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

January 23, 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 / Crown Site BU: 876381**
AT&T Site ID: CTL05640
Located at: 2365 Long Hill Road, Guilford, CT 06437
Latitude: 41° 20′ 47.34″/ Longitude: -72° 43′ 23.15″

Dear Ms. Bachman:

AT&T is requesting to file an Exempt Modification for an existing 176-foot monopole tower located at 2365 Long Hill Road, Guilford, CT 06437. AT&T currently maintains nine (9) antennas at the 167-foot level of the existing monopole. The tower is owned by Crown Castle. The property is owned by the James Ward Family and Janice Ward Family. AT&T now intends to swap out six (6) panel antennas antenna and (3) RRUs add (3) RRUs, (1) surge protector, (2) DC cables and (1) Fiber cable.

This facility was approved by the Connecticut Siting Council in Docket No. 238 on May 3, 2009. This approval included the conditions that:

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 Sprint and other entities, both public and private, but such tower shall not exceed a height of 180 feet above ground level including all appurtenances.
2. The access road shall avoid Wetland 7 and minimize impacts to other wetlands.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j- 73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Joseph S. Mazza, First Selectman, Town of Guilford, the Department of Planning and Development for the City of West Haven, as well as the property owner.

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc:

Mr. Joseph S. Mazza
Town of Guilford
31 Park Street
Guilford, CT 06437
(203) 453-8015

Planning & Zoning/Inland Wetlands
Town of Guilford
50 Boston Street
Guilford, CT 06437
(203) 453-8039

James or Janice Ward -Trustees
2365 Long Hill Road
Guilford, CT 06437
(203) 915-4827

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

SHIP DATE: 25JAN19
ACTWGT: 4.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO MELANIE BACHMAN
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

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

565J2/D74C/23AD

FedEx Express

J191019010701uv

MON - 28 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7743 1554 4071

06051 BDL
CT-US

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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:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 25JAN19
ACTWGT: 2.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO JOSEPH MAZZA, FIRST SELECTMAN
TOWN OF GUILFORD
31 PARK ST

GUILFORD CT 06437
(203) 453-8032 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

E

J191019010701uv

TRK# 0201 7743 1545 1530

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PRIORITY OVERNIGHT

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06437
CT-US BDL

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

SHIP DATE: 25JAN19
ACTWGT: 2.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **PLANNING & ZONING/INLAND WETLANDS**
TOWN OF GUILFORD
50 BOSTON STREET
GUILFORD CT 06437
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

J191019010701uv

MON - 28 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7743 1547 3498**

SE RSPA

06437
CT-US **BDL**

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

SHIP DATE: 25JAN19
ACTWGT: 2.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **JAMES OR JANICE WARD - TRUSTEES**
2365 LONG HILL ROAD

GUILFORD CT 06437
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

E

J191019010701uv

MON - 28 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7743 1549 3191**

06437
CT-US **BDL**

SE RSPA

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Connecticut Siting Council
Decisions

DOCKET NO. 238 - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility located at 2381 Long Hill Road, Guilford, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	May 6, 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 wireless 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 Sprint Spectrum L. P. (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at 2381 Long Hill Road, Guilford, Connecticut with the tower relocated approximately 430 feet to the northwest to keep the tower radius within the property boundaries. The Council will not approve the proposed locations of the tower or access road as proposed in the application.

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 Sprint and other entities, both public and private, but such tower shall not exceed a height of 180 feet above ground level including all appurtenances.

2. The access road shall avoid Wetland 7 and minimize impacts to other wetlands.

3. The Certificate Holder shall prepare a 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 final site plan(s) for site development to include the location of the tower and the access road and specifications for the tower foundation, placement of carrier antennas, tower height, equipment buildings, security fence, access road, and utility line; construction plans for site clearing, tree trimming, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; landscaping and provisions to protect the existing vegetative buffer that would extend around the facility compound; a tower finish that may include painting; and provisions for the prevention and containment of spills and/or other discharge into surface water and groundwater bodies.

4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities 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 provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

5. 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.

6. 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.

7. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, 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.

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

9. 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, The New Haven Register, The Guilford Courier, and the Shore Line Times.

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	**Its Representative**
Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Daniel F. Leary, Esq. Cuddy & Feder & Worby 90 Maple Avenue White Plains, NY 10601

Content Last Modified on 6/2/2003 11:20:53 AM

Town of Guilford
Property Listing Report

Parcel ID 101023B

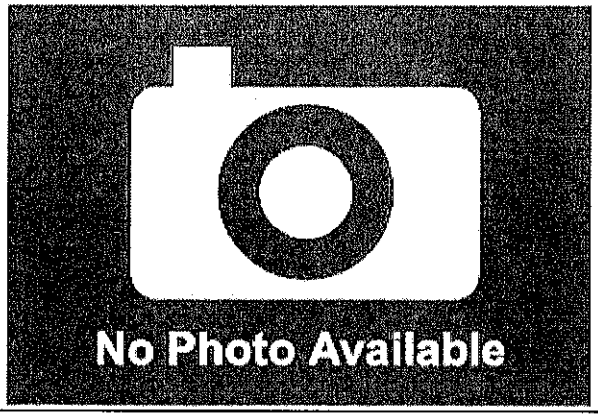
Account

Property Information

Owner	WARD JAMES J FAMILY & JANICE M FAMILY
Address	2365 LONG HILL RD
Mailing Address	2365 LONG HILL RD GUILFORD , CT 06437
Land Use	- SINGLE FAMILY
Land Class	Residential

Census Tract	1903
Neighborhood	59
Zoning	R-5
Acreage	12.96
Utilities	
Lot Setting/ Desc	/

Photo



PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings	242587	169810
Outbuildings	20251	14180
Improvements		
Extras		
Land	188226	131750
Total	451064	315740
Previous		

Construction Details

Year Built	2004
Stories	1.4
Building Style	1.4
Building Use	Residential
Building Condition	GOOD
Total Rooms	4
Bedrooms	1
Full Bathrooms	2
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	GABLE
Roof Cover	ARCH SHINGLES

EXTERIOR WALLS:	
Primary	VINYL
Secondary	
INTERIOR WALLS:	
Primary	DRYWALL
Secondary	OTHER
FLOORS:	
Primary	OTHER
Secondary	
HEATING/AC:	
Heating Type	HWBB
Heating Fuel	OIL
AC Type	

BUILDING AREA:	
Effective Building Area	
Gross Building Area	0
Total Living Area	2521

SALES HISTORY:	
Sale Date	3/17/2005
Sale Price	0
Book/ Page	0689/933+

Report Created On 9/20/2017

Town of Guilford, Connecticut - Assessment Parcel Map

Unique ID: **9786** Address: 2365 LONG HILL RD

N

Approximate Scale: **1 inch = 300 feet**

0 210 420 Feet

Map Produced:
August 2016

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

PROJECT INFORMATION

SCOPE OF WORK

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:

- REMOVE (6) ANTENNAS, (3) RRU's & (6) TRIPLEXERS

- INSTALL AT&T ANTENNA (HPA-65R-BUAA) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T ANTENNA (800-10965)(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 4449 B5/B12 (B5/B7/B0) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 8843 B2/B66A (AWS/PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 1).
- INSTALL (2) DC TRUNKS & (1) FIBER CABLE.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- INSTALL (1) 6630 FOR 5G
- SWAP (1) 6630 FOR LTE

ITEMS TO REMAIN:

- (3) ANTENNAS, (6) TMAS, (1) SURGE SUPPRESSOR, (12) COAX, (2) DC TRUNK CABLES & (1) FIBER TRUNK CABLE.

SITE ADDRESS:	2365 LONG HILL ROAD GUILFORD, CT 06437
LATITUDE (NAD 83):	N 41° 20' 47.34"
LONGITUDE (NAD 83):	W 72° 43' 23.15"
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
TYPE OF SITE:	MONOPOLE/OUTDOOR
TOWER HEIGHT:	176'
RAD CENTER:	167'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CTL05640

FA LOCATION CODE: 10071056

SITE NAME: GUILDFORD

CROWN SITE NAME: WARD

PROJECT: LTE 2C/3C/4C/4TX4RX

PACE ID: MRCTB035148, MRCTB035172, MRCTB035144, MRCTB035366

BU#: 876381

NOTE:

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

DRAWING INDEX

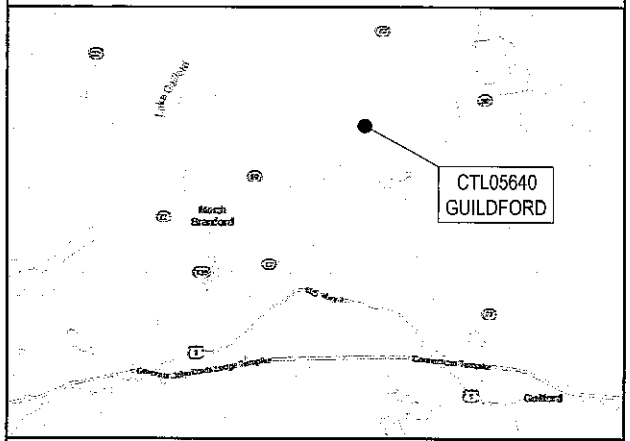
SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
C-1	SITE PLAN
C-2	EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION
C-3	EXISTING & PROPOSED ANTENNA LAYOUT
C-4	EQUIPMENT DETAILS I
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 876381
CROWN CASTLE SITE NAME: WARD

ENGINEERING

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

VICINITY MAP



JMCT5640 GUILFORD EAST I-95 NORTH TO EXIT 58 ROUTE 77. AT BOTTOM OF RAMP CONTINUE TO ROUTE 77. MAKE A LEFT AND FOLLOW ALL THE WAY TO ROUTE 80. AT THIS INTERSECTION MAKE A LEFT AND FOLLOW TO LONG HILL ROAD. MAKE A LEFT AND TAKE TO 2361. MAKE A LEFT INTO DRIVEWAY AND FOLLOW ALL THE WAY TO THE REAR AND FOLLOW PATH TO MONOPOLE AND COMPOUND. NOTE: CLOSE GATES BEHIND YOU AS YOU ENTER FARM AS LOOSE CATTLE ARE IN THE AREA AND WILL RUN OUT IF LEFT OPEN!

GENERAL NOTES

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

CONNECTICUT ONE CALL SYSTEM, INC. — 1-800-922-4455 — STOP! CALL BEFORE YOU DIG!!

UNDERGROUND SERVICE ALERT

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

at&t
5641 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO	ERCC0604
DRAWN BY:	JB
CHECKED BY:	CAT

SUBMITTALS

0	12/28/16	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILFORD
2365 LONG HILL ROAD
GUILFORD, CT 06437

TITLE SHEET

T-1

PART 1 - GENERAL

1.1 GENERAL CONDITIONS:

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

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

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

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

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

1.3 REFERENCES:

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

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

1.4 SCOPE OF WORK

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

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

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

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

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

PART 2 - PRODUCTS

2.1 GENERAL:

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

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

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

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

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

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

B. CONDUCTORS AND CABLE:

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

C. DISCONNECT SWITCHES:

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

D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:

1. INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES KQ-(*)CS OR KQL-(*)CS (*) LENGTH AS REQUIRED.
2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH 5 BREATHER HOLES, XIT MODEL #GB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID NUMBERING, AND THE ELECTRICAL POWER SOURCE.
3. BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.

E. SYSTEM GROUNDING:

1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER, ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
2. GROUNDING BUSSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS MGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"X10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.

F. OTHER MATERIALS:

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

G. PANELS AND LOAD CENTERS:

1. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

PART 3 - EXECUTION

3.1 GENERAL:

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

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

3.2 LABOR AND WORKMANSHIP:

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

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

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

3.3 COORDINATION:

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

3.4 INSTALLATION:

A. CONDUIT:

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

B. CONDUCTORS AND CABLE:

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

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

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

C. DISCONNECT SWITCHES:

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

D GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-20135, AND THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM. THE BUILDING STEEL, COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY) SEE STANDARD § 2.2.2
5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING
6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #8 AWG GROUNDING CONDUCTOR TO A GROUND BUS
11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX, FLUSH WITH GRADE.
14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES
15. IF COAX ON THE ICE BRIDGE IS MORE THAN 5 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
16. CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.

3.5 ACCEPTANCE TESTING:

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

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

C. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

at&t
5961 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO.	ERC00004
DRAWN BY:	JB
CHECKED BY:	CAT

SUBMITTALS

0	10/28/16	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD

2365 LONG HILL ROAD
GUILFORD, CT 06437

GENERAL NOTES I

GN-1

ANTENNA MOUNTING

1. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.
2. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
3. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
4. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
5. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
6. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
7. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
8. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-69246.
9. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
10. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
11. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

12. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
13. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.
    C. ALL 5/8 ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB-FT (12 NM).
14. ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB-FT (58 NM).
15. ALL GROUNDING HARDWARE SHALL BE TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUNDING HARDWARE IS NO LONGER LOOSE.
16. ALL DIN TYPE CONNECTIONS SHALL BE TIGHTENED TO 18-22 LB-FT (24.4 - 29.8 NM).
17. ALL N TYPE CONNECTIONS SHALL BE TIGHTENED TO 15-20 LB-IN (1.7 - 2.3 NM).

FIBER & POWER CABLE MOUNTING

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

COAXIAL CABLE NOTES

21. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
22. CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
23. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION. REFER TO "ANTENNA SYSTEM LABELING STANDARD" ND-00027 LATEST VERSION.
24. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".
25. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" O.C.
26. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
27. CONTRACTOR SHALL WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF AMALGAMATING TAPE. WEATHERPROOFING SHALL BE COMPLETED IN STRICT ACCORDANCE WITH AT&T STANDARDS.
28. CONTRACTOR SHALL GROUND ALL EQUIPMENT, INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
29. CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
30. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

31. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
32. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC, SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
33. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
34. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
35. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS.
36. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
37. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND
38. BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
39. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANTENNA AND THE COAX CONFIGURATION IS THE CORRECT MAKE AND MODELS, PRIOR TO INSTALLATION.
40. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC, SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.
41. ANTENNA CONTRACTOR SHALL FURNISH AND INSTALL A 12'-0" T-BOOM SECTOR ANTENNA MOUNT, IF APPLICABLE, INCLUDING ALL HARDWARE.

GROUNDING NOTES

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

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
EXOTHERMIC WITH INSPECTION SLEEVE
GROUNDING BAR
SHELTER GROUNDING BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE
SINGLE POLE SWITCH
DUPLEX RECEPTACLE
DUPLEX GFCI RECEPTACLE
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
EXISTING SMOKE DETECTION (DC)
EXISTING EMERGENCY LIGHTING (DC)
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A-400/51K-SR4-120-PE-DDDTXD
EXISTING UTILITY POLE
EXISTING CHAIN LINK FENCE
EXISTING WOOD/WROUGHT IRON FENCE
EXISTING WALL STRUCTURE
LEASE AREA
PROPERTY LINE (PL)
SETBACKS
PROPOSED/EXISTING ICE BRIDGE
PROPOSED/EXISTING CABLE TRAY
EXISTING WATER LINE
PROPOSED UNDERGROUND POWER
PROPOSED UNDERGROUND TELCO
PROPOSED OVERHEAD POWER
PROPOSED OVERHEAD TELCO
PROPOSED OVERHEAD UTILITIES
PROPOSED ABOVE GROUND POWER
PROPOSED ABOVE GROUND TELCO

CALL OUT REFERENCE
REVISION REFERENCE
WORKPOINT
SECTION REFERENCE
DETAIL REFERENCE
ELEVATION REFERENCE

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

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

at&t
5641 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO: ERCC0804
DRAWN BY: JB
CHECKED BY: CAT

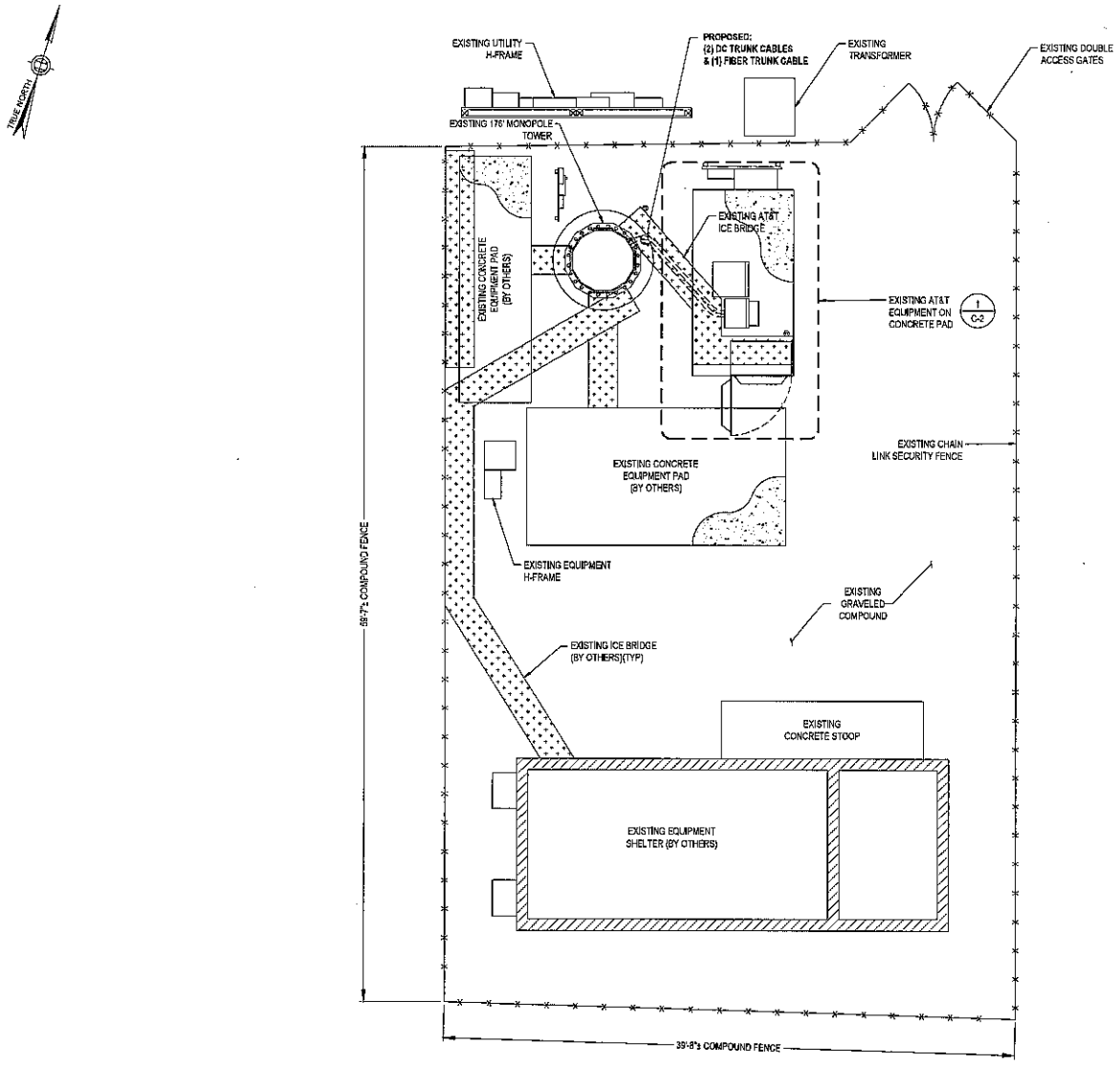
SUBMITTALS

0	12/26/19	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD
2385 LONG HILL ROAD
GUILFORD, CT 06437

GENERAL NOTES II

GN-2



NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY DEWBERRY ENGINEERS, INC ON 07/02/13. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

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

at&t
5961 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO.	BRCD0004
DRAWN BY:	JB
CHECKED BY:	CAT

SUBMITTALS

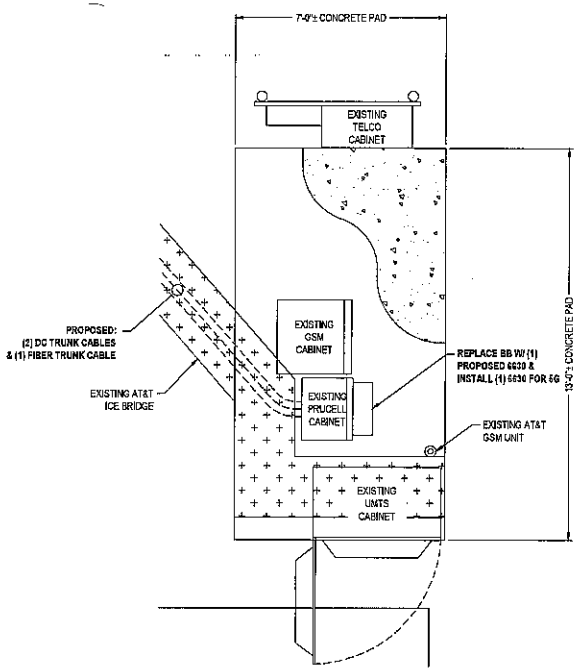
0	12/26/13	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD

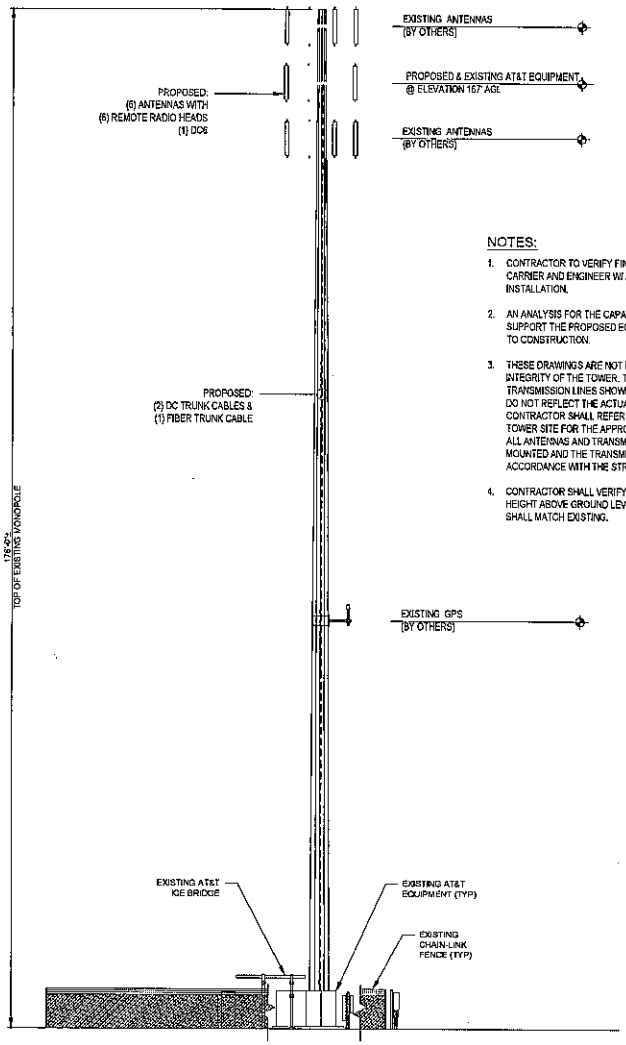
2365 LONG HILL ROAD
GUILFORD, CT 06437

SITE PLAN

C-1



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



NOTES:

1. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
2. AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
3. THESE DRAWINGS ARE NOT INTENDED TO REFLECT THE STRUCTURAL INTEGRITY OF THE TOWER. THE PROPOSED ANTENNAS AND TRANSMISSION LINES SHOWN ARE REPRESENTATIVE IN NATURE AND DO NOT REFLECT THE ACTUAL CONFIGURATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS OF THIS TOWER SITE FOR THE APPROVED LOCATION AND CONFIGURATION OF ALL ANTENNAS AND TRANSMISSION LINES. ALL ANTENNAS MUST BE MOUNTED AND THE TRANSMISSION LINES CONFIGURED IN STRICT ACCORDANCE WITH THE STRUCTURAL ANALYSIS.
4. CONTRACTOR SHALL VERIFY THE EXISTING ANTENNA CENTERLINE HEIGHT ABOVE GROUND LEVEL. PROPOSED ANTENNA CENTERLINE SHALL MATCH EXISTING.

2 TOWER ELEVATION SCALE: 3/32" = 1'-0"

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

PROJECT NO.	BRCC0004
DRAWN BY:	JB
CHECKED BY:	CAT

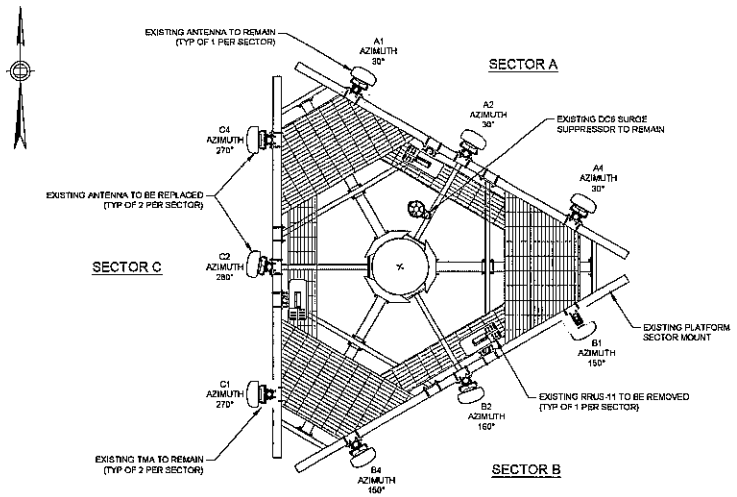
SUBMITTALS

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05840
GUILDFORD
2365 LONG HILL ROAD
GUILFORD, CT 06437

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

C-2



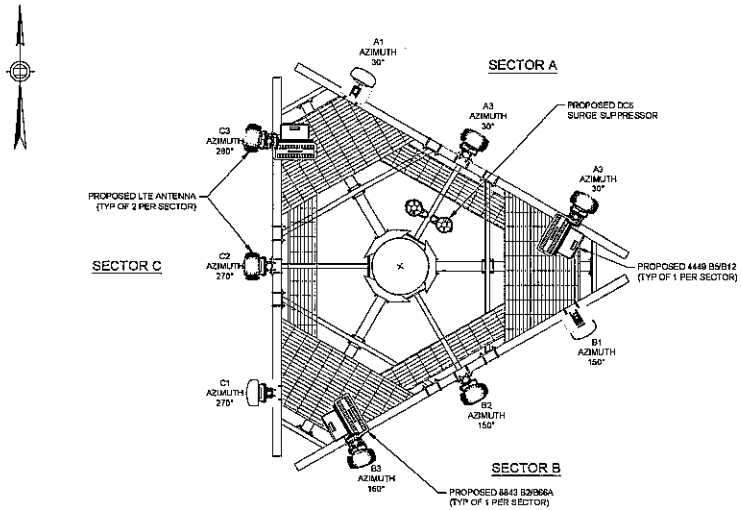
ELEVATION 167'

1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

NOTES:

1. THESE DRAWINGS ARE NOT INTENDED TO REFLECT THE STRUCTURAL INTEGRITY OF THE TOWER, THE PROPOSED ANTENNAS AND ASSOCIATED EQUIPMENT SHOWN ARE REPRESENTATIVE IN NATURE AND DO NOT REFLECT THE ACTUAL CONFIGURATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO THE MOUNT ANALYSIS OF THIS SITE FOR THE APPROVED LOCATION AND CONFIGURATION OF ALL ANTENNAS AND EQUIPMENT. ALL ANTENNAS AND EQUITMENT SHALL BE MOUNTED IN STRICT ACCORDANCE WITH THE MOUNT ANALYSIS.



ELEVATION 167'

1 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

SUBMITTALS

0	12/28/18	ISSUED FOR PERMITTING

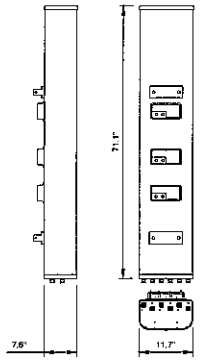
FA# 10071056
SITE# CTL05640
GUILDFORD

2385 LONG HILL ROAD
GUILFORD, CT 06437

EXISTING & PROPOSED
ANTENNA LAYOUT

C-3

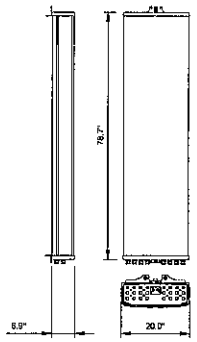
MANUFACTURER:	CCI
MODEL NO.:	HPA65R-BU6A A
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	71.1" x 11.7" x 7.6" 1807mm x 297mm x 193mm
WEIGHT (lbs):	41.8
CONNECTOR:	8 x 4.3-10 FEMALE
FRONT WIND LOAD:	201 LBS @ 100 MPH 894 N @ 161 KPH
SIDE WIND LOAD:	142 LBS @ 100 MPH 633 N @ 161 KPH
WIND SPEED MAX.:	>150 MPH (>241 KPH)



1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

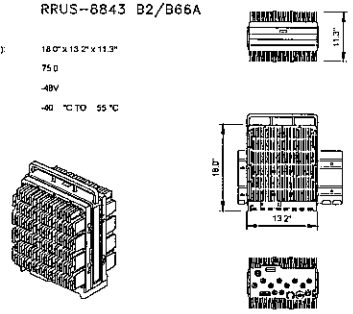
MANUFACTURER:	KATHREIN
MODEL NO.:	80010965
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	78.7" x 20.0" x 6.9" 1998mm x 508mm x 175mm
WEIGHT (lbs):	97.6
CONNECTOR:	8 x 4.3-10 FEMALE
FRONT WIND LOAD:	264 LBF @ 93 MPH 1130 N @ 150 KM/H
SIDE WIND LOAD:	256 LBF @ 93 MPH 1140 N @ 150 KM/H
WIND SPEED MAX.:	>150 MPH (>241 KM/H)



2 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

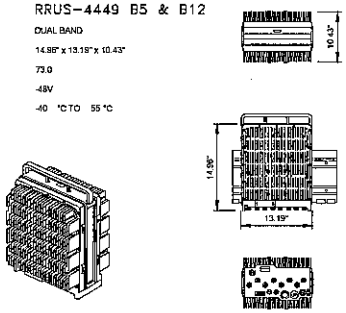
MANUFACTURER:	ERICSSON
MODEL NO.:	RRUS-8843 B2/B66A
DIMENSIONS (HxWxD):	18.0" x 13.2" x 11.3"
WEIGHT (lbs):	75.0
POWER SUPPLY:	-48V
TEMPERATURE:	-40 °C TO 55 °C



3 RRUS SPECIFICATIONS

SCALE: N.T.S.

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

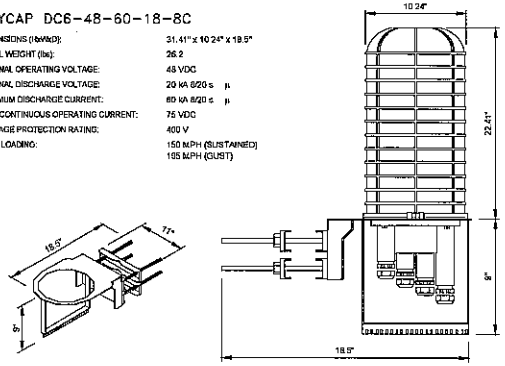


4 RRUS SPECIFICATIONS

SCALE: N.T.S.

