CROWN CASTLE

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

April 16, 2021

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

RE: **Notice of Exempt Modification for T-Mobile**
Crown Site ID# 876374; T-Mobile Site ID# CTNL048A
31F Clarks Falls Rd. North Stonington, CT 06359
Latitude: 41.464789/ Longitude: -72.826283

Dear Ms. Bachman

T-Mobile currently maintains six (6) antennas at the 152-foot mount on the existing 150-foot Monopole Tower located at 31F Clarks Falls Rd. in North Stonington. The property is owned by Ray G Jones and the Tower by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Planned Modifications:
Tower:

Remove and Replace:
(3) Commscope NNVV-65B-R4 Antennas **(REMOVE) –** (3) RFS APX16DWV-16DWV-S-E-A20 Antennas – **(REPLACE)**

(3) RFS/Celwave – APXVTM14-ALU-120 Antennas **(REMOVE) -** (3) RFS APXVAALL24_43-U-NA20 Antennas **(REPLACE)**

(3) Alcatel Lucent – PCS 1900MHZ 4x45W-65MHZ Radios **(REMOVE) -** (3) Ericsson 4415 B66A Radios **(REPLACE)**

(3) Alcatel Lucent –TD-RRH8X20-25 Radios **(REMOVE) –** (3) Ericsson 4449 B71+B85 Radios **(REPLACE)**

(3) Alcatel Lucent – RRH2X50-800 Radios **(REMOVE)** – (3) Ericsson 4424 B25 Radios **(REPLACE)**

Install New:
(3) Ericsson AIR6449 B41 Antennas
(4) 1 5/8" Hybrid Cables

(3) Site Pro 1 HRK 14 Handrail Kit

Remove:
(3) Alcatel Lucent – RRH2X50-800 Radios

Ground:

Remove and Replace:
(1) Sprint Cabinet **(REMOVE) -** (1) 6160 Site Support Cabinet (SSC) **(REPLACE)**
(1) Sprint Cabinet **(REMOVE)** – (1) B160 Cabinet **(REPLACE)**

Install New:
(1) RBS 6601 in 6160 SSC
(3) BB 6630 in 6160 SSC
(1) BB 6648 in 6160 SSC
(1) DUG20 in 6160 SSC
(1) PSU 4813 Voltage Booster in 6160 SSC
(1) CSR IXRE V2 (Gen2) Transport System in 6160 SSC

The facility was approved by the Connecticut Siting Council by way of Certificate of Environmental Compatibility and Public Need Docket Number 214 on April 3, 2002.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to Michael A. Urgo, First Selectman for the Town of North Stonington as well as Timothy Brennan, Building Official for the Town of North Stonington. A copy will also be sent to 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, T-Mobile 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).

Sincerely,

Colin Robinson

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive Suite 303
Chelmsford, MA 01824
crobinson@nbcllc.com
(360) 561-3311

cc:

Michael A. Urgo, First Selectman: *(via email only to murgo@northstoningtonct.gov)*
Old Town Hall
40 Main Street
North Stonington, CT 06359
(860) 535-2877 ext. 110

Timothy Brennan, Building Official *(via email only to building@northstoningtonct.gov)*
Old Town Hall
40 Main Street
North Stonington, CT 06359
(860)-535-2877 ext 118

Ray G Jones *(via FedEx)*
31F Clarks Falls Rd.
North Stonington, CT 06359

Colin Robinson

From: Colin Robinson
Sent: Friday, April 16, 2021 11:21 AM
To: murgo@northstoningtonct.gov
Cc: Colin Robinson; Jhodge@northstoningtonct.gov
Subject: CSC Exempt Modification Application 31F Clarks Falls Rd. North Stonington CT 876374
Attachments: CSC Exempt Modification Application 31F Clarks Falls Rd. North Stonington CT 876374 041621.pdf

Good Morning Mr. Urgo,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 31F Clarks Falls Rd. North Stonington CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311

Colin Robinson

From: Colin Robinson
Sent: Friday, April 16, 2021 10:56 AM
To: building@northstoningtonct.gov
Cc: Colin Robinson
Subject: CSC Exempt Modification Application 31F Clarks Falls Rd. North Stonington CT 876374
Attachments: CSC Exempt Modification Application 31F Clarks Falls Rd. North Stonington CT 876374 041621.pdf

Good Morning Mr. Brennan,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 31F Clarks Falls Rd. North Stonington CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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

Exhibit A

Original Facility Approval

DOCKET NO. 214 - 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 cellular telecommunications facility at 31F Clarks Falls Road or 472 Pendleton Hill Road, North Stonington, Connecticut.	} } } }	Connecticut Siting Council April 3, 2002

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility at the proposed prime site (31F Clarks Falls Road) in North Stonington, Connecticut, 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 d/b/a Sprint PCS for the construction, maintenance, and operation of a wireless telecommunications facility at the proposed prime site at 31F Clarks Falls Road in North Stonington, Connecticut. We deny certification of the proposed alternate site at 472 Pendleton Hill Road, North Stonington.

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 for Sprint PCS, and other telecommunications entities, both public and private, but such tower shall not exceed a height of 150 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include: a final site plan(s) for development of the proposed prime site including the location and specifications for the tower foundation, antennas, equipment and foundation for equipment, security fence, access road, and utility line that shall be underground; construction plans for site clearing, tree trimming, water drainage, and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sediment

Control, as amended; landscaping; 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.

3. 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.

4. The Certificate Holder shall provide electromagnetic radio frequency power density measurements within sixty days following commencement of commercial operation.

5. The Certificate Holder shall provide the Council with a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

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. Following completion of construction, if the facility does not initially provide or permanently ceases to provide wireless services this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment within sixty days, 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 antennas become obsolete and cease 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, Norwich Bulletin and the New London Day.

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

Sprint Spectrum, d/b/a Sprint PCS

Thomas J. Regan, Esq.
Brown, Rudnick, Freed & Gesmer, P.C.
CityPlace 1, 38th Floor
185 Asylum Street
Hartford, CT 06103-3402

Exhibit B

Property Card

Town of North Stonington, CT

Property Listing Report | Map Block Lot 89-6768 | Account J8610001

Property Information

Property Location	31F CLARKS FALLS
Owner	JONES RAY G
Co-Owner	
Mailing Address	31D CLARKS FALLS NORTH STONINGTON CT 06359
Land Use	4310 TEL REL TW
Land Class	I
Zoning Code	R80
Census Tract	7071
Sub Lot	

Neighborhood	
Acreage	0.25
Utilities	
Lot Setting/Desc	Rural Rolling
Survey Map	
Additional Info	

Photo

No Photo Available

Sketch

Primary Construction Details

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

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

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

Report Created On 9/27/2018

Town of North Stonington, CT

Property Listing Report | Map Block Lot 89-6768 | Account J8610001

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Outbuildings	0	0
Land	115000	80500
Total	115000	80500

Outbuilding and Extra Items

Type	Description

Sub Areas

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

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
JONES RAY G	195/ 345	10/7/2009	0
JONES DONALD A & BARBARA S	25/ 374	10/3/1951	0

Report Created On 9/27/2018

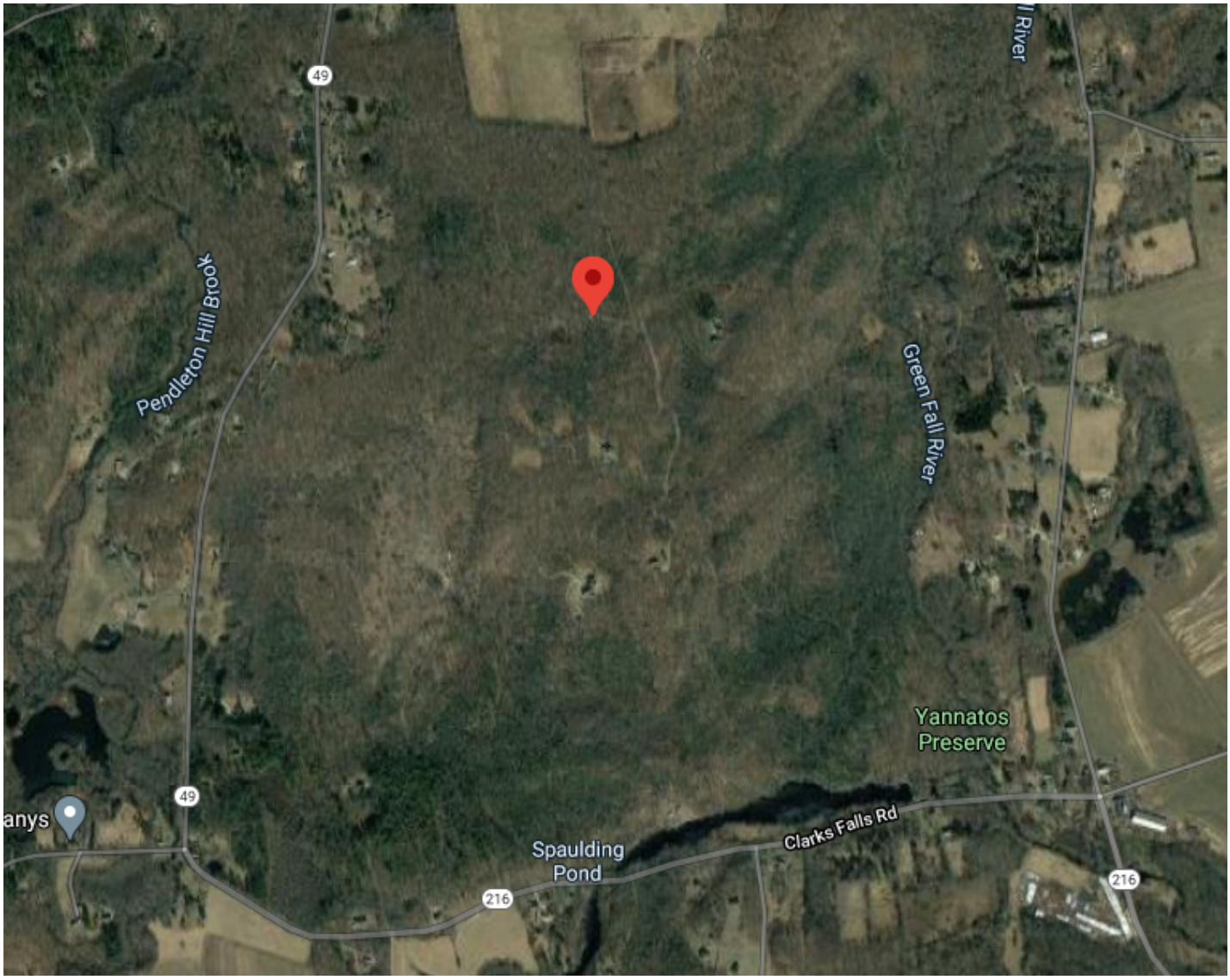

49
Pendleton Hill Brook
Green Fall River
Yannatos
Preserve
49
Spaulding
Pond
Clarks Falls Rd
216
216

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTNL048A
T-MOBILE SITE NAME: CTNL048A
SITE TYPE: MONOPOLE
TOWER HEIGHT: 150'-0"

BUSINESS UNIT #: 876374
SITE ADDRESS: 31F CLARKS FALLS ROAD
NORTH STONINGTON, CT 06359
COUNTY: NEW LONDON
JURISDICTION: TOWN OF NORTH STONINGTON

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67D5A998C 6160 (GSM ONLY)

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	OSCAWANA LAKE / JONES/ SSUSA
SITE ADDRESS:	31F CLARKS FALLS ROAD NORTH STONINGTON, CT 06359
COUNTY:	NEW LONDON
MAP/PARCEL #:	89-6768
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.464789
LONGITUDE:	-71.826283
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	233'
CURRENT ZONING:	R80
JURISDICTION:	TOWN OF NORTH STONINGTON
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	JONES RAY G 31D CLARKS FALLS, NORTH STONINGTON, CT 06359
TOWER OWNER:	CROWN CASTLE USA INC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054
ELECTRIC PROVIDER:	NOT PROVIDED
TELCO PROVIDER:	NOT PROVIDED

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S BOULDER AVE, SUITE 300 TULSA, OK 74119 JENNY PAUL (918) 587-4630
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277
PROJECT MANAGER:	TRICIA PELON (518) 424-2396
CONSTRUCTION MANAGER:	JASON D'AMICO (860) 209-0104

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 24X36. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

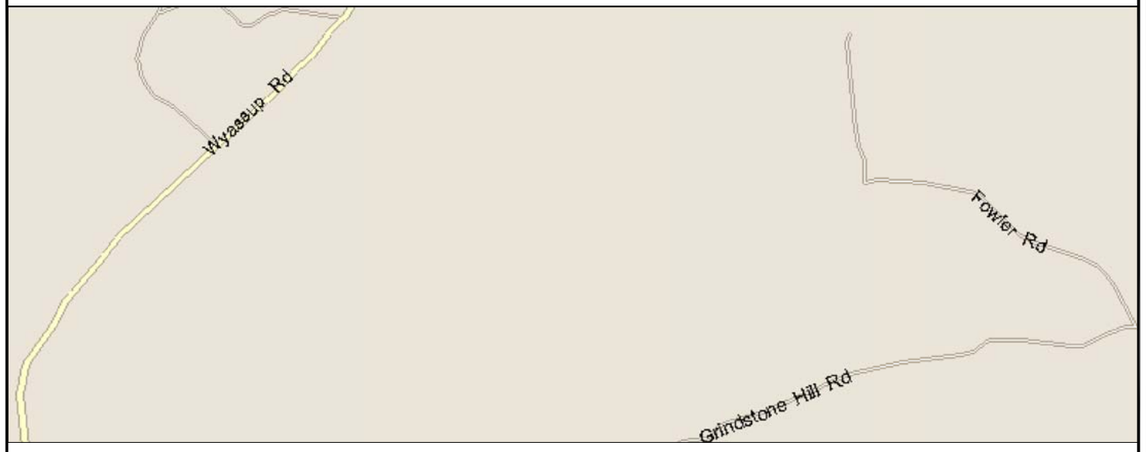
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
- REMOVE (12) RADIOS
- INSTALL (9) ANTENNAS
- INSTALL (9) RADIOS
- INSTALL (4) 1 5/8" HYBRID CABLE
- INSTALL (3) SITE PRO 1 HRK14 HANDRAIL KIT.

GROUND SCOPE OF WORK:
- REMOVE (2) EQUIPMENT CABINET
- INSTALL (1) 6160 SITE SUPPORT CABINET
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (1) RBS 6601 IN SSC
- INSTALL(3) BB 6630 IN 6160 SSC
- INSTALL(1) BB 6648 IN 6160 SSC
- INSTALL(1) DUG20 IN SSC
- INSTALL(1) PSU 4813
- INSTALL(1) CSR IXRE V2 (GEN2) TRANSPORT SYSTEM

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

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2015 IBC / 2018 CONNECTICUT SBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	2/19/21
MOUNT ANALYSIS:	INFINIGY ENGINEERING, PLLC
DATED:	2/1/21
RFDS REVISION:	1
DATED:	1/15/21
ORDER ID:	538778
REVISION:	1

CALL CONNECTICUT ONE CALL
(800) 922-4455 CBYD.COM
CALL 2 WORKING DAYS BEFORE YOU DIG!

APPROVALS

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

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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT 06359

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

STATE OF CONNECTICUT
No. 23924
LICENSED PROFESSIONAL ENGINEER
3/23/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: T–MOBILE
   TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
   #4 BARS AND SMALLER — 40 ksi
   #5 BARS AND LARGER — 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH — 3"
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 BARS AND LARGER — 2"
   #5 BARS AND SMALLER — 1–1/2"
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   SLAB AND WALLS — 3/4"
   BEAMS AND COLUMNS — 1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY 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 PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (–)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT 06359

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

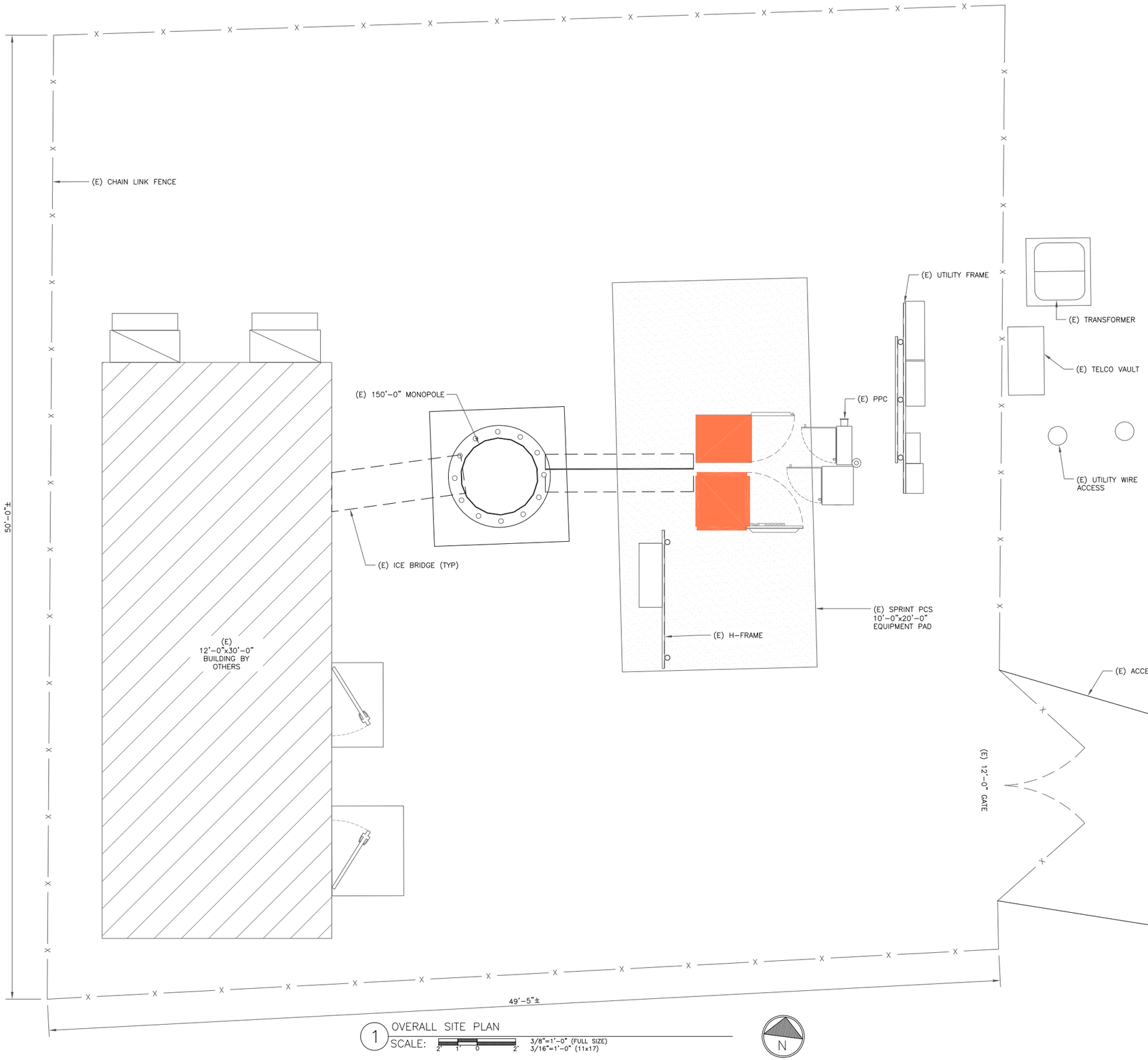
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM PREVIOUS PLAN SETS OR FROM ASSESSORS MAPS. CROWN CASTLE USA INC. HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET



1 OVERALL SITE PLAN
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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1717 S. BOULDER
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T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT
06359

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

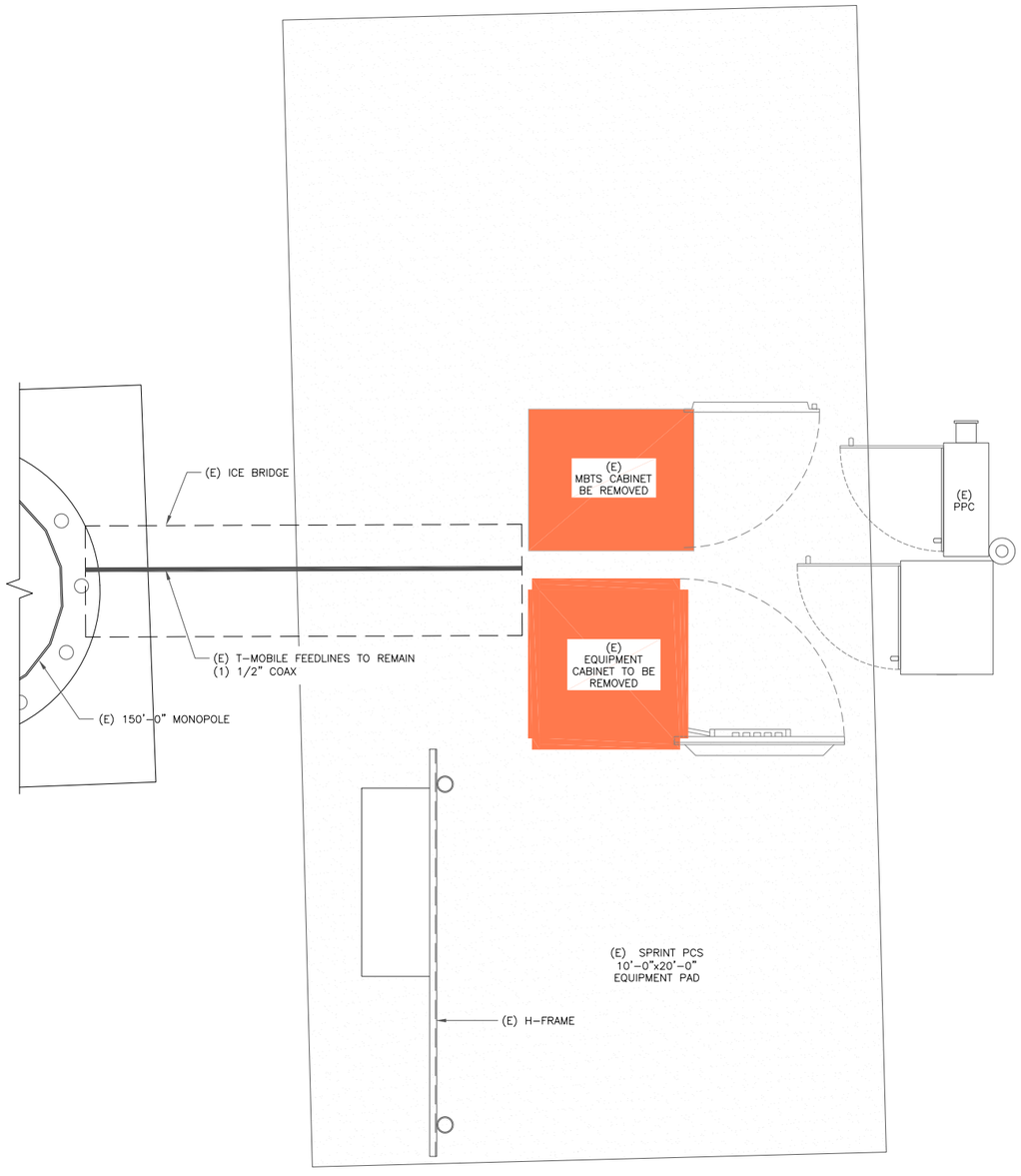
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: C-1.1
REVISION: 0

147463.003.01_OSCAWANA LAKE-JONES-SSUSA.dwg – Sheet:C-1.1 – User: ghoyes – Mar 23, 2021 – 8:23am

EQUIPMENT LEGEND:

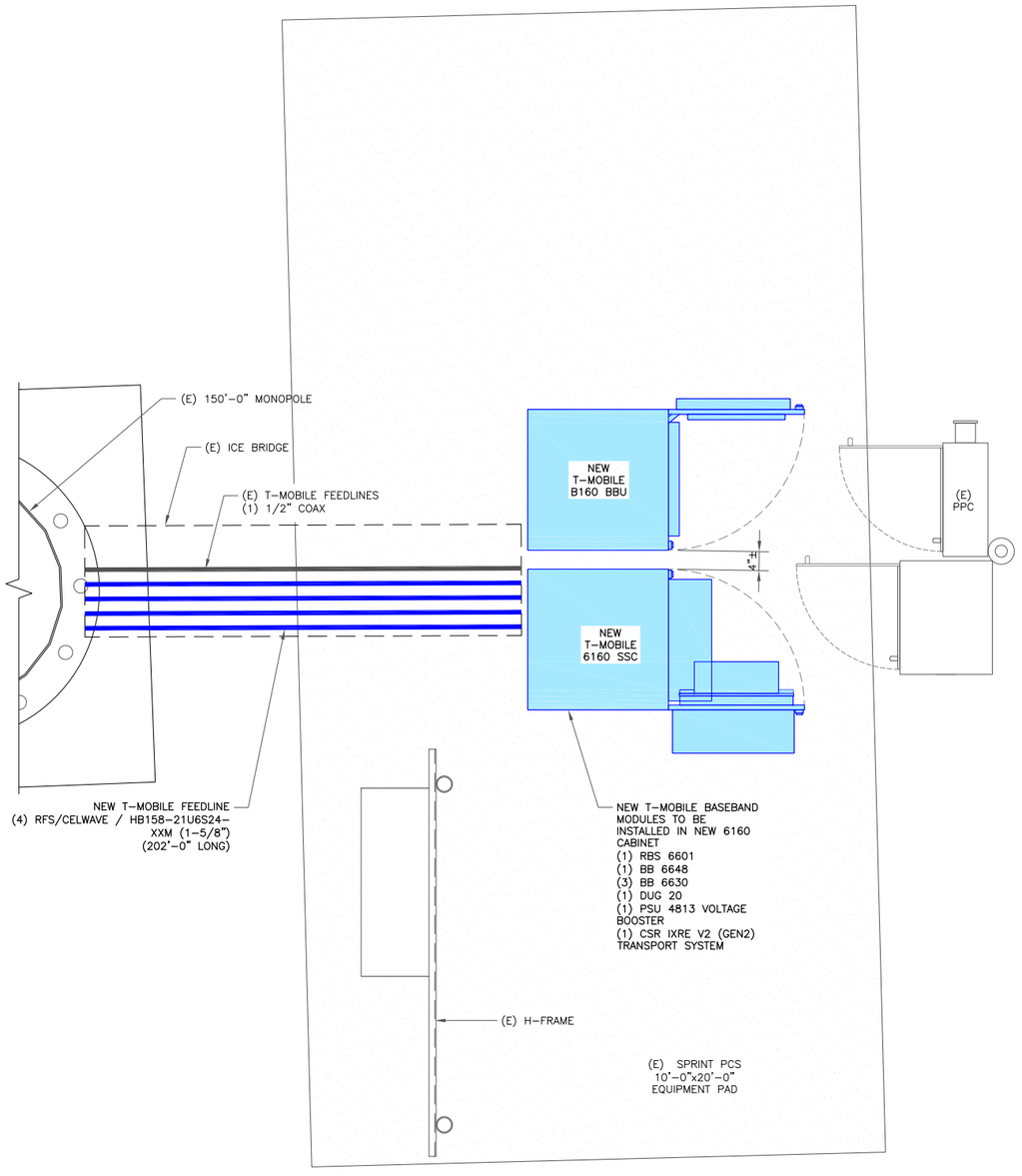
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW



1 EXISTING EQUIPMENT PLAN

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

N



2 FINAL EQUIPMENT PLAN

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

N

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT 06359

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

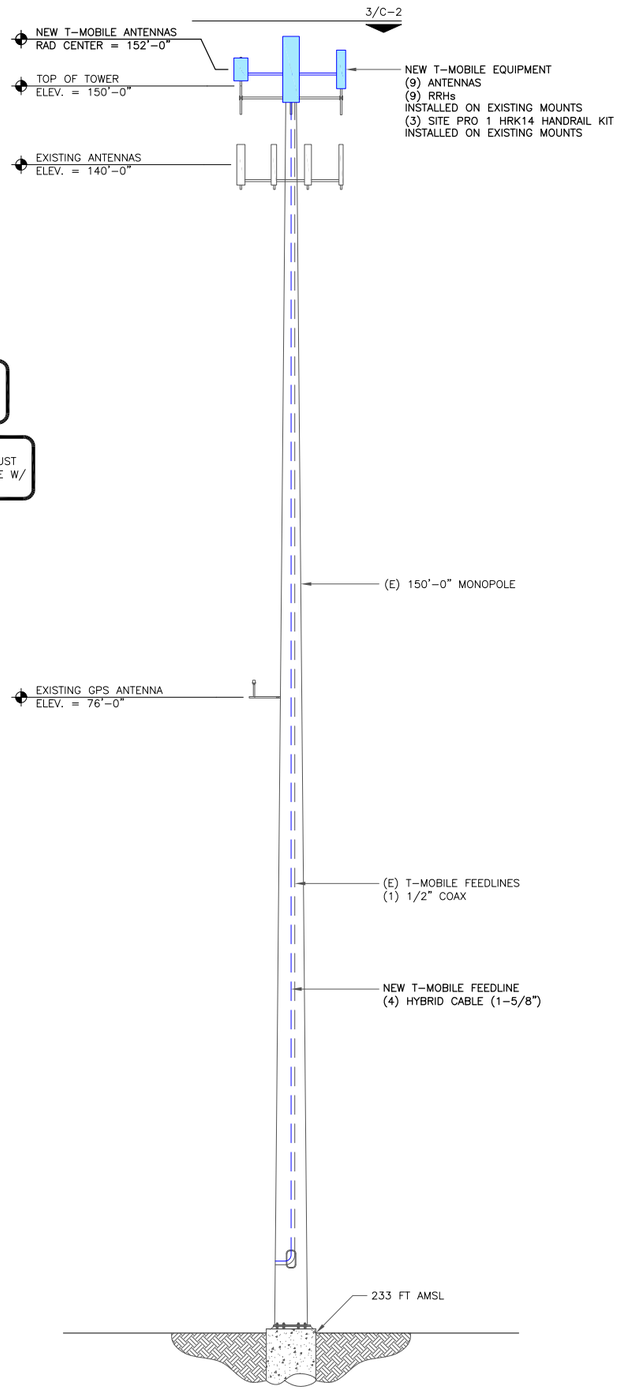
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/23/21

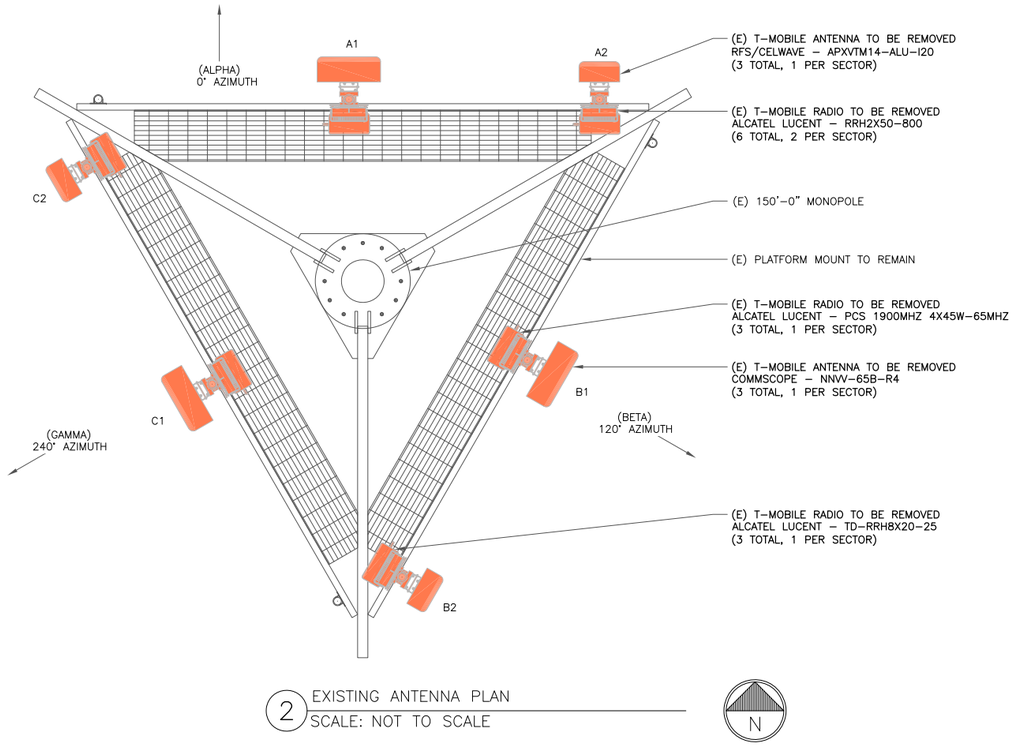
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: C-1.2

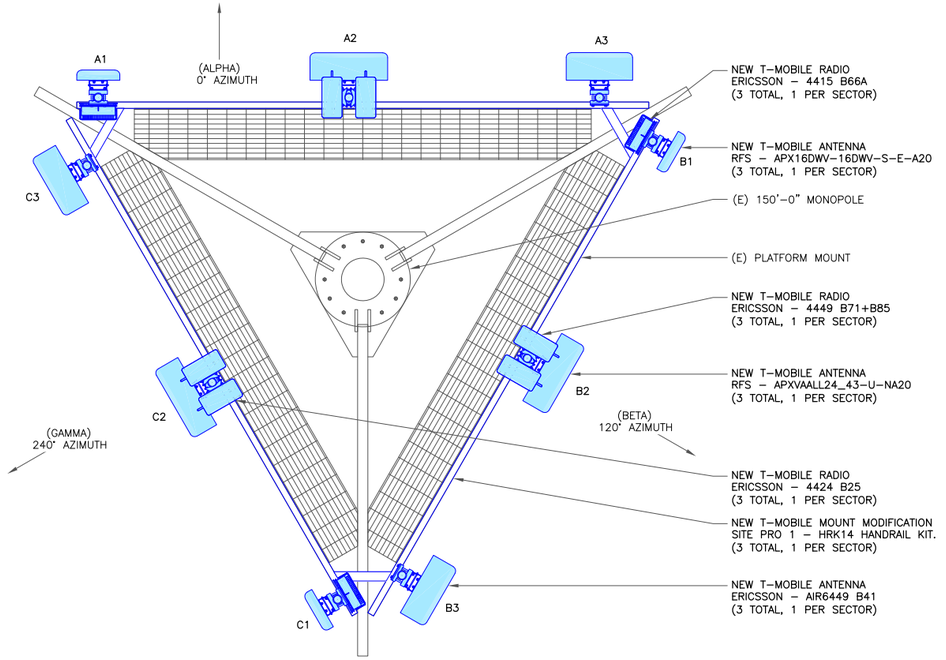
REVISION: 0



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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REVISION: 0

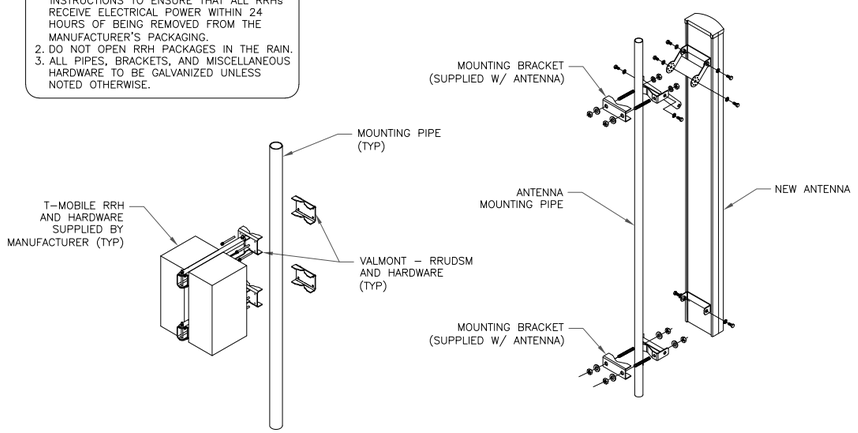
RF SYSTEM SCHEDULE

SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	CABLE TYPE	CABLE DIAMETER	CABLE LENGTH
ALPHA	A-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	0°	0°	2°	152'-0"	(1) 4415B66A	–	–	–
	A-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	0°	0°	2°/2°	152'-0"	(1) 4449 B71+B85 (1) 4424 B25	(2) HYBRID	6/24 AWG HYBRID	228'
	A-3	L2500/N2500	ERICSSON	AIR6449 B41	0°	0°	2°	152'-0"	–	–	–	–
BETA	B-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	120°	0°	2°	152'-0"	(1) 4415B66A	–	–	–
	B-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	120°	0°	2°/2°	152'-0"	(1) 4449 B71+B85 (1) 4424 B25	(1) HYBRID	6/24 AWG HYBRID	228'
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	120°	0°	2°	152'-0"	–	–	–	–
GAMMA	C-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	240°	0°	2°	152'-0"	(1) 4415B66A	–	–	–
	C-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	240°	0°	2°/2°	152'-0"	(1) 4449 B71+B85 (1) 4424 B25	(1) HYBRID	6/24 AWG HYBRID	228'
	C-3	L2500/N2500	ERICSSON	AIR6449 B41	240°	0°	2°	152'-0"	–	–	–	–

