY:	HARTFORD
MAP/PARCEL #:	NBRI-000813-000000-000200
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 39' 16.40"
LONGITUDE:	-72° 46' 09.59"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	112 FT.
CURRENT ZONING:	I2
JURISDICTION:	CITY OF NEW BRITAIN
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	GLOBAL SIGNAL ACQUISITION PO BOX 277455 ATLANTA, GA 30384-7455
TOWER OWNER:	CROWN ATLANTIC COMPANY LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	SIGFOX 545 BOYLSTON ST. 10TH FLOOR BOSTON, MA 02116
CROWN CASTLE APPLICATION ID:	426664
ELECTRIC PROVIDER:	CONNECTICUT LIGHT & POWER CO (800) 286-2000
TELCO PROVIDER:	AT&T (866) 620-6900

PROJECT TEAM

CROWN CASTLE A&E FIRM:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWNAE.APPROVAL@CROWNCASTLE.COM
CROWN CASTLE CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 BRENT MCPHERSON - PROJECT MANAGER (980) 209-8249 JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104 AMANDA CORNWALL - REAL ESTATE SPECIALIST AMANDA.CORNWALL@CROWNCASTLE.COM (339) 2057-7017
SIGFOX CONTACT:	FRANCO CORBO (201) 887-2226

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	OVERALL SITE PLAN
C-2	TOWER ELEVATION & ANTENNA LAYOUT
C-3	DETAILS
C-4	DETAILS
C-5	UTILITY FRAME ELEVATION
C-6	BILL OF MATERIALS
E-1	ONE LINE DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11x17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

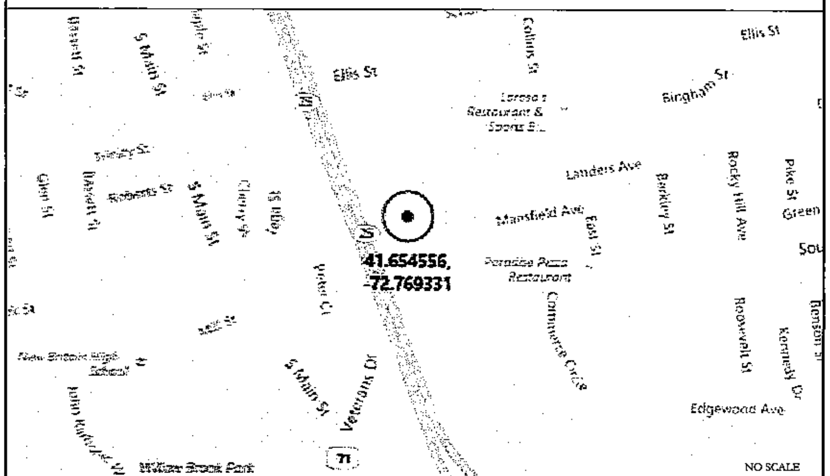
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK
- INSTALL VALMONT RING MOUNT W/ 2-1/2" SCH 40 PIPE
- INSTALL CONNECT-IT - S4 4'-0" STAND OFF
- INSTALL (1) PROCOM - CXL 900-3LW OMNI ANTENNA W/ MOUNTING CLAMPS
- INSTALL LNA W/ CAVITY FILTER
- INSTALL (1) 1/2" EC4-50 FEEDLINE

GROUND SCOPE OF WORK
- INSTALL BASE STATION, UPS, PRIMARY CONNECTIVITY MODEM, & BACKUP CONNECTIVITY GSM USB KEY ON A NEW H-FRAME IN A 3'-0"x3'-0" AREA
- INSTALL POWER TO CABINET

DESIGN PACKAGE BASED ON THE APPLICATION
ID: 426664
REVISION: 1

LOCATION MAP



APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2016 CT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS
MECHANICAL	2016 CT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS
ELECTRICAL	2016 CT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS

REFERENCE DOCUMENTS:
STRUCTURAL OPINION LETTER: CROWN CASTLE DATED FEBRUARY 23, 2018

MOUNT ANALYSIS: BY OTHERS

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

SIGFOX
One network A billion dreams
BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: CT8611
BU #: 803843
CT NEW BRITAIN 4 CAC
803843
200 STANLEY STREET
NEW BRITAIN, CT 06053
EXISTING 193'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/05/18	JJW	PRELIMINARY	KK
B	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

STATE OF CONNECTICUT
JUSTIN LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 AM EDT

Crown Castle USA Inc. Certificate of Registration #PEC.0001101

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

SHEET NUMBER: T-1
REVISION: 0

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED– NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH..................3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER..................................2 IN.
   #5 AND SMALLER & WWF.....................1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALLS..............................3/4 IN.
   BEAMS AND COLUMNS......................1 1/2 IN.

5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE I. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR– ________
   SUBCONTRACTOR– GENERAL CONTRACTOR (CONSTRUCTION)
   CARRIER– SIGFOX
   TOWER OWNER– CROWN CASTLE
   OEM– ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

SYMBOLS:

S/G	SOLID GROUND BUS BAR
S/N	SOLID NEUTRAL BUS BAR
	SUPPLEMENTAL GROUND CONDUCTOR
	2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	CHEMICAL GROUND ROD
	TEST WELL
	DISCONNECT SWITCH
M	METER
	EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
	MECHANICAL CONNECTION
	GROUNDING WIRE

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "SIGFOX".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

NEC INSULATOR COLOR CODE

DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED-POLARITY MARK AT TERMINATION
VDC NEG	-	*BLACK-POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

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BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: **CT8611**

BU #: 803843
CT NEW BRITAIN 4 CAC 803843

200 STANLEY STREET
NEW BRITAIN, CT 06053

EXISTING 193'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/05/18	JJW	PRELIMINARY	KK
B	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by: Justine Linette
18400582547...
STATE OF CONNECTICUT
JUSTIN LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 | 6:32:17 AM EDT

