



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

August 7, 2020

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

RE: **Notice of Exempt Modification for T-Mobile:
828540 - T-Mobile Site ID: CT11369A
218 Wheeler Road AKA 2 Richard Road, Torrington, CT 06790
Latitude: 41° 46' 50.33" / Longitude: -73° 8' 10.02"**

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 160-foot mount on the existing 160-foot Monopole Tower, located at 218 Wheeler Road AKA 2 Richard Road, Torrington, CT. The tower is owned by Crown Castle and the property is owned by Lucille G. Lefebvre. T-Mobile now intends to replace six (6) existing antennas with three (3) new 1900/2100 MHz antennas and three (3) new 600/700 MHz antennas. T-Mobile also intends to add three (3) new 2500 MHz antennas for a total antenna inventory of twelve (12) antennas. The new antennas will be installed at the 160-ft level of the tower. T-Mobile is also proposing tower mount modifications, as shown on the enclosed mount analysis.

Planned Modifications:

Tower:

Remove:
(12) Coax

Remove and Replace:

(3) LNX 6515DS-A1M Antenna (**REMOVE**) - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz (**REPLACE**)

(3) AIR21 KRC118023-1_B2P_B4A Antenna (**REMOVE**) – (3) AIR32_B66A_B2A Antenna 1900/2100 MHz (**REPLACE**)

(3) RRUS11 B12 (**REMOVE**) – (3) Radio 4449 B71/B12 (**REPLACE**)

Install New:

(3) Hybrid Fiber Line
(3) AIR6449 B41 2500MHz Antennas
(3) RRUS 4415 B25

Existing to Remain:

(3) AIR21 KRC118023-1_B2A_B4P Antenna 1900 MHz
(3) TMA

The Foundation for a Wireless World.

CrownCastle.com

(1) Hybrid Fiber Line

Ground:

Upgrade to existing ground cabinet. (Internally)

Remove and replace one ground cabinet.

The original approval documents were not able to be located at the time of this application. Nonetheless, the Council has approved several exempt modifications for all carriers since the tower came under the Council's jurisdiction. We maintain this modification constitutes an exempt modification regardless of the approval conditions.

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 Elinor Carbone, Mayor for the City of Torrington, Martin Connor, City Planner, Lucille Lefebvre as the property owner and Crown Castle is the tower 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). Please send approval/rejection letter to Attn: Anne Marie Zsamba.

Sincerely,

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

Melanie A. Bachman

Page 3

Attachments

cc:

Elinor Carbone, Mayor (*via email only to Elinor_carbone@torringtonct.org*)
City of Torrington – Mayor’s Office
140 Main Street
Torrington, CT 06790

Martin J. Connor, City Planner (*via email only to martin_connor@torringtonct.org*)
City of Torrington - Planning Department
140 Main Street
Torrington, CT 06790

Lucille G. Lefebvre, Property Owner (*via email only to lorrainefabbri@aol.com*)
264 Cathole Road
Litchfield, CT 06759

Crown Castle, Tower Owner

From: [Zsamba, Anne Marie](#)
To: ["lorrainefabri@aol.com"](mailto:lorrainefabri@aol.com)
Subject: T-Mobile Notice of Exempt Modification - 2 Richard Rd AKA 218 Wheeler Rd, Torrington - 828540
Date: Friday, August 7, 2020 10:15:00 AM
Attachments: [EM-T-MOBILE-2 Richard Rd AKA 218 Wheeler Rd Torrington-828540-CT11369A-notice.pdf](#)

Dear Ms. Lefebvre:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council, today Friday, August 7, 2020.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

CROWN CASTLE
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
CrownCastle.com

From: [Zsamba, Anne Marie](#)
To: ["Elinor_carbone@torringtonct.org"](mailto:Elinor_carbone@torringtonct.org)
Subject: T-Mobile Notice of Exempt Modification - 2 Richard Rd AKA 218 Wheeler Rd, Torrington - 828540
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Dear Mayor Carbone:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council, today Friday, August 7, 2020.

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Dear City Planner Connor:

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CROWN CASTLE
3 Corporate Park Drive, Suite 101
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CrownCastle.com

Exhibit A

Property Card

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2019.



Information on the Property Records for the Municipality of Torrington was last updated on 8/6/2020.

Property Summary Information

Parcel Data And Values Building ▾ Outbuildings Sales Permits

Parcel Information

Location:	RICHARD RD	Property Use:	Vacant Land	Primary Use:	Land with Outbuildings
Unique ID:	15376	Map Block Lot:	235/001/014/2	Acres:	1.62
490 Acres:	0.00	Zone:	R40	Volume / Page:	0428/0999
Developers Map / Lot:	4570/4592	Census:	5		

Value Information

	Appraised Value	Assessed Value
Land	72,671	50,870
Buildings	12,106	8,470

	Appraised Value	Assessed Value
Detached Outbuildings	20,023	14,020
Total	104,800	73,360

Owner's Information

Owner's Data

LEFEBVRE LUCILLE G
DBA VOICESTREAM WIRELESS CORP
PMB 331
4017 WASHINGTON RD

[Back To Search \(JavaScript:window.history.back\(1\);\)](#)

[Print View \(PrintPage.aspx?towncode=143&uniqueid=15376\)](#)

Information Published With Permission From The Assessor

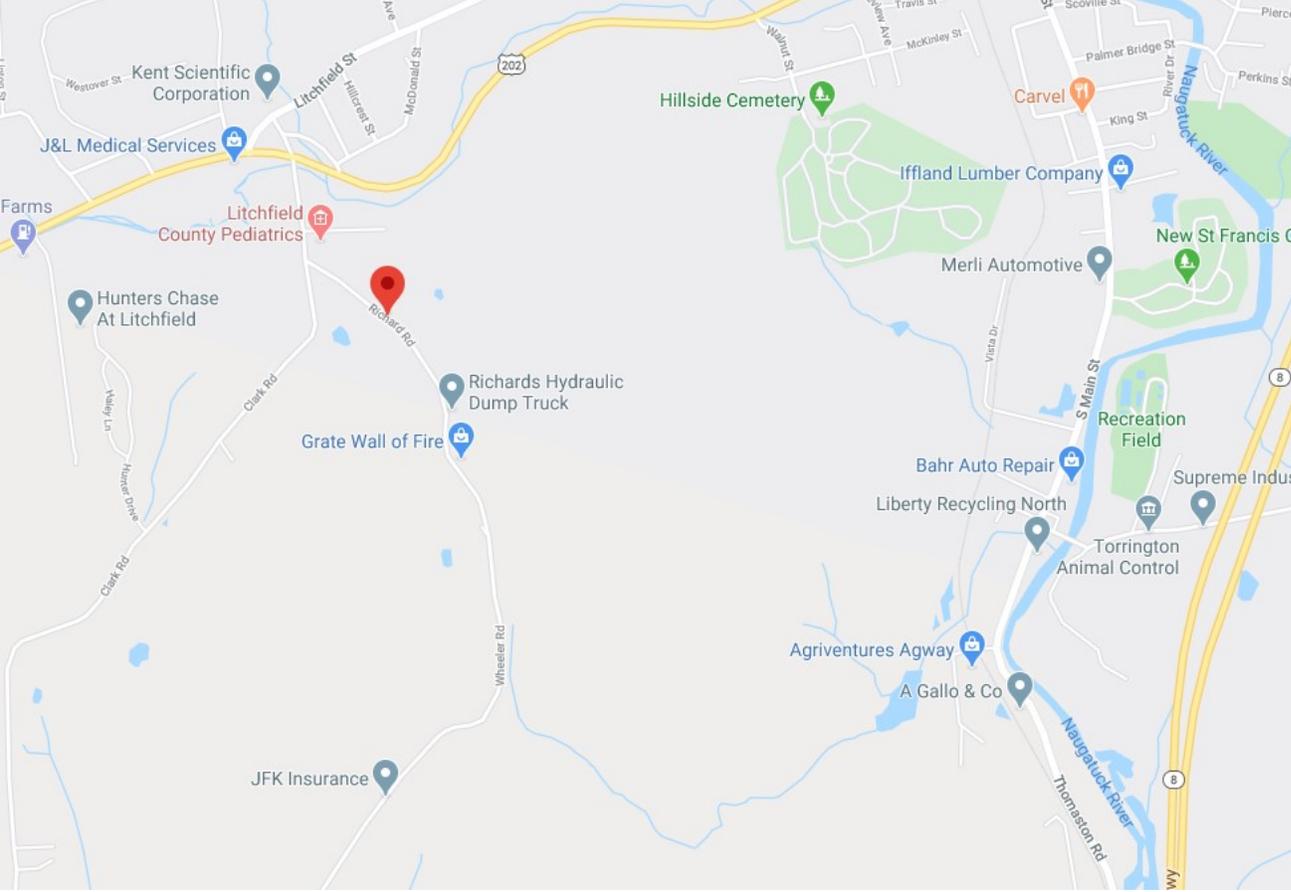


Exhibit B

Construction Drawings

T-MOBILE NORTHEAST LLC

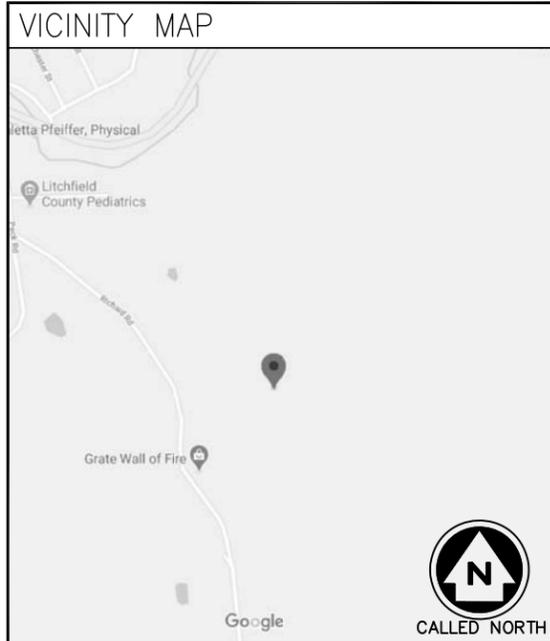
T-MOBILE SITE NUMBER: CT11369A

TORRINGTON/RT 8

CROWN CASTLE BU NUMBER: 828540

218 WHEELER ROAD
TORRINGTON, CT 06790

(67D5A992DB OUTDOOR CONFIGURATION)