1 ANTENNA & FEEDLINE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
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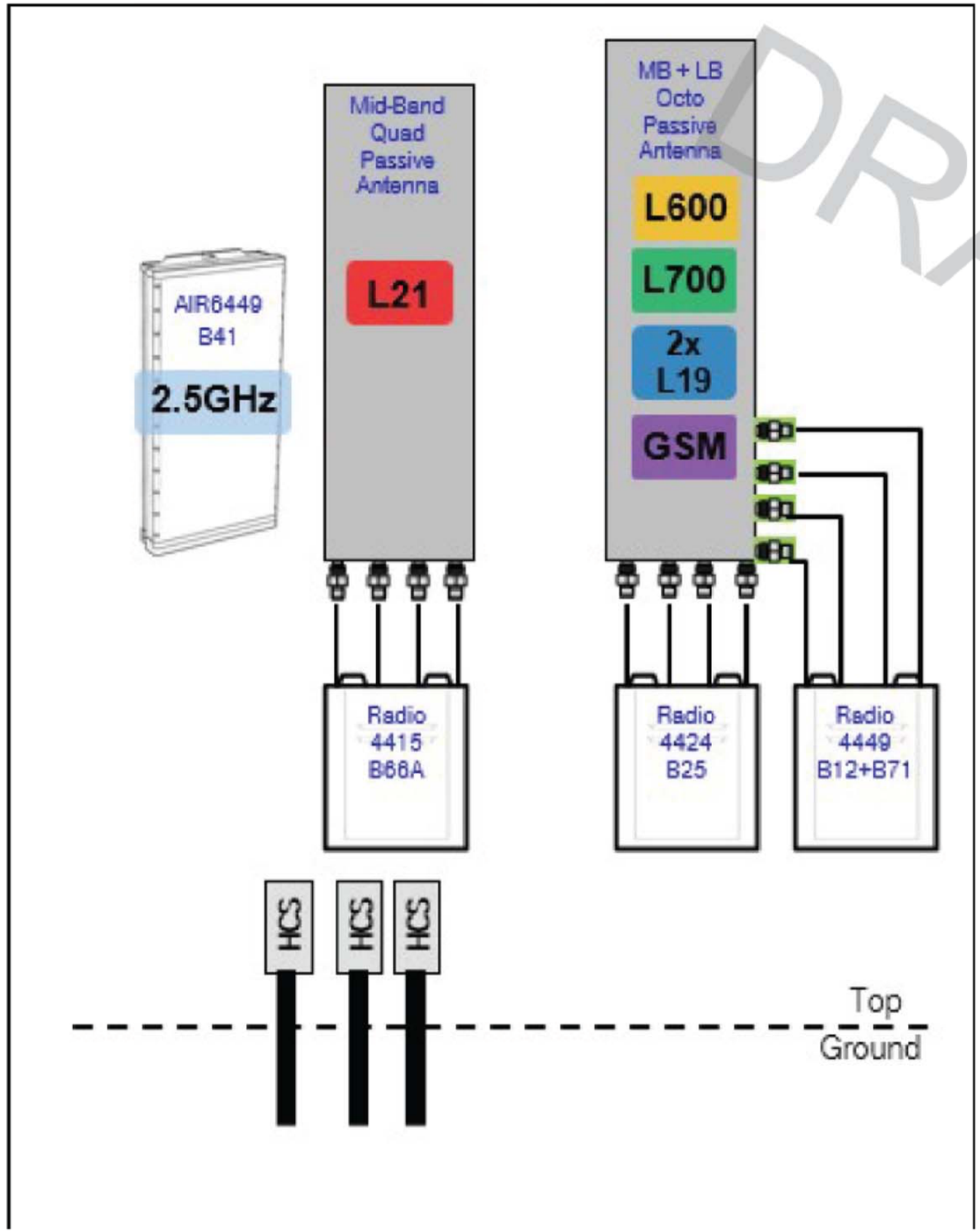
SHEET NUMBER: C-3

REVISION: 0

67D5A998C_1xAIR+1xQP+1xOP.jpg



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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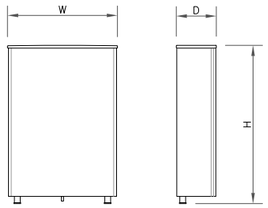
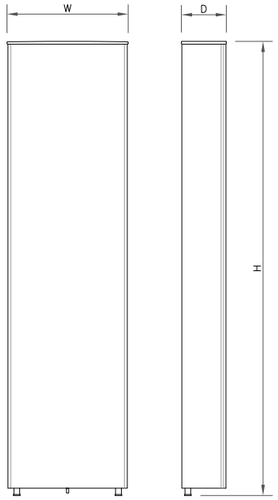
SHEET NUMBER: C-4

REVISION: 0



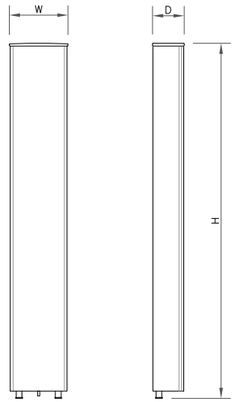
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



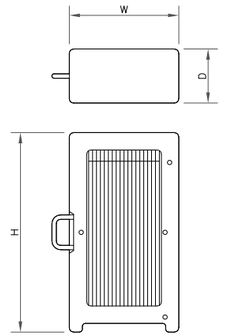
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APXVAALL24_43-UNA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



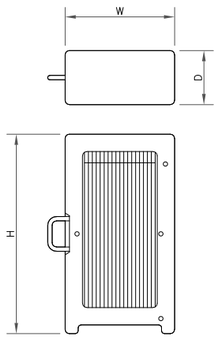
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APX16DWV-16DWVS-E-A20
WIDTH	13.30"
DEPTH	3.15"
HEIGHT	55.90"
WEIGHT	40.70 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



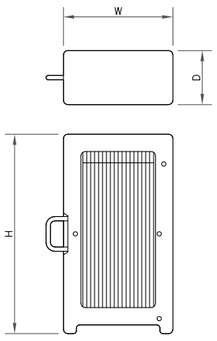
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4415 B66A
WIDTH	13.50"
DEPTH	6.30"
HEIGHT	16.50"
WEIGHT	49.60 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4424 B25
WIDTH	14.40"
DEPTH	11.30"
HEIGHT	17.10"
WEIGHT	86.0 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4449 B71 B85A
WIDTH	13.20"
DEPTH	10.63"
HEIGHT	17.91"
WEIGHT	73.21 LBS

6 RRU SPECS
SCALE: NOT TO SCALE

ERICSSON 6160 SSC
WEIGHT: 60.0 LBS
SIZE (HxWxD): 63"x25.6"x33.5" IN.

7 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH	26"
WEIGHT	

8 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE

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PH: (918) 587-4630
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T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT
06359

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

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0	3/23/21	JJR	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: C-5

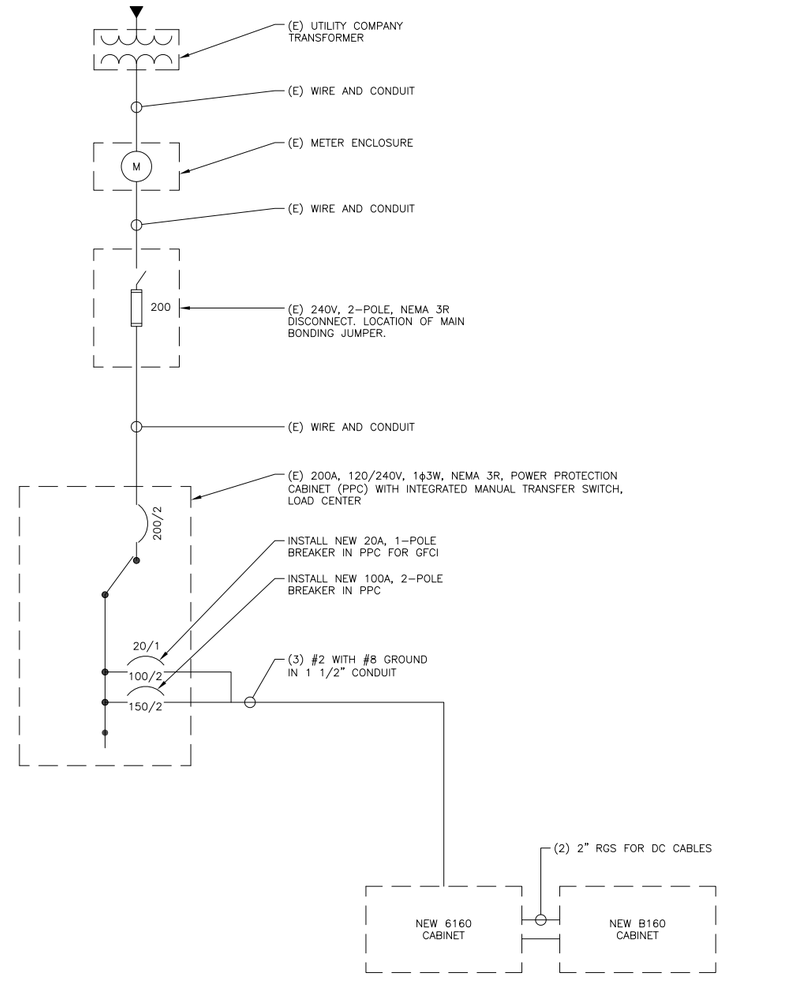
REVISION: 0

FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
SURGE ARRESTOR	2	60A	1	2	10A	1	OUTLET
			3	4	15A	1	FAN
			5	6			
UNIT BTS	2	100A	7	8			
			9	10			
			11	12			
6160 CABINET	2	100A	13	14			
			15	16			
B160 CABINET	1	20A	17	18			

RATED VOLTAGE: ■120/240 □_____, 1 PHASE, 3 WIRE	BRANCH POLES: □12 ■24 □30 □42	APPROVED MF'RS
RATED AMPS: □100 ■200 □400 □_____,	CABINET: ■SURFACE □FLUSH	NEMA □1 ■3R □4X
□MAIN LUGS ONLY ■MAIN 200 AMPS ■BREAKER □FUSED SWITCH	■HINGED DOOR	■KEYED DOOR LATCH
□FUSED ■CIRCUIT BREAKER BRANCH DEVICES	□_____ TO BE GFCI BREAKERS	FULL NEUTRAL BUS GROUND BAR
ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL		

REPLACE EXISTING BREAKER IN POSITION 13 AND 15 WITH A NEW 2P 100A BREAKER
REPLACE EXISTING BREAKER IN POSITION 17 WITH A NEW 1P 20A BREAKER
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE



NOTES:

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

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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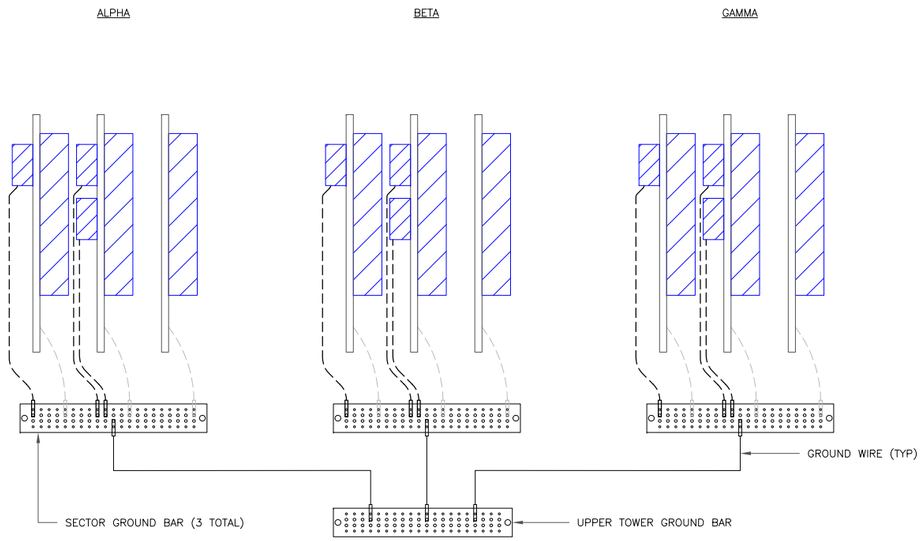
SHEET NUMBER: E-1

REVISION: 0



NOTE:

ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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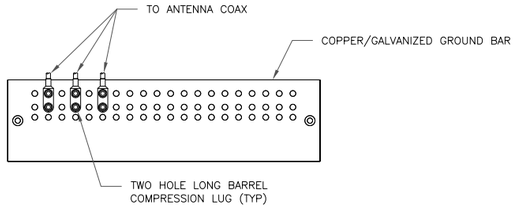
SHEET NUMBER: G-1

REVISION: 0

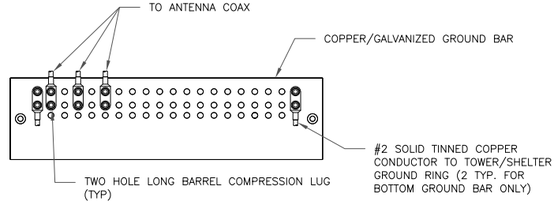
147463.003.01_OSCAWANA LAKE-JONES-SSUSA.dwg – Sheet:G-1 – User: ghoyes – Mar 23, 2021 – 8:23am



NOTES:

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

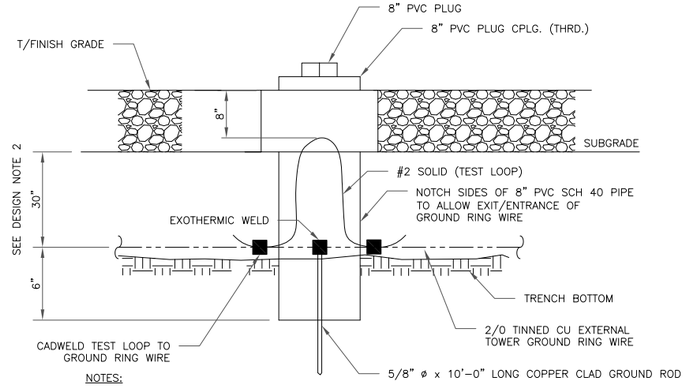
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

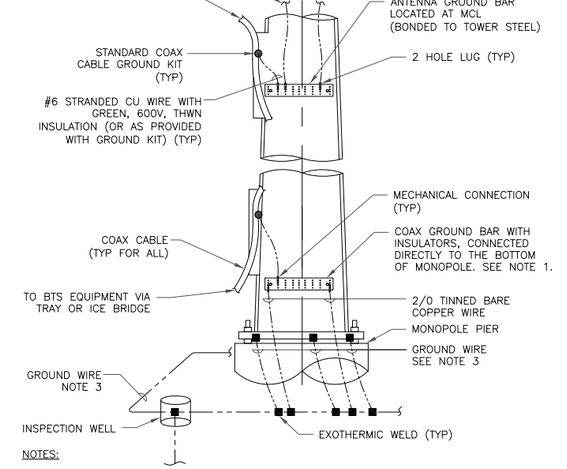
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

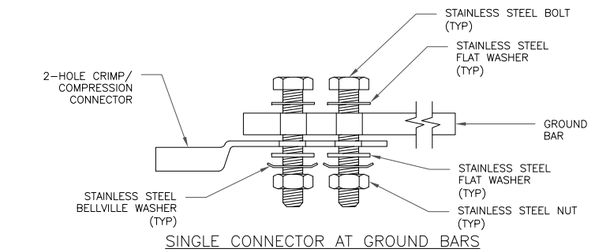
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



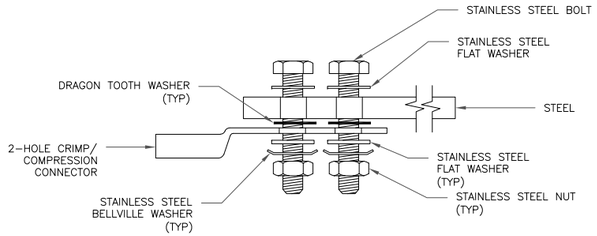
NOTES:

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

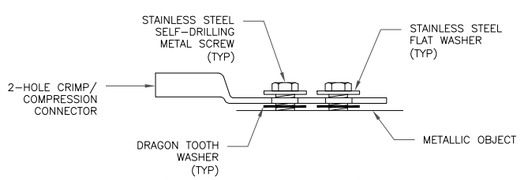
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

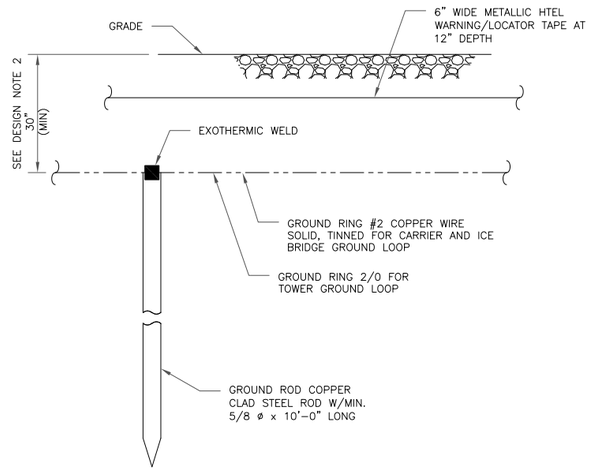


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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PH: (918) 587-4630
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T-MOBILE SITE NUMBER:
CTNL048A

BU #: **876374**
OSCAWANA LAKE / JONES/ SSUSA

31F CLARKS FALLS ROAD
NORTH STONINGTON, CT
06359

EXISTING
150'-0" MONOPOLE

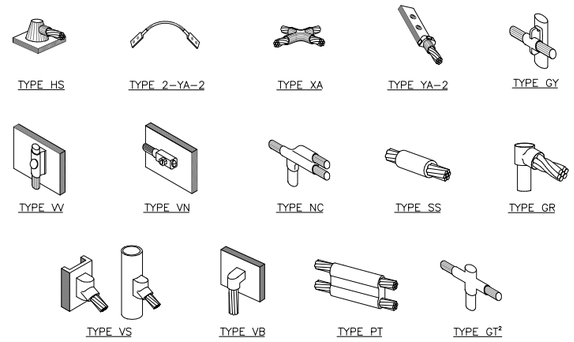
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: G-2
REVISION: 0

147463.003.01_OSCAWANA LAKE_JONES-SSUSA.dwg — Sheet:G-2 — User: ghoyes — Mar 23, 2021 — 8:23am

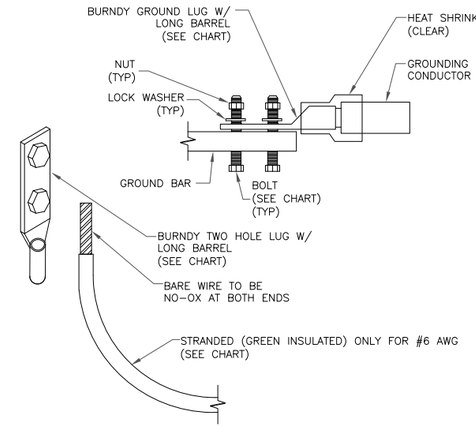


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

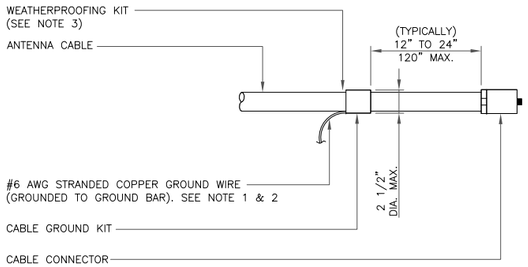
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

