Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

June 2, 2017

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

RE: **Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 876353**
T-Mobile Site ID: CT11216B
Located at: 352 S. Main Street, Newtown, CT 06482
Latitude: 41° 21' 20.64"/Longitude: -73° 15' 47.57"

Dear Ms. Bachman,

T-Mobile currently maintains three (3) antennas at the 135-foot level of the existing 150-foot monopole tower located at 352 S. Main Street, Newtown, CT. The tower is owned by Crown Castle. The property is owned by Knowlton Associates LLC c/o Crown Castle. T-Mobile now intends to: add three (3) new antennas and replace the three (3) existing antennas at the same 135-foot level; add one (1) equipment cabinet on the ground; and, replace three (3) TMAs.

This facility was approved by the Town of Newtown Zoning Board of Appeals, Docket Number 96-38 on November 12, 1996. This approval included the condition(s) that:

1. A landscaping screen of evergreens, which must be properly maintained, shall be planted around the fenced area which surrounds the equipment.

This modification complies with the aforementioned condition(s).

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 First Selectman E.

Patricia Llodra for the Town of Newtown, George Benson, Director of Planning, the property owner and the tower owner.

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

2. The proposed modification 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, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Amanda Cornwall.

Sincerely,

Amanda Cornwall
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
339-205-7017
Amanda.Cornwall@crowncastle.com

Attachments:

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

cc: First Selectman E. Patricia Llodra
Newtown Municipal Center
3 Primrose Street
Newtown, CT 06470

George Benson-Director of Planning Office
Newtown Municipal Center
3 Primrose Street
Newtown, CT 06470

Crown Castle (Tower Owner)
12 Gill Street, Suite 5800
Woburn, Ma 01801

Knowlton Associates LLC (Property Owner)
c/o Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

TOWN OF NEWTOWN

ZONING BOARD OF APPEALS

DOCKET DECISION 96-38

Application of Sprint Spectrum, L. P. for a variance of Section 4.18 of the Zoning Regulations. The property is located at 352 South Main Street in the Town of Newtown in a M-5 Zone.

Having considered the documentation and testimony presented at a public hearing held on November 6, 1996, the Board voted to APPROVE the application as presented with the following stipulation:

A landscaping screen of evergreens, which must be properly maintained, shall be planted around the fenced area which surrounds the equipment.

The Board therefore APPROVES the variance with the above-stated stipulation.

The Board orders further that the effective date of this decision shall be November 15, 1996, and that a certified copy hereof shall be filed in the office of the Town Clerk of the Town of Newtown and that public notice of such filing shall be published in the November 15, 1996 issue of the Newtown Bee.

ZONING BOARD OF APPEALS OF THE TOWN OF NEWTOWN

Charles E. Annett, III, Chairman

I hereby certify that the adoption of the foregoing decision is recorded in the minutes of the Zoning Board of Appeals of the Town of Newtown in the form of a resolution, the vote of which was as follows:

Charles E. Annett....."Yes"
Richard H. Kessler....."Yes"
Timothy Cronin....."Yes"
Sally J. O'Neil....."Yes"
Alan Clavette....."Yes"

Richard H. Kessler, Secretary

November 12, 1996

Newtown, CT

TOWN HALL SOUTH • THREE MAIN STREET • NEWTOWN, CONNECTICUT 06470
TEL. (203) 270-4260 • FAX (203) 270-1528

TOWN OF NEWTOWN

ZONING BOARD OF APPEALS

DOCKET DECISION 96-39

Application of Sprint Spectrum, L. P. for a special permit as required by Section 4.18.511 of the Zoning Regulations. The property is located at 352 South Main Street in the Town of Newtown in a M-5 Zone.

Having considered the documentation and testimony presented at a public hearing held on November 6, 1996, the Board voted to APPROVE the application as presented with the following stipulation:

A landscaping screen of evergreens, which must be properly maintained, shall be planted around the fenced area which surrounds the equipment.

The Board therefore APPROVES the special permit with the above-stated stipulation.

The Board orders further that the effective date of this decision shall be November 15, 1996, and that a certified copy hereof shall be filed in the office of the Town Clerk of the Town of Newtown and that public notice of such filing shall be published in the November 15, 1996 issue of the Newtown Bee.

ZONING BOARD OF APPEALS OF THE TOWN OF NEWTOWN

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November 12, 1996

Newtown, CT

TOWN HALL SOUTH • THREE MAIN STREET • NEWTOWN, CONNECTICUT 06470
TEL. (203) 270-4260 • FAX (203) 270-1528

VOL 546 PAGE 128

NOTICE OF GRANT OF VARIANCE

SPECIAL EXCEPTION, OR SPECIAL PERMIT

7381

Pursuant to Chapter 124 (PA-75-317) of the General Statutes of the State of Connecticut, notice is hereby given that on November 6, 1996 the Zoning Board of Appeals of the Town of Newtown, Connecticut, granted or granted conditionally a variance, special exception, special permit for property located at 352 South Main Street in the Town of Newtown

DESCRIPTION OF PROPERTY (lot size) 8.73 acres

Rec'd. for Record 12-13-1996
Town Clerk of Newtown
9:20a.m.
Cynthia Kurtz Sinn

PROPERTY OWNED BY Maureen A. Julian

NATURE OF VARIANCE, SPECIAL EXCEPTION, SPECIAL PERMIT

Chapter _____ Section 4.18.511 ; Chapter _____ Section _____
Chapter _____ Section _____ ; Chapter _____ Section _____
Chapter _____ Section _____ ; Chapter _____ Section _____

ZONING REGULATIONS - TOWN OF NEWTOWN, CONNECTICUT

USE PERMITTED Construction, operation and maintenance of a monopole structure over thirty (30) feet in height.

Dated and Certified by the Zoning Board of Appeals of the Town of Newtown this 13th day of December, 1996.

BY _____
Chairman ____ Secretary ____ Clerk X

VOL 546 PAGE 119

NOTICE OF GRANT OF VARIANCE

7382

SPECIAL EXCEPTION, OR SPECIAL PERMIT

Pursuant to Chapter 124 (PA-75-317) of the General Statutes of the State of Connecticut, notice is hereby given that on November 6, 1996 the Zoning Board of Appeals of the Town of Newtown, Connecticut, granted or granted conditionally a variance, special exception, special permit for property located at 352 South Main Street in the Town of Newtown

DESCRIPTION OF PROPERTY (lot size) 8.73

Rec'd. for Record 12-13-1996
Town Clerk of Newtown
9:21 a.m.
Cynthia Curtis Sinor

PROPERTY OWNED BY Maureen A. Julian

NATURE OF VARIANCE, SPECIAL EXCEPTION, SPECIAL PERMIT

Chapter _____ Section 4.18 ; Chapter _____ Section _____
Chapter _____ Section _____ ; Chapter _____ Section _____
Chapter _____ Section _____ ; Chapter _____ Section _____

ZONING REGULATIONS - TOWN OF NEWTOWN, CONNECTICUT

USE PERMITTED Installation operation and maintenance of a monopole for the operation of communication antenna in addition to the principal industrial use on the site, concrete operations.

Dated and Certified by the Zoning Board of Appeals of the Town of Newtown this 13th day of December, 1996.

BY _____
Chairman ____ Secretary ____ Clerk X

352 SOUTH MAIN STREET

Location	352 SOUTH MAIN STREET	**M/B/L**	47/ 6/ 2/C /
Acct#	00662100C	**Owner**	KNOWLTON ASSOCIATES LLC
Assessment	$319,200	**Appraisal**	$456,000
PID	15219	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$96,000	$360,000	$456,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$67,200	$252,000	$319,200

Owner of Record

Owner	KNOWLTON ASSOCIATES LLC	**Sale Price**	$0
Co-Owner	C/O CROWN CASTLE	**Certificate**	
Address	PMB 331 4017 WASHINGTON ROAD MCMURRAY, PA 15317	**Book & Page**	935/ 12
		Sale Date	10/08/2008

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
KNOWLTON ASSOCIATES LLC	$0		935/ 12	10/08/2008

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

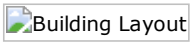
Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Grade:	

Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Extra Kitchens	
Fireplace(s)	
Extra Opening(s)	
Gas Fireplace(s)	
Blocked FPL(s)	
Woodstove(s)	
SF Fin Bsmt	
Fin Bsmt Qual	
Bsmt Garage	
Int Millwork	
Foundation	
Dormer LF	

Building Photo

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

Building Layout



Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	3920	**Size (Acres)**	0
Description	UNDEV LAND	**Frontage**	
Zone	M-5	**Depth**	
Neighborhood		**Assessed Value**	$252,000
Alt Land Appr	No	**Appraised Value**	$360,000
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CELL	Cell Tower			1 Units	$96,000	1

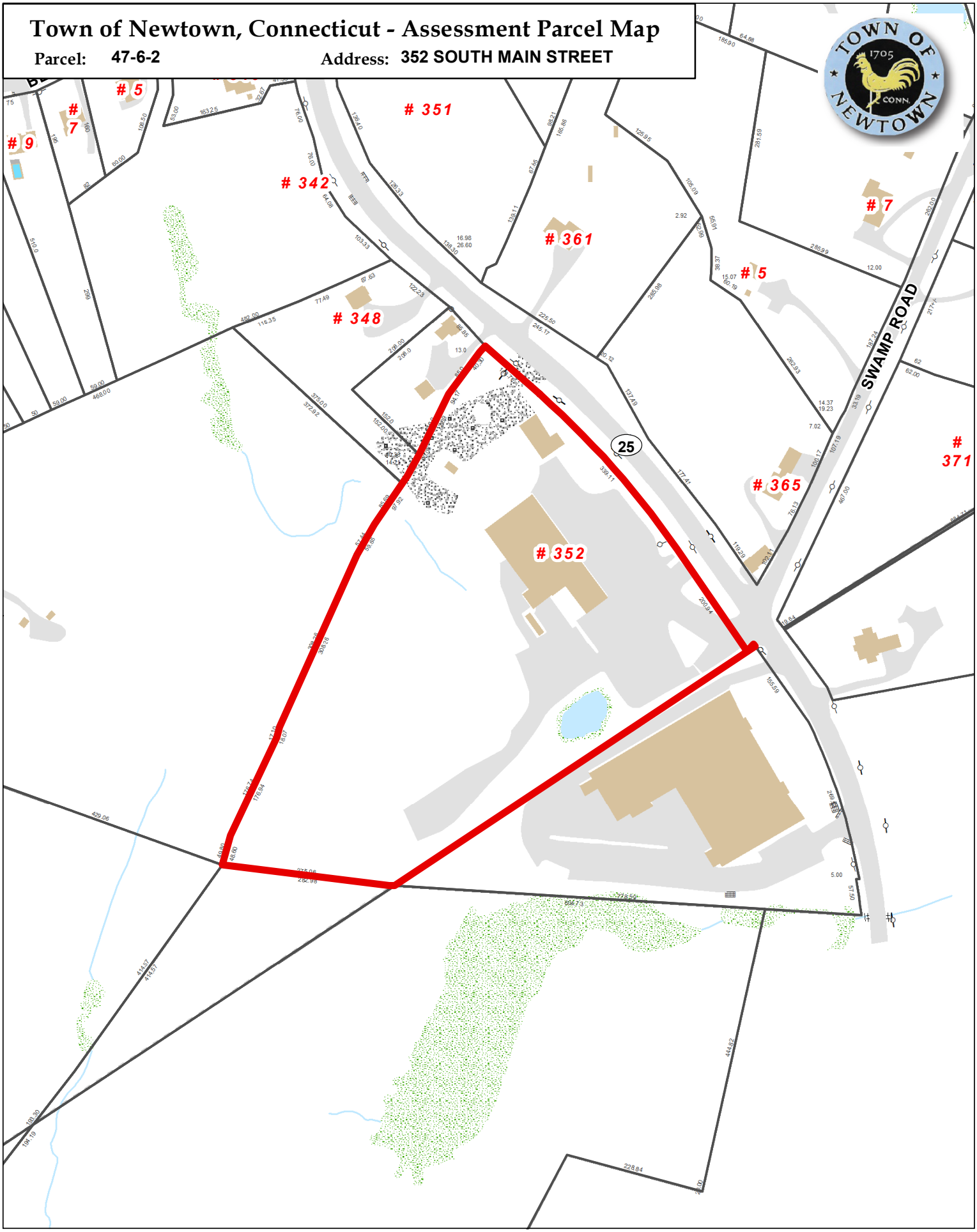
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$96,000	$360,000	$456,000
2014	$96,000	$360,000	$456,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$67,200	$252,000	$319,200
2014	$67,200	$252,000	$319,200

Town of Newtown, Connecticut - Assessment Parcel Map

Parcel: 47-6-2 **Address:** 352 SOUTH MAIN STREET



Approximate Scale:

0 50 100 150 200 Feet

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

Map Produced Oct 2016

T-Mobile

T-MOBILE SITE NUMBER: CT11216B
T-MOBILE SITE NAME: MONROE-2/RT-25
SITE TYPE: MONOPOLE
TOWER HEIGHT: 150'-0"

CROWN CASTLE BU #: 876353
SITE ADDRESS: 352 S. MAIN STREET NEWTOWN, CT 06470
COUNTY: FAIRFIELD
JURISDICTION: CONNECTICUT SITING COUNCIL

T-MOBILE L700 SITE CONFIGURATION: 704G

SITE INFORMATION

CROWN CASTLE SITE NAME:	352 S. MAIN ST, NEW TOWN, CT
SITE ADDRESS:	352 S. MAIN STREET NEWTOWN, CT 06470
COUNTY:	FAIRFIELD
MAP/PARCEL #:	NEWT-000066-002100
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 21' 20.64"
LONGITUDE:	-73° 15' 47.57"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	486 FT.
CURRENT ZONING:	M-5
JURISDICTION:	CONNECTICUT SITING COUNCIL
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	VB
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:	GLOBAL SIGNAL ACQUISITION II LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 510 VIRGINIA DRIVE, FT WASHINGTON, PA 19034
CROWN CASTLE APPLICATION ID:	372112
ELECTRIC PROVIDER:	CONNECTICUT LIGHT & POWER CO (800) 286-2000
TELCO PROVIDER:	CHARTER COMMUNICATIONS (855) 757-7328

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 TRICA PELON - PROJECT MANAGER (518) 373-3507 JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104 WILLIAM STONE - A&E PROJECT MANAGER WILLIAM.STONE@CROWNCASTLE.COM (518) 373-3543

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	ENLARGED EXISTING AND FINAL SITE PLAN
C-2	FINAL ELEVATION AND ANTENNA PLANS
C-3	ANTENNA AND CABLE SCHEDULE
C-4	EQUIPMENT SPECIFICATIONS
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	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.

