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

October 21, 2019

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

RE: **Notice of Exempt Modification for AT&T: 842865**
1593 Exeter Road, Lebanon, CT 06249
Latitude: 41° 37′ 40.53″ / Longitude: -72° 18′ 20.34″

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 119-foot mount on the existing 150-foot Monopole Tower, located at 1593 Exeter Road, Lebanon, CT. The tower is owned by Crown Castle and the property is owned by Mark Liebman & Susan Murray. AT&T now intends to replace six (6) existing antennas with six (6) new antennas. The new antennas will be installed at the 119-ft level of the tower.

The facility was approved by The Connecticut Siting Council on October 29, 2003 in Docket No. 257. This approval was given with conditions which this proposed exempt modification complies with.

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.C.S.A. § 16-50j-73, a copy of this letter is being sent to Betsy Petrie, First Selectman for the Town of Lebanon, Philip Chester, Town Planner, Crown Castle as the tower owner, and the property owners.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

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

Attachments
cc:

Betsy Petrie, First Selectman
Town of Lebanon
Town Hall – Selectman's Office
579 Exeter Road
Lebanon, CT 06249
860-642-6100

Philip Chester, Town Planner
Town of Lebanon
Town Hall – Planning Department
579 Exeter Road
Lebanon, CT 06249
860-642-2006

Mark Liebman & Susan Murray, Property Owner
1629 Exeter Road
Lebanon, CT 06249

Crown Castle, Tower Owner

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE

ROCHESTER, NY 14618
UNITED STATES US

SHIP DATE: 21OCT19
ACTWGT: 3.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
(860) 827-2951 REF: 1765.6680
INV:
PO: DEPT:

567J3/2A3C/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7767 6924 4710**

TUE - 22 OCT 10:30A
PRIORITY OVERNIGHT

XE BDLA

06051
BDL
CT-US

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Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE

ROCHESTER, NY 14618
UNITED STATES US

SHIP DATE: 21OCT19
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **BETSY PETRIE, FIRST SELECTMAN**
TOWN OF LEBANON
TOWN HALL - MAIN FL - SELECTMAN'S
579 EXETER ROAD
LEBANON CT 06249
(860) 642-6100 REF: 1734.7680
INV:
PO: DEPT:

567J3/2A3C/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7767 6926 9541**

TUE - 22 OCT 12:00P
PRIORITY OVERNIGHT

XE SKKA

06249
CT-US **BDL**

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ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE

ROCHESTER, NY 14618
UNITED STATES US

SHIP DATE: 21OCT19
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **PHILIP CHESTER, TOWN PLANNER**
TOWN OF LEBANON
TOWN HALL - PLANNING DEPT
579 EXETER ROAD
LEBANON CT 06249
(860) 642-2006 REF: 1734.7680
INV:
PO: DEPT:

567J3/2A3C/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7767 6930 3530**

TUE - 22 OCT 12:00P
PRIORITY OVERNIGHT

XE SKKA

06249
CT-US **BDL**

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ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE

ROCHESTER, NY 14618
UNITED STATES US

SHIP DATE: 21OCT19
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **MARK LIEBMAN & SUSAN MURRAY**
1629 EXETER ROAD

LEBANON CT 06249
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

567J3/2A3C/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7767 6933 9699**

TUE - 22 OCT 12:00P
PRIORITY OVERNIGHT

XE SKKA

06249
CT-US **BDL**

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Exhibit A

Original Facility Approval

Filing Guides
Meetings & Minutes
Public Participation
Audio Link to New Britain Hearing Rooms
Programs & Services
Telecommunications Database
Maps
Publications
Other Resources
Statutes & Regulations
Electric Transmission Upgrade Projects
Frequently Asked Questions

Melanie Bachman,
Executive Director

Decisions

Printable Version

DOCKET NO. 257 - AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 1593 Exeter Road or one of two sites on Levita Road, Lebanon, Connecticut.	Connecticut Siting Council October 29, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS d/b/a AT&T Wireless for the construction, maintenance and operation of a wireless telecommunications facility at Site A, 1593 Exeter Road, Lebanon, Connecticut. The Council denies certification of Sites B and C, both located at the Botticello Property, Levita Road, Lebanon, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless PCS, LLC and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level.

2. The tower foundation shall be of sufficient capacity to support a monopole extension to 150 feet above ground level.

3. Panel antennas shall be installed on the monopole using a flush mount or T-arm mount design.

4. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
   a) a detailed site development plan that depicts the location of the access road, compound, tower, utility line, erosion and sedimentation control features, and landscaping;
   b) specifications for the tower, tower foundation, antennas, equipment building, and security fence; and
   c) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

5. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

6. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

8. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

9. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and ceases to function.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant, and the Norwich Bulletin.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant
AT&T Wireless PCS, LLC
d/b/a AT&T Wireless

Its Representative
Christopher B. Fisher, Esq.
Cuddy & Feder LLP
90 Maple Avenue
White Plains, New York 10601
(914) 761-1300

Content Last Modified on 12/3/2003 11:33:42 AM

Exhibit B

Property Card

1699 EXETER RD

Location 1699 EXETER RD
Mblu 242/ / 15/ /
Acct# L0096950
Owner LIEBMAN LEON MARK &
Assessment $167,270
PID 2422
Building Count 1

Current Value

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$57,850	$109,420	$167,270

Owner of Record

Owner LIEBMAN LEON MARK &
Co-Owner MURRAY SUSAN ANN
Address 1629 EXETER RD
LEBANON, CT 06249

Sale Price $0
Certificate
Book & Page 297/ 682
Sale Date 03/21/2016
Instrument 31

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
LIEBMAN LEON MARK &	$0		297/ 682	31	03/21/2016
LIEBMAN LEON M &	$0		291/1098	31	11/05/2014
LIEBMAN FLORENCE	$0		280/ 906	25	10/19/2012
LIEBMAN HAROLD & FLORENCE	$0		0067/0384	29	02/14/1997

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**

Style	Vacant Land
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:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Kitchens	
Insulated	
Fireplaces	
Gas Fireplaces	

Building Photo

(http://images.vgsi.com/photos/LebanonCTPhotos//\00\01\22/11

Building Layout

(http://images.vgsi.com/photos/LebanonCTPhotos//Sketches/242

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

Use Code	431V
Description	CELL TOWR MDL-00
Zone	RA
Neighborhood	
Alt Land Appr	No

Land Line Valuation

Size (Acres)	10.06
Frontage	0
Depth	0
Assessed Value	$109,420

Category

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN3	FENCE-6' CHAIN			320 L.F.	$2,020	1
TW2	CELL TOWER			120 HEIGHT	$78,120	1
SHD1	SHED FRAME			240 S.F.	$2,520	1

Valuation History

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$57,850	$109,420	$167,270
2017	$60,100	$108,650	$168,750
2016	$60,100	$108,650	$168,750


1593 Exeter Road
Meadow Ridge Dr
207
Willimantic River
Lake Williams Campground Association, Inc
Exeter Rd
Lakewood Dr
Old Colchester Rd
Botticello's Used Auto & Truck
Levita Rd

Exhibit C

Construction Drawings

AT&T

AT&T SITE NUMBER:	**CT5747**
AT&T SITE NAME:	**LEBANON WEST**
AT&T FA CODE:	**10071090**
SITE TYPE:	**MONOPOLE**
BUSINESS UNIT #:	**842865**
SITE ADDRESS:	**1593 EXETER ROAD LEBANON, CT 06249**
COUNTY:	**NEW LONDON**
TOWER HEIGHT:	**149'-0"**

PROJECT: AT&T 4TX4RX, LTE 2C, LTE 3C, LTE 4C, LTE 5C
PACE NUMBER: MRCTB041561, MRCTB041372, MRCTB041392, MRCTB041783, MRCTB041623

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	LEBANON WEST
SITE ADDRESS:	1593 EXETER ROAD LEBANON, CT 06249
COUNTY:	NEW LONDON
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.6275919
LONGITUDE:	-72.3057989
LAT/LONG TYPE:	NAD83
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	AT&T MOBILITY ONE AT&T WAY BEDMINSTER, NJ 07921
CROWN CASTLE USA INC. APPLICATION ID:	492779

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 SOUTH BOULDER, SUITE 300 TULSA, OK 74119 MIKE OAKES (918) 217-8574
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3200 HORIZON SRIVE, SUITE 150 KING OF PRUSSIA, PA 19406

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN
C-2	EQUIPMENT PLAN
C-3	TOWER ELEVATIONS
C-4	ANTENNA ORIENTATION
C-5	ANTENNA SCHEDULE
C-6	ANTENNA AND RRH SPECS.
C-7	ANTENNA AND RRH DETAIL
C-8	ALPHA PLUMBING DIAGRAM
C-9	BETA PLUMBING DIAGRAM
C-10	GAMMA PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

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

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO PROPOSE AN ANTENNA MODIFICATION ON AN EXISTING WIRELESS SITE.

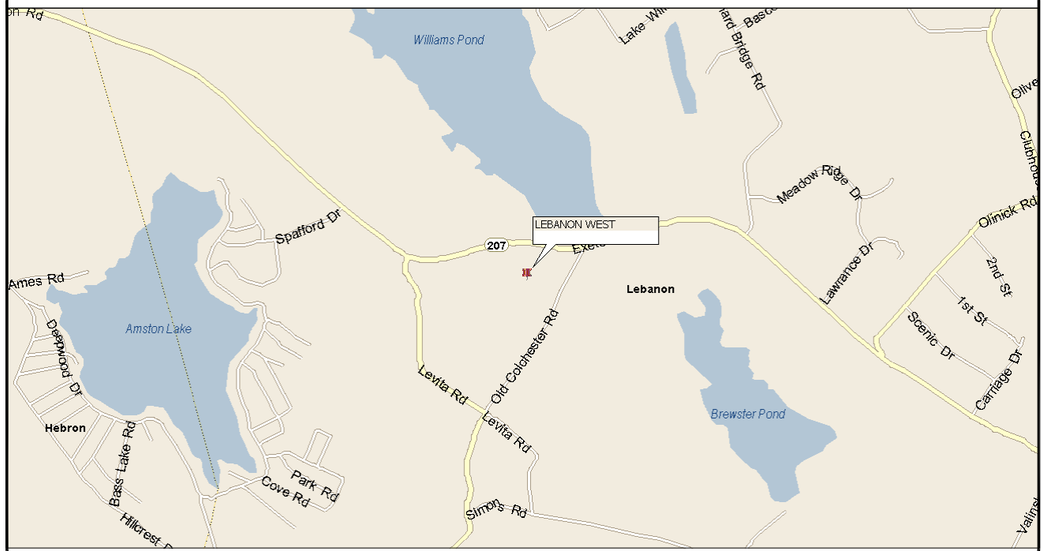
TOWER SCOPE OF WORK

- REMOVE (3) KMW AM-X-CD-17-65-00T-RET ANTENNAS
- REMOVE (3) POWERWAVE 7770 ANTENNA
- REMOVE (3) POWERWAVE LGP 21901 TMAS
- REMOVE (3) ERICSSON RRUS11 B12 RRH
- REMOVE (12) LGP21901 DIPLEXERS.
- INSTALL OF H-FRAME FOR GROUND RADIOS AND LBC
- INSTALL (3) CCI DMP65R-BU8DA ANTENNA
- INSTALL (3) CCI HP-65R-BU8AA ANTENNA
- INSTALL (3) ERICSSON 4449 B5/B12 RRH
- INSTALL (3) 8843 B2/B66A RRH.
- INSTALL (2) ERICSSON 4478 B14 RRH MOUNTED ON H-FRAME.
- INSTALL (1) OUTDOOR DC12.
- INSTALL (1) FIBER MAGAGEMENT BOX.
- INSTALL (3) LBC DBCT108F1V92-1.

DESIGN PACKAGE BASED ON THE RFDS
REVISION: FINAL
DATE: 10/14/19

DESIGN PACKAGE BASED ON THE APPLICATION
ID: 492779
REVISION: 0

LOCATION MAP



NO SCALE

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	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION SEPTEMBER 4, 2019

MOUNT ANALYSIS: TOWER ENGINEERING PROFESSIONALS AUGUST 28, 2019

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!

AT&T
ONE AT&T WAY
BEDMINSTER, NJ 07921

CROWN CASTLE
3200 HORIZON DRIVE, SUITE 150
KING OF PRUSSIA, PA 19406

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER:
CT5747

BU #: **842865**
LEBANON WEST

1593 EXETER ROAD
LEBANON, CT 06249

EXISTING 149'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/26/19	SMM	CONSTRUCTION	MDW
1	9/27/19	SMM	CONSTRUCTION	MDW
2	10/17/19	SMM	CONSTRUCTION	MDW

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
10/17/19

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER: T-1
REVISION: 2

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 USA INC. 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/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

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-	AT&T
TOWER OWNER-	CROWN CASTLE USA INC.
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 USA INC.
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 USA INC. 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
EXISTING	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:

- SOLID GROUND BUS BAR
- 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
- 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 USA INC.
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 "AT&T".
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 OR PURPLE
	PHASE C	YELLOW

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

AT&T
ONE AT&T WAY
BEDMINSTER, NJ 07921

CROWN CASTLE
3200 HORIZON DRIVE, SUITE 150
KING OF PRUSSIA, PA 19406

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER:
CT5747

BU #: **842865**
LEBANON WEST

1593 EXETER ROAD
LEBANON, CT 06249

EXISTING 149'-0"
MONOPOLE

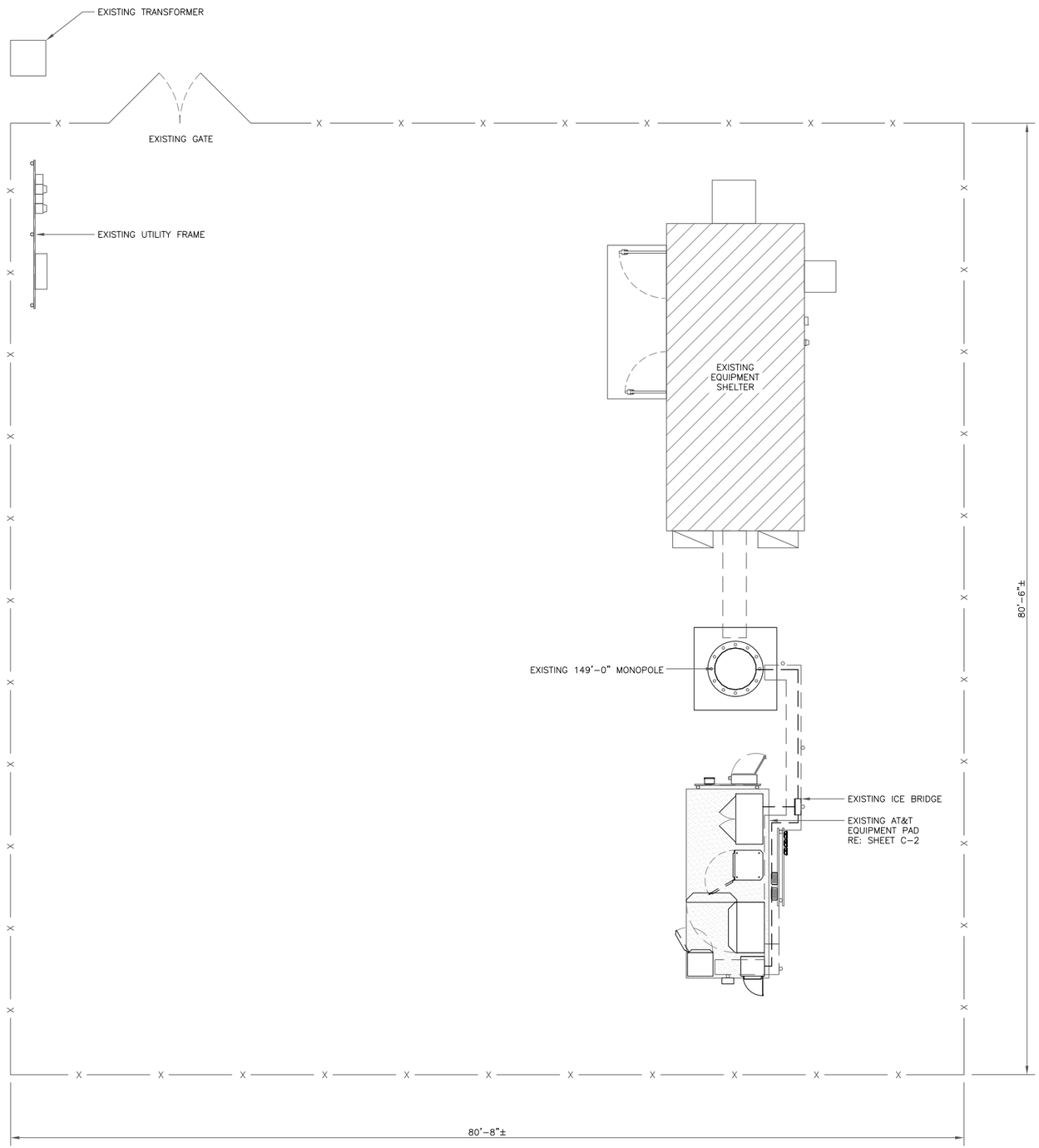
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/26/19	SMM	CONSTRUCTION	MDW
1	9/27/19	SMM	CONSTRUCTION	MDW
2	10/17/19	SMM	CONSTRUCTION	MDW

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
10/17/19

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER: T-2
REVISION: 2



1 SITE PLAN
SCALE: 4' 2' 0 4' 3/16"=1'-0" (FULL SIZE) 3/32"=1'-0" (11x17)

N

AT&T
ONE AT&T WAY
BEDMINSTER, NJ 07921

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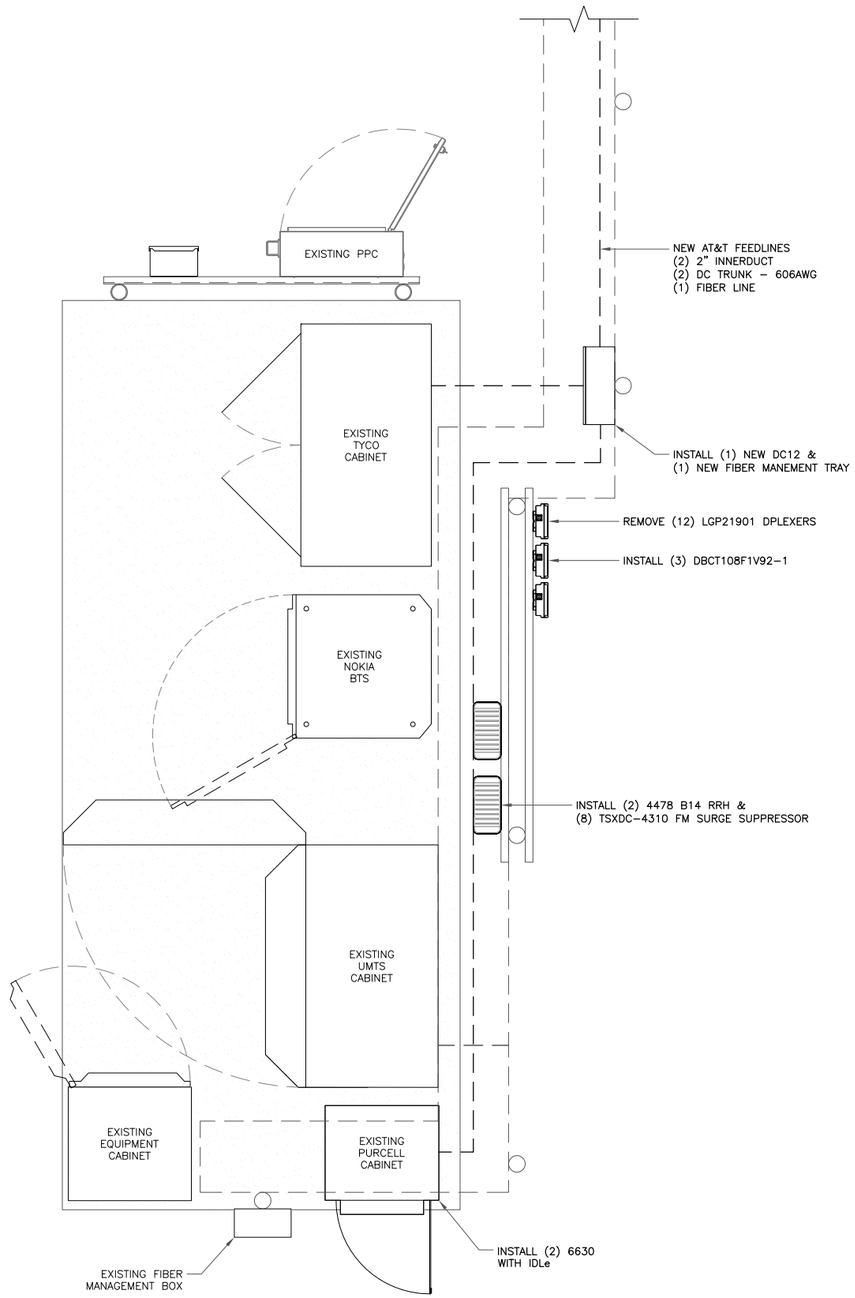
PROFESSIONAL ENGINEER
10/17/19

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER: C-1
REVISION: 2



1 EXISTING EQUIPMENT PLAN

SCALE: 1' 6" 0 1' 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

N

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10/17/19

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER: C-2

REVISION: 2

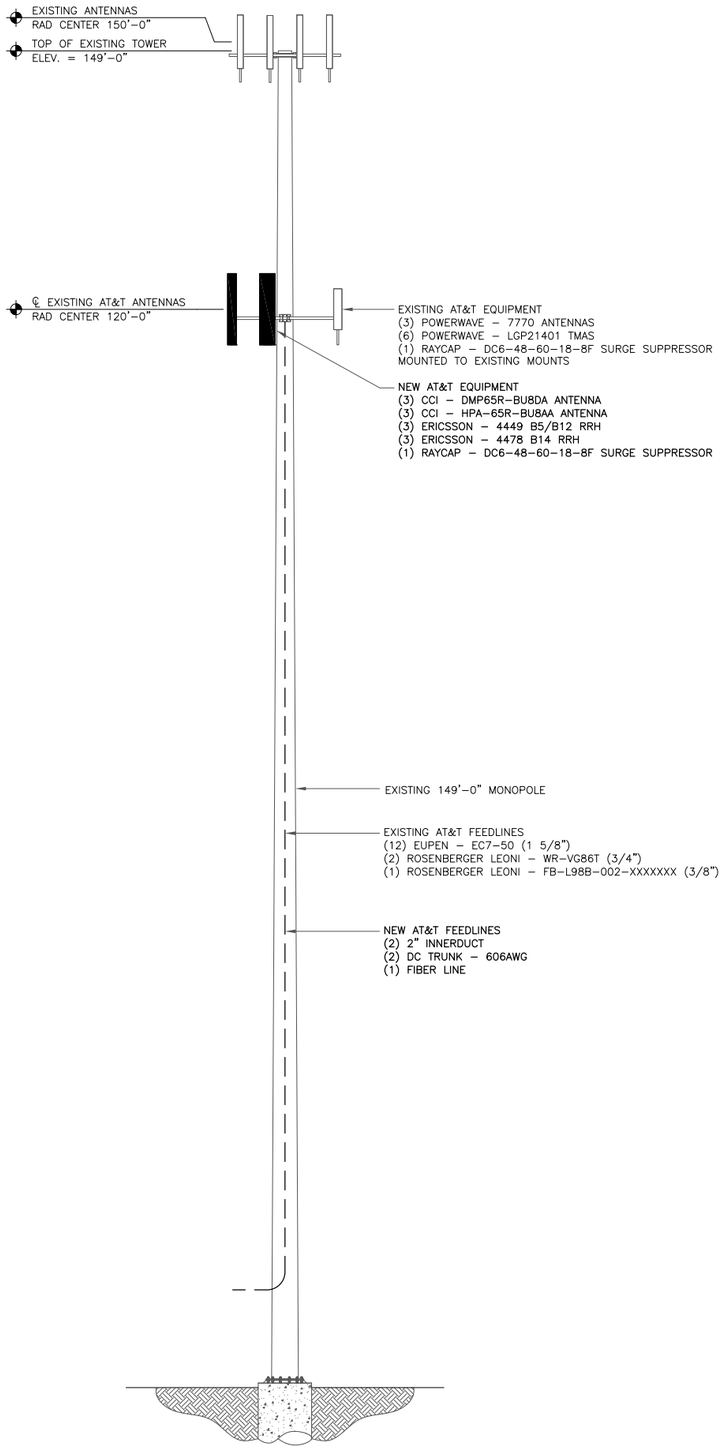
AT&T EQUIPMENT

ANTENNA CL: 120'-0"
MOUNT CL: 119'-0"