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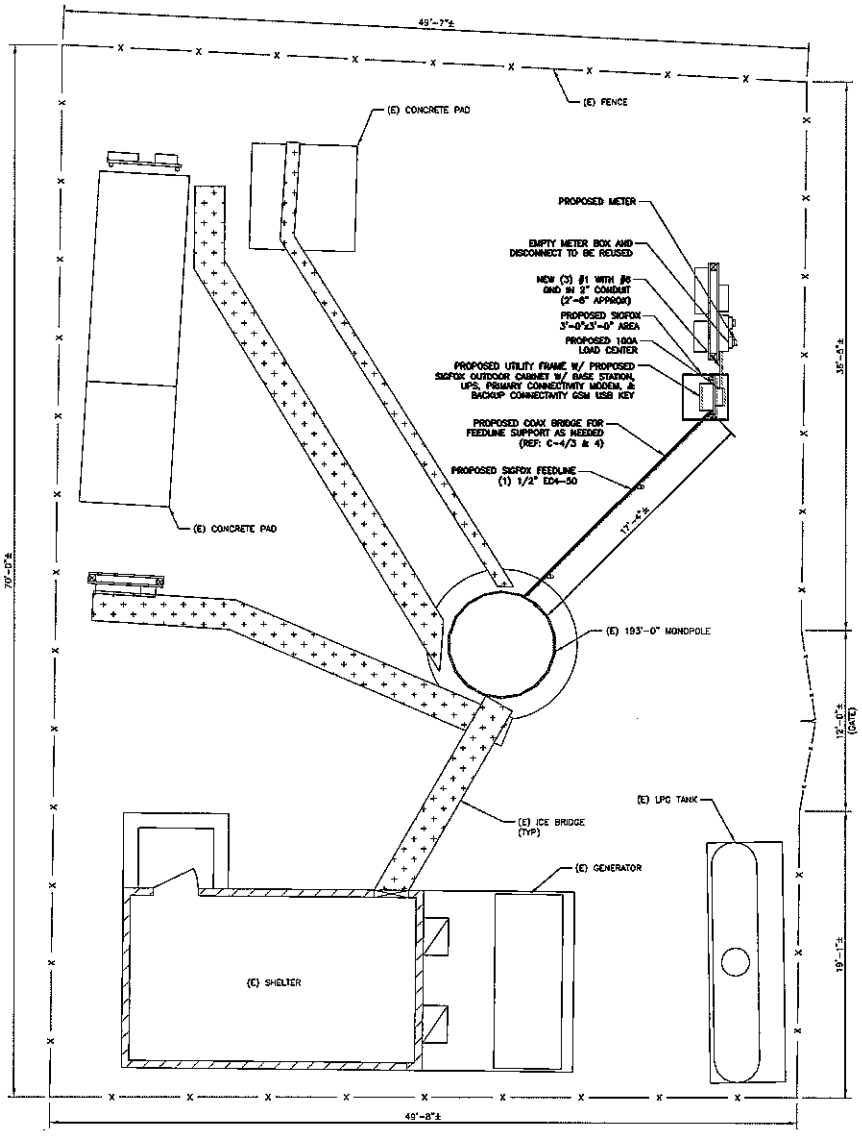
SHEET NUMBER: **T-2**
REVISION: **0**



1 OVERALL SITE PLAN
SCALE: 4 3 2 1 0 4' 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

N

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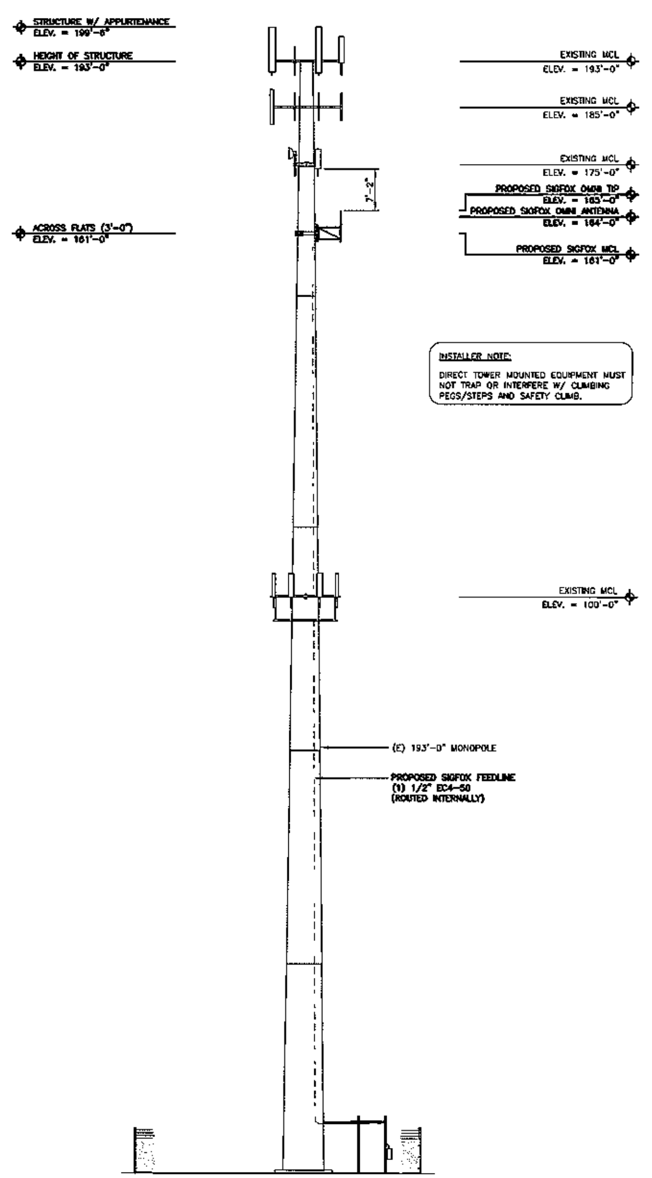
SHEET NUMBER: C-1
REVISION: 0



1 FINAL ELEVATION
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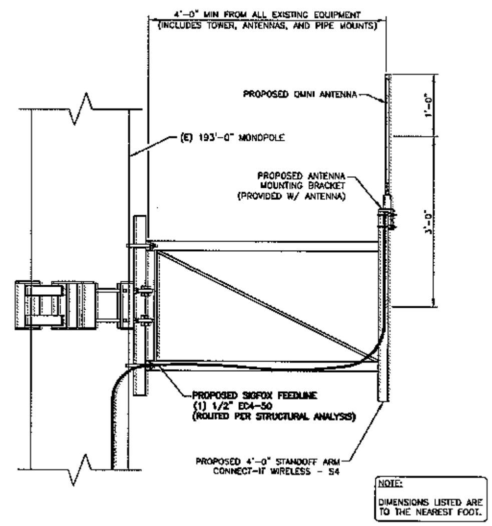

2 TYPICAL MOUNTING DETAIL
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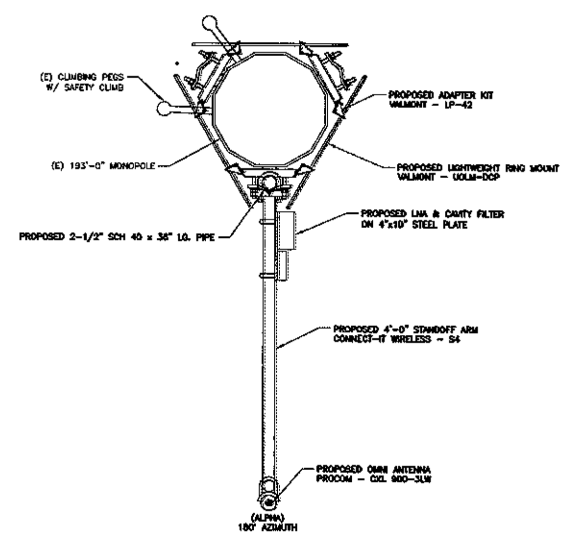

3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by:
Justin Linette
STATE OF CONNECTICUT
JUSTIN PERRY LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER
3/27/2018 | 10:57 AM EDT