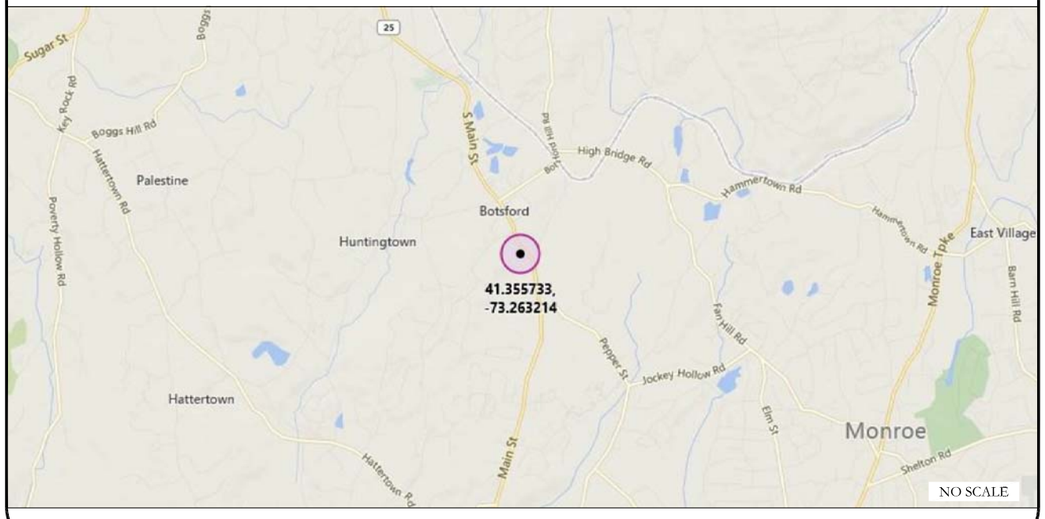
APPLICABLE CODES/REFERENCE DOCUMENTS

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 ANALYSIS: B+T GROUP DATED MAY 20, 2017 — 1
MOUNT ANALYSIS: BY OTHERS

LOCATION MAP



APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:
- REMOVE (3) ANTENNAS
- REMOVE (5) TMAs
- INSTALL (6) ANTENNAS
- INSTALL (3) TMAs

GROUND SCOPE OF WORK:
- INSTALL (1) BBU CABINET ON (E) PAD — 1

DESIGN PACKAGE BASED ON THE APPLICATION
ID: 372112
REVISION: 11

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!

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

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

T-MOBILE SITE NUMBER:
CT11216B

BU #: **876353**
352 S. MAIN ST, NEW TOWN, CT

352 S. MAIN STREET
NEWTOWN, CT 06470

EXISTING 150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	02/02/2017	DMB	PRELIMINARY	CTR
B	04/12/2017	DMB	PRELIMINARY	LMR
C	04/18/2017	DMB	PRELIMINARY	LMR
0	04/20/2017	AK	CONSTRUCTION	AJF
1	06/01/2017	DMB	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
18400B2547D41EE...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

SHEET NUMBER: T-1
REVISION: 1

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 1. 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-	T-MOBILE
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:

ES/G	SOLID GROUND BUS BAR
ES/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 "T-MOBILE".
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-POTENTAL 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)

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

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

T-MOBILE SITE NUMBER:
CT11216B

BU #: **876353**
352 S. MAIN ST, NEW TOWN, CT

352 S. MAIN STREET
NEWTOWN, CT 06470

EXISTING 150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	02/02/2017	DMB	PRELIMINARY	CTR
B	04/12/2017	DMB	PRELIMINARY	LMR
C	04/18/2017	DMB	PRELIMINARY	LMR
0	04/20/2017	AK	CONSTRUCTION	AJF
1	06/01/2017	DMB	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
184005B25473...

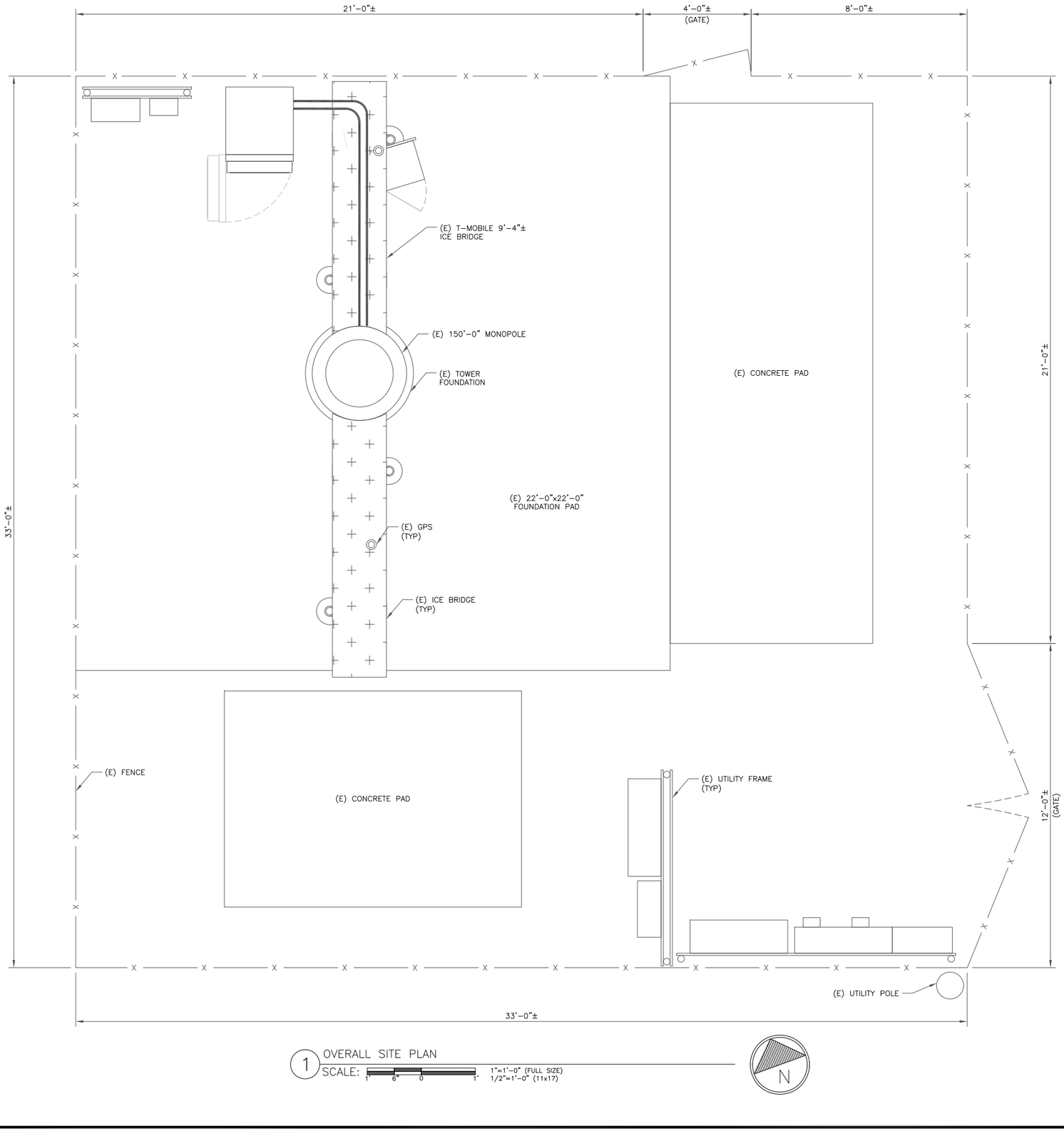
STATE OF CONNECTICUT
JUSTIN P. LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

SHEET NUMBER: T-2

REVISION: 1



1 OVERALL SITE PLAN

SCALE: 1'=1'-0" (FULL SIZE)
1/2"=1'-0" (11x17)

N

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510 VIRGINIA DRIVE,
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CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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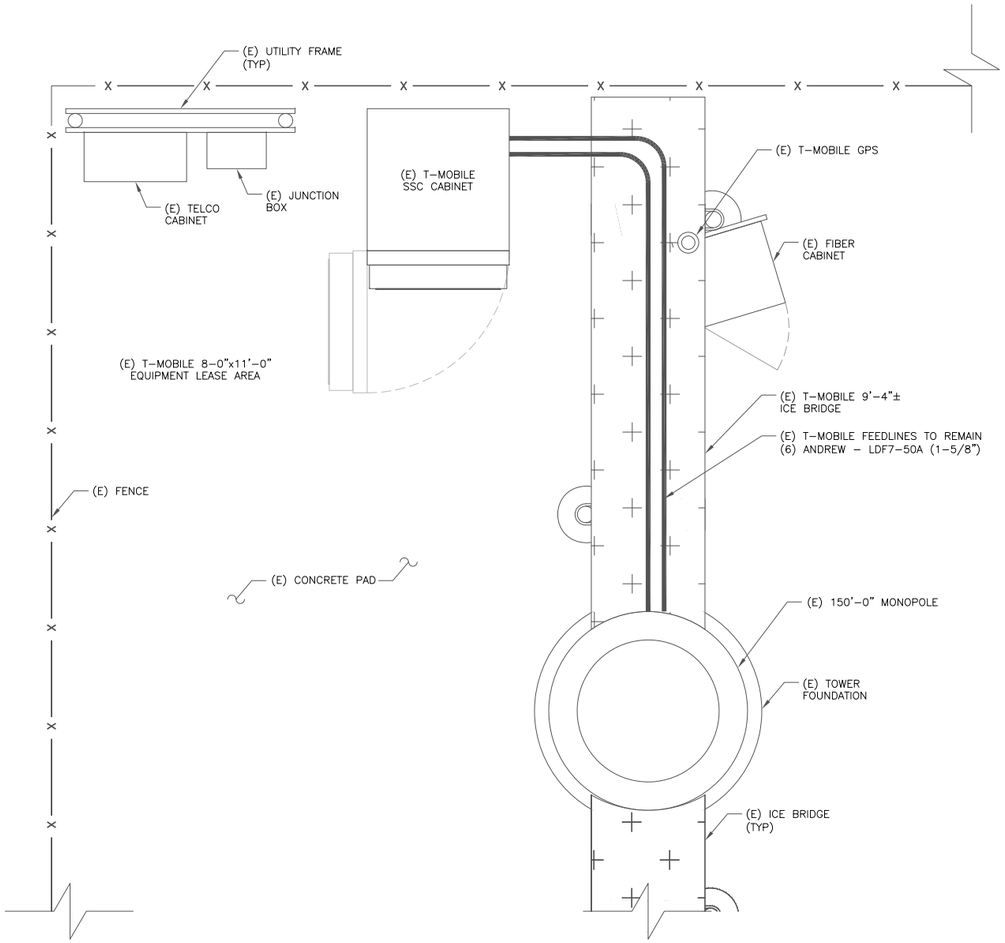
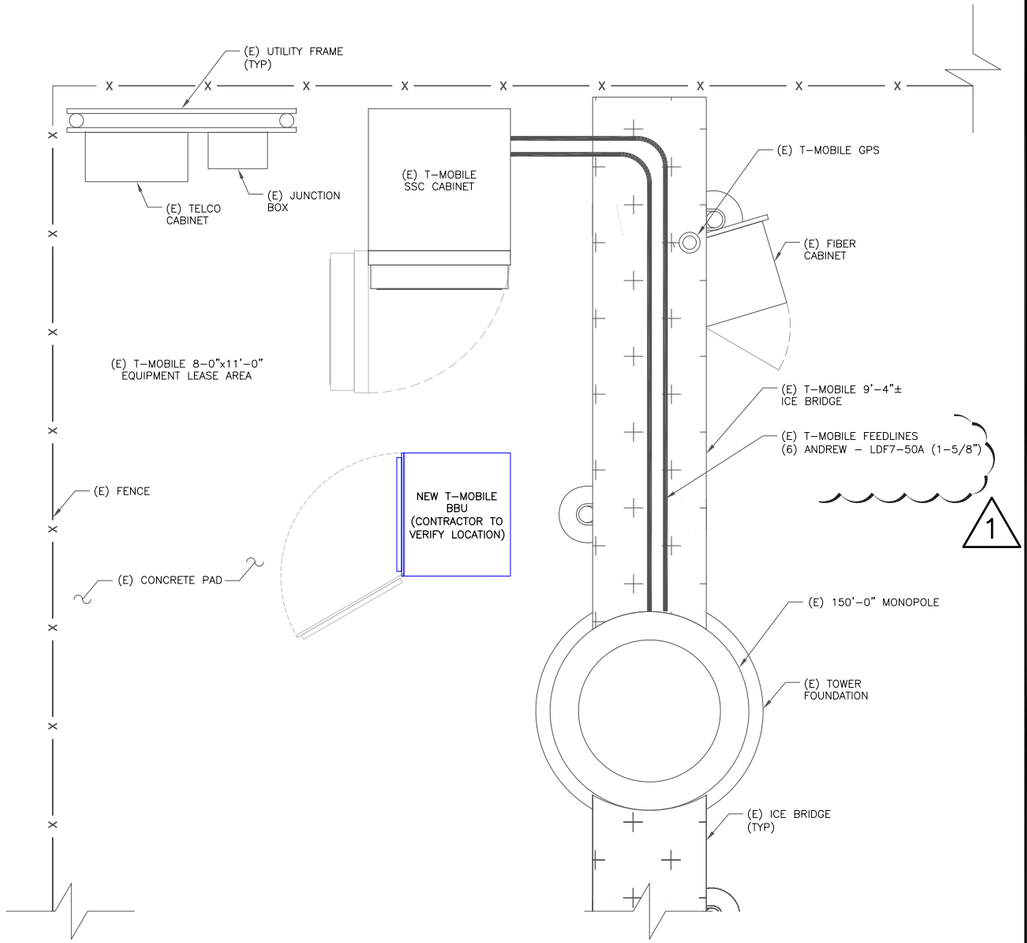
SHEET NUMBER: C-1.1