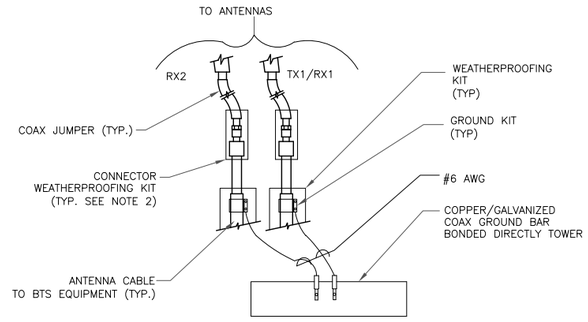
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

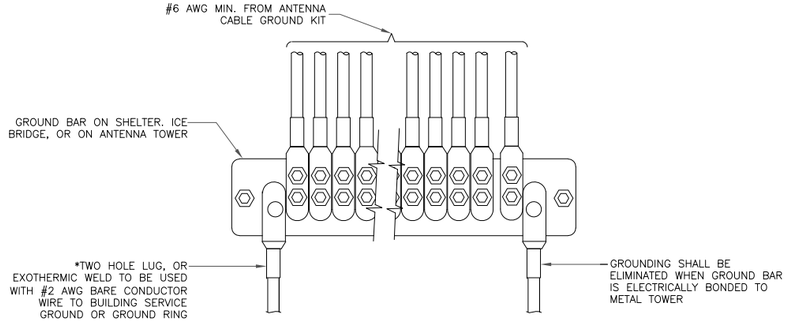
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



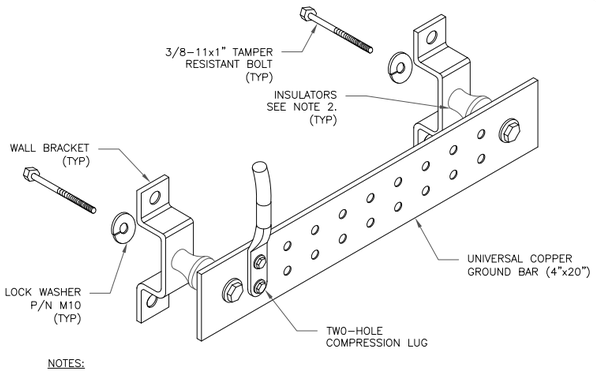
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



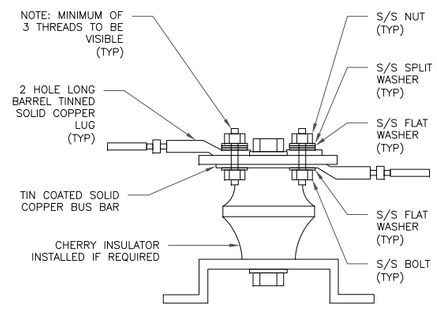
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



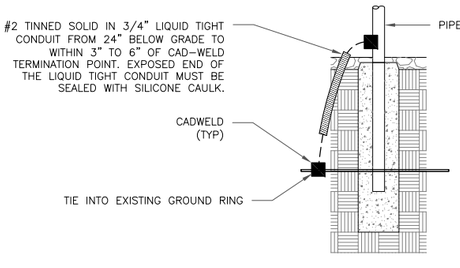
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
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T-MOBILE SITE NUMBER:
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31F CLARKS FALLS ROAD
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0	3/23/21	JJR	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: G-3
REVISION: 0

Exhibit D

Structural Analysis Report

Date: **February 19, 2021**

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

Subject:	**Structural Analysis Report**	
Designation:	***Sprint PCS* Co-Locate**	
	Site Number:	CTNL048A
	Site Name:	CTNL048A
Designation:	**BU Number:**	876374
	Site Name:	Oscawana Lake / Jones/ Ssusa
	JDE Job Number:	628853
	Work Order Number:	1919058
	Order Number:	538778 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	147463.002.01
Site Data:	**31F Clarks Falls Road, North Stoningto, New London County, CT** **Latitude *41° 27' 53.24"*, Longitude *-71° 49' 34.62"*** **150 Foot - Monopole Tower**	

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

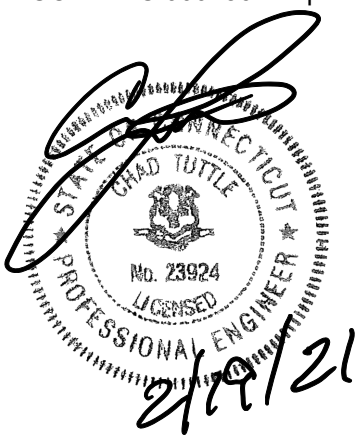
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2018 International Building Code based upon an ultimate 3-second gust wind speed of 135 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Jacob Johnson, E.I.T.

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564 Expires: 10-02-2021



Chad E. Tuttle, P.E.

tnxTower Report - version 8.0.7.5

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Engineered Endeavors, Inc. The tower has been modified by Crown Castle in July of 2018. The modifications consist of base plate stiffeners.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	152.0	3	Ericsson	AIR6449 B41_T-MOBILE	4	1-5/8
		3	Ericsson	Radio 4415 B66A		
		3	Ericsson	Radio 4424 B25_TMO		
		3	Ericsson	Radio 4449 B71 B85A_T-Mobile		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO		
	150.0	1	SitePro 1	HRK14 Handrail Kit		
		1	--	Platform Mount [LP 1202-1]		
76.0	76.0	1	Spectracom	8225	1	1/2
		1	--	Side Arm Mount [SO 702-1]		

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)
140.0	142.0	3	Alcatel Lucent	RRH2X40-AWS	2 1	1-1/4 1/2
		6	Antel	BXA-171063/12CF		
		6	Antel	BXA-70063-6CF-EDIN-0		
		2	Raycap	RRFDC-3315-PF-48		
	140.0	1	Tower Mounts	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	1630181	CCI Sites
Mount Analysis Report	9549301	CCI Sites
Tower Modification Drawing	7694966	CCI Sites
Post Modification Inspection	8048082	CCI Sites
Foundation Drawing	7615022	CCI Sites
Geotech Report	2158036	CCI Sites
Crown CAD Package	Date: 02/04/2021	CCI Sites

3.1) Analysis Method

tnxTower (version 8.0.7.5), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the - TIA-222 standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.17	Pole	TP21.15x15x0.188	1	-7.464	739.759	80.3	Pass
L2	123.17 - 84.877	Pole	TP29.42x20.049x0.25	2	-11.744	1374.943	95.3	Pass
L3	84.877 - 43.587	Pole	TP38.26x27.959x0.313	3	-18.788	2238.495	85.8	Pass
L4	43.587 - 0	Pole	TP47.5x36.429x0.313	4	-29.834	2874.942	96.6	Pass
							Summary	
						Pole (L4)	96.6	Pass
						Rating =	96.6	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	74.6	Pass
1	Base Plate	Base	73.4	Pass
1	Base Foundation (Structure)	Base	66.4	Pass
1	Base Foundation (Soil Interaction)	Base	89.2	Pass

Structure Rating (max from all components) =	96.6%

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

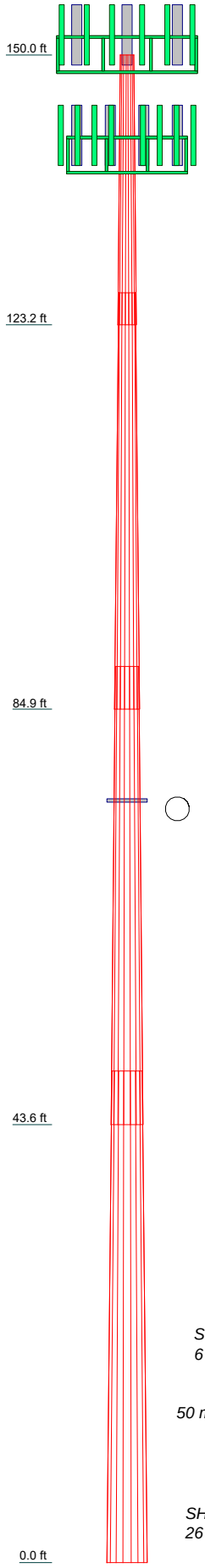
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	
Length (ft)	26.830	41.460	45.540	48.920	
Number of Sides	18	18	18	18	
Thickness (in)	0.188	0.250	0.313	0.313	
Socket Length (ft)	3.167	4.250	5.333		
Top Dia (in)	15.000	20.049	27.959	36.429	
Bot Dia (in)	21.150	29.420	38.260	47.500	
Grade	A572-65				
Weight (K)	1.0	2.7	5.0	6.9	15.6



ALL REACTIONS ARE FACTORED

AXIAL 48 K

SHEAR 6 K *MOMENT 665 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 30 K

SHEAR 26 K *MOMENT 2911 kip-ft*

TORQUE 0 kip-ft
REACTIONS - 135 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 96.6%

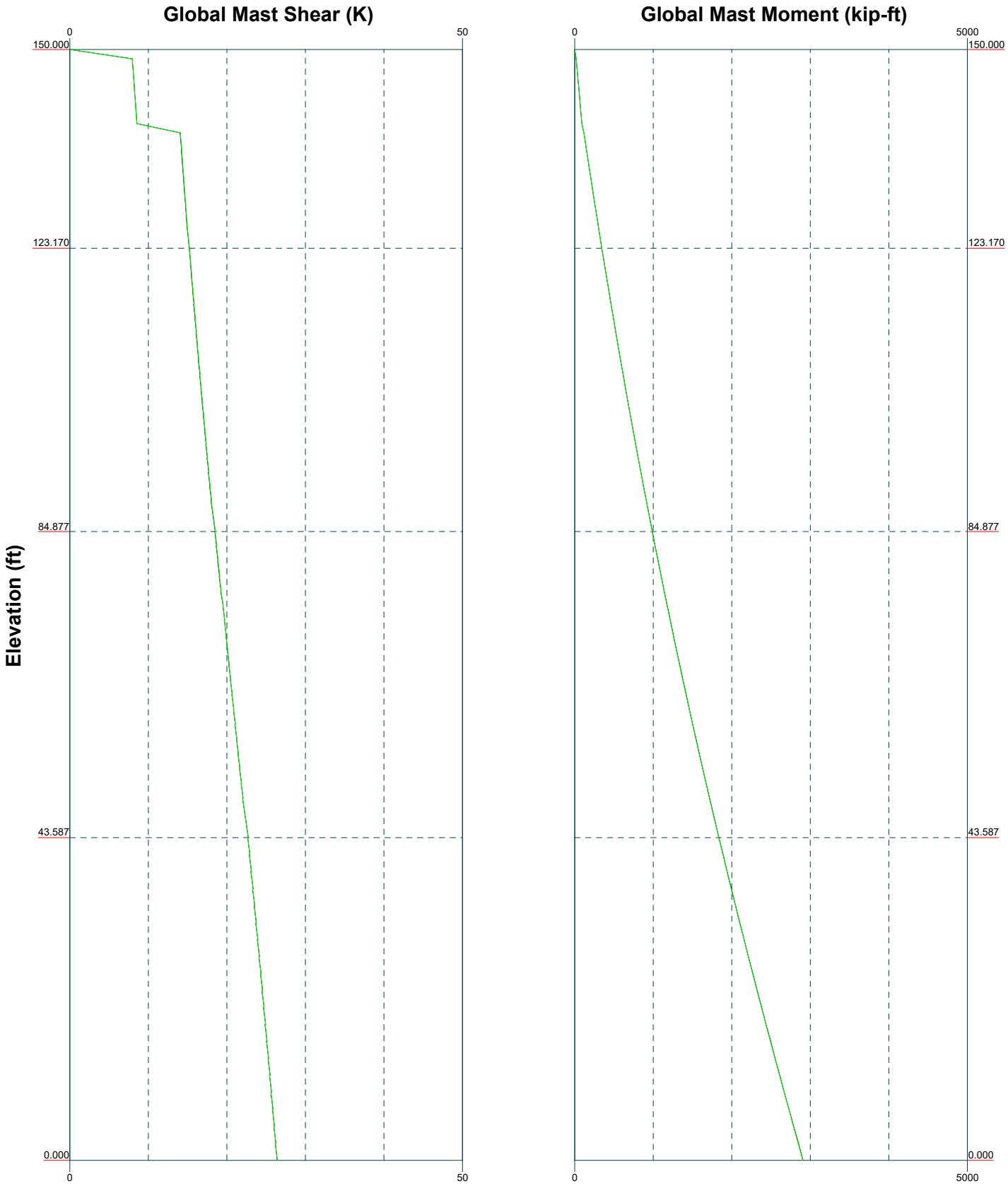
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	147463.002.01 - OSCAWANA LAKE/JONES/SSUSA, CT (BU# 87637		
Project:			
Client: Crown Castle		Drawn by: Pavan Upadhya	App'd:
Code: TIA-222-H		Date: 02/18/21	Scale: NTS
Path:			Dwg No. E-1

TIA-222-H - 135 mph/50 mph 1.500 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



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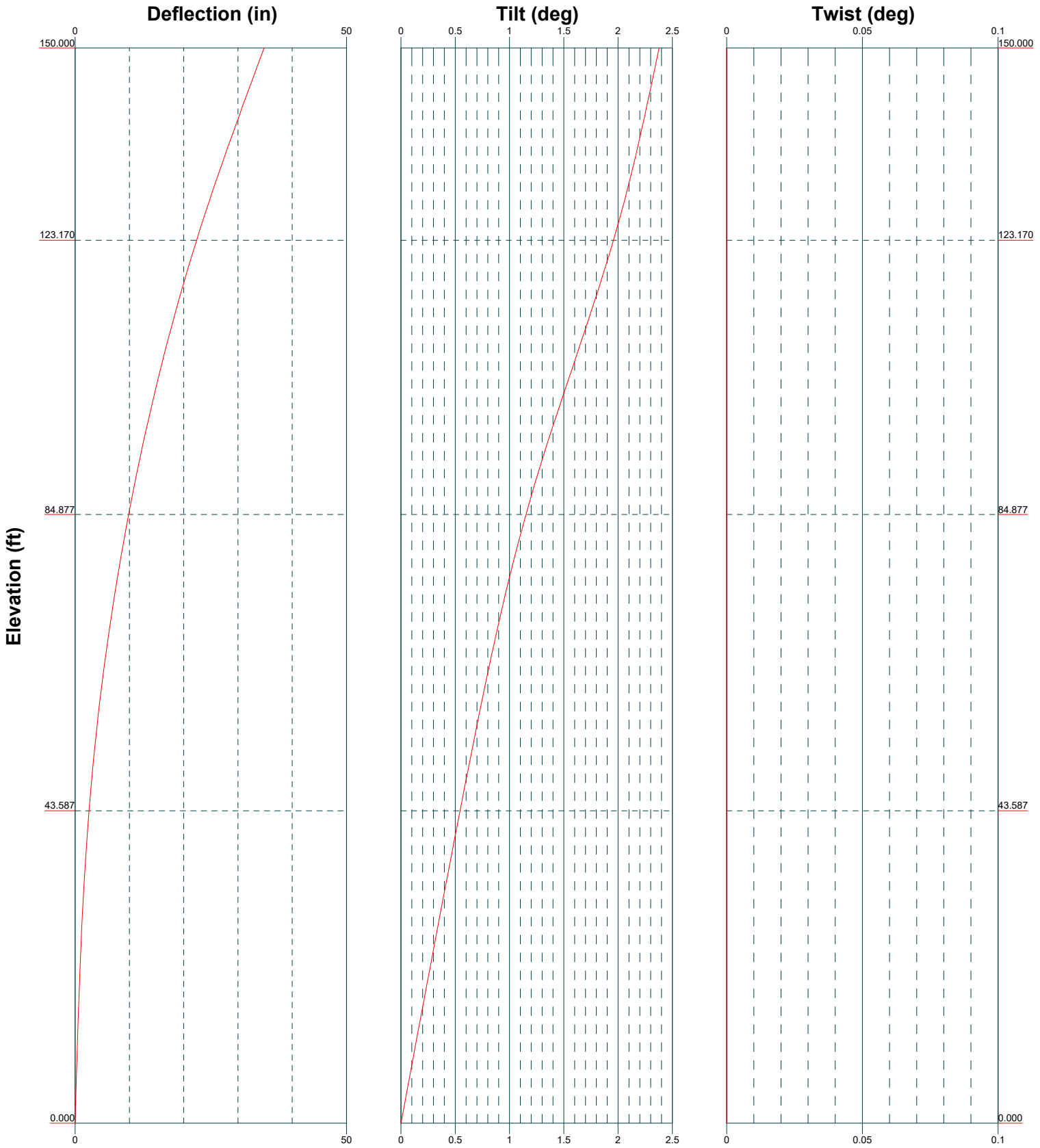
Project:			
Client: Crown Castle	Drawn by: Pavan Upadhya	App'd:	
Code: TIA-222-H	Date: 02/18/21	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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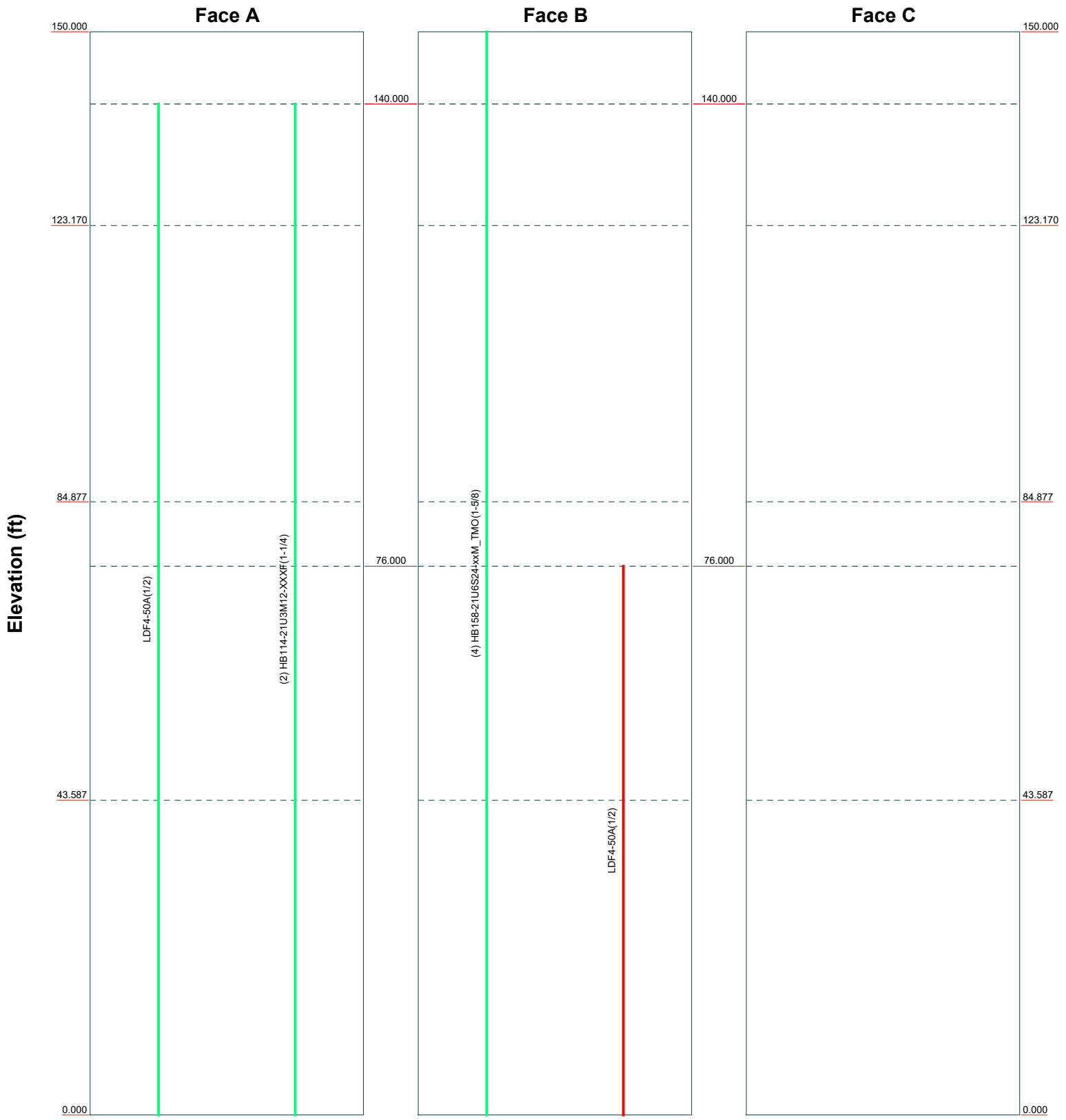
Job:	147463.002.01 - OSCAWANA LAKE/JONES/SSUSA, CT (BU# 87637		
Project:			
Client: Crown Castle		Drawn by: Pavan Upadhya	App'd:
Code: TIA-222-H		Date: 02/18/21	Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 150'