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL:
"CALL BEFORE YOU DIG"
WWW.CBYD.COM
CALL 811

CALL THREE WORKING DAYS PRIOR TO DIGGING
SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT ALL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC - RED	SEWER - GREEN	
GAS/OIL - YELLOW	SURVEY - PINK	
TEL/CATV - ORANGE	PROPOSED EXCAVATION - WHITE	
WATER - BLUE	RECLAIMED WATER - PURPLE	

GENERAL NOTES

- THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
- THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
- THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T-MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
- THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
- THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
- THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
- THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
- THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
- THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
- THE CONTRACTOR SHALL NOTIFY THE T-MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T-MOBILE REPRESENTATIVE.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
- THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.

PROJECT SUMMARY

SITE NUMBER:	CT11369A	APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088
SITE NAME:	TORRINGTON/RT 8		
SITE ADDRESS:	218 WHEELER ROAD TORRINGTON, CT 06790	PROJECT MANAGER:	CROWN CASTLE 1200 MACARTHUR BLVD, SUITE 200 MAHWAH, NJ 07430
TOWER OWNER:	CROWN CASTLE 1200 MACARTHUR BLVD, SUITE 200 MAHWAH, NJ 07430	CONTACT:	LORI DEGENOVA (865) 296-8988
CROWN BU NUMBER:	828540	ARCHITECT/ENGINEER:	INFINIGY ENGINEERING 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
LAT./LONG.:	N 41.780620° / W -73.1361520°	CONTACT:	ALEX WELLER 518-690-0790
CONSTRUCTION TYPE:	LTE UPGRADE		

PROJECT DESCRIPTION

- | | | |
|---|---|---|
| <input type="checkbox"/> EXISTING SELF SUPPORT | <input checked="" type="checkbox"/> EXISTING CABINET(S) | <input checked="" type="checkbox"/> OUTDOOR |
| <input type="checkbox"/> EXISTING GUYED TOWER | <input type="checkbox"/> EXISTING RBS 2106 | <input type="checkbox"/> INDOOR |
| <input type="checkbox"/> EXISTING TRANSMISSION TOWER | <input checked="" type="checkbox"/> EXISTING RBS 6131 | <input checked="" type="checkbox"/> EXISTING CONCRETE PAD |
| <input type="checkbox"/> EXISTING WATER TANK | <input type="checkbox"/> EXISTING RBS 6201 | <input type="checkbox"/> EXISTING STEEL PLATFORM |
| <input type="checkbox"/> EXISTING BUILDING | <input type="checkbox"/> EXISTING BATTERY | <input checked="" type="checkbox"/> EXISTING PPC |
| <input checked="" type="checkbox"/> EXISTING MONOPOLE | <input type="checkbox"/> SITE SUPPORT CABINET | <input type="checkbox"/> PANELBOARD |
| <input type="checkbox"/> EXISTING FORT WORTH | <input checked="" type="checkbox"/> GPS | |

T-MOBILE NORTHEAST LLC PROPOSES THE MODIFICATION OF AN UNMANNED WIRELESS BROADBAND FACILITY, INCLUDING:

TOWER SCOPE
REPLACE (6) PANEL ANTENNAS, ADD (3) PANEL ANTENNAS, REPLACE (3) RRUS, ADD (3) RRUS, ADD (3) 6x12 HYBRID CABLES, REMOVE ALL EXISTING COAX, REMOVE EXISTING TMAS, ADD HANDRAIL KIT

GROUND SCOPE
REMOVE EXISTING NORTEL CABINET, ADD (1) B6160 CABINET, ADD (1) B160 CABINET

SHEET INDEX

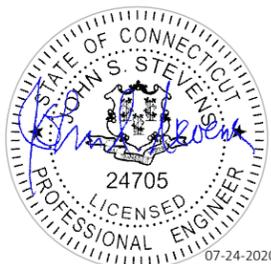
SHEET	DESCRIPTION	REVISION
T-1	TITLE SHEET	C
C-1	SITE PLAN	C
C-2	COMPOUND PLAN & ELEVATION	C
C-3	RF SCHEDULE	C
C-4	EQUIPMENT SPECIFICATIONS	C
C-5	RF SCHEDULE	C
E-1	GROUNDING AND POWER DIAGRAMS	C
E-2	COAX/FIBER PLUMBING DIAGRAM	C
N-1	GENERAL AND ELECTRICAL NOTES	C
S-1	GENERAL NOTES	C
S-2	PLATFORM MODIFICATIONS	C



SUBMITTALS		
DATE	DESCRIPTION	REVISION
04/29/20	FOR REVIEW	A
07/10/20	REVISED SCOPE	B
07/24/20	REVISED PER COMMENTS	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 5039-C0002-C
DRAWN BY: BMM
CHECKED BY: ASW



PROFESSIONAL SEAL

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED.

NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER
CT11369A

SITE NAME
TORRINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

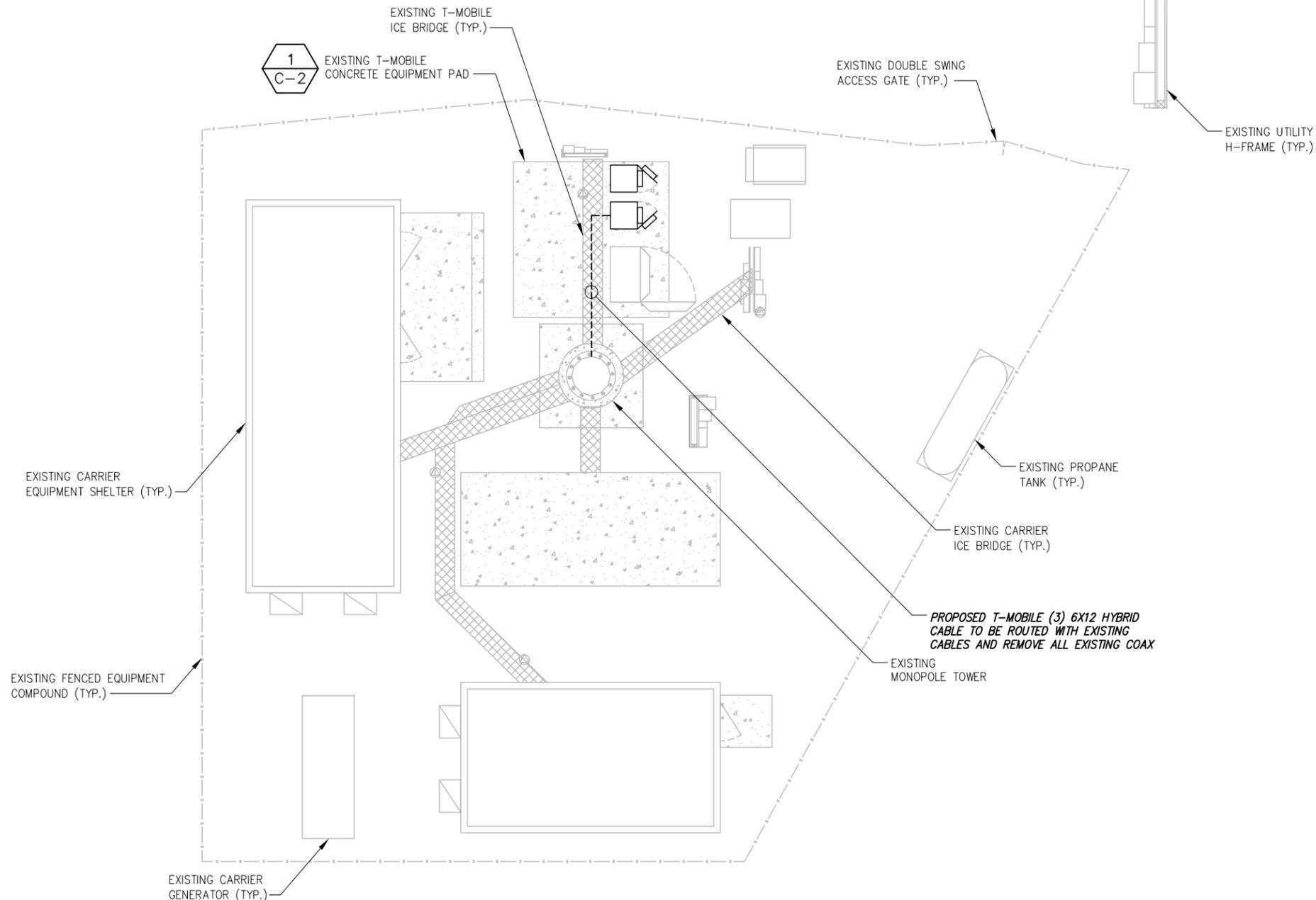
SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