REVISION: 1



1 EXISTING ENLARGED SITE PLAN
SCALE: 0 6" 1' 1-1/2"=1'-0" (FULL SIZE) 3/4"=1'-0" (11x17)

N



2 FINAL ENLARGED SITE PLAN
SCALE: 0 6" 1' 1-1/2"=1'-0" (FULL SIZE) 3/4"=1'-0" (11x17)

N

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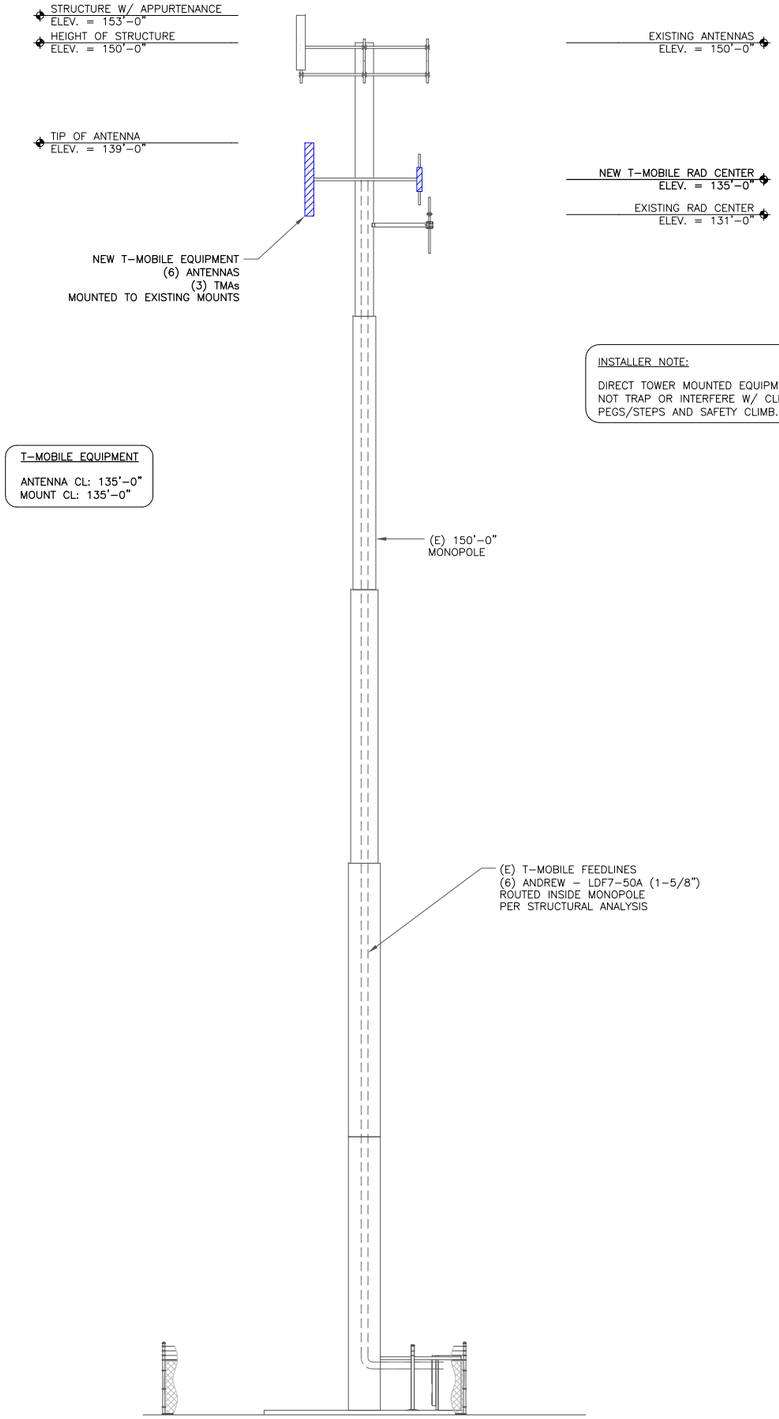
SHEET NUMBER: C-1.2
REVISION: 1



EXISTING ANTENNAS
ELEV. = 150'-0"

NEW T-MOBILE RAD CENTER
ELEV. = 135'-0"

EXISTING RAD CENTER
ELEV. = 131'-0"

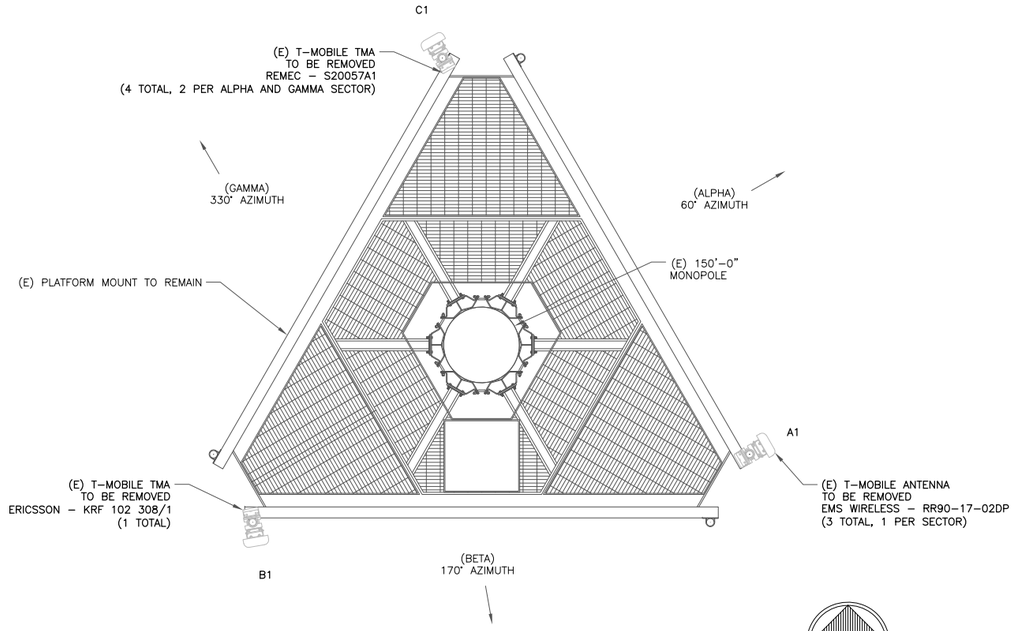
INSTALLER NOTE:

DIRECT TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ CLIMBING PEGS/STEPS AND SAFETY CLIMB.

T-MOBILE EQUIPMENT

ANTENNA CL: 135'-0"
MOUNT CL: 135'-0"

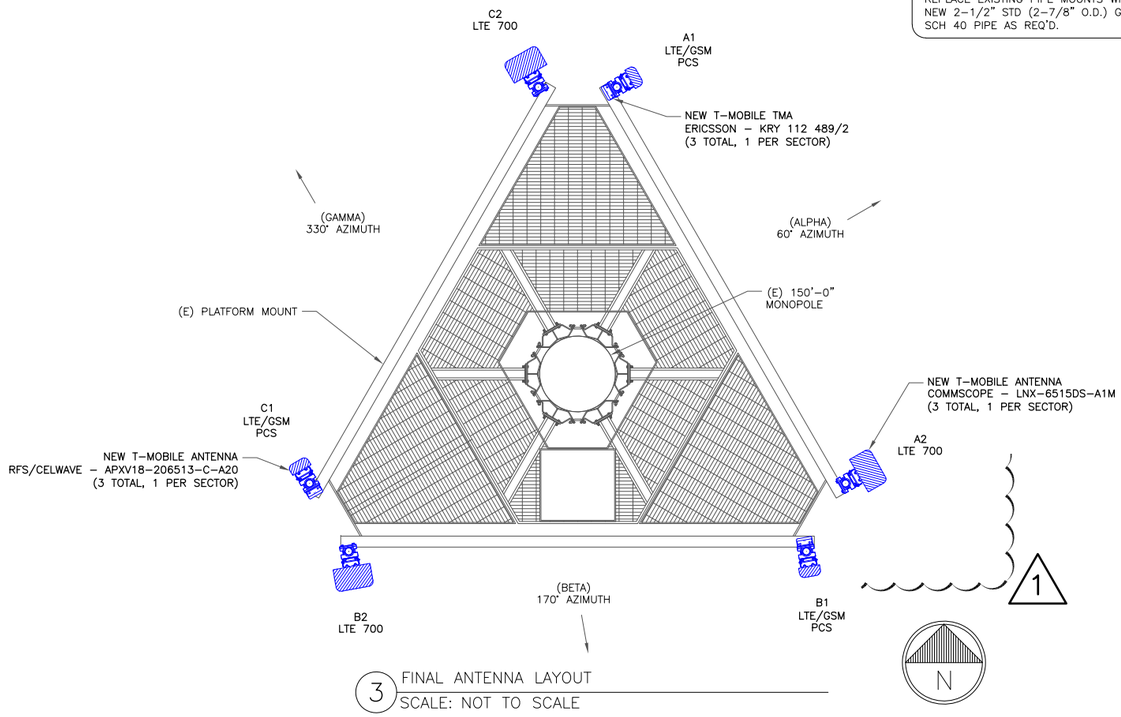
1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

INSTALLER NOTE:

REPLACE EXISTING PIPE MOUNTS WITH NEW 2-1/2" STD (2-7/8" O.D.) GALV. SCH 40 PIPE AS REQ'D.



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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6/1/2017 | 12:00:39 PM EDT

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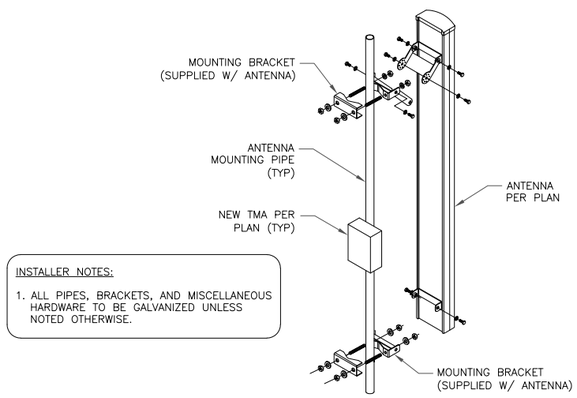
SHEET NUMBER: C-2

REVISION: 1

ANTENNA SCHEDULE									
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	LTE/GSM PCS	135'-0"	60°	RFS/CELWAVE	APXV18-206513-C-A20	0°	2°	(1) ERICSSON - KRY 112 489/2	COAX
ALPHA	A2	LTE 700	135'-0"	60°	COMMSCOPE	LNX-6515DS-A1M	0°	-	-	COAX
BETA	B1	LTE/GSM PCS	135'-0"	170°	RFS/CELWAVE	APXV18-206513-C-A20	0°	2°	(1) ERICSSON - KRY 112 489/2	COAX
BETA	B2	LTE 700	135'-0"	170°	COMMSCOPE	LNX-6515DS-A1M	0°	-	-	COAX
GAMMA	C1	LTE/GSM PCS	135'-0"	330°	RFS/CELWAVE	APXV18-206513-C-A20	0°	2°	(1) ERICSSON - KRY 112 489/2	COAX
GAMMA	C2	LTE 700	135'-0"	330°	COMMSCOPE	LNX-6515DS-A1M	0°	-	-	COAX

CABLE SCHEDULE			
STATUS	CABLE TYPE	SIZE	QUANTITY
EXISTING	COAX	1-5/8"	6
FINAL CABLE QUANTITY			6

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE



INSTALLER NOTES:

1. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.

2 MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

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

T-MOBILE SITE NUMBER:
CT11216B

BU #: **876353**
352 S. MAIN ST, NEW TOWN, CT

352 S. MAIN STREET
NEWTOWN, CT 06470

EXISTING 150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QC
A	02/02/2017	DMB	PRELIMINARY	CTR
B	04/12/2017	DMB	PRELIMINARY	LMR
C	04/18/2017	DMB	PRELIMINARY	LMR
0	04/20/2017	AK	CONSTRUCTION	AJF
1	06/01/2017	DMB	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
1B4005B2547D41E...

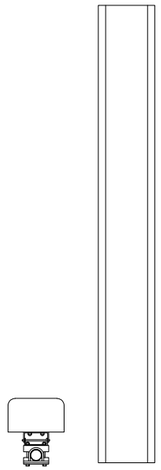
STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

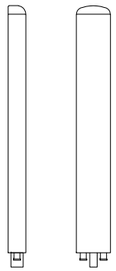
SHEET NUMBER: C-3

REVISION: 1



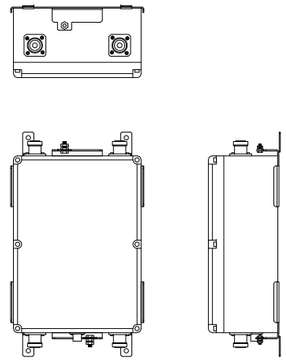
ANDREW – LNX-6515DS-A1M
WEIGHT (WITHOUT MOUNTING HARDWARE): 43.7 LBS
SIZE (HxWxD): 96.60x11.90x7.10 IN.
MOUNTING HARDWARE P/N: DB380-3 & DB5083D
RATED WIND VELOCITY: 149.8 MPH

1 ANDREW – LNX-6515DS-A1M
SCALE: NOT TO SCALE



RFS/CELWAVE – APXV18-206513-C-A20
WEIGHT (WITHOUT MOUNTING HARDWARE): 13.22 LBS
SIZE (HxWxD): 31.49x6.69x3.14 IN.
MOUNTING HARDWARE P/N: APM40-2
RATED WIND VELOCITY: 160 MPH

2 RFS/CELWAVE – APXV18-206513-C-A20
SCALE: NOT TO SCALE



ERICSSON – KRY 112 489/2
WEIGHT: 15.4 LBS
SIZE (HxWxD): 11.0x6.1x3.9 IN.