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



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

Job:	147463.002.01 - OSCAWANA LAKE/JONES/SSUSA, CT (BU# 87637		
Project:			
Client: Crown Castle		Drawn by: Pavan Upadhya	App'd:
Code: TIA-222-H		Date: 02/18/21	Scale: NTS
Path:			Dwg No. E-7

Tower Input Data

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

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 234.000 ft.
Basic wind speed of 135 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.000-123.170	26.830	3.167	18	15.000	21.150	0.188	0.750	A572-65 (65 ksi)
L2	123.170-84.877	41.460	4.250	18	20.049	29.420	0.250	1.000	A572-65 (65 ksi)
L3	84.877-43.587	45.540	5.333	18	27.959	38.260	0.313	1.250	A572-65 (65 ksi)
L4	43.587-0.000	48.920		18	36.429	47.500	0.313	1.250	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	15.202	8.815	244.360	5.258	7.620	32.068	489.042	4.408	2.310	12.32
	21.447	12.475	692.588	7.442	10.744	64.462	1386.087	6.239	3.392	18.093
L2	21.047	15.711	778.069	7.029	10.185	76.394	1557.161	7.857	3.089	12.355
	29.835	23.146	2488.248	10.355	14.945	166.490	4979.770	11.575	4.738	18.952
L3	29.319	27.422	2648.096	9.815	14.203	186.441	5299.676	13.714	4.371	13.987
	38.802	37.639	6847.687	13.471	19.436	352.318	13704.384	18.823	6.184	19.788
L4	38.168	35.823	5903.396	12.821	18.506	319.003	11814.561	17.915	5.861	18.757
	48.185	46.804	13166.650	16.752	24.130	545.655	26350.626	23.406	7.810	24.992

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.000-123.170				1	1	1			
L2 123.170-84.877				1	1	1			
L3 84.877-43.587				1	1	1			
L4 43.587-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
* LDF4-50A(1/2) * *	B	No	Surface Ar (CaAa)	76.000 - 0.000	1	1	0.250 0.270	0.630		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
HB158-21U6S24-xx M_TMO(1-5/8)	B	No	No	Inside Pole	150.000 - 0.000	4	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
*									
LDF4-50A(1/2)	A	No	No	Inside Pole	140.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
HB114-21U3M12-X XXF(1-1/4)	A	No	No	Inside Pole	140.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-123.170	A	0.000	0.000	0.000	0.000	0.044
		B	0.000	0.000	0.000	0.000	0.268
		C	0.000	0.000	0.000	0.000	0.000
L2	123.170-84.877	A	0.000	0.000	0.000	0.000	0.099
		B	0.000	0.000	0.000	0.000	0.383
		C	0.000	0.000	0.000	0.000	0.000
L3	84.877-43.587	A	0.000	0.000	0.000	0.000	0.107
		B	0.000	0.000	2.042	0.000	0.418
		C	0.000	0.000	0.000	0.000	0.000
L4	43.587-0.000	A	0.000	0.000	0.000	0.000	0.113
		B	0.000	0.000	2.746	0.000	0.442
		C	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-123.170	A	1.469	0.000	0.000	0.000	0.000	0.044
		B		0.000	0.000	0.000	0.000	0.268
		C		0.000	0.000	0.000	0.000	0.000
L2	123.170-84.877	A	1.429	0.000	0.000	0.000	0.000	0.099
		B		0.000	0.000	0.000	0.000	0.383
		C		0.000	0.000	0.000	0.000	0.000
L3	84.877-43.587	A	1.362	0.000	0.000	0.000	0.000	0.107
		B		0.000	0.000	11.305	0.000	0.534

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L4	43.587-0.000	C	1.223	0.000	0.000	0.000	0.000	0.000
		A		0.000	0.000	0.000	0.000	0.113
		B		0.000	0.000	14.615	0.000	0.587
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-123.170	0.000	0.000	0.000	0.000
L2	123.170-84.877	0.000	0.000	0.000	0.000
L3	84.877-43.587	0.410	0.009	1.220	0.026
L4	43.587-0.000	0.506	0.011	1.478	0.031

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
L3	7	LDF4-50A(1/2)	43.59 - 76.00	1.0000	1.0000
L4	7	LDF4-50A(1/2)	0.00 - 43.59	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 K
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Leg	4.000 / 0.000 / 2.000	0.000	150.000	No Ice	6.290	2.760	0.061
						1/2" Ice	6.860	3.270	0.105
						1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Leg	4.000 / 0.000 / 2.000	0.000	150.000	No Ice	6.290	2.760	0.061
						1/2" Ice	6.860	3.270	0.105
						1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Leg	4.000 / 0.000	0.000	150.000	No Ice	6.290	2.760	0.061
						1/2" Ice	6.860	3.270	0.105

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.183 0.311 0.453 0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.183 0.311 0.453 0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.183 0.311 0.453 0.782
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.870 6.233 6.606 7.382	3.270 3.728 4.203 5.200	0.128 0.177 0.232 0.359
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.870 6.233 6.606 7.382	3.270 3.728 4.203 5.200	0.128 0.177 0.232 0.359
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.870 6.233 6.606 7.382	3.270 3.728 4.203 5.200	0.128 0.177 0.232 0.359
RADIO 4415 B66A	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.856 2.027 2.204 2.582	0.870 0.997 1.134 1.432	0.050 0.064 0.081 0.124
RADIO 4415 B66A	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.856 2.027 2.204 2.582	0.870 0.997 1.134 1.432	0.050 0.064 0.081 0.124
RADIO 4415 B66A	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.856 2.027 2.204 2.582	0.870 0.997 1.134 1.432	0.050 0.064 0.081 0.124
RADIO 4424 B25_TMO	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.052 2.231 2.417 2.811	1.610 1.772 1.941 2.301	0.086 0.107 0.131 0.188
RADIO 4424 B25_TMO	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.052 2.231 2.417 2.811	1.610 1.772 1.941 2.301	0.086 0.107 0.131 0.188
RADIO 4424 B25_TMO	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.052 2.231 2.417 2.811	1.610 1.772 1.941 2.301	0.086 0.107 0.131 0.188
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.970 2.147 2.331 2.721	1.587 1.749 1.918 2.280	0.073 0.093 0.116 0.170
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.970 2.147 2.331	1.587 1.749 1.918	0.073 0.093 0.116

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.721	2.280	0.170
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.970 2.147 2.331 2.721	1.587 1.749 1.918 2.280	0.073 0.093 0.116 0.170
Platform Mount [LP 1202-1_HR-1]	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	29.240 35.360 41.260 52.600	29.240 35.360 41.260 52.600	3.704 4.488 5.380 7.494
*									
(2) BXA-171063/12CF w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.029 5.583 6.103 7.166	5.289 6.459 7.348 9.148	0.041 0.087 0.140 0.273
(2) BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.029 5.583 6.103 7.166	5.289 6.459 7.348 9.148	0.041 0.087 0.140 0.273
(2) BXA-171063/12CF w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.029 5.583 6.103 7.166	5.289 6.459 7.348 9.148	0.041 0.087 0.140 0.273
(2) BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
(2) BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
(2) BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
RRH2X40-AWS	A	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
RRH2X40-AWS	B	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
RRH2X40-AWS	C	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
RRFDC-3315-PF-48	A	From Leg	1.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.364 3.597 3.838 4.343	2.192 2.395 2.606 3.049	0.021 0.050 0.082 0.158
RRFDC-3315-PF-48	C	From Leg	1.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.364 3.597 3.838 4.343	2.192 2.395 2.606 3.049	0.021 0.050 0.082 0.158
Platform Mount [LP 303-1]	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice	14.690 18.010 21.340	14.690 18.010 21.340	1.250 1.569 1.942

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*						2" Ice	28.080	28.080	2.852
8225	A	From Leg	4.000 0.000 0.000	0.000	76.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.894 1.060 1.230 1.590	0.894 1.060 1.230 1.590	0.001 0.009 0.018 0.046
Side Arm Mount [SO 702-1]	A	From Leg	1.500 0.000 0.000	0.000	76.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.310 0.370 0.445 0.595	0.745 1.035 1.325 1.905	0.014 0.021 0.029 0.045
*									

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

Comb. No.	Description
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.285	0.182	0.105
			Max. Mx	20	-7.479	297.060	-0.437
			Max. My	2	-7.469	-0.436	297.541
			Max. Vy	20	-14.924	297.060	-0.437
			Max. Vx	2	-14.955	-0.436	297.541
			Max. Torque	4			0.193
L2	123.17 - 84.877	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.748	0.182	0.105
			Max. Mx	20	-11.754	908.708	-1.453
			Max. My	2	-11.747	-1.462	910.346
			Max. Vy	20	-18.018	908.708	-1.453
			Max. Vx	2	-18.049	-1.462	910.346
			Max. Torque	4			0.191
L3	84.877 - 43.587	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.728	0.047	0.443
			Max. Mx	20	-18.792	1714.750	-2.522
			Max. My	2	-18.790	-2.566	1717.044
			Max. Vy	20	-22.060	1714.750	-2.522
			Max. Vx	2	-22.066	-2.566	1717.044
			Max. Torque	6			0.484
L4	43.587 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.242	-0.211	0.591
			Max. Mx	20	-29.834	2905.309	-3.802
			Max. My	2	-29.834	-3.867	2907.924
			Max. Vy	20	-26.415	2905.309	-3.802
			Max. Vx	2	-26.420	-3.867	2907.924
			Max. Torque	6			0.481

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	48.242	-0.004	5.832
	Max. H_x	20	29.868	26.377	-0.025
	Max. H_z	2	29.868	-0.025	26.382
	Max. M_x	2	2907.924	-0.025	26.382
	Max. M_z	8	2905.264	-26.377	0.025
	Max. Torsion	6	0.479	-22.856	13.213
	Min. Vert	5	22.401	-13.210	22.860
	Min. H_x	8	29.868	-26.377	0.025
	Min. H_z	14	29.868	0.025	-26.382
	Min. M_x	14	-2907.741	0.025	-26.382
	Min. M_z	20	-2905.309	26.377	-0.025
	Min. Torsion	18	-0.470	22.856	-13.213

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	24.890	0.000	0.000	-0.070	0.015	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	29.868	0.025	-26.382	-2907.924	-3.867	-0.157
0.9 Dead+1.0 Wind 0 deg - No Ice	22.401	0.025	-26.382	-2854.396	-3.792	-0.156
1.2 Dead+1.0 Wind 30 deg - No Ice	29.868	13.210	-22.860	-2520.263	-1455.954	-0.367
0.9 Dead+1.0 Wind 30 deg - No Ice	22.401	13.210	-22.860	-2473.861	-1429.172	-0.367
1.2 Dead+1.0 Wind 60 deg - No Ice	29.868	22.856	-13.213	-1457.361	-2517.933	-0.479
0.9 Dead+1.0 Wind 60 deg - No Ice	22.401	22.856	-13.213	-1430.516	-2471.620	-0.479
1.2 Dead+1.0 Wind 90 deg - No Ice	29.868	26.377	-0.025	-3.965	-2905.264	-0.459
0.9 Dead+1.0 Wind 90 deg - No Ice	22.401	26.377	-0.025	-3.863	-2851.835	-0.460
1.2 Dead+1.0 Wind 120 deg - No Ice	29.868	22.830	13.169	1450.514	-2514.123	-0.314
0.9 Dead+1.0 Wind 120 deg - No Ice	22.401	22.830	13.169	1423.847	-2467.884	-0.315
1.2 Dead+1.0 Wind 150 deg - No Ice	29.868	13.166	22.835	2516.284	-1449.267	-0.084
0.9 Dead+1.0 Wind 150 deg - No Ice	22.401	13.166	22.835	2470.002	-1422.621	-0.086
1.2 Dead+1.0 Wind 180 deg - No Ice	29.868	-0.025	26.382	2907.741	3.899	0.164
0.9 Dead+1.0 Wind 180 deg - No Ice	22.401	-0.025	26.382	2854.263	3.814	0.163
1.2 Dead+1.0 Wind 210 deg - No Ice	29.868	-13.210	22.860	2520.091	1455.981	0.366
0.9 Dead+1.0 Wind 210 deg - No Ice	22.401	-13.210	22.860	2473.735	1429.190	0.365
1.2 Dead+1.0 Wind 240 deg - No Ice	29.868	-22.856	13.213	1457.199	2517.966	0.470
0.9 Dead+1.0 Wind 240 deg - No Ice	22.401	-22.856	13.213	1430.396	2471.643	0.470
1.2 Dead+1.0 Wind 270 deg - No Ice	29.868	-26.377	0.025	3.802	2905.309	0.452

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 270 deg - No Ice	22.401	-26.377	0.025	3.744	2851.867	0.452
1.2 Dead+1.0 Wind 300 deg - No Ice	29.868	-22.830	-13.169	-1450.688	2514.172	0.315
0.9 Dead+1.0 Wind 300 deg - No Ice	22.401	-22.830	-13.169	-1423.974	2467.919	0.316
1.2 Dead+1.0 Wind 330 deg - No Ice	29.868	-13.166	-22.835	-2516.467	1449.310	0.093
0.9 Dead+1.0 Wind 330 deg - No Ice	22.401	-13.166	-22.835	-2470.136	1422.651	0.094
1.2 Dead+1.0 Ice+1.0 Temp	48.242	0.000	0.000	-0.591	-0.211	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	48.242	0.004	-5.832	-664.173	-0.800	-0.036
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	48.242	2.921	-5.052	-575.596	-332.417	-0.084
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	48.242	5.055	-2.919	-332.986	-575.028	-0.109
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	48.242	5.835	-0.004	-1.321	-663.576	-0.105
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	48.242	5.051	2.913	330.502	-574.385	-0.073
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	48.242	2.914	5.048	573.580	-331.333	-0.021
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	48.242	-0.004	5.832	662.782	0.452	0.036
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	48.242	-2.921	5.052	574.223	332.079	0.084
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	48.242	-5.055	2.919	331.586	574.662	0.109
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	48.242	-5.835	0.004	-0.069	663.229	0.105
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	48.242	-5.051	-2.913	-331.893	574.038	0.073
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	48.242	-2.914	-5.048	-574.972	330.986	0.021
Dead+Wind 0 deg - Service	24.890	0.005	-4.908	-537.420	-0.698	-0.031
Dead+Wind 30 deg - Service	24.890	2.458	-4.253	-465.802	-269.043	-0.071
Dead+Wind 60 deg - Service	24.890	4.252	-2.458	-269.377	-465.293	-0.091
Dead+Wind 90 deg - Service	24.890	4.907	-0.005	-0.793	-536.845	-0.087
Dead+Wind 120 deg - Service	24.890	4.247	2.450	267.983	-464.576	-0.060
Dead+Wind 150 deg - Service	24.890	2.449	4.248	464.933	-267.801	-0.016
Dead+Wind 180 deg - Service	24.890	-0.005	4.908	537.267	0.736	0.031
Dead+Wind 210 deg - Service	24.890	-2.458	4.253	465.650	269.080	0.071
Dead+Wind 240 deg - Service	24.890	-4.252	2.458	269.225	465.330	0.091
Dead+Wind 270 deg - Service	24.890	-4.907	0.005	0.641	536.883	0.087
Dead+Wind 300 deg - Service	24.890	-4.247	-2.450	-268.136	464.614	0.060
Dead+Wind 330 deg - Service	24.890	-2.449	-4.248	-465.086	267.839	0.017