RAYCAP DC6-48-60-18-8C

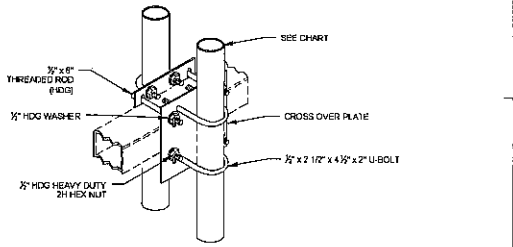
DIMENSIONS (HxWxD):	31.41" x 10.24" x 19.5"
TOTAL WEIGHT (lbs):	26.2
NOMINAL OPERATING VOLTAGE:	48 VDC
NOMINAL DISCHARGE VOLTAGE:	20 kA 8/20 s
MAXIMUM DISCHARGE CURRENT:	60 kA 8/20 s
MAX. CONTINUOUS OPERATING CURRENT:	75 VDC
VOLTAGE PROTECTION RATING:	400 V
WIND LOADING:	150 MPH (SUSTAINED) 185 MPH (GUST)



5 DC SURGE PROTECTION SPECIFICATIONS

SCALE: N.T.S.

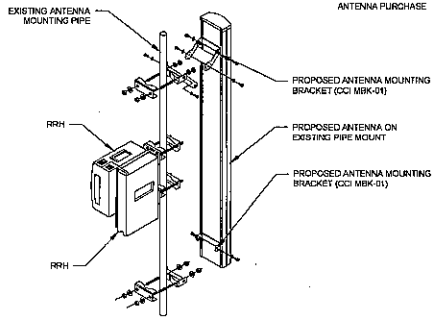
PART #	PIPE SIZE	STAND-OFF ARM
BBPM-K1	2-3/8"	3-1/2" - 4-1/2"
BBPM-K2	2-7/8"	3-1/2" - 4-1/2"
BBPM-K3	2-3/8"	3-1/2" - 6"
BBPM-U	2-3/8" - 4-1/2"	2-3/8" - 4-1/2"



6 DC6 MOUNTING DETAIL

SCALE: N.T.S.

NOTE
MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE



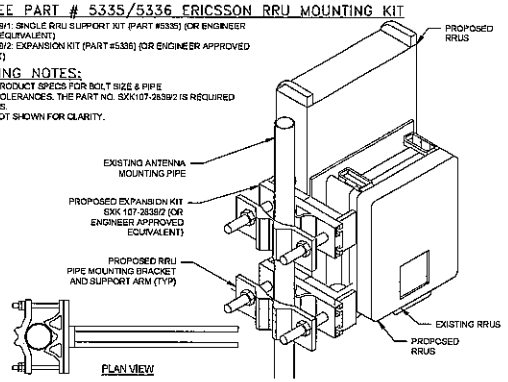
7 ANTENNA & RRH MOUNTING DETAIL

SCALE: N.T.S.

CUE DEE PART # 5335/5336 ERICSSON RRU MOUNTING KIT

SXK 107 2839/1: SINGLE RRU SUPPORT KIT (PART #5335) (OR ENGINEER APPROVED EQUIVALENT)
SXK 107 2839/2: EXPANSION KIT (PART #5336) (OR ENGINEER APPROVED EQUIVALENT)

MOUNTING NOTES:
REFER TO PRODUCT SPECS FOR BOLT SIZE & PIPE DIAMETER TOLERANCES. THE PART NO. SXK107-2839/2 IS REQUIRED FOR (2) RRUS.
ANTENNA NOT SHOWN FOR CLARITY.



8 RRU MOUNTING DETAIL

SCALE: N.T.S.

NOT USED

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO.	ERCD0004
DRAWN BY:	JB
CHECKED BY:	CAT

SUBMITTALS

0	12/20/18	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD

2365 LONG HILL ROAD
GUILFORD, CT 06437

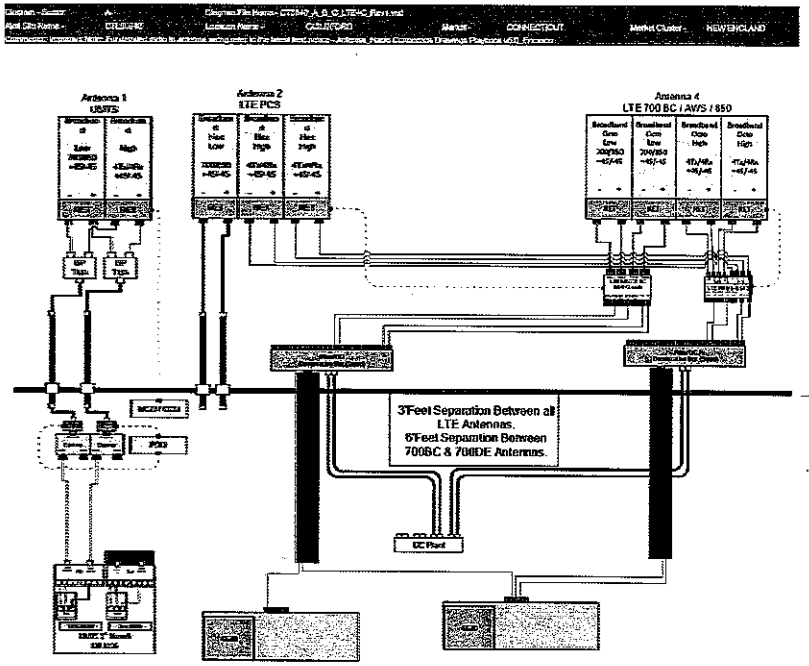
EQUIPMENT DETAILS I

C-4

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's	RRH's	FEEDER	RAYCAP
A1	7770 (55"x11"x5")	UMTS	30°	167'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 185')	(1) RAYCAP DC6-48-60-18-8F
A2	HPA-65R-BUBAA (71"x11.7"x7.6")	LTE	30°	167'	-	-	(2) 1-5/8" EXISTING (1) FIBER (2) DC (LENGTH @ 185')	
-	-	-	-	-	-	-	-	
A4	800-10965 (78.7"x20"x6.9")	LTE	30°	167'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (AWS/PCS)	(1) FIBER (2) DC (LENGTH @ 185')	(1) RAYCAP DC3-48-60-18-8C
B1	7770 (55"x11"x5")	UMTS	150°	167'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 185')	
B2	HPA-65R-BUBAA (71"x11.7"x7.6")	LTE	150°	167'	-	-	(2) 1-5/8" EXISTING (LENGTH @ 185')	
-	-	-	-	-	-	-	-	
B4	800-10965 (78.7"x20"x6.9")	LTE	150°	167'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (AWS/PCS)	-	
C1	7770 (55"x11"x5")	UMTS	270°	167'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 185')	
C2	HPA-65R-BUBAA (71"x11.7"x7.6")	LTE	270°	167'	-	-	(2) 1-5/8" EXISTING (LENGTH @ 185')	
-	-	-	-	-	-	-	-	
C4	800-10965 (78.7"x20"x6.9")	LTE	280°	167'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (AWS/PCS)	-	

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

1 ANTENNA INFORMATION CHART — SCALE: NONE



2 RF EQUIPMENT SCHEMATIC — SCALE: NONE

at&t
5841 BRIDGE STREET
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No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: BRCC0004
DRAWN BY: JB
CHECKED BY: CAT

SUBMITTALS

0	12/24/18	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD

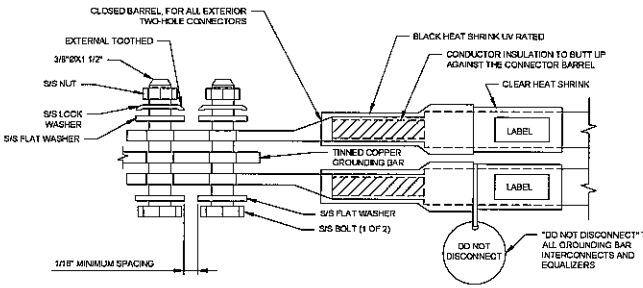
2385 LONG HILL ROAD
GUILFORD, CT 06437

ANTENNA CHART & RF EQUIPMENT SCHEMATIC

RF-1

NOTES:

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



1 EXTERIOR TWO HOLE LUG DETAIL — SCALE: NONE

GENERAL NOTES:

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

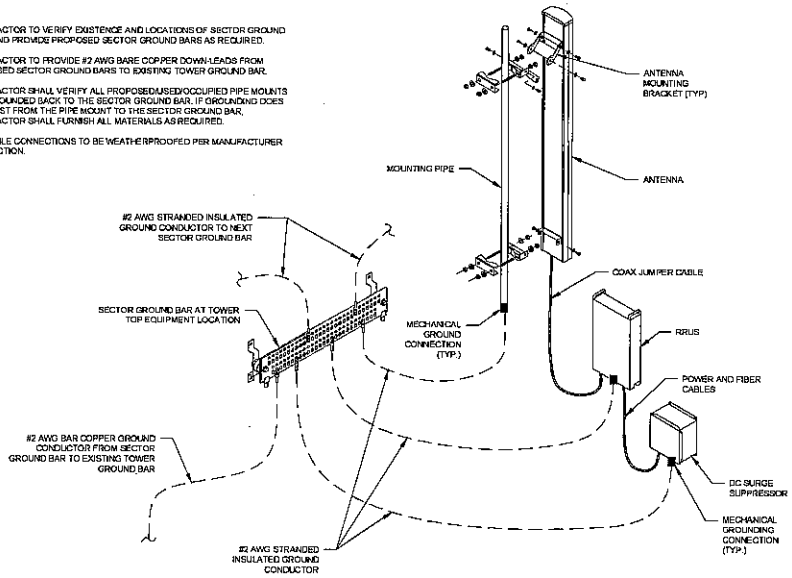
GROUNDING NOTES:

1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUNDRING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #361548: INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAT 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

2 GROUNDING BAR DETAIL — SCALE: NONE

NOTES:

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



3 TYPICAL ANTENNA GROUNDING SCHEMATIC — SCALE: NONE

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO:	ERC00004
DRAWN BY:	JB
CHECKED BY:	CAT

SUBMITTALS

0	12/20/18	ISSUED FOR PERMITTING

FA# 10071056
SITE# CTL05640
GUILDFORD
2365 LONG HILL ROAD
GUILFORD, CT 06437

GROUNDING DETAILS

G-1

Date: **December 17, 2018**

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

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10071056
	Carrier Site Name:	CTL05640
Crown Castle Designation:	**Crown Castle BU Number:**	876381
	Crown Castle Site Name:	Ward
	Crown Castle JDE Job Number:	548521
	Crown Castle Work Order Number:	1668656
	Crown Castle Order Number:	471550 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	51819.201007
Site Data:	**2365 Long Hill Rd., Guilford, New Haven County, CT 06437** **Latitude *41° 20' 47.34"*, Longitude *-72° 43' 23.15"*** **176 Foot - Monopole Tower**	

Dear Heather Simeone,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

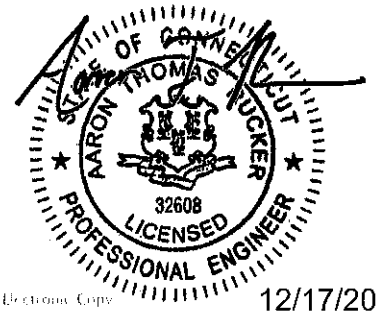
LC7: Proposed Equipment Configuration **Sufficient Capacity**

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

Structural analysis prepared by: Michael B. Bailey / DTS

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

12/17/2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 176-ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified multiple times in the past to accommodate additional loading. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1.0
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)
167.0	167.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 2 2 2	1-5/8 3/4 3/8 7/16
		3	CCI Antennas	HPA65R-BU6A w/ Mount Pipe		
		3	Kathrein	80010965 w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		3	Ericsson	RRUS 4449 B5/B12		
		2	Raycap	DC6-48-60-18-8F		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Tower Mounts	Platform Mount [LP 303-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
176.0	178.0	3	Commscope	DT465B-2XR w/ Mount Pipe	3 1	1/2 1-1/4
		3	RFS/Celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	Alcatel Lucent	RRH2X50-800		
	176.0	3	Alcatel Lucent	TD-RRH8x20-25		
		9	RFS/Celwave	ACU-A20-N		
		1	Tower Mounts	Platform Mount [LP 712-1]		
174.0	176.0	3	Alcatel Lucent	800 External Notch Filter	-	-
	175.0	3	Alcatel Lucent	800MHZ RRH		
	174.0	1	Tower Mounts	Side Arm Mount [SO 102-3]		
	173.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
155.0	155.0	3	Ericsson	AIR 21 B2A B4P	13	1-5/8
		3	Ericsson	Air 21 B4A B12P-B8P 4FT		
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	RRUS 11 B12		
		1	Tower Mounts	Platform Mount [LP 301-1]		
145.0	148.0	6	Amphenol	BXA-171063-12CF-EDIN-X w/ Mount Pipe	2	1-1/4
		6	Amphenol	BXA-70063-6CF-EDIN-X w/ Mount Pipe		
	145.0	3	Alcatel Lucent	RRH2X40-07-U		
		1	RFS/Celwave	DB-B1-6C-8AB-0Z		
		3	Alcatel Lucent	RRH2X40-AWS		
		1	Tower Mounts	Platform Mount [LP 303-1]		
50.0	51.0	1	Lucent	KS24019-L112A	1	1/2
	50.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		
10.0	12.0	1	Kathrein	OG-860/1920/GPS-A	1	1/4
	10.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Jaworski Geotech, Inc.	1532993	CCISites
Tower Foundation Drawings	Engineered Endeavors, Inc.	1614617	CCISites
Tower Manufacturer Drawings	Engineered Endeavors, Inc.	1613550	CCISites
Tower Design Calculations	Engineered Endeavors, Inc.	1614660	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	4318894	CCISites
Post Modification Inspection	Tower Engineering Professionals	5163807	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	5650483	CCISites
Post Modification Inspection	FDH Velocitel, Inc.	5885207	CCISites

3.1) Analysis Method

tnxTower (version 8.0.4.0), 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
3) All tower components are in sufficient condition to carry their full design capacity.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

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 tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)[1,2]

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
176 - 171	Pole	TP17.626x16.5x0.1875	Pole	11.2%	Pass
171 - 166	Pole	TP18.752x17.626x0.1875	Pole	21.1%	Pass
166 - 161	Pole	TP19.878x18.752x0.1875	Pole	34.1%	Pass
161 - 156	Pole	TP21.004x19.878x0.1875	Pole	45.1%	Pass
156 - 151	Pole	TP22.13x21.004x0.1875	Pole	57.9%	Pass
151 - 147.75	Pole	TP23.65x22.13x0.1875	Pole	65.5%	Pass
147.75 - 142.75	Pole	TP23.601x22.487x0.3125	Pole	46.2%	Pass
142.75 - 137.75	Pole	TP24.714x23.601x0.3125	Pole	52.7%	Pass
137.75 - 132.75	Pole	TP25.828x24.714x0.3125	Pole	58.1%	Pass
132.75 - 127.75	Pole	TP26.942x25.828x0.3125	Pole	62.5%	Pass
127.75 - 127.5	Pole + Reinf.	TP26.997x26.942x0.5	Reinf. 5 Tension Rupture	70.2%	Pass
127.5 - 122.5	Pole + Reinf.	TP28.111x26.997x0.4875	Reinf. 5 Tension Rupture	75.5%	Pass
122.5 - 120.75	Pole + Reinf.	TP28.501x28.111x0.4875	Reinf. 5 Tension Rupture	77.2%	Pass
120.75 - 120.5	Pole	TP28.557x28.501x0.3125	Pole	67.9%	Pass
120.5 - 117.25	Pole	TP29.28x28.557x0.3125	Pole	69.9%	Pass
117.25 - 117	Pole + Reinf.	TP29.336x29.28x0.5375	Reinf. 4 Tension Rupture	66.1%	Pass
117 - 112	Pole + Reinf.	TP30.45x29.336x0.525	Reinf. 4 Tension Rupture	69.8%	Pass
112 - 107	Pole + Reinf.	TP31.564x30.45x0.525	Reinf. 4 Tension Rupture	73.2%	Pass
107 - 102	Pole + Reinf.	TP32.677x31.564x0.5125	Reinf. 4 Tension Rupture	76.4%	Pass
102 - 99.41	Pole + Reinf.	TP34.33x32.677x0.5125	Reinf. 4 Tension Rupture	77.9%	Pass
99.41 - 94.41	Pole + Reinf.	TP33.741x32.628x0.575	Reinf. 4 Tension Rupture	74.2%	Pass
94.41 - 89.41	Pole + Reinf.	TP34.853x33.741x0.5625	Reinf. 4 Tension Rupture	76.4%	Pass
89.41 - 87.25	Pole + Reinf.	TP35.335x34.853x0.5625	Reinf. 4 Tension Rupture	77.4%	Pass
87.25 - 87	Pole + Reinf.	TP35.39x35.335x0.5625	Reinf. 3 Tension Rupture	77.5%	Pass
87 - 82	Pole + Reinf.	TP36.503x35.39x0.55	Reinf. 3 Tension Rupture	79.5%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
82 - 77	Pole + Reinf.	TP37.615x36.503x0.55	Reinf. 3 Tension Rupture	81.3%	Pass
77 - 72	Pole + Reinf.	TP38.727x37.615x0.5375	Reinf. 3 Tension Rupture	83.1%	Pass
72 - 67	Pole + Reinf.	TP39.84x38.727x0.5375	Reinf. 3 Tension Rupture	84.7%	Pass
67 - 62	Pole + Reinf.	TP40.952x39.84x0.525	Reinf. 3 Tension Rupture	86.2%	Pass
62 - 61.5	Pole + Reinf.	TP41.064x40.952x0.525	Reinf. 3 Tension Rupture	86.3%	Pass
61.5 - 61.25	Pole + Reinf.	TP41.119x41.064x0.5875	Reinf. 2 Tension Rupture	77.1%	Pass
61.25 - 56.25	Pole + Reinf.	TP42.232x41.119x0.575	Reinf. 2 Tension Rupture	78.5%	Pass
56.25 - 53.04	Pole + Reinf.	TP44.3x42.232x0.575	Reinf. 2 Tension Rupture	79.3%	Pass
53.04 - 45.95	Pole + Reinf.	TP43.773x42.197x0.575	Reinf. 2 Tension Rupture	83.4%	Pass
45.95 - 40.95	Pole + Reinf.	TP44.886x43.773x0.5625	Reinf. 2 Tension Rupture	84.6%	Pass
40.95 - 35.95	Pole + Reinf.	TP45.999x44.886x0.5625	Reinf. 2 Tension Rupture	85.7%	Pass
35.95 - 32.25	Pole + Reinf.	TP46.823x45.999x0.5625	Reinf. 2 Tension Rupture	86.4%	Pass
32.25 - 32	Pole + Reinf.	TP46.878x46.823x0.775	Reinf. 2 Tension Rupture	62.5%	Pass
32 - 31.75	Pole + Reinf.	TP46.934x46.878x0.6125	Reinf. 1 Tension Rupture	77.9%	Pass
31.75 - 26.75	Pole + Reinf.	TP48.047x46.934x0.6125	Reinf. 1 Tension Rupture	78.9%	Pass
26.75 - 21.75	Pole + Reinf.	TP49.159x48.047x0.6125	Reinf. 1 Tension Rupture	79.9%	Pass
21.75 - 16.75	Pole + Reinf.	TP50.272x49.159x0.6	Reinf. 1 Tension Rupture	80.8%	Pass
16.75 - 11.75	Pole + Reinf.	TP51.385x50.272x0.6	Reinf. 1 Tension Rupture	81.6%	Pass
11.75 - 6.75	Pole + Reinf.	TP52.498x51.385x0.5875	Reinf. 1 Tension Rupture	82.4%	Pass
6.75 - 1.75	Pole + Reinf.	TP53.611x52.498x0.5875	Reinf. 1 Tension Rupture	83.2%	Pass
1.75 - 0	Pole + Reinf.	TP54x53.611x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
				Summary	
			Pole	69.9%	Pass
			Reinforcement	86.4%	Pass
			Overall	**86.4%**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	85.7	Pass
1,2	Base Plate	-	83.0	Pass
1,2	Base Foundation Soil Interaction	-	36.5	Pass
1,2	Base Foundation Structural	-	75.3	Pass

Structure Rating (max from all components) =	86.4%

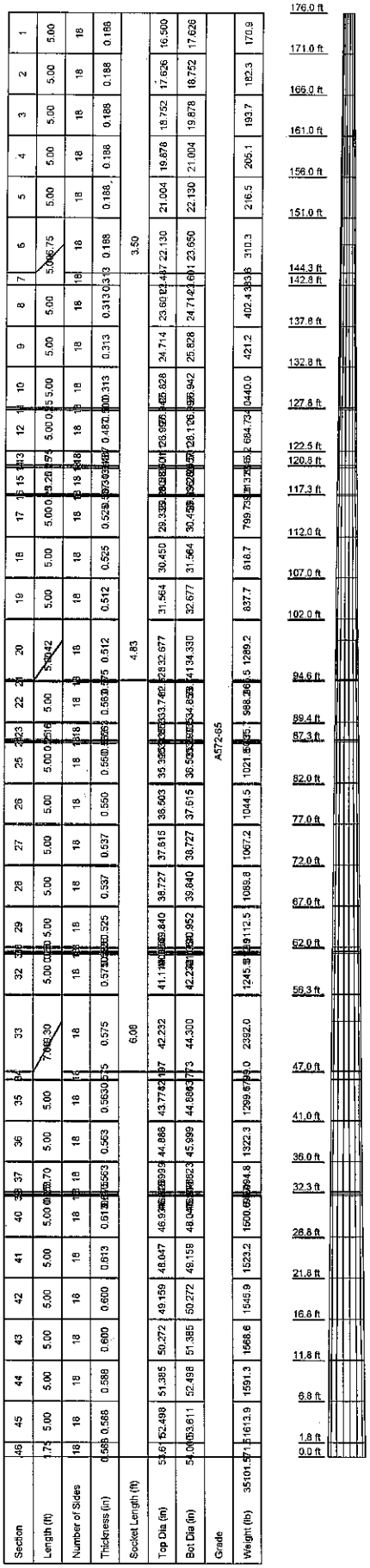
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



ALL REACTIONS ARE FACTORED

AXIAL 89123 lb

SHEAR 7350 lb — *MOMENT 979946 lb-ft*

TORQUE 242 lb-ft
50 mph WIND - 1.275 in ICE

AXIAL 59077 lb

SHEAR 38779 lb — *MOMENT 4526779 lb-ft*

TORQUE 927 lb-ft
REACTIONS - 130 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DT465B-2XR w/ Mount Pipe	176	RRUS 4449 B5/B12	167
DT465B-2XR w/ Mount Pipe	176	RRUS 4449 B5/B12	167
DT465B-2XR w/ Mount Pipe	176	RRUS 4449 B5/B12	167
APXVTM14-C-120 w/ Mount Pipe	176	DC6-48-60-18-8F	167
APXVTM14-C-120 w/ Mount Pipe	176	DC6-48-60-18-8F	167
APXVTM14-C-120 w/ Mount Pipe	176	RRUS 8843 B2/B66A	167
RRH2X50-800	176	RRUS 8843 B2/B66A	167
RRH2X50-800	176	RRUS 8843 B2/B66A	167
RRH2X50-800	176	Platform Mount [LP 303-1]	167
TD-RRH8x20-25	176	ERICSSON AIR 21 B2A B4P	155
TD-RRH8x20-25	176	ERICSSON AIR 21 B2A B4P	155
TD-RRH8x20-25	176	ERICSSON AIR 21 B2A B4P	155
(6) ACU-A20-N	176	Ericsson Air 21 B4A B12P-B8P 4FT	155
(3) ACU-A20-N	176	Ericsson Air 21 B4A B12P-B8P 4FT	155
(2) 6' x 2" Mount Pipe	176	Ericsson Air 21 B4A B12P-B8P 4FT	155
(2) 6' x 2" Mount Pipe	176	KRY 112 144/1	155
(2) 6' x 2" Mount Pipe	176	KRY 112 144/1	155
Platform Mount [LP 712-1]	176	KRY 112 144/1	155
800MHZ RRH	174	RRUS 11 B12	155
800MHZ RRH	174	RRUS 11 B12	155
800MHZ RRH	174	RRUS 11 B12	155
PCS 1900MHz 4x45W-65MHz	174	Platform Mount [LP 301-1]	155
PCS 1900MHz 4x45W-65MHz	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
PCS 1900MHz 4x45W-65MHz	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
6' x 2" Mount Pipe	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
6' x 2" Mount Pipe	174	RRH2X40-07-U	145
6' x 2" Mount Pipe	174	RRH2X40-07-U	145
Side Arm Mount [SO 102-3]	174	RRH2X40-07-U	145
7770.00 w/ Mount Pipe	167	RRH2X40-AWS	145
7770.00 w/ Mount Pipe	167	RRH2X40-AWS	145
7770.00 w/ Mount Pipe	167	RRH2X40-AWS	145
HPA65R-BU6A w/ Mount Pipe	167	DB-B1-6C-8AB-0Z	145
HPA65R-BU6A w/ Mount Pipe	167	Platform Mount [LP 303-1]	145
HPA65R-BU6A w/ Mount Pipe	167	KS24019-L112A	50
80010965 w/ Mount Pipe	167	3' x 2" Pipe Mount	50
80010965 w/ Mount Pipe	167	Side Arm Mount [SO 701-1]	50
80010965 w/ Mount Pipe	167	OG-660/1920/GPS-A	10
(2) LGP21401	167	3' x 2" Pipe Mount	10
(2) LGP21401	167	Side Arm Mount [SO 701-1]	10
(2) LGP21401	167		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B 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 1.27 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S

Tower Engineering Professionals
326 Tryon Road
Raleigh NC, 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: *Ward (BU 876381)*			
Project: *TEP No. 51819.201007*			
Client: Crown Castle	Drawn by: Michael B. Bailey	App'd:	
Code: TIA-222-H	Date: 12/11/18	Scale: NTS	
Path: T:\51819\PP-165552 L-201007 876381 WARD_Structural Analysis\ctoTower\876381 LC7.eri		Dwg No. E-	

tnxTower

Tower Engineering Professionals
326 Tryon Road
Raleigh NC, 27603
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Job	Page
Ward (BU 876381)	1 of 32
Project	**Date**
TEP No. 51819.201007	15:40:07 12/11/18
Client	**Designed by**
Crown Castle	Michael B. Bailey

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 Haven County, Connecticut.
Tower base elevation above sea level: 181.00 ft.
Basic wind speed of 130 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.275 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.
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	176.00-171.00	5.00	0.00	18	16.500	17.626	0.188	0.750	A572-65 (65 ksi)
L2	171.00-166.00	5.00	0.00	18	17.626	18.752	0.188	0.750	A572-65 (65 ksi)
L3	166.00-161.00	5.00	0.00	18	18.752	19.878	0.188	0.750	A572-65 (65 ksi)
L4	161.00-156.00	5.00	0.00	18	19.878	21.004	0.188	0.750	A572-65 (65 ksi)
L5	156.00-151.00	5.00	0.00	18	21.004	22.130	0.188	0.750	A572-65 (65 ksi)
L6	151.00-144.25	6.75	3.50	18	22.130	23.650	0.188	0.750	A572-65 (65 ksi)
L7	144.25-142.75	5.00	0.00	18	22.487	23.601	0.313	1.250	A572-65 (65 ksi)
L8	142.75-137.75	5.00	0.00	18	23.601	24.714	0.313	1.250	A572-65 (65 ksi)
L9	137.75-132.75	5.00	0.00	18	24.714	25.828	0.313	1.250	A572-65 (65 ksi)
L10	132.75-127.75	5.00	0.00	18	25.828	26.942	0.313	1.250	A572-65 (65 ksi)
L11	127.75-127.50	0.25	0.00	18	26.942	26.997	0.500	2.000	A572-65 (65 ksi)
L12	127.50-122.50	5.00	0.00	18	26.997	28.111	0.487	1.950	A572-65 (65 ksi)
L13	122.50-120.75	1.75	0.00	18	28.111	28.501	0.487	1.950	A572-65 (65 ksi)
L14	120.75-120.50	0.25	0.00	18	28.501	28.557	0.313	1.250	A572-65 (65 ksi)
L15	120.50-117.25	3.25	0.00	18	28.557	29.280	0.313	1.250	A572-65 (65 ksi)
L16	117.25-117.00	0.25	0.00	18	29.280	29.336	0.537	2.150	A572-65 (65 ksi)
L17	117.00-112.00	5.00	0.00	18	29.336	30.450	0.525	2.100	A572-65 (65 ksi)
L18	112.00-107.00	5.00	0.00	18	30.450	31.564	0.525	2.100	A572-65 (65 ksi)
L19	107.00-102.00	5.00	0.00	18	31.564	32.677	0.512	2.050	A572-65 (65 ksi)
L20	102.00-94.58	7.42	4.83	18	32.677	34.330	0.512	2.050	A572-65 (65 ksi)
L21	94.58-94.41	5.00	0.00	18	32.628	33.741	0.575	2.300	A572-65 (65 ksi)
L22	94.41-89.41	5.00	0.00	18	33.741	34.853	0.563	2.250	A572-65 (65 ksi)
L23	89.41-87.25	2.16	0.00	18	34.853	35.335	0.563	2.250	A572-65 (65 ksi)
L24	87.25-87.00	0.25	0.00	18	35.335	35.390	0.563	2.250	A572-65 (65 ksi)
L25	87.00-82.00	5.00	0.00	18	35.390	36.503	0.550	2.200	A572-65 (65 ksi)
L26	82.00-77.00	5.00	0.00	18	36.503	37.615	0.550	2.200	A572-65 (65 ksi)
L27	77.00-72.00	5.00	0.00	18	37.615	38.727	0.537	2.150	A572-65 (65 ksi)
L28	72.00-67.00	5.00	0.00	18	38.727	39.840	0.537	2.150	A572-65 (65 ksi)
L29	67.00-62.00	5.00	0.00	18	39.840	40.952	0.525	2.100	A572-65 (65 ksi)
L30	62.00-61.50	0.50	0.00	18	40.952	41.064	0.525	2.100	A572-65 (65 ksi)
L31	61.50-61.25	0.25	0.00	18	41.064	41.119	0.588	2.350	A572-65