1 EXISTING ELEVATION
SCALE: NOT TO SCALE

AT&T EQUIPMENT

ANTENNA CL: 120'-0"
MOUNT CL: 119'-0"



2 FINAL ELEVATION
SCALE: NOT TO SCALE

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ONE AT&T WAY
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10/17/19

B&T ENGINEERING, INC.
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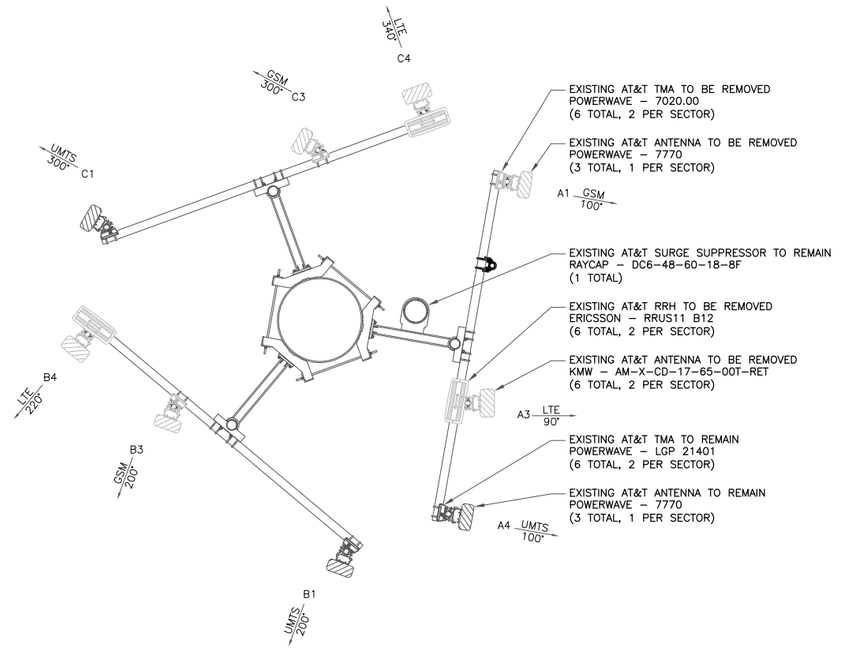
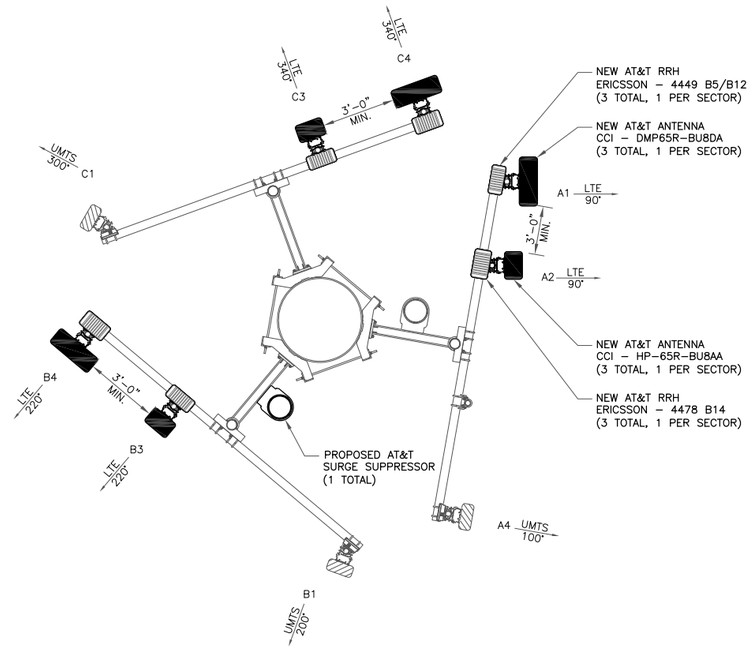
SHEET NUMBER: C-3

REVISION: 2



1 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

N



2 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

N

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BEDMINSTER, NJ 07921

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B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER:
CT5747

BU #: **842865**
LEBANON WEST

1593 EXETER ROAD
LEBANON, CT 06249

EXISTING 149'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/26/19	SMM	CONSTRUCTION	MDW
1	9/27/19	SMM	CONSTRUCTION	MDW
2	10/17/19	SMM	CONSTRUCTION	MDW

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SHEET NUMBER: C-4
REVISION: 2

FINAL ANTENNA AND COAXIAL CABLE SCHEDULE

POS.	TECH	STATUS	AZIMUTH	ANTENNA TYPE	ANTENNA RAD CENTER	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	MAIN COAX SIZE	MAIN COAX LENGTH	COAX QTY	TMA QTY AND MODEL	RAYCAP	DC (WR-VG86ST-BRD) FIBER CABLES (FB-L98B-034-XXXXXX)	RRHs QTY ON TOWER	RRHs ON GROUND	DIPLEXER ON TOWER	DIPLEXER ON GROUND	RET CABLE
ALPHA SECTOR																		
A1	LTE B5/B12	NEW	90°	CCI DMP65R-BU8DA	120'-0"	0°	0°/2°/2°/2°/2°	–	150'-0"	–	–	DC6-48-60-18-8F	(1) FIBER (2) DC LINES	(1) 4449 B5/B12	–	–	–	–
A2	LTE B2/B66A	NEW	90°	CCI HPA-65R-BU8AA	120'-0"	0°	2°/2°/2°	(2) 1 1/4"	150'-0"	–	–			(1) 8843 B2/B66A	(2) 4478 B14	–	2	–
A3	–	–	–	–	–	–	–	–	–	–	–			–	–	–	–	–
A4	UMTS	EXISTING	100°	POWERWAVE 7770	120'-0"	0°	4°/2°	(2) 1 1/4"	150'-0"	2	LGP 21401			–	–	–	–	–
BETA SECTOR																		
B1	UMTS	EXISTING	200°	POWERWAVE 7770	120'-0"	0°	4°/2°	(2) 1 1/4"	150'-0"	2	LGP 21401	PROPOSED DC6-48-60-18-8F	PROPOSED (1) FIBER (2) DC LINES	–	–	–	–	–
B2	–	–	–	–	–	–	–	–	–	–	–			–	–	–	–	–
B3	LTE B2/B66A	NEW	220°	CCI HPA-65R-BU8AA	120'-0"	0°	2°/2°/2°	(2) 1 1/4"	150'-0"	–	–			(1) 8843 B2/B66A	(2) 4478 B14	–	2	–
B4	LTE B5/B12	NEW	220°	CCI DMP65R-BU8DA	120'-0"	0°	0°/2°/2°/2°/2°	–	150'-0"	–	–			(1) 4449 B5/B12	–	–	–	–
GAMMA SECTOR																		
C1	UMTS	EXISTING	300°	POWERWAVE 7770	120'-0"	0°	4°/2°	(2) 1 1/4"	150'-0"	2	LGP 21401	–	–	–	–	–	–	–
C2	–	–	–	–	–	–	–	–	–	–	–			–	–	–	–	–
C3	LTE B2/B66A	NEW	340°	CCI HPA-65R-BU8AA	120'-0"	0°	2°/2°/2°	(2) 1 1/4"	150'-0"	–	–			(1) 8843 B2/B66A	(2) 4478 B14	–	2	–
C4	LTE B5/B12	NEW	340°	CCI DMP65R-BU8DA	120'-0"	0°	0°/2°/2°/2°/2°	–	150'-0"	–	–			(1) 4449 B5/B12	–	–	–	–

NOTE: BOLD DENOTES NEW EQUIPMENT

1 FINAL ANTENNA AND COAXIAL CABLE SCHEDULE
SCALE: NOT TO SCALE

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BU #: **842865**
LEBANON WEST

1593 EXETER ROAD
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EXISTING 149'-0"
MONOPOLE

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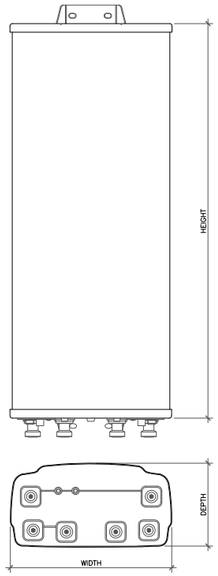
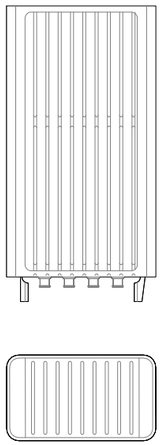
SHEET NUMBER: C-5

REVISION: 2



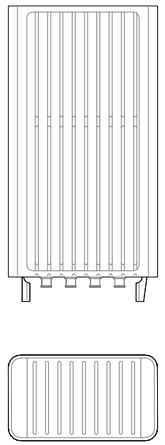
ANTENNA DIMENSIONS (INCHES)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
DMP65R-BU8D	96"	20.7"	7.7"	95.7 lbs
HPA65R-BU8A	96"	11.7"	7.6"	54.0 lbs

1 ANTENNA DETAIL
SCALE: NOT TO SCALE



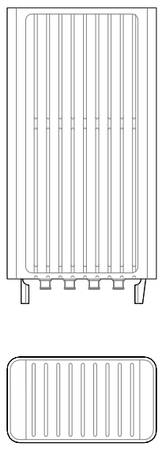
ERICSSON – 4449 B5/B12
WEIGHT (FULLY EQUIPPED): 71.0 LBS
SIZE (HxWxD): 17.9x13.19x9.44 IN.

2 RRH DETAIL
SCALE: NOT TO SCALE



ERICSSON – 8843 B2/B66A
WEIGHT (FULLY EQUIPPED): 72.0 LBS
SIZE (HxWxD): 14.9x13.2x10.9 IN.

3 RRH DETAIL
SCALE: NOT TO SCALE



ERICSSON – 4478 B14
WEIGHT (FULLY EQUIPPED): 60.0 LBS
SIZE (HxWxD): 14.9x13.1x7.3 IN.

4 RRH DETAIL
SCALE: NOT TO SCALE

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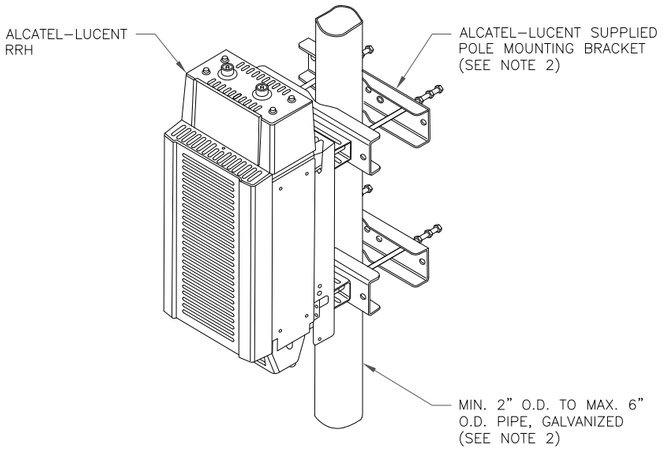
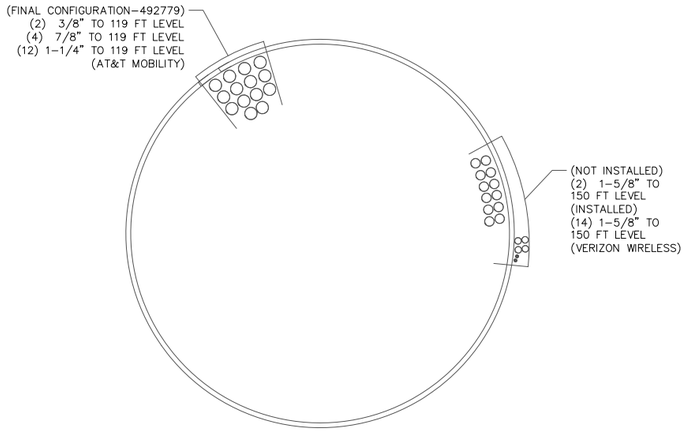
SHEET NUMBER: C-6
REVISION: 2

NOTES:

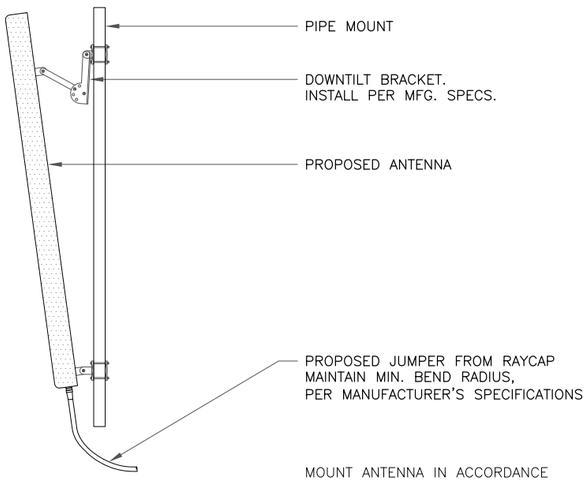
1. ALCATEL–LUCENT (ALU) VIA AT&T SUPPLIES RRH, RRH POLE–MOUNTING BRACKET. SUBCONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ALU RRH POLE–MOUNTING BRACKET. ALU INSTALLS RRH AND MAKES CABLE TERMINATIONS.
2. FOR POLE DIAMETERS FROM 6" TO 15", ALCATEL–LUCENT CAN SUPPLY A PAIR OF POLE MOUNTING METAL BANDS WITH BOLTING WELDMENT.
3. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED
4. 8" MIN. SEPARATION BETWEEN RRH AND BACK OF ANTENNA



1 RRH MOUNTING DETAIL
SCALE: NOT TO SCALE



2 BASE LEVEL DRAWING
SCALE: NOT TO SCALE



3 ANTENNA MOUNTING DETAIL
SCALE: NOT TO SCALE

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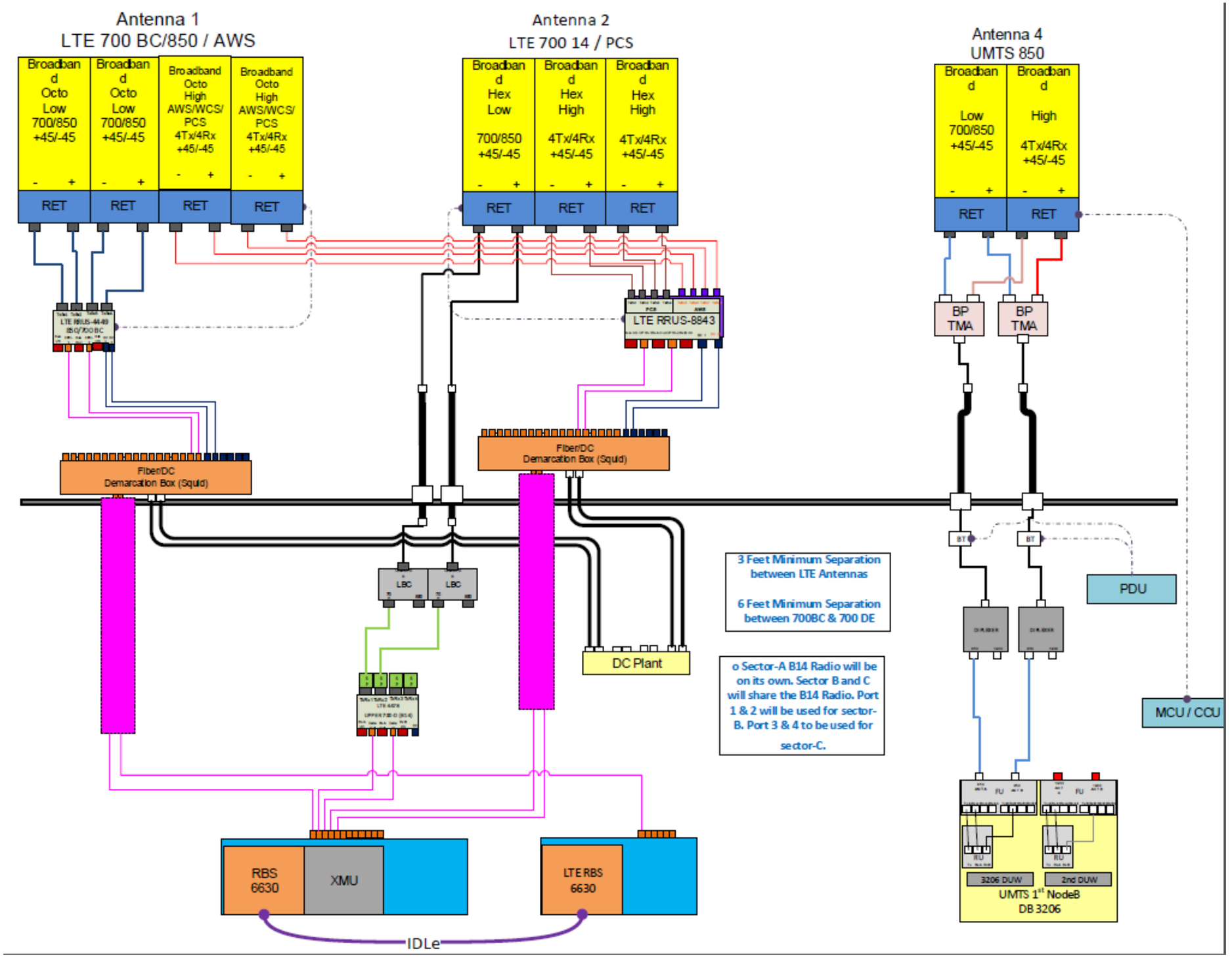
SHEET NUMBER: C-7
REVISION: 2



1 ALPHA PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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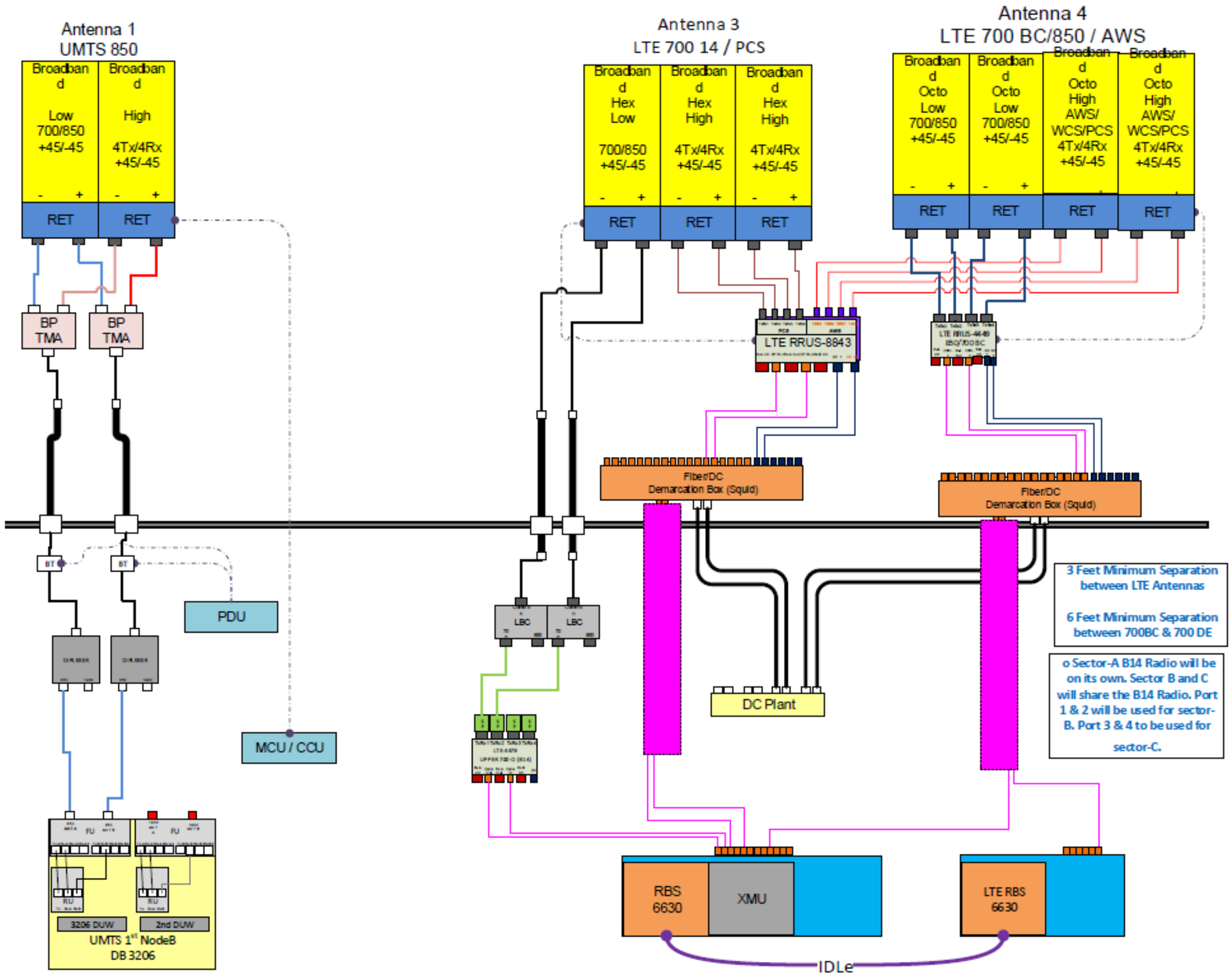
SHEET NUMBER: C-8
REVISION: 2