SHEET 1 OF 8 SHEETS



- GENERAL SITE NOTES:**
1. A COMPLETE BOUNDARY SURVEY OF THE HOST PARCEL HAS NOT BEEN PERFORMED BY INFINIGY. BOUNDARY INFORMATION IF SHOWN WAS OBTAINED FROM INFORMATION PROVIDED BY OTHERS. PROPERTY IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
 2. BASEMAPPING INFORMATION BASED ON PROVIDED INFORMATION.
 3. CONTRACTOR TO FIELD VERIFY DIMENSIONS AS NECESSARY BEFORE CONSTRUCTION.
 4. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE SIGNS OF ADVERTISING.
 5. THE PROPOSED DEVELOPMENT IS UNMANNED AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.
 6. NO LANDSCAPING WORK IS PROPOSED IN CONJUNCTION WITH THIS DEVELOPMENT OTHER THAN THAT WHICH IS SHOWN.
 7. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.
 8. UTILITIES SHOWN ON PLAN ARE TAKEN FROM OWNERS RECORDS AND FIELD LOCATION OF VISIBLE SURFACE FEATURES. THE EXISTENCE, EXTENT AND EXACT HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES HAS NOT BEEN VERIFIED. ANY CONTRACTOR PERFORMING WORK ON THIS SITE MUST CONTACT MISS UTILITY AT LEAST 48 HOURS PRIOR TO COMMENCING WORK.
 9. ALL OBSOLETE OR UNUSED FACILITIES SHALL BE REMOVED WITHIN 12 MONTHS OF CESSATION OF OPERATIONS.

SITE LEGEND

- SITE PROPERTY LINE
- STREET OR ROAD
- - - CHAIN LINK FENCE
- OPAQUE WOODEN FENCE
- ⊗ TREES/SHRUBS
- ~ TREE LINE
- ⊗ UTILITY POLE
- (E) EXISTING
- (N) NEW
- (P) PROPOSED
- (F) FUTURE

T-Mobile
 T-MOBILE NORTHEAST LLC
 103 MONARCH DRIVE
 LIVERPOOL, NY 13088

CROWN CASTLE
 CROWN CASTLE
 1200 MACARTHUR BLVD, SUITE 200
 MAHWAH, NJ 07430

INFINIGY
 INFINIGY ENGINEERING, PLLC
 1033 WHEELER ROAD
 ALBANY, NY 12205
 Office # (518) 690-0790
 Fax # (518) 690-0793

SUBMITTALS

DATE	DESCRIPTION	REVISION
04/29/20	FOR REVIEW	A
07/10/20	REVISED SCOPE	B
07/24/20	REVISED PER COMMENTS	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
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ZONING			
OPS			
CONSTR.			
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PROJECT NO: 5039-C0002-C
 DRAWN BY: BMM
 CHECKED BY: ASW



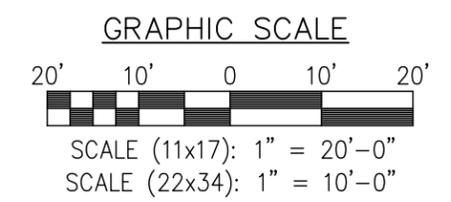
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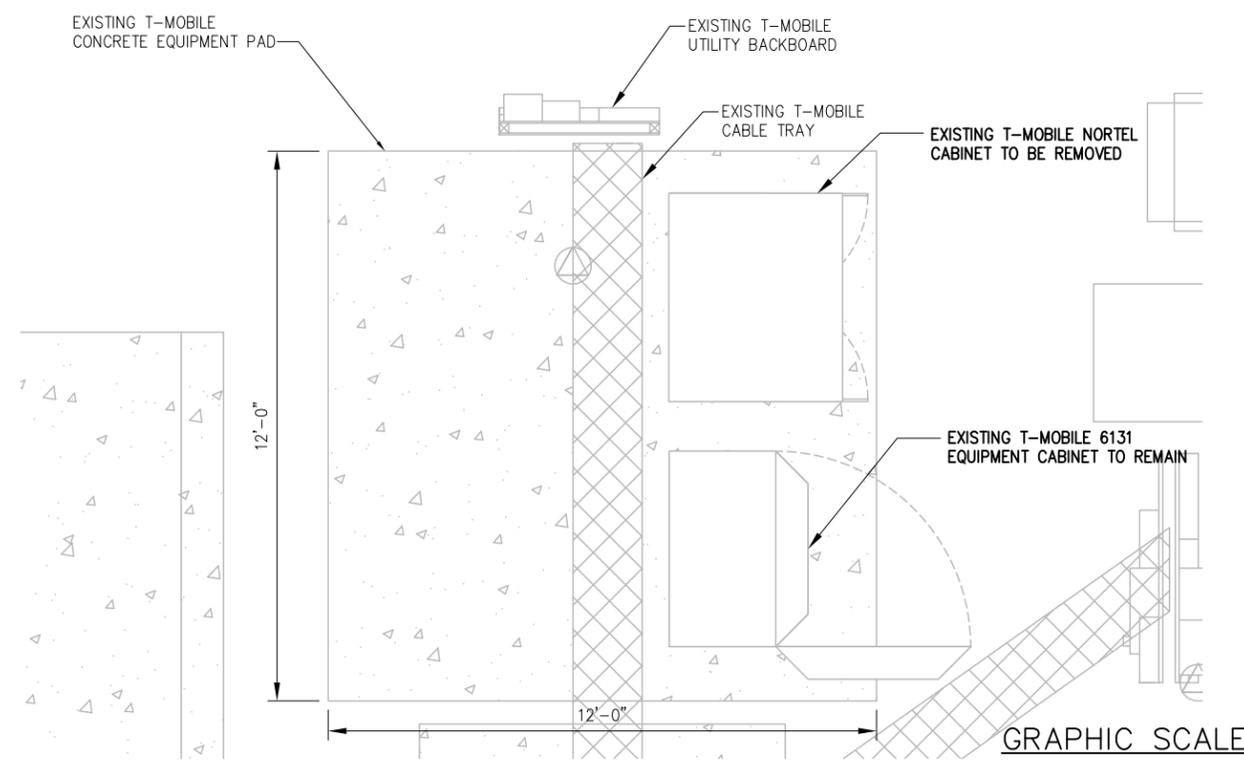
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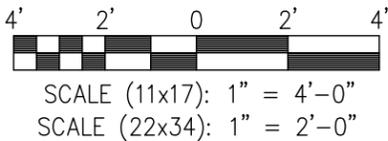
SHEET TITLE
SITE PLAN

SHEET NUMBER
C-1
 SHEET 2 OF 8 SHEETS





1 EXISTING EQUIPMENT PLAN
SCALE: AS NOTED

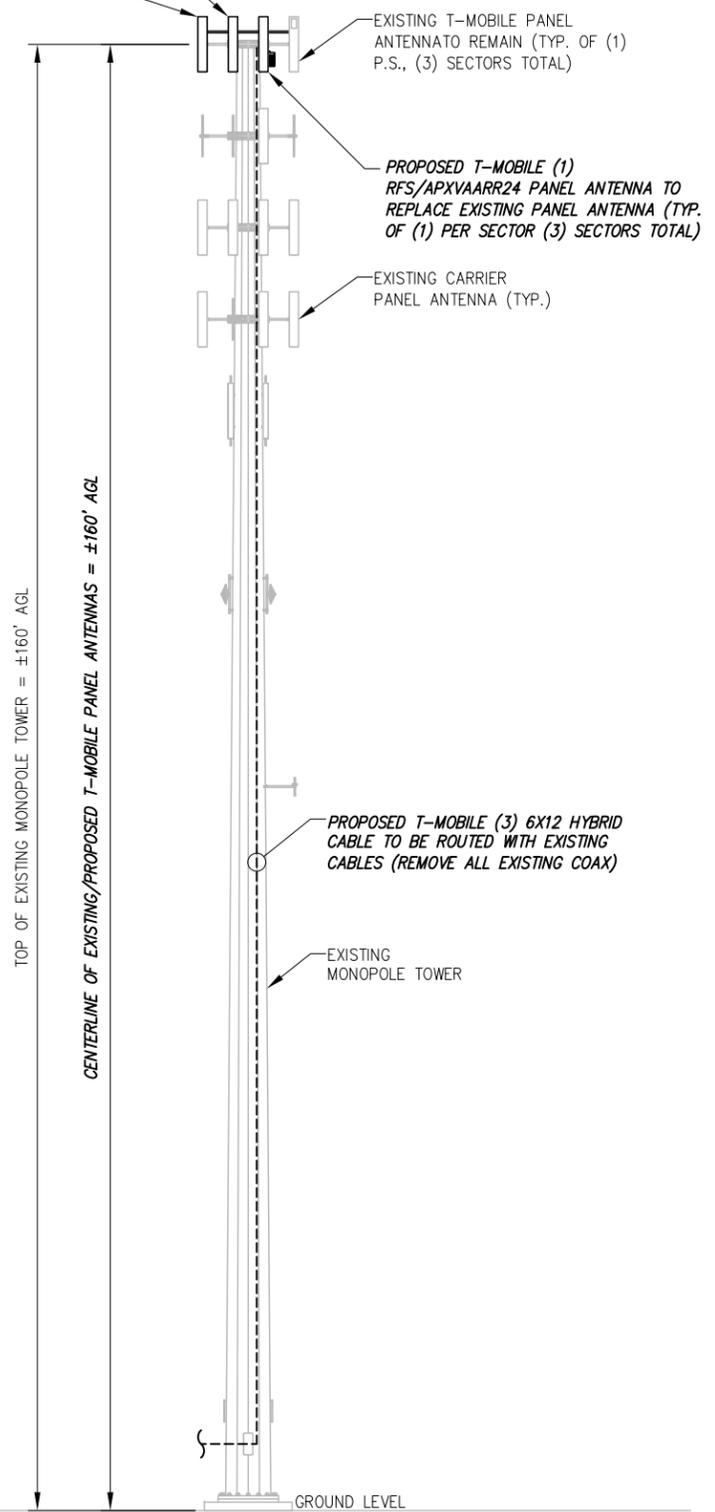


PROPOSED T-MOBILE (1) ERISSON/AIR6449 B41 PANEL ANTENNA (TYP. OF (1) PER SECTOR (3) SECTORS TOTAL)