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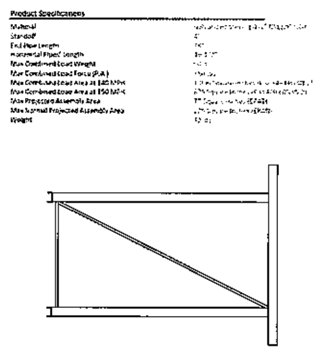
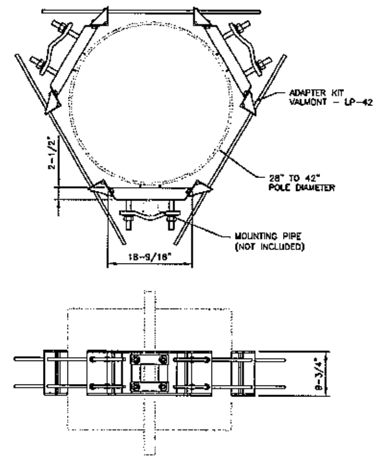
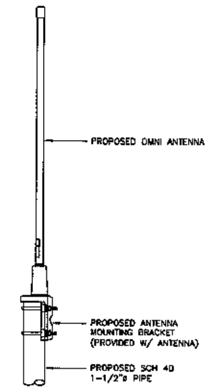


1 CONNECT–IT WIRELESS STANDOFF ARM
SCALE: NOT TO SCALE



2 VALMONT – UGLM–DCP
SCALE: NOT TO SCALE

SPECIFICATIONS	
MODEL	CXL 900–3LW
RADIATION	OMNIDIRECTIONAL
FREQUENCY	824–960 MHz
TOTAL HEIGHT	27.5"
DIA. AT TOP	0.47"
DIA. AT END	0.63"
WEIGHT	1.5 LBS



3 PROCOM – CXL 900–3LW
SCALE: NOT TO SCALE

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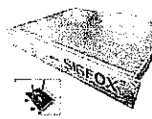
SIGFOX SBS-T-902



SIGFOX SBS-T-902 series are ultra wide range, high linearity transceivers and feature first class performance radio and innovative software defined processing, for use in Ultra Narrow Band Machine-To-Machine wireless communication systems. SBS-T-902 variant is targeting M2M applications compliant with FCC regulations. It operates in the band 902-928 MHz. SIGFOX TAP series are indoor units with aluminum chassis suitable for wall mount, rack mount or desktop installations.

Key Features

ABOUT SIGFOX TECHNOLOGY

SIGFOX is the first and only operator of a cellular network fully dedicated to low-throughput communication for connected objects. With an extremely cost effective and very low energy consuming out-of-the-box connectivity offer, SIGFOX brings a revolution to the world of Internet of Things and M2M. The network, which already connects tens of thousands of objects, is being rolled out worldwide.

4 SIGFOX – SBS–T–902
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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B	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by: Justin Lynette
STATE OF CONNECTICUT
JUSTIN PETER LYNETTE
No. 31966
LICENSED PROFESSIONAL ENGINEER
3/27/2018 | 9:17 AM EDT

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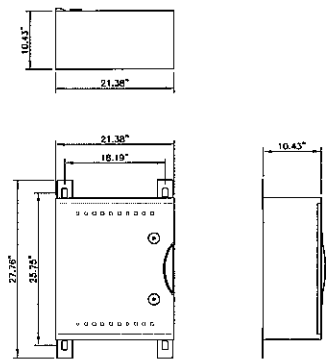
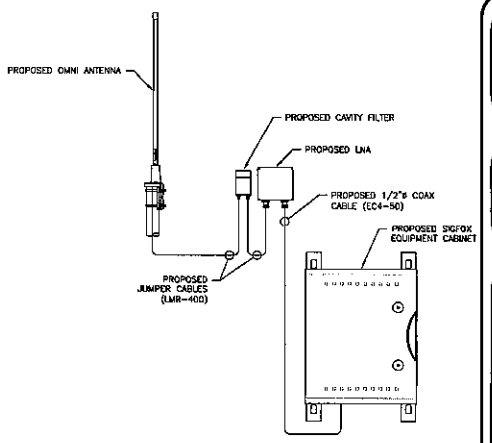
SHEET NUMBER: C-3
REVISION: 0

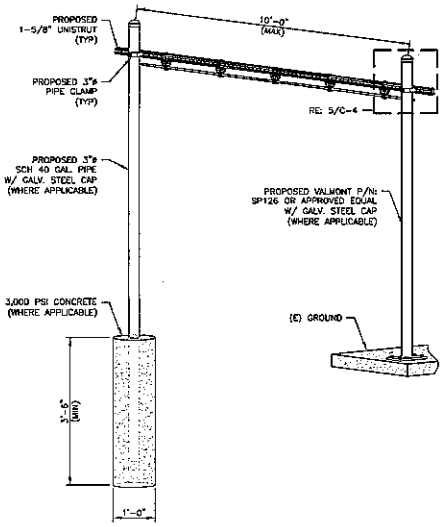


1 EQUIPMENT CABINET DETAIL
SCALE: NOT TO SCALE

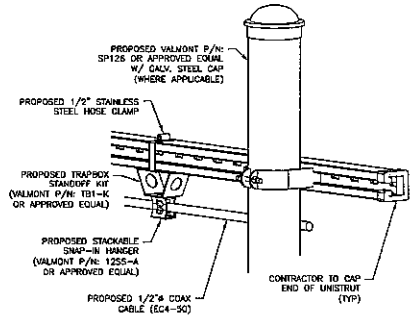
2 NOT USED
SCALE: NOT TO SCALE



3 EQUIPMENT DIAGRAM
SCALE: NOT TO SCALE



4 COAX BRIDGE DETAIL
SCALE: NOT TO SCALE



INSTALLER NOTE:
COAX HANGERS TO BE SPACED 18" O.C. MAX

5 CABLE TRAPEZE DETAIL
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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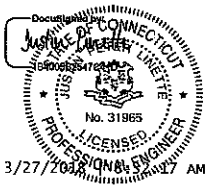
B	03/15/18	JJW	PRELIMINARY	JH
0	03/26/18	JJW	CONSTRUCTION	JL