1 BETA PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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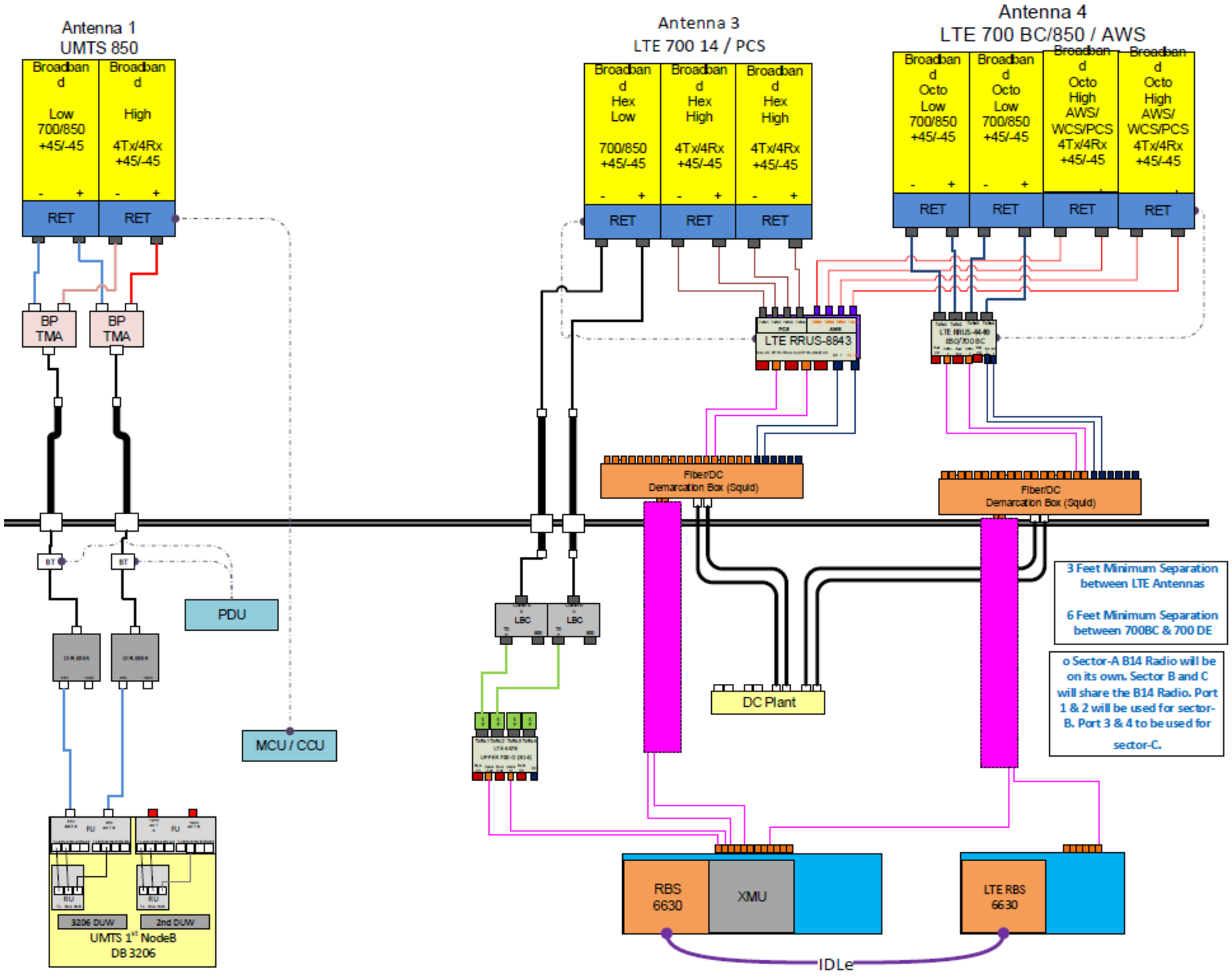
SHEET NUMBER: C-9
REVISION: 2



1 GAMMA PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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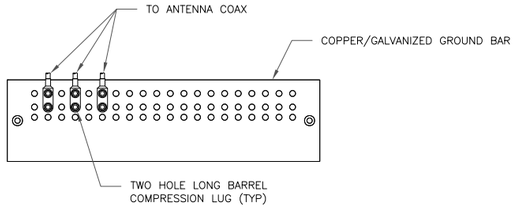
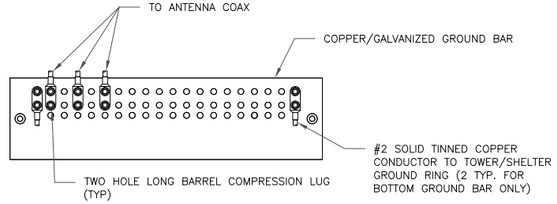
SHEET NUMBER: C-10
REVISION: 2



NOTES:

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

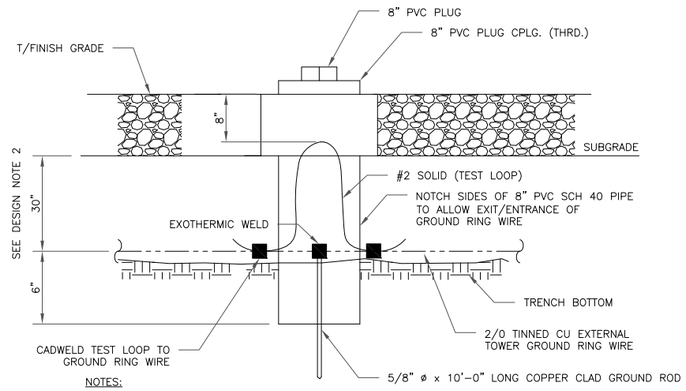
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

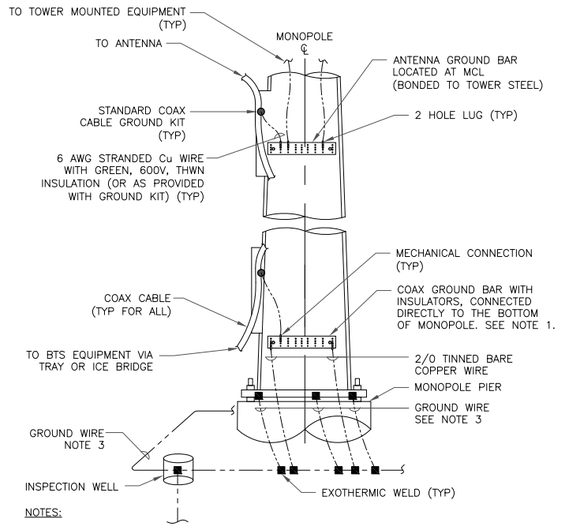
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

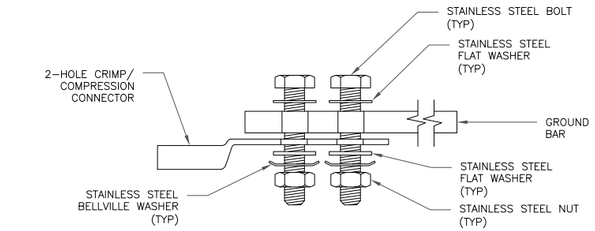
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



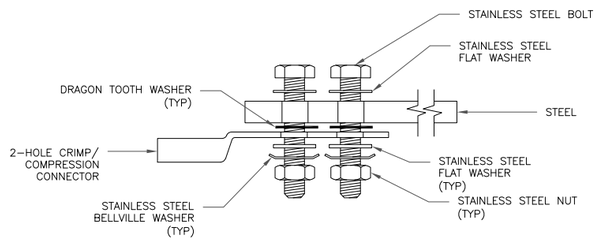
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. 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.

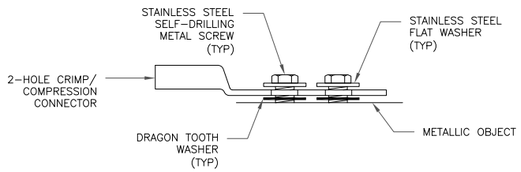
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

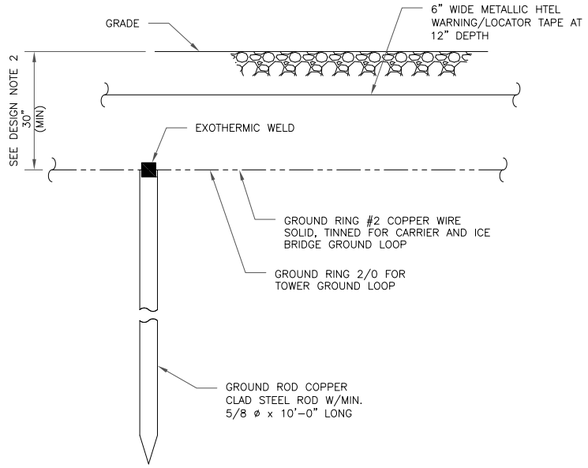


SINGLE CONNECTOR AT STEEL OBJECTS



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

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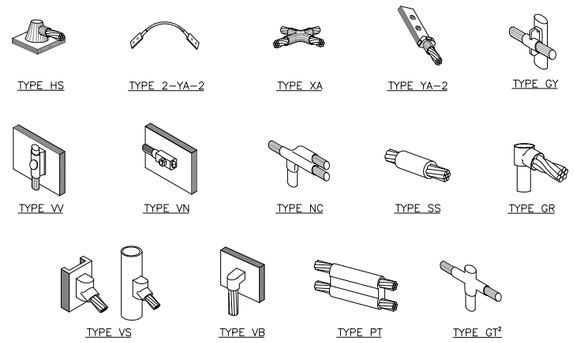
SHEET NUMBER: G-1
REVISION: 2

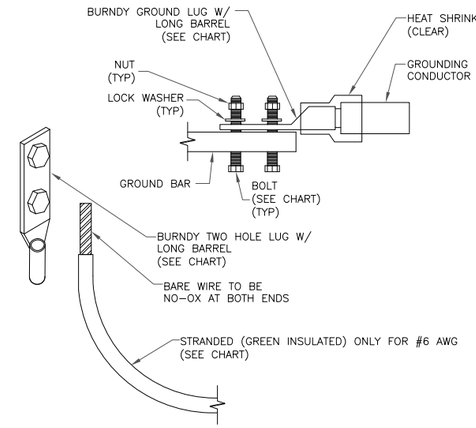


NOTE:

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

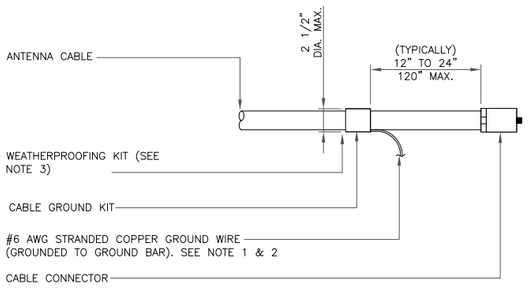
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



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.

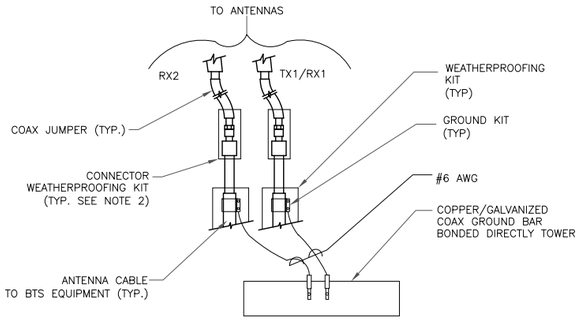
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



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.

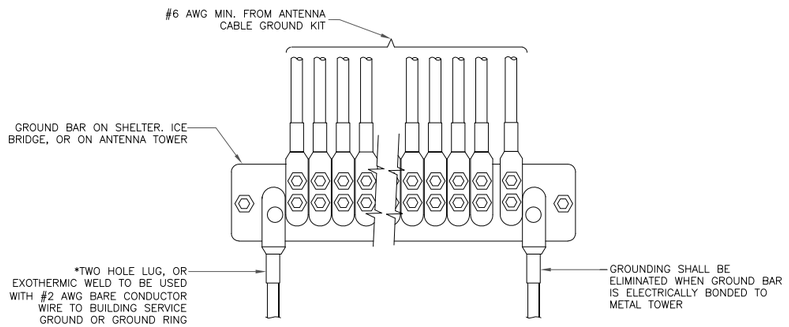
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



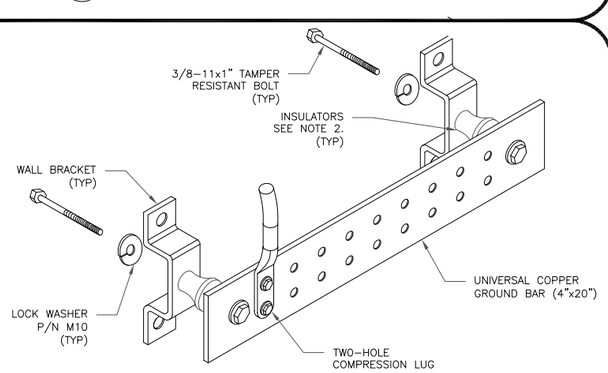
NOTES:

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



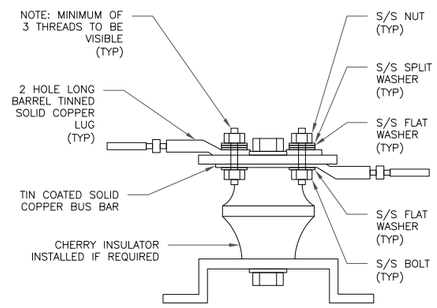
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



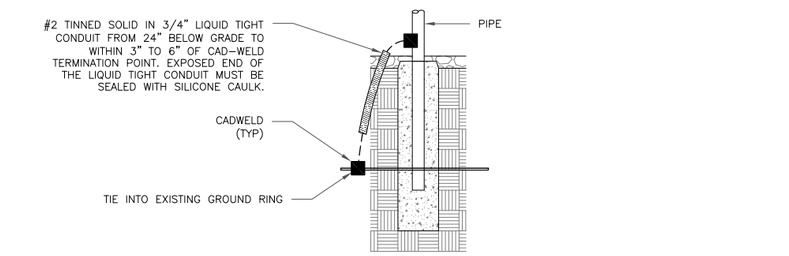
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. 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

AT&T
ONE AT&T WAY
BEDMINSTER, NJ 07921

CROWN CASTLE
3200 HORIZON DRIVE, SUITE 150
KING OF PRUSSIA, PA 19406

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER:
CT5747

BU #: **842865**
LEBANON WEST

1593 EXETER ROAD
LEBANON, CT 06249

EXISTING 149'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/26/19	SMM	CONSTRUCTION	MDW
1	9/27/19	SMM	CONSTRUCTION	MDW
2	10/17/19	SMM	CONSTRUCTION	MDW

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER: G-2
REVISION: 2

Exhibit D

Structural Analysis Report

Date: **September 4, 2019**

GPD Engineering and Architecture
Professional Corporation

Heather Simeone
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10071090
	Carrier Site Name:	Lebanon West
Crown Castle Designation:	**Crown Castle BU Number:**	842865
	Crown Castle Site Name:	LEBANON WEST
	Crown Castle JDE Job Number:	574646
	Crown Castle Work Order Number:	1783795
	Crown Castle Order Number:	492779 Rev. 0
Engineering Firm Designation:	**GPD Project Number:**	2019777.842865.01
Site Data:	**1593 Exeter Road, Lebanon, New London County, CT 06249**	
	Latitude *41° 37' 40.53"*, Longitude *-72° 18' 20.34"*	
	149.0 Foot – Modified EEI Monopole Tower	

Dear Heather Simeone,

We are pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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

LC5: Proposed Equipment Configuration **Sufficient Capacity – 61.4%**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Majd Alkacace

Respectfully submitted by:

Christopher J. Scheks P.E. 9/4/2019
Connecticut #: 0030026

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 149 ft monopole tower designed by Engineered Endeavors, Inc. in November of 2003. The tower was originally designed for a wind speed of 85 mph per TIA-222-F, and was mapped by FDH Velocitel in March of 2016.

The existing monopole has four major sections connected by slip joints at 49.0' and 84.5' and a flange at 120'. It has 18 sides and is evenly tapered from 51.0" (flat-flat) at the base to 19.5" (flat-flat) at the top. The structure is galvanized and has no tower lighting.

Modifications designed by GPD (Project #: 2010276.14, dated 12/28/2010) consist of installing a 30' tower extension from 119' to 149'. These modifications have been considered in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	120.0	3	CCI Antennas	DMP65R-BU8D	12 2 4	1-1/4 3/8 7/8
		3	CCI Antennas	HPA65R-BU8A		
		3	Powerwave Technologies	7770.00		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		6	Powerwave Technologies	LGP21401		
		1	Raycap	DC6-48-60-0-8C-EV		
		1	Raycap	DC6-48-60-18-8F		
	119.0	1	-	T-Arm Mount [TA 601-3]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	150.0	3	antel	BXA-70063/6CF	14	1-5/8
		6	antel	BXA-171063/12CF		
		3	antel	BXA-80063/6CF		
		3	alcatel lucent	RRH2X40-AWS		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		1	-	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	VN Engineers, Inc. Project #: 23-121G, Dated 11/5/2003	4713227	CCISITES
Tower Manufacturer Drawings	Engineered Endeavors Inc. Project #: 12092, Dated 11/6/2003	Dan Palkovic	GPD
Tower Design Calculations	Engineered Endeavors Inc. Project #: 12092, Dated 11/12/2003	Dan Palkovic	GPD
Tower Foundation Drawings/Design/Specs	Engineered Endeavors Inc. Project #: 12092, Dated 11/12/2003	4858940	CCISITES
Tower Mapping	FDHV project #: 16BBIN1500, Dated 3/3/2016	6126908	CCISITES
Tower Mod Drawing	GPD project #: 2010276.14, Dated 12/28/10	5588342	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	149 - 119	Pole	TP26.12x19.5x0.1875	1	-3.70	947.98	38.0	Pass
L2	119 - 82.11	Pole	TP34.268x26.12x0.25	2	-9.84	1606.60	58.7	Pass
L3	82.11 - 46.15	Pole	TP41.5831x32.7122x0.3125	3	-16.81	2438.83	61.1	Pass
L4	46.15 - 0	Pole	TP51x39.717x0.375	4	-31.09	3701.25	61.4	Pass
							Summary	
						Pole (L4)	61.4	Pass
						Rating =	61.4	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Plate	119	38.2	Pass
1,2	Flange Bolts	119	49.5	Pass
1,2	Anchor Rods	0	56.4	Pass
1,2	Base Plate	0	64.8	Pass
1,2	Base Foundation Structural	0	46.2	Pass
1,2	Base Foundation Soil Interaction	0	42.8	Pass

Structure Rating (max from all components) =	64.8%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H section 15.5.

4.1) Recommendations

The tower has sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

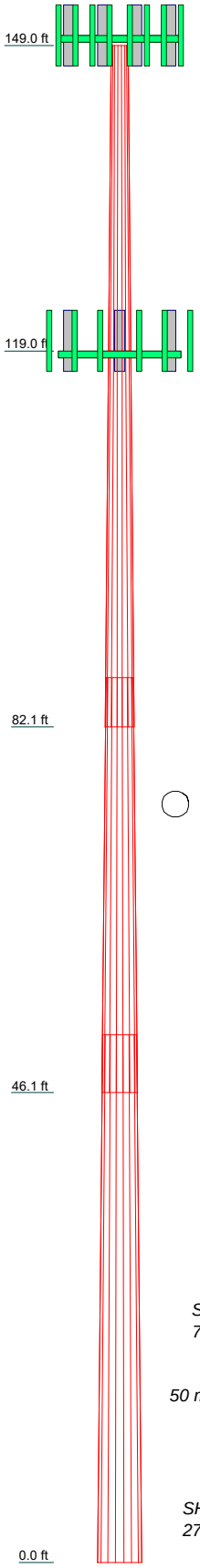
Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

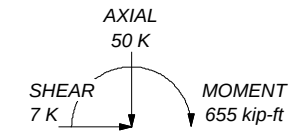
APPENDIX A

TNXTOWER OUTPUT

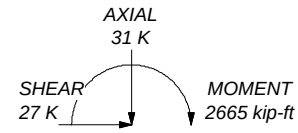
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	30.00	18	0.1875		19.5000	26.1200		1.4
2	36.89	18	0.2500	4.78	26.1200	34.2680		3.0
3	40.74	18	0.3125	5.70	32.7122	41.5831		5.1
4	51.85	18	0.3750		39.7170	51.0000		9.4
							A572-65	18.9



ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE



TORQUE 1 kip-ft
REACTIONS - 130 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

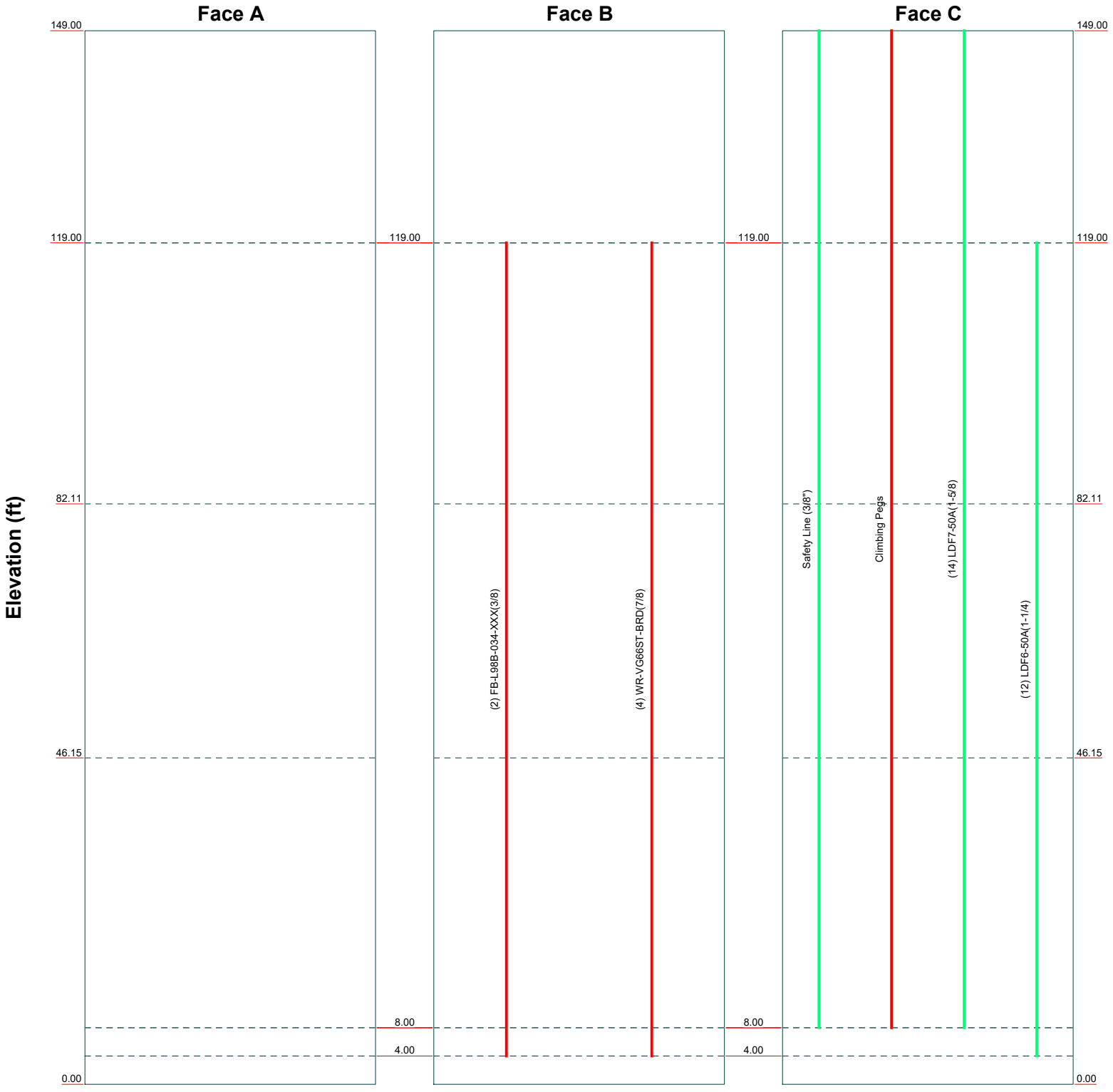
1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 61.4%