3 ERICSSON – KRY 112 489/2
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
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FT WASHINGTON, PA 19034

CROWN CASTLE
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1	06/01/2017	DMB	CONSTRUCTION	JPL

DocuSigned by:
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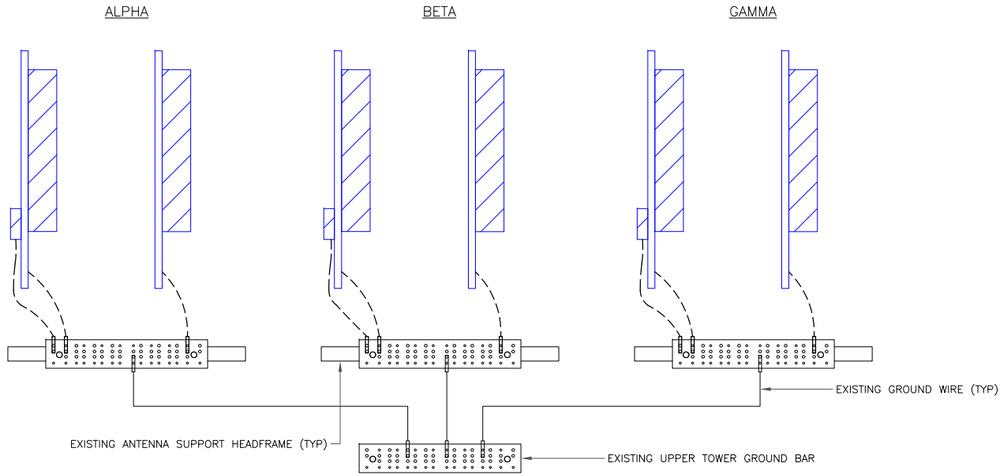
SHEET NUMBER: C-4

REVISION: 1



1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

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

T-MOBILE SITE NUMBER:
CT11216B

BU #: **876353**
352 S. MAIN ST, NEW TOWN, CT

352 S. MAIN STREET
NEWTOWN, CT 06470

EXISTING 150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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1	06/01/2017	DMB	CONSTRUCTION	JPL

DocuSigned by:
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184005B2547C41E...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
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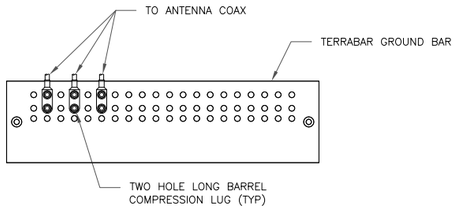
PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

SHEET NUMBER: G-1

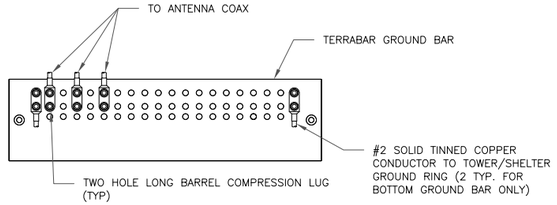
REVISION: 1



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.

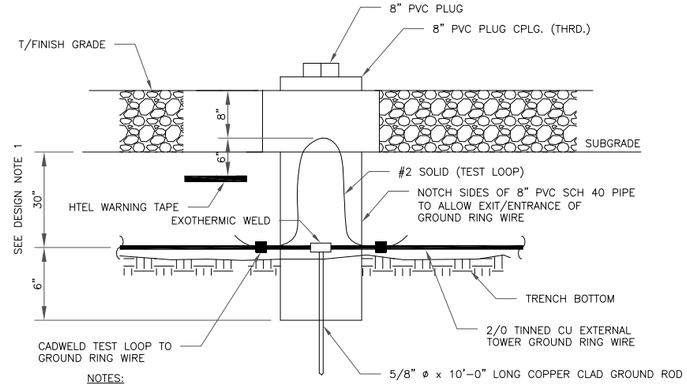
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



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. INSTALL GROUND BARS AT 75 FT. INTERVAL MAXIMUM.
4. 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 PORT 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.

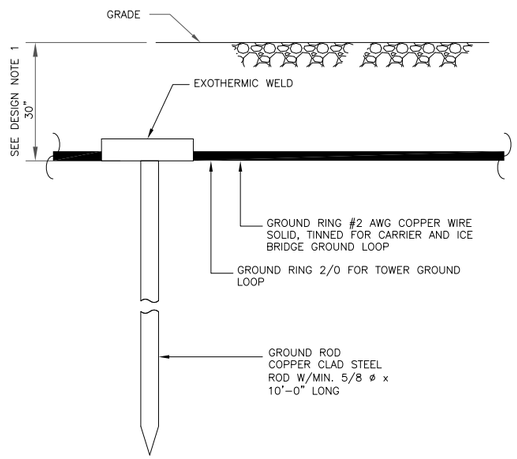
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE

SINGLE CONNECTOR AT GROUND BARS

SINGLE CONNECTOR AT STEEL OBJECTS

SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

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

T-Mobile
510 VIRGINIA DRIVE,
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CROWN CASTLE
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0	04/20/2017	AK	CONSTRUCTION	AJF
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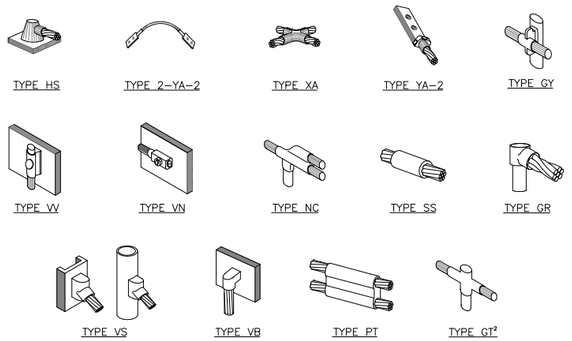
DocuSigned by:
Justin Linette
1B4005B254704DE...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

SHEET NUMBER: G-2
REVISION: 1

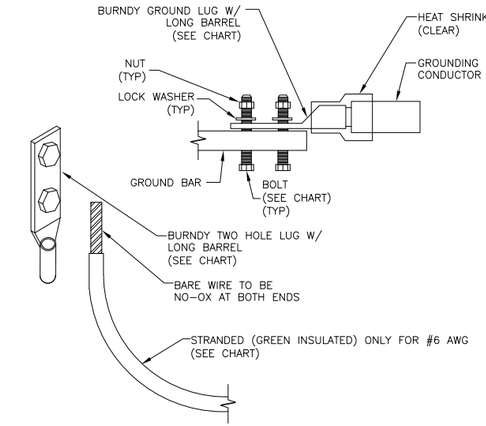


NOTE:

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

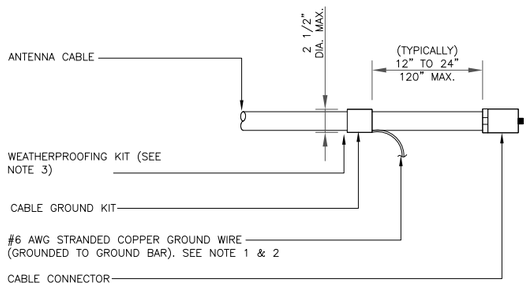
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



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.

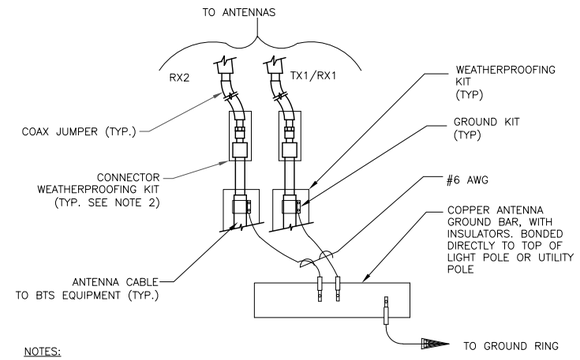
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



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.

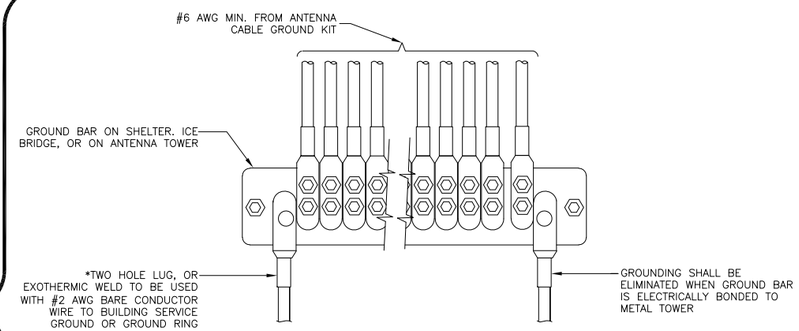
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



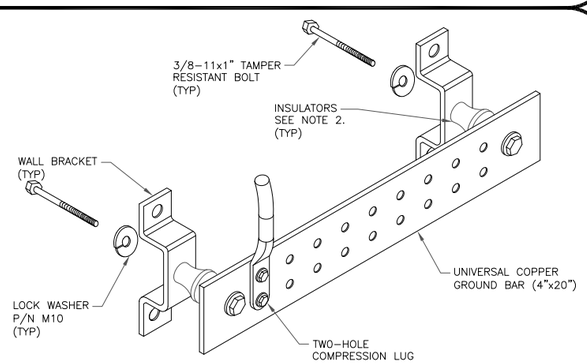
NOTES:

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



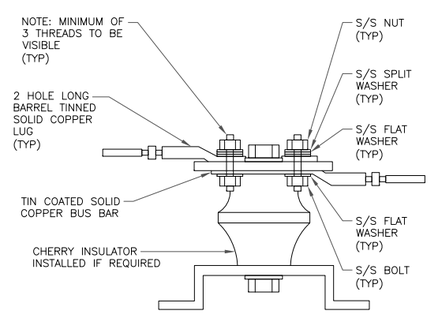
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



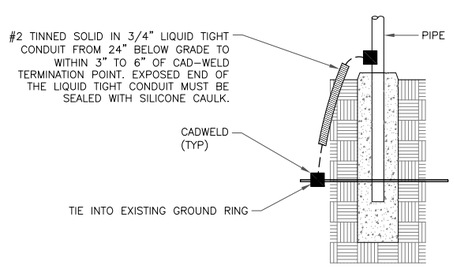
NOTES:

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

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

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

T-MOBILE SITE NUMBER:
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DocuSigned by:
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18400B3254704CE...

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LICENSED PROFESSIONAL ENGINEER

6/1/2017 | 12:00:39 PM EDT

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. Certificate of Registration #PEC.0001101

SHEET NUMBER: G-3
REVISION: 1

May 20, 2017

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

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11216B
	Carrier Site Name:	Monroe-2/RT-25
Crown Castle Designation:	**Crown Castle BU Number:**	876353
	Crown Castle Site Name:	352 S. Main ST, New Town, CT
	Crown Castle JDE Job Number:	413051
	Crown Castle Work Order Number:	1407303
	Crown Castle Application Number:	372112 Rev. 11
Engineering Firm Designation:	**B+T Group Project Number:**	111217.003.01
Site Data:	**352 S. Main Street, Newtown, Fairfield County, CT** **Latitude *41° 21' 20.64"*, Longitude *-73° 15' 47.57"*** **150 Foot - Monopole Tower**	

Dear Charles McGuirt,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1039014, in accordance with application 372112, revision 11.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

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

Respectfully submitted by:
B+T Engineering, Inc.

Matthew Allen
Project Engineer

Scott S. Vance, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2018

STATE OF CONNECTICUT SCOTT VANCE 31627 LICENSED PROFESSIONAL ENGINEER

5/20/17

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft. Monopole tower designed by Rohn in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

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 93 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
135.0	135.0	3	Commscope	LNX-6515DS-A1M	--	--	--
		3	Ericsson	KRY 112 489/2			
		3	Rfs Celwave	APXV18-206513-C-A20			

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
148.0	153.0	1	Decibel	DB222-A	1 3	1/2 1-1/4	1
	150.0	3	Alcatel Lucent	1900MHz RRH (65MHz)			
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
		9	Rfs Celwave	ACU-A20-N			
		3	Rfs Celwave	APXVSPP18-C-A20			
	148.0	1	--	Platform Mount [LP 502-1]			
135.0	135.0	**3**	**Ems Wireless**	**RR90-17-02DP**	**--**	**--**	**2**
		1	**Ericsson**	**KRF 102 308/1**			
		4	**Remec**	**S20057A1**			
		1	--	Platform Mount [LP 712-1]	6	1-5/8	1
130.0	131.0	1	Gps	GPS_A	1	1/2	1
	130.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	Swedcom	ALP9212 + Cellular Platform	12	1-5/8
130	130	12	Swedcom	ALP9212 + Cellular Platform	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T Mobile Co-Locate, Rev# 11	372112	CCI Sites
Tower Manufacturer Drawing	Rohn, Eng. File No. 34738SW	2047929	CCI Sites
Foundation Drawing	Rohn, Eng. File No. 34738SW	1619496	CCI Sites
Geotech Report	Soil Testing, Inc. Date: 12/03/1996	1531889	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 05/16/2017	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.
5) The existing base plate grout was not considered in this analysis.
6) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	P24x1/4	1	-6.502	662.265	39.3	Pass
L2	120 - 90	Pole	P30x3/8	2	-11.111	1311.060	42.3	Pass
L3	90 - 60	Pole	P36x3/8	3	-16.636	1490.100	52.4	Pass
L4	60 - 30	Pole	P42x3/8	4	-23.071	1668.870	59.0	Pass
L5	30 - 0	Pole	P42x1/2	5	-31.541	2410.400	59.3	Pass
							Summary	
						Pole (L5)	59.3	Pass
						Rating =	59.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	30	59.0	Pass
1,2	Flange Connection	60	52.4	Pass
1,2	Flange Connection	90	42.3	Pass
1,2	Flange Connection	120	39.3	Pass
1	Anchor Rods	Base	59.8	Pass
1,3	Base Plate	Base	59.8	Pass
1	Base Foundation (Structure)	Base	15.4	Pass
1	Base Foundation (Soil Interaction)	Base	57.0	Pass

Structure Rating (max from all components) =	59.8%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Flange plates have the same capacity as their respective Shaft.
3) Base plates have the same capacity as their respective bolt.