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
									(65 ksi)
L32	61.25-56.25	5.00	0.00	18	41.119	42.232	0.575	2.300	A572-65 (65 ksi)
L33	56.25-46.95	9.30	6.08	18	42.232	44.300	0.575	2.300	A572-65 (65 ksi)
L34	46.95-45.95	7.08	0.00	18	42.197	43.773	0.575	2.300	A572-65 (65 ksi)
L35	45.95-40.95	5.00	0.00	18	43.773	44.886	0.563	2.250	A572-65 (65 ksi)
L36	40.95-35.95	5.00	0.00	18	44.886	45.999	0.563	2.250	A572-65 (65 ksi)
L37	35.95-32.25	3.70	0.00	18	45.999	46.823	0.563	2.250	A572-65 (65 ksi)
L38	32.25-32.00	0.25	0.00	18	46.823	46.878	0.775	3.100	A572-65 (65 ksi)
L39	32.00-31.75	0.25	0.00	18	46.878	46.934	0.613	2.450	A572-65 (65 ksi)
L40	31.75-26.75	5.00	0.00	18	46.934	48.047	0.613	2.450	A572-65 (65 ksi)
L41	26.75-21.75	5.00	0.00	18	48.047	49.159	0.613	2.450	A572-65 (65 ksi)
L42	21.75-16.75	5.00	0.00	18	49.159	50.272	0.600	2.400	A572-65 (65 ksi)
L43	16.75-11.75	5.00	0.00	18	50.272	51.385	0.600	2.400	A572-65 (65 ksi)
L44	11.75-6.75	5.00	0.00	18	51.385	52.498	0.588	2.350	A572-65 (65 ksi)
L45	6.75-1.75	5.00	0.00	18	52.498	53.611	0.588	2.350	A572-65 (65 ksi)
L46	1.75-0.00	1.75		18	53.611	54.000	0.588	2.350	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	16.726	9.708	326.368	5.791	8.382	38.937	653.165	4.855	2.574	13.728
	17.869	10.378	398.724	6.191	8.954	44.530	797.972	5.190	2.772	14.785
L2	17.869	10.378	398.724	6.191	8.954	44.530	797.972	5.190	2.772	14.785
	19.012	11.048	481.053	6.590	9.526	50.499	962.740	5.525	2.970	15.842
L3	19.012	11.048	481.053	6.590	9.526	50.499	962.740	5.525	2.970	15.842
	20.156	11.718	574.001	6.990	10.098	56.843	1148.758	5.860	3.169	16.899
L4	20.156	11.718	574.001	6.990	10.098	56.843	1148.758	5.860	3.169	16.899
	21.299	12.388	678.211	7.390	10.670	63.562	1357.314	6.195	3.367	17.956
L5	21.299	12.388	678.211	7.390	10.670	63.562	1357.314	6.195	3.367	17.956
	22.442	13.058	794.327	7.790	11.242	70.657	1589.699	6.530	3.565	19.013
L6	22.442	13.058	794.327	7.790	11.242	70.657	1589.699	6.530	3.565	19.013
	23.986	13.963	971.110	8.329	12.014	80.830	1943.498	6.983	3.832	20.439
L7	23.577	21.994	1366.296	7.872	11.423	119.606	2734.390	10.999	3.408	10.905
	23.916	23.099	1582.676	8.267	11.989	132.010	3167.435	11.552	3.604	11.532
L8	23.916	23.099	1582.676	8.267	11.989	132.010	3167.435	11.552	3.604	11.532
	25.047	24.203	1820.775	8.663	12.555	145.026	3643.946	12.104	3.800	12.159
L9	25.047	24.203	1820.775	8.663	12.555	145.026	3643.946	12.104	3.800	12.159
	26.178	25.308	2081.630	9.058	13.121	158.654	4166.000	12.656	3.996	12.786
L10	26.178	25.308	2081.630	9.058	13.121	158.654	4166.000	12.656	3.996	12.786
	27.309	26.413	2366.281	9.453	13.686	172.893	4735.675	13.209	4.192	13.414

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
L11	27.280	41.963	3706.637	9.387	13.686	270.827	7418.151	20.985	3.862	7.723
	27.337	42.051	3730.104	9.407	13.715	271.980	7465.117	21.030	3.872	7.743
L12	27.339	41.019	3642.001	9.411	13.715	265.556	7288.795	20.514	3.894	7.987
	28.469	42.743	4120.569	9.806	14.280	288.547	8246.561	21.375	4.090	8.389
L13	28.469	42.743	4120.569	9.806	14.280	288.547	8246.561	21.375	4.090	8.389
	28.865	43.346	4297.480	9.945	14.478	296.819	8600.614	21.677	4.158	8.53
L14	28.892	27.959	2806.746	10.007	14.478	193.857	5617.184	13.982	4.466	14.292
	28.949	28.015	2823.413	10.027	14.507	194.628	5650.540	14.010	4.476	14.323
L15	28.949	28.015	2823.413	10.027	14.507	194.628	5650.540	14.010	4.476	14.323
	29.684	28.733	3046.122	10.284	14.874	204.789	6096.251	14.369	4.603	14.731
L16	29.649	49.036	5118.190	10.204	14.874	344.092	10243.115	24.523	4.207	7.828
	29.706	49.131	5147.995	10.224	14.903	345.439	10302.764	24.570	4.217	7.846
L17	29.708	48.009	5034.825	10.228	14.903	337.845	10076.274	24.009	4.239	8.075
	30.839	49.865	5641.557	10.623	15.469	364.712	11290.537	24.937	4.435	8.448
L18	30.839	49.865	5641.557	10.623	15.469	364.712	11290.537	24.937	4.435	8.448
	31.969	51.721	6295.174	11.019	16.034	392.607	12598.632	25.865	4.631	8.821
L19	31.971	50.510	6152.717	11.023	16.034	383.723	12313.529	25.260	4.653	9.079
	33.102	52.322	6838.785	11.418	16.600	411.974	13686.570	26.166	4.849	9.462
L20	33.102	52.322	6838.785	11.418	16.600	411.974	13686.570	26.166	4.849	9.462
	34.781	55.010	7948.089	12.005	17.440	455.748	15906.637	27.510	5.140	10.029
L21	34.135	58.499	7593.432	11.379	16.575	458.118	15196.856	29.255	4.731	8.227
	34.173	60.529	8411.780	11.774	17.140	490.758	16834.628	30.270	4.926	8.568
L22	34.175	59.236	8238.223	11.778	17.140	480.632	16487.286	29.624	4.948	8.797
	35.304	61.222	9094.961	12.173	17.705	513.680	18201.889	30.617	5.144	9.145
L23	35.304	61.222	9094.961	12.173	17.705	513.680	18201.889	30.617	5.144	9.145
	35.793	62.081	9483.272	12.344	17.950	528.317	18979.023	31.046	5.229	9.296
L24	35.793	62.081	9483.272	12.344	17.950	528.317	18979.023	31.046	5.229	9.296
	35.849	62.180	9528.853	12.364	17.978	530.022	19070.244	31.096	5.239	9.313
L25	35.851	60.821	9327.136	12.368	17.978	518.802	18666.545	30.416	5.261	9.565
	36.981	62.762	10249.391	12.763	18.543	552.727	20512.268	31.387	5.456	9.921
L26	36.981	62.762	10249.391	12.763	18.543	552.727	20512.268	31.387	5.456	9.921
	38.110	64.704	11230.520	13.158	19.108	587.726	22475.818	32.358	5.652	10.277
L27	38.112	63.255	10986.389	13.163	19.108	574.950	21987.234	31.634	5.674	10.557
	39.242	65.153	12005.213	13.557	19.674	610.221	24026.222	32.583	5.870	10.921
L28	39.242	65.153	12005.213	13.557	19.674	610.221	24026.222	32.583	5.870	10.921
	40.372	67.051	13085.154	13.952	20.239	646.543	26187.525	33.532	6.066	11.285
L29	40.373	65.512	12793.046	13.957	20.239	632.110	25602.926	32.762	6.088	11.596
	41.503	67.366	13910.007	14.352	20.804	668.629	27838.316	33.689	6.284	11.969
L30	41.503	67.366	13910.007	14.352	20.804	668.629	27838.316	33.689	6.284	11.969
	41.616	67.551	14025.150	14.391	20.860	672.338	28068.754	33.782	6.303	12.006
L31	41.606	75.477	15622.330	14.369	20.860	748.904	31265.216	37.745	6.193	10.542
	41.663	75.580	15686.822	14.389	20.889	750.978	31394.285	37.797	6.203	10.558
L32	41.665	73.995	15367.269	14.393	20.889	735.680	30754.758	37.005	6.225	10.826
	42.794	76.025	16667.199	14.788	21.454	776.894	33356.329	38.020	6.421	11.167
L33	42.794	76.025	16667.199	14.788	21.454	776.894	33356.329	38.020	6.421	11.167
	44.895	79.800	19275.323	15.522	22.504	856.514	38576.010	39.908	6.785	11.8
L34	44.134	75.962	16625.299	14.776	21.436	775.582	33272.474	37.988	6.415	11.156
	44.360	78.838	18586.709	15.335	22.237	835.858	37197.876	39.427	6.692	11.638
L35	44.361	77.147	18198.439	15.340	22.237	818.398	36420.825	38.581	6.714	11.936
	45.491	79.134	19640.912	15.735	22.802	861.369	39307.669	39.574	6.910	12.284
L36	45.491	79.134	19640.912	15.735	22.802	861.369	39307.669	39.574	6.910	12.284
	46.621	81.120	21157.663	16.130	23.367	905.441	42343.167	40.568	7.106	12.632
L37	46.621	81.120	21157.663	16.130	23.367	905.441	42343.167	40.568	7.106	12.632
	47.458	82.592	22329.943	16.422	23.786	938.789	44689.268	41.304	7.251	12.89
L38	47.425	113.270	30343.668	16.347	23.786	1275.700	60727.264	56.646	6.877	8.873
	47.482	113.407	30453.792	16.367	23.814	1278.810	60947.657	56.714	6.887	8.886
L39	47.507	89.944	24323.718	16.424	23.814	1021.397	48679.443	44.981	7.173	11.71
	47.563	90.052	24411.578	16.444	23.842	1023.871	48855.277	45.035	7.182	11.726
L40	47.563	90.052	24411.578	16.444	23.842	1023.871	48855.277	45.035	7.182	11.726
	48.693	92.216	26213.483	16.839	24.408	1073.983	52461.457	46.117	7.378	12.046
L41	48.693	92.216	26213.483	16.839	24.408	1073.983	52461.457	46.117	7.378	12.046
	49.823	94.379	28101.944	17.234	24.973	1125.293	56240.866	47.198	7.574	12.366

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
L42	49.825	92.477	27549.705	17.239	24.973	1103.180	55135.661	46.247	7.596	12.66
	50.955	94.596	29487.393	17.634	25.538	1154.635	59013.586	47.307	7.792	12.987
L43	50.955	94.596	29487.393	17.634	25.538	1154.635	59013.586	47.307	7.792	12.987
	52.085	96.715	31513.872	18.029	26.104	1207.263	63069.211	48.367	7.988	13.313
L44	52.087	94.723	30880.124	18.033	26.104	1182.984	61800.881	47.371	8.010	13.634
	53.217	96.798	32954.284	18.428	26.669	1235.684	65951.930	48.408	8.206	13.967
L45	53.217	96.798	32954.284	18.428	26.669	1235.684	65951.930	48.408	8.206	13.967
	54.347	98.873	35119.303	18.823	27.234	1289.532	70284.816	49.446	8.401	14.3
L46	54.347	98.873	35119.303	18.823	27.234	1289.532	70284.816	49.446	8.401	14.3
	54.742	99.600	35898.885	18.961	27.432	1308.650	71845.007	49.809	8.470	14.417

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 176.00-171.00				1	1	1			
L2 171.00-166.00				1	1	1			
L3 166.00-161.00				1	1	1			
L4 161.00-156.00				1	1	1			
L5 156.00-151.00				1	1	1			
L6 151.00-144.25				1	1	1			
L7 144.25-142.75				1	1	1			
L8 142.75-137.75				1	1	1			
L9 137.75-132.75				1	1	1			
L10 132.75-127.75				1	1	1			
L11 127.75-127.50				1	1	0.950471			
L12 127.50-122.50				1	1	0.960942			
L13 122.50-120.75				1	1	0.956491			
L14 120.75-120.50				1	1	1			
L15 120.50-117.25				1	1	1			
L16 117.25-117.00				1	1	0.952317			
L17 117.00-112.00				1	1	0.960451			
L18 112.00-107.00				1	1	0.947346			
L19 107.00-102.00				1	1	0.957586			
L20 102.00-94.58				1	1	0.951464			
L21 94.58-94.41				1	1	0.953493			
L22 94.41-89.41				1	1	0.964335			
L23				1	1	0.960215			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
89.41-87.25									
L24				1	1	0.959746			
87.25-87.00									
L25				1	1	0.971943			
87.00-82.00									
L26				1	1	0.963236			
82.00-77.00									
L27				1	1	0.976926			
77.00-72.00									
L28				1	1	0.969022			
72.00-67.00									
L29				1	1	0.984143			
67.00-62.00									
L30				1	1	0.983402			
62.00-61.50									
L31				1	1	0.96416			
61.50-61.25									
L32				1	1	0.975934			
61.25-56.25									
L33				1	1	0.97047			
56.25-46.95									
L34				1	1	0.964381			
46.95-45.95									
L35				1	1	0.977521			
45.95-40.95									
L36				1	1	0.969908			
40.95-35.95									
L37				1	1	0.964506			
35.95-32.25									
L38				1	1	0.989599			
32.25-32.00									
L39				1	1	0.976298			
32.00-31.75									
L40				1	1	0.967758			
31.75-26.75									
L41				1	1	0.959609			
26.75-21.75									
L42				1	1	0.971411			
21.75-16.75									
L43				1	1	0.96382			
16.75-11.75									
L44 11.75-6.75				1	1	0.976672			
L45 6.75-1.75				1	1	0.969571			
L46 1.75-0.00				1	1	0.967156			

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
*** 50' ***										
LDF4P-50A(1/2")	C	No	Surface Af (CaAa)	50.00 - 0.00	1	1	0.000 0.000	0.000	1.000	0.15
Equipment										

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
Safety Line 3/8	A	No	Surface Af (CaAa)	176.00 - 0.00	1	1	0.000 0.000	0.000	0.750	0.22
***Mods**										
CCI-65FP-065125	A	No	Surface Af (CaAa)	35.00 - 0.00	1	1	0.000 0.000	6.500	15.500	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	35.00 - 0.00	1	1	0.000 0.000	6.500	15.500	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	35.00 - 0.00	1	1	0.500 0.500	6.500	15.500	0.00
CCI-65FP-065125	C	No	Surface Af (CaAa)	35.00 - 0.00	1	1	0.500 0.500	6.500	15.500	0.00
*****										
CCI-65FP-065125	A	No	Surface Af (CaAa)	64.25 - 29.25	1	1	0.000 0.000	6.500	15.500	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	64.25 - 29.25	1	1	0.000 0.000	6.500	15.500	0.00
CCI-65FP-065125	C	No	Surface Af (CaAa)	64.25 - 29.25	1	1	0.000 0.000	6.500	15.500	0.00
*****										
CCI-65FP-060100	A	No	Surface Af (CaAa)	89.25 - 64.25	1	1	0.000 0.000	6.000	14.000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	89.25 - 64.25	1	1	0.000 0.000	6.000	14.000	0.00
CCI-65FP-060100	C	No	Surface Af (CaAa)	89.25 - 64.25	1	1	0.000 0.000	6.000	14.000	0.00
*****										
CCI-65FP-060100	A	No	Surface Af (CaAa)	119.25 - 89.25	1	1	0.000 0.000	6.000	14.000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	119.25 - 89.25	1	1	0.000 0.000	6.000	14.000	0.00
CCI-65FP-060100	C	No	Surface Af (CaAa)	119.25 - 89.25	1	1	0.000 0.000	6.000	14.000	0.00
***										
*****										
CCI-65FP-045100	A	No	Surface Af (CaAa)	129.25 - 119.25	1	1	0.000 0.000	4.500	11.000	0.00
CCI-65FP-045100	B	No	Surface Af (CaAa)	129.25 - 119.25	1	1	0.000 0.000	4.500	11.000	0.00
CCI-65FP-045100	C	No	Surface Af (CaAa)	129.25 - 119.25	1	1	0.000 0.000	4.500	11.000	0.00
*****										

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 ft²/ft	Weight plf
176*									
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	176.00 - 0.00	1	No Ice	0.00	1.22
							1/2" Ice	0.00	1.22
							1" Ice	0.00	1.22
							2" Ice	0.00	1.22
HYBRIFLEX RRH 1-SECTOR(1/2)	C	No	No	Inside Pole	176.00 - 0.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
174*									
*** 167' ***									
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
LDF7-50A(1-5/8")	B	No	No	Inside Pole	167.00 - 0.00	12	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
FB-L98B-002-75000 (3/8")	B	No	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG122ST-BRD A(7/16)	B	No	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	0.14
							1/2" Ice	0.00	0.14
							1" Ice	0.00	0.14
							2" Ice	0.00	0.14
2" Flexible Conduit	B	No	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
*** 155' ***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	155.00 - 0.00	13	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
*** 145' ***									
MLE Hybrid 3Power/6Fiber RL 2(1 1/4")	C	No	No	Inside Pole	145.00 - 0.00	2	No Ice	0.00	0.68
							1/2" Ice	0.00	0.68
							1" Ice	0.00	0.68
							2" Ice	0.00	0.68
*** 10' ***									
LDF1-50A(1/4)	C	No	No	Inside Pole	10.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
***									
*****									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	176.00-171.00	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	0.000	8
L2	171.00-166.00	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	12
		C	0.000	0.000	0.000	0.000	8
L3	166.00-161.00	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	59
		C	0.000	0.000	0.000	0.000	8

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 lb
L4	161.00-156.00	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	59
		C	0.000	0.000	0.000	0.000	8
L5	156.00-151.00	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	59
		C	0.000	0.000	0.000	0.000	51
L6	151.00-144.25	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	79
		C	0.000	0.000	0.000	0.000	84
L7	144.25-142.75	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	18
		C	0.000	0.000	0.000	0.000	21
L8	142.75-137.75	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	59
		C	0.000	0.000	0.000	0.000	68
L9	137.75-132.75	A	0.000	0.000	0.000	0.000	1
		B	0.000	0.000	0.000	0.000	59
		C	0.000	0.000	0.000	0.000	68
L10	132.75-127.75	A	0.000	0.000	1.125	0.000	1
		B	0.000	0.000	1.125	0.000	59
		C	0.000	0.000	1.125	0.000	68
L11	127.75-127.50	A	0.000	0.000	0.188	0.000	0
		B	0.000	0.000	0.188	0.000	3
		C	0.000	0.000	0.188	0.000	3
L12	127.50-122.50	A	0.000	0.000	3.750	0.000	1
		B	0.000	0.000	3.750	0.000	59
		C	0.000	0.000	3.750	0.000	68
L13	122.50-120.75	A	0.000	0.000	1.313	0.000	0
		B	0.000	0.000	1.313	0.000	21
		C	0.000	0.000	1.313	0.000	24
L14	120.75-120.50	A	0.000	0.000	0.188	0.000	0
		B	0.000	0.000	0.188	0.000	3
		C	0.000	0.000	0.188	0.000	3
L15	120.50-117.25	A	0.000	0.000	2.938	0.000	1
		B	0.000	0.000	2.938	0.000	38
		C	0.000	0.000	2.938	0.000	44
L16	117.25-117.00	A	0.000	0.000	0.250	0.000	0
		B	0.000	0.000	0.250	0.000	3
		C	0.000	0.000	0.250	0.000	3
L17	117.00-112.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L18	112.00-107.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L19	107.00-102.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L20	102.00-94.58	A	0.000	0.000	7.420	0.000	2
		B	0.000	0.000	7.420	0.000	87
		C	0.000	0.000	7.420	0.000	102
L21	94.58-94.41	A	0.000	0.000	0.167	0.000	0
		B	0.000	0.000	0.167	0.000	2
		C	0.000	0.000	0.167	0.000	2
L22	94.41-89.41	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L23	89.41-87.25	A	0.000	0.000	2.163	0.000	0
		B	0.000	0.000	2.163	0.000	25
		C	0.000	0.000	2.163	0.000	30
L24	87.25-87.00	A	0.000	0.000	0.250	0.000	0

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 lb
		B	0.000	0.000	0.250	0.000	3
		C	0.000	0.000	0.250	0.000	3
L25	87.00-82.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L26	82.00-77.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L27	77.00-72.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L28	72.00-67.00	A	0.000	0.000	5.000	0.000	1
		B	0.000	0.000	5.000	0.000	59
		C	0.000	0.000	5.000	0.000	68
L29	67.00-62.00	A	0.000	0.000	5.188	0.000	1
		B	0.000	0.000	5.188	0.000	59
		C	0.000	0.000	5.188	0.000	68
L30	62.00-61.50	A	0.000	0.000	0.542	0.000	0
		B	0.000	0.000	0.542	0.000	6
		C	0.000	0.000	0.542	0.000	7
L31	61.50-61.25	A	0.000	0.000	0.271	0.000	0
		B	0.000	0.000	0.271	0.000	3
		C	0.000	0.000	0.271	0.000	3
L32	61.25-56.25	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	5.417	0.000	59
		C	0.000	0.000	5.417	0.000	68
L33	56.25-46.95	A	0.000	0.000	10.072	0.000	2
		B	0.000	0.000	10.072	0.000	109
		C	0.000	0.000	10.072	0.000	128
L34	46.95-45.95	A	0.000	0.000	1.083	0.000	0
		B	0.000	0.000	1.083	0.000	12
		C	0.000	0.000	1.083	0.000	14
L35	45.95-40.95	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	5.417	0.000	59
		C	0.000	0.000	5.417	0.000	69
L36	40.95-35.95	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	5.417	0.000	59
		C	0.000	0.000	5.417	0.000	69
L37	35.95-32.25	A	0.000	0.000	6.991	0.000	1
		B	0.000	0.000	9.970	0.000	43
		C	0.000	0.000	6.991	0.000	51
L38	32.25-32.00	A	0.000	0.000	0.542	0.000	0
		B	0.000	0.000	0.813	0.000	3
		C	0.000	0.000	0.542	0.000	3
L39	32.00-31.75	A	0.000	0.000	0.542	0.000	0
		B	0.000	0.000	0.813	0.000	3
		C	0.000	0.000	0.542	0.000	3
L40	31.75-26.75	A	0.000	0.000	8.125	0.000	1
		B	0.000	0.000	13.542	0.000	59
		C	0.000	0.000	8.125	0.000	69
L41	26.75-21.75	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	10.833	0.000	59
		C	0.000	0.000	5.417	0.000	69
L42	21.75-16.75	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	10.833	0.000	59
		C	0.000	0.000	5.417	0.000	69
L43	16.75-11.75	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	10.833	0.000	59
		C	0.000	0.000	5.417	0.000	69
L44	11.75-6.75	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	10.833	0.000	59

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 lb
		C	0.000	0.000	5.417	0.000	69
L45	6.75-1.75	A	0.000	0.000	5.417	0.000	1
		B	0.000	0.000	10.833	0.000	59
		C	0.000	0.000	5.417	0.000	70
L46	1.75-0.00	A	0.000	0.000	1.896	0.000	0
		B	0.000	0.000	3.792	0.000	21
		C	0.000	0.000	1.896	0.000	24

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 lb
L1	176.00-171.00	A	1.505	0.000	0.000	1.505	0.000	20
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	0.000	8
L2	171.00-166.00	A	1.501	0.000	0.000	1.501	0.000	20
		B		0.000	0.000	0.000	0.000	12
		C		0.000	0.000	0.000	0.000	8
L3	166.00-161.00	A	1.496	0.000	0.000	1.496	0.000	20
		B		0.000	0.000	0.000	0.000	59
		C		0.000	0.000	0.000	0.000	8
L4	161.00-156.00	A	1.492	0.000	0.000	1.492	0.000	20
		B		0.000	0.000	0.000	0.000	59
		C		0.000	0.000	0.000	0.000	8
L5	156.00-151.00	A	1.487	0.000	0.000	1.487	0.000	20
		B		0.000	0.000	0.000	0.000	59
		C		0.000	0.000	0.000	0.000	51
L6	151.00-144.25	A	1.481	0.000	0.000	1.999	0.000	26
		B		0.000	0.000	0.000	0.000	79
		C		0.000	0.000	0.000	0.000	84
L7	144.25-142.75	A	1.477	0.000	0.000	0.444	0.000	6
		B		0.000	0.000	0.000	0.000	18
		C		0.000	0.000	0.000	0.000	21
L8	142.75-137.75	A	1.473	0.000	0.000	1.473	0.000	19
		B		0.000	0.000	0.000	0.000	59
		C		0.000	0.000	0.000	0.000	68
L9	137.75-132.75	A	1.468	0.000	0.000	1.468	0.000	19
		B		0.000	0.000	0.000	0.000	59
		C		0.000	0.000	0.000	0.000	68
L10	132.75-127.75	A	1.463	0.000	0.000	2.836	0.000	33
		B		0.000	0.000	1.373	0.000	73
		C		0.000	0.000	1.373	0.000	83
L11	127.75-127.50	A	1.460	0.000	0.000	0.302	0.000	3
		B		0.000	0.000	0.229	0.000	5
		C		0.000	0.000	0.229	0.000	6
L12	127.50-122.50	A	1.457	0.000	0.000	6.030	0.000	66
		B		0.000	0.000	4.574	0.000	106
		C		0.000	0.000	4.574	0.000	115
L13	122.50-120.75	A	1.453	0.000	0.000	2.109	0.000	23
		B		0.000	0.000	1.600	0.000	37
		C		0.000	0.000	1.600	0.000	40
L14	120.75-120.50	A	1.451	0.000	0.000	0.301	0.000	3
		B		0.000	0.000	0.229	0.000	5
		C		0.000	0.000	0.229	0.000	6
L15	120.50-117.25	A	1.449	0.000	0.000	4.664	0.000	46
		B		0.000	0.000	3.722	0.000	72
		C		0.000	0.000	3.722	0.000	78

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L16	117.25-117.00	A	1.447	0.000	0.000	0.395	0.000	4
		B		0.000	0.000	0.322	0.000	6
		C		0.000	0.000	0.322	0.000	6
L17	117.00-112.00	A	1.444	0.000	0.000	7.888	0.000	73
		B		0.000	0.000	6.444	0.000	113
		C		0.000	0.000	6.444	0.000	123
L18	112.00-107.00	A	1.437	0.000	0.000	7.875	0.000	73
		B		0.000	0.000	6.437	0.000	113
		C		0.000	0.000	6.437	0.000	123
L19	107.00-102.00	A	1.431	0.000	0.000	7.862	0.000	72
		B		0.000	0.000	6.431	0.000	113
		C		0.000	0.000	6.431	0.000	122
L20	102.00-94.58	A	1.422	0.000	0.000	11.640	0.000	106
		B		0.000	0.000	9.530	0.000	167
		C		0.000	0.000	9.530	0.000	181
L21	94.58-94.41	A	1.416	0.000	0.000	0.262	0.000	2
		B		0.000	0.000	0.214	0.000	4
		C		0.000	0.000	0.214	0.000	4
L22	94.41-89.41	A	1.413	0.000	0.000	7.825	0.000	71
		B		0.000	0.000	6.413	0.000	112
		C		0.000	0.000	6.413	0.000	122
L23	89.41-87.25	A	1.407	0.000	0.000	3.380	0.000	31
		B		0.000	0.000	2.772	0.000	48
		C		0.000	0.000	2.772	0.000	52
L24	87.25-87.00	A	1.405	0.000	0.000	0.390	0.000	4
		B		0.000	0.000	0.320	0.000	6
		C		0.000	0.000	0.320	0.000	6
L25	87.00-82.00	A	1.401	0.000	0.000	7.801	0.000	70
		B		0.000	0.000	6.401	0.000	111
		C		0.000	0.000	6.401	0.000	121
L26	82.00-77.00	A	1.392	0.000	0.000	7.784	0.000	70
		B		0.000	0.000	6.392	0.000	111
		C		0.000	0.000	6.392	0.000	121
L27	77.00-72.00	A	1.383	0.000	0.000	7.766	0.000	69
		B		0.000	0.000	6.383	0.000	110
		C		0.000	0.000	6.383	0.000	120
L28	72.00-67.00	A	1.374	0.000	0.000	7.747	0.000	68
		B		0.000	0.000	6.374	0.000	110
		C		0.000	0.000	6.374	0.000	120
L29	67.00-62.00	A	1.363	0.000	0.000	7.914	0.000	69
		B		0.000	0.000	6.551	0.000	111
		C		0.000	0.000	6.551	0.000	121
L30	62.00-61.50	A	1.357	0.000	0.000	0.813	0.000	7
		B		0.000	0.000	0.677	0.000	11
		C		0.000	0.000	0.677	0.000	12
L31	61.50-61.25	A	1.357	0.000	0.000	0.406	0.000	4
		B		0.000	0.000	0.339	0.000	6
		C		0.000	0.000	0.339	0.000	6
L32	61.25-56.25	A	1.351	0.000	0.000	8.118	0.000	71
		B		0.000	0.000	6.767	0.000	113
		C		0.000	0.000	6.767	0.000	123
L33	56.25-46.95	A	1.333	0.000	0.000	15.030	0.000	129
		B		0.000	0.000	12.551	0.000	208
		C		0.000	0.000	13.363	0.000	236
L34	46.95-45.95	A	1.319	0.000	0.000	1.617	0.000	14
		B		0.000	0.000	1.350	0.000	22
		C		0.000	0.000	1.617	0.000	28
L35	45.95-40.95	A	1.311	0.000	0.000	8.038	0.000	68
		B		0.000	0.000	6.727	0.000	111
		C		0.000	0.000	8.038	0.000	137
L36	40.95-35.95	A	1.295	0.000	0.000	8.006	0.000	67

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
		B		0.000	0.000	6.711	0.000	110
		C		0.000	0.000	8.006	0.000	135
L37	35.95-32.25	A	1.279	0.000	0.000	9.589	0.000	76
		B		0.000	0.000	12.324	0.000	137
		C		0.000	0.000	9.589	0.000	127
L38	32.25-32.00	A	1.272	0.000	0.000	0.732	0.000	6
		B		0.000	0.000	1.003	0.000	10
		C		0.000	0.000	0.732	0.000	9
L39	32.00-31.75	A	1.271	0.000	0.000	0.732	0.000	6
		B		0.000	0.000	1.003	0.000	10
		C		0.000	0.000	0.732	0.000	9
L40	31.75-26.75	A	1.260	0.000	0.000	11.274	0.000	89
		B		0.000	0.000	16.691	0.000	183
		C		0.000	0.000	11.274	0.000	158
L41	26.75-21.75	A	1.236	0.000	0.000	7.889	0.000	63
		B		0.000	0.000	13.306	0.000	156
		C		0.000	0.000	7.889	0.000	131
L42	21.75-16.75	A	1.208	0.000	0.000	7.833	0.000	61
		B		0.000	0.000	13.249	0.000	153
		C		0.000	0.000	7.833	0.000	129
L43	16.75-11.75	A	1.172	0.000	0.000	7.761	0.000	58
		B		0.000	0.000	13.178	0.000	150
		C		0.000	0.000	7.761	0.000	127
L44	11.75-6.75	A	1.123	0.000	0.000	7.662	0.000	55
		B		0.000	0.000	13.079	0.000	145
		C		0.000	0.000	7.662	0.000	124
L45	6.75-1.75	A	1.039	0.000	0.000	7.494	0.000	50
		B		0.000	0.000	12.910	0.000	137
		C		0.000	0.000	7.494	0.000	119
L46	1.75-0.00	A	0.887	0.000	0.000	2.517	0.000	14
		B		0.000	0.000	4.412	0.000	43
		C		0.000	0.000	2.517	0.000	38