PROPOSED T-MOBILE (1) ERISSON/AIR32 B66A/B2A PANEL ANTENNA TO REPLACE EXISTING PANEL ANTENNA (TYP. OF (1) PER SECTOR (3) SECTORS TOTAL)

NOTE:

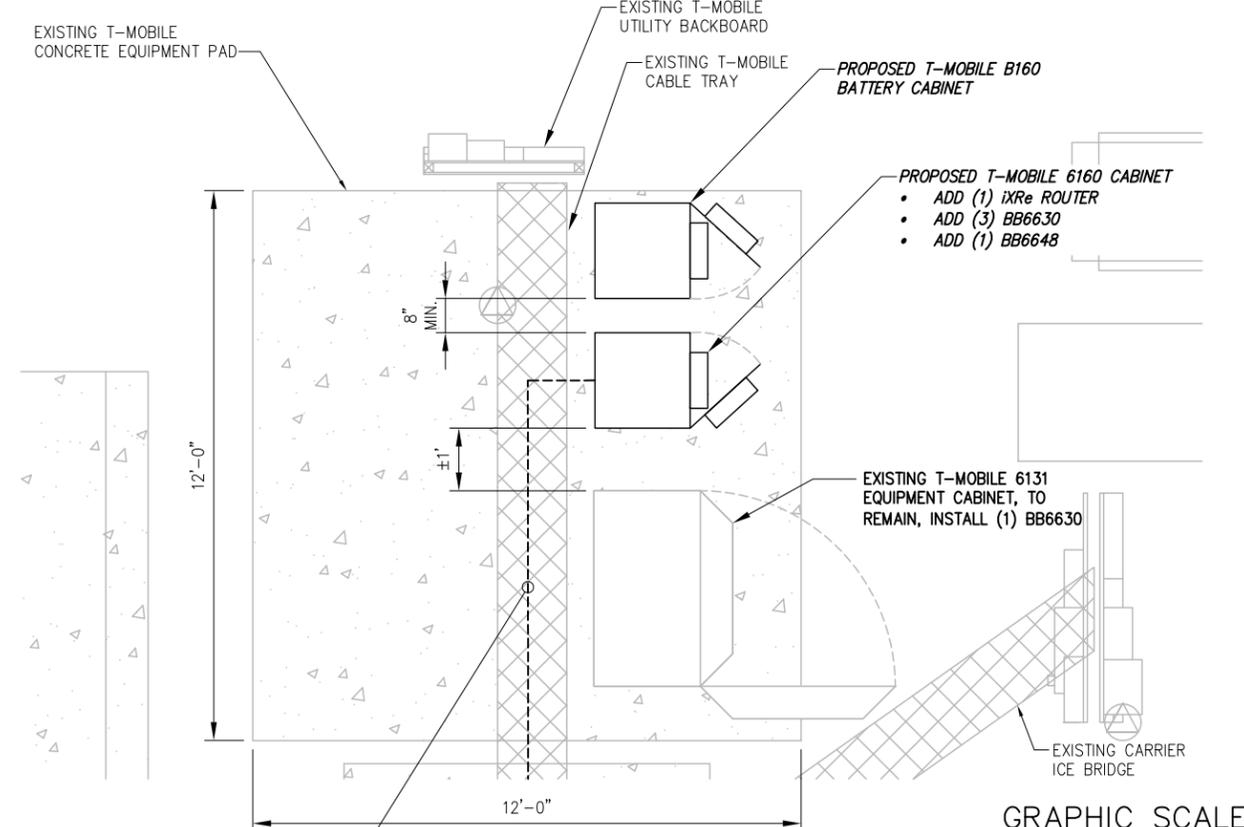
- INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY STRUCTURAL ANALYSIS.
- FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY DATED 06/23/20, SEE SHEETS S1-S2 FOR ADDITIONAL MODIFICATION DETAILS



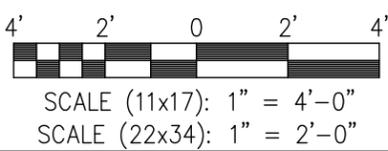
TOP OF EXISTING MONOPOLE TOWER = ±160' AGL

CENTERLINE OF EXISTING/PROPOSED T-MOBILE PANEL ANTENNAS = ±160' AGL

2 TOWER ELEVATION
NOT TO SCALE



1 PROPOSED EQUIPMENT PLAN
SCALE: AS NOTED



PROPOSED T-MOBILE (3) 6X12 HYBRID CABLE TO BE ROUTED WITH EXISTING CABLES (REMOVE ALL EXISTING COAX)

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

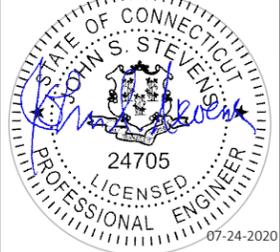
CROWN CASTLE
CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

INFINIGY
INFINIGY ENGINEERING, PLLC
1033 WATKINS ST
ALBANY, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

SUBMITTALS		
DATE	DESCRIPTION	REVISION
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PROJECT NO: 5039-C0002-C
DRAWN BY: BMM
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SITE NAME
TORRINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

SHEET TITLE
COMPOUND PLAN & ELEVATION

SHEET NUMBER
C-2

SHEET 3 OF 8 SHEETS

FINAL ANTENNA CONFIGURATION

SECTOR	BAND	ANTENNA MODEL	ANTENNA RAD	AZIMUTH	ELECTRICAL TILT	MECHANICAL TILT	RADIOS	TMAS	CABLE FEED LINES	CABLE LENGTH
A	U1900/G1900	(E) AIR21 KRC1188023-1_B2A_B4P	160'-0"	40°	2'/2'	0°	--	(E) GENERIC TWIN STYLE 1B - AWS	(E) (1) FIBER JUMPER	±195'*
	L600/L700/L1900/N600	(P) RFS-APXVAARR24_43-U-NA20	160'-0"	40°	2'/2'	0°	(P) RADIO 4449 B71+B85 (P) 4415 B25	--	(P) (2) FIBER JUMPER	±195'*
	L2500/N2500	(P) AIR6449 B41	160'-0"	40°	--	0°	--	--	--	--
	L1900/L2100	(P) AIR32 KRD901146-1_B66A_B2A	160'-0"	40°	2'	0°	--	--	(P) (2) FIBER JUMPER	±195'*
B	U1900/G1900	(E) AIR21 KRC1188023-1_B2A_B4P	160'-0"	160°	2'/2'	0°	--	(E) GENERIC TWIN STYLE 1B - AWS	(E) (1) FIBER JUMPER	±195'*
	L600/L700/L1900/N600	(P) RFS-APXVAARR24_43-U-NA20	160'-0"	160°	2'/2'	0°	(P) RADIO 4449 B71+B85 (P) 4415 B25	--	(P) (2) FIBER JUMPER	±195'*
	L2500/N2500	(P) AIR6449 B41	160'-0"	160°	--	0°	--	--	--	--
	L1900/L2100	(P) AIR32 KRD901146-1_B66A_B2A	160'-0"	160°	2'	0°	--	--	(P) (2) FIBER JUMPER	±195'*
C	U1900/G1900	(E) AIR21 KRC1188023-1_B2A_B4P	160'-0"	280°	2'/2'	0°	--	(E) GENERIC TWIN STYLE 1B - AWS	(E) (1) FIBER JUMPER	±195'*
	L600/L700/L1900/N600	(P) RFS-APXVAARR24_43-U-NA20	160'-0"	280°	2'/2'	0°	(P) RADIO 4449 B71+B85 (P) 4415 B25	--	(P) (2) FIBER JUMPER	±195'*
	L2500/N2500	(P) AIR6449 B41	160'-0"	280°	--	0°	--	--	--	--
	L1900/L2100	(P) AIR32 KRD901146-1_B66A_B2A	160'-0"	280°	2'	0°	--	--	(P) (2) FIBER JUMPER	±195'*

* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20% BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.