3/27/2018 8:57 AM EDT

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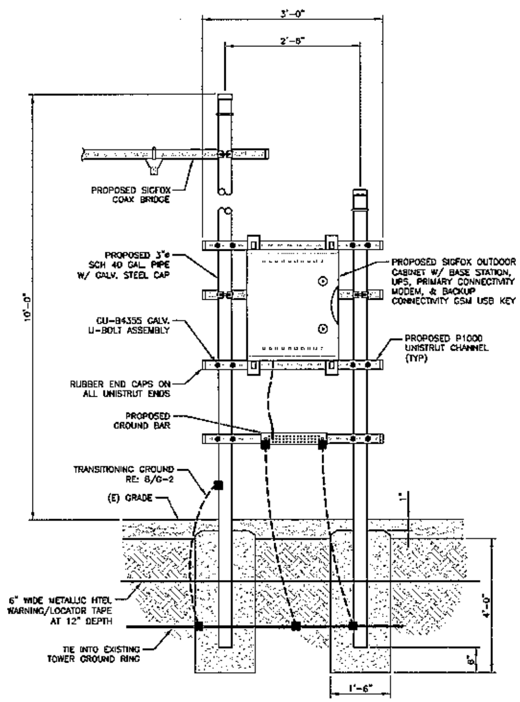
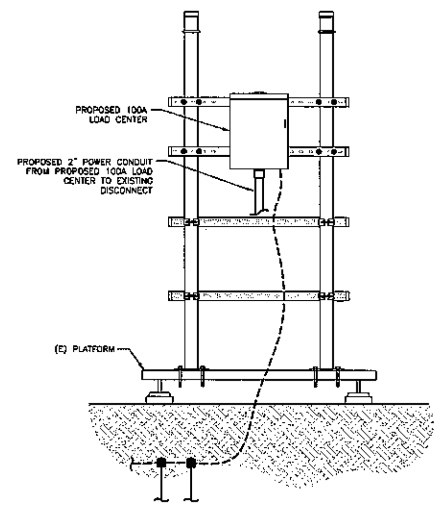
SHEET NUMBER: C-4
REVISION: 0

NOTE:
1. ALL EXPOSED ELECTRICAL CONDUIT MUST BE GALVANIZED STEEL RIGID CONDUIT.
2. THREADLESS CONNECTORS ARE NOT ALLOWED.
3. EMT CONDUIT CAN ONLY BE USED INSIDE.
4. USE ONLY COMPRESSION TYPE FITTINGS ON EMT CONDUIT.
5. USE ONLY STRANDED CONDUCTORS FOR ALL ELECTRICAL WIRING. (EXCEPT TELCO AND THERMOSTAT)
6. USE SCHEDULE 80 CONDUIT UNDER DRIVEWAYS AND/OR ANY VEHICLE CROSSING AREA.



1 UTILITY FRAME ELEVATION (FRONT)
SCALE: NOT TO SCALE



2 UTILITY FRAME ELEVATION (BACK)
SCALE: NOT TO SCALE

SIGFOX
One network A billion dreams
BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: CT8611

BU #: 803843
CT NEW BRITAIN 4 CAC
803843

200 STANLEY STREET
NEW BRITAIN, CT 06053

EXISTING 193'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/05/18	JJW	PRELIMINARY	KK
B	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by:
Justin Lynette
1E40098B2647C424...
STATE OF CONNECTICUT
JUSTIN WAYNE LYNETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER
3/27/2018 | 8:55:17 AM EDT

Crown Castle USA Inc. Certificate of Registration #PEC.0001101

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SHEET NUMBER: C-5
REVISION: 0

ANTENNA AND FEEDER

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
ANTENNA	OMNIDIRECTIONAL ANTENNA (2.1M HIGH MAX)	–	SIGFOX	1
ANTENNA MOUNTING SUPPORT	RING MOUNT (VALMONT UGLM-DCP) ADAPTER KIT (VALMONT LP-42) STANDOFF ARM (CONNECT-IT S4) 2-1/2" SCH 40 x 36" LG. PIPE	–	CROWN CASTLE	1
LOW NOISE AMPLIFIER	SIGFOX PREAMP 868	–	SIGFOX	1
LNA V2 MOUNTING PLATE	4"x10" STEEL PLATE	–	CROWN CASTLE	1
FEEDER CABLE	1/2" COAXIAL CABLE (< 262'-0") 7/8" COAXIAL CABLE (> 262'-0")	2	CROWN CASTLE	1
	JUMPER CABLE LMR400 : ANT<->LNA (L=1.5M MAX) CONNECTOR NMALE/NFEMALE	1	CROWN CASTLE	1
	JUMPER CABLE LMR400 : LNA<->FEEDER (L=1.5M MAX) CONNECTOR NMALE/NFEMALE	7	CROWN CASTLE	1
	JUMPER CABLE LMR400 : FEEDER<->TAP (L=1.5M MAX) CONNECTOR NMALE/NFEMALE	8	CROWN CASTLE	1 OR 2
COAX BRIDGE	SEE PAGE C-4/ 4 & 5	–	CROWN CASTLE	TBD
CONNECTOR	NMALE FEEDER CONNECTOR	–	CROWN CASTLE	2
SURGE SUPPRESSOR	TELEGARTNER 90V J01028A0034	–	SIGFOX	1
GROUNDING KIT FOR FEEDER	CLICK-ON COAX GROUNDING KIT (SABRE INDUSTRIES C20-114-001)	–	CROWN CASTLE	1
BARREL CUSHION	VALMONT BCU12X FOR 1/2" COAX VALMONT BCU78X FOR 7/8" COAX	–	CROWN CASTLE	TBD
BUTTERFLY HANGER	VALMONT BUG12 FOR 1/2" COAX VALMONT BUG78 FOR 7/8" COAX	–	CROWN CASTLE	TBD
HOISTING GRIP	VALMONT GRIP12 FOR 1/2" COAX VALMONT GRIP78 FOR 7/8" COAX	–	CROWN CASTLE	1
ANGLE ADAPTER	GALVANIZED 3/8" ANGLE ADAPTERS (VALMONT GAP38)	–	CROWN CASTLE	TBD

BASE STATION

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
TAP	TAP-868 V2	–	SIGFOX	1

INTERNET CONNECTION

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
MODEM	ADSL MODEM + POWER CABLE	–	SIGFOX	TO BE CONFIRMED
ETHERNET CABLE	CABLE RJ45 1M	3	SIGFOX	1
USB 3G KEY	3G KEY SIGFOX APPROVED MODEL : HUAWEI E352/K3806	–	SIGFOX	1
	STANDARD M2M SIM CARD WITHOUT PIN CODE NEITHER PASSWORD	–	SIGFOX	1
	USB CABLE – 50CM	5	SIGFOX	1