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: **BU #: 842865, LEBANON WEST**			
Project: **2019777.842865.01**			
Client: Crown Castle USA, Inc.	Drawn by: MAlkacace	App'd:	
Code: TIA-222-H	Date: 09/04/19	Scale: NTS	
Path: T:\Crown\842865\01\Rev.0\tnx\842865 tnx.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 149'

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



GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: ***BU #: 842865, LEBANON WEST***			
Project: ***2019777.842865.01***			
Client: Crown Castle USA, Inc.	Drawn by: MAlkacace	App'd:	
Code: TIA-222-H	Date: 09/04/19	Scale: NTS	
Path: T:\Crown\842865\01\Rev.0\tnx\842865 tnx.eri		Dwg No. E-7	

Tower Input Data

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

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 487.00 ft.
Basic wind speed of 130 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °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 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	149.00-119.00	30.00	0.00	18	19.5000	26.1200	0.1875	0.7500	A572-65 (65 ksi)
L2	119.00-82.11	36.89	4.78	18	26.1200	34.2680	0.2500	1.0000	A572-65 (65 ksi)
L3	82.11-46.15	40.74	5.70	18	32.7122	41.5831	0.3125	1.2500	A572-65 (65 ksi)
L4	46.15-0.00	51.85		18	39.7170	51.0000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.7719	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	26.4940	15.4331	1311.2298	9.2060	13.2690	98.8193	2624.1849	7.7180	4.2671	22.758
L2	26.4844	20.5278	1735.6960	9.1838	13.2690	130.8087	3473.6759	10.2659	4.1571	16.628
	34.7581	26.9933	3946.4873	12.0764	17.4081	226.7035	7898.1675	13.4992	5.5912	22.365
L3	34.2255	32.1365	4262.0494	11.5019	16.6178	256.4748	8529.7068	16.0713	5.2074	16.664
	42.1764	40.9353	8808.7999	14.6511	21.1242	417.0001	17629.1906	20.4715	6.7686	21.66
L4	41.5313	46.8268	9156.7989	13.9664	20.1762	453.8412	18325.6465	23.4178	6.3302	16.88
	51.7289	60.2564	19510.6056	17.9719	25.9080	753.0726	39046.8837	30.1339	8.3160	22.176

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 149.00-119.00				1	1	1			
L2 119.00-82.11				1	1	1			
L3 82.11-46.15				1	1	1			
L4 46.15-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Climbing Pegs	C	No	Surface Ar (CaAa)	149.00 - 8.00	1	1	0.000 0.000	0.1500		0.31
FB-L98B-034-XXX(3/8)	B	No	Surface Ar (CaAa)	119.00 - 4.00	2	2	0.200 0.200	0.0000		0.06
WR-VG66ST-BRD(7/8)	B	No	Surface Ar (CaAa)	119.00 - 4.00	4	2	0.180 0.190	0.9570		0.91

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line (3/8")	C	No	No	CaAa (Out Of Face)	149.00 - 8.00	1	No Ice	0.04	0.22
							1/2" Ice	0.14	0.75
							1" Ice	0.24	1.28
							2" Ice	0.44	2.34
LDF7-50A(1-5/8)	C	No	No	Inside Pole	149.00 - 8.00	14	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
LDF6-50A(1-1/4)	C	No	No	Inside Pole	119.00 - 4.00	12	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60

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	149.00-119.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.450	1.125	0.36
L2	119.00-82.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	7.061	0.000	0.14
		C	0.000	0.000	0.553	1.383	0.71
L3	82.11-46.15	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	6.883	0.000	0.14
		C	0.000	0.000	0.539	1.349	0.69
L4	46.15-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	8.068	0.000	0.16
		C	0.000	0.000	0.572	1.431	0.76

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	149.00-119.00	A	1.466	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	9.246	9.921	0.49
L2	119.00-82.11	A	1.424	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	35.098	0.000	0.47
		C		0.000	0.000	11.062	11.892	0.87
L3	82.11-46.15	A	1.362	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	34.213	0.000	0.46
		C		0.000	0.000	10.783	11.592	0.84
L4	46.15-0.00	A	1.231	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	38.785	0.000	0.51
		C		0.000	0.000	10.963	11.821	0.91

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	149.00-119.00	-0.2537	0.2645	-1.0065	1.6713
L2	119.00-82.11	1.2123	0.0444	1.8428	0.8907
L3	82.11-46.15	1.2233	0.0478	2.0099	0.9840
L4	46.15-0.00	1.1471	0.0220	2.0692	0.8312

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063/6CF w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.07 8.74 9.37 10.55	5.66 6.92 8.04 9.94	0.05 0.11 0.18 0.34
BXA-70063/6CF w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.07 8.74 9.37 10.55	5.66 6.92 8.04 9.94	0.05 0.11 0.18 0.34
BXA-70063/6CF w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.07 8.74 9.37 10.55	5.66 6.92 8.04 9.94	0.05 0.11 0.18 0.34
(2) BXA-171063/12CF w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	5.34 6.15 6.96 8.65	0.05 0.10 0.15 0.28
(2) BXA-171063/12CF w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	5.34 6.15 6.96 8.65	0.05 0.10 0.15 0.28
(2) BXA-171063/12CF w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	5.34 6.15 6.96 8.65	0.05 0.10 0.15 0.28
BXA-80063/6CF w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.60 8.05 8.51 9.45	5.19 6.12 6.93 8.60	0.04 0.09 0.16 0.31
BXA-80063/6CF w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.60 8.05 8.51 9.45	5.19 6.12 6.93 8.60	0.04 0.09 0.16 0.31
BXA-80063/6CF w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.60 8.05 8.51 9.45	5.19 6.12 6.93 8.60	0.04 0.09 0.16 0.31
RRH2X40-AWS	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.16 2.36 2.57 3.00	1.42 1.59 1.77 2.14	0.04 0.06 0.08 0.13

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
RRH2X40-AWS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.16 2.36 2.57 3.00	1.42 1.59 1.77 2.14	0.04 0.06 0.08 0.13
RRH2X40-AWS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.16 2.36 2.57 3.00	1.42 1.59 1.77 2.14	0.04 0.06 0.08 0.13
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
Platform Mount [LP 303-1]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 18.01 21.34 28.08	14.69 18.01 21.34 28.08	1.25 1.57 1.94 2.85
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.11 18.84 19.59 21.01	10.26 11.78 13.33 15.67	0.13 0.25 0.38 0.68
DMP65R-BU8D w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.11 18.84 19.59 21.01	10.26 11.78 13.33 15.67	0.13 0.25 0.38 0.68
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.11 18.84 19.59 21.01	10.26 11.78 13.33 15.67	0.13 0.25 0.38 0.68
HPA65R-BU8A w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.23 11.85 12.47 13.72	9.94 11.37 12.64 14.86	0.08 0.17 0.27 0.50
HPA65R-BU8A w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.23 11.85 12.47 13.72	9.94 11.37 12.64 14.86	0.08 0.17 0.27 0.50
HPA65R-BU8A w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.23 11.85 12.47 13.72	9.94 11.37 12.64 14.86	0.08 0.17 0.27 0.50
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.00	0.0000	119.00	No Ice	1.97	1.41	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	2.14	1.56	0.09
			1.00				1" Ice	2.33	1.73	0.11
							2" Ice	2.72	2.07	0.16
RRUS 4449 B5/B12	C	From Leg	4.00		0.0000	119.00	No Ice	1.97	1.41	0.07
			0.00				1/2" Ice	2.14	1.56	0.09
			1.00				1" Ice	2.33	1.73	0.11
							2" Ice	2.72	2.07	0.16
RRUS 8843 B2/B66A	A	From Leg	4.00		0.0000	119.00	No Ice	1.64	1.35	0.07
			0.00				1/2" Ice	1.80	1.50	0.09
			1.00				1" Ice	1.97	1.65	0.11
							2" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	B	From Leg	4.00		0.0000	119.00	No Ice	1.64	1.35	0.07
			0.00				1/2" Ice	1.80	1.50	0.09
			1.00				1" Ice	1.97	1.65	0.11
							2" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	C	From Leg	4.00		0.0000	119.00	No Ice	1.64	1.35	0.07
			0.00				1/2" Ice	1.80	1.50	0.09
			1.00				1" Ice	1.97	1.65	0.11
							2" Ice	2.32	1.99	0.16
(2) LGP21401	A	From Leg	4.00		0.0000	119.00	No Ice	1.10	0.35	0.01
			0.00				1/2" Ice	1.24	0.44	0.02
			1.00				1" Ice	1.38	0.54	0.03
							2" Ice	1.69	0.77	0.05
(2) LGP21401	B	From Leg	4.00		0.0000	119.00	No Ice	1.10	0.35	0.01
			0.00				1/2" Ice	1.24	0.44	0.02
			1.00				1" Ice	1.38	0.54	0.03
							2" Ice	1.69	0.77	0.05
(2) LGP21401	C	From Leg	4.00		0.0000	119.00	No Ice	1.10	0.35	0.01
			0.00				1/2" Ice	1.24	0.44	0.02
			1.00				1" Ice	1.38	0.54	0.03
							2" Ice	1.69	0.77	0.05
DC6-48-60-0-8C-EV	B	From Leg	4.00		0.0000	119.00	No Ice	2.74	4.79	0.03
			0.00				1/2" Ice	2.96	5.07	0.06
			1.00				1" Ice	3.20	5.35	0.10
							2" Ice	3.68	5.95	0.20
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	4.00		0.0000	119.00	No Ice	0.92	0.92	0.02
			0.00				1/2" Ice	1.46	1.46	0.04
			1.00				1" Ice	1.64	1.64	0.06
							2" Ice	2.04	2.04	0.11
5' x 2" Mount Pipe	A	From Leg	3.00		0.0000	119.00	No Ice	1.19	1.19	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.46	2.46	0.08
5' x 2" Mount Pipe	B	From Leg	3.00		0.0000	119.00	No Ice	1.19	1.19	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.46	2.46	0.08
5' x 2" Mount Pipe	C	From Leg	3.00		0.0000	119.00	No Ice	1.19	1.19	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.46	2.46	0.08
T-Arm Mount [TA 601-3]	C	None			0.0000	119.00	No Ice	12.56	12.56	0.73
							1/2" Ice	15.36	15.36	0.94
							1" Ice	18.04	18.04	1.21
							2" Ice	23.69	23.69	1.92

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 119	19.970	41	1.2383	0.0024
L2	119 - 82.11	12.644	41	1.0556	0.0015
L3	86.89 - 46.15	6.546	41	0.7358	0.0006
L4	51.85 - 0	2.278	41	0.4074	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	BXA-70063/6CF w/ Mount Pipe	41	19.970	1.2383	0.0024	33609
119.00	DMP65R-BU8D w/ Mount Pipe	41	12.644	1.0556	0.0015	5776

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 119	99.777	6	6.1904	0.0123
L2	119 - 82.11	63.198	6	5.2834	0.0076
L3	86.89 - 46.15	32.733	6	3.6822	0.0033
L4	51.85 - 0	11.393	6	2.0384	0.0013

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	BXA-70063/6CF w/ Mount Pipe	6	99.777	6.1904	0.0123	6908
119.00	DMP65R-BU8D w/ Mount Pipe	6	63.198	5.2834	0.0076	1183

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	149 - 119 (1)	TP26.12x19.5x0.1875	30.00	0.00	0.0	15.4331	-3.70	902.84	0.004
L2	119 - 82.11 (2)	TP34.268x26.12x0.25	36.89	0.00	0.0	26.1555	-9.84	1530.10	0.006
L3	82.11 - 46.15 (3)	TP41.5831x32.7122x0.3125	40.74	0.00	0.0	39.7042	-16.81	2322.70	0.007
L4	46.15 - 0 (4)	TP51x39.717x0.375	51.85	0.00	0.0	60.2564	-31.09	3525.00	0.009

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	149 - 119 (1)	TP26.12x19.5x0.1875	214.86	545.47	0.394	0.00	545.47	0.000
L2	119 - 82.11 (2)	TP34.268x26.12x0.25	728.13	1195.97	0.609	0.00	1195.97	0.000
L3	82.11 - 46.15 (3)	TP41.5831x32.7122x0.3125	1410.99	2227.10	0.634	0.00	2227.10	0.000
L4	46.15 - 0 (4)	TP51x39.717x0.375	2664.78	4195.52	0.635	0.00	4195.52	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	149 - 119 (1)	TP26.12x19.5x0.1875	8.33	270.85	0.031	0.10	615.11	0.000
L2	119 - 82.11 (2)	TP34.268x26.12x0.25	17.52	459.03	0.038	0.84	1325.07	0.001
L3	82.11 - 46.15 (3)	TP41.5831x32.7122x0.3125	21.43	696.81	0.031	0.84	2442.72	0.000
L4	46.15 - 0 (4)	TP51x39.717x0.375	26.69	1057.50	0.025	0.83	4688.41	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	149 - 119 (1)	0.004	0.394	0.000	0.031	0.000	0.399	1.050	4.8.2
L2	119 - 82.11 (2)	0.006	0.609	0.000	0.038	0.001	0.617	1.050	4.8.2
L3	82.11 - 46.15 (3)	0.007	0.634	0.000	0.031	0.000	0.642	1.050	4.8.2
L4	46.15 - 0 (4)	0.009	0.635	0.000	0.025	0.000	0.645	1.050	4.8.2

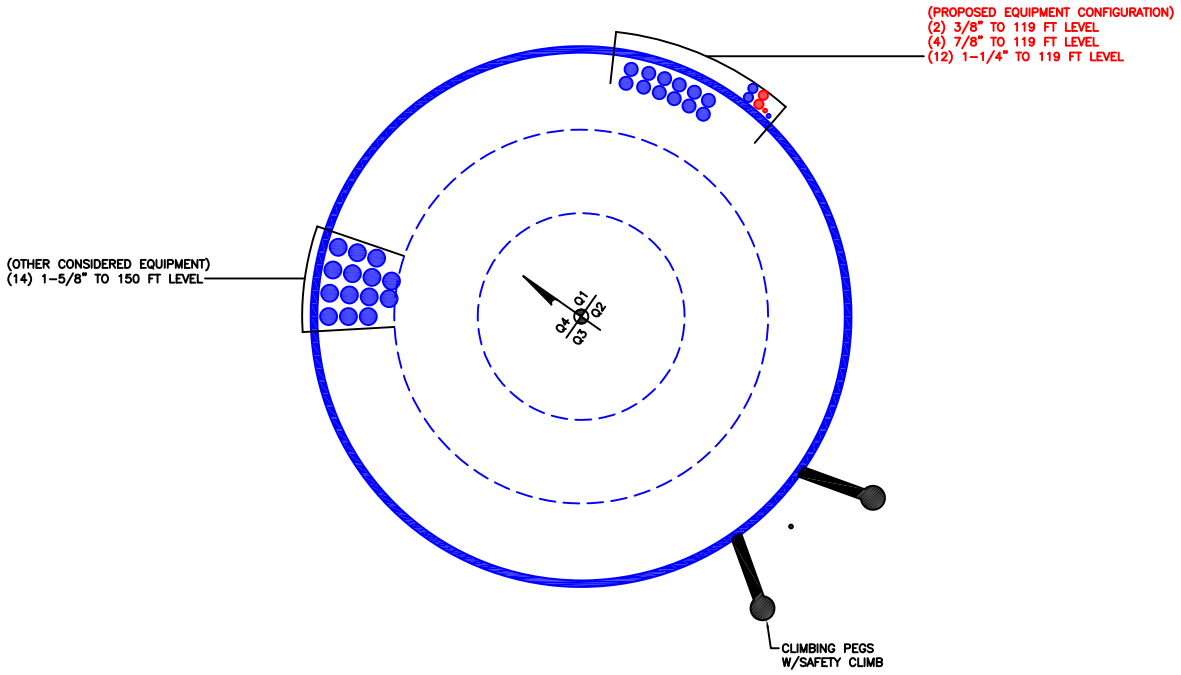
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	149 - 119	Pole	TP26.12x19.5x0.1875	1	-3.70	947.98	38.0	Pass
L2	119 - 82.11	Pole	TP34.268x26.12x0.25	2	-9.84	1606.60	58.7	Pass
L3	82.11 - 46.15	Pole	TP41.5831x32.7122x0.3125	3	-16.81	2438.83	61.1	Pass
L4	46.15 - 0	Pole	TP51x39.717x0.375	4	-31.09	3701.25	61.4	Pass

Summary	ELC:	Load Case 5
Pole (L4)	61.4	Pass
Rating =	61.4	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842865 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

29/07/14	NEW BUILD PER WORK ORDER #901189	AMT
24/6/2015	UPDATED PER WORK ORDER 1061554	KAH
07/03/18	UPDATED PER WORK ORDER 1524873	SV
22/08/19	UPDATED PER WORK ORDER 1783794	SMB

DRAWN BY: MSH
CHECKED BY: AMT
DRAWING DATE: 29/07/14

SITE NUMBER:
SITE NAME:

SITE NAME

LEBANON WEST

BUSINESS UNIT NUMBER

842865

SITE ADDRESS

1593 EXETER ROAD
LEBANON, CT 06249
NEW LONDON COUNTY
USA

SHEET TITLE

BASE LEVEL DRAWING

SHEET NUMBER

A1-0

N.T.S.

PLOT DATE: 6/24/2015

FILE NAME: 842865_BASELEVEL.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

Elevation = 119 ft.

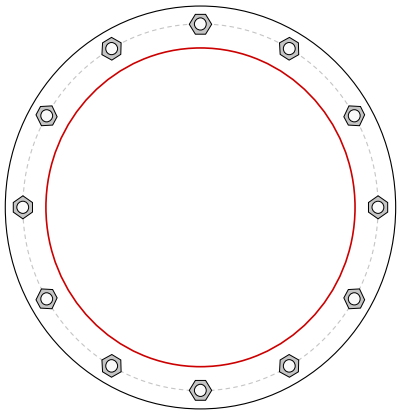
BU #	842865
Site Name	LEBANON WEST
Order #	492779 Rev.0

TIA-222 Revision	H

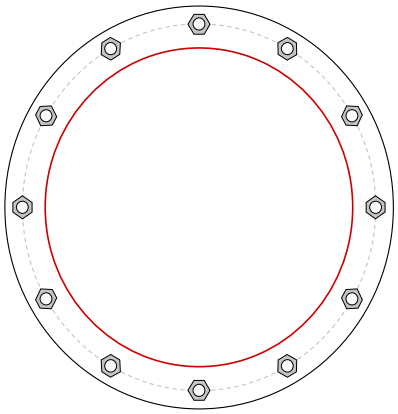
Applied Loads	
Moment (kip-ft)	214.86
Axial Force (kips)	3.70
Shear Force (kips)	8.33

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 30" BC

Top Plate Data

33" OD x 1.25" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Bottom Plate Data

33" OD x 1" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

26.12" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

26.12" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	28.33	
Allowable (kips)	54.53	
Stress Rating:	**49.5%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	13.87	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	**24.5%**	**Pass**
Tension Side Stress Rating:	**11.7%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	21.67	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	**38.2%**	**Pass**
Tension Side Stress Rating:	**18.2%**	**Pass**

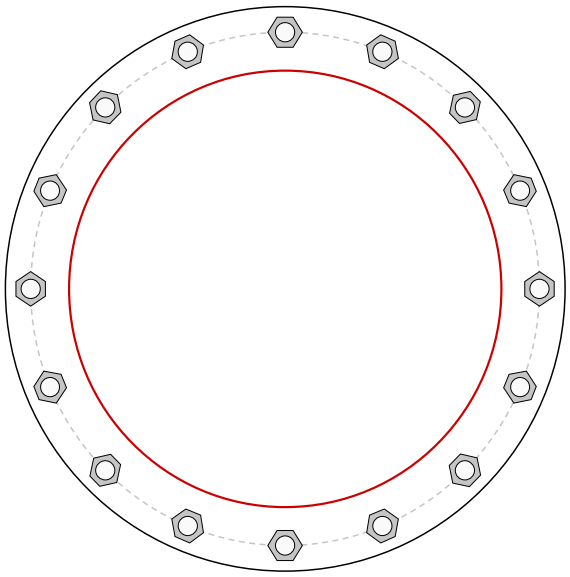
Monopole Base Plate Connection

Site Info	
BU #	842865
Site Name	LEBANON WEST
Order #	492779 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	3.25

Applied Loads	
Moment (kip-ft)	2664.77
Axial Force (kips)	31.09
Shear Force (kips)	26.69

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

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

Base Plate Data

66" OD x 2" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

51" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_c = 135.11	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.67	ϕVn = 73.13	**56.4%**
Mu = 3.52	ϕMn = 94.7	**Pass**

Base Plate Summary

Max Stress (ksi):	36.76	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**64.8%**	**Pass**

Pier and Pad Foundation

BU # :	842865
Site Name:	LEBANON WEST
App. Number:	492779 Rev.0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	31.09	kips
Base Shear, Vu_comp:	26.69	kips
Moment, M_u:	2664.77	ft-kips
Tower Height, **H**:	149	ft
BP Dist. Above Fdn, bp_{dist}:	5.5	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	45	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties

Depth, **D**:	6.5	ft
Pad Width, **W**:	25	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	40	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	135	pcf
Ultimate Gross Bearing, Qult:	11.123	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	36	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	19	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	334.73	26.69	**7.6%**	**Pass**
Bearing Pressure (ksf)	8.34	1.95	**22.2%**	**Pass**
*Overturning (kip*ft)*	6716.16	2877.18	**42.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5734.94	2784.88	**46.2%**	**Pass**
Pier Compression (kip)	31187.52	70.78	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	4347.14	922.76	**20.2%**	**Pass**
Pad Shear - 1-way (kips)	896.51	142.49	**15.1%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.028	**13.9%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5555.13	1670.93	**28.6%**	**Pass**

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

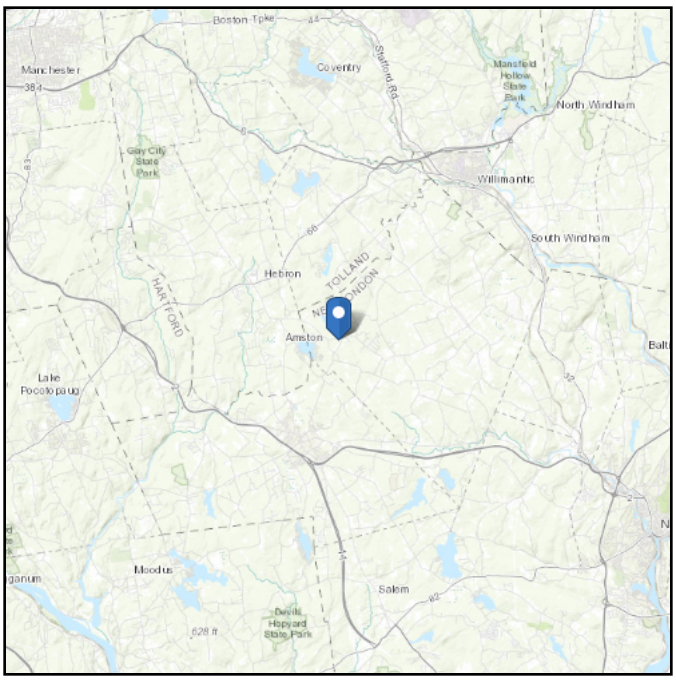
Soil Rating*:	**42.8%**
Structural Rating*:	**46.2%**

Version 3.2.0

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	486.64 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.627925
Soil Class:	D - Stiff Soil	**Longitude:**	-72.30565