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	176.00-171.00	0.000	0.000	-0.975	-0.563
L2	171.00-166.00	0.000	0.000	-0.987	-0.570
L3	166.00-161.00	0.000	0.000	-0.998	-0.576
L4	161.00-156.00	0.000	0.000	-1.007	-0.582
L5	156.00-151.00	0.000	0.000	-1.016	-0.586
L6	151.00-144.25	0.000	0.000	-1.024	-0.591
L7	144.25-142.75	0.000	0.000	-1.029	-0.594
L8	142.75-137.75	0.000	0.000	-1.031	-0.595
L9	137.75-132.75	0.000	0.000	-1.036	-0.598
L10	132.75-127.75	0.000	0.000	-0.830	-0.479
L11	127.75-127.50	0.000	0.000	-0.570	-0.329
L12	127.50-122.50	0.000	0.000	-0.576	-0.333
L13	122.50-120.75	0.000	0.000	-0.583	-0.336
L14	120.75-120.50	0.000	0.000	-0.585	-0.337
L15	120.50-117.25	0.000	0.000	-0.529	-0.306
L16	117.25-117.00	0.000	0.000	-0.502	-0.290
L17	117.00-112.00	0.000	0.000	-0.507	-0.292
L18	112.00-107.00	0.000	0.000	-0.516	-0.298
L19	107.00-102.00	0.000	0.000	-0.524	-0.303

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L20	102.00-94.58	0.000	0.000	-0.534	-0.308
L21	94.58-94.41	0.000	0.000	-0.536	-0.309
L22	94.41-89.41	0.000	0.000	-0.538	-0.310
L23	89.41-87.25	0.000	0.000	-0.543	-0.313
L24	87.25-87.00	0.000	0.000	-0.544	-0.314
L25	87.00-82.00	0.000	0.000	-0.548	-0.316
L26	82.00-77.00	0.000	0.000	-0.554	-0.320
L27	77.00-72.00	0.000	0.000	-0.560	-0.323
L28	72.00-67.00	0.000	0.000	-0.565	-0.326
L29	67.00-62.00	0.000	0.000	-0.562	-0.324
L30	62.00-61.50	0.000	0.000	-0.555	-0.321
L31	61.50-61.25	0.000	0.000	-0.555	-0.321
L32	61.25-56.25	0.000	0.000	-0.557	-0.322
L33	56.25-46.95	0.000	0.000	-0.556	-0.107
L34	46.95-45.95	0.000	0.000	-0.548	0.318
L35	45.95-40.95	0.000	0.000	-0.545	0.316
L36	40.95-35.95	0.000	0.000	-0.546	0.317
L37	35.95-32.25	-1.644	0.000	-2.102	0.223
L38	32.25-32.00	-2.007	0.000	-2.457	0.203
L39	32.00-31.75	-2.009	0.000	-2.458	0.203
L40	31.75-26.75	-2.343	0.000	-2.860	0.235
L41	26.75-21.75	-2.813	0.000	-3.419	0.277
L42	21.75-16.75	-2.846	0.000	-3.451	0.275
L43	16.75-11.75	-2.877	0.000	-3.477	0.271
L44	11.75-6.75	-2.908	0.000	-3.496	0.264
L45	6.75-1.75	-2.938	0.000	-3.498	0.250
L46	1.75-0.00	-2.958	0.000	-3.452	0.219

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	22	Safety Line 3/8	171.00 - 176.00	1.0000	1.0000
L2	22	Safety Line 3/8	166.00 - 171.00	1.0000	1.0000
L3	22	Safety Line 3/8	161.00 - 166.00	1.0000	1.0000
L4	22	Safety Line 3/8	156.00 - 161.00	1.0000	1.0000
L5	22	Safety Line 3/8	151.00 - 156.00	1.0000	1.0000
L6	22	Safety Line 3/8	144.25 - 151.00	1.0000	1.0000
L8	22	Safety Line 3/8	137.75 - 142.75	1.0000	1.0000
L9	22	Safety Line 3/8	132.75 - 137.75	1.0000	1.0000
L10	22	Safety Line 3/8	127.75 - 132.75	1.0000	1.0000
L10	42	CCI-65FP-045100	127.75 - 129.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L10	43	CCI-65FP-045100	127.75 - 129.25	1.0000	1.0000
L10	44	CCI-65FP-045100	127.75 - 129.25	1.0000	1.0000
L11	22	Safety Line 3/8	127.50 - 127.75	1.0000	1.0000
L11	42	CCI-65FP-045100	127.50 - 127.75	1.0000	1.0000
L11	43	CCI-65FP-045100	127.50 - 127.75	1.0000	1.0000
L11	44	CCI-65FP-045100	127.50 - 127.75	1.0000	1.0000
L12	22	Safety Line 3/8	122.50 - 127.50	1.0000	1.0000
L12	42	CCI-65FP-045100	122.50 - 127.50	1.0000	1.0000
L12	43	CCI-65FP-045100	122.50 - 127.50	1.0000	1.0000
L12	44	CCI-65FP-045100	122.50 - 127.50	1.0000	1.0000
L13	22	Safety Line 3/8	120.75 - 122.50	1.0000	1.0000
L13	42	CCI-65FP-045100	120.75 - 122.50	1.0000	1.0000
L13	43	CCI-65FP-045100	120.75 - 122.50	1.0000	1.0000
L13	44	CCI-65FP-045100	120.75 - 122.50	1.0000	1.0000
L14	22	Safety Line 3/8	120.50 - 120.75	1.0000	1.0000
L14	42	CCI-65FP-045100	120.50 - 120.75	1.0000	1.0000
L14	43	CCI-65FP-045100	120.50 - 120.75	1.0000	1.0000
L14	44	CCI-65FP-045100	120.50 - 120.75	1.0000	1.0000
L15	22	Safety Line 3/8	117.25 - 120.50	1.0000	1.0000
L15	37	CCI-65FP-060100	117.25 - 119.25	1.0000	1.0000
L15	38	CCI-65FP-060100	117.25 - 119.25	1.0000	1.0000
L15	39	CCI-65FP-060100	117.25 - 119.25	1.0000	1.0000
L15	42	CCI-65FP-045100	119.25 - 120.50	1.0000	1.0000
L15	43	CCI-65FP-045100	119.25 - 120.50	1.0000	1.0000
L15	44	CCI-65FP-045100	119.25 - 120.50	1.0000	1.0000
L16	22	Safety Line 3/8	117.00 - 117.25	1.0000	1.0000
L16	37	CCI-65FP-060100	117.00 - 117.25	1.0000	1.0000
L16	38	CCI-65FP-060100	117.00 - 117.25	1.0000	1.0000
L16	39	CCI-65FP-060100	117.00 - 117.25	1.0000	1.0000
L17	22	Safety Line 3/8	112.00 - 117.00	1.0000	1.0000
L17	37	CCI-65FP-060100	112.00 - 117.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L17	38	CCI-65FP-060100	112.00 - 117.00	1.0000	1.0000
L17	39	CCI-65FP-060100	112.00 - 117.00	1.0000	1.0000
L18	22	Safety Line 3/8	107.00 - 112.00	1.0000	1.0000
L18	37	CCI-65FP-060100	107.00 - 112.00	1.0000	1.0000
L18	38	CCI-65FP-060100	107.00 - 112.00	1.0000	1.0000
L18	39	CCI-65FP-060100	107.00 - 112.00	1.0000	1.0000
L19	22	Safety Line 3/8	102.00 - 107.00	1.0000	1.0000
L19	37	CCI-65FP-060100	102.00 - 107.00	1.0000	1.0000
L19	38	CCI-65FP-060100	102.00 - 107.00	1.0000	1.0000
L19	39	CCI-65FP-060100	102.00 - 107.00	1.0000	1.0000
L20	22	Safety Line 3/8	94.58 - 102.00	1.0000	1.0000
L20	37	CCI-65FP-060100	94.58 - 102.00	1.0000	1.0000
L20	38	CCI-65FP-060100	94.58 - 102.00	1.0000	1.0000
L20	39	CCI-65FP-060100	94.58 - 102.00	1.0000	1.0000
L22	22	Safety Line 3/8	89.41 - 94.41	1.0000	1.0000
L22	37	CCI-65FP-060100	89.41 - 94.41	1.0000	1.0000
L22	38	CCI-65FP-060100	89.41 - 94.41	1.0000	1.0000
L22	39	CCI-65FP-060100	89.41 - 94.41	1.0000	1.0000
L23	22	Safety Line 3/8	87.25 - 89.41	1.0000	1.0000
L23	33	CCI-65FP-060100	87.25 - 89.25	1.0000	1.0000
L23	34	CCI-65FP-060100	87.25 - 89.25	1.0000	1.0000
L23	35	CCI-65FP-060100	87.25 - 89.25	1.0000	1.0000
L23	37	CCI-65FP-060100	89.25 - 89.41	1.0000	1.0000
L23	38	CCI-65FP-060100	89.25 - 89.41	1.0000	1.0000
L23	39	CCI-65FP-060100	89.25 - 89.41	1.0000	1.0000
L24	22	Safety Line 3/8	87.00 - 87.25	1.0000	1.0000
L24	33	CCI-65FP-060100	87.00 - 87.25	1.0000	1.0000
L24	34	CCI-65FP-060100	87.00 - 87.25	1.0000	1.0000
L24	35	CCI-65FP-060100	87.00 - 87.25	1.0000	1.0000
L25	22	Safety Line 3/8	82.00 - 87.00	1.0000	1.0000
L25	33	CCI-65FP-060100	82.00 - 87.00	1.0000	1.0000
L25	34	CCI-65FP-060100	82.00 - 87.00	1.0000	1.0000
L25	35	CCI-65FP-060100	82.00 - 87.00	1.0000	1.0000
L26	22	Safety Line 3/8	77.00 - 82.00	1.0000	1.0000
L26	33	CCI-65FP-060100	77.00 - 82.00	1.0000	1.0000
L26	34	CCI-65FP-060100	77.00 - 82.00	1.0000	1.0000
L26	35	CCI-65FP-060100	77.00 - 82.00	1.0000	1.0000
L27	22	Safety Line 3/8	72.00 - 77.00	1.0000	1.0000
L27	33	CCI-65FP-060100	72.00 - 77.00	1.0000	1.0000
L27	34	CCI-65FP-060100	72.00 - 77.00	1.0000	1.0000
L27	35	CCI-65FP-060100	72.00 - 77.00	1.0000	1.0000
L28	22	Safety Line 3/8	67.00 - 72.00	1.0000	1.0000
L28	33	CCI-65FP-060100	67.00 - 72.00	1.0000	1.0000
L28	34	CCI-65FP-060100	67.00 - 72.00	1.0000	1.0000
L28	35	CCI-65FP-060100	67.00 - 72.00	1.0000	1.0000
L29	22	Safety Line 3/8	62.00 - 67.00	1.0000	1.0000
L29	29	CCI-65FP-065125	62.00 - 64.25	1.0000	1.0000
L29	30	CCI-65FP-065125	62.00 - 64.25	1.0000	1.0000
L29	31	CCI-65FP-065125	62.00 - 64.25	1.0000	1.0000
L29	33	CCI-65FP-060100	64.25 - 67.00	1.0000	1.0000
L29	34	CCI-65FP-060100	64.25 - 67.00	1.0000	1.0000
L29	35	CCI-65FP-060100	64.25 - 67.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	22	Safety Line 3/8	61.50 - 62.00	1.0000	1.0000
L30	29	CCI-65FP-065125	61.50 - 62.00	1.0000	1.0000
L30	30	CCI-65FP-065125	61.50 - 62.00	1.0000	1.0000
L30	31	CCI-65FP-065125	61.50 - 62.00	1.0000	1.0000
L31	22	Safety Line 3/8	61.25 - 61.50	1.0000	1.0000
L31	29	CCI-65FP-065125	61.25 - 61.50	1.0000	1.0000
L31	30	CCI-65FP-065125	61.25 - 61.50	1.0000	1.0000
L31	31	CCI-65FP-065125	61.25 - 61.50	1.0000	1.0000
L32	22	Safety Line 3/8	56.25 - 61.25	1.0000	1.0000
L32	29	CCI-65FP-065125	56.25 - 61.25	1.0000	1.0000
L32	30	CCI-65FP-065125	56.25 - 61.25	1.0000	1.0000
L32	31	CCI-65FP-065125	56.25 - 61.25	1.0000	1.0000
L33	17	LDF4P-50A(1/2")	46.95 - 50.00	1.0000	1.0000
L33	22	Safety Line 3/8	46.95 - 56.25	1.0000	1.0000
L33	29	CCI-65FP-065125	46.95 - 56.25	1.0000	1.0000
L33	30	CCI-65FP-065125	46.95 - 56.25	1.0000	1.0000
L33	31	CCI-65FP-065125	46.95 - 56.25	1.0000	1.0000
L35	17	LDF4P-50A(1/2")	40.95 - 45.95	1.0000	1.0000
L35	22	Safety Line 3/8	40.95 - 45.95	1.0000	1.0000
L35	29	CCI-65FP-065125	40.95 - 45.95	1.0000	1.0000
L35	30	CCI-65FP-065125	40.95 - 45.95	1.0000	1.0000
L35	31	CCI-65FP-065125	40.95 - 45.95	1.0000	1.0000
L36	17	LDF4P-50A(1/2")	35.95 - 40.95	1.0000	1.0000
L36	22	Safety Line 3/8	35.95 - 40.95	1.0000	1.0000
L36	29	CCI-65FP-065125	35.95 - 40.95	1.0000	1.0000
L36	30	CCI-65FP-065125	35.95 - 40.95	1.0000	1.0000
L36	31	CCI-65FP-065125	35.95 - 40.95	1.0000	1.0000
L37	17	LDF4P-50A(1/2")	32.25 - 35.95	1.0000	1.0000
L37	22	Safety Line 3/8	32.25 - 35.95	1.0000	1.0000
L37	24	CCI-65FP-065125	32.25 - 35.00	1.0000	1.0000
L37	25	CCI-65FP-065125	32.25 - 35.00	1.0000	1.0000
L37	26	CCI-65FP-065125	32.25 - 35.00	1.0000	1.0000
L37	27	CCI-65FP-065125	32.25 - 35.00	1.0000	1.0000
L37	29	CCI-65FP-065125	32.25 - 35.95	1.0000	1.0000
L37	30	CCI-65FP-065125	32.25 - 35.95	1.0000	1.0000
L37	31	CCI-65FP-065125	32.25 - 35.95	1.0000	1.0000
L38	17	LDF4P-50A(1/2")	32.00 - 32.25	1.0000	1.0000
L38	22	Safety Line 3/8	32.00 - 32.25	1.0000	1.0000
L38	24	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	25	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	26	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	27	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	29	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	30	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L38	31	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L39	17	LDF4P-50A(1/2")	31.75 - 32.00	1.0000	1.0000
L39	22	Safety Line 3/8	31.75 - 32.00	1.0000	1.0000
L39	24	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	25	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	26	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	27	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	29	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	30	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L39	31	CCI-65FP-065125	31.75 - 32.00	1.0000	1.0000
L40	17	LDF4P-50A(1/2")	26.75 - 31.75	1.0000	1.0000
L40	22	Safety Line 3/8	26.75 - 31.75	1.0000	1.0000
L40	24	CCI-65FP-065125	26.75 - 31.75	1.0000	1.0000
L40	25	CCI-65FP-065125	26.75 - 31.75	1.0000	1.0000
L40	26	CCI-65FP-065125	26.75 - 31.75	1.0000	1.0000
L40	27	CCI-65FP-065125	26.75 - 31.75	1.0000	1.0000
L40	29	CCI-65FP-065125	29.25 - 31.75	1.0000	1.0000
L40	30	CCI-65FP-065125	29.25 - 31.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	31	CCI-65FP-065125	29.25 - 31.75	1.0000	1.0000
L41	17	LDF4P-50A(1/2")	21.75 - 26.75	1.0000	1.0000
L41	22	Safety Line 3/8	21.75 - 26.75	1.0000	1.0000
L41	24	CCI-65FP-065125	21.75 - 26.75	1.0000	1.0000
L41	25	CCI-65FP-065125	21.75 - 26.75	1.0000	1.0000
L41	26	CCI-65FP-065125	21.75 - 26.75	1.0000	1.0000
L41	27	CCI-65FP-065125	21.75 - 26.75	1.0000	1.0000
L42	17	LDF4P-50A(1/2")	16.75 - 21.75	1.0000	1.0000
L42	22	Safety Line 3/8	16.75 - 21.75	1.0000	1.0000
L42	24	CCI-65FP-065125	16.75 - 21.75	1.0000	1.0000
L42	25	CCI-65FP-065125	16.75 - 21.75	1.0000	1.0000
L42	26	CCI-65FP-065125	16.75 - 21.75	1.0000	1.0000
L42	27	CCI-65FP-065125	16.75 - 21.75	1.0000	1.0000
L43	17	LDF4P-50A(1/2")	11.75 - 16.75	1.0000	1.0000
L43	22	Safety Line 3/8	11.75 - 16.75	1.0000	1.0000
L43	24	CCI-65FP-065125	11.75 - 16.75	1.0000	1.0000
L43	25	CCI-65FP-065125	11.75 - 16.75	1.0000	1.0000
L43	26	CCI-65FP-065125	11.75 - 16.75	1.0000	1.0000
L43	27	CCI-65FP-065125	11.75 - 16.75	1.0000	1.0000
L44	17	LDF4P-50A(1/2")	6.75 - 11.75	1.0000	1.0000
L44	22	Safety Line 3/8	6.75 - 11.75	1.0000	1.0000
L44	24	CCI-65FP-065125	6.75 - 11.75	1.0000	1.0000
L44	25	CCI-65FP-065125	6.75 - 11.75	1.0000	1.0000
L44	26	CCI-65FP-065125	6.75 - 11.75	1.0000	1.0000
L44	27	CCI-65FP-065125	6.75 - 11.75	1.0000	1.0000
L45	17	LDF4P-50A(1/2")	1.75 - 6.75	1.0000	1.0000
L45	22	Safety Line 3/8	1.75 - 6.75	1.0000	1.0000
L45	24	CCI-65FP-065125	1.75 - 6.75	1.0000	1.0000
L45	25	CCI-65FP-065125	1.75 - 6.75	1.0000	1.0000
L45	26	CCI-65FP-065125	1.75 - 6.75	1.0000	1.0000
L45	27	CCI-65FP-065125	1.75 - 6.75	1.0000	1.0000
L46	17	LDF4P-50A(1/2")	0.00 - 1.75	1.0000	1.0000
L46	22	Safety Line 3/8	0.00 - 1.75	1.0000	1.0000
L46	24	CCI-65FP-065125	0.00 - 1.75	1.0000	1.0000
L46	25	CCI-65FP-065125	0.00 - 1.75	1.0000	1.0000
L46	26	CCI-65FP-065125	0.00 - 1.75	1.0000	1.0000
L46	27	CCI-65FP-065125	0.00 - 1.75	1.0000	1.0000

Discrete Tower Loads

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 lb
*** 176' ***									
DT465B-2XR w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.34 9.91 10.44 11.53	7.63 8.82 9.72 11.54	84 160 245 442
DT465B-2XR w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice	9.34 9.91 10.44	7.63 8.82 9.72	84 160 245

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	11.53	11.54	442
DT465B-2XR w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.34 9.91 10.44 11.53	7.63 8.82 9.72 11.54	84 160 245 442
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.34 6.72 7.10 7.88	3.61 3.97 4.33 5.07	56 96 140 245
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.34 6.72 7.10 7.88	3.61 3.97 4.33 5.07	56 96 140 245
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.34 6.72 7.10 7.88	3.61 3.97 4.33 5.07	56 96 140 245
RRH2X50-800	A	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
RRH2X50-800	B	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
RRH2X50-800	C	From Centroid-Le g	4.00 0.00 2.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
TD-RRH8x20-25	A	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	66 90 117 183
TD-RRH8x20-25	B	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	66 90 117 183
TD-RRH8x20-25	C	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	66 90 117 183
(6) ACU-A20-N	B	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	1 2 4 12
(3) ACU-A20-N	C	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	1 2 4 12
(2) 6' x 2" Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90
(2) 6' x 2" Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90

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 lb
(2) 6' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90
Platform Mount [LP 712-1]	C	None		0.000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.53 29.94 35.35 46.17	24.53 29.94 35.35 46.17	1335 1646 1956 2577
*** 174' ***									
800MHZ RRH	A	From Leg	1.50 0.00 1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
800MHZ RRH	B	From Leg	1.50 0.00 1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
800MHZ RRH	C	From Leg	1.50 0.00 1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53 74 98 157
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.50 0.00 -1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	60 83 110 173
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.50 0.00 -1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	60 83 110 173
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.50 0.00 -1.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	60 83 110 173
800 EXTERNAL NOTCH FILTER	A	From Leg	1.50 0.00 2.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	11 17 24 45
800 EXTERNAL NOTCH FILTER	B	From Leg	1.50 0.00 2.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	11 17 24 45
800 EXTERNAL NOTCH FILTER	C	From Leg	1.50 0.00 2.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	11 17 24 45
6' x 2" Mount Pipe	A	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90
6' x 2" Mount Pipe	B	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90
6' x 2" Mount Pipe	C	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	20 33 48 90

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 lb
Side Arm Mount [SO 102-3]	C	None		0.000	174.00	No Ice	3.00	3.00	81
						1/2" Ice	3.48	3.48	111
						1" Ice	3.96	3.96	141
						2" Ice	4.92	4.92	201
*** 169' ***									
*** 167' ***									
7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55 103 157 287
7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55 103 157 287
7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55 103 157 287
HPA65R-BU6A w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.09 8.64 9.16 10.22	7.19 8.36 9.24 11.05	67 136 212 393
HPA65R-BU6A w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.09 8.64 9.16 10.22	7.19 8.36 9.24 11.05	67 136 212 393
HPA65R-BU6A w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.09 8.64 9.16 10.22	7.19 8.36 9.24 11.05	67 136 212 393
80010965 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	125 222 327 569
80010965 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	125 222 327 569
80010965 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	125 222 327 569
(2) LGP21401	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	14 21 30 55
(2) LGP21401	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	14 21 30 55
(2) LGP21401	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	14 21 30 55
RRUS 4449 B5/B12	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	71 90 111

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
						2" Ice	2.72	2.07	163
RRUS 4449 B5/B12	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	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	71 90 111 163
RRUS 4449 B5/B12	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	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	71 90 111 163
DC6-48-60-18-8F	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	33 55 80 138
DC6-48-60-18-8F	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	33 55 80 138
RRUS 8843 B2/B66A	A	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	72 90 110 159
RRUS 8843 B2/B66A	B	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	72 90 110 159
RRUS 8843 B2/B66A	C	From Centroid-Leg	4.00 0.00 0.00	0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	72 90 110 159
Platform Mount [LP 303-1]	C	None		0.000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1250 1481 1713 2175
155'									
ERICSSON AIR 21 B2A B4P	A	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.09 6.46 6.84 7.61	4.30 4.65 5.00 5.74	92 133 180 290
ERICSSON AIR 21 B2A B4P	B	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.09 6.46 6.84 7.61	4.30 4.65 5.00 5.74	92 133 180 290
ERICSSON AIR 21 B2A B4P	C	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.09 6.46 6.84 7.61	4.30 4.65 5.00 5.74	92 133 180 290
Ericsson Air 21 B4A B12P-B8P 4FT	A	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.65 8.05 8.45 9.28	5.29 5.66 6.04 6.82	124 178 237 373
Ericsson Air 21 B4A B12P-B8P 4FT	B	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.65 8.05 8.45 9.28	5.29 5.66 6.04 6.82	124 178 237 373
Ericsson Air 21 B4A B12P-B8P 4FT	C	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice	7.65 8.05 8.45	5.29 5.66 6.04	124 178 237

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 lb
						2" Ice	9.28	6.82	373
KRY 112 144/1	A	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.16 0.22 0.28 0.44	11 14 18 32
KRY 112 144/1	B	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.16 0.22 0.28 0.44	11 14 18 32
KRY 112 144/1	C	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.16 0.22 0.28 0.44	11 14 18 32
RRUS 11 B12	A	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	51 72 95 153
RRUS 11 B12	B	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	51 72 95 153
RRUS 11 B12	C	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	51 72 95 153
Platform Mount [LP 301-1]	C	None		0.000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice	30.10 40.80 51.50 72.90	30.10 40.80 51.50 72.90	1589 2029 2470 3351
*** 145' ***									
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.03 5.58 6.10 7.17	5.29 6.46 7.35 9.15	41 87 140 273
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.03 5.58 6.10 7.17	5.29 6.46 7.35 9.15	41 87 140 273
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.03 5.58 6.10 7.17	5.29 6.46 7.35 9.15	41 87 140 273
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	42 103 171 335
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	42 103 171 335
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 3.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	42 103 171 335
RRH2X40-07-U	A	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	No Ice 1/2" Ice 1" Ice	1.93 2.10 2.28	1.05 1.19 1.33	50 67 86

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert ft / ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
						2" Ice	2.66	1.64	134
RRH2X40-07-U	B	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.93 2.10 2.28 2.66	1.05 1.19 1.33 1.64	50 67 86 134
RRH2X40-07-U	C	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.93 2.10 2.28 2.66	1.05 1.19 1.33 1.64	50 67 86 134
RRH2X40-AWS	A	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	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	44 61 82 132
RRH2X40-AWS	B	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	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	44 61 82 132
RRH2X40-AWS	C	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	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	44 61 82 132
DB-B1-6C-8AB-0Z	A	From Centroid-Leg	4.00 0.00 0.00	0.000	145.00	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	44 80 120 213
Platform Mount [LP 303-1]	C	None		0.000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1250 1481 1713 2175
*** 50' ***									
KS24019-L112A	A	From Leg	3.00 0.00 1.00	0.000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.08 0.13 0.19 0.35	0.08 0.13 0.19 0.35	5 6 8 15
3' x 2" Pipe Mount	A	From Leg	3.00 0.00 0.00	0.000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.58 0.77 0.97 1.42	0.58 0.77 0.97 1.42	10 17 24 47
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	65 79 93 121
******									
OG-860/1920/GPS-A	A	From Leg	3.00 0.00 2.00	0.000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.40 0.49 0.70	0.37 0.46 0.55 0.77	2 5 10 24
3' x 2" Pipe Mount	A	From Leg	3.00 0.00 0.00	0.000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.58 0.77 0.97 1.42	0.58 0.77 0.97 1.42	10 17 24 47
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	65 79 93 121
***									

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	176 - 171	27.524	45	1.638	0.001
L2	171 - 166	25.814	45	1.626	0.001
L3	166 - 161	24.127	45	1.597	0.001
L4	161 - 156	22.478	45	1.549	0.001
L5	156 - 151	20.888	45	1.486	0.001
L6	151 - 144.25	19.371	45	1.409	0.001
L7	147.75 - 142.75	18.431	45	1.352	0.001
L8	142.75 - 137.75	17.035	45	1.307	0.001
L9	137.75 - 132.75	15.703	45	1.238	0.000
L10	132.75 - 127.75	14.445	45	1.163	0.000
L11	127.75 - 127.5	13.268	45	1.085	0.000
L12	127.5 - 122.5	13.211	45	1.083	0.000
L13	122.5 - 120.75	12.105	45	1.031	0.000
L14	120.75 - 120.5	11.730	45	1.013	0.000
L15	120.5 - 117.25	11.677	45	1.009	0.000
L16	117.25 - 117	11.009	45	0.956	0.000
L17	117 - 112	10.959	45	0.953	0.000
L18	112 - 107	9.986	45	0.904	0.000
L19	107 - 102	9.066	45	0.855	0.000
L20	102 - 94.58	8.197	45	0.804	0.000
L21	99.413 - 94.413	7.768	45	0.778	0.000
L22	94.413 - 89.413	6.966	45	0.753	0.000
L23	89.413 - 87.25	6.202	45	0.706	0.000
L24	87.25 - 87	5.887	45	0.686	0.000
L25	87 - 82	5.851	45	0.683	0.000
L26	82 - 77	5.160	45	0.636	0.000
L27	77 - 72	4.519	45	0.589	0.000
L28	72 - 67	3.927	45	0.542	0.000
L29	67 - 62	3.384	45	0.496	0.000
L30	62 - 61.5	2.888	45	0.450	0.000
L31	61.5 - 61.25	2.842	45	0.445	0.000
L32	61.25 - 56.25	2.818	45	0.443	0.000
L33	56.25 - 46.953	2.376	45	0.402	0.000
L34	53.036 - 45.953	2.115	45	0.375	0.000
L35	45.953 - 40.953	1.580	45	0.342	0.000
L36	40.953 - 35.953	1.244	45	0.300	0.000
L37	35.953 - 32.25	0.952	45	0.258	0.000
L38	32.25 - 32	0.763	45	0.228	0.000
L39	32 - 31.75	0.751	45	0.227	0.000
L40	31.75 - 26.75	0.739	45	0.225	0.000
L41	26.75 - 21.75	0.523	45	0.188	0.000
L42	21.75 - 16.75	0.344	45	0.153	0.000
L43	16.75 - 11.75	0.203	45	0.117	0.000
L44	11.75 - 6.75	0.099	45	0.081	0.000
L45	6.75 - 1.75	0.033	45	0.046	0.000
L46	1.75 - 0	0.002	45	0.012	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	DT465B-2XR w/ Mount Pipe	45	27.524	1.638	0.001	13709
174.00	800MHZ RRH	45	26.839	1.634	0.001	13709

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.00	7770.00 w/ Mount Pipe	45	24.462	1.604	0.001	8366
155.00	ERICSSON AIR 21 B2A B4P	45	20.578	1.472	0.001	3883
145.00	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	45	17.656	1.325	0.001	5024
50.00	KS24019-L112A	45	1.878	0.360	0.000	10429
10.00	OG-860/1920/GPS-A	45	0.072	0.069	0.000	8224