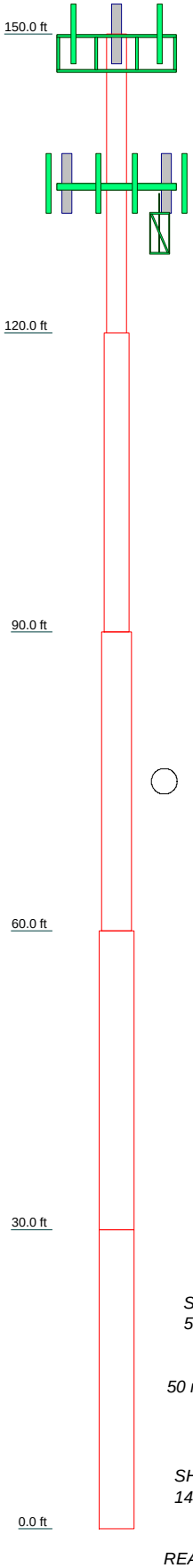
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x1/4	30.000	A53-B-42	1.9
2	P30x3/8	30.000		3.6
3	P36x3/8	30.000		4.3
4	P42x3/8	30.000		5.0
5	P42x1/2	30.000		6.7
				21.4



ALL REACTIONS ARE FACTORED

AXIAL 48 K

SHEAR 5 K

MOMENT 529 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.750 in ICE

AXIAL 32 K

SHEAR 14 K

MOMENT 1428 kip-ft

TORQUE 1 kip-ft

REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	148	(3) 4' x 2" Pipe Mount (E)	148
		(3) 4' x 2" Pipe Mount (E)	148
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	148	(3) 4' x 2" Pipe Mount (E)	148
		Platform Mount [LP 502-1] (E)	148
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	148	APXV18-206513-C-A20 w/ Mount Pipe (P)	135
DB222-A (E)	148		
800 EXTERNAL NOTCH FILTER (E)	148	APXV18-206513-C-A20 w/ Mount Pipe (P)	135
800 EXTERNAL NOTCH FILTER (E)	148		
800 EXTERNAL NOTCH FILTER (E)	148	APXV18-206513-C-A20 w/ Mount Pipe (P)	135
800 EXTERNAL NOTCH FILTER (E)	148		
800MHZ RRH (E)	148	LNX-6515DS-A1M w/ Mount Pipe (P)	135
800MHZ RRH (E)	148	LNX-6515DS-A1M w/ Mount Pipe (P)	135
800MHZ RRH (E)	148	LNX-6515DS-A1M w/ Mount Pipe (P)	135
(3) ACU-A20-N (E)	148	KRY 112 489/2 (P)	135
(3) ACU-A20-N (E)	148	KRY 112 489/2 (P)	135
(3) ACU-A20-N (E)	148	KRY 112 489/2 (P)	135
1900MHz RRH (65MHz) (E)	148	Platform Mount [LP 712-1] (E)	135
1900MHz RRH (65MHz) (E)	148	GPS_A (E)	130
1900MHz RRH (65MHz) (E)	148	Side Arm Mount [SO 701-1] (E)	130

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 59.3%

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

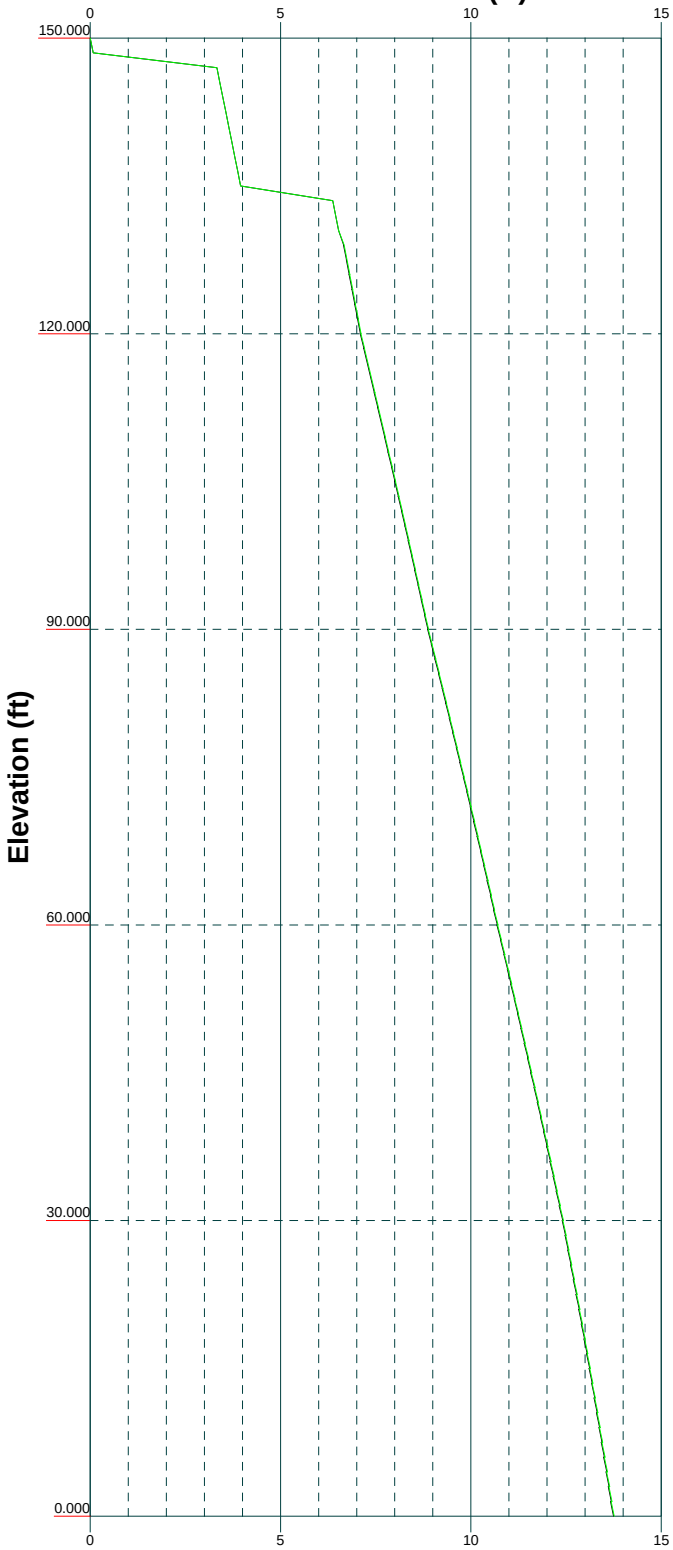
Job: ***111217.003.01 - 352 S. MAIN ST, NEW TOWN, CT, CT (BU# 87635***		
Project:		
Client: Crown Castle	Drawn by: Yathish	App'd:
Code: TIA-222-G	Date: 05/20/17	Scale: NTS
Path:		Dwg No. E-1

TIA-222-G - 93 mph/50 mph 0.750 in Ice Exposure B

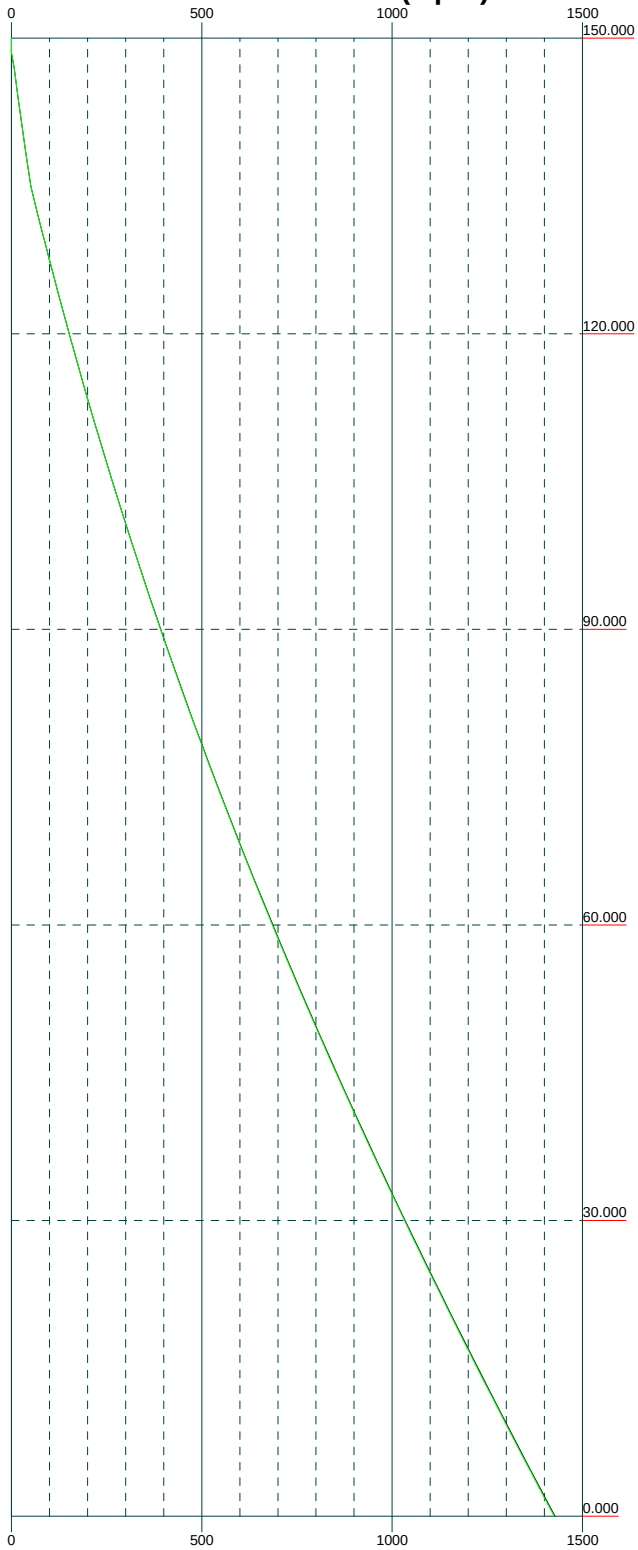
Maximum Values

Vx Vz Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



B+T GRP

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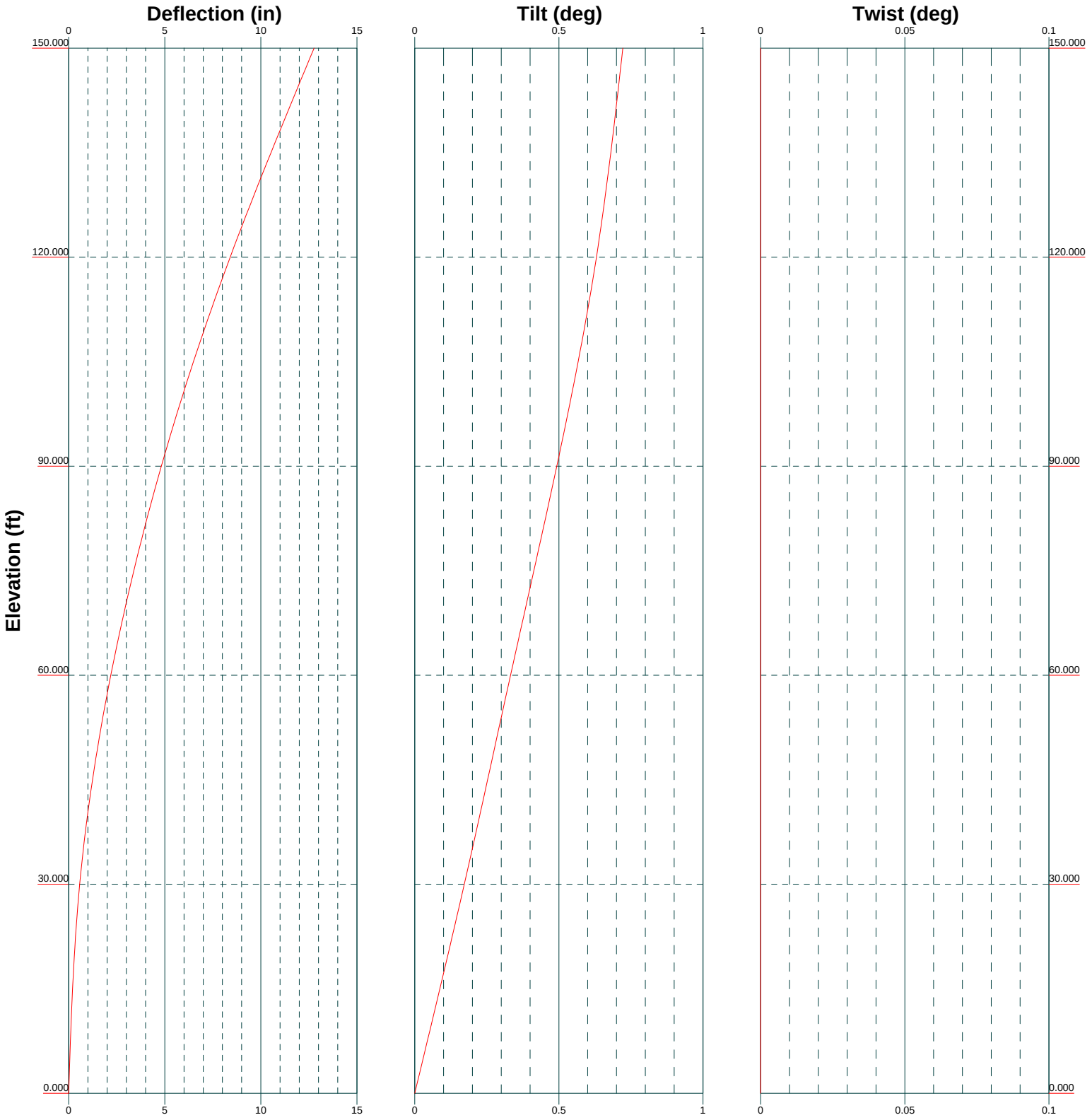
Job: *111217.003.01 - 352 S. MAIN ST, NEW TOWN, CT, CT (BU# 87635*		
Project:		
Client: Crown Castle	Drawn by: Yathish	App'd:
Code: TIA-222-G	Date: 05/20/17	Scale: NTS
Path:		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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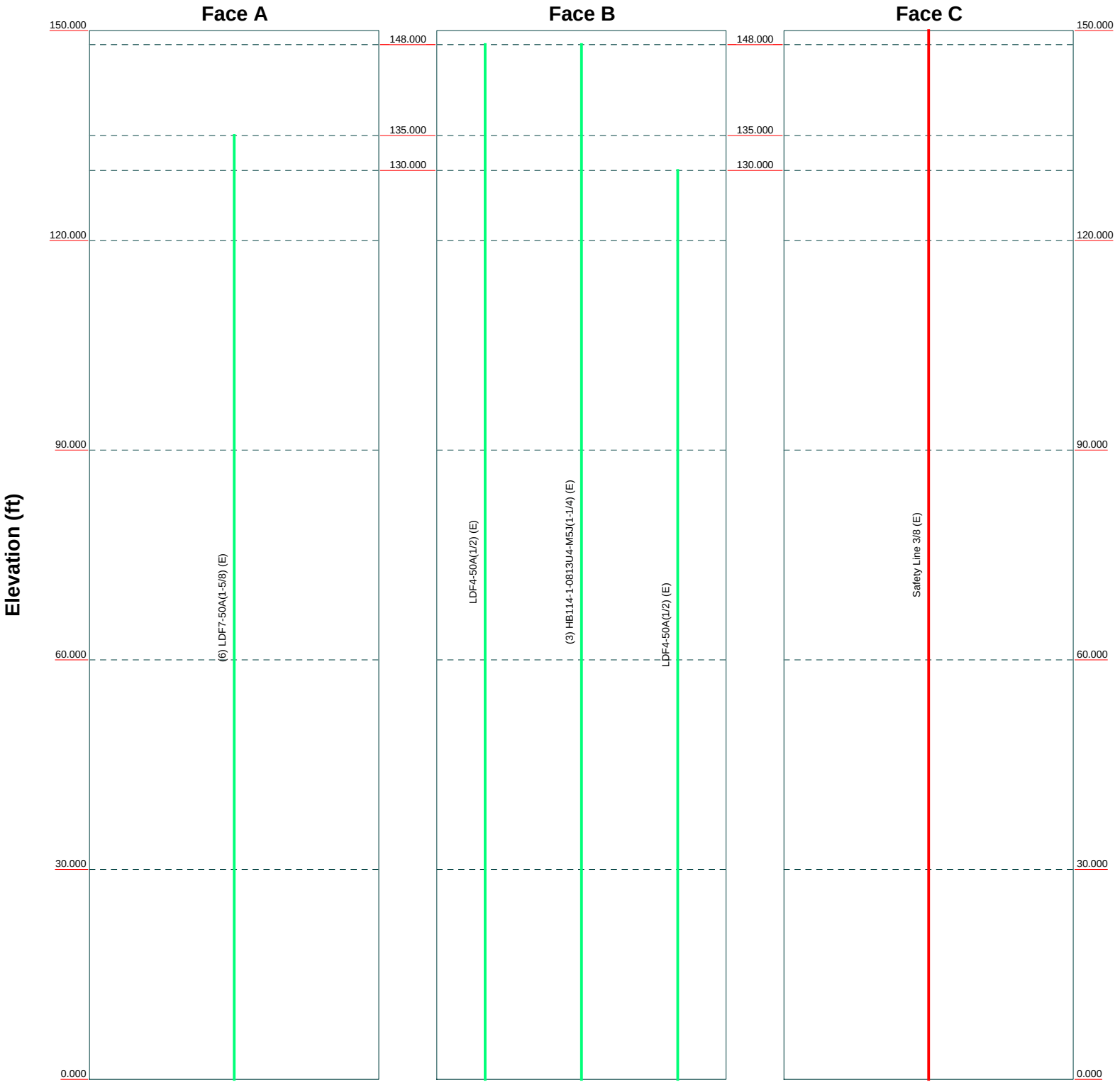
Project:			
Client: Crown Castle		Drawn by: Yathish	App'd:
Code: TIA-222-G		Date: 05/20/17	Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 150'