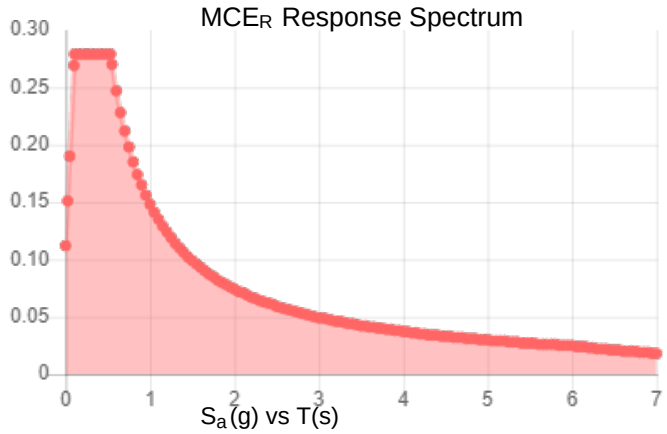
Seismic

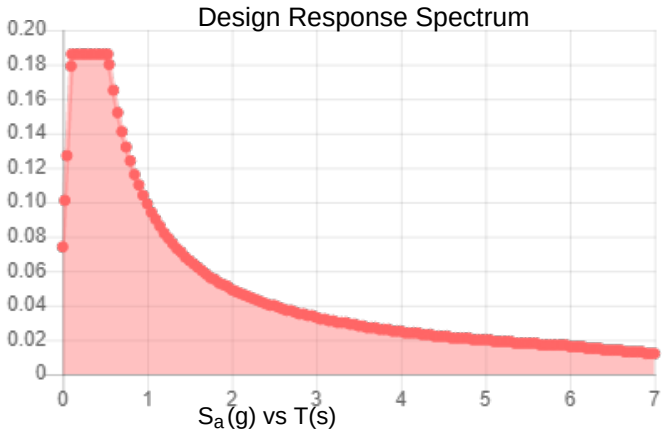
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.174	S_{DS} :	0.186
S_1 :	0.062	S_{D1} :	0.099
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.088
S_{MS} :	0.279	PGA_M :	0.14
S_{M1} :	0.148	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Aug 29 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Aug 29 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

Mount Analysis

August 28, 2019

Kevin Morrow
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6619

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Structures@tepgroup.net

Subject:	**Mount Analysis**	
Carrier Designation:	***AT&T Mobility* Reconfiguration**	
	Client Site Number:	10071090
	Client Site Name:	Lebanon West
Crown Castle Designation:	**Crown Castle BU Number:**	842865
	Crown Castle Site Name:	Lebanon West
	Crown Castle JDE Job Number:	574646
	Crown Castle Order Number:	492779 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	155516.293551
Site Data:	**1593 Exeter Road, Lebanon, New London County, CT 06249** **Latitude *41° 37' 40.53"*, Longitude *-72° 18' 20.34"***	
Structure Information:	**Tower Height & Type:**	150.0± ft Monopole
	Mount Elevation:	119.0 ft
	Mount Width & Type:	7.7 ft T-Arm Mount

Dear Kevin Morrow,

Tower Engineering Professionals is pleased to submit this **"Mount Analysis"** to determine the structural integrity of AT&T Mobility's antenna mounting system with proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis, we have determined the mount stress level to be:

T-Arm Mount **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph from the 2018 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Traveon S. Harris / GHM

Respectfully submitted by:

Aaron T. Rucker, P.E.
Structural Division Manager

Electronic Copy

08/28/2019

TABLE OF CONTENTS

1) INTRODUCTION

The mount is an existing 7.7-ft T-Arm mount, mapped by Tower Engineering Professionals.

2) ANALYSIS CRITERIA

Building Code:	2018 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	C
Topographic Category at Base:	1.0
Topographic Category at Mount:	1.0
Ice Thickness:	1.00 in
Wind Speed with Ice:	50 mph
Seismic Design Category:	B
Seismic S_s:	0.201
Seismic S_1:	0.055
Live Loading Wind Speed:	30 mph
Live Loading at Mid/End-Points:	250 lb
Man Live Loading at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
119.0	120.0	3	CCI Antennas	DMP65R-BU8D	T-Arm Mount
		3	CCI Antennas	HPA65R-BU8A	
		3	Powerwave Technologies	7770.00	
		3	Ericsson	RRUS 4449 B5/B12	
		3	Ericsson	RRUS 8843 B2/B66A	
		6	Powerwave Technologies	LGP21401	
		1	Raycap	DC6-48-60-0-8C-EV	
		1	Raycap	DC6-48-60-18-8F	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Mapping	Tower Engineering Professionals	8500516	CCIsites
Loading Application	AT&T Mobility	Order 492779 Rev. 0	CCIsites

3.1) Analysis Method

RISA-3D (Version 17.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A and Appendix C.

TEP Mount Analysis Tool, a tool internally developed by TEP using Microsoft Excel, was used to calculate member loading for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis (Revision C)*.

In addition, this analysis is in accordance with AT&T's *Mount Technical Directive – R14.1*.

3.2) Assumptions

1) The mount was built in accordance with the manufacturer's specifications.
2) The mount has been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, mounts and other appurtenances are as specified in Table 1. All mount components have been assumed to be in sufficient condition to carry their full design capacity for this analysis. Refer to the issued mapping for any structural and/or maintenance issues found during our site visit if applicable.
4) All mount components are in sufficient condition to carry their full design capacity.
5) TEP did not analyze the collar mount connection to the pole and assumes it to have sufficient structural capacity to transfer the applied forces from the mount to the tower.
6) All material grades used for this analysis, unless verified by mount manufacturer design, were assumed per AISC Table 2-4, 15th Edition. See RISA-3D output for confirmation on grades used in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (T-Arm Mount)

Notes	Component	Critical Member	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontals	FTTH	119.0	55.5	Pass
1	Support Arms	SA-1	119.0	17.2	Pass
1	Mount Pipes	MP-2	119.0	99.2	Pass
2	Connection Bolts	-	119.0	12.5	Pass
2	Connection Plate	-	119.0	25.3	Pass

Structure Rating (max from all components) =	99.2%

Notes:
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity listed.
2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity listed.
3) All sectors are typical.

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing/ Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb)[3]	Notes
-	-	-	-	-	-	-

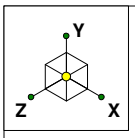
Notes:
1) Tieback connection point is within 25% of either end of the connected tower member.
2) Tower connection point is NOT within 25% of either end of the connected tower member.
3) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances.*

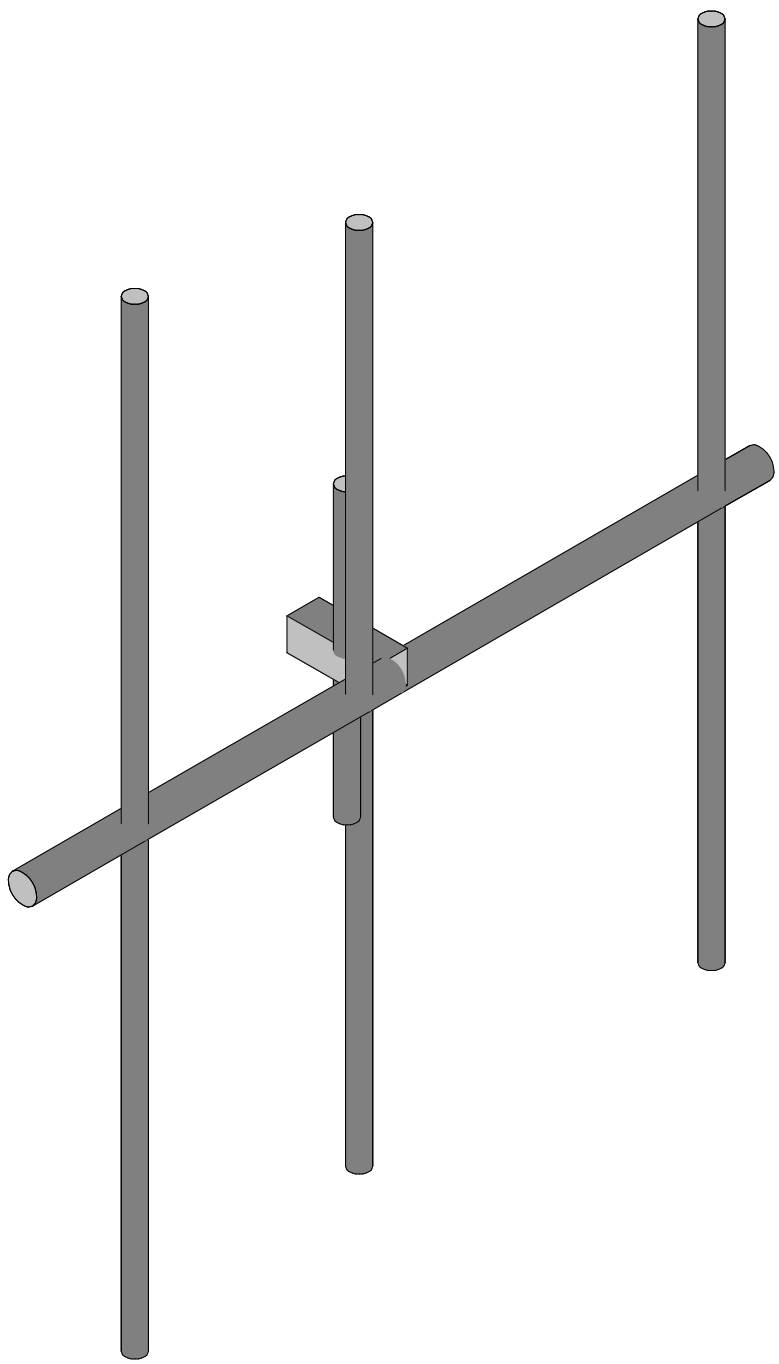
4.1) Recommendations

1) If the load differs from that described in Table 1 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The mount and its connection have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

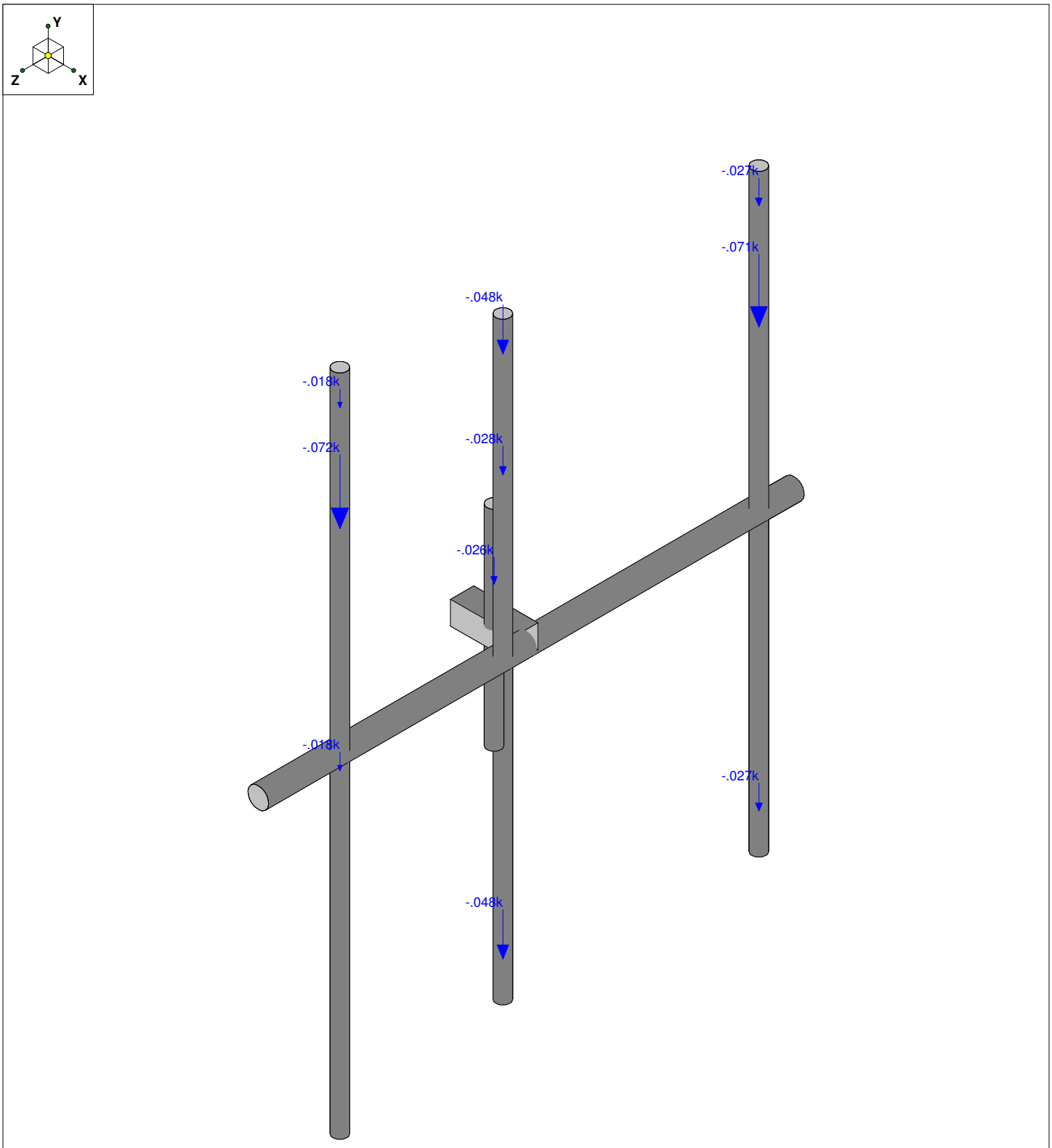
WIRE FRAME AND RENDERED MODELS





Envelope Only Solution

Tower Engineering Profes...	CCI BU No. 842865	SK - 1
Traveon S. Harris		Aug 28, 2019 at 11:36 AM
TEP No. 155516.293551		CCI BU No. 842865.r3d



Loads: BLC 1, Dead
Envelope Only Solution

Tower Engineering Profes...	CCI BU No. 842865	SK - 2
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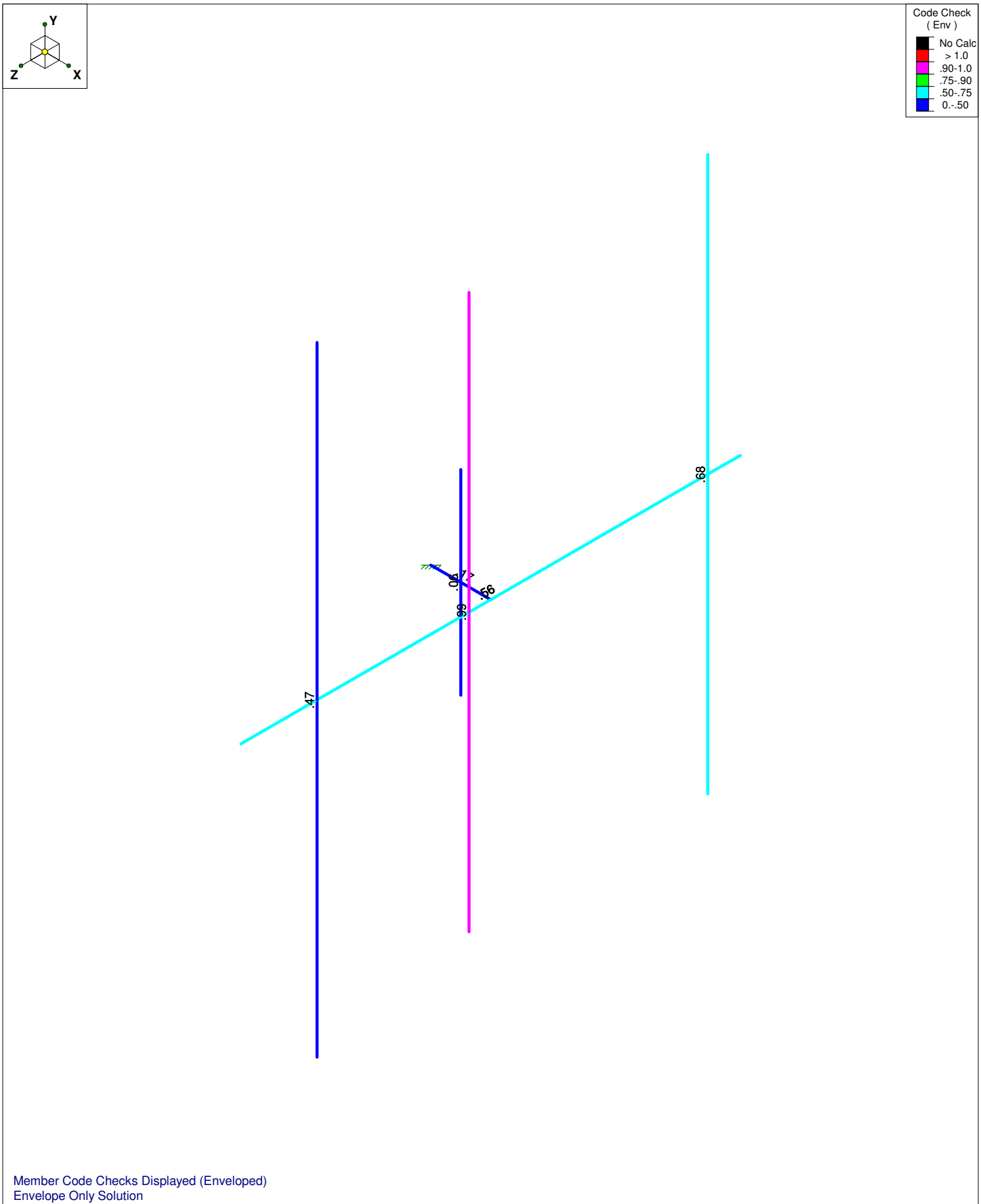
TEP No. 155516.293551		CCI BU No. 842865.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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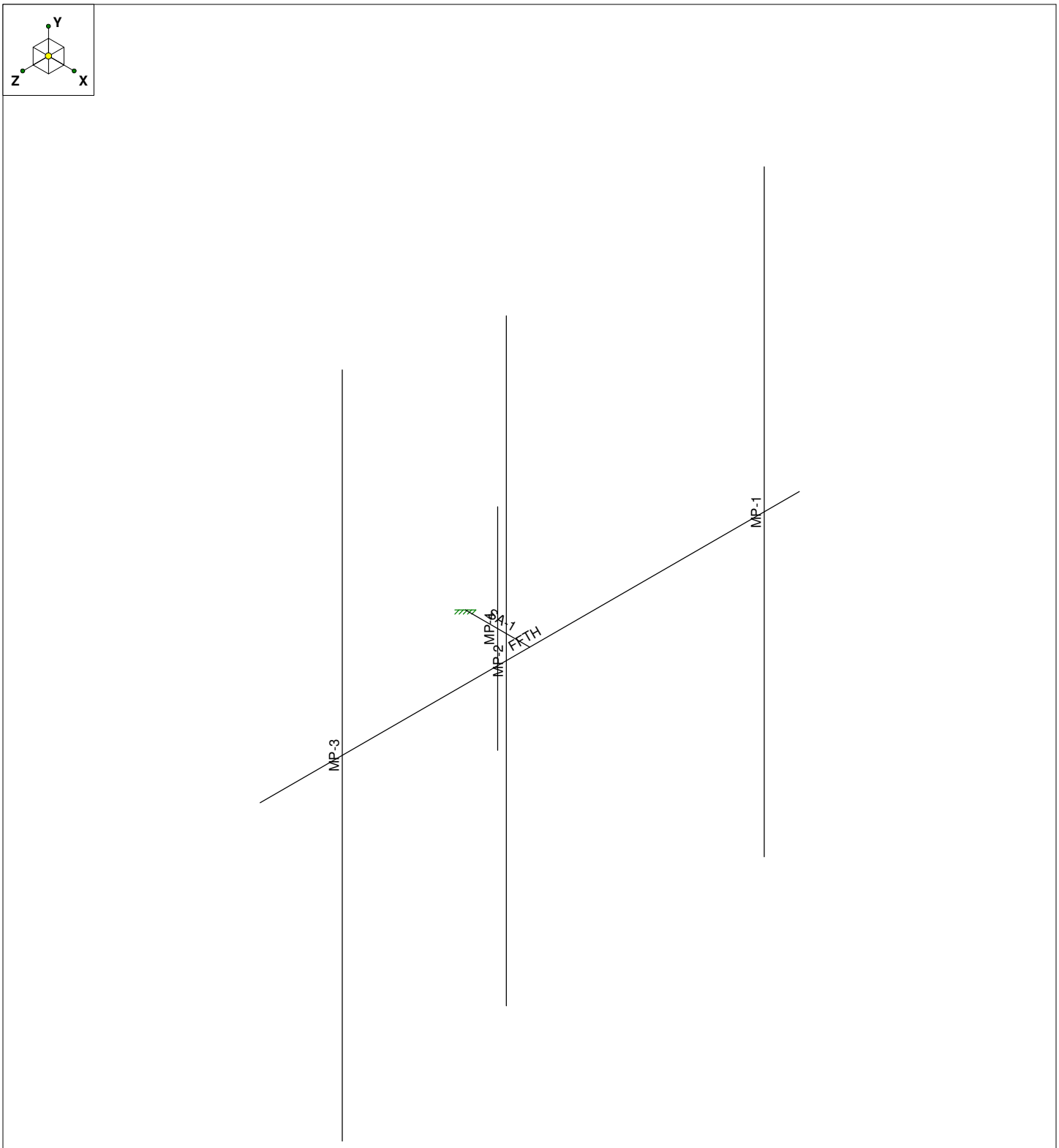