ELECTRICAL PANEL

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
100A, 12 SPACE LOAD CENER	SQUARE D PART NO. QO112M100RB	–	CROWN CASTLE	1
20A, 2-POLE BREAKER	BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING BREAKERS	–	CROWN CASTLE	1
#12 STRANDED COPPER WIRE	INSULATED ELECTRICAL CONDUCTORS TYPE THWN-2 OR XHHW-2 (90° C)	–	CROWN CASTLE	TBD
3/4" CONDUIT AND FITTINGS	ELECTRICAL METALLIC TUBING (EMT)	–	CROWN CASTLE	1

POWER SUPPLY

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
BASE STATION POWER CABLE	POWER CABLE (PLUG TO FEM) TO TAP	11-1	SIGFOX	1

UTILITY FRAME

COMPONENT	DESCRIPTION	INDEX	SUPPLIER	QUANTITY
UNISTRUTS	3'-0" LONG UNISTRUTS W/ RUBBER END CAPS ON ALL UNISTRUT ENDS	–	CROWN CASTLE	3
U-BOLTS	GU-B4355 GALV. U-BOLT ASSEMBLY	–	CROWN CASTLE	6
3"ø SCH 40 PIPE 10'-0" ABOVE GRADE	GALV. PIPE W/ GALV. STEEL CAP (TYP)	–	CROWN CASTLE	2

(1) BILL OF MATERIALS
SCALE: NOT TO SCALE

SIGFOX
One network A billion dreams
BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: CT8611

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0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by: Justin Linette
STATE OF CONNECTICUT
JUSTIN E. LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 | 8:52:17 AM EDT

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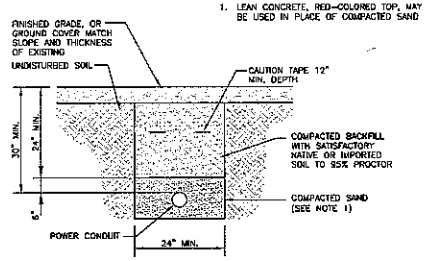
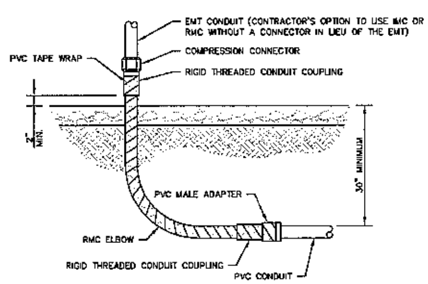
SHEET NUMBER: C-6
REVISION: 0

NOTES:

1. LEAN CONCRETE, RED-COLORED TOP, MAY BE USED IN PLACE OF COMPACTED SAND

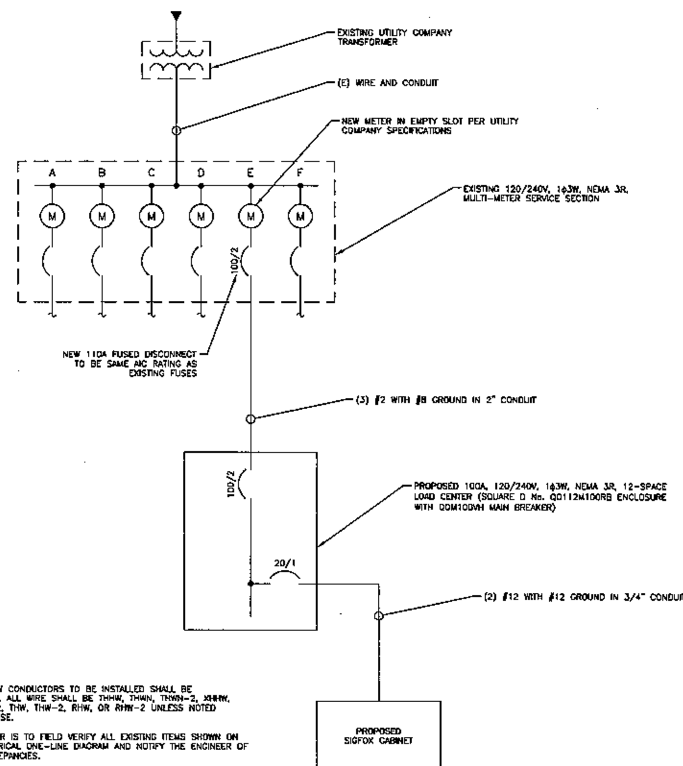


① TYP TRENCH DETAIL
SCALE: NOT TO SCALE



ALL METAL CONDUIT INSTALLED IN DIRECT CONTACT WITH THE EARTH SHALL BE CONSIDERED TO BE INSTALLED IN A SEVERELY CORROSIVE ENVIRONMENT AND IS REQUIRED TO HAVE SUPPLEMENTAL PROTECTION AGAINST CORROSION (NEC ARTICLE 342.10(B) & 344.10(B)(1)). THIS PROTECTION SHALL EITHER BE AN APPROVED MANUFACTURER INSTALLED PROTECTIVE COATING ON THE CONDUIT OR SHALL BE (2) LAYERS OF 10 MIL PVC PIPE WRAP TAPE INSTALLED USING OPPOSING SPIRAL WRAPS. ON VERTICAL PIPE THE OUTSIDE LAYER OF TAPE SHALL BE WRAPPED SO AS TO PROVIDE SHEDDING OF WATER (i.e. TAPE SHOULD WRAP IN AN UPWARD DIRECTION WITH LOWER WRAP BEING BENEATH THE WRAP ABOVE). SPIRAL WRAPS SHALL HAVE A MINIMUM OF 1/4" OVERLAP WITH THE PRECEDING TAPE WRAP. ANY OTHER METHODS OF CORROSION PROTECTION SHALL REQUIRE APPROVAL BY THE ENGINEER OF RECORD PRIOR TO BEING USED.

② CONDUIT STUB UP DETAIL
SCALE: NOT TO SCALE



NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL WIRE SHALL BE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.
4. ELECTRICAL UTILITY ACCOUNT WILL BE IN CROWN CASTLE'S NAME.