SUBMITTALS		
DATE	DESCRIPTION	REVISION
04/29/20	FOR REVIEW	A
07/10/20	REVISED SCOPE	B
07/24/20	REVISED PER COMMENTS	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 5039-C0002-C
 DRAWN BY: BMM
 CHECKED BY: ASW



PROFESSIONAL SEAL

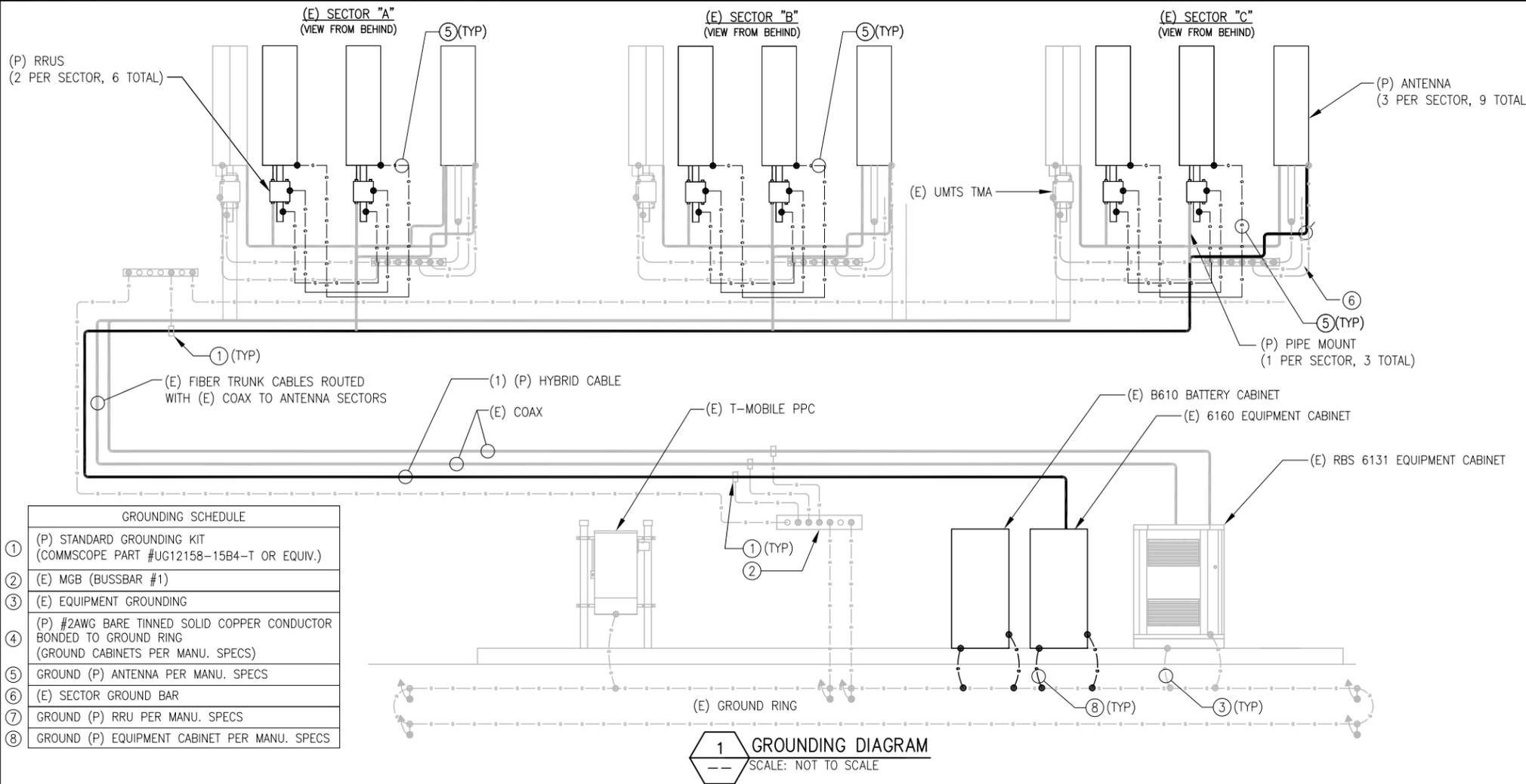
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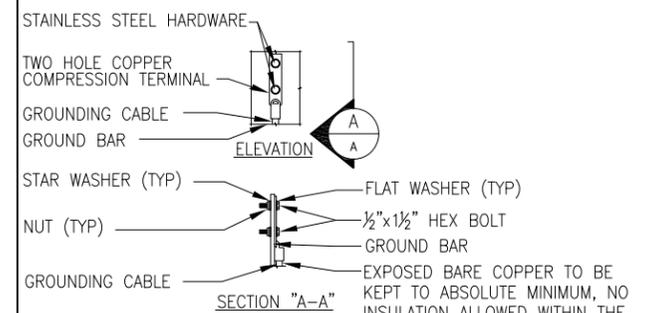
SITE NUMBER
CT11369A
 SITE NAME
 TORRINGTON/RT 8
 218 WHEELER ROAD
 TORRINGTON, CT 06790

SHEET TITLE
RF SCHEDULE

SHEET NUMBER
C-5
 SHEET 5 OF 8 SHEETS



GROUNDING SCHEDULE	
1	(P) STANDARD GROUNDING KIT (COMMSCOPE PART #UG12158-15B4-T OR EQUIV.)
2	(E) MGB (BUSSBAR #1)
3	(E) EQUIPMENT GROUNDING
4	(P) #2AWG BARE TINNED SOLID COPPER CONDUCTOR BONDED TO GROUND RING (GROUND CABINETS PER MANU. SPECS)
5	GROUND (P) ANTENNA PER MANU. SPECS
6	(E) SECTOR GROUND BAR
7	GROUND (P) RRU PER MANU. SPECS
8	GROUND (P) EQUIPMENT CABINET PER MANU. SPECS



STAINLESS STEEL HARDWARE

TWO HOLE COPPER COMPRESSION TERMINAL

GROUNDING CABLE

GROUND BAR

ELEVATION

STAR WASHER (TYP)

NUT (TYP)

GROUNDING CABLE

SECTION "A-A"

FLAT WASHER (TYP)

1/2"x1/2" HEX BOLT

GROUND BAR

EXPOSED BARE COPPER TO BE KEPT TO ABSOLUTE MINIMUM, NO INSULATION ALLOWED WITHIN THE COMPRESSION TERMINAL (TYP.)

NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

#2AWG WITH LONG BARREL COMPRESSION LUGS, USE STAR WASHERS, LOCKWASHERS, AND STAINLESS STEEL HARDWARE TO SECURE TO EXTERNAL GROUND BAR BY GENERAL CONTRACTOR.

NEW COAXIAL GROUND KITS WITH LONG BARREL COMPRESSION LUGS WITH TWO (2) 3/8"Ø BOLTS AND LOCK WASHERS SIMILAR TO ANDREW 3241088-9.

COPPER GROUND BAR

5/16" (TYP)

1/16"

1 1/2" (TYP)

6" MIN.

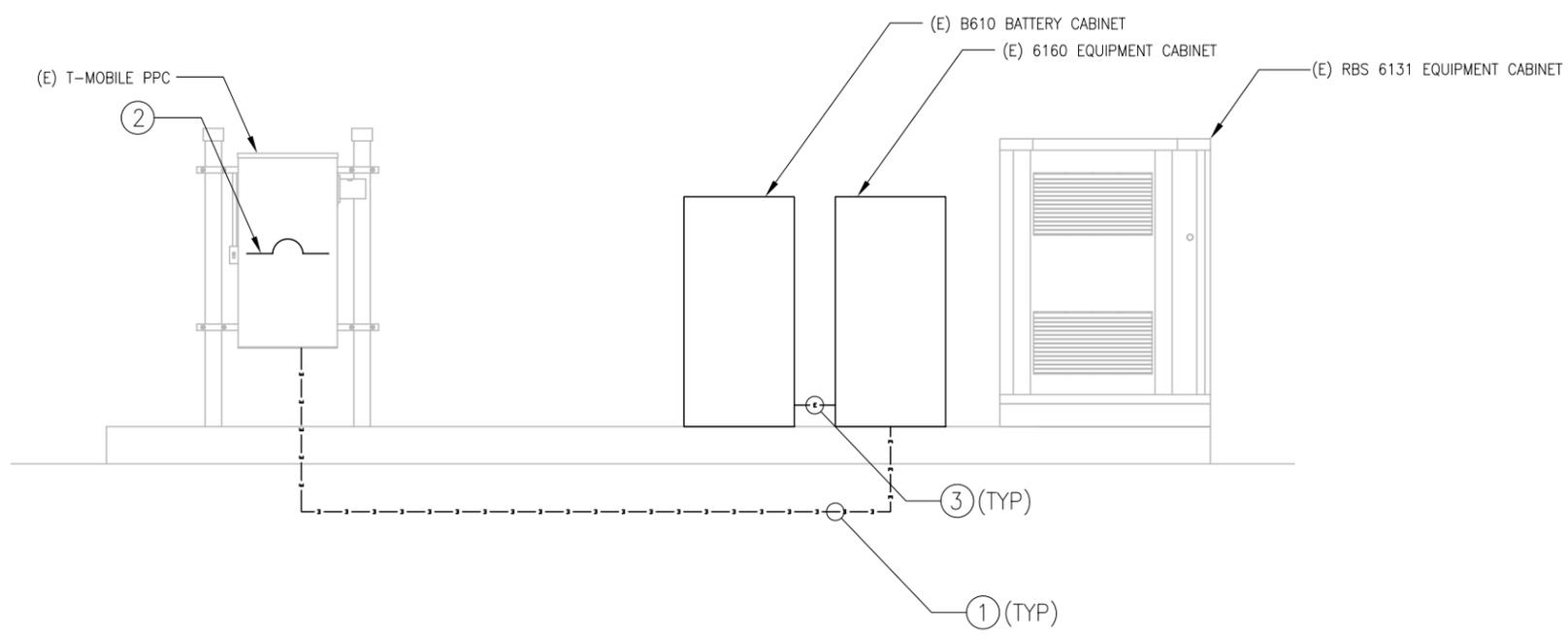
1'-8"

#2 BARE SOLID-TINNED COPPER CONDUCTOR TO GROUND BUS.

NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 GROUND BAR CONNECTION DETAILS
SCALE: NOT TO SCALE

CONDUIT SCHEDULE	
1	(P) POWER CONDUIT
2	(P) 100AMP BREAKER
3	(P) INNERDUCT



NOTE:
INFINIGY HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADING PRIOR TO CONSTRUCTION TO ENSURE EXISTING INCOMING SERVICE CAPACITY. ALL ELECTRICAL INSTALLATION IS TO COMPLY WITH NEC, ADOPTED VERSION.

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



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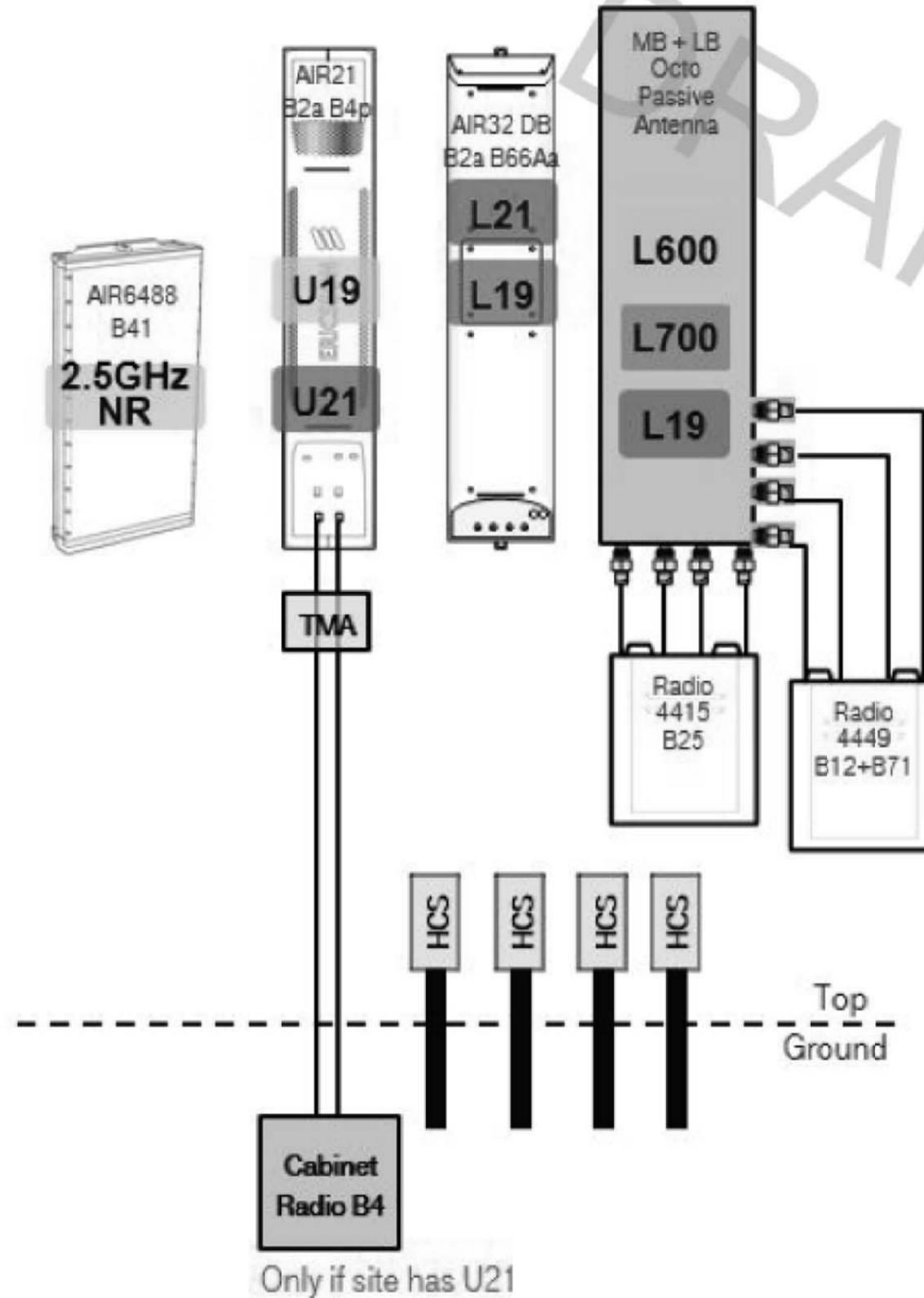
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SITE NUMBER
CT11369A
SITE NAME
TORRINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

SHEET TITLE
GROUNDING & POWER DIAGRAMS

SHEET NUMBER
E-1
SHEET 6 OF 8 SHEETS



Only if site has U21

1 67D02C CONFIGURATION COAX/FIBER PLUMBING DIAGRAM
NOT TO SCALE

SUBMITTALS		
DATE	DESCRIPTION	REVISION
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PROFESSIONAL SEAL

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CT11369A
SITE NAME
TORRINGTON/RT 8
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TORRINGTON, CT 06790

SHEET TITLE
COAX/FIBER PLUMBING DIAGRAM

SHEET NUMBER
E-2
SHEET 7 OF 8 SHEETS

ELECTRICAL NOTES:

WORK INCLUDED

- INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
 - PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
 - SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
 - EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT. FOR SLAB PENETRATIONS THROUGH POST TENSION SLABS, X-RAY EXACT AREA OF PENETRATION PRIOR TO PERFORMING WORK. COORDINATE ALL X-RAY WORK WITH BUILDING ENGINEER.
 - PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER THE WORK OF HIS CONTRACT. PROVIDE COUNTER FLASHING, SLEEVES AND SEALS FOR FLOOR AND WALL PENETRATIONS.
 - MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
- IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATIONS. IF AN ITEM OF WORK IS INDICATED IN THE DRAWINGS, IT IS CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NOT SPECIFICALLY MENTIONED IN THE CONTRACT DOCUMENTS.

GENERAL REQUIREMENTS

- PROVIDE ALL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND LOCAL AND STATE ELECTRICAL CODES.
- THE ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT DIMENSIONS OF THE BUILDING.
- LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING. CONTRACTOR IS TO VERIFY ALL EXISTING RATINGS AND LOADS PRIOR TO PURCHASING OF SPECIFIED EQUIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY ENGINEER.
- EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE EQUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
- GENERAL
 - AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE, AND THE NATURE AND EXACT QUANTITY OF WORK TO BE PERFORMED. NO EXTRA COMPENSATION WILL BE ALLOWED FOR FAILURE TO NOTIFY THE OWNER, IN WRITING, OF ANY DISCREPANCIES THAT MAY HAVE BEEN NOTED BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS AND SPECIFICATIONS.
 - VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME.
- QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
 - PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER BY THOSE REGULARLY ENGAGED IN THE PRODUCTION AND MANUFACTURE OF SPECIFIED MATERIALS AND EQUIPMENT. WHERE UL, OR OTHER AGENCY, HAS ESTABLISHED STANDARDS FOR MATERIALS, PROVIDE MATERIALS WHICH ARE LISTED AND LABELED ACCORDINGLY. THE COMMERCIAL STANDARD ITEMS OF EQUIPMENT AND THE SPECIFIC NAMES MENTIONED HEREIN ARE INTENDED FOR THE PROPER FUNCTIONING OF THE WORK.
 - WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE REQUIRED FOR THE WORK. INSTALL MATERIALS AND EQUIPMENT TO PRESENT A NEAT APPEARANCE WHEN COMPLETED AND IN ACCORDANCE WITH THE APPROVED RECOMMENDATIONS OF THE MANUFACTURER AND IN ACCORDANCE WITH CONTRACT DOCUMENTS.
 - PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS DESCRIBED OR INDICATED HEREIN, OR WHICH MAY BE REASONABLY IMPLIED AS ESSENTIAL WHENEVER MENTIONED IN THE CONTRACT DOCUMENT OR NOT.
 - MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS TO ARCHITECT/ENGINEER IN CASE OF DOUBT AS TO WORK INTENDED OR IN EVENT OF NEED FOR EXPLANATION THEREOF.
 - PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM THE CONTRACT DOCUMENT REMAINS SOLELY WITH ARCHITECT/ENGINEER. CONTRACT DOCUMENT OR NOT.

GUARANTEE

- QUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT. DURING THAT PERIOD, MAKE GOOD FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP WITH NO ADDITIONAL COMPENSATION AND AS DIRECTED BY ARCHITECT.

CLEANING

- REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE WORK.
- CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

COORDINATION AND SUPERVISION

- CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. WHERE SUCH WORK IS NECESSARY, HOWEVER, PATCH AND REPAIR THE WORK IN AN APPROVED MANNER BY SKILLED MECHANICS AT NO ADDITIONAL COST TO THE OWNER. RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK WILL BE INSTALLED IN CLOSE PROXIMITY TO WORK OF OTHER TRADES. ASSIST IN WORKING OUT SPACE CONDITIONS. IF WORK IS INSTALLED BEFORE COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE.