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



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Job: ***111217.003.01 - 352 S. MAIN ST, NEW TOWN, CT, CT (BU# 87635***		
Project:		
Client: Crown Castle	Drawn by: Yathish	App'd:
Code: TIA-222-G	Date: 05/20/17	Scale: NTS
Path:		Dwg No. E-7

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	150.000-120.000	30.000	P24x1/4	A53-B-42 (42 ksi)	
L2	120.000-90.000	30.000	P30x3/8	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L3	90.000-60.000	30.000	P36x3/8	A53-B-42 (42 ksi)	
L4	60.000-30.000	30.000	P42x3/8	A53-B-42 (42 ksi)	
L5	30.000-0.000	30.000	P42x1/2	A53-B-42 (42 ksi)	

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 150.000-120.000				1	1	1			
L2 120.000-90.000				1	1	1			
L3 90.000-60.000				1	1	1			
L4 60.000-30.000				1	1	1			
L5 30.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
--*-* Safety Line 3/8 (E) *-*-*-*	C	Surface Ar (CaAa)	150.000 - 0.000	1	1	0.450 0.460	0.375		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF4-50A(1/2) (E)	B	No	Inside Pole	148.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
HB114-1-0813U4-M5J(1-1/4) (E) *-*-*-*	B	No	Inside Pole	148.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF4-50A(1/2) (E) *-*-*-*	B	No	Inside Pole	130.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF7-50A(1-5/8)	A	No	Inside Pole	135.000 - 0.000	6	No Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
--*-*								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-120.000	A	0.000	0.000	0.000	0.000	0.074
		B	0.000	0.000	0.000	0.000	0.107
		C	0.000	0.000	1.125	0.000	0.007
L2	120.000-90.000	A	0.000	0.000	0.000	0.000	0.148
		B	0.000	0.000	0.000	0.000	0.117
		C	0.000	0.000	1.125	0.000	0.007
L3	90.000-60.000	A	0.000	0.000	0.000	0.000	0.148
		B	0.000	0.000	0.000	0.000	0.117
		C	0.000	0.000	1.125	0.000	0.007
L4	60.000-30.000	A	0.000	0.000	0.000	0.000	0.148
		B	0.000	0.000	0.000	0.000	0.117
		C	0.000	0.000	1.125	0.000	0.007
L5	30.000-0.000	A	0.000	0.000	0.000	0.000	0.148
		B	0.000	0.000	0.000	0.000	0.117
		C	0.000	0.000	1.125	0.000	0.007

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-120.000	A	1.727	0.000	0.000	0.000	0.000	0.074
		B		0.000	0.000	0.000	0.000	0.107
		C		0.000	0.000	11.487	0.000	0.140
L2	120.000-90.000	A	1.684	0.000	0.000	0.000	0.000	0.148
		B		0.000	0.000	0.000	0.000	0.117
		C		0.000	0.000	11.229	0.000	0.134
L3	90.000-60.000	A	1.628	0.000	0.000	0.000	0.000	0.148
		B		0.000	0.000	0.000	0.000	0.117
		C		0.000	0.000	10.895	0.000	0.126
L4	60.000-30.000	A	1.547	0.000	0.000	0.000	0.000	0.148
		B		0.000	0.000	0.000	0.000	0.117
		C		0.000	0.000	10.409	0.000	0.116
L5	30.000-0.000	A	1.386	0.000	0.000	0.000	0.000	0.148
		B		0.000	0.000	0.000	0.000	0.117
		C		0.000	0.000	9.443	0.000	0.096

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	150.000-120.000	-0.046	0.032	-0.356	0.253
L2	120.000-90.000	-0.046	0.033	-0.367	0.261
L3	90.000-60.000	-0.046	0.033	-0.370	0.263
L4	60.000-30.000	-0.046	0.033	-0.365	0.259
L5	30.000-0.000	-0.046	0.033	-0.336	0.239

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	6	Safety Line 3/8	120.00 - 150.00	1.0000	1.0000
L2	6	Safety Line 3/8	90.00 - 120.00	1.0000	1.0000
L3	6	Safety Line 3/8	60.00 - 90.00	1.0000	1.0000
L4	6	Safety Line 3/8	30.00 - 60.00	1.0000	1.0000
L5	6	Safety Line 3/8	0.00 - 30.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (E-Per Photo)	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
DB222-A (E)	B	From Leg	4.000 0.000 5.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	1.600 2.880 4.160	1.600 2.880 4.160	0.016 0.021 0.026
800 EXTERNAL NOTCH FILTER (E)	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (E)	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (E)	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800MHZ RRH	A	From Leg	4.000	0.000	148.000	No Ice	2.134	1.773	0.053

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			2.000			1" Ice	2.512	2.127	0.098
800MHZ RRH	B	From Leg	4.000	0.000	148.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			2.000			1" Ice	2.512	2.127	0.098
800MHZ RRH	C	From Leg	4.000	0.000	148.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			2.000			1" Ice	2.512	2.127	0.098
(3) ACU-A20-N	A	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			2.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	B	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			2.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	C	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			2.000			1" Ice	0.148	0.215	0.004
1900MHz RRH (65MHz)	A	From Leg	4.000	0.000	148.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			2.000			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	B	From Leg	4.000	0.000	148.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			2.000			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	C	From Leg	4.000	0.000	148.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			2.000			1" Ice	2.728	2.794	0.111
(3) 4' x 2" Pipe Mount	A	From Leg	4.000	0.000	148.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
(3) 4' x 2" Pipe Mount	B	From Leg	4.000	0.000	148.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
(3) 4' x 2" Pipe Mount	C	From Leg	4.000	0.000	148.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
Platform Mount [LP 502-1]	C	None		0.000	148.000	No Ice	32.347	32.347	0.925
(E)						1/2" Ice	45.668	45.668	1.193
						1" Ice	58.988	58.988	1.460
--*-*									
APXV18-206513-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	135.000	No Ice	2.107	1.785	0.026
(P)			0.000			1/2" Ice	2.378	2.209	0.048
			0.000			1" Ice	2.658	2.649	0.074
APXV18-206513-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	135.000	No Ice	2.107	1.785	0.026
(P)			0.000			1/2" Ice	2.378	2.209	0.048
			0.000			1" Ice	2.658	2.649	0.074
APXV18-206513-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	135.000	No Ice	2.107	1.785	0.026
(P)			0.000			1/2" Ice	2.378	2.209	0.048
			0.000			1" Ice	2.658	2.649	0.074
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.000	0.000	135.000	No Ice	11.683	9.842	0.083
(P)			0.000			1/2" Ice	12.404	11.366	0.173
			0.000			1" Ice	13.135	12.914	0.273
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.000	0.000	135.000	No Ice	11.683	9.842	0.083
(P)			0.000			1/2" Ice	12.404	11.366	0.173
			0.000			1" Ice	13.135	12.914	0.273
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.000	0.000	135.000	No Ice	11.683	9.842	0.083
(P)			0.000			1/2" Ice	12.404	11.366	0.173
			0.000			1" Ice	13.135	12.914	0.273

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
KRY 112 489/2	A	From Leg	4.000	0.000	135.000	No Ice	0.559	0.365	0.015
(P)			0.000			1/2" Ice	0.658	0.448	0.020
			0.000			1" Ice	0.764	0.542	0.027
KRY 112 489/2	B	From Leg	4.000	0.000	135.000	No Ice	0.559	0.365	0.015
(P)			0.000			1/2" Ice	0.658	0.448	0.020
			0.000			1" Ice	0.764	0.542	0.027
KRY 112 489/2	C	From Leg	4.000	0.000	135.000	No Ice	0.559	0.365	0.015
(P)			0.000			1/2" Ice	0.658	0.448	0.020
			0.000			1" Ice	0.764	0.542	0.027
Platform Mount [LP 712-1]	C	None		0.000	135.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
--*-*									
GPS_A	B	From Leg	4.000	0.000	130.000	No Ice	0.255	0.255	0.001
(E)			0.000			1/2" Ice	0.320	0.320	0.005
			1.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	B	From Leg	4.000	0.000	130.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp

Comb. No.	Description
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	150 - 120	Pole	Max Tension	8	0.000	0.000	0.000
			Max. Compression	26	-14.012	-0.686	-0.553
			Max. Mx	8	-6.504	-151.797	-0.094
			Max. My	14	-6.502	-0.257	-151.798
			Max. Vy	8	7.099	-151.797	-0.094
			Max. Vx	14	7.115	-0.257	-151.798
			Max. Torque	5			-0.703
L2	120 - 90	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.696	-0.546	-0.652
			Max. Mx	8	-11.113	-391.669	0.326
			Max. My	14	-11.112	0.171	-392.185
			Max. Vy	8	8.871	-391.669	0.326
			Max. Vx	14	8.887	0.171	-392.185
			Max. Torque	5			-0.703
L3	90 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-28.528	-0.389	-0.764
			Max. Mx	8	-16.637	-685.539	0.751
			Max. My	14	-16.636	0.608	-686.575
			Max. Vy	8	10.695	-685.539	0.751
			Max. Vx	14	10.712	0.608	-686.575
			Max. Torque	5			-0.702
L4	60 - 30	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.439	-0.220	-0.883
			Max. Mx	8	-23.072	-1032.560	1.174
			Max. My	14	-23.071	1.049	-1034.117
			Max. Vy	8	12.414	-1032.560	1.174
			Max. Vx	14	12.430	1.049	-1034.117
			Max. Torque	5			-0.702
L5	30 - 0	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-48.044	-0.080	-0.983
			Max. Mx	8	-31.541	-1425.509	1.593
			Max. My	14	-31.541	1.486	-1427.579
			Max. Vy	8	13.749	-1425.509	1.593
			Max. Vx	14	13.765	1.486	-1427.579
			Max. Torque	5			-0.701

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	48.044	0.007	-5.060
	Max. H_x	20	31.546	13.737	-0.014
	Max. H_z	2	31.546	-0.014	13.753
	Max. M_x	2	1426.988	-0.014	13.753
	Max. M_z	8	1425.509	-13.737	0.014
	Max. Torsion	17	0.701	6.880	-11.917
	Min. Vert	23	23.660	11.889	6.864
	Min. H_x	8	31.546	-13.737	0.014
	Min. H_z	14	31.546	0.014	-13.753
	Min. M_x	14	-1427.579	0.014	-13.753
	Min. M_z	20	-1424.704	13.737	-0.014
	Min. Torsion	5	-0.701	-6.880	11.917

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	26.289	0.000	0.000	0.233	-0.315	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	31.546	0.014	-13.753	-1426.988	-2.288	0.605
0.9 Dead+1.6 Wind 0 deg - No Ice	23.660	0.014	-13.753	-1414.565	-2.165	0.607
1.2 Dead+1.6 Wind 30 deg - No Ice	31.546	6.880	-11.917	-1236.714	-714.588	0.699
0.9 Dead+1.6 Wind 30 deg - No Ice	23.660	6.880	-11.917	-1225.955	-708.227	0.701
1.2 Dead+1.6 Wind 60 deg - No Ice	31.546	11.903	-6.889	-714.984	-1235.524	0.605
0.9 Dead+1.6 Wind 60 deg - No Ice	23.660	11.903	-6.889	-708.794	-1224.600	0.607
1.2 Dead+1.6 Wind 90 deg - No Ice	31.546	13.737	-0.014	-1.593	-1425.509	0.350
0.9 Dead+1.6 Wind 90 deg - No Ice	23.660	13.737	-0.014	-1.652	-1412.923	0.351
1.2 Dead+1.6 Wind 120 deg - No Ice	31.546	11.889	6.864	712.306	-1233.641	0.000
0.9 Dead+1.6 Wind 120 deg - No Ice	23.660	11.889	6.864	705.993	-1222.734	0.000
1.2 Dead+1.6 Wind 150 deg - No Ice	31.546	6.856	11.903	1235.420	-711.322	-0.350