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	176 - 171	145.401	14	8.667	0.005
L2	171 - 166	136.386	14	8.600	0.005
L3	166 - 161	127.485	14	8.450	0.005
L4	161 - 156	118.789	14	8.200	0.004
L5	156 - 151	110.399	14	7.864	0.004
L6	151 - 144.25	102.393	14	7.459	0.003
L7	147.75 - 142.75	97.430	14	7.159	0.003
L8	142.75 - 137.75	90.059	14	6.919	0.003
L9	137.75 - 132.75	83.020	14	6.551	0.003
L10	132.75 - 127.75	76.378	14	6.156	0.002
L11	127.75 - 127.5	70.156	14	5.745	0.002
L12	127.5 - 122.5	69.856	14	5.731	0.002
L13	122.5 - 120.75	64.008	14	5.455	0.002
L14	120.75 - 120.5	62.029	14	5.360	0.002
L15	120.5 - 117.25	61.749	14	5.338	0.002
L16	117.25 - 117	58.215	14	5.059	0.001
L17	117 - 112	57.951	14	5.047	0.001
L18	112 - 107	52.810	14	4.784	0.001
L19	107 - 102	47.942	14	4.523	0.001
L20	102 - 94.58	43.350	14	4.256	0.001
L21	99.413 - 94.413	41.083	14	4.119	0.001
L22	94.413 - 89.413	36.839	14	3.987	0.001
L23	89.413 - 87.25	32.799	14	3.735	0.001
L24	87.25 - 87	31.133	14	3.628	0.001
L25	87 - 82	30.943	14	3.615	0.001
L26	82 - 77	27.291	14	3.364	0.001
L27	77 - 72	23.900	14	3.117	0.001
L28	72 - 67	20.768	14	2.868	0.001
L29	67 - 62	17.893	14	2.624	0.001
L30	62 - 61.5	15.274	14	2.379	0.001
L31	61.5 - 61.25	15.026	14	2.355	0.001
L32	61.25 - 56.25	14.903	14	2.344	0.001
L33	56.25 - 46.953	12.565	14	2.124	0.001
L34	53.036 - 45.953	11.182	14	1.985	0.000
L35	45.953 - 40.953	8.353	14	1.808	0.000
L36	40.953 - 35.953	6.577	14	1.585	0.000
L37	35.953 - 32.25	5.031	14	1.367	0.000
L38	32.25 - 32	4.033	14	1.208	0.000
L39	32 - 31.75	3.970	14	1.200	0.000
L40	31.75 - 26.75	3.907	14	1.191	0.000
L41	26.75 - 21.75	2.763	14	0.997	0.000
L42	21.75 - 16.75	1.819	14	0.807	0.000
L43	16.75 - 11.75	1.074	14	0.617	0.000
L44	11.75 - 6.75	0.525	14	0.431	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L45	6.75 - 1.75	0.172	14	0.245	0.000
L46	1.75 - 0	0.011	14	0.062	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	DT465B-2XR w/ Mount Pipe	14	145.401	8.667	0.005	2721
174.00	800MHZ RRH	14	141.788	8.646	0.005	2721
167.00	7770.00 w/ Mount Pipe	14	129.251	8.488	0.005	1661
155.00	ERICSSON AIR 21 B2A B4P	14	108.764	7.791	0.004	763
145.00	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	14	93.338	7.017	0.003	980
50.00	KS24019-L112A	14	9.932	1.906	0.000	1974
10.00	OG-860/1920/GPS-A	14	0.380	0.366	0.000	1556

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	176 - 171 (1)	TP17.626x16.5x0.188	5.00	0.00	0.0	10.378	-2671	771039	0.003
L2	171 - 166 (2)	TP18.752x17.626x0.188	5.00	0.00	0.0	11.048	-5338	812697	0.007
L3	166 - 161 (3)	TP19.878x18.752x0.188	5.00	0.00	0.0	11.718	-5652	848879	0.007
L4	161 - 156 (4)	TP21.004x19.878x0.188	5.00	0.00	0.0	12.388	-5998	883562	0.007
L5	156 - 151 (5)	TP22.13x21.004x0.188	5.00	0.00	0.0	13.059	-8912	916745	0.010
L6	151 - 144.25 (6)	TP23.65x22.13x0.188	6.75	0.00	0.0	13.494	-9226	937510	0.010
L7	144.25 - 142.75 (7)	TP23.601x22.487x0.313	5.00	0.00	0.0	23.099	-12055	1716130	0.007
L8	142.75 - 137.75 (8)	TP24.714x23.601x0.313	5.00	0.00	0.0	24.204	-12765	1798200	0.007
L9	137.75 - 132.75 (9)	TP25.828x24.714x0.313	5.00	0.00	0.0	25.308	-13519	1880270	0.007
L10	132.75 - 127.75 (10)	TP26.942x25.828x0.313	5.00	0.00	0.0	26.413	-14307	1962340	0.007
L11	127.75 - 127.5 (11)	TP26.997x26.942x0.5	0.25	0.00	0.0	42.051	-14369	3124200	0.005
L12	127.5 - 122.5 (12)	TP28.111x26.997x0.488	5.00	0.00	0.0	42.743	-15371	3175560	0.005
L13	122.5 - 120.75 (13)	TP28.501x28.111x0.488	1.75	0.00	0.0	43.346	-15724	3220370	0.005
L14	120.75 - 120.5 (14)	TP28.557x28.501x0.313	0.25	0.00	0.0	28.014	-15780	2081340	0.008
L15	120.5 - 117.25 (15)	TP29.28x28.557x0.313	3.25	0.00	0.0	28.733	-16307	2134690	0.008
L16	117.25 - 117	TP29.336x29.28x0.538	0.25	0.00	0.0	49.131	-16380	3650200	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	(16)								
L17	117 - 112 (17)	TP30.45x29.336x0.525	5.00	0.00	0.0	49.865	-17524	3704740	0.005
L18	112 - 107 (18)	TP31.564x30.45x0.525	5.00	0.00	0.0	51.721	-18705	3842620	0.005
L19	107 - 102 (19)	TP32.677x31.564x0.513	5.00	0.00	0.0	52.322	-19916	3887230	0.005
L20	102 - 94.58 (20)	TP34.33x32.677x0.513	7.42	0.00	0.0	53.259	-20552	3956870	0.005
L21	94.58 - 94.413 (21)	TP33.741x32.628x0.575	5.00	0.00	0.0	60.529	-22893	4497040	0.005
L22	94.413 - 89.413 (22)	TP34.853x33.741x0.563	5.00	0.00	0.0	61.222	-24284	4548490	0.005
L23	89.413 - 87.25 (23)	TP35.335x34.853x0.563	2.16	0.00	0.0	62.081	-24901	4612320	0.005
L24	87.25 - 87 (24)	TP35.39x35.335x0.563	0.25	0.00	0.0	62.181	-24982	4619700	0.005
L25	87 - 82 (25)	TP36.503x35.39x0.55	5.00	0.00	0.0	62.763	-26423	4662940	0.006
L26	82 - 77 (26)	TP37.615x36.503x0.55	5.00	0.00	0.0	64.704	-27905	4807210	0.006
L27	77 - 72 (27)	TP38.727x37.615x0.538	5.00	0.00	0.0	65.153	-29420	4840540	0.006
L28	72 - 67 (28)	TP39.84x38.727x0.538	5.00	0.00	0.0	67.051	-30968	4981540	0.006
L29	67 - 62 (29)	TP40.952x39.84x0.525	5.00	0.00	0.0	67.366	-32549	5004960	0.007
L30	62 - 61.5 (30)	TP41.064x40.952x0.525	0.50	0.00	0.0	67.551	-32716	5018730	0.007
L31	61.5 - 61.25 (31)	TP41.119x41.064x0.588	0.25	0.00	0.0	75.580	-32805	5615240	0.006
L32	61.25 - 56.25 (32)	TP42.232x41.119x0.575	5.00	0.00	0.0	76.025	-34531	5648300	0.006
L33	56.25 - 46.953 (33)	TP44.3x42.232x0.575	9.30	0.00	0.0	77.330	-35664	5745260	0.006
L34	46.953 - 45.953 (34)	TP43.773x42.197x0.575	7.08	0.00	0.0	78.839	-40089	5857300	0.007
L35	45.953 - 40.953 (35)	TP44.886x43.773x0.563	5.00	0.00	0.0	79.134	-41909	5879230	0.007
L36	40.953 - 35.953 (36)	TP45.999x44.886x0.563	5.00	0.00	0.0	81.120	-43760	6026840	0.007
L37	35.953 - 32.25 (37)	TP46.823x45.999x0.563	3.70	0.00	0.0	82.592	-45147	6136150	0.007
L38	32.25 - 32 (38)	TP46.878x46.823x0.775	0.25	0.00	0.0	113.407	-45287	8425580	0.005
L39	32 - 31.75 (39)	TP46.934x46.878x0.613	0.25	0.00	0.0	90.052	-45389	6690440	0.007
L40	31.75 - 26.75 (40)	TP48.047x46.934x0.613	5.00	0.00	0.0	92.216	-47439	6851160	0.007
L41	26.75 - 21.75 (41)	TP49.159x48.047x0.613	5.00	0.00	0.0	94.379	-49528	7011880	0.007
L42	21.75 - 16.75 (42)	TP50.272x49.159x0.6	5.00	0.00	0.0	94.596	-51648	7027990	0.007
L43	16.75 - 11.75 (43)	TP51.385x50.272x0.6	5.00	0.00	0.0	96.715	-53798	7185440	0.007
L44	11.75 - 6.75 (44)	TP52.498x51.385x0.588	5.00	0.00	0.0	96.798	-56072	7191630	0.008
L45	6.75 - 1.75 (45)	TP53.611x52.498x0.588	5.00	0.00	0.0	98.873	-58283	7345800	0.008
L46	1.75 - 0 (46)	TP54x53.611x0.588	1.75	0.00	0.0	99.600	-59056	7399750	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	176 - 171 (1)	TP17.626x16.5x0.188	31468	275698	0.114	0	275698	0.000
L2	171 - 166 (2)	TP18.752x17.626x0.188	66202	309556	0.214	0	309556	0.000
L3	166 - 161 (3)	TP19.878x18.752x0.188	120334	343145	0.351	0	343145	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L4	161 - 156 (4)	TP21.004x19.878x0.188	176014	377783	0.466	0	377783	0.000
L5	156 - 151 (5)	TP22.13x21.004x0.188	246852	413362	0.597	0	413362	0.000
L6	151 - 144.25 (6)	TP23.65x22.13x0.188	295890	436944	0.677	0	436944	0.000
L7	144.25 - 142.75 (7)	TP23.601x22.487x0.313	390423	817307	0.478	0	817307	0.000
L8	142.75 - 137.75 (8)	TP24.714x23.601x0.313	490209	897892	0.546	0	897892	0.000
L9	137.75 - 132.75 (9)	TP25.828x24.714x0.313	591821	982267	0.603	0	982267	0.000
L10	132.75 - 127.75 (10)	TP26.942x25.828x0.313	695125	1070425	0.649	0	1070425	0.000
L11	127.75 - 127.5 (11)	TP26.997x26.942x0.5	700337	1683892	0.416	0	1683892	0.000
L12	127.5 - 122.5 (12)	TP28.111x26.997x0.488	806326	1786467	0.451	0	1786467	0.000
L13	122.5 - 120.75 (13)	TP28.501x28.111x0.488	844217	1837683	0.459	0	1837683	0.000
L14	120.75 - 120.5 (14)	TP28.557x28.501x0.313	849667	1204992	0.705	0	1204992	0.000
L15	120.5 - 117.25 (15)	TP29.28x28.557x0.313	921192	1267900	0.727	0	1267900	0.000
L16	117.25 - 117 (16)	TP29.336x29.28x0.538	926742	2138700	0.433	0	2138700	0.000
L17	117 - 112 (17)	TP30.45x29.336x0.525	1039767	2258025	0.460	0	2258025	0.000
L18	112 - 107 (18)	TP31.564x30.45x0.525	1156408	2430733	0.476	0	2430733	0.000
L19	107 - 102 (19)	TP32.677x31.564x0.513	1276675	2550633	0.501	0	2550633	0.000
L20	102 - 94.58 (20)	TP34.33x32.677x0.513	1340333	2643575	0.507	0	2643575	0.000
L21	94.58 - 94.413 (21)	TP33.741x32.628x0.575	1466475	3038408	0.483	0	3038408	0.000
L22	94.413 - 89.413 (22)	TP34.853x33.741x0.563	1596592	3180325	0.502	0	3180325	0.000
L23	89.413 - 87.25 (23)	TP35.335x34.853x0.563	1654025	3270942	0.506	0	3270942	0.000
L24	87.25 - 87 (24)	TP35.39x35.335x0.563	1660708	3281500	0.506	0	3281500	0.000
L25	87 - 82 (25)	TP36.503x35.39x0.55	1796258	3422067	0.525	0	3422067	0.000
L26	82 - 77 (26)	TP37.615x36.503x0.55	1935458	3638758	0.532	0	3638758	0.000
L27	77 - 72 (27)	TP38.727x37.615x0.538	2078300	3778033	0.550	0	3778033	0.000
L28	72 - 67 (28)	TP39.84x38.727x0.538	2224758	4002908	0.556	0	4002908	0.000
L29	67 - 62 (29)	TP40.952x39.84x0.525	2374800	4139650	0.574	0	4139650	0.000
L30	62 - 61.5 (30)	TP41.064x40.952x0.525	2390000	4162608	0.574	0	4162608	0.000
L31	61.5 - 61.25 (31)	TP41.119x41.064x0.588	2397617	4649492	0.516	0	4649492	0.000
L32	61.25 - 56.25 (32)	TP42.232x41.119x0.575	2551800	4809942	0.531	0	4809942	0.000
L33	56.25 - 46.953 (33)	TP44.3x42.232x0.575	2652800	4977633	0.533	0	4977633	0.000
L34	46.953 - 45.953 (34)	TP43.773x42.197x0.575	2881033	5175008	0.557	0	5175008	0.000
L35	45.953 - 40.953 (35)	TP44.886x43.773x0.563	3046933	5332950	0.571	0	5332950	0.000
L36	40.953 - 35.953 (36)	TP45.999x44.886x0.563	3216083	5605808	0.574	0	5605808	0.000
L37	35.953 - 32.25 (37)	TP46.823x45.999x0.563	3343450	5812275	0.575	0	5812275	0.000
L38	32.25 - 32 (38)	TP46.878x46.823x0.775	3352117	7917433	0.423	0	7917433	0.000
L39	32 - 31.75 (39)	TP46.934x46.878x0.613	3360792	6339041	0.530	0	6339041	0.000
L40	31.75 - 26.75 (40)	TP48.047x46.934x0.613	3535975	6649300	0.532	0	6649300	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L41	26.75 - 21.75 (41)	TP49.159x48.047x0.613	3714325	6966967	0.533	0	6966967	0.000
L42	21.75 - 16.75 (42)	TP50.272x49.159x0.6	3895775	7148633	0.545	0	7148633	0.000
L43	16.75 - 11.75 (43)	TP51.385x50.272x0.6	4080367	7474467	0.546	0	7474467	0.000
L44	11.75 - 6.75 (44)	TP52.498x51.385x0.588	4267933	7650425	0.558	0	7650425	0.000
L45	6.75 - 1.75 (45)	TP53.611x52.498x0.588	4459108	7983817	0.559	0	7983817	0.000
L46	1.75 - 0 (46)	TP54x53.611x0.588	4526783	8102175	0.559	0	8102175	0.000

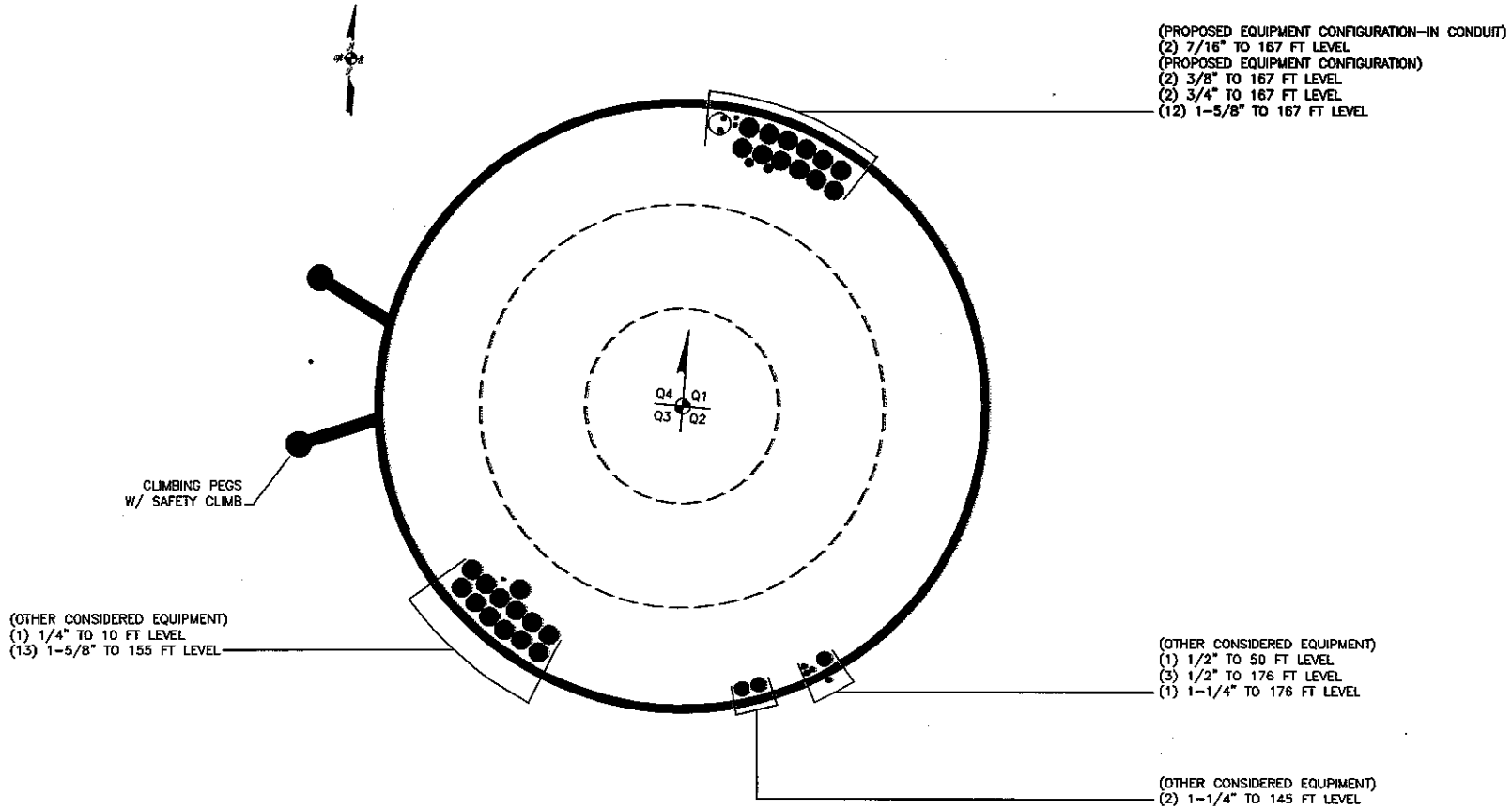
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	176 - 171 (1)	TP17.626x16.5x0.188	5883	179783	0.033	55	272203	0.000
L2	171 - 166 (2)	TP18.752x17.626x0.188	10675	193896	0.055	112	308897	0.000
L3	166 - 161 (3)	TP19.878x18.752x0.188	10984	205656	0.053	112	347909	0.000
L4	161 - 156 (4)	TP21.004x19.878x0.188	11297	217416	0.052	112	389242	0.000
L5	156 - 151 (5)	TP22.13x21.004x0.188	15007	229176	0.065	112	432893	0.000
L6	151 - 144.25 (6)	TP23.65x22.13x0.188	15214	234273	0.065	237	462510	0.001
L7	144.25 - 142.75 (7)	TP23.601x22.487x0.313	19740	405384	0.049	147	804720	0.000
L8	142.75 - 137.75 (8)	TP24.714x23.601x0.313	20162	420893	0.048	237	884625	0.000
L9	137.75 - 132.75 (9)	TP25.828x24.714x0.313	20502	440280	0.047	236	968317	0.000
L10	132.75 - 127.75 (10)	TP26.942x25.828x0.313	20841	459667	0.045	236	1055783	0.000
L11	127.75 - 127.5 (11)	TP26.997x26.942x0.5	20868	738000	0.028	236	1648508	0.000
L12	127.5 - 122.5 (12)	TP28.111x26.997x0.488	21543	744084	0.029	236	1751183	0.000
L13	122.5 - 120.75 (13)	TP28.501x28.111x0.488	21786	750133	0.029	236	1801858	0.000
L14	120.75 - 120.5 (14)	TP28.557x28.501x0.313	21809	490686	0.044	236	1189333	0.000
L15	120.5 - 117.25 (15)	TP29.28x28.557x0.313	22225	500056	0.044	236	1251783	0.000
L16	117.25 - 117 (16)	TP29.336x29.28x0.538	22252	862252	0.026	236	2094217	0.000
L17	117 - 112 (17)	TP30.45x29.336x0.525	22975	875135	0.026	236	2213675	0.000
L18	112 - 107 (18)	TP31.564x30.45x0.525	23700	907705	0.026	235	2384558	0.000
L19	107 - 102 (19)	TP32.677x31.564x0.513	24429	918244	0.027	235	2504767	0.000
L20	102 - 94.58 (20)	TP34.33x32.677x0.513	24807	934695	0.027	235	2596792	0.000
L21	94.58 - 94.413 (21)	TP33.741x32.628x0.575	25670	1061100	0.024	235	2979375	0.000
L22	94.413 - 89.413 (22)	TP34.853x33.741x0.563	26403	1074450	0.025	235	3121592	0.000
L23	89.413 - 87.25 (23)	TP35.335x34.853x0.563	26721	1089520	0.025	235	3211308	0.000
L24	87.25 - 87 (24)	TP35.39x35.335x0.563	26753	1091270	0.025	235	3221758	0.000
L25	87 - 82 (25)	TP36.503x35.39x0.55	27489	1101480	0.025	235	3362767	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L26	82 - 77 (26)	TP37.615x36.503x0.55	28219	1135560	0.025	235	3577417	0.000
L27	77 - 72 (27)	TP38.727x37.615x0.538	28945	1143440	0.025	235	3717308	0.000
L28	72 - 67 (28)	TP39.84x38.727x0.538	29666	1176740	0.025	235	3940208	0.000
L29	67 - 62 (29)	TP40.952x39.84x0.525	30382	1182270	0.026	235	4077733	0.000
L30	62 - 61.5 (30)	TP41.064x40.952x0.525	30447	1185530	0.026	234	4100500	0.000
L31	61.5 - 61.25 (31)	TP41.119x41.064x0.588	30483	1326440	0.023	234	4572758	0.000
L32	61.25 - 56.25 (32)	TP42.232x41.119x0.575	31214	1334240	0.023	234	4733975	0.000
L33	56.25 - 46.953 (33)	TP44.3x42.232x0.575	31667	1357150	0.023	234	4900208	0.000
L34	46.953 - 45.953 (34)	TP43.773x42.197x0.575	32868	1383620	0.024	234	5095883	0.000
L35	45.953 - 40.953 (35)	TP44.886x43.773x0.563	33527	1388800	0.024	234	5254800	0.000
L36	40.953 - 35.953 (36)	TP45.999x44.886x0.563	34167	1423660	0.024	234	5525442	0.000
L37	35.953 - 32.25 (37)	TP46.823x45.999x0.563	34665	1449480	0.024	234	5730258	0.000
L38	32.25 - 32 (38)	TP46.878x46.823x0.775	34687	1990300	0.017	234	7767908	0.000
L39	32 - 31.75 (39)	TP46.934x46.878x0.613	34722	1580420	0.022	234	6242691	0.000
L40	31.75 - 26.75 (40)	TP48.047x46.934x0.613	35376	1618380	0.022	234	6550341	0.000
L41	26.75 - 21.75 (41)	TP49.159x48.047x0.613	35997	1656350	0.022	234	6865400	0.000
L42	21.75 - 16.75 (42)	TP50.272x49.159x0.6	36621	1660160	0.022	234	7048341	0.000
L43	16.75 - 11.75 (43)	TP51.385x50.272x0.6	37250	1697350	0.022	234	7371625	0.000
L44	11.75 - 6.75 (44)	TP52.498x51.385x0.588	37935	1698810	0.022	234	7549041	0.000
L45	6.75 - 1.75 (45)	TP53.611x52.498x0.588	38573	1735230	0.022	234	7879950	0.000
L46	1.75 - 0 (46)	TP54x53.611x0.588	38811	1747970	0.022	234	7997441	0.000

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876381 TOWER ID: C_BASELEVEL

APPENDIX C

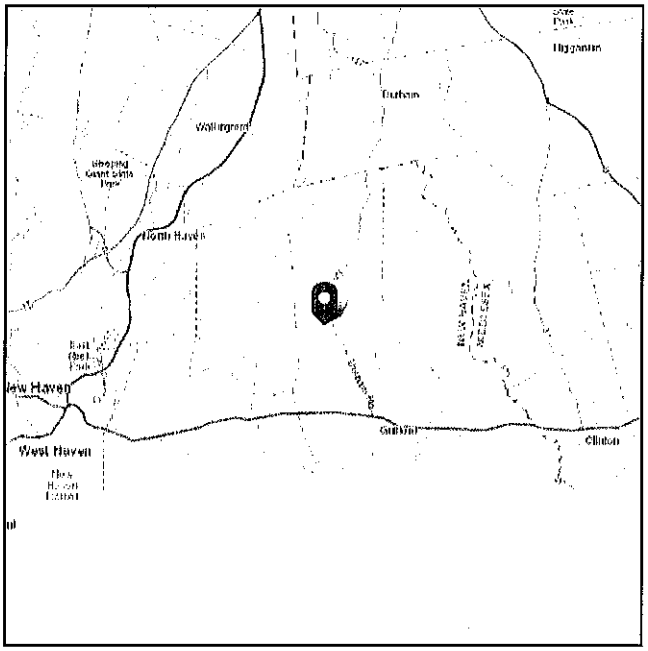
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 181.21 ft (NAVD 88)
Latitude: 41.346483
Longitude: -72.723097



Wind

Results:	**78 Vmph**
Wind Speed:	127 Vmph
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	95 Vmph
100-year MRI	104 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Dec 10 2018

Wind speed updated per local jurisdiction requirements

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

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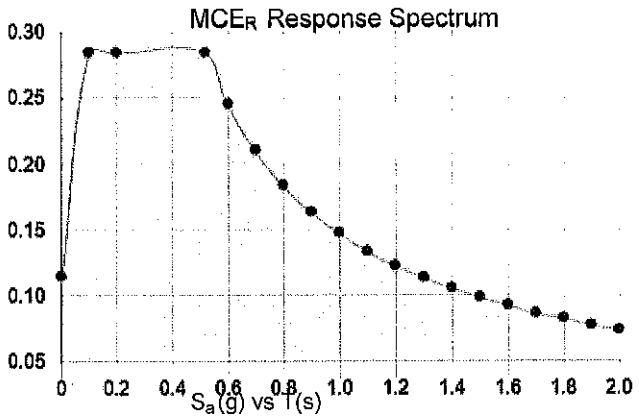
Seismic

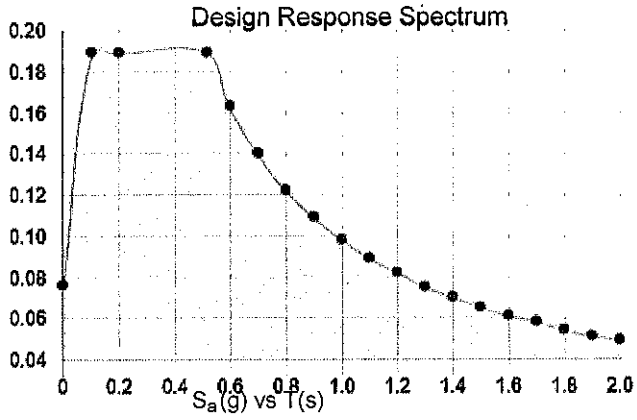
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.178	S_{DS} :	0.189
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.091
S_{MS} :	0.284	PGA_M :	0.145
S_{M1} :	0.147	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Dec 10 2018

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.

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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:	Mon Dec 10 2018

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.