SUBMITTALS

- AS-BUILT DRAWINGS:
 - UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
- SERVICE MANUALS:
 - UPON COMPLETION OF THE WORK, FULLY INSTRUCT T-MOBILE AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, EQUIPMENT AND SYSTEMS.
 - PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

CUTTING AND PATCHING

- PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING REQUIRED TO COMPLETE THE WORK.
- OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

TESTS, INSPECTION AND APPROVAL

- BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT EACH UNIT IN DETAIL. TIGHTEN ALL BOLTS AND CONNECTIONS (TORQUE-TIGHTEN WHERE REQUIRED) AND DETERMINE THAT ALL COMPONENTS ARE ALIGNED, AND THE EQUIPMENT IS IN SAFE, OPERATIONAL CONDITION.
- PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS SUCH THAT THE SYSTEM WILL OPERATE SATISFACTORILY UNDER FULL LOAD CONDITIONS, WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

SPECIAL REQUIREMENTS

- DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. DO NOT INTERFERE WITH OR CUTOFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S WRITTEN PERMISSION.
- WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS, INCLUDING FEEDER OR BRANCH CIRCUITING SUPPLYING EXISTING FACILITIES, CONFER WITH THE OWNER AND ARRANGE THE PERIOD OF INTERRUPTION FOR A TIME MUTUALLY AGREED UPON. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

GROUNDING

- ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER.
- ROUTE 500 KCMIL CU. THHN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL. VERIFY BUILDING STEEL IS EFFECTIVELY GROUNDED PER NEC TO THE MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR (GEC).
- MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.
- USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS.
- HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING. PROVIDE 4 SETS OF THE CERTIFIED DOCUMENTS TO THE OWNER FOR VERIFICATION PRIOR TO THE PROJECT COMPLETION.

RACEWAYS

- ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
 - EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO BE IN SCH 40 PVC.
 - EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).
 - ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO BE EMT.
 - INSTALL PULL ROPES IN ALL NEW EMPTY CONDUITS INSTALLED ON THIS PROJECT.
 - ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "T-MOBILE". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
 - INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS.
 - MINIMUM SIZE CONDUIT TO BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
 - FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
 - CONDUIT TO BE RUN CONCEALED IN CEILINGS, FINISHED AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED.
 - THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND CLEARANCES.
 - ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.

RACEWAYS CONT'D

- PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS SO AS TO MAINTAIN THE STRUCTURAL OR WATERPROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM TO BE PENETRATED. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE OR SMOKE RATED WALLS, CEILINGS OR SMOKE TIGHT CORRIDOR PARTITIONS TO MAINTAIN PROPER RATING OF WALL OR CEILING.
- PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS.
- CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC, IN HORIZONTAL AND VERTICAL DIRECTIONS.
- PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL JUNCTION BOXES AND/OR OUTLET BOXES NOT USED IN EXPOSED AREAS. PROVIDE ALL OTHER UNUSED BOXES WITH STANDARD STEEL COVER PLATES.
- WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS, PER BUILDING.

WIRES AND CABLES

- CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO BID.
- ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR.
- ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/ THHN INSULATION, EXCEPT AS NOTED.
- WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO. 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED.
- CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES. CONTROL WIRING WILL CONSIST OF MULTI-CONDUCTOR CABLES WHEREVER POSSIBLE. CABLES TO BE PROVIDED WITH AN OVERALL FLAME-RETARDANT, EXTRUDED JACKET AND RATED FOR PLENUM USE. ALL CONTROL WIRE TO BE 600VOLT RATED.
- WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED AND IS NOT TO BE RE-PULLED.
- HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V CIRCUITS:

LENGTH (FT.)	HOME RUN WIRE SIZE
0 TO 50	NO. 12
51 TO 100	NO. 10
101 TO 150	NO. 8
- VOLTAGE DROP IS NOT TO EXCEED 3%.
- MAKE ALL CONNECTIONS WITH UL APPROVED, SOLDERLESS, PRESSURE TYPE INSULATED CONNECTORS: SCOTCHLOK OR AND APPROVED EQUAL.

WIRING DEVICES

- ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION. DISCONNECT SWITCHES AND FUSES
 - DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE SUPPLIED.
 - PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
 - PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION, NEMA 3R FOR EXTERIOR INSTALLATION.
 - DISCONNECT SWITCHES TO BE MANUFACTURED BY:
 - GENERAL ELECTRIC COMPANY
 - SQUARE-D
 - PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

INSTALLATION

- INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
- INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.
- FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.
- FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS FOLLOWS:
 - THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF 60A, USED FOR INITIAL FUSING.
 - TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND SIZE BE FURNISHED.

GENERAL NOTES:

INTENT

- THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
- THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.
- THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
- THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
- MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

CONFLICTS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
- THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.
- NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

CONTRACTS AND WARRANTIES

- CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
- SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

STORAGE

- ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

CLEANUP

- THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY TO USE.
- EXTERIOR
 - VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
 - REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
 - IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
- INTERIOR
 - VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING.
 - REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
 - REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

CHANGE ORDER PROCEDURE:

- REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

RELATED DOCUMENTS AND COORDINATION

- GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

SHOP DRAWINGS

- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
- ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

PRODUCTS AND SUBSTITUTIONS

- SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.
- SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER, SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

QUALITY ASSURANCE

- ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE, BUT NOT BE LIMITED TO THE APPLICABLE CODES SET FORTH BY THE LOCAL GOVERNING BODY. SEE "CODE COMPLIANCE" T-1.

ADMINISTRATION

- BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
- SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT THE SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
- PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE, BUT NOT LIMITED TO, THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
- CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
- DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WPCS SAFETY REQUIREMENTS IN THEIR AGREEMENT.
- PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
- COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
- NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

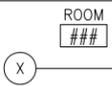
INSURANCE AND BONDS

- CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
- THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
- CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

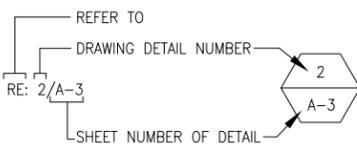
ABBREVIATIONS

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR Ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EGB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VIF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

ARCHITECTURAL SYMBOLS



DETAIL REFERENCE KEY



T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088



CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
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SUBMITTALS

DATE	DESCRIPTION	REVISION
04/29/20	FOR REVIEW	A
07/10/20	REVISED SCOPE	B
07/24/20	REVISED PER COMMENTS	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	5039-C0002-C
DRAWN BY:	BMM
CHECKED BY:	ASW



PROFESSIONAL SEAL

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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER
CT11369A

SITE NAME
TORRINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

SHEET TITLE

**GENERAL AND
ELECTRICAL
NOTES**

SHEET NUMBER

N-1

SHEET 8 OF 8 SHEETS

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
 - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
 - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
 - RECTANGULAR HSS TO BE A500, GRADE B. Fy=46 KSI, U.N.O.
 - ROUND HSS TO BE A500, GRADE B. Fy=42 KSI, U.N.O.
 - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
 - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
 - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
 - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
 - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
 - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
 - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.
12. REMOVAL/REPLACEMENT OF STRUCTURAL MEMBERS SHALL BE DONE ONE MEMBER AT A TIME. CONTRACTOR IS RESPONSIBLE FOR ENSURING THE STRUCTURAL INTEGRITY OF THE STRUCTURE DURING ALL PHASES OF CONSTRUCTION.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE		
SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER		
	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
 - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
 - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
 - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
 - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
 - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

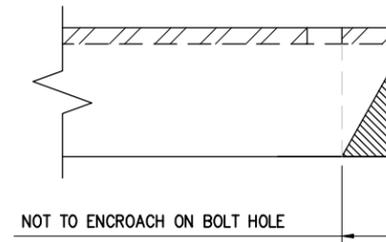
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
 - a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
 - b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
 - c. MECHANICAL AND EPOXIED ANCHORAGES.
 - d. FIBER REINFORCED POLYMER.
 - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
 - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
 - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



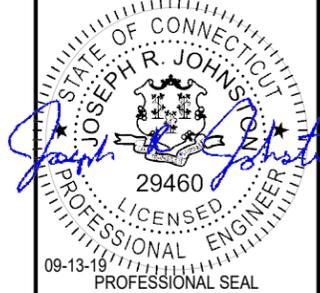
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793



SUBMITTALS		
DATE	DESCRIPTION	REVISION
09/13/19	FOR REVIEW	0

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 1039-C0002-B
DRAWN BY: TAG
CHECKED BY: KD