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-24.890	0.000	0.000	24.890	0.000	0.000%
2	0.025	-29.868	-26.382	-0.025	29.868	26.382	0.000%
3	0.025	-22.401	-26.382	-0.025	22.401	26.382	0.000%
4	13.210	-29.868	-22.860	-13.210	29.868	22.860	0.000%
5	13.210	-22.401	-22.860	-13.210	22.401	22.860	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
6	22.856	-29.868	-13.213	-22.856	29.868	13.213	0.000%
7	22.856	-22.401	-13.213	-22.856	22.401	13.213	0.000%
8	26.377	-29.868	-0.025	-26.377	29.868	0.025	0.000%
9	26.377	-22.401	-0.025	-26.377	22.401	0.025	0.000%
10	22.830	-29.868	13.169	-22.830	29.868	-13.169	0.000%
11	22.830	-22.401	13.169	-22.830	22.401	-13.169	0.000%
12	13.166	-29.868	22.835	-13.166	29.868	-22.835	0.000%
13	13.166	-22.401	22.835	-13.166	22.401	-22.835	0.000%
14	-0.025	-29.868	26.382	0.025	29.868	-26.382	0.000%
15	-0.025	-22.401	26.382	0.025	22.401	-26.382	0.000%
16	-13.210	-29.868	22.860	13.210	29.868	-22.860	0.000%
17	-13.210	-22.401	22.860	13.210	22.401	-22.860	0.000%
18	-22.856	-29.868	13.213	22.856	29.868	-13.213	0.000%
19	-22.856	-22.401	13.213	22.856	22.401	-13.213	0.000%
20	-26.377	-29.868	0.025	26.377	29.868	-0.025	0.000%
21	-26.377	-22.401	0.025	26.377	22.401	-0.025	0.000%
22	-22.830	-29.868	-13.169	22.830	29.868	13.169	0.000%
23	-22.830	-22.401	-13.169	22.830	22.401	13.169	0.000%
24	-13.166	-29.868	-22.835	13.166	29.868	22.835	0.000%
25	-13.166	-22.401	-22.835	13.166	22.401	22.835	0.000%
26	0.000	-48.242	0.000	0.000	48.242	0.000	0.000%
27	0.004	-48.242	-5.831	-0.004	48.242	5.832	0.000%
28	2.921	-48.242	-5.052	-2.921	48.242	5.052	0.000%
29	5.055	-48.242	-2.919	-5.055	48.242	2.919	0.000%
30	5.835	-48.242	-0.004	-5.835	48.242	0.004	0.000%
31	5.051	-48.242	2.912	-5.051	48.242	-2.913	0.000%
32	2.914	-48.242	5.048	-2.914	48.242	-5.048	0.000%
33	-0.004	-48.242	5.831	0.004	48.242	-5.832	0.000%
34	-2.921	-48.242	5.052	2.921	48.242	-5.052	0.000%
35	-5.055	-48.242	2.919	5.055	48.242	-2.919	0.000%
36	-5.835	-48.242	0.004	5.835	48.242	-0.004	0.000%
37	-5.051	-48.242	-2.912	5.051	48.242	2.913	0.000%
38	-2.914	-48.242	-5.048	2.914	48.242	5.048	0.000%
39	0.005	-24.890	-4.908	-0.005	24.890	4.908	0.000%
40	2.458	-24.890	-4.253	-2.458	24.890	4.253	0.000%
41	4.252	-24.890	-2.458	-4.252	24.890	2.458	0.000%
42	4.907	-24.890	-0.005	-4.907	24.890	0.005	0.000%
43	4.247	-24.890	2.450	-4.247	24.890	-2.450	0.000%
44	2.449	-24.890	4.248	-2.449	24.890	-4.248	0.000%
45	-0.005	-24.890	4.908	0.005	24.890	-4.908	0.000%
46	-2.458	-24.890	4.253	2.458	24.890	-4.253	0.000%
47	-4.252	-24.890	2.458	4.252	24.890	-2.458	0.000%
48	-4.907	-24.890	0.005	4.907	24.890	-0.005	0.000%
49	-4.247	-24.890	-2.450	4.247	24.890	2.450	0.000%
50	-2.449	-24.890	-4.248	2.449	24.890	4.248	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005890
3	Yes	5	0.00000001	0.00001511
4	Yes	7	0.00000001	0.00017442
5	Yes	6	0.00000001	0.00056302
6	Yes	7	0.00000001	0.00017655

7	Yes	6	0.00000001	0.00057095
8	Yes	5	0.00000001	0.00027673
9	Yes	5	0.00000001	0.00010934
10	Yes	7	0.00000001	0.00017515
11	Yes	6	0.00000001	0.00056594
12	Yes	7	0.00000001	0.00017547
13	Yes	6	0.00000001	0.00056719
14	Yes	5	0.00000001	0.00025935
15	Yes	5	0.00000001	0.00010157
16	Yes	7	0.00000001	0.00017666
17	Yes	6	0.00000001	0.00057139
18	Yes	7	0.00000001	0.00017422
19	Yes	6	0.00000001	0.00056225
20	Yes	5	0.00000001	0.00006700
21	Yes	5	0.00000001	0.00002097
22	Yes	7	0.00000001	0.00017596
23	Yes	6	0.00000001	0.00056895
24	Yes	7	0.00000001	0.00017594
25	Yes	6	0.00000001	0.00056889
26	Yes	4	0.00000001	0.00000001
27	Yes	6	0.00000001	0.00038206
28	Yes	6	0.00000001	0.00099505
29	Yes	7	0.00000001	0.00020175
30	Yes	6	0.00000001	0.00038124
31	Yes	6	0.00000001	0.00098793
32	Yes	6	0.00000001	0.00098938
33	Yes	6	0.00000001	0.00038124
34	Yes	7	0.00000001	0.00020146
35	Yes	6	0.00000001	0.00099297
36	Yes	6	0.00000001	0.00038162
37	Yes	6	0.00000001	0.00099856
38	Yes	6	0.00000001	0.00099774
39	Yes	4	0.00000001	0.00060310
40	Yes	5	0.00000001	0.00038547
41	Yes	5	0.00000001	0.00039485
42	Yes	4	0.00000001	0.00060700
43	Yes	5	0.00000001	0.00038431
44	Yes	5	0.00000001	0.00038519
45	Yes	4	0.00000001	0.00060663
46	Yes	5	0.00000001	0.00039500
47	Yes	5	0.00000001	0.00038503
48	Yes	4	0.00000001	0.00060292
49	Yes	5	0.00000001	0.00038818
50	Yes	5	0.00000001	0.00038789

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	150 - 123.17	34.821	40	2.378	0.001
L2	126.337 - 84.877	23.709	40	2.014	0.001
L3	89.127 - 43.587	10.951	40	1.230	0.000
L4	48.92 - 0	3.167	40	0.611	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	40	34.821	2.378	0.001	11085
140.000	(2) BXA-171063/12CF w/ Mount Pipe	40	29.958	2.236	0.001	5542
76.000	8225	40	7.773	0.996	0.000	3337

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.17	187.666	2	12.878	0.006
L2	126.337 - 84.877	127.968	2	10.909	0.004
L3	89.127 - 43.587	59.208	4	6.666	0.002
L4	48.92 - 0	17.142	4	3.310	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	2	187.666	12.878	0.006	2232
140.000	(2) BXA-171063/12CF w/ Mount Pipe	2	161.554	12.111	0.005	1113
76.000	8225	4	42.046	5.396	0.002	628

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 123.17 (1)	TP21.15x15x0.188	26.830	0.000	0.0	12.043	-7.464	704.532	0.011
L2	123.17 - 84.877 (2)	TP29.42x20.049x0.25	41.460	0.000	0.0	22.384	-11.744	1309.470	0.009
L3	84.877 - 43.587 (3)	TP38.26x27.959x0.313	45.540	0.000	0.0	36.443	-18.788	2131.900	0.009
L4	43.587 - 0 (4)	TP47.5x36.429x0.313	48.920	0.000	0.0	46.804	-29.834	2738.040	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 123.17 (1)	TP21.15x15x0.188	297.774	359.820	0.828	0.000	359.820	0.000
L2	123.17 - 84.877 (2)	TP29.42x20.049x0.25	911.167	920.775	0.990	0.000	920.775	0.000
L3	84.877 - 43.587 (3)	TP38.26x27.959x0.313	1718.667	1928.883	0.891	0.000	1928.883	0.000
L4	43.587 - 0 (4)	TP47.5x36.429x0.313	2910.592	2904.417	1.002	0.000	2904.417	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 123.17 (1)	TP21.15x15x0.188	14.970	211.360	0.071	0.191	374.575	0.001
L2	123.17 - 84.877 (2)	TP29.42x20.049x0.25	18.065	392.842	0.046	0.188	970.492	0.000
L3	84.877 - 43.587 (3)	TP38.26x27.959x0.313	22.088	639.570	0.035	0.369	2057.892	0.000
L4	43.587 - 0 (4)	TP47.5x36.429x0.313	26.441	821.412	0.032	0.367	3394.442	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.17 (1)	0.011	0.828	0.000	0.071	0.001	0.843 ✔	1.050	4.8.2 ✔
L2	123.17 - 84.877 (2)	0.009	0.990	0.000	0.046	0.000	1.001 ✔	1.050	4.8.2 ✔
L3	84.877 - 43.587 (3)	0.009	0.891	0.000	0.035	0.000	0.901 ✔	1.050	4.8.2 ✔
L4	43.587 - 0 (4)	0.011	1.002	0.000	0.032	0.000	1.014 ✔	1.050	4.8.2 ✔

Section Capacity Table

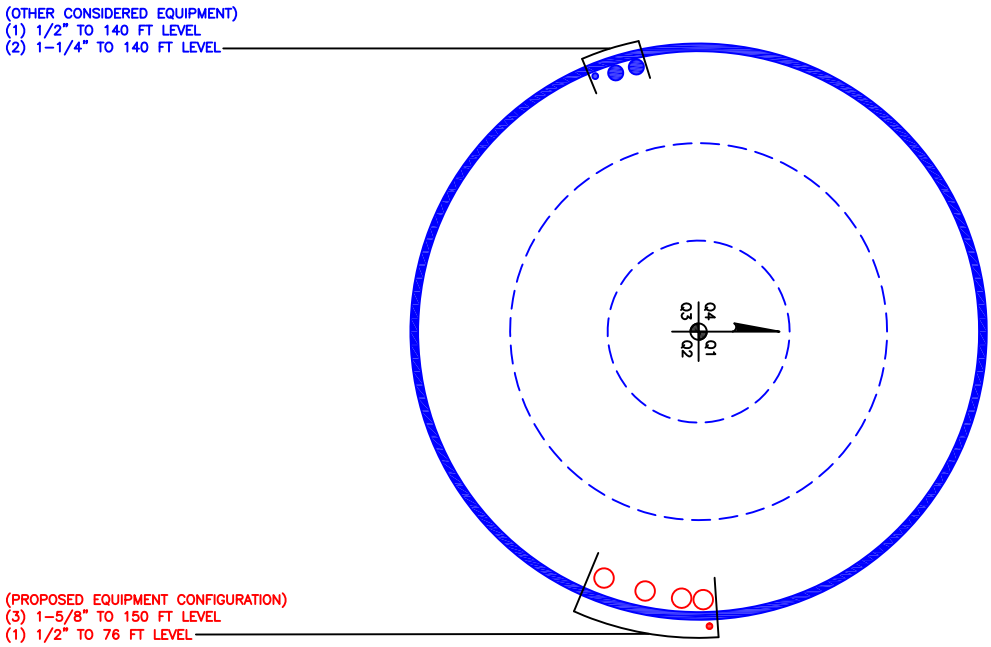
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 123.17	Pole	TP21.15x15x0.188	1	-7.464	739.759	80.3	Pass
L2	123.17 - 84.877	Pole	TP29.42x20.049x0.25	2	-11.744	1374.943	95.3	Pass
L3	84.877 - 43.587	Pole	TP38.26x27.959x0.313	3	-18.788	2238.495	85.8	Pass
L4	43.587 - 0	Pole	TP47.5x36.429x0.313	4	-29.834	2874.942	96.6	Pass
							Summary	
						Pole (L4)	96.6	Pass
						RATING =	**96.6**	**Pass**

Program Version 8.0.7.5

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876374

APPENDIX C

ADDITIONAL CALCULATIONS

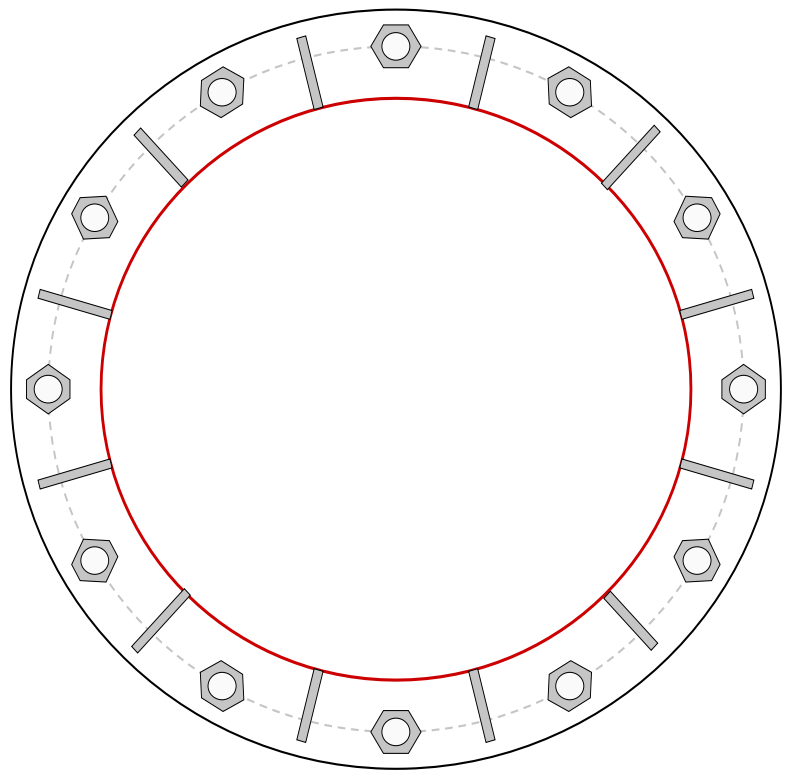
Monopole Base Plate Connection

Site Info	
BU #	876374
Site Name	VANA LAKE / JONES/SSU
Order #	538778, Rev# 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.75

Applied Loads	
Moment (kip-ft)	2910.59
Axial Force (kips)	29.83
Shear Force (kips)	26.44

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 56" BC

Base Plate Data

62" OD x 1.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(12) 18"H x 6"W x 0.75"T, Notch: 0.75"
plate: Fy= 60 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" groove, 45° dbl bevel, 0.25" fillet
vert. weld: 0.25" fillet

Pole Data

47.5" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_c = 210.25	ϕPn_c = 268.39	**Stress Rating**
Vu = 2.2	ϕVn = 120.77	**74.6%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	41.64	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**73.4%**	**Pass**

Stiffener Summary

Horizontal Weld:	**62.6%**	**Pass**
Vertical Weld:	**69.4%**	**Pass**
Plate Flexure+Shear:	**15.7%**	**Pass**
Plate Tension+Shear:	**60.8%**	**Pass**
Plate Compression:	**61.2%**	**Pass**

Pole Summary

Punching Shear:	**15.0%**	**Pass**

Pier and Pad Foundation

BU # :	876374
Site Name:	OSCAWANA LAKE
App. Number:	538778, Rev# 1

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	30	kips
Base Shear, Vu_comp:	26	kips
Moment, M_u:	2911	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	33	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties

Depth, **D**:	6	ft
Pad Width, W_1:	21	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	23	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

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

Soil Properties

Total Soil Unit Weight, **γ**:	125	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, **ϕ**:	32	degrees
SPT Blow Count, N_{blows}:	50	
Base Friction, **μ**:		
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	90.43	26.00	**27.4%**	**Pass**
Bearing Pressure (ksf)	9.00	5.95	**66.1%**	**Pass**
*Overturning (kip*ft)*	3476.20	3099.50	**89.2%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	4326.31	3015.00	**66.4%**	**Pass**
Pier Compression (kip)	31187.52	65.28	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	2523.58	1457.96	**55.0%**	**Pass**
Pad Shear - 1-way (kips)	753.06	273.07	**34.5%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3784.61	1809.00	**45.5%**	**Pass**

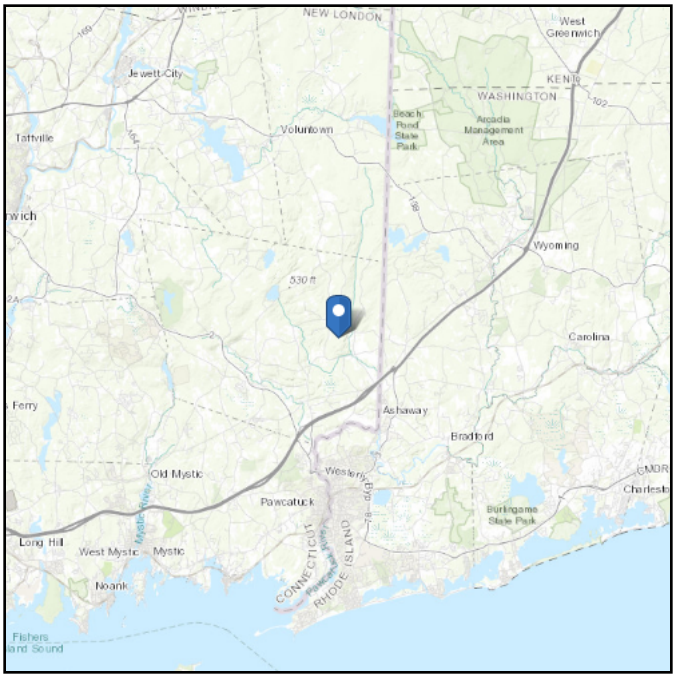
**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**89.2%**
Structural Rating*:	**66.4%**

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	233.63 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.464789
Soil Class:	D - Stiff Soil	**Longitude:**	-71.826283



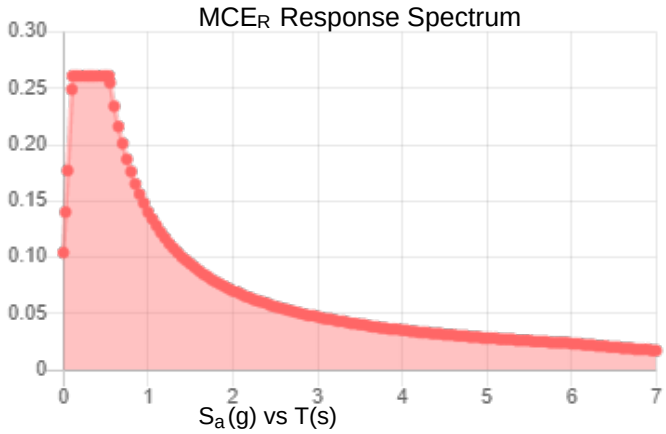
Seismic

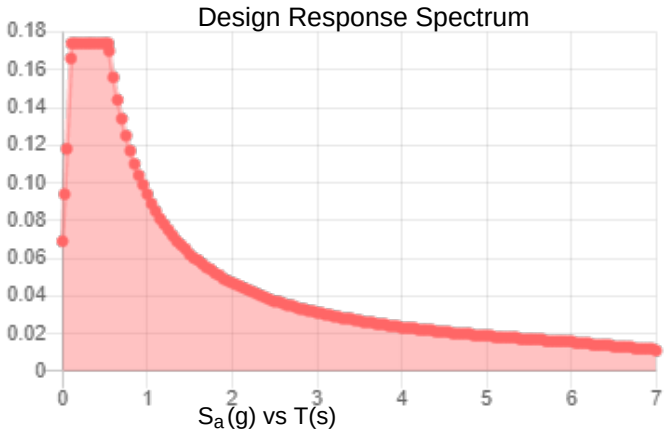
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.163	S_{DS} :	0.174
S_1 :	0.059	S_{D1} :	0.094
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.082
S_{MS} :	0.261	PGA_M :	0.13
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Feb 05 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Feb 05 2021

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

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

Exhibit E

Mount Analysis

Date: **February 1, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**Sprint PCS Retain**	
	Carrier Site Number:	CTNL048A
	Carrier Site Name:	CTNL048A
Crown Castle Designation:	**Crown Castle BU Number:**	876374
	Crown Castle Site Name:	OSCAWANA LAKE / JONES/ SSUSA
	Crown Castle JDE Job Number:	628853
	Crown Castle Order Number:	538778 Rev. 0
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B	
Site Data:	**31F Clarks Falls Road**, **North Stonington**, **New London County**, **CT**, **06359** **Latitude 41°27'53.24", Longitude -71°49'34.62"**	
Structure Information:	**Tower Height & Type:**	**150.0 ft Monopole**
	Mount Elevation:	**150.0 ft**
	Mount Type:	**14.0 ft Platform**

Dear Darcy Tarr,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of Sprint PCS'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.