CCIpole

per TIA-222- H

Site BU: 876381

Work Order: 1668656

CROWN CASTLE

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	176	31.75	3.5	18	16.5	23.65	0.1875	Auto	A572-65
2	147.75	53.17	4.833	18	22.49	34.33	0.3125	Auto	A572-65
3	99.413	52.46	6.083	18	32.63	44.3	0.375	Auto	A572-65
4	53.036	53.036	0	18	42.20	54	0.375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	32.25	plate	CCI-WSFP-065125	4		0				0					0				0			
2	32	61.5	plate	CCI-SFP-065125	3	0						0						0					
3	61.5	87.25	plate	CCI-SFP-060100	3	0						0						0					
4	87.25	117.25	plate	CCI-SFP-060100	3	0						0						0					
5	120.75	127.75	plate	CCI-SFP-045100	3	0						0						0					
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	n/a	33.000	19.000	6.563	1.1875	A572-65
2	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
3	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
4	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
5	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	176 - 171	5		18	16.500	17.626	0.1875	A572-65	1.000
2	171 - 166	5		18	17.626	18.752	0.1875	A572-65	1.000
3	166 - 161	5		18	18.752	19.878	0.1875	A572-65	1.000
4	161 - 156	5		18	19.878	21.004	0.1875	A572-65	1.000
5	156 - 151	5		18	21.004	22.130	0.1875	A572-65	1.000
6	151 - 147.75	6.75	3.5	18	22.130	23.650	0.1875	A572-65	1.000
7	147.75 - 142.75	5		18	22.487	23.601	0.3125	A572-65	1.000
8	142.75 - 137.75	5		18	23.601	24.714	0.3125	A572-65	1.000
9	137.75 - 132.75	5		18	24.714	25.828	0.3125	A572-65	1.000
10	132.75 - 127.75	5		18	25.828	26.942	0.3125	A572-65	1.000
11	127.75 - 127.5	0.25		18	26.942	26.997	0.5	A572-65	0.950
12	127.5 - 122.5	5		18	26.997	28.111	0.4875	A572-65	0.961
13	122.5 - 120.75	1.75		18	28.111	28.501	0.4875	A572-65	0.956
14	120.75 - 120.5	0.25		18	28.501	28.557	0.3125	A572-65	1.000
15	120.5 - 117.25	3.25		18	28.557	29.280	0.3125	A572-65	1.000
16	117.25 - 117	0.25		18	29.280	29.336	0.5375	A572-65	0.952
17	117 - 112	5		18	29.336	30.450	0.525	A572-65	0.960
18	112 - 107	5		18	30.450	31.564	0.525	A572-65	0.947
19	107 - 102	5		18	31.564	32.677	0.5125	A572-65	0.958
20	102 - 99.413	7.42	4.833	18	32.677	34.330	0.5125	A572-65	0.951
21	99.413 - 94.413	5		18	32.628	33.741	0.575	A572-65	0.953
22	94.413 - 89.413	5		18	33.741	34.853	0.5625	A572-65	0.964
23	89.413 - 87.25	2.163		18	34.853	35.335	0.5625	A572-65	0.960
24	87.25 - 87	0.25		18	35.335	35.390	0.5625	A572-65	0.960
25	87 - 82	5		18	35.390	36.503	0.55	A572-65	0.972
26	82 - 77	5		18	36.503	37.615	0.55	A572-65	0.963
27	77 - 72	5		18	37.615	38.727	0.5375	A572-65	0.977
28	72 - 67	5		18	38.727	39.840	0.5375	A572-65	0.969
29	67 - 62	5		18	39.840	40.952	0.525	A572-65	0.984
30	62 - 61.5	0.5		18	40.952	41.064	0.525	A572-65	0.983
31	61.5 - 61.25	0.25		18	41.064	41.119	0.5875	A572-65	0.964
32	61.25 - 56.25	5		18	41.119	42.232	0.575	A572-65	0.976
33	56.25 - 53.036	9.297	6.083	18	42.232	44.300	0.575	A572-65	0.970
34	53.036 - 45.953	7.083		18	42.197	43.773	0.575	A572-65	0.964
35	45.953 - 40.953	5		18	43.773	44.886	0.5625	A572-65	0.978
36	40.953 - 35.953	5		18	44.886	45.999	0.5625	A572-65	0.970
37	35.953 - 32.25	3.703		18	45.999	46.823	0.5625	A572-65	0.965
38	32.25 - 32	0.25		18	46.823	46.878	0.775	A572-65	0.990
39	32 - 31.75	0.25		18	46.878	46.934	0.6125	A572-65	0.976
40	31.75 - 26.75	5		18	46.934	48.047	0.6125	A572-65	0.968
41	26.75 - 21.75	5		18	48.047	49.159	0.6125	A572-65	0.960
42	21.75 - 16.75	5		18	49.159	50.272	0.6	A572-65	0.971
43	16.75 - 11.75	5		18	50.272	51.385	0.6	A572-65	0.964
44	11.75 - 6.75	5		18	51.385	52.498	0.5875	A572-65	0.977
45	6.75 - 1.75	5		18	52.498	53.611	0.5875	A572-65	0.970
46	1.75 - 0	1.75		18	53.611	54.000	0.5875	A572-65	0.967

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	176 - 171	2.67	31.47	5.88
2	171 - 166	5.34	66.20	10.68
3	166 - 161	5.65	120.33	10.98
4	161 - 156	6.00	176.01	11.30
5	156 - 151	8.91	246.85	15.01
6	151 - 147.75	9.23	295.92	15.21
7	147.75 - 142.75	12.06	390.42	19.74
8	142.75 - 137.75	12.76	490.21	20.16
9	137.75 - 132.75	13.52	591.82	20.50
10	132.75 - 127.75	14.31	695.12	20.84
11	127.75 - 127.5	14.37	700.34	20.87
12	127.5 - 122.5	15.37	806.33	21.54
13	122.5 - 120.75	15.72	844.22	21.79
14	120.75 - 120.5	15.78	849.67	21.81
15	120.5 - 117.25	16.31	921.19	22.22
16	117.25 - 117	16.38	926.75	22.25
17	117 - 112	17.52	1039.77	22.97
18	112 - 107	18.70	1156.41	23.70
19	107 - 102	19.92	1276.68	24.43
20	102 - 99.413	20.55	1340.33	24.81
21	99.413 - 94.413	22.89	1466.47	25.67
22	94.413 - 89.413	24.28	1596.59	26.40
23	89.413 - 87.25	24.90	1654.02	26.72
24	87.25 - 87	24.98	1660.70	26.75
25	87 - 82	26.42	1796.25	27.49
26	82 - 77	27.90	1935.46	28.22
27	77 - 72	29.42	2078.30	28.95
28	72 - 67	30.97	2224.76	29.67
29	67 - 62	32.55	2374.80	30.38
30	62 - 61.5	32.72	2390.00	30.45
31	61.5 - 61.25	32.81	2397.62	30.48
32	61.25 - 56.25	34.53	2551.80	31.21
33	56.25 - 53.036	35.66	2652.80	31.67
34	53.036 - 45.953	40.09	2881.03	32.87
35	45.953 - 40.953	41.91	3046.94	33.53
36	40.953 - 35.953	43.76	3216.08	34.17
37	35.953 - 32.25	45.15	3343.45	34.66
38	32.25 - 32	45.29	3352.12	34.69
39	32 - 31.75	45.39	3360.79	34.72
40	31.75 - 26.75	47.44	3535.98	35.38
41	26.75 - 21.75	49.53	3714.32	36.00
42	21.75 - 16.75	51.65	3895.78	36.62
43	16.75 - 11.75	53.80	4080.37	37.25
44	11.75 - 6.75	56.07	4267.94	37.94
45	6.75 - 1.75	58.28	4459.11	38.57
46	1.75 - 0	59.06	4526.78	38.81

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
176 - 171	Pole	TP17.626x16.5x0.1875	Pole	11.2%	Pass
171 - 166	Pole	TP18.752x17.626x0.1875	Pole	21.1%	Pass
166 - 161	Pole	TP19.878x18.752x0.1875	Pole	34.1%	Pass
161 - 156	Pole	TP21.004x19.878x0.1875	Pole	45.1%	Pass
156 - 151	Pole	TP22.13x21.004x0.1875	Pole	57.9%	Pass
151 - 147.75	Pole	TP23.65x22.13x0.1875	Pole	65.5%	Pass
147.75 - 142.75	Pole	TP23.601x22.487x0.3125	Pole	46.2%	Pass
142.75 - 137.75	Pole	TP24.714x23.601x0.3125	Pole	52.7%	Pass
137.75 - 132.75	Pole	TP25.828x24.714x0.3125	Pole	58.1%	Pass
132.75 - 127.75	Pole	TP26.942x25.828x0.3125	Pole	62.5%	Pass
127.75 - 127.5	Pole + Reinf.	TP26.997x26.942x0.5	Reinf. 5 Tension Rupture	70.2%	Pass
127.5 - 122.5	Pole + Reinf.	TP28.111x26.997x0.4875	Reinf. 5 Tension Rupture	75.5%	Pass
122.5 - 120.75	Pole + Reinf.	TP28.501x28.111x0.4875	Reinf. 5 Tension Rupture	77.2%	Pass
120.75 - 120.5	Pole	TP28.557x28.501x0.3125	Pole	67.9%	Pass
120.5 - 117.25	Pole	TP29.28x28.557x0.3125	Pole	69.9%	Pass
117.25 - 117	Pole + Reinf.	TP29.336x29.28x0.5375	Reinf. 4 Tension Rupture	66.1%	Pass
117 - 112	Pole + Reinf.	TP30.45x29.336x0.525	Reinf. 4 Tension Rupture	69.8%	Pass
112 - 107	Pole + Reinf.	TP31.564x30.45x0.525	Reinf. 4 Tension Rupture	73.2%	Pass
107 - 102	Pole + Reinf.	TP32.677x31.564x0.5125	Reinf. 4 Tension Rupture	76.4%	Pass
102 - 99.41	Pole + Reinf.	TP34.33x32.677x0.5125	Reinf. 4 Tension Rupture	77.9%	Pass
99.41 - 94.41	Pole + Reinf.	TP33.741x32.628x0.575	Reinf. 4 Tension Rupture	74.2%	Pass
94.41 - 89.41	Pole + Reinf.	TP34.853x33.741x0.5625	Reinf. 4 Tension Rupture	76.4%	Pass
89.41 - 87.25	Pole + Reinf.	TP35.335x34.853x0.5625	Reinf. 4 Tension Rupture	77.4%	Pass
87.25 - 87	Pole + Reinf.	TP35.39x35.335x0.5625	Reinf. 3 Tension Rupture	77.5%	Pass
87 - 82	Pole + Reinf.	TP36.503x35.39x0.55	Reinf. 3 Tension Rupture	79.5%	Pass
82 - 77	Pole + Reinf.	TP37.615x36.503x0.55	Reinf. 3 Tension Rupture	81.3%	Pass
77 - 72	Pole + Reinf.	TP38.727x37.615x0.5375	Reinf. 3 Tension Rupture	83.1%	Pass
72 - 67	Pole + Reinf.	TP39.84x38.727x0.5375	Reinf. 3 Tension Rupture	84.7%	Pass
67 - 62	Pole + Reinf.	TP40.952x39.84x0.525	Reinf. 3 Tension Rupture	86.2%	Pass
62 - 61.5	Pole + Reinf.	TP41.064x40.952x0.525	Reinf. 3 Tension Rupture	86.3%	Pass
61.5 - 61.25	Pole + Reinf.	TP41.119x41.064x0.5875	Reinf. 2 Tension Rupture	77.1%	Pass
61.25 - 56.25	Pole + Reinf.	TP42.232x41.119x0.575	Reinf. 2 Tension Rupture	78.5%	Pass
56.25 - 53.04	Pole + Reinf.	TP44.3x42.232x0.575	Reinf. 2 Tension Rupture	79.3%	Pass
53.04 - 45.95	Pole + Reinf.	TP43.773x42.197x0.575	Reinf. 2 Tension Rupture	83.4%	Pass
45.95 - 40.95	Pole + Reinf.	TP44.886x43.773x0.5625	Reinf. 2 Tension Rupture	84.6%	Pass
40.95 - 35.95	Pole + Reinf.	TP45.999x44.886x0.5625	Reinf. 2 Tension Rupture	85.7%	Pass
35.95 - 32.25	Pole + Reinf.	TP46.823x45.999x0.5625	Reinf. 2 Tension Rupture	86.4%	Pass
32.25 - 32	Pole + Reinf.	TP46.878x46.823x0.775	Reinf. 2 Tension Rupture	62.5%	Pass
32 - 31.75	Pole + Reinf.	TP46.934x46.878x0.6125	Reinf. 1 Tension Rupture	77.9%	Pass
31.75 - 26.75	Pole + Reinf.	TP48.047x46.934x0.6125	Reinf. 1 Tension Rupture	78.9%	Pass
26.75 - 21.75	Pole + Reinf.	TP49.159x48.047x0.6125	Reinf. 1 Tension Rupture	79.9%	Pass
21.75 - 16.75	Pole + Reinf.	TP50.272x49.159x0.6	Reinf. 1 Tension Rupture	80.8%	Pass
16.75 - 11.75	Pole + Reinf.	TP51.385x50.272x0.6	Reinf. 1 Tension Rupture	81.6%	Pass
11.75 - 6.75	Pole + Reinf.	TP52.498x51.385x0.5875	Reinf. 1 Tension Rupture	82.4%	Pass
6.75 - 1.75	Pole + Reinf.	TP53.611x52.498x0.5875	Reinf. 1 Tension Rupture	83.2%	Pass
1.75 - 0	Pole + Reinf.	TP54x53.611x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
				Summary	
			Pole	69.9%	Pass
			Reinforcement	86.4%	Pass
			Overall	86.4%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*					
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5
176 - 171	399	n/a	399	10.38	n/a	10.38	11.2%					
171 - 166	481	n/a	481	11.05	n/a	11.05	21.1%					
166 - 161	574	n/a	574	11.72	n/a	11.72	34.1%					
161 - 156	678	n/a	678	12.39	n/a	12.39	45.1%					
156 - 151	794	n/a	794	13.06	n/a	13.06	57.9%					
151 - 147.75	876	n/a	876	13.49	n/a	13.49	65.5%					
147.75 - 142.75	1582	n/a	1582	23.10	n/a	23.10	46.2%					
142.75 - 137.75	1820	n/a	1820	24.20	n/a	24.20	52.7%					
137.75 - 132.75	2081	n/a	2081	25.31	n/a	25.31	58.1%					
132.75 - 127.75	2365	n/a	2365	26.41	n/a	26.41	62.5%					
127.75 - 127.5	2380	1335	3715	26.47	13.50	39.97	39.7%					70.2%
127.5 - 122.5	2691	1442	4133	27.57	13.50	41.07	42.8%					75.5%
122.5 - 120.75	2806	1481	4286	27.96	13.50	41.46	43.8%					77.2%
120.75 - 120.5	2822	n/a	2822	28.01	n/a	28.01	67.9%					
120.5 - 117.25	3045	n/a	3045	28.73	n/a	28.73	69.9%					
117.25 - 117	3063	2098	5161	28.79	18.00	46.79	41.1%				66.1%	
117 - 112	3429	2253	5682	29.89	18.00	47.89	43.6%				69.8%	
112 - 107	3823	2414	6237	31.00	18.00	49.00	46.2%				73.2%	
107 - 102	4247	2580	6826	32.10	18.00	50.10	48.7%				76.4%	
102 - 99.41	4478	2668	7145	32.67	18.00	50.67	49.9%				77.9%	
99.41 - 94.41	5584	2743	8327	39.71	18.00	57.71	46.3%				74.2%	
94.41 - 89.41	6161	2920	9081	41.04	18.00	59.04	47.7%				76.4%	
89.41 - 87.25	6423	2998	9421	41.61	18.00	59.61	48.3%				77.4%	
87.25 - 87	6454	3007	9461	41.68	18.00	59.68	48.4%			77.5%		
87 - 82	7088	3192	10281	43.00	18.00	61.00	49.9%			79.5%		
82 - 77	7763	3383	11146	44.32	18.00	62.32	51.5%			81.3%		
77 - 72	8480	3579	12059	45.65	18.00	63.65	53.0%			83.1%		
72 - 67	9240	3781	13020	46.97	18.00	64.97	54.5%			84.7%		
67 - 62	10043	3988	14031	48.30	18.00	66.30	55.9%			86.2%		
62 - 61.5	10126	4009	14135	48.43	18.00	66.43	56.0%			86.3%		
61.5 - 61.25	10168	5514	15682	48.49	24.38	72.87	50.8%		77.1%			
61.25 - 56.25	11023	5805	16828	49.82	24.38	74.19	52.1%		78.5%			
56.25 - 53.04	11598	5996	17594	50.67	24.38	75.04	53.0%		79.3%			
53.04 - 45.95	12287	6221	18507	51.65	24.38	76.03	56.1%		83.4%			
45.95 - 40.95	13256	6530	19786	52.98	24.38	77.35	57.4%		84.6%			
40.95 - 35.95	14275	6846	21122	54.30	24.38	78.68	58.6%		85.7%			
35.95 - 32.25	15063	7086	22149	55.28	24.38	79.66	59.5%		86.4%			
32.25 - 32	15117	15527	30644	55.35	56.88	112.22	43.7%	60.5%	62.5%			
32 - 31.75	15171	9208	24380	55.41	32.50	87.91	55.3%	77.9%				
31.75 - 26.75	16285	9932	26217	56.74	32.50	89.24	55.7%	78.9%				
26.75 - 21.75	17453	10383	27835	58.06	32.50	90.56	56.8%	79.9%				
21.75 - 16.75	18674	10843	29518	59.39	32.50	91.89	58.0%	80.8%				
16.75 - 11.75	19952	11314	31266	60.71	32.50	93.21	59.1%	81.6%				
11.75 - 6.75	21286	11795	33081	62.04	32.50	94.54	60.2%	82.4%				
6.75 - 1.75	22679	12286	34965	63.36	32.50	95.86	61.3%	83.2%				
1.75 - 0	23180	12460	35641	63.82	32.50	96.32	61.7%	83.4%				

Note: Section capacity checked in 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Base Plate Connection

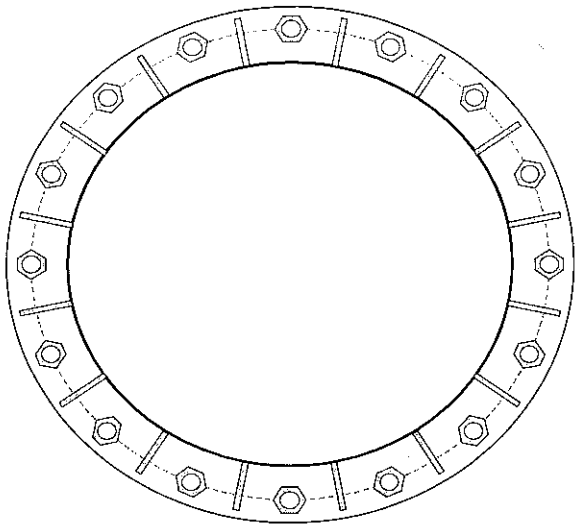
CROWN CASTLE

Site Info	
BU #	876381
Site Name	Ward
Order #	471550 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.5

Applied Loads	
Moment (kip-ft)	4526.78
Axial Force (kips)	59.06
Shear Force (kips)	38.81

**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 63" BC

Base Plate Data

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

Stiffener Data

(16) 15"H x 6.5"W x 0.75"T, Notch: 0.75"
plate: Fy= 65 ksi ; weld: Fy= 80 ksi
horiz. weld: 0.375" groove, 45° dbl bevel, 0.3125" fillet
vert. weld: 0.3125" fillet

Pole Data

54" 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 = 219.14	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.43	ϕVn = 73.13	**85.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	35.93	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**63.4%**	**Pass**

Stiffener Summary		
Horizontal Weld:	**58.3%**	**Pass**
Vertical Weld:	**66.8%**	**Pass**
Plate Flexure+Shear:	**23.1%**	**Pass**
Plate Tension+Shear:	**56.9%**	**Pass**
Plate Compression:	**83.0%**	**Pass**
Pole Summary		
Punching Shear:	**20.6%**	**Pass**

Drilled Pier Foundation

BU # :	876381
Site Name:	Ward
Order Number:	471550 Rev. 0

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4526.779	
Axial Force (kips)	59.077	
Shear Force (kips)	38.779	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	29	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 29' below grade		
Pier Diameter	7	ft
Rebar Quantity	24	
Rebar Size	11	
Rebar Cage Diameter	73	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.26	-
Soil Safety Factor	3.47	-
Max Moment (kip-ft)	4763.17	-
Rating*	*36.5%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	841.16	-
End Bearing (kips)	650.06	-
Weight of Concrete (kips)	150.18	-
Total Capacity (kips)	1491.22	-
Axial (kips)	209.26	-
Rating*	*13.4%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.22	-
Critical Moment (kip-ft)	4763.14	-
Critical Moment Capacity	6026.36	-
Rating*	*75.3%*	-

Soil Interaction Rating*	**36.5%**
Structural Foundation Rating*	**75.3%**

*Rating per TIA-222-H Section 15.5

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

Soil Profile			
Groundwater Depth	9	ft	# of Layers: 3

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	130	150	0		0.000	0.000	0.00	0.00			Cohesionless
2	3.5	9	5.5	130	150		35	0.000	0.000	2.00	2.00			Cohesionless
3	9	29	20	67.6	87.6		35	0.000	0.000	2.00	2.00	22.522		Cohesionless

Date: **December 27, 2018**

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Subject:	**Mount Analysis Report**	
Carrier Designation:	**AT&T Equipment Change Out**	
	Carrier Site Number:	10071056
	Carrier Site Name:	CTL05640
Crown Castle Designation:	**Crown Castle BU Number:**	876381
	Crown Castle Site Name:	WARD
	Crown Castle JDE Job Number:	548521
	Crown Castle Order Number:	471550, Rev. 0
Engineering Firm Designation:	**Infinigy Report Designation:**	1039-A0002-B
Site Data:	**2365 Long Hill Rd, Guilford, CT, 06437** **Latitude 41°20'47.34" Longitude -72°43'23.15"**	
Structure Information:	**Tower Height & Type:**	**176 ft Monopole**
	Mount Elevation:	**167 ft**
	Mount Type:	**12.5 ft Platform**

Dear Charles McGuirt,

Infinigy is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of AT&T's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned 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:

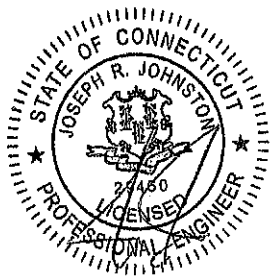
Platform (typical) **Sufficient**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 130 mph from the 2015 International Building Code and the 2018 Connecticut State Building Code. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

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

Mount analysis prepared by: Christopher Kudlacik
Respectfully Submitted by:

Joe Johnston, P.E.
VP Structural Engineering / Principal



12-28-18

TABLE OF CONTENTS

1) INTRODUCTION

This mount is a existing 12.5 ft Platform designed by Andrew.This mount is installed at the 167 ft elevation on 3 sector(s) of the 176 ft Monopole.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.28 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Final Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
167	167	3	CCI	HPA65R-BU6A	Platform
		3	Kathrein	80010965	
		3	Powerwave	7770.00	
		3	Ericsson	RRUS 4449 B5/B12	
		3	Ericsson	RRUS 8843 B2/B66A	
		6	Powerwave	LGP21401	
		2	Raycap	DC6-48-60-18-8F	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
AT&T Application	Crown Application	471550 Rev. 0	CCI Sites
Design Drawings	February 25, 2005	MT-196	Andrew
Site Photos	May 29, 2018	876381	CCI Sites

3.1) Analysis Method

RISA-3D (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

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

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A53 (GR 35)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Infinigy 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 (Platform, typical)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
	Mount Pipe	MP2	167	64.5	Pass
	Standoff	M5		81.1	Pass
	Main Horizontal	M18		20.6	Pass
	Bolt Check	--		11.8	Pass

Structure Rating (max from all components) =	81.1%

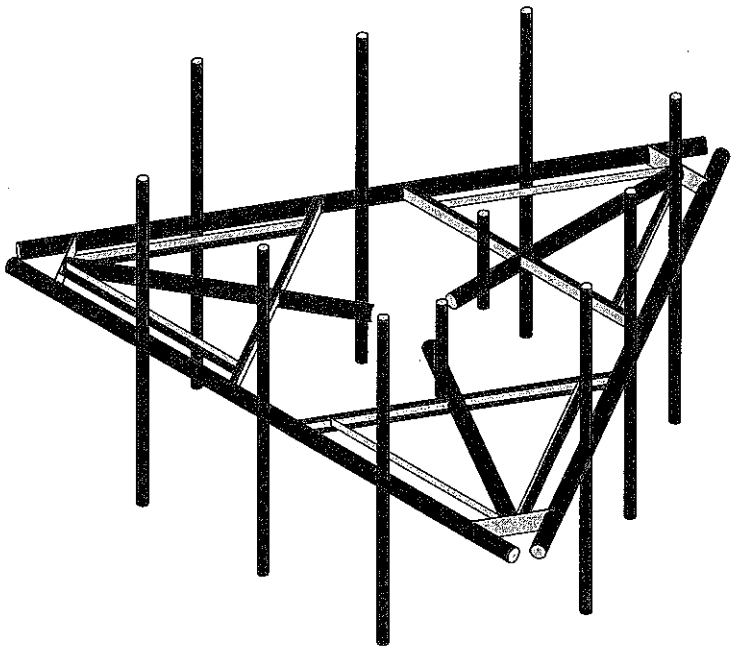
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

The Sector Frame Mount has sufficient capacity to support the proposed loading. No modifications are required at this time.

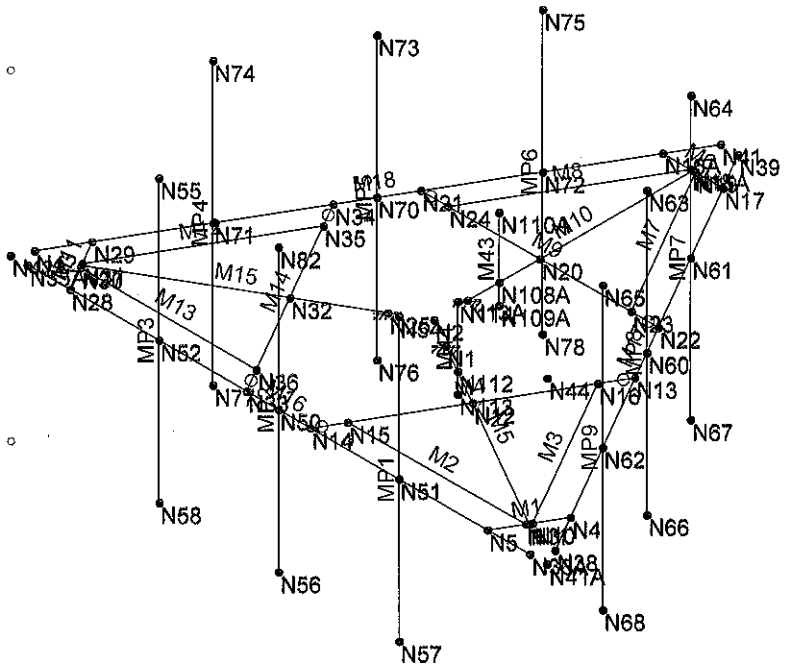
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy	MT-196	Existing Configuration
AC		Dec 27, 2018 at 10:19 AM
		876381_Commscope MT-196.r3d



Envelope Only Solution

Infinigy	MT-196	Wireframe
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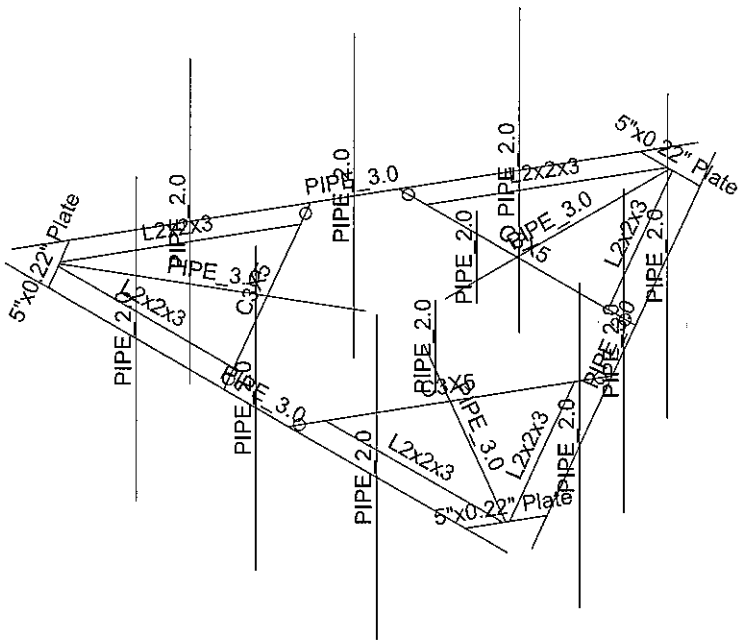

Envelope Only Solution

Infinigy	MT-196	Member Shapes
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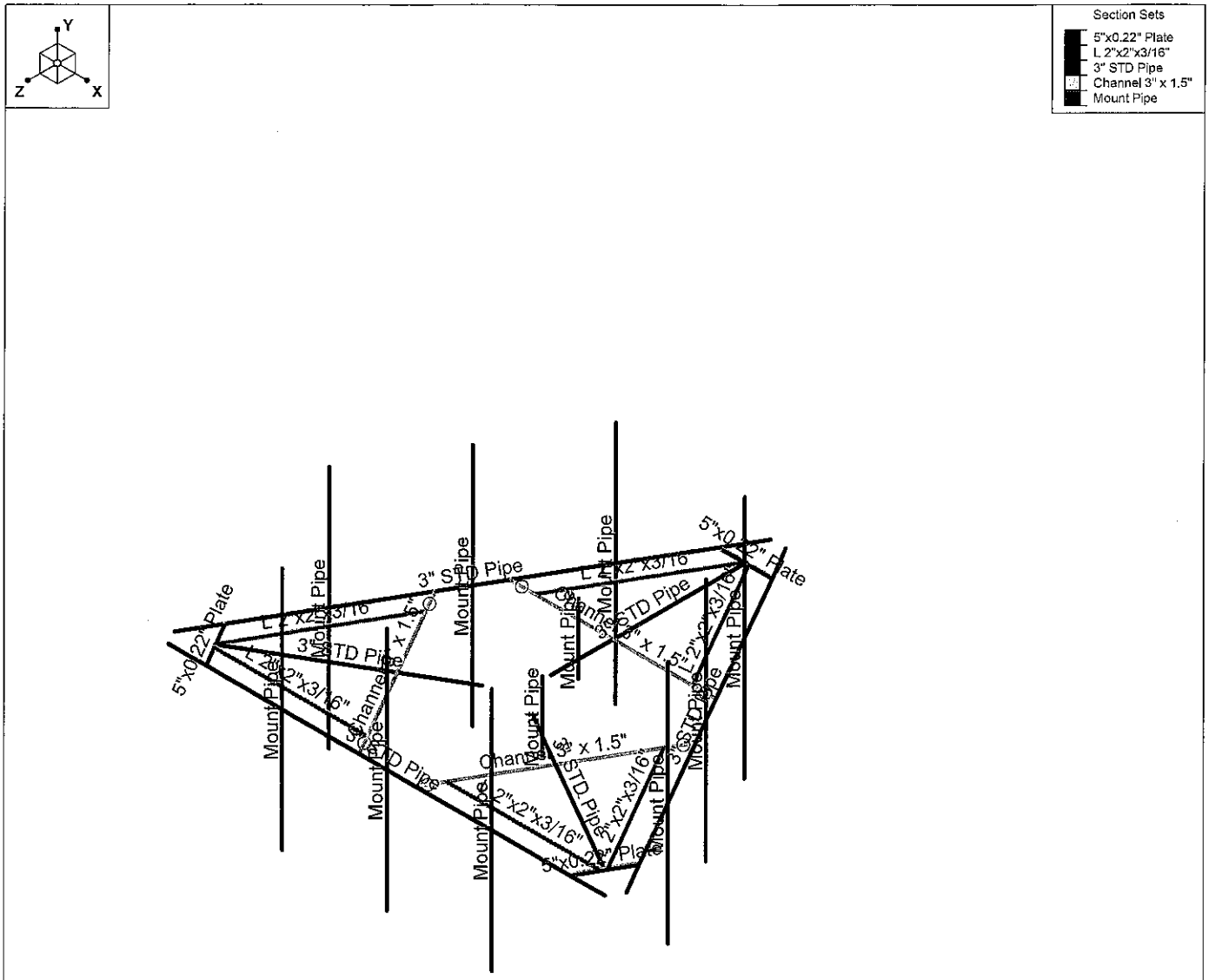

Envelope Only Solution

Infinigy	MT-196	Section Sets
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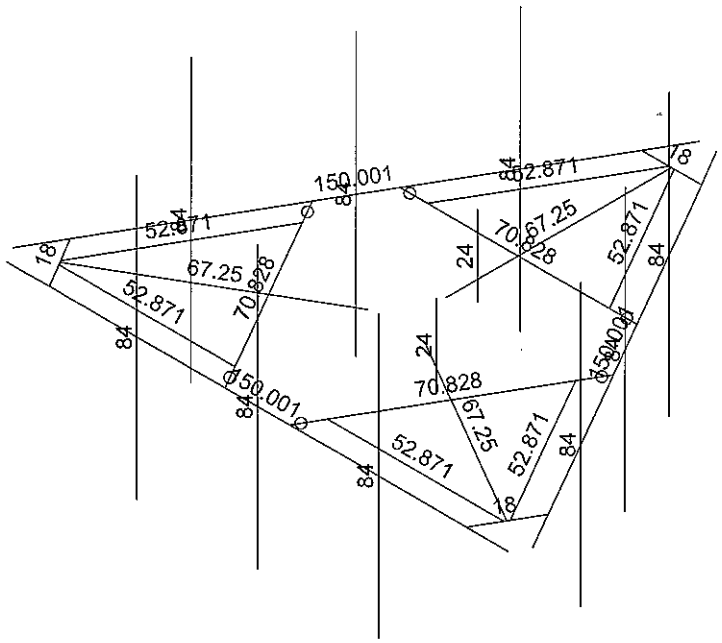

Member Length (in) Displayed
Envelope Only Solution

Infinigy	MT-196	Member Lengths
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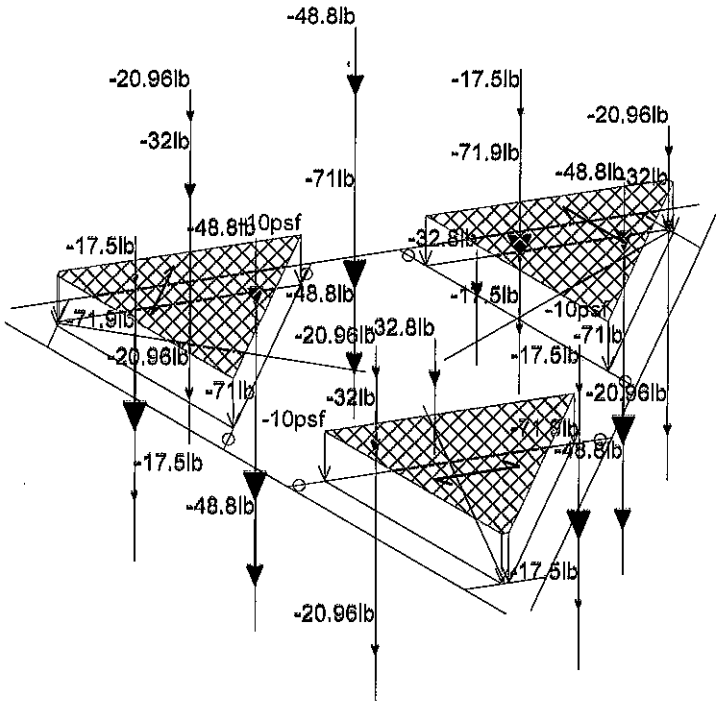

Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy	MT-196	Dead Load
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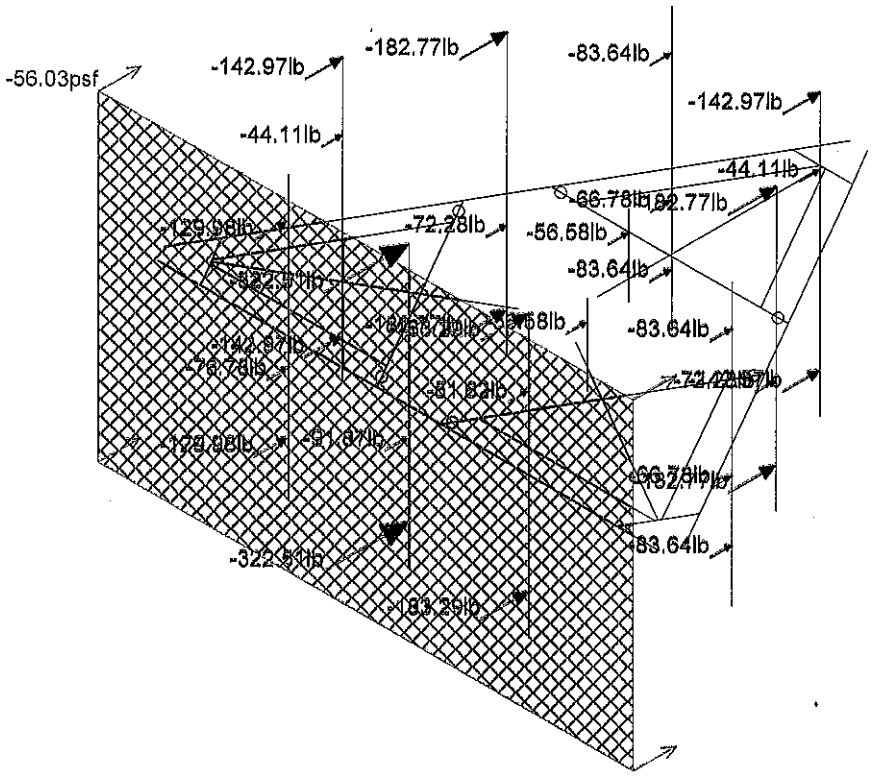

Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

Infinigy	MT-196	Wind Load 000
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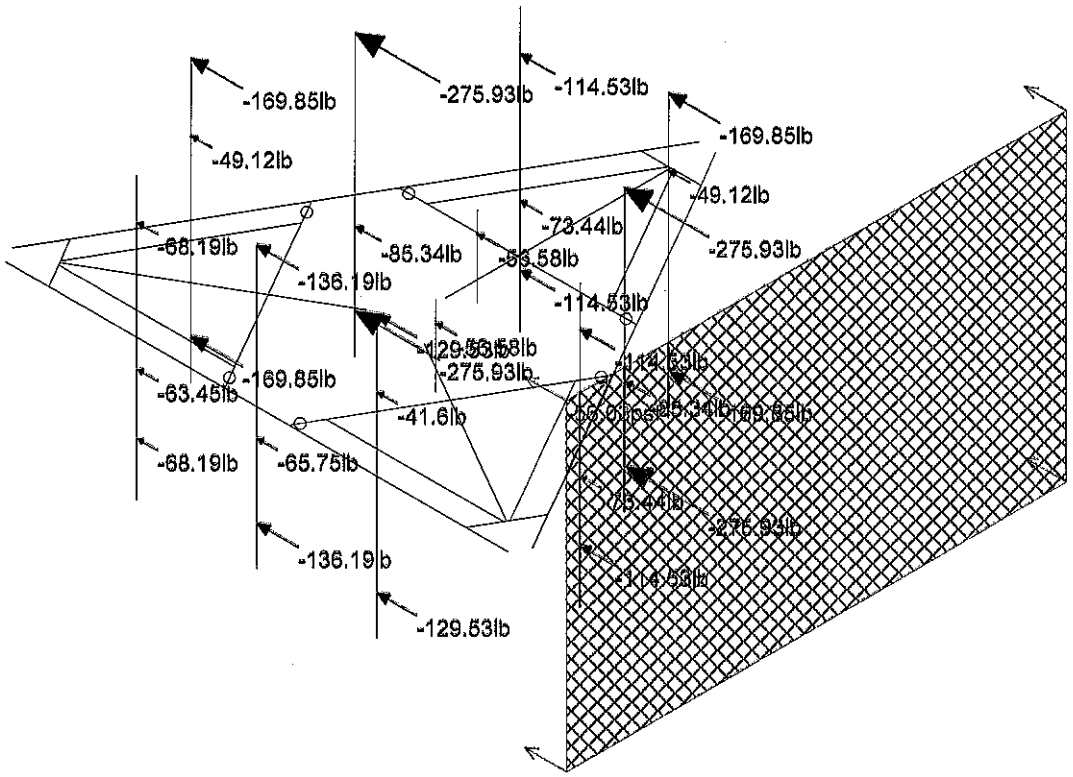

Loads: BLC 3, Wind Load AZI 090
Envelope Only Solution

Infinigy	MT-196	Wind Load 090
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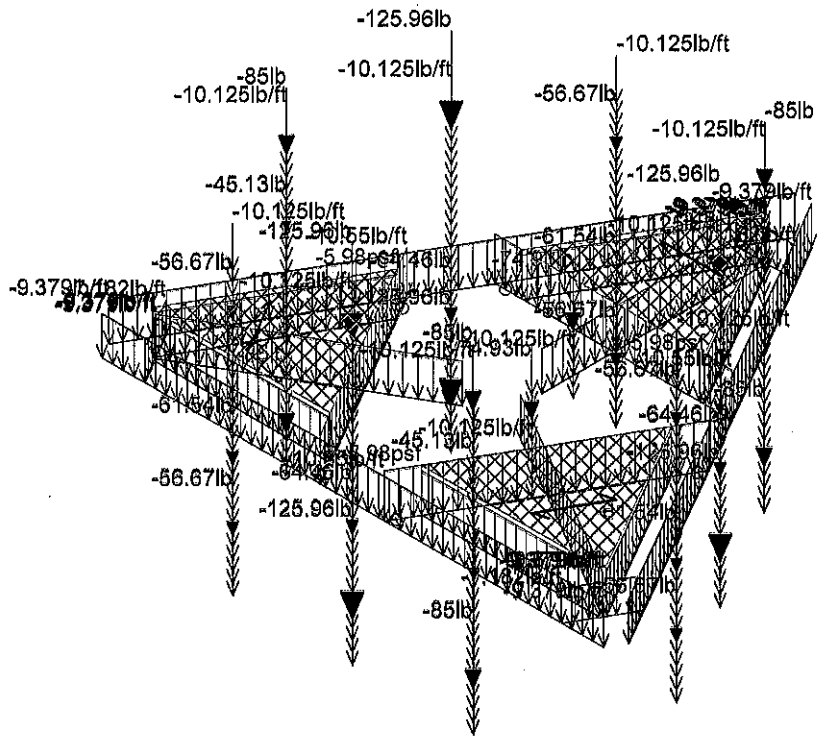

Loads: BLC 4, Ice Weight
Envelope Only Solution

Infinigy	MT-196	Ice Load
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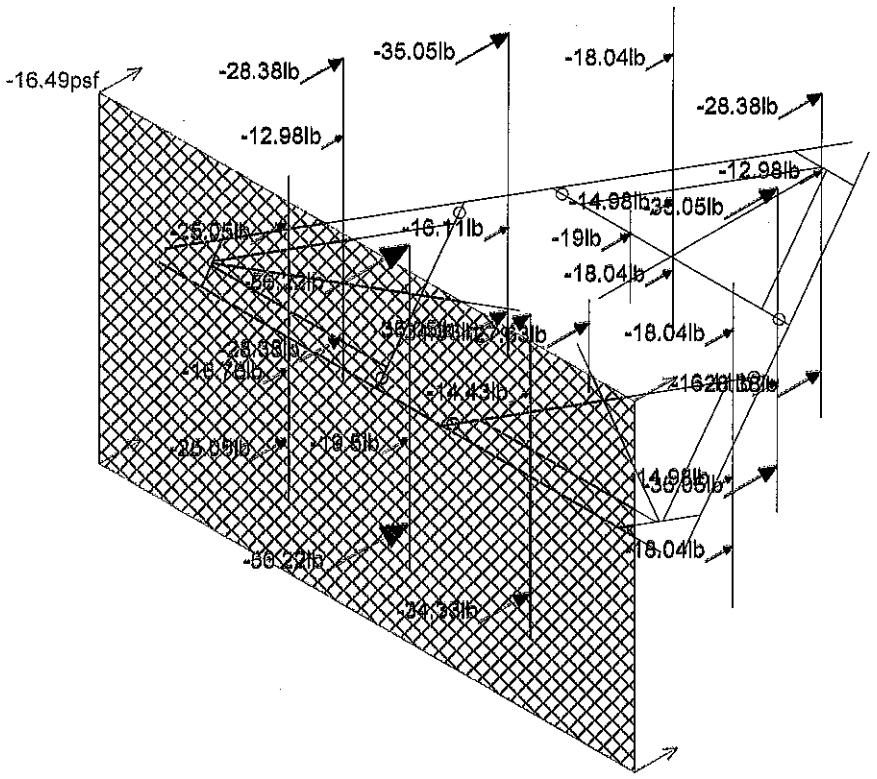

Loads: BLC 5, Wind + Ice Load AZI 000
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Infinigy	MT-196	Wind + Ice Load 000
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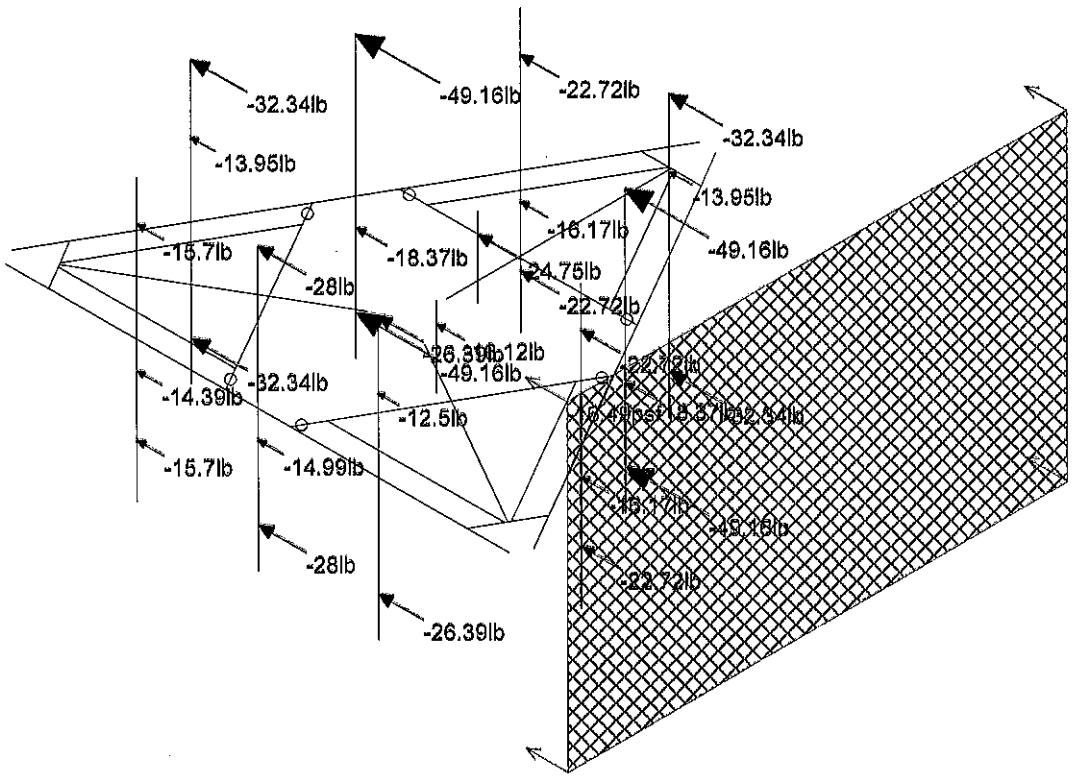
		876381_Commscope MT-196.r3d



Loads: BLC 6, Wind + Ice Load AZI 090
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Infinigy	MT-196	Wind + Ice Load 090
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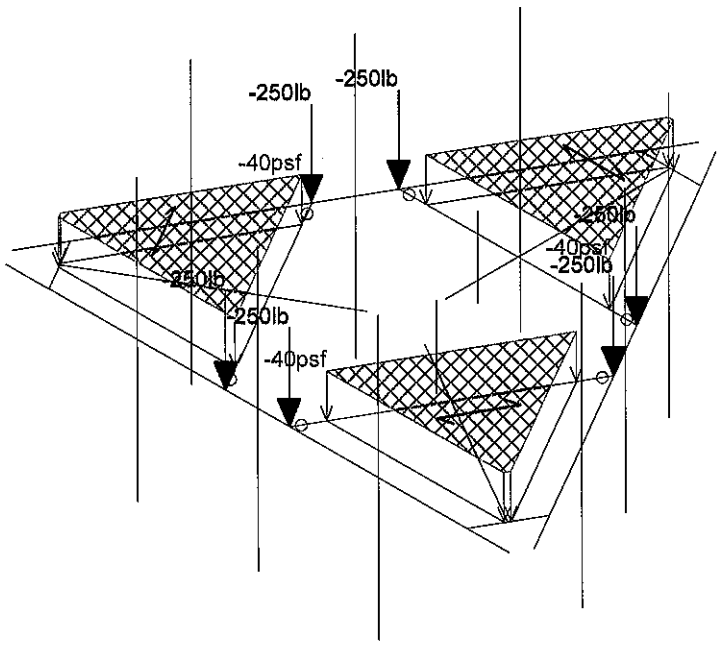

Loads: BLC 7, Service Live 1
Envelope Only Solution

Infinigy	MT-196	Service Load
AC		Dec 27, 2018 at 10:23 AM
		876381_Commscope MT-196.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	876381
Client:	Crown Castle
Carrier:	AT&T
Engineer:	CLK
Date:	12/27/2018

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INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-H
Antenna Load Standard:	TIA-222-H
Structure Risk Category:	II
Structure Type:	Mount - Platform
Number of Sectors:	3
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?: No

Wind Loading Inputs:

Design Wind Velocity:	130	mph (ultimate 3-second gust)
Wind Centerline 1 (z_1):	167.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
46.69	1.00	**56.03**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.91	1.00	**16.31**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (ultimate 3-second gust)
Base Ice Thickness:	1.28	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
CCI HPA65R-BUBA	167.0	3	1.00	Flat	Flat	46.69	7.85	366.58	259.06	285.94	339.70
Kathrein 80010965	167.0	3	1.00	Flat	Flat	46.69	13.81	645.02	272.38	365.54	551.86
Powerwave 7770.00	167.0	3	1.00	Flat	Flat	46.69	5.57	259.96	136.38	167.27	229.06
Ericsson RRUS 4449 B5/B12	167.0	3	1.00	Flat	Flat	46.69	1.97	91.87	65.75	72.28	85.34
Ericsson RRUS 8843 B2/B66A	167.0	3	1.00	Flat	Flat	46.69	1.64	76.78	63.45	66.78	73.44
Powerwave LGP21401	167.0	6	1.00	Flat	Flat	46.69	0.55	25.81	20.80	22.05	24.56
Raycap DC6-48-60-18-8F	167.0	2	1.00	Round	Round	46.69	1.21	56.58	56.58	56.58	56.58

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N5	N4			5"x0.22" Plate	Beam	None	A53 Gr.B	Typical
2	M2	N11	N15			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
3	M3	N10	N16			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
4	M4	N14	N13			Channel 3" x 1.5"	Beam	None	A53 Gr.B	Typical
5	M5	N3	N1			3" STD Pipe	Beam	None	A53 Gr.B	Typical
6	M6	N17	N16A			5"x0.22" Plate	Beam	None	A53 Gr.B	Typical
7	M7	N19	N23			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
8	M8	N18	N24			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
9	M9	N22	N21			Channel 3" x 1.5"	Beam	None	A53 Gr.B	Typical
10	M10	N15A	N13A			3" STD Pipe	Beam	None	A53 Gr.B	Typical
11	M11	N29	N28			5"x0.22" Plate	Beam	None	A53 Gr.B	Typical
12	M12	N31	N35			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
13	M13	N30	N36			L 2"x2"x3/16"	Beam	None	A53 Gr.B	Typical
14	M14	N34	N33			Channel 3" x 1.5"	Beam	None	A53 Gr.B	Typical
15	M15	N27	N25			3" STD Pipe	Beam	None	A53 Gr.B	Typical
16	M16	N36A	N35A			3" STD Pipe	Beam	None	A53 Gr.B	Typical
17	M17	N39	N38			3" STD Pipe	Beam	None	A53 Gr.B	Typical
18	M18	N42	N41			3" STD Pipe	Beam	None	A53 Gr.B	Typical
19	MP3	N55	N58			Mount Pipe	Beam	None	A53 Gr.B	Typical
20	MP1	N54	N57			Mount Pipe	Beam	None	A53 Gr.B	Typical
21	MP9	N65	N68			Mount Pipe	Beam	None	A53 Gr.B	Typical
22	MP8	N63	N66			Mount Pipe	Beam	None	A53 Gr.B	Typical
23	MP7	N64	N67			Mount Pipe	Beam	None	A53 Gr.B	Typical
24	MP6	N75	N78			Mount Pipe	Beam	None	A53 Gr.B	Typical
25	MP5	N73	N76			Mount Pipe	Beam	None	A53 Gr.B	Typical
26	MP4	N74	N77			Mount Pipe	Beam	None	A53 Gr.B	Typical
27	M43	N109A	N110A			Mount Pipe	Beam	None	A53 Gr.B	Typical
28	M44	N113	N114			Mount Pipe	Beam	None	A53 Gr.B	Typical
29	MP2	N82	N56			Mount Pipe	Beam	None	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A53 Gr.B	5"x0.22" Plate	3	54	0
3	A53 Gr.B	C3X5	3	212.5	0
4	A53 Gr.B	L2x2x3	6	317.2	0
5	A53 Gr.B	PIPE_2.0	11	804	.2
6	A53 Gr.B	PIPE_3.0	6	651.8	.4
7	Total HR Steel		29	2039.5	.8

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1			29		3	
2	Wind Load AZI 000	WLZ					29		1	
3	Wind Load AZI 090	WLX					29		1	
4	Ice Weight	OL1					29	29	3	
5	Wind + Ice Load AZI ...	OL2					29		1	
6	Wind + Ice Load AZI ...	OL3					29		1	
7	Service Live 1	LL				6			3	
8	BLC 1 Transient Area...	None						45		
9	BLC 2 Transient Area...	None						28		
10	BLC 3 Transient Area...	None						26		
11	BLC 4 Transient Area...	None						45		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
12	BLC 5 Transient Area...	None						28		
13	BLC 6 Transient Area...	None						26		
14	BLC 7 Transient Area...	None						45		

Load Combinations

	Description	So...	PDe...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Fa...	BLC	F.....	F.....	F.....	F.....	F.....	F...
1	1.4D	Yes	Y		DL	1.4													
2	1.2D + 1W AZI 000	Yes	Y		DL	1.2	WLZ	1											
3	1.2D + 1W AZI 030	Yes	Y		DL	1.2	WLZ	.866	WLX	.5									
4	1.2D + 1W AZI 060	Yes	Y		DL	1.2	WLZ	.5	WLX	.866									
5	1.2D + 1W AZI 090	Yes	Y		DL	1.2			WLX	1									
6	1.2D + 1W AZI 120	Yes	Y		DL	1.2	WLZ	-.5	WLX	.866									
7	1.2D + 1W AZI 150	Yes	Y		DL	1.2	WLZ	-.866	WLX	.5									
8	1.2D + 1W AZI 180	Yes	Y		DL	1.2	WLZ	-1											
9	1.2D + 1W AZI 210	Yes	Y		DL	1.2	WLZ	-.866	WLX	-.5									
10	1.2D + 1W AZI 240	Yes	Y		DL	1.2	WLZ	-.5	WLX	-.866									
11	1.2D + 1W AZI 270	Yes	Y		DL	1.2			WLX	-1									
12	1.2D + 1W AZI 300	Yes	Y		DL	1.2	WLZ	.5	WLX	-.866									
13	1.2D + 1W AZI 330	Yes	Y		DL	1.2	WLZ	.866	WLX	-.5									
14	0.9D + 1W AZI 000	Yes	Y		DL	.9	WLZ	1											
15	0.9D + 1W AZI 030	Yes	Y		DL	.9	WLZ	.866	WLX	.5									
16	0.9D + 1W AZI 060	Yes	Y		DL	.9	WLZ	.5	WLX	.866									
17	0.9D + 1W AZI 090	Yes	Y		DL	.9			WLX	1									
18	0.9D + 1W AZI 120	Yes	Y		DL	.9	WLZ	-.5	WLX	.866									
19	0.9D + 1W AZI 150	Yes	Y		DL	.9	WLZ	-.866	WLX	.5									
20	0.9D + 1W AZI 180	Yes	Y		DL	.9	WLZ	-1											
21	0.9D + 1W AZI 210	Yes	Y		DL	.9	WLZ	-.866	WLX	-.5									
22	0.9D + 1W AZI 240	Yes	Y		DL	.9	WLZ	-.5	WLX	-.866									
23	0.9D + 1W AZI 270	Yes	Y		DL	.9			WLX	-1									
24	0.9D + 1W AZI 300	Yes	Y		DL	.9	WLZ	.5	WLX	-.866									
25	0.9D + 1W AZI 330	Yes	Y		DL	.9	WLZ	.866	WLX	-.5									
26	1.2D + 1.0Dl	Yes	Y		DL	1.2	OL1	1											
27	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	1									
28	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5							
29	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866							
30	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1			OL3	1							
31	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866							
32	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5							
33	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-1									
34	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5							
35	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.8...							
36	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1			OL3	-1							
37	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.8...							
38	1.2D + 1.0Dl + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5							
39	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	.053									
40	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	.046	WLX	.027							
41	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	.027	WLX	.046							
42	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5			WLX	.053							
43	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.027	WLX	.046							
44	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.046	WLX	.027							
45	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.053									
46	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.046	WLX	-.0...							
47	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.027	WLX	-.0...							
48	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5			WLX	-.0...							
49	1.2D + 1.5L + 1.0W...	Yes	Y		DL	1.2	LL	1.5	WLZ	.027	WLX	-.0...							

Load Combinations (Continued)

	Description	So...	PDe...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Fa...	BLC	F.....	F.....	F.....	F.....	F.....	F...
50	1.2D + 1.5L + 1.0W..	Yes	Y		DL	1.2	LL	1.5	WLZ	.046	WLX	-.0..							

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N25	max	1491.871	17	2160.997	31	1754.254	14	-329.75	25	2116.601	3	-708.761	24
2		min	-1492.418	11	491.206	24	-1754.273	8	-2276.102	32	-2114.128	21	-3913.196	31
3	N1	max	1516.352	17	2301.216	35	1871.494	2	-324.255	15	2152.063	7	4027.586	36
4		min	-1516.376	11	529.515	16	-1870.349	20	-2339.21	33	-2152.408	25	671.795	17
5	N13A	max	2227.212	5	2301.249	27	1693.411	14	4643.065	27	2958.547	11	265.235	23
6		min	-2226.643	23	529.764	20	-1694.499	8	809.471	20	-2957.394	17	-272.161	17
7	Totals:	max	5235.283	17	6682.909	38	5318.978	14						
8		min	-5235.283	11	1949.587	14	-5318.978	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc.....		LC	phi*Pnc [lb]	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M5	PIPE_3.0	.811	67.25	35	.152	67.25		13	60323.871	65205	5748.75	5748.75	1	H1-1b
2	M10	PIPE_3.0	.811	67.25	27	.175	67.25		5	60323.871	65205	5748.75	5748.75	1	H1-1b
3	M15	PIPE_3.0	.789	67.25	31	.138	67.25		9	60323.871	65205	5748.75	5748.75	1	H1-1b
4	M14	C3X5	.693	35.414	31	.258	8.116	y	36	37646.831	46305	954.006	3921.4...	1	H1-1b
5	M9	C3X5	.692	35.414	28	.258	8.116	y	31	37646.831	46305	954.006	3921.4...	1	H1-1b
6	M4	C3X5	.690	35.414	28	.259	8.116	y	27	37646.831	46305	954.006	3921.4...	1	H1-1b
7	MP2	PIPE_2.0	.645	42	8	.047	42		8	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
8	MP5	PIPE_2.0	.557	42	5	.042	42		5	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
9	MP8	PIPE_2.0	.557	42	11	.042	42		11	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
10	M1	5"x0.22" ...	.539	8.25	9	.558	8.25	y	49	3093.743	34650	158.813	2425.9...	1...	H1-1b
11	M11	5"x0.22" ...	.528	8.25	5	.558	8.25	y	45	3093.743	34650	158.813	2468.5...	1...	H1-1b
12	M6	5"x0.22" ...	.524	8.25	13	.558	8.25	y	41	3093.743	34650	158.813	2507.8...	1...	H1-1b
13	MP1	PIPE_2.0	.433	42	8	.028	42		8	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
14	M12	L2x2x3	.430	52.871	5	.036	52....	y	47	8829.699	22743	542.224	1189.8...	2...	H2-1
15	M2	L2x2x3	.429	52.871	9	.036	52....	y	39	8829.699	22743	542.224	1191.5...	2...	H2-1
16	M7	L2x2x3	.424	52.871	13	.036	52....	y	43	8829.699	22743	542.224	1187.4...	2...	H2-1
17	MP4	PIPE_2.0	.406	42	5	.027	42		5	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
18	MP7	PIPE_2.0	.406	42	11	.027	42		11	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
19	M13	L2x2x3	.392	52.871	19	.036	52....	y	42	8829.699	22743	542.224	1204.8...	2...	H2-1
20	M3	L2x2x3	.391	52.871	23	.036	52....	y	46	8829.699	22743	542.224	1204.8...	2...	H2-1
21	M8	L2x2x3	.383	52.871	15	.036	52....	y	50	8829.699	22743	542.224	1204.8...	2...	H2-1
22	MP3	PIPE_2.0	.216	42	8	.026	42		8	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
23	M17	PIPE_3.0	.206	65.625	37	.073	75		5	58785.78	65205	5748.75	5748.75	1	H1-1b
24	M18	PIPE_3.0	.206	84.376	30	.066	14....		5	58785.78	65205	5748.75	5748.75	1	H1-1b
25	M16	PIPE_3.0	.205	84.376	33	.071	14....		8	58785.78	65205	5748.75	5748.75	1	H1-1b
26	MP9	PIPE_2.0	.197	42	11	.024	42		11	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
27	MP6	PIPE_2.0	.197	42	5	.024	42		5	17855.085	32130	1871.6...	1871.6...	1...	H1-1b
28	M43	PIPE_2.0	.038	6	2	.008	6		2	30625.434	32130	1871.6...	1871.6...	1...	H1-1b
29	M44	PIPE_2.0	.038	6	10	.008	6		10	30625.434	32130	1871.6...	1871.6...	1...	H1-1b

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	5"x0.22" Plate	5"x0.22" ...	Beam	None	A53 Gr.B	Typical	1.1	.004	2.292	.017
2	L 2"x2"x3/16"	L2x2x3	Beam	None	A53 Gr.B	Typical	.722	.271	.271	.009
3	3" STD Pipe	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
4	Channel 3" x 1.5"	C3X5	Beam	None	A53 Gr.B	Typical	1.47	.241	1.85	.043
5	Mount Pipe	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

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	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes				None
4	M4	BenPIN	BenPIN				Yes				None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes				None
8	M8						Yes				None
9	M9	BenPIN	BenPIN				Yes				None
10	M10						Yes				None
11	M11						Yes				None
12	M12						Yes				None
13	M13						Yes				None
14	M14	BenPIN	BenPIN				Yes				None
15	M15						Yes				None
16	M16						Yes				None
17	M17						Yes				None
18	M18						Yes				None
19	MP3						Yes				None
20	MP1						Yes				None
21	MP9						Yes				None
22	MP8						Yes				None
23	MP7						Yes				None
24	MP6						Yes				None
25	MP5						Yes				None
26	MP4						Yes				None
27	M43						Yes				None
28	M44						Yes				None
29	MP2						Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	5"x0.22" Pla..	18			Lbyy						Lateral
2	M2	L 2"x2"x3/16"	52.871			Lbyy						Lateral
3	M3	L 2"x2"x3/16"	52.871			Lbyy						Lateral
4	M4	Channel 3" ...	70.828	25.75	25.75	27.25	27.25	25.75				Lateral
5	M5	3" STD Pipe	67.25	45.75	45.75	45.75	45.75	45.75				Lateral
6	M6	5"x0.22" Pla..	18			Lbyy						Lateral
7	M7	L 2"x2"x3/16"	52.871			Lbyy						Lateral
8	M8	L 2"x2"x3/16"	52.871			Lbyy						Lateral
9	M9	Channel 3" ...	70.828	25.75	25.75	27.25	27.25	25.75				Lateral
10	M10	3" STD Pipe	67.25	45.75	45.75	45.75	45.75	45.75				Lateral
11	M11	5"x0.22" Pla..	18			Lbyy						Lateral
12	M12	L 2"x2"x3/16"	52.871			Lbyy						Lateral
13	M13	L 2"x2"x3/16"	52.871			Lbyy						Lateral
14	M14	Channel 3" ...	70.828	25.75	25.75	27.25	27.25	25.75				Lateral
15	M15	3" STD Pipe	67.25	45.75	45.75	45.75	45.75	45.75				Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
16	M16	3" STD Pipe	150.001	52.8	52.8	52.8	52.8	52.8				Lateral
17	M17	3" STD Pipe	150.001	52.8	52.8	52.8	52.8	52.8				Lateral
18	M18	3" STD Pipe	150.001	52.8	52.8	52.8	52.8	52.8				Lateral
19	MP3	Mount Pipe	84			Lbyy						Lateral
20	MP1	Mount Pipe	84			Lbyy						Lateral
21	MP9	Mount Pipe	84			Lbyy						Lateral
22	MP8	Mount Pipe	84			Lbyy						Lateral
23	MP7	Mount Pipe	84			Lbyy						Lateral
24	MP6	Mount Pipe	84			Lbyy						Lateral
25	MP5	Mount Pipe	84			Lbyy						Lateral
26	MP4	Mount Pipe	84			Lbyy						Lateral
27	M43	Mount Pipe	24			Lbyy						Lateral
28	M44	Mount Pipe	24			Lbyy						Lateral
29	MP2	Mount Pipe	84			Lbyy						Lateral