Envelope Only Solution

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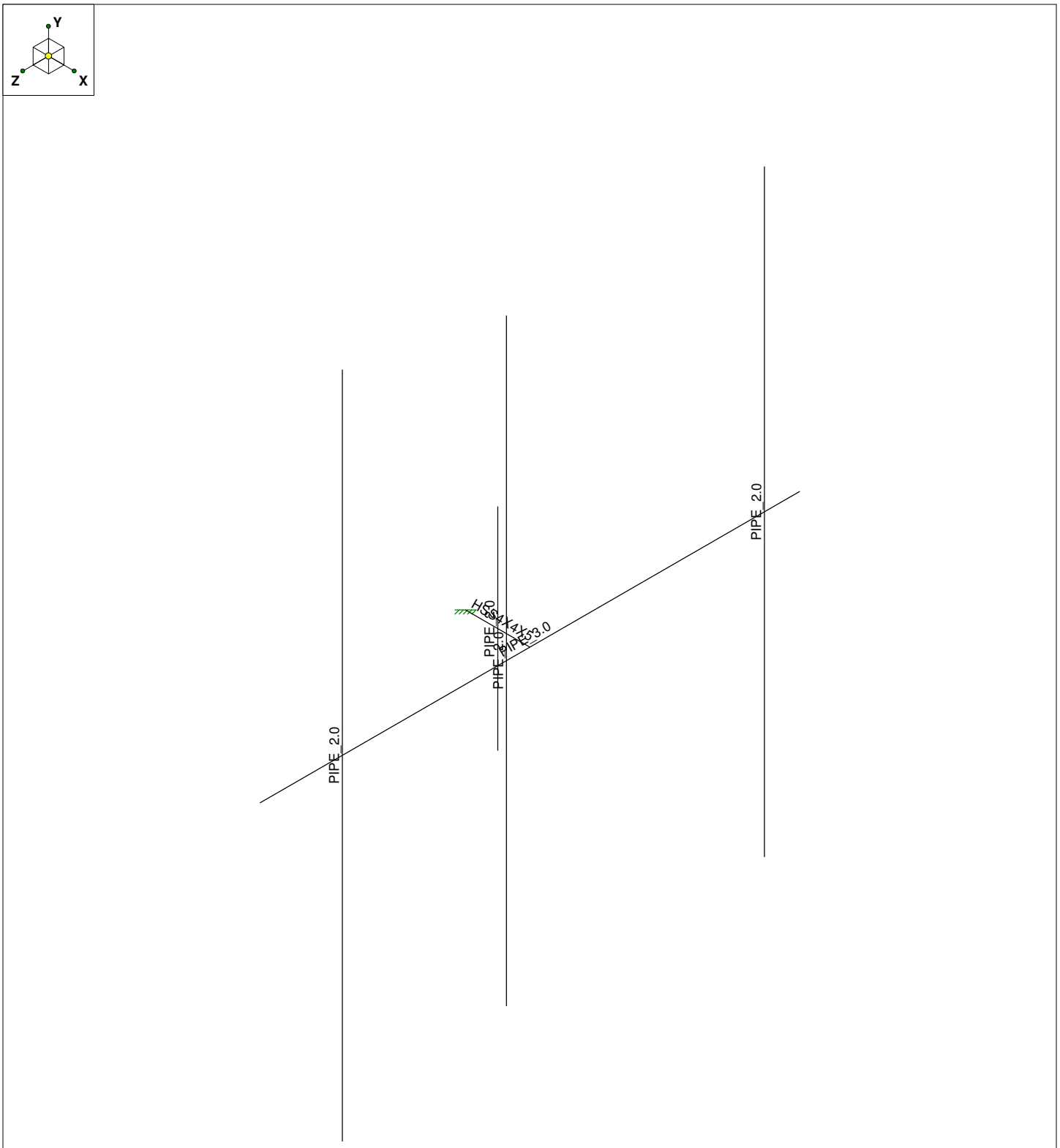

Envelope Only Solution

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TEP No. 155516.293551		CCI BU No. 842865.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

TOWER ENGINEERING PROFESSIONALS

CCI BU No. 842779

TEP No.	155516.293551	
Analysis By:	TSH	8/28/2019
Checked By:	GHM	8/28/2019

Code Revisions:	TIA-222-H	IBC 2018
Tower Type:	Monopole	

Wind Inputs:

Ult. Wind Velocity:	130.0	mph
Live Load Velocity:	30.0	mph
Ice Wind Velocity:	50.0	mph
Base Ice Thickness:	1.00	inches
Mount Centerline:	119.0	ft
Antenna Centerline:	120.0	ft
Exposure Category:	C	
Topo Category:	1	
Risk Category:	II	
Ground Elevation:	486.64	ft

Wind Calculations:

K_{zt}:	1.000	Section 2.6.6
K_d:	0.950	
$K_{z\text{-}Mount}$:	1.313	Section 2.6.5.2
$K_{z\text{-}Antenna}$:	1.315	Section 2.6.5.2
K_{iz}:	1.137	Section 2.6.10
Ice Thickness:	0.967	inches - Section 2.6.10
$K_{es\text{-}wind}$:	0.95	Annex S (Table S-1)
$K_{es\text{-}ice}$:	0.85	Annex S (Table S-1)

Without Ice - (psf)		With Ice - (psf)	
$(q_zG_h)_{Mount}$:	50.37	**$(q_zG_h)_{Mount}$:**	7.84
$(q_zG_h)_{Antenna}$:	50.45	**$(q_zG_h)_{Antenna}$:**	7.86

TOWER ENGINEERING PROFESSIONALS

CCI BU No. 842779

TEP No.	155516.293551	
Analysis By:	TSH	8/28/2019
Checked By:	GHM	8/28/2019

Antenna Loads are Calculated in Accordance with TIA-222-H

Azimuth is the absolute angle measured clockwise from RISA-3D global X-axis.

										Distance from start node of the member		
MFR	**Model**	**Height (in)**	**Width (in)**	**Depth (in)**	**Wt. (lbs)**	**Azimuth°**	**Qty**	**Shape**	**Member Label**	**Location #1 (ft,%)**	**Location #2 (ft,%)**	**Location #3 (ft,%)**
CCI Antennas	HPA65R-BU8A	96.00	11.70	7.60	54.00	0.00	1	Flat	MP-1	0.50	8.00	
Ericsson	RRUS 4449 B5/B12	17.90	13.19	9.44	71.00	0.00	1	Flat	MP-1	2.00		
CCI Antennas	DMP65R-BU8D	96.00	20.70	7.70	95.70	0.00	1	Flat	MP-2	0.50	8.00	
Powerwave Technologies	LGP21401	14.40	9.20	2.60	14.10	0.00	2	Flat	MP-2	2.00		
Powerwave Technologies	7770.00	55.00	11.00	5.00	35.00	0.00	1	Flat	MP-3	0.50	5.00	
Ericsson	RRUS 8843 B2/B66A	14.90	13.20	10.90	72.00	0.00	1	Flat	MP-3	2.00		
Raycap	DC6-48-60-0-8C-EV	31.40	10.24	18.28	26.20	0.00	1	Flat	MP-4	1.00		

Member Forces are Calculated in Accordance with TIA-222-H

Member Name	Wind Proj. (in)	Length (in)	Shape	θ (°)	Perimeter (in)
FFTH	3.500	92.00	Round	90.00	11.00
MP-1	2.375	102.00	Round		7.46
MP-2	2.375	102.00	Round		7.46
MP-3	2.375	114.00	Round		7.46
SA-1	4.000	11.00	Flat	0.00	16.00
MP-4	2.375	36.00	Round		7.46

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	No
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

Company : Tower Engineering Professionals, Inc.
Designer : Traveon S. Harris
Job Number : TEP No. 155516.293551
Model Name : CCI BU No. 842865

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(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Support Arm	HSS4X4X5	Beam	None	A500 Gr.B...	Typical	4.1	9.14	9.14	15.3
3	Mount Pipes	PIPE_2.0	Column	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A500 Gr.B Rect	HSS4X4X5	1	.9	0
3	A53 Gr.B	PIPE_2.0	4	29.5	.1
4	A53 Gr.B	PIPE_3.0	1	7.7	0
5	Total HR Steel		6	38.1	.2

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	SA1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Type	Design List	Material	Design Rules
1	FFTH	FF1	FF2			Face Horizontal	Beam	None	A53 Gr.B	Typical
2	MP-1	MP-1A	MP-1B			Mount Pipes	Column	None	A53 Gr.B	Typical
3	MP-2	MP-2A	MP-2B			Mount Pipes	Column	None	A53 Gr.B	Typical
4	MP-3	MP-3A	MP-3B			Mount Pipes	Column	None	A53 Gr.B	Typical
5	SA-1	SA1	SF1-3			Support Arm	Beam	None	A500 Gr....	Typical
6	MP-4	SF1-V1A	SF1-V1B			Mount Pipes	Column	None	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	FFTH						Yes				None
2	MP-1						Yes	** NA **			None
3	MP-2						Yes	** NA **			None
4	MP-3						Yes	** NA **			None
5	SA-1						Yes				None
6	MP-4						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	FFTH	Face Horizo...	7.667	3.833	3.833				2.1	2.1		Lateral
2	MP-1	Mount Pipes	8.5	Segment	Segment				2.1	2.1		Lateral
3	MP-2	Mount Pipes	8.5	Segment	Segment				2.1	2.1		Lateral
4	MP-3	Mount Pipes	9.5	Segment	Segment				2.1	2.1		Lateral
5	SA-1	Support Arm	.917						2.1	2.1		Lateral
6	MP-4	Mount Pipes	3	Segment	Segment				2.1	2.1		Lateral

Cold Formed Steel Design Parameters

Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp b...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	R	y sway	z sway
No Data to Print ...														

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1			10			
2	0 Wind - No Ice	None					10	6		
3	30 Wind - No Ice	None					20	12		
4	45 Wind - No Ice	None					20	12		
5	60 Wind - No Ice	None					20	12		
6	90 Wind - No Ice	None					10	6		
7	120 Wind - No Ice	None					20	12		
8	135 Wind - No Ice	None					20	12		
9	150 Wind - No Ice	None					20	12		
10	180 Wind - No Ice	None					10	6		
11	210 Wind - No Ice	None					20	12		
12	225 Wind - No Ice	None					20	12		
13	240 Wind - No Ice	None					20	12		

Company : Tower Engineering Professionals, Inc.
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Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
14	270 Wind - No Ice	None					10	6		
15	300 Wind - No Ice	None					20	12		
16	315 Wind - No Ice	None					20	12		
17	330 Wind - No Ice	None					20	12		
18	Ice Weight	None					10	6		
19	0 Wind - Ice	None					10	6		
20	30 Wind - Ice	None					20	12		
21	45 Wind - Ice	None					20	12		
22	60 Wind - Ice	None					20	12		
23	90 Wind - Ice	None					10	6		
24	120 Wind - Ice	None					20	12		
25	135 Wind - Ice	None					20	12		
26	150 Wind - Ice	None					20	12		
27	180 Wind - Ice	None					10	6		
28	210 Wind - Ice	None					20	12		
29	225 Wind - Ice	None					20	12		
30	240 Wind - Ice	None					20	12		
31	270 Wind - Ice	None					10	6		
32	300 Wind - Ice	None					20	12		
33	315 Wind - Ice	None					20	12		
34	330 Wind - Ice	None					20	12		
35	Lm	None				1				
36	Lv	None				1				
37	Seismic Load X	ELX	-1							
38	Seismic Load Z	ELZ			-1					

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4D	Yes	Y		1	1.4																		
2	0.9D+1.0 0-Wind	Yes	Y		1	.9	2	1																
3	0.9D+1.0 30-Wind	Yes	Y		1	.9	3	1																
4	0.9D+1.0 45-Wind	Yes	Y		1	.9	4	1																
5	0.9D+1.0 60-Wind	Yes	Y		1	.9	5	1																
6	0.9D+1.0 90-Wind	Yes	Y		1	.9	6	1																
7	0.9D+1.0 120-Wind	Yes	Y		1	.9	7	1																
8	0.9D+1.0 135-Wind	Yes	Y		1	.9	8	1																
9	0.9D+1.0 150-Wind	Yes	Y		1	.9	9	1																
10	0.9D+1.0 180-Wind	Yes	Y		1	.9	10	1																
11	0.9D+1.0 210-Wind	Yes	Y		1	.9	11	1																
12	0.9D+1.0 225-Wind	Yes	Y		1	.9	12	1																
13	0.9D+1.0 240-Wind	Yes	Y		1	.9	13	1																
14	0.9D+1.0 270-Wind	Yes	Y		1	.9	14	1																
15	0.9D+1.0 300-Wind	Yes	Y		1	.9	15	1																
16	0.9D+1.0 315-Wind	Yes	Y		1	.9	16	1																
17	0.9D+1.0 330-Wind	Yes	Y		1	.9	17	1																
18	1.2D+1.0 0-Wind	Yes	Y		1	1.2	2	1																
19	1.2D+1.0 30-Wind	Yes	Y		1	1.2	3	1																
20	1.2D+1.0 45-Wind	Yes	Y		1	1.2	4	1																
21	1.2D+1.0 60-Wind	Yes	Y		1	1.2	5	1																
22	1.2D+1.0 90-Wind	Yes	Y		1	1.2	6	1																
23	1.2D+1.0 120-Wind	Yes	Y		1	1.2	7	1																
24	1.2D+1.0 135-Wind	Yes	Y		1	1.2	8	1																
25	1.2D+1.0 150-Wind	Yes	Y		1	1.2	9	1																
26	1.2D+1.0 180-Wind	Yes	Y		1	1.2	10	1																
27	1.2D+1.0 210-Wind	Yes	Y		1	1.2	11	1																

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
28	1.2D+1.0 225-Wind	Yes	Y		1	1.2	12	1																				
29	1.2D+1.0 240-Wind	Yes	Y		1	1.2	13	1																				
30	1.2D+1.0 270-Wind	Yes	Y		1	1.2	14	1																				
31	1.2D+1.0 300-Wind	Yes	Y		1	1.2	15	1																				
32	1.2D+1.0 315-Wind	Yes	Y		1	1.2	16	1																				
33	1.2D+1.0 330-Wind	Yes	Y		1	1.2	17	1																				
34	1.2D+1.0Di+1.0 0-Wi...	Yes	Y		1	1.2	18	1	19	1																		
35	1.2D+1.0Di+1.0 30-...	Yes	Y		1	1.2	18	1	20	1																		
36	1.2D+1.0Di+1.0 45-...	Yes	Y		1	1.2	18	1	21	1																		
37	1.2D+1.0Di+1.0 60-...	Yes	Y		1	1.2	18	1	22	1																		
38	1.2D+1.0Di+1.0 90-...	Yes	Y		1	1.2	18	1	23	1																		
39	1.2D+1.0Di+1.0 120-...	Yes	Y		1	1.2	18	1	24	1																		
40	1.2D+1.0Di+1.0 135-...	Yes	Y		1	1.2	18	1	25	1																		
41	1.2D+1.0Di+1.0 150-...	Yes	Y		1	1.2	18	1	26	1																		
42	1.2D+1.0Di+1.0 180-...	Yes	Y		1	1.2	18	1	27	1																		
43	1.2D+1.0Di+1.0 210-...	Yes	Y		1	1.2	18	1	28	1																		
44	1.2D+1.0Di+1.0 225-...	Yes	Y		1	1.2	18	1	29	1																		
45	1.2D+1.0Di+1.0 240-...	Yes	Y		1	1.2	18	1	30	1																		
46	1.2D+1.0Di+1.0 270-...	Yes	Y		1	1.2	18	1	31	1																		
47	1.2D+1.0Di+1.0 300-...	Yes	Y		1	1.2	18	1	32	1																		
48	1.2D+1.0Di+1.0 315-...	Yes	Y		1	1.2	18	1	33	1																		
49	1.2D+1.0Di+1.0 330-...	Yes	Y		1	1.2	18	1	34	1																		
50	1.2D+1.5Lv	Yes	Y		36	1.5	1	1.2																				
51	1.2D+1.5Lm+1.0 0-...	Yes	Y		1	1.2	2	.053	35	1.5																		
52	1.2D+1.5Lm+1.0 30-...	Yes	Y		1	1.2	3	.053	35	1.5																		
53	1.2D+1.5Lm+1.0 45-...	Yes	Y		1	1.2	4	.053	35	1.5																		
54	1.2D+1.5Lm+1.0 60-...	Yes	Y		1	1.2	5	.053	35	1.5																		
55	1.2D+1.5Lm+1.0 90-...	Yes	Y		1	1.2	6	.053	35	1.5																		
56	1.2D+1.5Lm+1.0 120...	Yes	Y		1	1.2	7	.053	35	1.5																		
57	1.2D+1.5Lm+1.0 135...	Yes	Y		1	1.2	8	.053	35	1.5																		
58	1.2D+1.5Lm+1.0 150...	Yes	Y		1	1.2	9	.053	35	1.5																		
59	1.2D+1.5Lm+1.0 180...	Yes	Y		1	1.2	10	.053	35	1.5																		
60	1.2D+1.5Lm+1.0 210...	Yes	Y		1	1.2	11	.053	35	1.5																		
61	1.2D+1.5Lm+1.0 225...	Yes	Y		1	1.2	12	.053	35	1.5																		
62	1.2D+1.5Lm+1.0 240...	Yes	Y		1	1.2	13	.053	35	1.5																		
63	1.2D+1.5Lm+1.0 270...	Yes	Y		1	1.2	14	.053	35	1.5																		
64	1.2D+1.5Lm+1.0 300...	Yes	Y		1	1.2	15	.053	35	1.5																		
65	1.2D+1.5Lm+1.0 315...	Yes	Y		1	1.2	16	.053	35	1.5																		
66	1.2D+1.5Lm+1.0 330...	Yes	Y		1	1.2	17	.053	35	1.5																		
67	(1.2+0.2Sds)D+1.0 0...		Y		1	1.4	ELX	.5	0																			
68	(1.2+0.2Sds)D+1.0 3...		Y		1	1.4	ELX	.433	ELZ	.25																		
69	(1.2+0.2Sds)D+1.0 4...		Y		1	1.4	ELX	.354	ELZ	.354																		
70	(1.2+0.2Sds)D+1.0 6...		Y		1	1.4	ELX	.25	ELZ	.433																		
71	(1.2+0.2Sds)D+1.0 9...		Y		1	1.4	0		ELZ	.5																		
72	(1.2+0.2Sds)D+1.0 1...		Y		1	1.4	ELX	-.25	ELZ	.433																		
73	(1.2+0.2Sds)D+1.0 1...		Y		1	1.4	ELX	-.354	ELZ	.354																		
74	(1.2+0.2Sds)D+1.0 1...		Y		1	1.4	ELX	-.433	ELZ	.25																		
75	(1.2+0.2Sds)D+1.0 1...		Y		1	1.4	ELX	-.5	0																			
76	(1.2+0.2Sds)D+1.0 2...		Y		1	1.4	ELX	-.433	ELZ	-.25																		
77	(1.2+0.2Sds)D+1.0 2...		Y		1	1.4	ELX	-.354	ELZ	-.354																		
78	(1.2+0.2Sds)D+1.0 2...		Y		1	1.4	ELX	-.25	ELZ	-.433																		
79	(1.2+0.2Sds)D+1.0 2...		Y		1	1.4	0		ELZ	-.5																		
80	(1.2+0.2Sds)D+1.0 3...		Y		1	1.4	ELX	.25	ELZ	-.433																		
81	(1.2+0.2Sds)D+1.0 3...		Y		1	1.4	ELX	.354	ELZ	-.354																		
82	(1.2+0.2Sds)D+1.0 3...		Y		1	1.4	ELX	.433	ELZ	-.25																		
83	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.5	0																			
84	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.433	ELZ	.25																		

Company : Tower Engineering Professionals, Inc.
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Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
85	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.354	ELZ	.354																		
86	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.25	ELZ	.433																		
87	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	0		ELZ	.5																		
88	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.25	ELZ	.433																		
89	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.354	ELZ	.354																		
90	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.433	ELZ	.25																		
91	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.5	0																			
92	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.433	ELZ	-.25																		
93	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.354	ELZ	-.354																		
94	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	-.25	ELZ	-.433																		
95	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	0		ELZ	-.5																		
96	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.25	ELZ	-.433																		
97	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.354	ELZ	-.354																		
98	(0.9-0.2Sds)*DL+1.0 ...		Y		1	.7	ELX	.433	ELZ	-.25																		

Joint Loads and Enforced Displacements (BLC 35 : Lm)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft,..
1	N13	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 36 : Lv)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft,..
1	FF1	L	Y	-.25

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Y	-.027	.5
2	MP-1	Y	-.071	2
3	MP-2	Y	-.048	.5
4	MP-2	Y	-.028	2
5	MP-3	Y	-.018	.5
6	MP-3	Y	-.072	2
7	MP-4	Y	-.026	1
8	MP-1	Y	-.027	8
9	MP-2	Y	-.048	8
10	MP-3	Y	-.018	5

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.255	.5
2	MP-1	X	-.089	2
3	MP-2	X	-.406	.5
4	MP-2	X	-.1	2
5	MP-3	X	-.125	.5
6	MP-3	X	-.074	2
7	MP-4	X	-.124	1
8	MP-1	X	-.255	8
9	MP-2	X	-.406	8
10	MP-3	X	-.125	5

Member Point Loads (BLC 3 : 30 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.205	.5

Member Point Loads (BLC 3 : 30 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
2	MP-1	X	-.072	2
3	MP-2	X	-.303	.5
4	MP-2	X	-.072	2
5	MP-3	X	-.096	.5
6	MP-3	X	-.062	2
7	MP-4	X	-.128	1
8	MP-1	X	-.205	8
9	MP-2	X	-.303	8
10	MP-3	X	-.096	5
11	MP-1	Z	-.118	.5
12	MP-1	Z	-.041	2
13	MP-2	Z	-.175	.5
14	MP-2	Z	-.042	2
15	MP-3	Z	-.055	.5
16	MP-3	Z	-.036	2
17	MP-4	Z	-.074	1
18	MP-1	Z	-.118	8
19	MP-2	Z	-.175	8
20	MP-3	Z	-.055	5

Member Point Loads (BLC 4 : 45 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.155	.5
2	MP-1	X	-.054	2
3	MP-2	X	-.209	.5
4	MP-2	X	-.047	2
5	MP-3	X	-.068	.5
6	MP-3	X	-.048	2
7	MP-4	X	-.121	1
8	MP-1	X	-.155	8
9	MP-2	X	-.209	8
10	MP-3	X	-.068	5
11	MP-1	Z	-.155	.5
12	MP-1	Z	-.054	2
13	MP-2	Z	-.209	.5
14	MP-2	Z	-.047	2
15	MP-3	Z	-.068	.5
16	MP-3	Z	-.048	2
17	MP-4	Z	-.121	1
18	MP-1	Z	-.155	8
19	MP-2	Z	-.209	8
20	MP-3	Z	-.068	5

Member Point Loads (BLC 5 : 60 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.1	.5
2	MP-1	X	-.035	2
3	MP-2	X	-.12	.5
4	MP-2	X	-.024	2
5	MP-3	X	-.041	.5
6	MP-3	X	-.032	2
7	MP-4	X	-.097	1
8	MP-1	X	-.1	8
9	MP-2	X	-.12	8
10	MP-3	X	-.041	5
11	MP-1	Z	-.174	.5

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Designer : Traveon S. Harris
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Member Point Loads (BLC 5 : 60 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
12	MP-1	Z	-.061	2
13	MP-2	Z	-.208	.5
14	MP-2	Z	-.042	2
15	MP-3	Z	-.07	.5
16	MP-3	Z	-.056	2
17	MP-4	Z	-.168	1
18	MP-1	Z	-.174	8
19	MP-2	Z	-.208	8
20	MP-3	Z	-.07	5

Member Point Loads (BLC 6 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	-.183	.5
2	MP-1	Z	-.064	2
3	MP-2	Z	-.184	.5
4	MP-2	Z	-.032	2
5	MP-3	Z	-.066	.5
6	MP-3	Z	-.061	2
7	MP-4	Z	-.217	1
8	MP-1	Z	-.183	8
9	MP-2	Z	-.184	8
10	MP-3	Z	-.066	5

Member Point Loads (BLC 7 : 120 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.1	.5
2	MP-1	X	.035	2
3	MP-2	X	.12	.5
4	MP-2	X	.024	2
5	MP-3	X	.041	.5
6	MP-3	X	.032	2
7	MP-4	X	.097	1
8	MP-1	X	.1	8
9	MP-2	X	.12	8
10	MP-3	X	.041	5
11	MP-1	Z	-.174	.5
12	MP-1	Z	-.061	2
13	MP-2	Z	-.208	.5
14	MP-2	Z	-.042	2
15	MP-3	Z	-.07	.5
16	MP-3	Z	-.056	2
17	MP-4	Z	-.168	1
18	MP-1	Z	-.174	8
19	MP-2	Z	-.208	8
20	MP-3	Z	-.07	5

Member Point Loads (BLC 8 : 135 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.155	.5
2	MP-1	X	.054	2
3	MP-2	X	.209	.5
4	MP-2	X	.047	2
5	MP-3	X	.068	.5
6	MP-3	X	.048	2
7	MP-4	X	.121	1