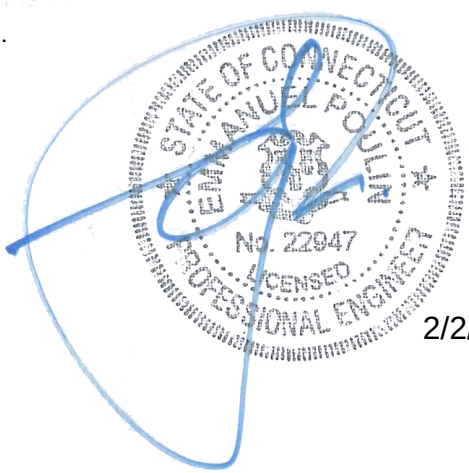
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficient - 77.2%**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code and Appendix N based upon an ultimate 3-second gust wind speed of 135 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jacques S. Grimaldi, M.S., P.E.

Respectfully Submitted by:
Emmanuel Poulin, P.E.
518-690-0790
structural@infinigy.com
CT PE License No. 22947



2/2/21

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 14.0 ft Platform, designed by Engineered Endeavors Incorporated.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code and Appendix N
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	135 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.163
Seismic S_1:	0.059
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 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
150.0	152.0	3	Ericsson	AIR6449 B41_T-MOBILE	14.0 ft Platform
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4415 B66A	
		3	Ericsson	RADIO 4424 B25_TMO	
		3	Ericsson	RADIO 4449 B71 B85A_ T-MOBILE	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Sprint PCS Application	538778 Rev. 0	CCI Sites
Loading Document	Sprint PCS	RFDS Version: 1	TSA
Tower Manufacturer Drawings	Engineered Endeavors Incorporated	1630181	CCI Sites
Previous Mount Analysis	Infinigy Engineering	7576917	CCI Sites

3.1) Analysis Method

RISA-3D (Version 19.0.1), 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.

Infinigy Mount Analysis Tool V2.1.4, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

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) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
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 Engineering, PLLC 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, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP2	150.0	67.6	Pass
	Horizontal(s)	M14		41.0	Pass
	Handrail(s)	M42		63.1	Pass
	Standoff(s)	M1		77.2	Pass
	Mount Connection(s)	-		8.0	Pass

Structure Rating (max from all components) =	77.2%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in “Appendix D - Additional Calculations” for detailed mount connection calculations.

4.1) Recommendations

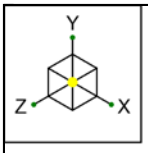
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

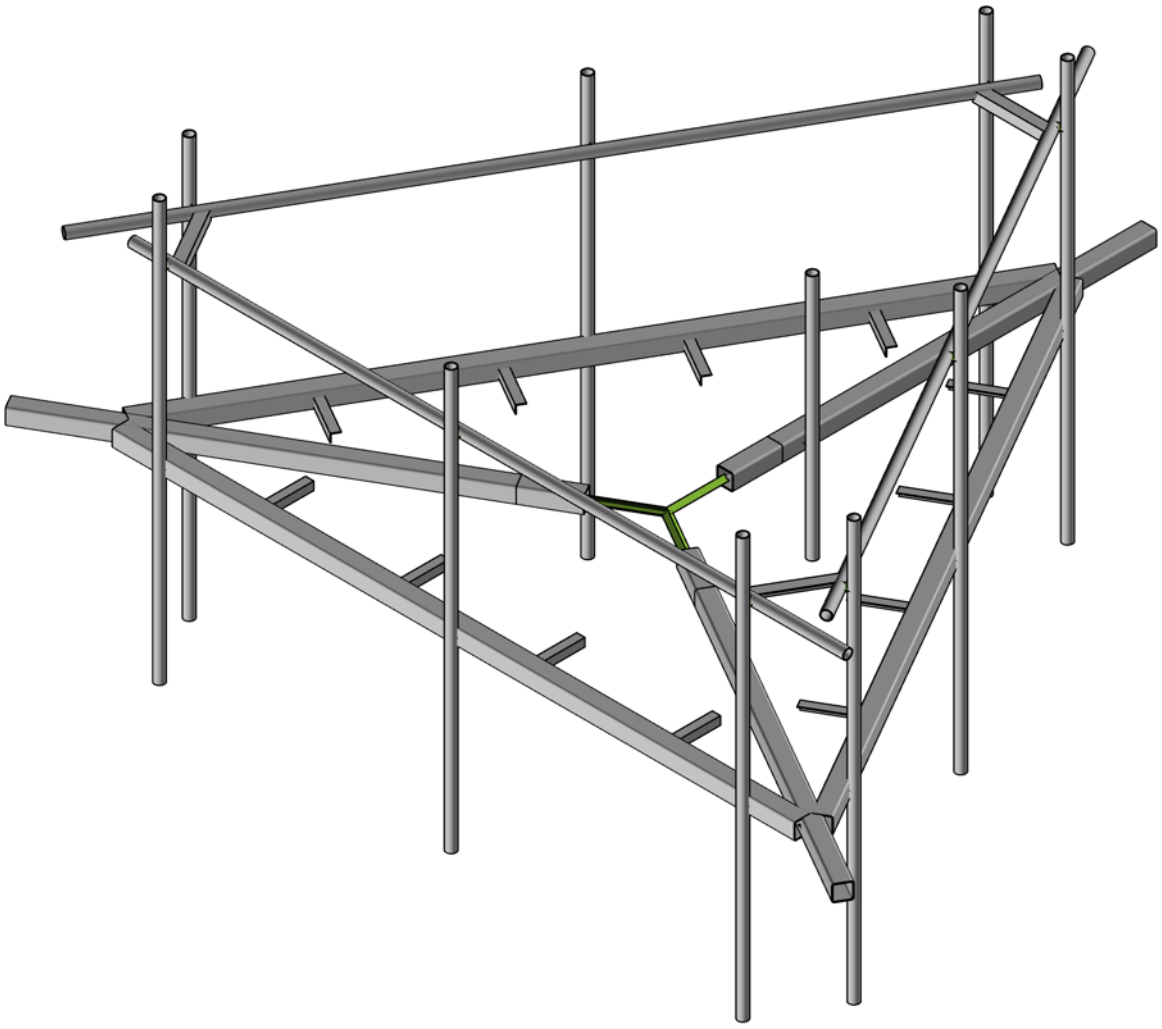
1. Installation of proposed Site Pro 1 HRK14 handrail kit.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS





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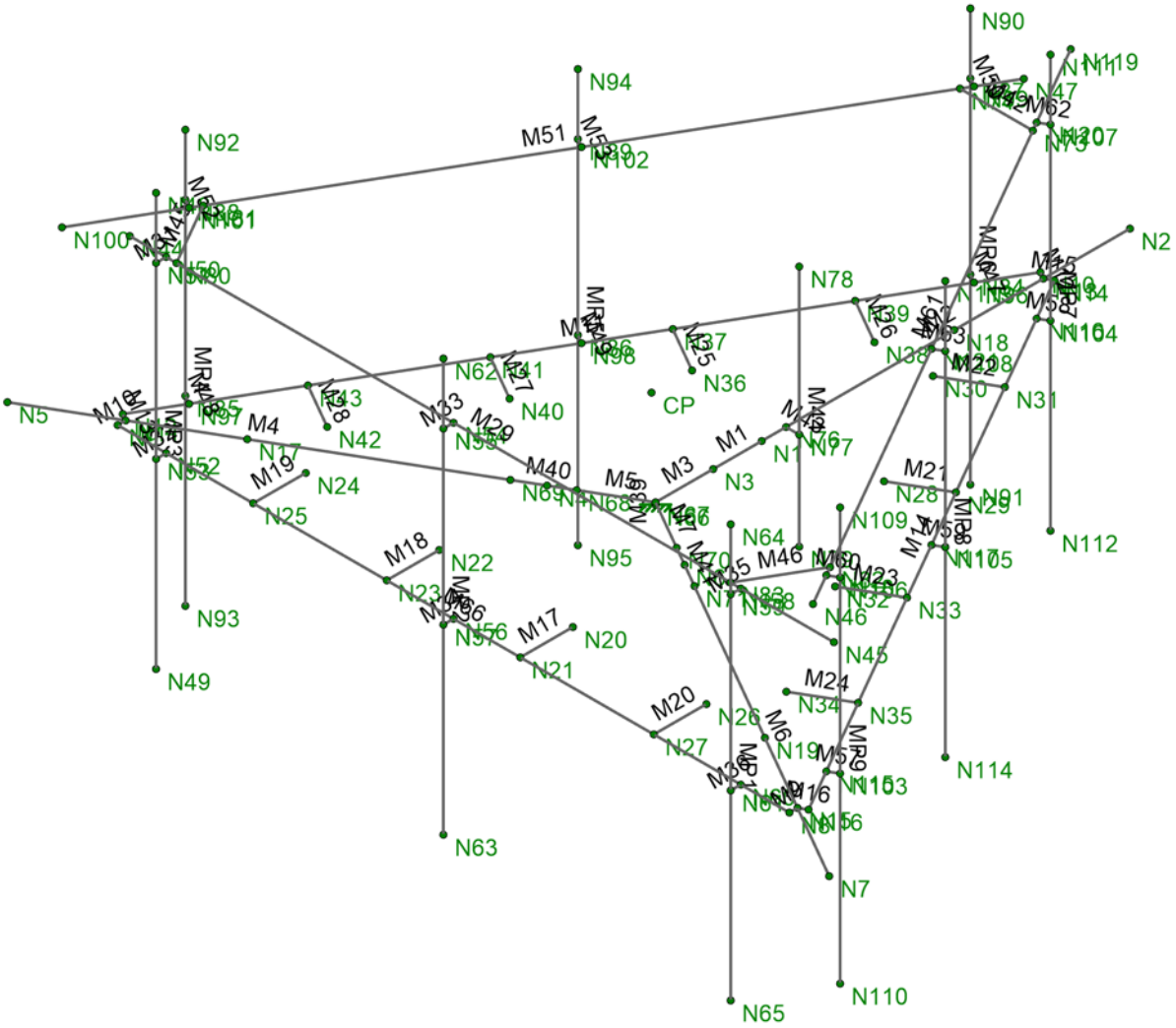
JG		Feb 01, 2021
1039-Z0001-B		876374_loaded.r3d



Infinigy Engineering, PLLC	876374	Wireframe
JG		Feb 01, 2021
1039-Z0001-B		876374_loaded.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	Sprint PCS
Engineer:	Jacques Grimaldi

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil	
Ground Elevation:	233.63	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	150.0	ft
Tower Height AGL:	150.0	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.95	
Ground Ele. Factor (K_e):	0.99	*Rev H Only
Rooftop Speed-Up (K_s):	1.00	*Rev H Only
Topographic Factor (K_{zt}):	1.00	
Gust Effect Factor (G_h):	1.0	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	135	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1.5	in
Flat Pressure:	121.16	psf
Round Pressure:	72.70	psf
Ice Wind Pressure:	9.97	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.163	g
1-Second Accel. (S_1):	0.059	g
Short-Period Design (S_{DS}):	0.17	
1-Second Design (S_{D1}):	0.09	
Short-Period Coeff. (F_a):	1.60	
1-Second Coeff. (F_v):	2.40	
Amplification Factor (a_p):	1.00	
Response Mod. (R_p):	2.50	
Overstrength (Ω_o):	1.00	

INFINIGY

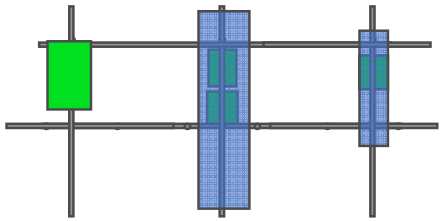
FROM ZERO TO INFINIGY

the solutions are endless

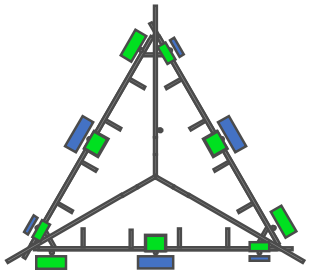
Infinigy Load Calculator V2.1.4

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.4

APPURTENANCE INFORMATION

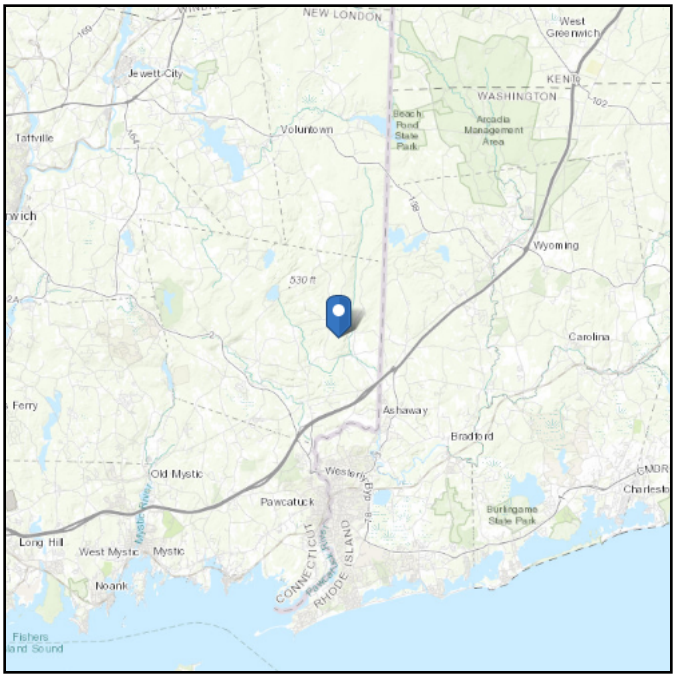
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
ERICSSON AIR6449 B41_T-MOBILE	152.0	3	0.90	60.75	5.66	2.48	309.41	135.40	114.63	9.97	MP3
RFS/CELWAVE APX16DWV-16DWV-S-E-A20	152.0	3	0.90	60.75	6.26	1.50	342.26	82.01	40.70	3.54	MP1
RFS/CELWAVE APXVAALL24_43-U-NA20_TMO	152.0	3	0.90	60.75	14.67	5.32	802.08	290.87	149.90	13.03	MP2
ERICSSON RADIO 4415 B66A	152.0	3	0.90	60.75	1.86	0.87	101.49	47.57	49.60	4.31	MP1
ERICSSON RADIO 4424 B25_TMO	152.0	3	0.90	60.75	2.05	1.61	112.19	88.04	86.00	7.48	MP2
ERICSSON RADIO 4449 B71 B85A_T-MOBILE	152.0	3	0.90	60.75	1.97	1.59	107.71	86.74	73.21	6.36	MP2

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 233.63 ft (NAVD 88)
Latitude: 41.464789
Longitude: -71.826283



Wind

Results:

Wind Speed:	135 Vmph
10-year MRI	80 Vmph
25-year MRI	90 Vmph
50-year MRI	100 Vmph
100-year MRI	110 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: Sun Jan 31 2021

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.

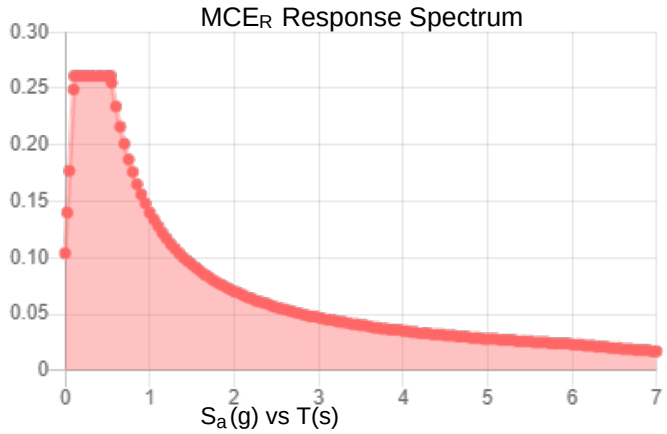
Seismic

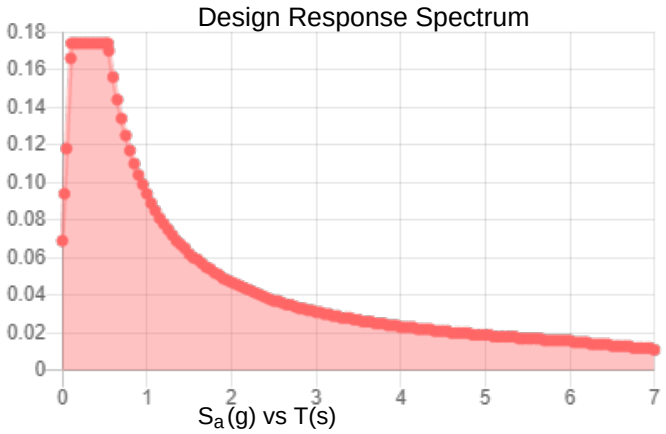
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.163	S_{DS} :	0.174
S_1 :	0.059	S_{D1} :	0.094
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.082
S_{MS} :	0.261	PGA_M :	0.13
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Sun Jan 31 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Sun Jan 31 2021