③ ONE LINE DIAGRAM
SCALE: NOT TO SCALE

SIGFOX
One network A billion dreams
BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: **CT8611**

BU #: 803843
CT NEW BRITAIN 4 CAC
803843

200 STANLEY STREET
NEW BRITAIN, CT 06053

EXISTING 193'-0" MONOPOLE

ISSUED FOR:

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A	03/05/18	JJW	PRELIMINARY	KC
0	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by: [signature]
STATE OF CONNECTICUT
JUSTIN LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 | 8:53:17 AM EDT

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SHEET NUMBER: E-1
REVISION: 0

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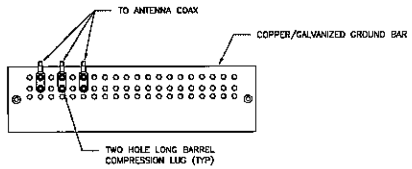
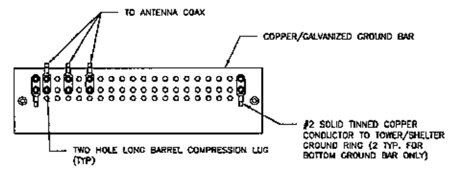


NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

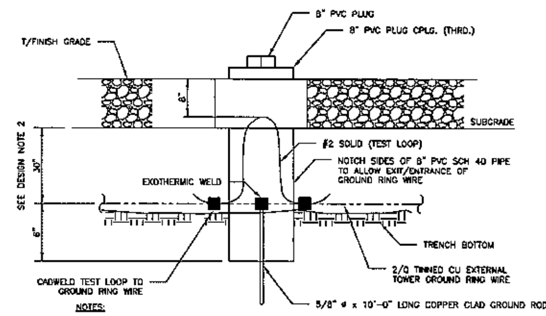
(1) ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

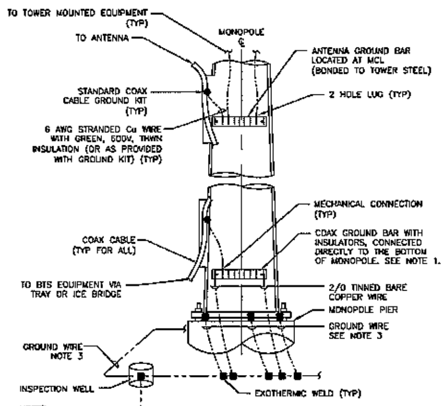
(2) TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

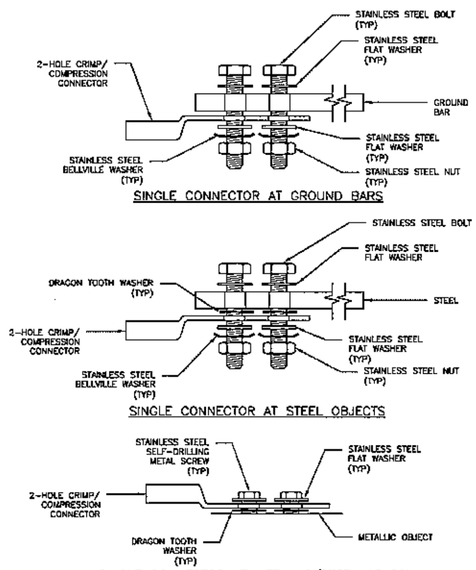
(3) INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



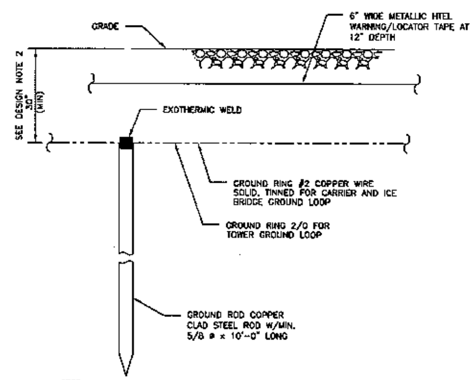
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

(4) TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



(5) HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

(6) GROUND ROD DETAIL
SCALE: NOT TO SCALE

SIGFOX
One network A billion dreams
BOYLSTON ST. 10TH FLOOR
BOSTON, MA 02116

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

SIGFOX SITE NUMBER: **CT8611**

BU #: **803843**
CT NEW BRITAIN 4 CAC
803843

200 STANLEY STREET
NEW BRITAIN, CT 06053

EXISTING 193'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/05/18	JJW	PRELIMINARY	KK
B	03/15/18	JJW	PRELIMINARY	JM
0	03/26/18	JJW	CONSTRUCTION	JL

DocuSigned by: Justin Linette
STATE OF CONNECTICUT
JUSTIN P. LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 | 11:57 AM EDT

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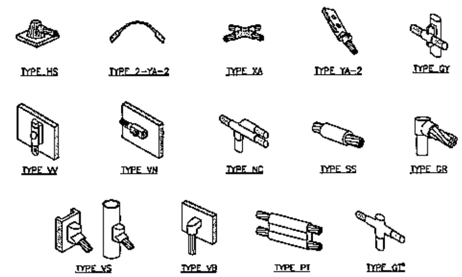
SHEET NUMBER: G-1
REVISION: 0

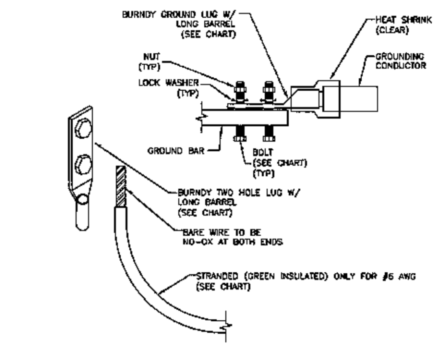


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

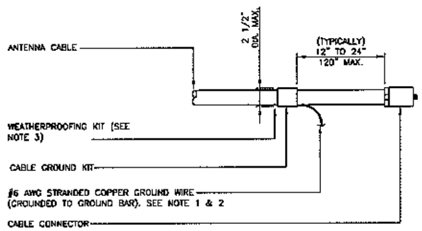
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

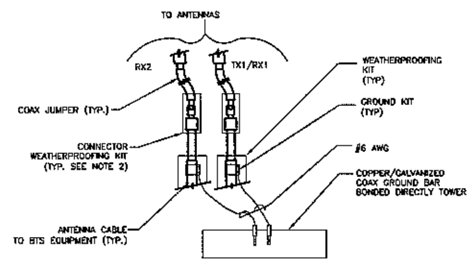
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

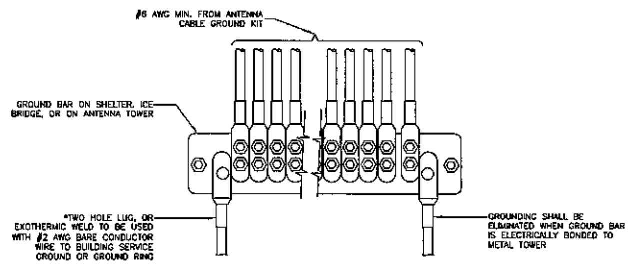
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



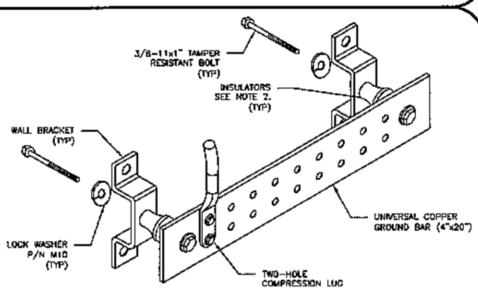
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