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
0.9 Dead+1.6 Wind 150 deg - No Ice	23.660	6.856	11.903	1224.525	-704.991	-0.351
1.2 Dead+1.6 Wind 180 deg - No Ice	31.546	-0.014	13.753	1427.579	1.486	-0.605
0.9 Dead+1.6 Wind 180 deg - No Ice	23.660	-0.014	13.753	1415.002	1.574	-0.607
1.2 Dead+1.6 Wind 210 deg - No Ice	31.546	-6.880	11.917	1237.304	713.787	-0.699
0.9 Dead+1.6 Wind 210 deg - No Ice	23.660	-6.880	11.917	1226.391	707.636	-0.701
1.2 Dead+1.6 Wind 240 deg - No Ice	31.546	-11.903	6.889	715.572	1234.721	-0.605
0.9 Dead+1.6 Wind 240 deg - No Ice	23.660	-11.903	6.889	709.229	1224.008	-0.607
1.2 Dead+1.6 Wind 270 deg - No Ice	31.546	-13.737	0.014	2.182	1424.704	-0.350
0.9 Dead+1.6 Wind 270 deg - No Ice	23.660	-13.737	0.014	2.087	1412.329	-0.351
1.2 Dead+1.6 Wind 300 deg - No Ice	31.546	-11.889	-6.864	-711.715	1232.836	-0.000
0.9 Dead+1.6 Wind 300 deg - No Ice	23.660	-11.889	-6.864	-705.556	1222.140	-0.000
1.2 Dead+1.6 Wind 330 deg - No Ice	31.546	-6.856	-11.903	-1234.828	710.519	0.350
0.9 Dead+1.6 Wind 330 deg - No Ice	23.660	-6.856	-11.903	-1224.087	704.398	0.351
1.2 Dead+1.0 Ice+1.0 Temp	48.044	0.000	0.000	0.983	-0.080	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	48.044	0.007	-5.060	-526.448	-1.027	0.329
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	48.044	2.532	-4.386	-456.231	-264.135	0.380
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	48.044	4.379	-2.536	-263.482	-456.499	0.329
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	48.044	5.053	-0.007	0.153	-526.576	0.190
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	48.044	4.372	2.524	264.033	-455.587	0.000
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	48.044	2.521	4.379	457.451	-262.555	-0.190
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	48.044	-0.007	5.060	528.580	0.798	-0.329
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	48.044	-2.532	4.386	458.362	263.906	-0.380
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	48.044	-4.379	2.536	265.612	456.269	-0.329
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	48.044	-5.053	0.007	1.978	526.345	-0.190
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	48.044	-4.372	-2.524	-261.901	455.357	-0.000
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	48.044	-2.521	-4.379	-455.318	262.325	0.190
Dead+Wind 0 deg - Service	26.289	0.003	-3.201	-330.165	-0.770	0.142
Dead+Wind 30 deg - Service	26.289	1.602	-2.774	-286.117	-165.664	0.164
Dead+Wind 60 deg - Service	26.289	2.771	-1.603	-165.339	-286.258	0.142
Dead+Wind 90 deg - Service	26.289	3.197	-0.003	-0.192	-330.239	0.082
Dead+Wind 120 deg - Service	26.289	2.767	1.598	165.071	-285.821	0.000
Dead+Wind 150 deg - Service	26.289	1.596	2.771	286.170	-164.908	-0.082
Dead+Wind 180 deg - Service	26.289	-0.003	3.201	330.655	0.104	-0.142
Dead+Wind 210 deg - Service	26.289	-1.602	2.774	286.606	164.998	-0.164
Dead+Wind 240 deg - Service	26.289	-2.771	1.603	165.828	285.592	-0.142
Dead+Wind 270 deg - Service	26.289	-3.197	0.003	0.681	329.573	-0.082

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
Dead+Wind 300 deg - Service	26.289	-2.767	-1.598	-164.582	285.155	-0.000
Dead+Wind 330 deg - Service	26.289	-1.596	-2.771	-285.681	164.242	0.082

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-26.289	0.000	0.000	26.289	0.000	0.000%
2	0.014	-31.546	-13.753	-0.014	31.546	13.753	0.000%
3	0.014	-23.660	-13.753	-0.014	23.660	13.753	0.000%
4	6.880	-31.546	-11.917	-6.880	31.546	11.917	0.000%
5	6.880	-23.660	-11.917	-6.880	23.660	11.917	0.000%
6	11.903	-31.546	-6.889	-11.903	31.546	6.889	0.000%
7	11.903	-23.660	-6.889	-11.903	23.660	6.889	0.000%
8	13.737	-31.546	-0.014	-13.737	31.546	0.014	0.000%
9	13.737	-23.660	-0.014	-13.737	23.660	0.014	0.000%
10	11.889	-31.546	6.864	-11.889	31.546	-6.864	0.000%
11	11.889	-23.660	6.864	-11.889	23.660	-6.864	0.000%
12	6.856	-31.546	11.903	-6.856	31.546	-11.903	0.000%
13	6.856	-23.660	11.903	-6.856	23.660	-11.903	0.000%
14	-0.014	-31.546	13.753	0.014	31.546	-13.753	0.000%
15	-0.014	-23.660	13.753	0.014	23.660	-13.753	0.000%
16	-6.880	-31.546	11.917	6.880	31.546	-11.917	0.000%
17	-6.880	-23.660	11.917	6.880	23.660	-11.917	0.000%
18	-11.903	-31.546	6.889	11.903	31.546	-6.889	0.000%
19	-11.903	-23.660	6.889	11.903	23.660	-6.889	0.000%
20	-13.737	-31.546	0.014	13.737	31.546	-0.014	0.000%
21	-13.737	-23.660	0.014	13.737	23.660	-0.014	0.000%
22	-11.889	-31.546	-6.864	11.889	31.546	6.864	0.000%
23	-11.889	-23.660	-6.864	11.889	23.660	6.864	0.000%
24	-6.856	-31.546	-11.903	6.856	31.546	11.903	0.000%
25	-6.856	-23.660	-11.903	6.856	23.660	11.903	0.000%
26	0.000	-48.044	0.000	0.000	48.044	0.000	0.000%
27	0.007	-48.044	-5.060	-0.007	48.044	5.060	0.000%
28	2.532	-48.044	-4.386	-2.532	48.044	4.386	0.000%
29	4.379	-48.044	-2.536	-4.379	48.044	2.536	0.000%
30	5.053	-48.044	-0.007	-5.053	48.044	0.007	0.000%
31	4.372	-48.044	2.524	-4.372	48.044	-2.524	0.000%
32	2.521	-48.044	4.379	-2.521	48.044	-4.379	0.000%
33	-0.007	-48.044	5.060	0.007	48.044	-5.060	0.000%
34	-2.532	-48.044	4.386	2.532	48.044	-4.386	0.000%
35	-4.379	-48.044	2.536	4.379	48.044	-2.536	0.000%
36	-5.053	-48.044	0.007	5.053	48.044	-0.007	0.000%
37	-4.372	-48.044	-2.524	4.372	48.044	2.524	0.000%
38	-2.521	-48.044	-4.379	2.521	48.044	4.379	0.000%
39	0.003	-26.289	-3.201	-0.003	26.289	3.201	0.000%
40	1.602	-26.289	-2.774	-1.602	26.289	2.774	0.000%
41	2.771	-26.289	-1.603	-2.771	26.289	1.603	0.000%
42	3.197	-26.289	-0.003	-3.197	26.289	0.003	0.000%
43	2.767	-26.289	1.598	-2.767	26.289	-1.598	0.000%
44	1.596	-26.289	2.771	-1.596	26.289	-2.771	0.000%
45	-0.003	-26.289	3.201	0.003	26.289	-3.201	0.000%
46	-1.602	-26.289	2.774	1.602	26.289	-2.774	0.000%
47	-2.771	-26.289	1.603	2.771	26.289	-1.603	0.000%
48	-3.197	-26.289	0.003	3.197	26.289	-0.003	0.000%
49	-2.767	-26.289	-1.598	2.767	26.289	1.598	0.000%
50	-1.596	-26.289	-2.771	1.596	26.289	2.771	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	0.00057851
3	Yes	4	0.00000001	0.00038985
4	Yes	5	0.00000001	0.00031484
5	Yes	5	0.00000001	0.00015505
6	Yes	5	0.00000001	0.00029100
7	Yes	5	0.00000001	0.00014271
8	Yes	4	0.00000001	0.00032155
9	Yes	4	0.00000001	0.00020834
10	Yes	5	0.00000001	0.00029943
11	Yes	5	0.00000001	0.00014711
12	Yes	5	0.00000001	0.00030613
13	Yes	5	0.00000001	0.00015057
14	Yes	4	0.00000001	0.00053224
15	Yes	4	0.00000001	0.00035807
16	Yes	5	0.00000001	0.00028938
17	Yes	5	0.00000001	0.00014190
18	Yes	5	0.00000001	0.00031247
19	Yes	5	0.00000001	0.00015388
20	Yes	4	0.00000001	0.00036472
21	Yes	4	0.00000001	0.00023899
22	Yes	5	0.00000001	0.00029818
23	Yes	5	0.00000001	0.00014667
24	Yes	5	0.00000001	0.00029223
25	Yes	5	0.00000001	0.00014357
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00030787
28	Yes	5	0.00000001	0.00036361
29	Yes	5	0.00000001	0.00035935
30	Yes	5	0.00000001	0.00030835
31	Yes	5	0.00000001	0.00036111
32	Yes	5	0.00000001	0.00036266
33	Yes	5	0.00000001	0.00030985
34	Yes	5	0.00000001	0.00036051
35	Yes	5	0.00000001	0.00036385
36	Yes	5	0.00000001	0.00030725
37	Yes	5	0.00000001	0.00035767
38	Yes	5	0.00000001	0.00035707
39	Yes	4	0.00000001	0.00003860
40	Yes	4	0.00000001	0.00012660
41	Yes	4	0.00000001	0.00010070
42	Yes	4	0.00000001	0.00003034
43	Yes	4	0.00000001	0.00010913
44	Yes	4	0.00000001	0.00011702
45	Yes	4	0.00000001	0.00003827
46	Yes	4	0.00000001	0.00009967
47	Yes	4	0.00000001	0.00012346
48	Yes	4	0.00000001	0.00003053
49	Yes	4	0.00000001	0.00010751
50	Yes	4	0.00000001	0.00010176

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	12.767	45	0.722	0.002
L2	120 - 90	8.402	45	0.629	0.001
L3	90 - 60	4.821	45	0.491	0.001
L4	60 - 30	2.192	46	0.332	0.000
L5	30 - 0	0.572	46	0.173	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	APXVSPP18-C-A20 w/ Mount Pipe	45	12.466	0.716	0.002	68932
135.000	APXV18-206513-C-A20 w/ Mount Pipe	45	10.526	0.679	0.001	22977
130.000	GPS_A	45	9.799	0.664	0.001	17233

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	55.147	16	3.117	0.008
L2	120 - 90	36.310	16	2.717	0.004
L3	90 - 60	20.838	16	2.121	0.002
L4	60 - 30	9.472	16	1.435	0.001
L5	30 - 0	2.472	16	0.747	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	APXVSPP18-C-A20 w/ Mount Pipe	16	53.847	3.093	0.008	16175
135.000	APXV18-206513-C-A20 w/ Mount Pipe	16	45.478	2.934	0.006	5391
130.000	GPS_A	16	42.341	2.867	0.006	4042

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	150 - 120 (1)	P24x1/4	30.000	0.000	0.0	18.653	-6.502	662.265	0.010
L2	120 - 90 (2)	P30x3/8	30.000	0.000	0.0	34.901	-11.111	1311.060	0.008
L3	90 - 60 (3)	P36x3/8	30.000	0.000	0.0	41.970	-16.636	1490.100	0.011
L4	60 - 30 (4)	P42x3/8	30.000	0.000	0.0	49.038	-23.071	1668.870	0.014
L5	30 - 0 (5)	P42x1/2	30.000	0.000	0.0	65.188	-31.541	2410.400	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 120 (1)	P24x1/4	151.798	396.683	0.383	0.000	396.683	0.000
L2	120 - 90 (2)	P30x3/8	392.277	947.858	0.414	0.000	947.858	0.000
L3	90 - 60 (3)	P36x3/8	686.921	1338.808	0.513	0.000	1338.808	0.000
L4	60 - 30 (4)	P42x3/8	1034.717	1796.558	0.576	0.000	1796.558	0.000
L5	30 - 0 (5)	P42x1/2	1428.433	2463.608	0.580	0.000	2463.608	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	150 - 120 (1)	P24x1/4	7.115	331.132	0.021	0.607	648.611	0.001
L2	120 - 90 (2)	P30x3/8	8.896	655.528	0.014	0.700	1598.367	0.000
L3	90 - 60 (3)	P36x3/8	10.720	745.048	0.014	0.700	2189.067	0.000
L4	60 - 30 (4)	P42x3/8	12.438	834.437	0.015	0.699	2868.842	0.000
L5	30 - 0 (5)	P42x1/2	13.773	1205.200	0.011	0.699	4118.958	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.010	0.383	0.000	0.021	0.001	0.393 ✔	1.000	4.8.2 ✔
L2	120 - 90 (2)	0.008	0.414	0.000	0.014	0.000	0.423 ✔	1.000	4.8.2 ✔
L3	90 - 60 (3)	0.011	0.513	0.000	0.014	0.000	0.524 ✔	1.000	4.8.2 ✔
L4	60 - 30 (4)	0.014	0.576	0.000	0.015	0.000	0.590 ✔	1.000	4.8.2 ✔
L5	30 - 0 (5)	0.013	0.580	0.000	0.011	0.000	0.593 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
							✔		