Joint Loads and Enforced Displacements (BLC 7 : Service Live 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2,..
1	N33	L	Y	-250
2	N34	L	Y	-250
3	N21	L	Y	-250
4	N22	L	Y	-250
5	N13	L	Y	-250
6	N14	L	Y	-250

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-20.96	0
2	MP2	Y	-48.8	0
3	MP3	Y	-17.5	12
4	MP2	Y	-71	50
5	MP3	Y	-71.9	50
6	MP1	Y	-32	20
7	M44	Y	-32.8	18
8	MP1	Y	-20.96	72
9	MP2	Y	-48.8	72
10	MP3	Y	-17.5	68
11	MP4	Y	-20.96	0
12	MP5	Y	-48.8	0
13	MP6	Y	-17.5	12
14	MP5	Y	-71	50
15	MP6	Y	-71.9	50
16	MP4	Y	-32	20
17	M43	Y	-32.8	18
18	MP4	Y	-20.96	72
19	MP5	Y	-48.8	72
20	MP6	Y	-17.5	68
21	MP7	Y	-20.96	0
22	MP8	Y	-48.8	0
23	MP9	Y	-17.5	12
24	MP8	Y	-71	50
25	MP9	Y	-71.9	50
26	MP7	Y	-32	20
27	MP7	Y	-20.96	72
28	MP8	Y	-48.8	72

Member Point Loads (BLC 1 : Self Weight) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
29	MP9	Y	-17.5	68

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-183.29	0
2	MP2	Z	-322.51	0
3	MP3	Z	-129.98	12
4	MP2	Z	-91.87	50
5	MP3	Z	-76.78	50
6	MP1	Z	-51.62	20
7	M44	Z	-56.58	18
8	MP1	Z	-183.29	72
9	MP2	Z	-322.51	72
10	MP3	Z	-129.98	68
11	MP4	Z	-142.97	0
12	MP5	Z	-182.77	0
13	MP6	Z	-83.64	12
14	MP5	Z	-72.28	50
15	MP6	Z	-66.78	50
16	MP4	Z	-44.11	20
17	M43	Z	-56.58	18
18	MP4	Z	-142.97	72
19	MP5	Z	-182.77	72
20	MP6	Z	-83.64	68
21	MP7	Z	-142.97	0
22	MP8	Z	-182.77	0
23	MP9	Z	-83.64	12
24	MP8	Z	-72.28	50
25	MP9	Z	-66.78	50
26	MP7	Z	-44.11	20
27	MP7	Z	-142.97	72
28	MP8	Z	-182.77	72
29	MP9	Z	-83.64	68

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-129.53	0
2	MP2	X	-136.19	0
3	MP3	X	-68.19	12
4	MP2	X	-65.75	50
5	MP3	X	-63.45	50
6	MP1	X	-41.6	20
7	M44	X	-56.58	18
8	MP1	X	-129.53	72
9	MP2	X	-136.19	72
10	MP3	X	-68.19	68
11	MP4	X	-169.85	0
12	MP5	X	-275.93	0
13	MP6	X	-114.53	12
14	MP5	X	-85.34	50
15	MP6	X	-73.44	50
16	MP4	X	-49.12	20
17	M43	X	-56.58	18
18	MP4	X	-169.85	72
19	MP5	X	-275.93	72
20	MP6	X	-114.53	68

Member Point Loads (BLC 3 : Wind Load AZI 090) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
21	MP7	X	-169.85	0
22	MP8	X	-275.93	0
23	MP9	X	-114.53	12
24	MP8	X	-85.34	50
25	MP9	X	-73.44	50
26	MP7	X	-49.12	20
27	MP7	X	-169.85	72
28	MP8	X	-275.93	72
29	MP9	X	-114.53	68

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-85	0
2	MP2	Y	-125.96	0
3	MP3	Y	-56.67	12
4	MP2	Y	-64.46	50
5	MP3	Y	-61.54	50
6	MP1	Y	-45.13	20
7	M44	Y	-74.93	18
8	MP1	Y	-85	72
9	MP2	Y	-125.96	72
10	MP3	Y	-56.67	68
11	MP4	Y	-85	0
12	MP5	Y	-125.96	0
13	MP6	Y	-56.67	12
14	MP5	Y	-64.46	50
15	MP6	Y	-61.54	50
16	MP4	Y	-45.13	20
17	M43	Y	-74.93	18
18	MP4	Y	-85	72
19	MP5	Y	-125.96	72
20	MP6	Y	-56.67	68
21	MP7	Y	-85	0
22	MP8	Y	-125.96	0
23	MP9	Y	-56.67	12
24	MP8	Y	-64.46	50
25	MP9	Y	-61.54	50
26	MP7	Y	-45.13	20
27	MP7	Y	-85	72
28	MP8	Y	-125.96	72
29	MP9	Y	-56.67	68

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-34.33	0
2	MP2	Z	-56.22	0
3	MP3	Z	-25.05	12
4	MP2	Z	-19.5	50
5	MP3	Z	-16.76	50
6	MP1	Z	-14.43	20
7	M44	Z	-27.63	18
8	MP1	Z	-34.33	72
9	MP2	Z	-56.22	72
10	MP3	Z	-25.05	68
11	MP4	Z	-28.38	0
12	MP5	Z	-35.05	0

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
13	MP6	Z	-18.04	12
14	MP5	Z	-16.11	50
15	MP6	Z	-14.98	50
16	MP4	Z	-12.98	20
17	M43	Z	-19	18
18	MP4	Z	-28.38	72
19	MP5	Z	-35.05	72
20	MP6	Z	-18.04	68
21	MP7	Z	-28.38	0
22	MP8	Z	-35.05	0
23	MP9	Z	-18.04	12
24	MP8	Z	-16.11	50
25	MP9	Z	-14.98	50
26	MP7	Z	-12.98	20
27	MP7	Z	-28.38	72
28	MP8	Z	-35.05	72
29	MP9	Z	-18.04	68

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-26.39	0
2	MP2	X	-28	0
3	MP3	X	-15.7	12
4	MP2	X	-14.99	50
5	MP3	X	-14.39	50
6	MP1	X	-12.5	20
7	M44	X	-16.12	18
8	MP1	X	-26.39	72
9	MP2	X	-28	72
10	MP3	X	-15.7	68
11	MP4	X	-32.34	0
12	MP5	X	-49.16	0
13	MP6	X	-22.72	12
14	MP5	X	-18.37	50
15	MP6	X	-16.17	50
16	MP4	X	-13.95	20
17	M43	X	-24.75	18
18	MP4	X	-32.34	72
19	MP5	X	-49.16	72
20	MP6	X	-22.72	68
21	MP7	X	-32.34	0
22	MP8	X	-49.16	0
23	MP9	X	-22.72	12
24	MP8	X	-18.37	50
25	MP9	X	-16.17	50
26	MP7	X	-13.95	20
27	MP7	X	-32.34	72
28	MP8	X	-49.16	72
29	MP9	X	-22.72	68

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M1	Y	-7.182	-7.182	0	%100
2	M2	Y	-9.379	-9.379	0	%100
3	M3	Y	-9.379	-9.379	0	%100

Member Distributed Loads (BLC 4 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
4	M4	Y	-10.55	-10.55	0	%100
5	M5	Y	-9.379	-9.379	0	%100
6	M6	Y	-7.182	-7.182	0	%100
7	M7	Y	-9.379	-9.379	0	%100
8	M8	Y	-9.379	-9.379	0	%100
9	M9	Y	-10.55	-10.55	0	%100
10	M10	Y	-9.379	-9.379	0	%100
11	M11	Y	-7.182	-7.182	0	%100
12	M12	Y	-9.379	-9.379	0	%100
13	M13	Y	-9.379	-9.379	0	%100
14	M14	Y	-10.55	-10.55	0	%100
15	M15	Y	-9.379	-9.379	0	%100
16	M16	Y	-9.379	-9.379	0	%100
17	M17	Y	-9.379	-9.379	0	%100
18	M18	Y	-9.379	-9.379	0	%100
19	MP3	Y	-10.125	-10.125	0	%100
20	MP1	Y	-10.125	-10.125	0	%100
21	MP9	Y	-10.125	-10.125	0	%100
22	MP8	Y	-10.125	-10.125	0	%100
23	MP7	Y	-10.125	-10.125	0	%100
24	MP6	Y	-10.125	-10.125	0	%100
25	MP5	Y	-10.125	-10.125	0	%100
26	MP4	Y	-10.125	-10.125	0	%100
27	M43	Y	-10.125	-10.125	0	%100
28	M44	Y	-10.125	-10.125	0	%100
29	MP2	Y	-10.125	-10.125	0	%100

Member Distributed Loads (BLC 8 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M2	Y	-.103	-2.432	0	10.574
2	M2	Y	-2.432	-4.783	10.574	21.148
3	M2	Y	-4.783	-6.442	21.148	31.722
4	M2	Y	-6.442	-7.045	31.722	42.297
5	M2	Y	-7.045	-7.254	42.297	52.871
6	M3	Y	-.103	-2.432	0	10.574
7	M3	Y	-2.432	-4.779	10.574	21.148
8	M3	Y	-4.779	-6.437	21.148	31.722
9	M3	Y	-6.437	-7.043	31.722	42.297
10	M3	Y	-7.043	-7.256	42.297	52.871
11	M5	Y	-2.063	-4.889	0	10.76
12	M5	Y	-4.889	-11.716	10.76	21.52
13	M5	Y	-11.716	-21.044	21.52	32.28
14	M5	Y	-21.044	-12.549	32.28	43.04
15	M5	Y	-12.549	-.141	43.04	53.8
16	M7	Y	-.103	-2.432	0	10.574
17	M7	Y	-2.432	-4.783	10.574	21.148
18	M7	Y	-4.783	-6.442	21.148	31.722
19	M7	Y	-6.442	-7.045	31.722	42.297
20	M7	Y	-7.045	-7.254	42.297	52.871
21	M8	Y	-.103	-2.432	0	10.574
22	M8	Y	-2.432	-4.775	10.574	21.148
23	M8	Y	-4.775	-6.431	21.148	31.722
24	M8	Y	-6.431	-7.042	31.722	42.297
25	M8	Y	-7.042	-7.257	42.297	52.871
26	M10	Y	-2.063	-4.889	0	10.76
27	M10	Y	-4.889	-11.72	10.76	21.52

Member Distributed Loads (BLC 8 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
28	M10	Y	-11.72	-21.049	21.52	32.28
29	M10	Y	-21.049	-12.55	32.28	43.04
30	M10	Y	-12.55	-.141	43.04	53.8
31	M12	Y	-.103	-2.432	0	10.574
32	M12	Y	-2.432	-4.783	10.574	21.148
33	M12	Y	-4.783	-6.442	21.148	31.722
34	M12	Y	-6.442	-7.045	31.722	42.297
35	M12	Y	-7.045	-7.254	42.297	52.871
36	M13	Y	-.103	-2.432	0	10.574
37	M13	Y	-2.432	-4.775	10.574	21.148
38	M13	Y	-4.775	-6.431	21.148	31.722
39	M13	Y	-6.431	-7.042	31.722	42.297
40	M13	Y	-7.042	-7.257	42.297	52.871
41	M15	Y	-2.063	-4.889	0	10.76
42	M15	Y	-4.889	-11.72	10.76	21.52
43	M15	Y	-11.72	-21.049	21.52	32.28
44	M15	Y	-21.049	-12.55	32.28	43.04
45	M15	Y	-12.55	-.141	43.04	53.8

Member Distributed Loads (BLC 9 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M1	Z	-11.673	-11.673	0	18
2	M2	Z	-9.338	-9.338	0	52.871
3	M3	Z	-4.658	-4.658	0	52.871
4	M4	Z	-7.004	-7.004	0	70.828
5	M5	Z	-14.153	-14.153	0	67.25
6	M6	Z	-23.346	-23.346	0	18
7	M7	Z	-4.681	-4.681	0	52.871
8	M8	Z	-4.681	-4.681	0	52.871
9	M9	Z	-14.007	-14.007	0	70.828
10	M11	Z	-11.673	-11.673	0	18
11	M12	Z	-4.658	-4.658	0	52.871
12	M13	Z	-9.338	-9.338	0	52.871
13	M14	Z	-7.004	-7.004	0	70.828
14	M15	Z	-14.153	-14.153	0	67.25
15	M16	Z	-16.342	-16.342	0	150.001
16	M17	Z	-8.171	-8.171	0	150.001
17	M18	Z	-8.171	-8.171	0	150.001
18	MP3	Z	-11.089	-11.089	0	84
19	MP1	Z	-11.089	-11.089	0	84
20	MP9	Z	-11.089	-11.089	0	84
21	MP8	Z	-11.089	-11.089	0	84
22	MP7	Z	-11.089	-11.089	0	84
23	MP6	Z	-11.089	-11.089	0	84
24	MP5	Z	-11.089	-11.089	0	84
25	MP4	Z	-11.089	-11.089	0	84
26	M43	Z	-11.089	-11.089	0	24
27	M44	Z	-11.089	-11.089	0	24
28	MP2	Z	-11.089	-11.089	0	84

Member Distributed Loads (BLC 10 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M1	X	-20.218	-20.218	0	18
2	M2	X	-.013	-.013	0	52.871
3	M3	X	-8.094	-8.094	0	52.871
4	M4	X	-12.131	-12.131	0	70.828

Member Distributed Loads (BLC 10 : BLC 3 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
5	M5	X	-8.171	-8.171	0	67.25
6	M7	X	-8.081	-8.081	0	52.871
7	M8	X	-8.081	-8.081	0	52.871
8	M10	X	-16.342	-16.342	0	67.25
9	M11	X	-20.218	-20.218	0	18
10	M12	X	-8.094	-8.094	0	52.871
11	M13	X	-.013	-.013	0	52.871
12	M14	X	-12.131	-12.131	0	70.828
13	M15	X	-8.171	-8.171	0	67.25
14	M17	X	-14.153	-14.153	0	150.001
15	M18	X	-14.153	-14.153	0	150.001
16	MP3	X	-11.089	-11.089	0	84
17	MP1	X	-11.089	-11.089	0	84
18	MP9	X	-11.089	-11.089	0	84
19	MP8	X	-11.089	-11.089	0	84
20	MP7	X	-11.089	-11.089	0	84
21	MP6	X	-11.089	-11.089	0	84
22	MP5	X	-11.089	-11.089	0	84
23	MP4	X	-11.089	-11.089	0	84
24	M43	X	-11.089	-11.089	0	24
25	M44	X	-11.089	-11.089	0	24
26	MP2	X	-11.089	-11.089	0	84

Member Distributed Loads (BLC 11 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M2	Y	-.062	-1.454	0	10.574
2	M2	Y	-1.454	-2.86	10.574	21.148
3	M2	Y	-2.86	-3.853	21.148	31.722
4	M2	Y	-3.853	-4.213	31.722	42.297
5	M2	Y	-4.213	-4.338	42.297	52.871
6	M3	Y	-.062	-1.454	0	10.574
7	M3	Y	-1.454	-2.858	10.574	21.148
8	M3	Y	-2.858	-3.849	21.148	31.722
9	M3	Y	-3.849	-4.212	31.722	42.297
10	M3	Y	-4.212	-4.339	42.297	52.871
11	M5	Y	-1.234	-2.924	0	10.76
12	M5	Y	-2.924	-7.006	10.76	21.52
13	M5	Y	-7.006	-12.584	21.52	32.28
14	M5	Y	-12.584	-7.504	32.28	43.04
15	M5	Y	-7.504	-.084	43.04	53.8
16	M7	Y	-.062	-1.454	0	10.574
17	M7	Y	-1.454	-2.86	10.574	21.148
18	M7	Y	-2.86	-3.853	21.148	31.722
19	M7	Y	-3.853	-4.213	31.722	42.297
20	M7	Y	-4.213	-4.338	42.297	52.871
21	M8	Y	-.062	-1.454	0	10.574
22	M8	Y	-1.454	-2.855	10.574	21.148
23	M8	Y	-2.855	-3.846	21.148	31.722
24	M8	Y	-3.846	-4.211	31.722	42.297
25	M8	Y	-4.211	-4.339	42.297	52.871
26	M10	Y	-1.234	-2.924	0	10.76
27	M10	Y	-2.924	-7.009	10.76	21.52
28	M10	Y	-7.009	-12.587	21.52	32.28
29	M10	Y	-12.587	-7.505	32.28	43.04
30	M10	Y	-7.505	-.084	43.04	53.8
31	M12	Y	-.062	-1.454	0	10.574

Member Distributed Loads (BLC 11 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
32	M12	Y	-1.454	-2.86	10.574	21.148
33	M12	Y	-2.86	-3.853	21.148	31.722
34	M12	Y	-3.853	-4.213	31.722	42.297
35	M12	Y	-4.213	-4.338	42.297	52.871
36	M13	Y	-.062	-1.454	0	10.574
37	M13	Y	-1.454	-2.855	10.574	21.148
38	M13	Y	-2.855	-3.846	21.148	31.722
39	M13	Y	-3.846	-4.211	31.722	42.297
40	M13	Y	-4.211	-4.339	42.297	52.871
41	M15	Y	-1.234	-2.924	0	10.76
42	M15	Y	-2.924	-7.009	10.76	21.52
43	M15	Y	-7.009	-12.587	21.52	32.28
44	M15	Y	-12.587	-7.505	32.28	43.04
45	M15	Y	-7.505	-.084	43.04	53.8

Member Distributed Loads (BLC 12 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M1	Z	-3.435	-3.435	0	18
2	M2	Z	-2.748	-2.748	0	52.871
3	M3	Z	-1.371	-1.371	0	52.871
4	M4	Z	-2.061	-2.061	0	70.828
5	M5	Z	-4.165	-4.165	0	67.25
6	M6	Z	-6.871	-6.871	0	18
7	M7	Z	-1.378	-1.378	0	52.871
8	M8	Z	-1.378	-1.378	0	52.871
9	M9	Z	-4.122	-4.122	0	70.828
10	M11	Z	-3.435	-3.435	0	18
11	M12	Z	-1.371	-1.371	0	52.871
12	M13	Z	-2.748	-2.748	0	52.871
13	M14	Z	-2.061	-2.061	0	70.828
14	M15	Z	-4.165	-4.165	0	67.25
15	M16	Z	-4.81	-4.81	0	150.001
16	M17	Z	-2.405	-2.405	0	150.001
17	M18	Z	-2.405	-2.405	0	150.001
18	MP3	Z	-3.264	-3.264	0	84
19	MP1	Z	-3.264	-3.264	0	84
20	MP9	Z	-3.264	-3.264	0	84
21	MP8	Z	-3.264	-3.264	0	84
22	MP7	Z	-3.264	-3.264	0	84
23	MP6	Z	-3.264	-3.264	0	84
24	MP5	Z	-3.264	-3.264	0	84
25	MP4	Z	-3.264	-3.264	0	84
26	M43	Z	-3.264	-3.264	0	24
27	M44	Z	-3.264	-3.264	0	24
28	MP2	Z	-3.264	-3.264	0	84

Member Distributed Loads (BLC 13 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M1	X	-5.95	-5.95	0	18
2	M2	X	-.004	-.004	0	52.871
3	M3	X	-2.382	-2.382	0	52.871
4	M4	X	-3.57	-3.57	0	70.828
5	M5	X	-2.405	-2.405	0	67.25
6	M7	X	-2.378	-2.378	0	52.871
7	M8	X	-2.378	-2.378	0	52.871
8	M10	X	-4.81	-4.81	0	67.25

Member Distributed Loads (BLC 13 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
9	M11	X	-5.95	-5.95	0	18
10	M12	X	-2.382	-2.382	0	52.871
11	M13	X	-.004	-.004	0	52.871
12	M14	X	-3.57	-3.57	0	70.828
13	M15	X	-2.405	-2.405	0	67.25
14	M17	X	-4.165	-4.165	0	150.001
15	M18	X	-4.165	-4.165	0	150.001
16	MP3	X	-3.264	-3.264	0	84
17	MP1	X	-3.264	-3.264	0	84
18	MP9	X	-3.264	-3.264	0	84
19	MP8	X	-3.264	-3.264	0	84
20	MP7	X	-3.264	-3.264	0	84
21	MP6	X	-3.264	-3.264	0	84
22	MP5	X	-3.264	-3.264	0	84
23	MP4	X	-3.264	-3.264	0	84
24	M43	X	-3.264	-3.264	0	24
25	M44	X	-3.264	-3.264	0	24
26	MP2	X	-3.264	-3.264	0	84

Member Distributed Loads (BLC 14 : BLC 7 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...	End Location[in,%]
1	M2	Y	-.414	-9.729	0	10.574
2	M2	Y	-9.729	-19.133	10.574	21.148
3	M2	Y	-19.133	-25.77	21.148	31.722
4	M2	Y	-25.77	-28.179	31.722	42.297
5	M2	Y	-28.179	-29.018	42.297	52.871
6	M3	Y	-.413	-9.728	0	10.574
7	M3	Y	-9.728	-19.117	10.574	21.148
8	M3	Y	-19.117	-25.747	21.148	31.722
9	M3	Y	-25.747	-28.171	31.722	42.297
10	M3	Y	-28.171	-29.023	42.297	52.871
11	M5	Y	-8.254	-19.556	0	10.76
12	M5	Y	-19.556	-46.864	10.76	21.52
13	M5	Y	-46.864	-84.174	21.52	32.28
14	M5	Y	-84.174	-50.197	32.28	43.04
15	M5	Y	-50.197	-.565	43.04	53.8
16	M7	Y	-.414	-9.729	0	10.574
17	M7	Y	-9.729	-19.133	10.574	21.148
18	M7	Y	-19.133	-25.77	21.148	31.722
19	M7	Y	-25.77	-28.179	31.722	42.297
20	M7	Y	-28.179	-29.018	42.297	52.871
21	M8	Y	-.413	-9.728	0	10.574
22	M8	Y	-9.728	-19.098	10.574	21.148
23	M8	Y	-19.098	-25.725	21.148	31.722
24	M8	Y	-25.725	-28.168	31.722	42.297
25	M8	Y	-28.168	-29.026	42.297	52.871
26	M10	Y	-8.254	-19.556	0	10.76
27	M10	Y	-19.556	-46.88	10.76	21.52
28	M10	Y	-46.88	-84.195	21.52	32.28
29	M10	Y	-84.195	-50.202	32.28	43.04
30	M10	Y	-50.202	-.565	43.04	53.8
31	M12	Y	-.414	-9.729	0	10.574
32	M12	Y	-9.729	-19.133	10.574	21.148
33	M12	Y	-19.133	-25.77	21.148	31.722
34	M12	Y	-25.77	-28.179	31.722	42.297
35	M12	Y	-28.179	-29.018	42.297	52.871

Member Distributed Loads (BLC 14 : BLC 7 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in,...]	End Location[in,%]
36	M13	Y	-.413	-9.728	0	10.574
37	M13	Y	-9.728	-19.098	10.574	21.148
38	M13	Y	-19.098	-25.725	21.148	31.722
39	M13	Y	-25.725	-28.168	31.722	42.297
40	M13	Y	-28.168	-29.026	42.297	52.871
41	M15	Y	-8.254	-19.556	0	10.76
42	M15	Y	-19.556	-46.88	10.76	21.52
43	M15	Y	-46.88	-84.195	21.52	32.28
44	M15	Y	-84.195	-50.202	32.28	43.04
45	M15	Y	-50.202	-.565	43.04	53.8

Member Area Loads (BLC 1 : Self Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N15	N16	N10	N11	Y	A-B	-10
2	N23	N24	N18	N19	Y	A-B	-10
3	N35	N36	N30	N31	Y	A-B	-10

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N45	N48	N47	N44	Z	Open Structure	-56.03

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N44	N47	N49	N46	X	Open Structure	-56.03

Member Area Loads (BLC 4 : Ice Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N15	N16	N10	N11	Y	A-B	-5.98
2	N23	N24	N18	N19	Y	A-B	-5.98
3	N35	N36	N30	N31	Y	A-B	-5.98

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N45	N48	N47	N44	Z	Open Structure	-16.49

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N44	N47	N49	N46	X	Open Structure	-16.49

Member Area Loads (BLC 7 : Service Live 1)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N15	N16	N10	N11	Y	A-B	-40
2	N23	N24	N18	N19	Y	A-B	-40
3	N35	N36	N30	N31	Y	A-B	-40

APPENDIX D

ADDITIONAL CALCUATIONS

Date:	12/27/2018
Client	Crown Castle
Carrier	AT&T
Engineer:	CLK
Site:	876381
Job #:	1039-A0002-B

Code:	LRFD	
Axial:	2301.00	lbs
Shear:	2226.00	lbs

Bolt Capacity (1/2" A307 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	8226.7	6170.0	2	12340
Shear(lb)	5133.3	3850.0	2	7700

Interaction Check	
$T/\phi T_n$	18.6%
$V/\phi Vn$	28.9%
≤1.0	11.8%
	OK

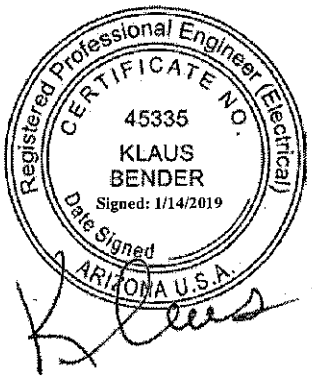
RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of AT&T Mobility, LLC

Site: WARD
Crown Castle Site ID: 876381
App ID: 471550
2365 Long Hill Rd
GUILFORD, CT
1/11/2019

Report Status:

AT&T Mobility, LLC Is Compliant



Klaus Bender
Registered Professional Engineer (Electrical)
Expires December 31, 2021

Prepared By:

Sitesafe, LLC

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

My signature on the cover of this document indicates:

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

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

That I am an employee of Sitesafe, LLC in 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 Radiofrequency Electromagnetic Fields; and

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

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

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

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

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

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

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

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is no more than 0.960% of the maximum in any accessible area on the ground and

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

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 2.378% of the maximum in any accessible area up to two meters above the ground per OET-65; and

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

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

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

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

AT&T Mobility, LLC
WARD
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.228 %
AT&T Mobility, LLC	0.273 %
AT&T Mobility, LLC (Proposed)	0.284 %
AT&T Mobility, LLC (Proposed)	0.175 %
Sprint	0.124 %
Sprint	0.094 %
T-Mobile	0.102 %
T-Mobile	0.069 %
Verizon Wireless	0.297 %
Verizon Wireless	0.286 %
Verizon Wireless	0.198 %
Verizon Wireless	0.249 %
Composite Site MPE:	2.378 %

AT&T Mobility, LLC
WARD
Carrier Summary

Frequency:	1930	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.2786	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.22786	%

					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	167	30	4679	0.884597	0.08846	1.851265	0.185127
Powerwave	7770	167	160	4679	0.884597	0.08846	1.851265	0.185127
Powerwave	7770	167	270	4679	0.884597	0.08846	1.851265	0.185126

AT&T Mobility, LLC
WARD
Carrier Summary

Frequency:	869	MHz
Maximum Permissible Exposure (MPE):	579.33	µW/cm^2
Maximum power density at ground level:	1.57989	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.27271	%

					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	167	30	2188	0.738942	0.12755	1.15331	0.199075
Powerwave	7770	167	160	2188	0.739884	0.127713	1.15331	0.199075
Powerwave	7770	167	280	2188	0.739884	0.127713	1.15331	0.199075

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

Frequency:	2110	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.8435	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.28435	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Kathrein-Scala	800-10965	167	30	7114	1.075619	0.107562	2.603683	0.260368
Kathrein-Scala	800-10965	167	160	7114	1.075619	0.107562	2.603683	0.260368
Kathrein-Scala	800-10965	167	270	7114	1.10232	0.110232	2.603683	0.260368

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

Frequency:	734	MHz
Maximum Permissible Exposure (MPE):	489.33	µW/cm^2
Maximum power density at ground level:	0.85392	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.17451	%

					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-BU6A	167	30	2819	0.75632	0.154561	0.789045	0.161249
CCI Antennas	HPA65R-BU6A	167	150	2819	0.75305	0.153893	0.789045	0.161249
CCI Antennas	HPA65R-BU6A	167	270	2819	0.75632	0.154561	0.789044	0.161249

Sprint
WARD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.23664	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.12366	%

					On Axis		Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density (µW/cm^2)	Percent of MPE	Max Power Density (µW/cm^2)	Percent of MPE
RFS	APXVSPP18-C-A20	178	20	3804	0.593085	0.059309	1.058281	0.105828
RFS	APXVSPP18-C-A20	178	160	3804	0.595433	0.059543	1.058281	0.105828
RFS	APXVSPP18-C-A20	178	270	3804	0.593085	0.059309	1.058281	0.105828

Sprint
WARD
Carrier Summary

Frequency:	862	MHz
Maximum Permissible Exposure (MPE):	574.67	µW/cm^2
Maximum power density at ground level:	0.54051	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.09406	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	178	20	2168	0.481202	0.083736	0.493332	0.085847
RFS	APXVSPP18-C-A20	178	160	2168	0.482799	0.084014	0.493332	0.085847
RFS	APXVSPP18-C-A20	178	270	2168	0.481202	0.083736	0.493332	0.085847

T-Mobile
WARD
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.01752	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.10175	%

					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**
Ericsson	AIR21 B4A B12-B5P	155	30	1637	0.532074	0.053207	0.95767	0.095767
Ericsson	AIR21 B4A B12-B5P	155	150	1637	0.535945	0.053595	0.95767	0.095767
Ericsson	AIR21 B4A B12-B5P	155	270	1637	0.532074	0.053207	0.95767	0.095767

T-Mobile
WARD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.69224	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.06922	%

					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
Ericsson	AIR 21 B2A B4P	155	30	2061	0.413073	0.041307	0.472048	0.047205
Ericsson	AIR 21 B2A B4P	155	150	2061	0.413221	0.041322	0.472048	0.047205
Ericsson	AIR 21 B2A B4P	155	270	2061	0.413073	0.041307	0.472048	0.047205

Verizon Wireless
WARD
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.68089	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.29663	%

					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	148	20	4509	1.645549	0.290391	1.676958	0.295934
Antel	BXA-70063-6CF	148	140	4509	1.645661	0.290411	1.676958	0.295934
Antel	BXA-70063-6CF	148	270	4509	1.645549	0.290391	1.676958	0.295934

Verizon Wireless
WARD
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.86207	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.28621	%

					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	148	20	5877	1.354887	0.135489	2.777287	0.277729
Antel	BXA-171063-12CF	148	140	5877	1.354887	0.135489	2.777288	0.277729
Antel	BXA-171063-12CF	148	270	5877	1.354887	0.135489	2.777288	0.277729

Verizon Wireless
WARD
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	0.9933	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.1984	%

					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	148	20	2010	0.765857	0.152968	0.905702	0.180899
Antel	BXA-70063-6CF	148	140	2010	0.76396	0.152589	0.905702	0.180899
Antel	BXA-70063-6CF	148	270	2010	0.765857	0.152967	0.905702	0.180899

Verizon Wireless
WARD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.4901	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.24901	%

					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	148	20	5360	0.929963	0.092996	2.20871	0.220871
Antel	BXA-171063-12CF	148	140	5360	0.929963	0.092996	2.20871	0.220871
Antel	BXA-171063-12CF	148	270	5360	0.929236	0.092924	2.20871	0.220871