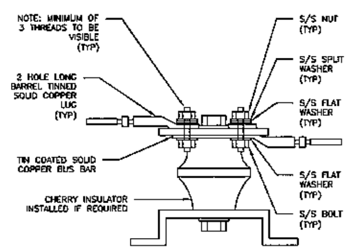
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



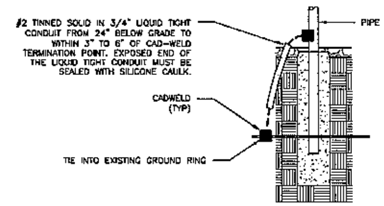
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

SIGFOX
One network A billion dreams
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DocuSigned by: Justin Linette
STATE OF CONNECTICUT
JUSTIN LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER
3/27/2018 AM EDT

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SHEET NUMBER: G-2
REVISION: 0

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In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
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Signing Complete	Security Checked	3/27/2018 | 8:32:17 AM
Completed	Security Checked	3/27/2018 | 8:32:17 AM

Payment Events	Status	Timestamps

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ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

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Date: **May 02, 2018**

Cheryl Schultz
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:	***SIGFOX SA* Co-Locate**	
	Carrier Site Number:	CT8611
Crown Castle Designation:	**Crown Castle BU Number:**	803843
	Crown Castle Site Name:	CT NEW BRITAIN 4 CAC 803843
	Crown Castle JDE Job Number:	506311
	Crown Castle Work Order Number:	1565667
	Crown Castle Order Number:	441630 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1565667
Site Data:	**200 Stanley Street, New Britain, Hartford County, CT** **Latitude *41° 39' 16.4"*, Longitude *-72° 46' 9.59"*** **192 Foot - Monopole Tower**	

Dear Cheryl Schultz,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1565667, in accordance with order 441630, revision 1.

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

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

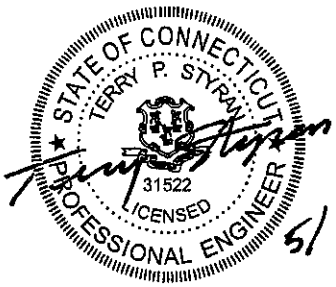
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception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

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

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

Structural analysis prepared by: Emma McCarty / RTC

Respectfully submitted by:



5/2/2018

Terry P. Styran, P.E.
Senior Project Engineer

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 192 ft Monopole tower designed by Summit in April of 2001. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1-inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
161.0	164.0	1	sigfox	CXL 900-3LW	1	1/2	-
	161.0	1	sigfox	CAVITY FILTER			
		1	sigfox	LNA			
		1	tower mounts	Side Arm Mount [SO 306-1]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
197.0	197.0	1	tower mounts	Miscellaneous [NA 509-3]	6 4 1 2	1-5/8 3/4 3/8 conduit	1
		1	tower mounts	Miscellaneous [NA 510-1]			
		1	tower mounts	Platform Mount [LP 1201-1]			
	195.0	3	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	ericsson	RRUS-11			
		3	kathrein	800 10121 w/ Mount Pipe			
		2	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe	1 4 2	3/8 3/4 conduit	2
		3	ericsson	RRUS 12			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B66			
		3	ericsson	RRUS 4478 B14			
		3	ericsson	RRUS E2 B29			
		1	kathrein	80010965 w/ Mount Pipe			
		2	kathrein	80010966 w/ Mount Pipe			
		6	kathrein	860 10025			
		1	quintel technology	QS66512-2 w/ Mount Pipe			
		2	raycap	DC6-48-60-0-8F			
	193.0	6	powerwave technologies	LGP21401	-	-	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		2	ericsson	RRUS-11			
		1	raycap	DC6-48-60-18-8F			
186.0	188.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
	186.0	1	tower mounts	Platform Mount [LP 1201-1]			
175.0	179.0	1	andrew	PX2F-52	3 3 1 3 2	5/8 1/2 5/16 1/4 conduit	1
		2	andrew	VHLP2-23			
		2	dragonwave	HORIZON COMPACT			
	178.0	3	argus technologies	LLPX310R w/ Mount Pipe			
	175.0	1	motorola	TIMING 2000			
		1	tower mounts	Side Arm Mount [SO 101-3]			
	172.0	3	samsung telecommunications	RRH-2WB			
103.0	104.0	1	andrew	LNX-6512DS-T4M w/ Mount Pipe	13	1-5/8	1
		1	antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe			
		1	antel	BXA-70063-6CF-EDIN-6 w/ Mount Pipe			
		2	antel	BXA-80080/4CF w/ Mount Pipe			
		1	antel	BXA-80090/4CF w/ Mount Pipe			
	103.0	6	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	tower mounts	Pipe Mount [PM 501-3]			
		1	tower mounts	T-Arm Mount [TA 602-3]			
	102.0	3	alcatel lucent	B13 RRH 4X30			
		3	alcatel lucent	B4 RRH2X60-4R			
	100.0	1	raycap	RRFDC-3315-PF-48			
		6	rfs celwave	FD9R6004/2C-3L			

Notes:
1) Existing equipment
2) Reserved equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
192	192	generic	Panel Antennas (CaAa = 75 sq. ft. total)	-	-
185	185	generic	Panel Antennas (CaAa = 75 sq. ft. total)	-	-
175	175	generic	Panel Antennas (CaAa = 75 sq. ft. total)	-	-
165	165	generic	Microwave w/ Mount (CaAa = 110 sq. ft.)	-	-
155	155	generic	Panel Antennas (CaAa = 75 sq. ft. total)	-	-

Mounting Level (ft)	Center Line Elevation (ft)	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145	145	generic	Panel Antennas (CaAa = 75 sq. ft. total)	-	-
135	135	generic	Microwave w/ Mount (CaAa = 110 sq. ft.)	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	2384583	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1118798	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	925033	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	192 - 151.25	Pole	TP39.245x26x0.3125	1	-15.3824	2616.0300	29.1	Pass
L2	151.25 - 111.25	Pole	TP51.621x36.9948x0.4375	2	-27.0722	4908.9300	27.4	Pass
L3	111.25 - 72.75	Pole	TP63.259x48.6333x0.5	3	-46.3224	6732.8200	28.4	Pass
L4	72.75 - 35.75	Pole	TP74.285x59.6589x0.5625	4	-68.4410	8776.6300	27.9	Pass
L5	35.75 - 0	Pole	TP84.78x70.1535x0.5625	5	-101.1580	9779.9500	31.3	Pass
							Summary	
						Pole (L5)	31.3	Pass
						Rating =	31.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	45.3	Pass
1	Base Plate	0	35.2	Pass
1,2	Drilled Pier Base Foundation (Structure)	0	37.4	Pass
1,2	Drilled Pier Base Foundation (Soil Interaction)	0	38.8	Pass
1,2	Pier and Pad Base Foundation (Structure)	0	23.8	Pass
1,2	Pier and Pad Base Foundation (Soil Interaction)	0	43.3	Pass

Structure Rating (max from all components) =	45.3%

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.