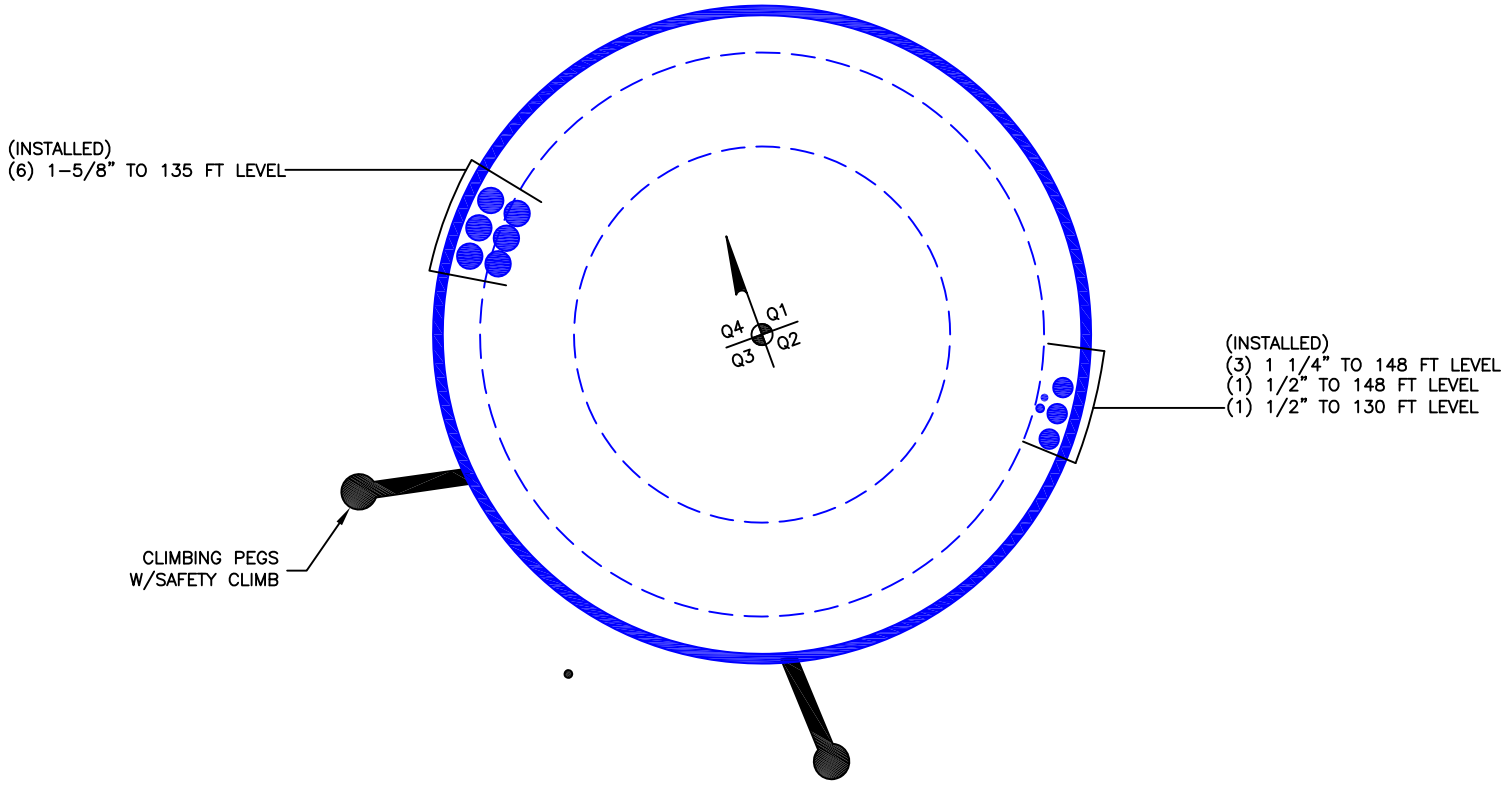
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 120	Pole	P24x1/4	1	-6.502	662.265	39.3	Pass
L2	120 - 90	Pole	P30x3/8	2	-11.111	1311.060	42.3	Pass
L3	90 - 60	Pole	P36x3/8	3	-16.636	1490.100	52.4	Pass
L4	60 - 30	Pole	P42x3/8	4	-23.071	1668.870	59.0	Pass
L5	30 - 0	Pole	P42x1/2	5	-31.541	2410.400	59.3	Pass
							Summary	
						Pole (L5)	59.3	Pass
						RATING =	**59.3**	**Pass**

Program Version 7.0.5.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT:876353

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876353*
Site Name: *352 S. MAIN ST, NEW TOV*
App #: *372112 Revision # 11*

Reactions		
Mu	151.81	ft-kips
Axial, Pu:	6.50	kips
Shear, Vu:	7.10	kips
Elevation:	120	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer: Rohn

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	35		

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.28	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

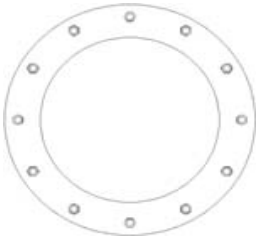
			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	16.81	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.535	in	
Min PL "treq" for actual **T w/ Pry**:	0.745	in	
Min PL "t1" for actual **T w/o Pry**:	0.986	in	
T allowable with Prying:	87.61	kips	0≤α'≤1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	16.81	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	15.1%	**Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Piroc OK	TIA G
Allowable Plate Stress:	32.4 ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc OK	Comp. Y.L. Length:
No Prying		25.48
Tension Side Stress Ratio, (treq/t)^2:	13.9% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876353*
Site Name: *352 S. MAIN ST, NEW TOV*
App #: *372112 Revision # 11*

Reactions		
Mu	392.28	ft-kips
Axial, Pu:	11.11	kips
Shear, Vu:	8.90	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer: Rohn

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	16		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	41		

Plate Data		
Diam:	47	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.89	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

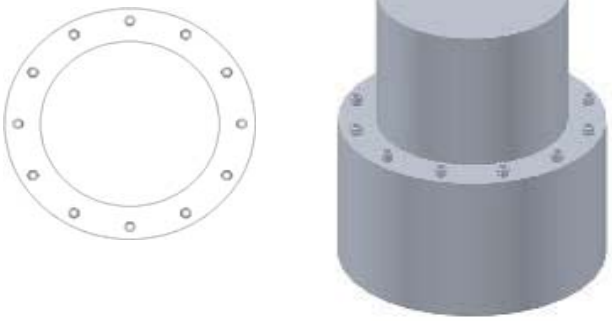
			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	28.01	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.618	in	
Min PL "treq" for actual **T w/ Pry**:	0.998	in	
Min PL "t1" for actual **T w/o Pry**:	1.315	in	
T allowable with Prying:	85.20	kips	0≤α'≤1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	28.01	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	25.2%	**Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Piroc OK	TIA G
Allowable Plate Stress:	32.4 ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc OK	Comp. Y.L. Length:
No Prying		27.95
Tension Side Stress Ratio, (treq/t)^2:	24.9% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876353*
Site Name: *352 S. MAIN ST, NEW TOV*
App #: *372112 Revision # 11*

Reactions		
Mu	686.92	ft-kips
Axial, Pu:	16.64	kips
Shear, Vu:	10.72	kips
Elevation:	60	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer: Rohn

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	18		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	47		

Plate Data		
Diam:	53	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.28	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

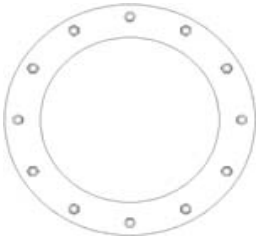
			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	38.05	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.535	in	
Min PL "treq" for actual **T w/ Pry**:	1.121	in	
Min PL "t1" for actual **T w/o Pry**:	1.484	in	
T allowable with Prying:	87.61	kips	0≤α'≤1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	38.05	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	34.3%	**Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Piroc OK	TIA G
Allowable Plate Stress:	32.4 ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc OK	Comp. Y.L. Length:
No Prying		30.22
Tension Side Stress Ratio, (treq/t)^2:	31.4% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876353*
Site Name: *352 S. MAIN ST, NEW TOV*
App #: *372112 Revision # 11*

Reactions		
Mu	1034.72	ft-kips
Axial, Pu:	23.07	kips
Shear, Vu:	12.44	kips
Elevation:	30	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Rohn

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	18		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	47		

Plate Data		
Diam:	53	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.33	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

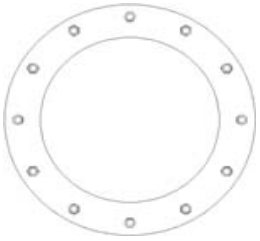
			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	57.43	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.424	in	
Min PL "treq" for actual **T w/ Pry**:	0.766	in	
Min PL "t1" for actual **T w/o Pry**:	1.024	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	57.43	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	51.7%	**Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Piroc OK	TIA G
Allowable Plate Stress:	32.4 ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc OK	Comp. Y.L. Length:
No Prying		21.10
Tension Side Stress Ratio, (treq/t)^2:	14.7% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

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

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

Site Data	
BU#:	*876353*
Site Name:	*352 S. MAIN ST, NEW TOWN, CT,*
App #:	*372112 Revision # 11*
Pole Manufacturer:	*Rohn*

Reactions		
Mu:	1428	ft-kips
Axial, Pu:	32	kips
Shear, Vu:	14	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	18	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ή):	84.3 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	141.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	59.8% **Pass**	

Plate Data		
Diam:	53	in
Thick:	2	in
Grade:	50	ksi
Single-Rod B-eff:	7.33	in

Base Plate Results

		Rigid
Flexural Check		AISC LRFD
Base Plate Stress:	Rohn/Pirod, OK	φ*Fy
Allowable Plate Stress:	45.0 ksi	Y.L. Length:
Base Plate Stress Ratio:	Rohn/Pirod, OK	21.10

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

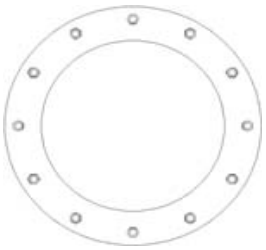
Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Diam:	42	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

PROJECT	**111217.003.01 - 352 S. MAIN ST, NEW TOWN, CT, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**05-20-17**	PAGE	1	OF	1

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

Monopole Pad & Pier Foundation Analysis

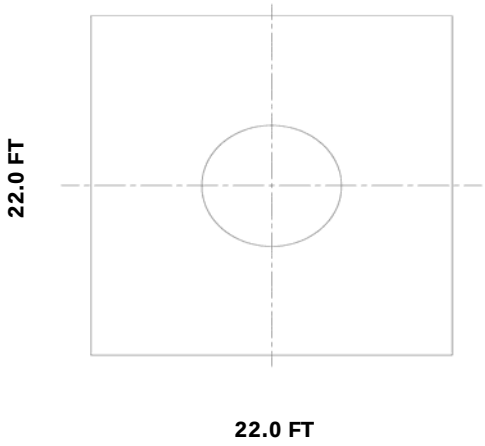
Rev. Type: G

Design Loads:

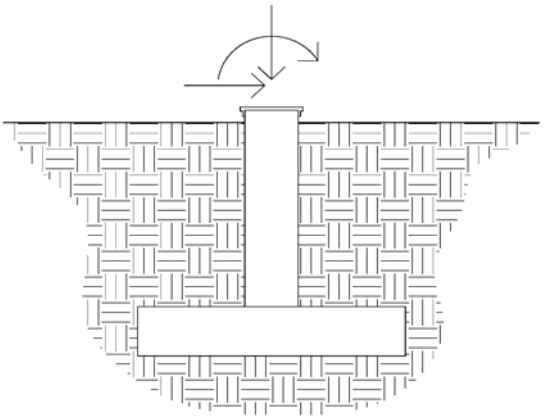
	Input factored loads	
Shear:	14.0	kips
Moment:	1,428.0	ft-kips
Tower Height:	150.0	ft
Tower Weight:	32.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	42.00	in
Bearing Depth:	5.5	ft
Pad Width:	22.0	ft
Neglected Depth:	4.0	ft
Thickness:	6.0	ft
Pier Diameter:	0.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pad Rebar Size:	8	
Pad Rebar Quanity:	23	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.1136	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.080	kcf
Ult. Bearing Capacity:	4.000	ksf
Angle of Friction:	35.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

Summary of Results

Overturning	57.0%
Shear Capacity	18.1%
Bearing	47.8%
Pad Shear - 1-way	10.7%
Pad Shear - 2-way	1.3%
Pad Moment Capacity	15.4%

** Notes:

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11216B

Monroe-2/Rt-25
352 S. Main Street
Newtown, CT 06470

April 17, 2017

EBI Project Number: 6217001579

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	1.25 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

April 17, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11216B – Monroe-2/Rt-25**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **352 S. Main Street, Newtown, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **352 S. Main Street, Newtown, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

4) Since all radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 0.76 dB of additional cable loss for all ground mounted 700 MHz Channels and 1.35 dB of additional cable loss for all ground mounted 1900 MHz channels were factored into the calculations used for this analysis. This is based on manufacturers Specifications for 135 feet of 1-5/8" coax cable on each path.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **RFS APXV18-206513-C-A20** for 1900 MHz (PCS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APXV18-206513-C-A20** has a maximum gain of **12.6 dBd** at its main lobe at 1900 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **135 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

10) All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV18-206513-C-A20	Make / Model:	RFS APXV18-206513-C-A20	Make / Model:	RFS APXV18-206513-C-A20
Gain:	12.6 dBd	Gain:	12.6 dBd	Gain:	12.6 dBd
Height (AGL):	135	Height (AGL):	135	Height (AGL):	135
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	2,400.34	ERP (W):	2,400.34	ERP (W):	2,400.34
Antenna A1 MPE%	0.52	Antenna B1 MPE%	0.52	Antenna C1 MPE%	0.52
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	135	Height (AGL):	135	Height (AGL):	135
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	726.31	ERP (W):	726.31	ERP (W):	726.31
Antenna A2 MPE%	0.34	Antenna B2 MPE%	0.34	Antenna C2 MPE%	0.34

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**0.85 %**
Sprint	0.40 %
Town (receive Only)	0.00 %
Site Total MPE %:	**1.25 %**

T-Mobile Sector A Total:	0.85 %
T-Mobile Sector B Total:	0.85 %
T-Mobile Sector C Total:	0.85 %
Site Total:	1.25 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	800.11	135	3.46	PCS - 1900 MHz	1000	0.35%
T-Mobile PCS - 1900 MHz GSM	2	400.06	135	1.73	PCS - 1900 MHz	1000	0.17%
	1	726.31	135	1.57	700 MHz	467	0.34%
						Total*:	**0.85%**

*NOTE: Totals may vary by 0.01 percent due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	0.85 %
Sector B:	0.85 %
Sector C:	0.85 %
T-Mobile Per Sector Maximum:	0.85 %
Site Total:	1.25 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **1.25%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.