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.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N3	N1		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
2	M2	N1	N2		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
3	M3	N67	N3		RIGID	None	None	RIGID	Typical
4	M4	N69	N5		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
5	M5	N67	N68		RIGID	None	None	RIGID	Typical
6	M6	N71	N7		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
7	M7	N67	N70		RIGID	None	None	RIGID	Typical
8	M9	N15	N8		RIGID	None	None	RIGID	Typical
9	M10	N11	N9		RIGID	None	None	RIGID	Typical
10	M11	N10	N12		Horizontal	Beam	Tube	A500 Gr.B Rect	Typical
11	M12	N13	N10		RIGID	None	None	RIGID	Typical
12	M13	N11	N12		RIGID	None	None	RIGID	Typical
13	M14	N14	N16		Horizontal	Beam	Tube	A500 Gr.B Rect	Typical
14	M15	N13	N14		RIGID	None	None	RIGID	Typical
15	M16	N15	N16		RIGID	None	None	RIGID	Typical
16	M17	N20	N21	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
17	M18	N22	N23	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
18	M19	N24	N25	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
19	M20	N26	N27	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
20	M21	N28	N29	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
21	M22	N30	N31	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
22	M23	N32	N33	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
23	M24	N34	N35	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
24	M25	N36	N37	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
25	M26	N38	N39	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
26	M27	N40	N41	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
27	M28	N42	N43	90	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
28	M29	N45	N44		Handrail	Beam	Pipe	A53 Gr.B	Typical
29	MP3	N48	N49		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
30	M31	N50	N51		RIGID	None	None	RIGID	Typical
31	M32	N52	N53		RIGID	None	None	RIGID	Typical
32	M33	N54	N55		RIGID	None	None	RIGID	Typical
33	M34	N56	N57		RIGID	None	None	RIGID	Typical
34	M35	N58	N59		RIGID	None	None	RIGID	Typical
35	M36	N60	N61		RIGID	None	None	RIGID	Typical
36	MP2	N62	N63		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
37	MP1	N64	N65		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
38	M39	N66	N67		RIGID	None	None	RIGID	Typical
39	M40	N68	N69		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
40	M41	N70	N71		Standoff	Beam	Tube	A500 Gr.B Rect	Typical
41	M42	N74	N73	180	Corner Angle	HBrace	Single Angle	A36 Gr.36	Typical
42	M43	N76	N77		RIGID	None	None	RIGID	Typical
43	M44	N78	N79		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
44	M45	N80	N81	180	Corner Angle	HBrace	Single Angle	A36 Gr.36	Typical
45	M46	N82	N83	180	Corner Angle	HBrace	Single Angle	A36 Gr.36	Typical
46	M47	N96	N84		RIGID	None	None	RIGID	Typical
47	M48	N97	N85		RIGID	None	None	RIGID	Typical
48	M49	N98	N86		RIGID	None	None	RIGID	Typical
49	M50	N99	N87		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
50	M51	N100	N47		Handrail	Beam	Pipe	A53 Gr.B	Typical
51	M52	N101	N88		RIGID	None	None	RIGID	Typical
52	M53	N102	N89		RIGID	None	None	RIGID	Typical
53	MP6	N90	N91		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
54	MP4	N92	N93		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
55	MP5	N94	N95		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
56	M57	N115	N103		RIGID	None	None	RIGID	Typical
57	M58	N116	N104		RIGID	None	None	RIGID	Typical
58	M59	N117	N105		RIGID	None	None	RIGID	Typical
59	M60	N118	N106		RIGID	None	None	RIGID	Typical
60	M61	N119	N46		Handrail	Beam	Pipe	A53 Gr.B	Typical
61	M62	N120	N107		RIGID	None	None	RIGID	Typical
62	M63	N121	N108		RIGID	None	None	RIGID	Typical
63	MP9	N109	N110		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
64	MP7	N111	N112		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
65	MP8	N113	N114		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
66	M66	N8	N9		Horizontal	Beam	Tube	A500 Gr.B Rect	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		29	103.5	0
3	Total General		29	103.5	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L2x2x3	12	156	31.938
7	A36 Gr.36	L2.5x2.5x3	3	54	13.805
8	A500 Gr.B Rect	HSS4X4X3	3	498	391.846
9	A500 Gr.B Rect	HSS4X4X4	6	309	317.582
10	A53 Gr.B	PIPE_2.0	13	1500	433.854
11	Total HR Steel		37	2517	1189.026

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	Self Weight	DL		-1			36		3
2	Wind Load AZI 0	WLZ					72		
3	Wind Load AZI 30	None					72		
4	Wind Load AZI 60	None					72		
5	Wind Load AZI 90	WLX					72		
6	Wind Load AZI 120	None					72		
7	Wind Load AZI 150	None					72		
8	Wind Load AZI 180	None					72		
9	Wind Load AZI 210	None					72		
10	Wind Load AZI 240	None					72		
11	Wind Load AZI 270	None					72		
12	Wind Load AZI 300	None					72		
13	Wind Load AZI 330	None					72		
14	Distr. Wind Load Z	WLZ						66	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
15	Distr. Wind Load X	WLX						66	
16	Ice Weight	OL1					36	66	3
17	Ice Wind Load AZI 0	OL2					72		
18	Ice Wind Load AZI 30	None					72		
19	Ice Wind Load AZI 60	None					72		
20	Ice Wind Load AZI 90	OL3					72		
21	Ice Wind Load AZI 120	None					72		
22	Ice Wind Load AZI 150	None					72		
23	Ice Wind Load AZI 180	None					72		
24	Ice Wind Load AZI 210	None					72		
25	Ice Wind Load AZI 240	None					72		
26	Ice Wind Load AZI 270	None					72		
27	Ice Wind Load AZI 300	None					72		
28	Ice Wind Load AZI 330	None					72		
29	Distr. Ice Wind Load Z	OL2						66	
30	Distr. Ice Wind Load X	OL3						66	
31	Seismic Load Z	ELZ			-0.087		36		
32	Seismic Load X	ELX	-0.087				36		
33	Service Live Loads	LL				1			
34	Maintenance Load 1	LL				1			
35	Maintenance Load 2	LL				1			
36	Maintenance Load 3	LL				1			
37	Maintenance Load 4	LL				1			
38	Maintenance Load 5	LL				1			
39	Maintenance Load 6	LL				1			
40	Maintenance Load 7	LL				1			
41	Maintenance Load 8	LL				1			
42	Maintenance Load 9	LL				1			
43	BLC 1 Transient Area Loads	None						51	
44	BLC 16 Transient Area Loads	None						51	

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.235	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.235	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.235	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.235	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.235	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.235	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.235	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.235	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.235	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.235	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.235	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.235	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.865	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.865	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.865	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.865	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.865	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.865	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.865	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.865	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.865	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.865	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.865	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.865	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.198	14	0.198	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.198	14	0.171	15	0.099	33	1.5

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.198	14	0.099	15	0.171	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.198	14		15	0.198	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.198	14	-0.099	15	0.171	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.198	14	-0.171	15	0.099	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.198	14	-0.198	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.198	14	-0.171	15	-0.099	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.198	14	-0.099	15	-0.171	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.198	14		15	-0.198	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.198	14	0.099	15	-0.171	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.198	14	0.171	15	-0.099	33	1.5
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.049	14	0.049	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.049	14	0.043	15	0.025
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.049	14	0.025	15	0.043
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.049	14		15	0.049
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.049	14	-0.025	15	0.043
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.049	14	-0.043	15	0.025
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.049	14	-0.049	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.049	14	-0.043	15	-0.025
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.049	14	-0.025	15	-0.043
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.049	14		15	-0.049
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.049	14	0.025	15	-0.043
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.049	14	0.043	15	-0.025
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.049	14	0.049	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.049	14	0.043	15	0.025
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.049	14	0.025	15	0.043
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.049	14		15	0.049
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.049	14	-0.025	15	0.043
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.049	14	-0.043	15	0.025
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.049	14	-0.049	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.049	14	-0.043	15	-0.025
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.049	14	-0.025	15	-0.043
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.049	14		15	-0.049
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.049	14	0.025	15	-0.043
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.049	14	0.043	15	-0.025
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.049	14	0.049	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.049	14	0.043	15	0.025
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.049	14	0.025	15	0.043
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.049	14		15	0.049
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.049	14	-0.025	15	0.043
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.049	14	-0.043	15	0.025
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.049	14	-0.049	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.049	14	-0.043	15	-0.025
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.049	14	-0.025	15	-0.043
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.049	14		15	-0.049
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.049	14	0.025	15	-0.043
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.049	14	0.043	15	-0.025
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.049	14	0.049	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.049	14	0.043	15	0.025

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.049	14	0.025	15	0.043
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.049	14		15	0.049
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.049	14	-0.025	15	0.043
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.049	14	-0.043	15	0.025
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.049	14	-0.049	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.049	14	-0.043	15	-0.025
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.049	14	-0.025	15	-0.043
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.049	14		15	-0.049
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.049	14	0.025	15	-0.043
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.049	14	0.043	15	-0.025
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.049	14	0.049	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.049	14	0.043	15	0.025
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.049	14	0.025	15	0.043
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.049	14		15	0.049
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.049	14	-0.025	15	0.043
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.049	14	-0.043	15	0.025
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.049	14	-0.049	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.049	14	-0.043	15	-0.025
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.049	14	-0.025	15	-0.043
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.049	14		15	-0.049
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.049	14	0.025	15	-0.043
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.049	14	0.043	15	-0.025
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.049	14	0.049	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.049	14	0.043	15	0.025
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.049	14	0.025	15	0.043
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.049	14		15	0.049
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.049	14	-0.025	15	0.043
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.049	14	-0.043	15	0.025
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.049	14	-0.049	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.049	14	-0.043	15	-0.025
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.049	14	-0.025	15	-0.043
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.049	14		15	-0.049
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.049	14	0.025	15	-0.043
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.049	14	0.043	15	-0.025
148	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.049	14	0.049	15	
149	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.049	14	0.043	15	0.025
150	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.049	14	0.025	15	0.043
151	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.049	14		15	0.049
152	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.049	14	-0.025	15	0.043
153	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.049	14	-0.043	15	0.025
154	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.049	14	-0.049	15	
155	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.049	14	-0.043	15	-0.025
156	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.049	14	-0.025	15	-0.043
157	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.049	14		15	-0.049
158	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.049	14	0.025	15	-0.043
159	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.049	14	0.043	15	-0.025
160	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.049	14	0.049	15	
161	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.049	14	0.043	15	0.025
162	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.049	14	0.025	15	0.043

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
163	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.049	14		15	0.049
164	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.049	14	-0.025	15	0.043
165	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.049	14	-0.043	15	0.025
166	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.049	14	-0.049	15	
167	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.049	14	-0.043	15	-0.025
168	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.049	14	-0.025	15	-0.043
169	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.049	14		15	-0.049
170	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.049	14	0.025	15	-0.043
171	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.049	14	0.043	15	-0.025
172	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.049	14	0.049	15	
173	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.049	14	0.043	15	0.025
174	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.049	14	0.025	15	0.043
175	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.049	14		15	0.049
176	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.049	14	-0.025	15	0.043
177	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.049	14	-0.043	15	0.025
178	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.049	14	-0.049	15	
179	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.049	14	-0.043	15	-0.025
180	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.049	14	-0.025	15	-0.043
181	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.049	14		15	-0.049
182	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.049	14	0.025	15	-0.043

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N66	max	6953.765	5	9174.993	34	7066.303	14	7788.084	14	7332.17	23	7554.076	23
2		min	-6953.764	23	2569.705	52	-7066.304	8	-7701.357	20	-7327.516	17	-7542.029	17
3	Totals:	max	6953.765	5	9174.993	34	7066.303	14						
4		min	-6953.764	23	2569.705	52	-7066.304	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	M1	HSS4X4X4	0.772	0	37	0.116	0	z	23	138935.324	139518	16180.5	16180.5	1.116	H1-1b
2	M41	HSS4X4X4	0.765	0	35	0.11	0	y	13	138935.324	139518	16180.5	16180.5	1.114	H1-1b
3	M40	HSS4X4X4	0.764	0	31	0.11	0	y	9	138935.324	139518	16180.5	16180.5	1.114	H1-1b
4	MP2	PIPE_2.0	0.676	56.313	2	0.077	56.313		4	13511.278	32130	1871.625	1871.625	2.129	H1-1b
5	MP5	PIPE_2.0	0.669	56.313	10	0.083	56.313		12	13511.278	32130	1871.625	1871.625	1.685	H1-1b
6	MP8	PIPE_2.0	0.669	56.313	6	0.08	56.313		4	13511.278	32130	1871.625	1871.625	1.685	H1-1b
7	M42	L2.5x2.5x3	0.631	18.011	5	0.1	18.011	y	11	27044.913	29192.4	872.574	1971.83	1.5	H2-1
8	M46	L2.5x2.5x3	0.61	18.011	13	0.097	18.011	y	7	27044.913	29192.4	872.574	1971.83	1.5	H2-1
9	M45	L2.5x2.5x3	0.608	18.011	9	0.097	18.011	y	3	27044.913	29192.4	872.574	1971.83	1.5	H2-1
10	M6	HSS4X4X4	0.571	0	35	0.11	0	y	13	109675.001	139518	16180.5	16180.5	1.72	H1-1b
11	M4	HSS4X4X4	0.57	0	31	0.11	0	y	9	109675.001	139518	16180.5	16180.5	1.719	H1-1b
12	M2	HSS4X4X4	0.57	0	28	0.115	0	z	23	109675.001	139518	16180.5	16180.5	1.722	H1-1b
13	MP6	PIPE_2.0	0.416	56.313	11	0.129	56.313		11	13511.278	32130	1871.625	1871.625	1.958	H1-1b
14	MP9	PIPE_2.0	0.413	56.313	2	0.126	56.313		7	13511.278	32130	1871.625	1871.625	1.32	H1-1b
15	M14	HSS4X4X3	0.41	0	31	0.099	166	z	6	49449.972	106812	12661.5	12661.5	2.517	H1-1b
16	M66	HSS4X4X3	0.409	0	27	0.103	166	z	2	49449.972	106812	12661.5	12661.5	2.518	H1-1b
17	M11	HSS4X4X3	0.409	0	35	0.103	0	z	11	49449.972	106812	12661.5	12661.5	2.517	H1-1b
18	MP7	PIPE_2.0	0.403	56.313	8	0.119	56.313		6	13511.278	32130	1871.625	1871.625	2.104	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
19	MP4	PIPE_2.0	0.402	56.313	12	0.117	56.313		10	13511.278	32130	1871.625	1871.625	2.118	H1-1b
20	MP3	PIPE_2.0	0.402	56.313	12	0.127	56.313		3	13511.278	32130	1871.625	1871.625	2.022	H1-1b
21	MP1	PIPE_2.0	0.391	56.313	4	0.117	56.313		2	13511.278	32130	1871.625	1871.625	1.988	H1-1b
22	M29	PIPE_2.0	0.298	94.25	8	0.261	25.375		13	4678.524	32130	1871.625	1871.625	3	H1-1b
23	M61	PIPE_2.0	0.293	94.25	12	0.274	25.375		5	4678.524	32130	1871.625	1871.625	3	H1-1b
24	M51	PIPE_2.0	0.29	94.25	4	0.264	25.375		9	4678.524	32130	1871.625	1871.625	3	H1-1b
25	M25	L2x2x3	0.036	13	30	0.005	13	z	33	22057.073	23392.8	557.717	1239.29	1.5	H2-1
26	M27	L2x2x3	0.036	13	36	0.005	13	z	34	22057.073	23392.8	557.717	1239.29	1.5	H2-1
27	M21	L2x2x3	0.036	13	36	0.005	13	z	37	22057.073	23392.8	557.717	1239.29	1.5	H2-1
28	M23	L2x2x3	0.036	13	38	0.005	13	z	34	22057.073	23392.8	557.717	1239.29	1.5	H2-1
29	M17	L2x2x3	0.036	13	33	0.005	13	z	32	22057.073	23392.8	557.717	1239.29	1.5	H2-1
30	M18	L2x2x3	0.036	13	33	0.005	13	z	35	22057.073	23392.8	557.717	1239.29	1.5	H2-1
31	M44	PIPE_2.0	0.034	35.625	2	0.004	35.625		2	23808.54	32130	1871.625	1871.625	1.568	H1-1b
32	M24	L2x2x3	0.033	13	35	0.005	13	z	37	22057.073	23392.8	557.717	1239.29	1.5	H2-1
33	M26	L2x2x3	0.033	13	38	0.005	13	z	38	22057.073	23392.8	557.717	1239.29	1.5	H2-1
34	M19	L2x2x3	0.033	13	26	0.005	13	z	38	22057.073	23392.8	557.717	1239.29	1.5	H2-1
35	M20	L2x2x3	0.033	13	37	0.005	13	z	35	22057.073	23392.8	557.717	1239.29	1.5	H2-1
36	M22	L2x2x3	0.033	13	27	0.005	13	z	27	22057.073	23392.8	557.717	1239.29	1.5	H2-1
37	M28	L2x2x3	0.033	13	29	0.005	13	z	35	22057.073	23392.8	557.717	1239.29	1.5	H2-1

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	OSCAWANA LAKE / JONES/ SSUS/
Site Number:	876374
Job Code:	1039-Z0001-B
Connection Description:	Platform to Tower

APPLIED LOADS		
Bolt Tension:	2548.82	lbs
Bolt Shear:	2542.35	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	1	in
Bolt Grade:	A325	-
# of Bolts:	6	-
Threads Excluded?	No	-

BOLT CHECK		
Tensile Strength	54516.96	
Shear Strength	31808.63	
Tensile Usage	4.7%	
Shear Usage	8.0%	
Interaction Check	0.01	***≤1.05***
Result	Pass	

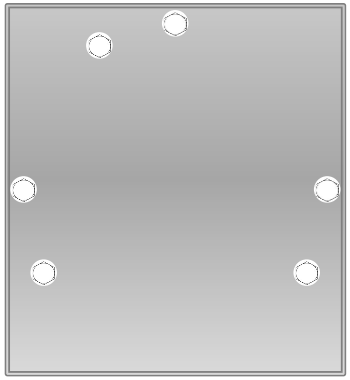


Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNL048A

31F Clarks Falls Road
North Stonington, Connecticut 06359

March 24, 2021

EBI Project Number: 6221001372

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.74%**

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

March 24, 2021

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

Emissions Analysis for Site: CTNL048A -

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **31F Clarks Falls Road** in **North Stonington, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 31F Clarks Falls Road in North Stonington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

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

10) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antenna mounting height centerline of the proposed antennas is 152 feet above ground level (AGL).

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

14) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE %:	**0.79%**	Antenna B1 MPE %:	**0.79%**	Antenna C1 MPE %:	**0.79%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	**3.09%**	Antenna B2 MPE %:	**3.09%**	Antenna C2 MPE %:	**3.09%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	**2.17%**	Antenna B3 MPE %:	**2.17%**	Antenna C3 MPE %:	**2.17%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	6.05%
Sprint	2.66%
Verizon	2.03%
Site Total MPE % :	10.74%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	6.05%
T-Mobile Sector B Total:	6.05%
T-Mobile Sector C Total:	6.05%
Site Total MPE % :	10.74%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	152.0	7.87	2100 MHz LTE	1000	0.79%
T-Mobile 600 MHz LTE	2	591.73	152.0	2.00	600 MHz LTE	400	0.50%
T-Mobile 600 MHz NR	1	1577.94	152.0	2.66	600 MHz NR	400	0.67%
T-Mobile 700 MHz LTE	2	695.22	152.0	2.35	700 MHz LTE	467	0.50%
T-Mobile 1900 MHz GSM	4	1052.26	152.0	7.10	1900 MHz GSM	1000	0.71%
T-Mobile 1900 MHz LTE	2	2104.51	152.0	7.10	1900 MHz LTE	1000	0.71%
T-Mobile 2500 MHz LTE	1	6444.38	152.0	10.87	2500 MHz LTE	1000	1.09%
T-Mobile 2500 MHz NR	1	6444.38	152.0	10.87	2500 MHz NR	1000	1.09%
						Total:	**6.05%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	6.05%
Sector B:	6.05%
Sector C:	6.05%
T-Mobile Maximum MPE % (Sector A):	6.05%
Site Total:	10.74%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.74%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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