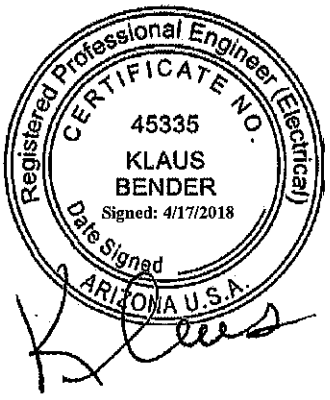
RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of SigFox

Crown Castle Site ID: 803843
Crown Castle Site Name: CT NEW BRITAIN 4 CAC 803843
Sig Fox Site Number: CT8611
Application ID: CT NEW BRITAIN 4 CAC 803843
200 Stanley Street
New Britain, CT
4/16/2018

Report Status:

SigFox Is Compliant



Klaus Bender
Registered Professional Engineer (Electrical)
Expires December 31, 2018

Prepared By:

Sitesafe, LLC

200 North Glebe Road, Suite 1000 Arlington, VA 22203 Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
New Britain, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, LLC in Arlington, Virginia; 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 Crown Castle (See attached Site Summary and Carrier documents), and that SigFox's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "CT NEW BRITAIN 4 CAC 803843" ("the site"); and

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

That in addition to the emitters specified in the worksheet, there are additional collocated point-to-point microwave facilities on this structure and, the antennas used are highly directional oriented at angles at or just below the horizontal and, that the energy present at ground level is typically so low as to be considered insignificant and have not been included in this analysis; 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 SigFox'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 SigFox operation is no more than 0.051% 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 2.161% 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 SigFox'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.

SigFox
CT NEW BRITAIN 4 CAC 803843
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.113 %
AT&T Mobility, LLC	0.131 %
AT&T Mobility, LLC	0.167 %
AT&T Mobility, LLC	0.082 %
Clearwire	0.017 %
MetroPCS	0.048 %
SigFox (Proposed)	0.051 %
Verizon Wireless	0.423 %
Verizon Wireless	1.129 %
Composite Site MPE:	2.161 %

AT&T Mobility, LLC
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.13152	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.11315	%

					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-H8	195	0	1750	0.951727	0.095173	1.116905	0.111691
CCI Antennas	OPA-65R-LCUU-H8	195	110	1750	0.951727	0.095173	1.116905	0.111691
CCI Antennas	OPA-65R-LCUU-H8	195	240	1750	0.947975	0.094797	1.116905	0.111691

AT&T Mobility, LLC
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	µW/cm^2
Maximum power density at ground level:	0.61292	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.13134	%

					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	SBNH-1D6565C	195	0	1490	0.2286	0.048986	0.41425	0.088768
ANDREW	SBNH-1D6565C	195	110	1490	0.228396	0.048942	0.41425	0.088768
ANDREW	SBNH-1D6565C	195	240	1490	0.2286	0.048986	0.41425	0.088768

AT&T Mobility, LLC
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.67211	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.16721	%

					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	800-10121	195	0	2099	0.335803	0.03358	0.767	0.0767
ANDREW	SBNH-1D6565C	195	0	2334	0.611215	0.061121	0.886403	0.08864
Kathrein	800-10121	195	110	2099	0.335803	0.03358	0.767	0.0767
ANDREW	SBNH-1D6565C	195	110	2334	0.604399	0.06044	0.886403	0.08864
Kathrein	800-10121	195	240	2099	0.335803	0.03358	0.767	0.0767
ANDREW	SBNH-1D6565C	195	240	2334	0.604399	0.06044	0.886403	0.08864

AT&T Mobility, LLC
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	0.46355	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.0818	%

					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	800-10121	195	0	1043	0.264668	0.046706	0.403605	0.071224
Kathrein	800-10121	195	110	1043	0.264668	0.046706	0.403605	0.071224
Kathrein	800-10121	195	240	1043	0.264331	0.046647	0.403605	0.071224

Clearwire
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.17036	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.01704	%

					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**
ARGUS	LLPX310R	176	30	355	0.088257	0.008826	0.160378	0.016038
ARGUS	LLPX310R	176	150	355	0.088935	0.008893	0.160378	0.016038
ARGUS	LLPX310R	176	270	355	0.088257	0.008826	0.160378	0.016038

MetroPCS
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.4777	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.04777	%

					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**
RFS	APXV18-206517S-C	185	30	2313	0.237703	0.02377	0.425255	0.042526
RFS	APXV18-206517S-C	185	150	2313	0.237851	0.023785	0.425255	0.042526
RFS	APXV18-206517S-C	185	270	2313	0.237703	0.02377	0.425255	0.042526

SigFox (Proposed)
CT NEW BRITAIN 4 CAC 803843
Carrier Summary

Frequency:	90.2	MHz
Maximum Permissible Exposure (MPE):	200	µW/cm^2
Maximum power density at ground level:	0.10229	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.05115	%

					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**
SigFox	CXL 900-3LW	164	180	61	0.102294	0.051147	0.102294	0.051147

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Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	µW/cm^2
Maximum power density at ground level:	1.97316	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.42282	%

					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	LNX-6512DS	102	30	951	1.911823	0.409676	1.965626	0.421205
ANDREW	LNX-6512DS	102	150	951	1.913602	0.410058	1.965626	0.421205
ANDREW	LNX-6512DS	102	270	951	1.913602	0.410057	1.965626	0.421205

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Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	6.39485	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	1.1285	%

					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**
RFS	APL868013	102	30	1560	1.703592	0.300634	2.119391	0.37401
Antel	BXA-80080-4CF	102	30	1268	1.218719	0.215068	1.99626	0.352281
RFS	APL868013	102	30	1560	1.703592	0.300634	2.119391	0.37401
RFS	APL868013	102	150	1560	1.703592	0.300634	2.119391	0.37401
Antel	BXA-80080-4CF	102	150	1268	1.219596	0.215223	1.99626	0.352281
RFS	APL868013	102	150	1560	1.703592	0.300634	2.119391	0.37401
RFS	APL868013	102	270	1560	1.703592	0.300634	2.119391	0.37401
Antel	BXA-80080-4CF	102	270	1268	1.218719	0.215068	1.99626	0.352281
RFS	APL868013	102	270	1560	1.703592	0.300634	2.119391	0.37401