Member Point Loads (BLC 8 : 135 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
8	MP-1	X	.155	8
9	MP-2	X	.209	8
10	MP-3	X	.068	5
11	MP-1	Z	-.155	.5
12	MP-1	Z	-.054	2
13	MP-2	Z	-.209	.5
14	MP-2	Z	-.047	2
15	MP-3	Z	-.068	.5
16	MP-3	Z	-.048	2
17	MP-4	Z	-.121	1
18	MP-1	Z	-.155	8
19	MP-2	Z	-.209	8
20	MP-3	Z	-.068	5

Member Point Loads (BLC 9 : 150 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.205	.5
2	MP-1	X	.072	2
3	MP-2	X	.303	.5
4	MP-2	X	.072	2
5	MP-3	X	.096	.5
6	MP-3	X	.062	2
7	MP-4	X	.128	1
8	MP-1	X	.205	8
9	MP-2	X	.303	8
10	MP-3	X	.096	5
11	MP-1	Z	-.118	.5
12	MP-1	Z	-.041	2
13	MP-2	Z	-.175	.5
14	MP-2	Z	-.042	2
15	MP-3	Z	-.055	.5
16	MP-3	Z	-.036	2
17	MP-4	Z	-.074	1
18	MP-1	Z	-.118	8
19	MP-2	Z	-.175	8
20	MP-3	Z	-.055	5

Member Point Loads (BLC 10 : 180 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.255	.5
2	MP-1	X	.089	2
3	MP-2	X	.406	.5
4	MP-2	X	.1	2
5	MP-3	X	.125	.5
6	MP-3	X	.074	2
7	MP-4	X	.124	1
8	MP-1	X	.255	8
9	MP-2	X	.406	8
10	MP-3	X	.125	5

Member Point Loads (BLC 11 : 210 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.205	.5
2	MP-1	X	.072	2
3	MP-2	X	.303	.5

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Member Point Loads (BLC 11 : 210 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	MP-2	X	.072	2
5	MP-3	X	.096	.5
6	MP-3	X	.062	2
7	MP-4	X	.128	1
8	MP-1	X	.205	8
9	MP-2	X	.303	8
10	MP-3	X	.096	5
11	MP-1	Z	.118	.5
12	MP-1	Z	.041	2
13	MP-2	Z	.175	.5
14	MP-2	Z	.042	2
15	MP-3	Z	.055	.5
16	MP-3	Z	.036	2
17	MP-4	Z	.074	1
18	MP-1	Z	.118	8
19	MP-2	Z	.175	8
20	MP-3	Z	.055	5

Member Point Loads (BLC 12 : 225 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.155	.5
2	MP-1	X	.054	2
3	MP-2	X	.209	.5
4	MP-2	X	.047	2
5	MP-3	X	.068	.5
6	MP-3	X	.048	2
7	MP-4	X	.121	1
8	MP-1	X	.155	8
9	MP-2	X	.209	8
10	MP-3	X	.068	5
11	MP-1	Z	.155	.5
12	MP-1	Z	.054	2
13	MP-2	Z	.209	.5
14	MP-2	Z	.047	2
15	MP-3	Z	.068	.5
16	MP-3	Z	.048	2
17	MP-4	Z	.121	1
18	MP-1	Z	.155	8
19	MP-2	Z	.209	8
20	MP-3	Z	.068	5

Member Point Loads (BLC 13 : 240 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.1	.5
2	MP-1	X	.035	2
3	MP-2	X	.12	.5
4	MP-2	X	.024	2
5	MP-3	X	.041	.5
6	MP-3	X	.032	2
7	MP-4	X	.097	1
8	MP-1	X	.1	8
9	MP-2	X	.12	8
10	MP-3	X	.041	5
11	MP-1	Z	.174	.5
12	MP-1	Z	.061	2
13	MP-2	Z	.208	.5

Member Point Loads (BLC 13 : 240 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
14	MP-2	Z	.042	2
15	MP-3	Z	.07	.5
16	MP-3	Z	.056	2
17	MP-4	Z	.168	1
18	MP-1	Z	.174	8
19	MP-2	Z	.208	8
20	MP-3	Z	.07	5

Member Point Loads (BLC 14 : 270 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	.183	.5
2	MP-1	Z	.064	2
3	MP-2	Z	.184	.5
4	MP-2	Z	.032	2
5	MP-3	Z	.066	.5
6	MP-3	Z	.061	2
7	MP-4	Z	.217	1
8	MP-1	Z	.183	8
9	MP-2	Z	.184	8
10	MP-3	Z	.066	5

Member Point Loads (BLC 15 : 300 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.1	.5
2	MP-1	X	-.035	2
3	MP-2	X	-.12	.5
4	MP-2	X	-.024	2
5	MP-3	X	-.041	.5
6	MP-3	X	-.032	2
7	MP-4	X	-.097	1
8	MP-1	X	-.1	8
9	MP-2	X	-.12	8
10	MP-3	X	-.041	5
11	MP-1	Z	.174	.5
12	MP-1	Z	.061	2
13	MP-2	Z	.208	.5
14	MP-2	Z	.042	2
15	MP-3	Z	.07	.5
16	MP-3	Z	.056	2
17	MP-4	Z	.168	1
18	MP-1	Z	.174	8
19	MP-2	Z	.208	8
20	MP-3	Z	.07	5

Member Point Loads (BLC 16 : 315 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.155	.5
2	MP-1	X	-.054	2
3	MP-2	X	-.209	.5
4	MP-2	X	-.047	2
5	MP-3	X	-.068	.5
6	MP-3	X	-.048	2
7	MP-4	X	-.121	1
8	MP-1	X	-.155	8
9	MP-2	X	-.209	8

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Member Point Loads (BLC 16 : 315 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
10	MP-3	X	-.068	5
11	MP-1	Z	.155	.5
12	MP-1	Z	.054	2
13	MP-2	Z	.209	.5
14	MP-2	Z	.047	2
15	MP-3	Z	.068	.5
16	MP-3	Z	.048	2
17	MP-4	Z	.121	1
18	MP-1	Z	.155	8
19	MP-2	Z	.209	8
20	MP-3	Z	.068	5

Member Point Loads (BLC 17 : 330 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.205	.5
2	MP-1	X	-.072	2
3	MP-2	X	-.303	.5
4	MP-2	X	-.072	2
5	MP-3	X	-.096	.5
6	MP-3	X	-.062	2
7	MP-4	X	-.128	1
8	MP-1	X	-.205	8
9	MP-2	X	-.303	8
10	MP-3	X	-.096	5
11	MP-1	Z	.118	.5
12	MP-1	Z	.041	2
13	MP-2	Z	.175	.5
14	MP-2	Z	.042	2
15	MP-3	Z	.055	.5
16	MP-3	Z	.036	2
17	MP-4	Z	.074	1
18	MP-1	Z	.118	8
19	MP-2	Z	.175	8
20	MP-3	Z	.055	5

Member Point Loads (BLC 18 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Y	-.068	.5
2	MP-1	Y	-.038	2
3	MP-2	Y	-.098	.5
4	MP-2	Y	-.031	2
5	MP-3	Y	-.034	.5
6	MP-3	Y	-.036	2
7	MP-4	Y	-.075	1
8	MP-1	Y	-.068	8
9	MP-2	Y	-.098	8
10	MP-3	Y	-.034	5

Member Point Loads (BLC 19 : 0 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.046	.5
2	MP-1	X	-.018	2
3	MP-2	X	-.07	.5
4	MP-2	X	-.021	2
5	MP-3	X	-.023	.5

Member Point Loads (BLC 19 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
6	MP-3	X	-.015	2
7	MP-4	X	-.024	1
8	MP-1	X	-.046	8
9	MP-2	X	-.07	8
10	MP-3	X	-.023	5

Member Point Loads (BLC 20 : 30 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.037	.5
2	MP-1	X	-.014	2
3	MP-2	X	-.053	.5
4	MP-2	X	-.016	2
5	MP-3	X	-.018	.5
6	MP-3	X	-.013	2
7	MP-4	X	-.024	1
8	MP-1	X	-.037	8
9	MP-2	X	-.053	8
10	MP-3	X	-.018	5
11	MP-1	Z	-.022	.5
12	MP-1	Z	-.008	2
13	MP-2	Z	-.031	.5
14	MP-2	Z	-.009	2
15	MP-3	Z	-.01	.5
16	MP-3	Z	-.007	2
17	MP-4	Z	-.014	1
18	MP-1	Z	-.022	8
19	MP-2	Z	-.031	8
20	MP-3	Z	-.01	5

Member Point Loads (BLC 21 : 45 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.029	.5
2	MP-1	X	-.011	2
3	MP-2	X	-.037	.5
4	MP-2	X	-.011	2
5	MP-3	X	-.013	.5
6	MP-3	X	-.01	2
7	MP-4	X	-.023	1
8	MP-1	X	-.029	8
9	MP-2	X	-.037	8
10	MP-3	X	-.013	5
11	MP-1	Z	-.029	.5
12	MP-1	Z	-.011	2
13	MP-2	Z	-.037	.5
14	MP-2	Z	-.011	2
15	MP-3	Z	-.013	.5
16	MP-3	Z	-.01	2
17	MP-4	Z	-.023	1
18	MP-1	Z	-.029	8
19	MP-2	Z	-.037	8
20	MP-3	Z	-.013	5

Member Point Loads (BLC 22 : 60 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.019	.5

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Member Point Loads (BLC 22 : 60 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
2	MP-1	X	-.007	2
3	MP-2	X	-.022	.5
4	MP-2	X	-.006	2
5	MP-3	X	-.008	.5
6	MP-3	X	-.007	2
7	MP-4	X	-.018	1
8	MP-1	X	-.019	8
9	MP-2	X	-.022	8
10	MP-3	X	-.008	5
11	MP-1	Z	-.032	.5
12	MP-1	Z	-.012	2
13	MP-2	Z	-.038	.5
14	MP-2	Z	-.011	2
15	MP-3	Z	-.014	.5
16	MP-3	Z	-.012	2
17	MP-4	Z	-.031	1
18	MP-1	Z	-.032	8
19	MP-2	Z	-.038	8
20	MP-3	Z	-.014	5

Member Point Loads (BLC 23 : 90 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	-.035	.5
2	MP-1	Z	-.013	2
3	MP-2	Z	-.035	.5
4	MP-2	Z	-.009	2
5	MP-3	Z	-.014	.5
6	MP-3	Z	-.013	2
7	MP-4	Z	-.04	1
8	MP-1	Z	-.035	8
9	MP-2	Z	-.035	8
10	MP-3	Z	-.014	5

Member Point Loads (BLC 24 : 120 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.019	.5
2	MP-1	X	.007	2
3	MP-2	X	.022	.5
4	MP-2	X	.006	2
5	MP-3	X	.008	.5
6	MP-3	X	.007	2
7	MP-4	X	.018	1
8	MP-1	X	.019	8
9	MP-2	X	.022	8
10	MP-3	X	.008	5
11	MP-1	Z	-.032	.5
12	MP-1	Z	-.012	2
13	MP-2	Z	-.038	.5
14	MP-2	Z	-.011	2
15	MP-3	Z	-.014	.5
16	MP-3	Z	-.012	2
17	MP-4	Z	-.031	1
18	MP-1	Z	-.032	8
19	MP-2	Z	-.038	8
20	MP-3	Z	-.014	5

Member Point Loads (BLC 25 : 135 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.029	.5
2	MP-1	X	.011	2
3	MP-2	X	.037	.5
4	MP-2	X	.011	2
5	MP-3	X	.013	.5
6	MP-3	X	.01	2
7	MP-4	X	.023	1
8	MP-1	X	.029	8
9	MP-2	X	.037	8
10	MP-3	X	.013	5
11	MP-1	Z	-.029	.5
12	MP-1	Z	-.011	2
13	MP-2	Z	-.037	.5
14	MP-2	Z	-.011	2
15	MP-3	Z	-.013	.5
16	MP-3	Z	-.01	2
17	MP-4	Z	-.023	1
18	MP-1	Z	-.029	8
19	MP-2	Z	-.037	8
20	MP-3	Z	-.013	5

Member Point Loads (BLC 26 : 150 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.037	.5
2	MP-1	X	.014	2
3	MP-2	X	.053	.5
4	MP-2	X	.016	2
5	MP-3	X	.018	.5
6	MP-3	X	.013	2
7	MP-4	X	.024	1
8	MP-1	X	.037	8
9	MP-2	X	.053	8
10	MP-3	X	.018	5
11	MP-1	Z	-.022	.5
12	MP-1	Z	-.008	2
13	MP-2	Z	-.031	.5
14	MP-2	Z	-.009	2
15	MP-3	Z	-.01	.5
16	MP-3	Z	-.007	2
17	MP-4	Z	-.014	1
18	MP-1	Z	-.022	8
19	MP-2	Z	-.031	8
20	MP-3	Z	-.01	5

Member Point Loads (BLC 27 : 180 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.046	.5
2	MP-1	X	.018	2
3	MP-2	X	.07	.5
4	MP-2	X	.021	2
5	MP-3	X	.023	.5
6	MP-3	X	.015	2
7	MP-4	X	.024	1
8	MP-1	X	.046	8
9	MP-2	X	.07	8
10	MP-3	X	.023	5

Company : Tower Engineering Professionals, Inc.
Designer : Traveon S. Harris
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Member Point Loads (BLC 28 : 210 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.037	.5
2	MP-1	X	.014	2
3	MP-2	X	.053	.5
4	MP-2	X	.016	2
5	MP-3	X	.018	.5
6	MP-3	X	.013	2
7	MP-4	X	.024	1
8	MP-1	X	.037	8
9	MP-2	X	.053	8
10	MP-3	X	.018	5
11	MP-1	Z	.022	.5
12	MP-1	Z	.008	2
13	MP-2	Z	.031	.5
14	MP-2	Z	.009	2
15	MP-3	Z	.01	.5
16	MP-3	Z	.007	2
17	MP-4	Z	.014	1
18	MP-1	Z	.022	8
19	MP-2	Z	.031	8
20	MP-3	Z	.01	5

Member Point Loads (BLC 29 : 225 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.029	.5
2	MP-1	X	.011	2
3	MP-2	X	.037	.5
4	MP-2	X	.011	2
5	MP-3	X	.013	.5
6	MP-3	X	.01	2
7	MP-4	X	.023	1
8	MP-1	X	.029	8
9	MP-2	X	.037	8
10	MP-3	X	.013	5
11	MP-1	Z	.029	.5
12	MP-1	Z	.011	2
13	MP-2	Z	.037	.5
14	MP-2	Z	.011	2
15	MP-3	Z	.013	.5
16	MP-3	Z	.01	2
17	MP-4	Z	.023	1
18	MP-1	Z	.029	8
19	MP-2	Z	.037	8
20	MP-3	Z	.013	5

Member Point Loads (BLC 30 : 240 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.019	.5
2	MP-1	X	.007	2
3	MP-2	X	.022	.5
4	MP-2	X	.006	2
5	MP-3	X	.008	.5
6	MP-3	X	.007	2
7	MP-4	X	.018	1
8	MP-1	X	.019	8
9	MP-2	X	.022	8
10	MP-3	X	.008	5

Member Point Loads (BLC 30 : 240 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
11	MP-1	Z	.032	.5
12	MP-1	Z	.012	2
13	MP-2	Z	.038	.5
14	MP-2	Z	.011	2
15	MP-3	Z	.014	.5
16	MP-3	Z	.012	2
17	MP-4	Z	.031	1
18	MP-1	Z	.032	8
19	MP-2	Z	.038	8
20	MP-3	Z	.014	5

Member Point Loads (BLC 31 : 270 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	.035	.5
2	MP-1	Z	.013	2
3	MP-2	Z	.035	.5
4	MP-2	Z	.009	2
5	MP-3	Z	.014	.5
6	MP-3	Z	.013	2
7	MP-4	Z	.04	1
8	MP-1	Z	.035	8
9	MP-2	Z	.035	8
10	MP-3	Z	.014	5

Member Point Loads (BLC 32 : 300 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.019	.5
2	MP-1	X	-.007	2
3	MP-2	X	-.022	.5
4	MP-2	X	-.006	2
5	MP-3	X	-.008	.5
6	MP-3	X	-.007	2
7	MP-4	X	-.018	1
8	MP-1	X	-.019	8
9	MP-2	X	-.022	8
10	MP-3	X	-.008	5
11	MP-1	Z	.032	.5
12	MP-1	Z	.012	2
13	MP-2	Z	.038	.5
14	MP-2	Z	.011	2
15	MP-3	Z	.014	.5
16	MP-3	Z	.012	2
17	MP-4	Z	.031	1
18	MP-1	Z	.032	8
19	MP-2	Z	.038	8
20	MP-3	Z	.014	5

Member Point Loads (BLC 33 : 315 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.029	.5
2	MP-1	X	-.011	2
3	MP-2	X	-.037	.5
4	MP-2	X	-.011	2
5	MP-3	X	-.013	.5
6	MP-3	X	-.01	2

Member Point Loads (BLC 33 : 315 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
7	MP-4	X	-.023	1
8	MP-1	X	-.029	8
9	MP-2	X	-.037	8
10	MP-3	X	-.013	5
11	MP-1	Z	.029	.5
12	MP-1	Z	.011	2
13	MP-2	Z	.037	.5
14	MP-2	Z	.011	2
15	MP-3	Z	.013	.5
16	MP-3	Z	.01	2
17	MP-4	Z	.023	1
18	MP-1	Z	.029	8
19	MP-2	Z	.037	8
20	MP-3	Z	.013	5

Member Point Loads (BLC 34 : 330 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.037	.5
2	MP-1	X	-.014	2
3	MP-2	X	-.053	.5
4	MP-2	X	-.016	2
5	MP-3	X	-.018	.5
6	MP-3	X	-.013	2
7	MP-4	X	-.024	1
8	MP-1	X	-.037	8
9	MP-2	X	-.053	8
10	MP-3	X	-.018	5
11	MP-1	Z	.022	.5
12	MP-1	Z	.008	2
13	MP-2	Z	.031	.5
14	MP-2	Z	.009	2
15	MP-3	Z	.01	.5
16	MP-3	Z	.007	2
17	MP-4	Z	.014	1
18	MP-1	Z	.022	8
19	MP-2	Z	.031	8
20	MP-3	Z	.01	5

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.012	-.012	0	%100
2	MP-1	X	-.011	-.011	0	%100
3	MP-2	X	-.011	-.011	0	%100
4	MP-3	X	-.011	-.011	0	%100
5	SA-1	X	0	0	0	%100
6	MP-4	X	-.009	-.009	0	%100

Member Distributed Loads (BLC 3 : 30 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.009	-.009	0	%100
2	MP-1	X	-.009	-.009	0	%100
3	MP-2	X	-.009	-.009	0	%100
4	MP-3	X	-.009	-.009	0	%100
5	SA-1	X	-.008	-.008	0	%100

Member Distributed Loads (BLC 3 : 30 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
6	MP-4	X	-.008	-.008	0	%100
7	FFTH	Z	-.005	-.005	0	%100
8	MP-1	Z	-.005	-.005	0	%100
9	MP-2	Z	-.005	-.005	0	%100
10	MP-3	Z	-.005	-.005	0	%100
11	SA-1	Z	-.005	-.005	0	%100
12	MP-4	Z	-.004	-.004	0	%100

Member Distributed Loads (BLC 4 : 45 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.006	-.006	0	%100
2	MP-1	X	-.008	-.008	0	%100
3	MP-2	X	-.008	-.008	0	%100
4	MP-3	X	-.008	-.008	0	%100
5	SA-1	X	-.009	-.009	0	%100
6	MP-4	X	-.006	-.006	0	%100
7	FFTH	Z	-.006	-.006	0	%100
8	MP-1	Z	-.008	-.008	0	%100
9	MP-2	Z	-.008	-.008	0	%100
10	MP-3	Z	-.008	-.008	0	%100
11	SA-1	Z	-.009	-.009	0	%100
12	MP-4	Z	-.006	-.006	0	%100

Member Distributed Loads (BLC 5 : 60 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.003	-.003	0	%100
2	MP-1	X	-.005	-.005	0	%100
3	MP-2	X	-.005	-.005	0	%100
4	MP-3	X	-.005	-.005	0	%100
5	SA-1	X	-.008	-.008	0	%100
6	MP-4	X	-.004	-.004	0	%100
7	FFTH	Z	-.005	-.005	0	%100
8	MP-1	Z	-.009	-.009	0	%100
9	MP-2	Z	-.009	-.009	0	%100
10	MP-3	Z	-.009	-.009	0	%100
11	SA-1	Z	-.014	-.014	0	%100
12	MP-4	Z	-.008	-.008	0	%100

Member Distributed Loads (BLC 6 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	Z	0	0	0	%100
2	MP-1	Z	-.011	-.011	0	%100
3	MP-2	Z	-.011	-.011	0	%100
4	MP-3	Z	-.011	-.011	0	%100
5	SA-1	Z	-.018	-.018	0	%100
6	MP-4	Z	-.009	-.009	0	%100

Member Distributed Loads (BLC 7 : 120 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.003	.003	0	%100
2	MP-1	X	.005	.005	0	%100
3	MP-2	X	.005	.005	0	%100
4	MP-3	X	.005	.005	0	%100
5	SA-1	X	.008	.008	0	%100
6	MP-4	X	.004	.004	0	%100

Company : Tower Engineering Professionals, Inc.
Designer : Traveon S. Harris
Job Number : TEP No. 155516.293551
Model Name : CCI BU No. 842865

Aug 28, 2019
11:38 AM
Checked By: GHM

Member Distributed Loads (BLC 7 : 120 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
7	FFTH	Z	-.005	-.005	0	%100
8	MP-1	Z	-.009	-.009	0	%100
9	MP-2	Z	-.009	-.009	0	%100
10	MP-3	Z	-.009	-.009	0	%100
11	SA-1	Z	-.014	-.014	0	%100
12	MP-4	Z	-.008	-.008	0	%100

Member Distributed Loads (BLC 8 : 135 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.006	.006	0	%100
2	MP-1	X	.008	.008	0	%100
3	MP-2	X	.008	.008	0	%100
4	MP-3	X	.008	.008	0	%100
5	SA-1	X	.009	.009	0	%100
6	MP-4	X	.006	.006	0	%100
7	FFTH	Z	-.006	-.006	0	%100
8	MP-1	Z	-.008	-.008	0	%100
9	MP-2	Z	-.008	-.008	0	%100
10	MP-3	Z	-.008	-.008	0	%100
11	SA-1	Z	-.009	-.009	0	%100
12	MP-4	Z	-.006	-.006	0	%100

Member Distributed Loads (BLC 9 : 150 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.009	.009	0	%100
2	MP-1	X	.009	.009	0	%100
3	MP-2	X	.009	.009	0	%100
4	MP-3	X	.009	.009	0	%100
5	SA-1	X	.008	.008	0	%100
6	MP-4	X	.008	.008	0	%100
7	FFTH	Z	-.005	-.005	0	%100
8	MP-1	Z	-.005	-.005	0	%100
9	MP-2	Z	-.005	-.005	0	%100
10	MP-3	Z	-.005	-.005	0	%100
11	SA-1	Z	-.005	-.005	0	%100
12	MP-4	Z	-.004	-.004	0	%100

Member Distributed Loads (BLC 10 : 180 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.012	.012	0	%100
2	MP-1	X	.011	.011	0	%100
3	MP-2	X	.011	.011	0	%100
4	MP-3	X	.011	.011	0	%100
5	SA-1	X	0	0	0	%100
6	MP-4	X	.009	.009	0	%100

Member Distributed Loads (BLC 11 : 210 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.009	.009	0	%100
2	MP-1	X	.009	.009	0	%100
3	MP-2	X	.009	.009	0	%100
4	MP-3	X	.009	.009	0	%100
5	SA-1	X	.008	.008	0	%100
6	MP-4	X	.008	.008	0	%100
7	FFTH	Z	.005	.005	0	%100

Member Distributed Loads (BLC 11 : 210 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
8	MP-1	Z	.005	.005	0	%100
9	MP-2	Z	.005	.005	0	%100
10	MP-3	Z	.005	.005	0	%100
11	SA-1	Z	.005	.005	0	%100
12	MP-4	Z	.004	.004	0	%100

Member Distributed Loads (BLC 12 : 225 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.006	.006	0	%100
2	MP-1	X	.008	.008	0	%100
3	MP-2	X	.008	.008	0	%100
4	MP-3	X	.008	.008	0	%100
5	SA-1	X	.009	.009	0	%100
6	MP-4	X	.006	.006	0	%100
7	FFTH	Z	.006	.006	0	%100
8	MP-1	Z	.008	.008	0	%100
9	MP-2	Z	.008	.008	0	%100
10	MP-3	Z	.008	.008	0	%100
11	SA-1	Z	.009	.009	0	%100
12	MP-4	Z	.006	.006	0	%100

Member Distributed Loads (BLC 13 : 240 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.003	.003	0	%100
2	MP-1	X	.005	.005	0	%100
3	MP-2	X	.005	.005	0	%100
4	MP-3	X	.005	.005	0	%100
5	SA-1	X	.008	.008	0	%100
6	MP-4	X	.004	.004	0	%100
7	FFTH	Z	.005	.005	0	%100
8	MP-1	Z	.009	.009	0	%100
9	MP-2	Z	.009	.009	0	%100
10	MP-3	Z	.009	.009	0	%100
11	SA-1	Z	.014	.014	0	%100
12	MP-4	Z	.008	.008	0	%100

Member Distributed Loads (BLC 14 : 270 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	Z	0	0	0	%100
2	MP-1	Z	.011	.011	0	%100
3	MP-2	Z	.011	.011	0	%100
4	MP-3	Z	.011	.011	0	%100
5	SA-1	Z	.018	.018	0	%100
6	MP-4	Z	.009	.009	0	%100

Member Distributed Loads (BLC 15 : 300 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.003	-.003	0	%100
2	MP-1	X	-.005	-.005	0	%100
3	MP-2	X	-.005	-.005	0	%100
4	MP-3	X	-.005	-.005	0	%100
5	SA-1	X	-.008	-.008	0	%100
6	MP-4	X	-.004	-.004	0	%100
7	FFTH	Z	.005	.005	0	%100
8	MP-1	Z	.009	.009	0	%100

Member Distributed Loads (BLC 15 : 300 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
9	MP-2	Z	.009	.009	0	%100
10	MP-3	Z	.009	.009	0	%100
11	SA-1	Z	.014	.014	0	%100
12	MP-4	Z	.008	.008	0	%100

Member Distributed Loads (BLC 16 : 315 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.006	-.006	0	%100
2	MP-1	X	-.008	-.008	0	%100
3	MP-2	X	-.008	-.008	0	%100
4	MP-3	X	-.008	-.008	0	%100
5	SA-1	X	-.009	-.009	0	%100
6	MP-4	X	-.006	-.006	0	%100
7	FFTH	Z	.006	.006	0	%100
8	MP-1	Z	.008	.008	0	%100
9	MP-2	Z	.008	.008	0	%100
10	MP-3	Z	.008	.008	0	%100
11	SA-1	Z	.009	.009	0	%100
12	MP-4	Z	.006	.006	0	%100

Member Distributed Loads (BLC 17 : 330 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.009	-.009	0	%100
2	MP-1	X	-.009	-.009	0	%100
3	MP-2	X	-.009	-.009	0	%100
4	MP-3	X	-.009	-.009	0	%100
5	SA-1	X	-.008	-.008	0	%100
6	MP-4	X	-.008	-.008	0	%100
7	FFTH	Z	.005	.005	0	%100
8	MP-1	Z	.005	.005	0	%100
9	MP-2	Z	.005	.005	0	%100
10	MP-3	Z	.005	.005	0	%100
11	SA-1	Z	.005	.005	0	%100
12	MP-4	Z	.004	.004	0	%100

Member Distributed Loads (BLC 18 : Ice Weight)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	Y	-.005	-.005	0	%100
2	MP-1	Y	-.004	-.004	0	%100
3	MP-2	Y	-.004	-.004	0	%100
4	MP-3	Y	-.004	-.004	0	%100
5	SA-1	Y	-.007	-.007	0	%100
6	MP-4	Y	-.004	-.004	0	%100

Member Distributed Loads (BLC 19 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.003	-.003	0	%100
2	MP-1	X	-.003	-.003	0	%100
3	MP-2	X	-.003	-.003	0	%100
4	MP-3	X	-.003	-.003	0	%100
5	SA-1	X	-.005	-.005	0	%100
6	MP-4	X	-.002	-.002	0	%100

Member Distributed Loads (BLC 20 : 30 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 20 : 30 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.003	-.003	0	%100
2	MP-1	X	-.002	-.002	0	%100
3	MP-2	X	-.002	-.002	0	%100
4	MP-3	X	-.002	-.002	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.002	-.002	0	%100
7	FFTH	Z	-.001	-.001	0	%100
8	MP-1	Z	-.002	-.002	0	%100
9	MP-2	Z	-.002	-.002	0	%100
10	MP-3	Z	-.002	-.002	0	%100
11	SA-1	Z	-.001	-.001	0	%100
12	MP-4	Z	-.001	-.001	0	%100

Member Distributed Loads (BLC 21 : 45 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.002	-.002	0	%100
2	MP-1	X	-.002	-.002	0	%100
3	MP-2	X	-.002	-.002	0	%100
4	MP-3	X	-.002	-.002	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.001	-.001	0	%100
7	FFTH	Z	-.002	-.002	0	%100
8	MP-1	Z	-.002	-.002	0	%100
9	MP-2	Z	-.002	-.002	0	%100
10	MP-3	Z	-.002	-.002	0	%100
11	SA-1	Z	-.002	-.002	0	%100
12	MP-4	Z	-.002	-.002	0	%100

Member Distributed Loads (BLC 22 : 60 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.000839	-.000839	0	%100
2	MP-1	X	-.001	-.001	0	%100
3	MP-2	X	-.001	-.001	0	%100
4	MP-3	X	-.001	-.001	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.001	-.001	0	%100
7	FFTH	Z	-.001	-.001	0	%100
8	MP-1	Z	-.003	-.003	0	%100
9	MP-2	Z	-.003	-.003	0	%100
10	MP-3	Z	-.003	-.003	0	%100
11	SA-1	Z	-.004	-.004	0	%100
12	MP-4	Z	-.002	-.002	0	%100

Member Distributed Loads (BLC 23 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	Z	0	0	0	%100
2	MP-1	Z	-.003	-.003	0	%100
3	MP-2	Z	-.003	-.003	0	%100
4	MP-3	Z	-.003	-.003	0	%100
5	SA-1	Z	-.005	-.005	0	%100
6	MP-4	Z	-.002	-.002	0	%100

Member Distributed Loads (BLC 24 : 120 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.000839	.000839	0	%100

Member Distributed Loads (BLC 24 : 120 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
2	MP-1	X	.001	.001	0	%100
3	MP-2	X	.001	.001	0	%100
4	MP-3	X	.001	.001	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.001	.001	0	%100
7	FFTH	Z	-.001	-.001	0	%100
8	MP-1	Z	-.003	-.003	0	%100
9	MP-2	Z	-.003	-.003	0	%100
10	MP-3	Z	-.003	-.003	0	%100
11	SA-1	Z	-.004	-.004	0	%100
12	MP-4	Z	-.002	-.002	0	%100

Member Distributed Loads (BLC 25 : 135 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.002	.002	0	%100
2	MP-1	X	.002	.002	0	%100
3	MP-2	X	.002	.002	0	%100
4	MP-3	X	.002	.002	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.001	.001	0	%100
7	FFTH	Z	-.002	-.002	0	%100
8	MP-1	Z	-.002	-.002	0	%100
9	MP-2	Z	-.002	-.002	0	%100
10	MP-3	Z	-.002	-.002	0	%100
11	SA-1	Z	-.002	-.002	0	%100
12	MP-4	Z	-.002	-.002	0	%100

Member Distributed Loads (BLC 26 : 150 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.003	.003	0	%100
2	MP-1	X	.002	.002	0	%100
3	MP-2	X	.002	.002	0	%100
4	MP-3	X	.002	.002	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.002	.002	0	%100
7	FFTH	Z	-.001	-.001	0	%100
8	MP-1	Z	-.002	-.002	0	%100
9	MP-2	Z	-.002	-.002	0	%100
10	MP-3	Z	-.002	-.002	0	%100
11	SA-1	Z	-.001	-.001	0	%100
12	MP-4	Z	-.001	-.001	0	%100

Member Distributed Loads (BLC 27 : 180 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.003	.003	0	%100
2	MP-1	X	.003	.003	0	%100
3	MP-2	X	.003	.003	0	%100
4	MP-3	X	.003	.003	0	%100
5	SA-1	X	.005	.005	0	%100
6	MP-4	X	.002	.002	0	%100

Member Distributed Loads (BLC 28 : 210 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.003	.003	0	%100
2	MP-1	X	.002	.002	0	%100

Member Distributed Loads (BLC 28 : 210 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
3	MP-2	X	.002	.002	0	%100
4	MP-3	X	.002	.002	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.002	.002	0	%100
7	FFTH	Z	.001	.001	0	%100
8	MP-1	Z	.002	.002	0	%100
9	MP-2	Z	.002	.002	0	%100
10	MP-3	Z	.002	.002	0	%100
11	SA-1	Z	.001	.001	0	%100
12	MP-4	Z	.001	.001	0	%100

Member Distributed Loads (BLC 29 : 225 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.002	.002	0	%100
2	MP-1	X	.002	.002	0	%100
3	MP-2	X	.002	.002	0	%100
4	MP-3	X	.002	.002	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.001	.001	0	%100
7	FFTH	Z	.002	.002	0	%100
8	MP-1	Z	.002	.002	0	%100
9	MP-2	Z	.002	.002	0	%100
10	MP-3	Z	.002	.002	0	%100
11	SA-1	Z	.002	.002	0	%100
12	MP-4	Z	.002	.002	0	%100

Member Distributed Loads (BLC 30 : 240 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	.000839	.000839	0	%100
2	MP-1	X	.001	.001	0	%100
3	MP-2	X	.001	.001	0	%100
4	MP-3	X	.001	.001	0	%100
5	SA-1	X	.002	.002	0	%100
6	MP-4	X	.001	.001	0	%100
7	FFTH	Z	.001	.001	0	%100
8	MP-1	Z	.003	.003	0	%100
9	MP-2	Z	.003	.003	0	%100
10	MP-3	Z	.003	.003	0	%100
11	SA-1	Z	.004	.004	0	%100
12	MP-4	Z	.002	.002	0	%100

Member Distributed Loads (BLC 31 : 270 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	Z	0	0	0	%100
2	MP-1	Z	.003	.003	0	%100
3	MP-2	Z	.003	.003	0	%100
4	MP-3	Z	.003	.003	0	%100
5	SA-1	Z	.005	.005	0	%100
6	MP-4	Z	.002	.002	0	%100

Member Distributed Loads (BLC 32 : 300 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.000839	-.000839	0	%100
2	MP-1	X	-.001	-.001	0	%100
3	MP-2	X	-.001	-.001	0	%100

Company : Tower Engineering Professionals, Inc.
Designer : Traveon S. Harris
Job Number : TEP No. 155516.293551
Model Name : CCI BU No. 842865

Aug 28, 2019
11:38 AM
Checked By: GHM

Member Distributed Loads (BLC 32 : 300 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
4	MP-3	X	-.001	-.001	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.001	-.001	0	%100
7	FFTH	Z	.001	.001	0	%100
8	MP-1	Z	.003	.003	0	%100
9	MP-2	Z	.003	.003	0	%100
10	MP-3	Z	.003	.003	0	%100
11	SA-1	Z	.004	.004	0	%100
12	MP-4	Z	.002	.002	0	%100

Member Distributed Loads (BLC 33 : 315 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.002	-.002	0	%100
2	MP-1	X	-.002	-.002	0	%100
3	MP-2	X	-.002	-.002	0	%100
4	MP-3	X	-.002	-.002	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.001	-.001	0	%100
7	FFTH	Z	.002	.002	0	%100
8	MP-1	Z	.002	.002	0	%100
9	MP-2	Z	.002	.002	0	%100
10	MP-3	Z	.002	.002	0	%100
11	SA-1	Z	.002	.002	0	%100
12	MP-4	Z	.002	.002	0	%100

Member Distributed Loads (BLC 34 : 330 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F,...	Start Location[ft,%]	End Location[ft,%]
1	FFTH	X	-.003	-.003	0	%100
2	MP-1	X	-.002	-.002	0	%100
3	MP-2	X	-.002	-.002	0	%100
4	MP-3	X	-.002	-.002	0	%100
5	SA-1	X	-.002	-.002	0	%100
6	MP-4	X	-.002	-.002	0	%100
7	FFTH	Z	.001	.001	0	%100
8	MP-1	Z	.002	.002	0	%100
9	MP-2	Z	.002	.002	0	%100
10	MP-3	Z	.002	.002	0	%100
11	SA-1	Z	.001	.001	0	%100
12	MP-4	Z	.001	.001	0	%100

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	SA1	max	2.361	18	1.412	66	1.57	22	2.651	55	1.795	28	1.788	26
2		min	-2.361	10	.496	2	-1.57	14	-.682	14	-1.785	4	-.772	2
3	Totals:	max	2.361	18	1.412	66	1.57	22						
4		min	-2.361	10	.496	2	-1.57	14						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc.....	L..	phi*Pnc [k]	phi*Pnt [k]	phi*Mn..	phi*Mn.....	Eqn
1	MP-2	PIPE_2.0	.992	4.25	26	.057	4.25	26	12.349	32.13	1.872	1.872	1.. H1-1b
2	MP-1	PIPE_2.0	.678	4.25	26	.041	4.25	26	12.349	32.13	1.872	1.872	1.. H1-1b
3	FFTH	PIPE_3.0	.555	3.833	56	.262	3.833	26	46.092	65.205	5.749	5.749	1.. H1-1b
4	MP-3	PIPE_2.0	.467	4.75	26	.026	4.75	26	9.886	32.13	1.872	1.872	1.. H1-1b
5	SA-1	HSS4X4X5	.172	0	27	.191	0	y 55	167.029	169.74	19.285	19.285	1.. H1-1b
6	MP-4	PIPE_2.0	.064	1.5	22	.024	1.5	22	28.526	32.13	1.872	1.872	1 H1-1b

Envelope None Cold Formed Steel Code Checks

Member	Shape	Code Check	Loc[ft]	L..	She..	Loc.....	L...	Pn[k]	Tn[k]	Mnyy[...	Mnzz[...	Cb	CmyyCmzz	Eqn
No Data to Print ...														

APPENDIX D

ADDITIONAL CALCULATIONS

Job Name: CCI BU No. 842865
Job Number: TEP No. 155516.293551
Calc: TSH Check: GHM
Date: 8/28/2019

Moment Bolt Group - Support Arm

Bolt Size:	0.625	in
# Bolts:	4	
Plate Width:	11.5	in
Plate Height:	11.5	in
Bolt H Gap:	9.25	in
Bolt V Gap:	9.25	in
Plate T:	0.625	in
Slip Member Ø:	N/A	in
Bolt Grade:	A325N	
Fu_{bolt}:	120	ksi
r:	6.5407	in
J:	171.13	in^4/in^2
$Bolt_{Area}$:	0.307	in^2
$Bolt_{Area, Net Tensile}$:	0.226	in^2
Pretension:	19	kips
Slotted Holes:	No	

Code Checks Per ANSI/TIA-222-H:

Bolt Capacity =	**12.5%**	**PASS**
Plate Capacity =	**25.3%**	**PASS**

Plate Bending

Horizontal Member height: 4 in
Horizontal Member width: 4 in
Plate Fy: 36 ksi

My =	8.1624	k - in	Z_y =	1.123	in^3	S_y =	0.749	in^3
Mz =	9.1877	k - in	Z_z =	1.123	in^3	S_z =	0.749	in^3

$ØMp_y$ (Z):	36.387	k - in
$ØMp_y$ (S):	38.813	k - in
$ØMp_z$ (Z):	36.387	k - in
$ØMp_z$ (S):	38.813	k - in

Exhibit F

Power Density/RF Emissions Report

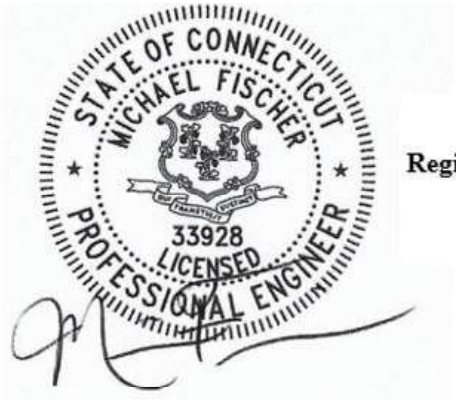
RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of AT&T Mobility, LLC

Crown Castle Site Name: LEBANON WEST
Crown Castle Site BU: 842865
AT&T Mobility, LLC Site FA #: 10071090
1593 Exeter Road
Lebanon, CT
10/4/2019

Report Status:

AT&T Mobility, LLC Is Compliant



Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
Connecticut License Number 33928
Expires January 31, 2020

Signed 04 October 2019

Prepared By:

Site Safe, LLC

8618 Westwood Center Drive
Suite 315

Vienna, VA 22182

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

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

My signature on the cover of this document indicates:

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

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

That I am an employee of Site Safe, LLC in Vienna, Virginia; and

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

That the technical information serving as the basis for this report was supplied by Crown Castle (see attached Site Summary and Carrier documents) and that AT&T Mobility, LLC's installation involves communications equipment, antennas and associated technical equipment at a location referred to as "LEBANON WEST" ("the site"); and

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

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

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

That such consideration of possible exposure of humans to radio frequency energy must utilize the standards set by the FCC, which is the federal agency having jurisdiction over communications facilities; and

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

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

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is

no more than 3.783% of the maximum permissible exposure limits in any accessible area on the ground; and

That it is understood per FCC Guidelines and OET 65 Appendix A, that regardless of the existent radio frequency environment, only those licensees whose contributions exceed 5% of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 5.212% of the maximum in any accessible area up to two meters above the ground per OET 65; and

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

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

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

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

Crown Castle
LEBANON WEST
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.174 %
AT&T Mobility, LLC (Proposed)	0.839 %
AT&T Mobility, LLC (Proposed)	0.385 %
AT&T Mobility, LLC (Proposed)	0.478 %
AT&T Mobility, LLC (Proposed)	0.598 %
AT&T Mobility, LLC (Proposed)	1.048 %
AT&T Mobility, LLC (Proposed)	0.261 %
Verizon Wireless	0.289 %
Verizon Wireless	0.417 %
Verizon Wireless	0.389 %
Verizon Wireless	0.334 %
Composite Site MPE:	5.212 %

AT&T Mobility, LLC
LEBANON WEST
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	0.9849	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.17381	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Powerwave	7770	120	100	547	0.369131	0.065141	0.577619	0.101933
Powerwave	7770	120	200	547	0.369131	0.065141	0.577619	0.101933
Powerwave	7770	120	300	547	0.369131	0.065141	0.577619	0.101933

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	8.39048	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.83905	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	DMP65R-BU8D	120	90	5250	7.395602	0.73956	8.350558	0.835056
CCI Antennas	DMP65R-BU8D	120	220	5250	7.395602	0.73956	8.350558	0.835056
CCI Antennas	DMP65R-BU8D	120	340	5250	7.395602	0.73956	8.350558	0.835056

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	2.18369	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.38536	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	DMP65R-BU8D	120	90	2885	1.138481	0.200908	2.141738	0.377954
CCI Antennas	DMP65R-BU8D	120	220	2885	1.138481	0.200908	2.141738	0.377954
CCI Antennas	DMP65R-BU8D	120	340	2885	1.138481	0.200908	2.141738	0.377954

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	763	MHz
Maximum Permissible Exposure (MPE):	508.67	µW/cm^2
Maximum power density at ground level:	2.43279	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.47827	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	DMP65R-BU8D	120	90	2692	1.095932	0.215452	2.046654	0.402357
CCI Antennas	DMP65R-BU8D	120	220	2692	1.095932	0.215452	2.046654	0.402357
CCI Antennas	DMP65R-BU8D	120	340	2692	1.095932	0.215452	2.046654	0.402357

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.97819	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.59782	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	HPA65R-BU8A	120	90	2667	5.957152	0.595715	5.957152	0.595715
CCI Antennas	HPA65R-BU8A	120	220	2667	5.957152	0.595715	5.957152	0.595715
CCI Antennas	HPA65R-BU8A	120	340	2667	5.957152	0.595715	5.957152	0.595715

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	10.4838	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	1.04838	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	HPA65R-BU8A	120	90	4679	9.548061	0.954806	10.419684	1.041968
CCI Antennas	HPA65R-BU8A	120	220	4679	9.548061	0.954806	10.419684	1.041968
CCI Antennas	HPA65R-BU8A	120	340	4679	9.548061	0.954806	10.419684	1.041968

AT&T Mobility, LLC (Proposed)
LEBANON WEST
Carrier Summary

Frequency:	737	MHz
Maximum Permissible Exposure (MPE):	491.33	µW/cm^2
Maximum power density at ground level:	1.28093	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.2607	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	HPA65R-BU8A	120	90	1242	0.509555	0.103709	1.009873	0.205537
CCI Antennas	HPA65R-BU8A	120	220	1242	0.509555	0.103709	1.009873	0.205537
CCI Antennas	HPA65R-BU8A	120	340	1242	0.509555	0.103709	1.009873	0.205537

Verizon Wireless
LEBANON WEST
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.63972	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.28936	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-80063-6CF	150	10	4509	1.604007	0.28306	1.630169	0.287677
Antel	BXA-80063-6CF	150	120	4509	1.604007	0.28306	1.630169	0.287677
Antel	BXA-80063-6CF	150	270	4509	1.604007	0.28306	1.630169	0.287677

Verizon Wireless
LEBANON WEST
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	2.08528	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.4165	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-70063-6CF	150	10	4019	1.494784	0.298559	1.76463	0.352456
Antel	BXA-70063-6CF	150	120	4019	1.494784	0.298559	1.76463	0.352456
Antel	BXA-70063-6CF	150	270	4019	1.494784	0.298559	1.76463	0.352456

Verizon Wireless
LEBANON WEST
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.89111	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.38911	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-171063-12CF	150	10	7837	1.747596	0.17476	3.59284	0.359284
Antel	BXA-171063-12CF	150	120	7837	1.747596	0.17476	3.59284	0.359284
Antel	BXA-171063-12CF	150	270	7837	1.747596	0.17476	3.59284	0.359284

Verizon Wireless
LEBANON WEST
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.34411	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.33441	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-171063-12CF	150	10	7147	1.199065	0.119906	2.870013	0.287001
Antel	BXA-171063-12CF	150	120	7147	1.199065	0.119906	2.870013	0.287001
Antel	BXA-171063-12CF	150	270	7147	1.199065	0.119906	2.870013	0.287001