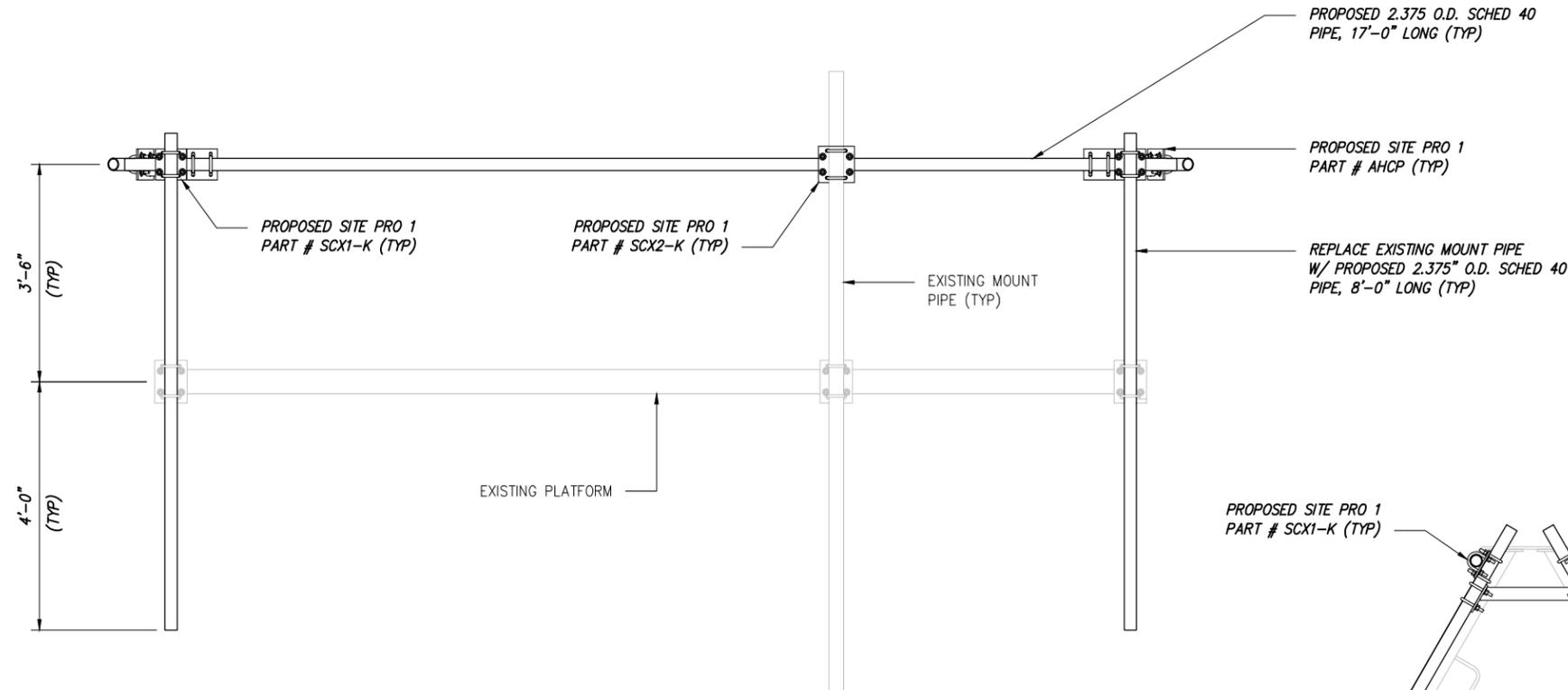
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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER
828540
SITE NAME
TORRINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

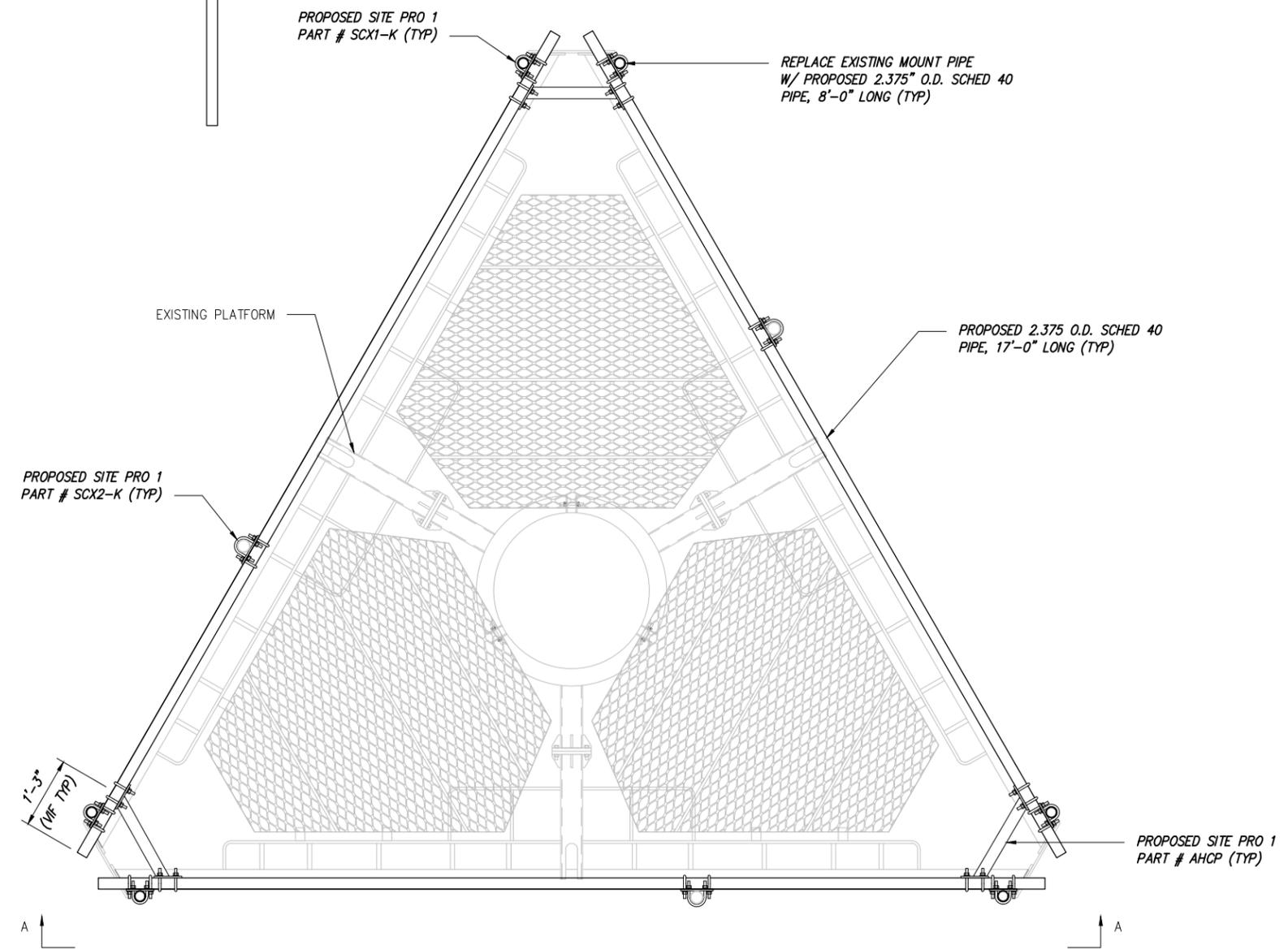
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
S1



NOTE:
 1. VARIOUS EXISTING CONDITIONS AND PROPOSED MODIFICATIONS NOT SHOWN FOR CLARITY.
 2. ALL SITE PRO 1 PARTS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS, EXCEPT IF OTHERWISE NOTED.
 3. ALL MODIFICATIONS ARE TO BE INSTALLED IN ALL SECTORS.

1 SECTION A-A
 SCALE: NOT TO SCALE



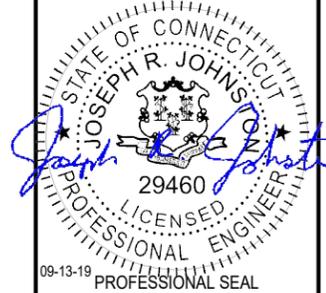
2 PLAN VIEW
 SCALE: NOT TO SCALE



SUBMITTALS		
DATE	DESCRIPTION	REVISION
09/13/19	FOR REVIEW	0

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 1039-C0002-B
 DRAWN BY: TAG
 CHECKED BY: KD



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SITE NUMBER
828540
 SITE NAME
 TORRINGTON/RT 8
 218 WHEELER ROAD
 TORRINGTON, CT 06790

SHEET TITLE
**PLATFORM
 MODIFICATION**

SHEET NUMBER
S2

Exhibit C

Structural Analysis Report

Date: **June 30, 2020**

Denice Nicholson
Crown Castle
3 Corporate Dr.
Clifton Park, NY 12065



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

Subject: Structural Analysis Report

Carrier Designation: **T-Mobile Co-Locate**
Carrier Site Number: CT11369A
Carrier Site Name: Torrington/RT 8

Crown Castle Designation: **Crown Castle BU Number:** 828540
Crown Castle Site Name: Torrington/RT 8
Crown Castle JDE Job Number: 576568
Crown Castle Work Order Number: 1860363
Crown Castle Order Number: 494417 Rev. 3

Engineering Firm Designation: **TEP Project Number:** 218105.427081

Site Data: **218 Wheeler Road, Torrington, Litchfield County, CT 06790**
Latitude 41° 46' 50.33", Longitude -73° 8' 10.02"
160 Foot - Monopole Tower

Dear Denice Nicholson,

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

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

LC7: Proposed Equipment Configuration

Sufficient Capacity

Structure Capacity	Base Foundation
79.1%	45.8%

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Christopher D. Crook, E.I. / ZSC

Respectfully submitted by:

Aaron T. Rucker, P.E.



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06/30/2020

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1) INTRODUCTION

This tower is a 160-ft monopole tower designed by Pirod, Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	116 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160.0	160.0	3	Ericsson	AIR 32 B2A B66AA w/ Mount Pipe	4	1-5/8
		3	Ericsson	AIR6449 B41 w/ Mount Pipe		
		3	Ericsson	AIR 21 B2A B4P w/ Mount Pipe		
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	Radio 4449 B71 B85A_T-Mobile		
		3	Ericsson	RRUS 4415 B25		
		3	Generic	2.375" Dia., Sch 40, 8-ft Pipe		
		3	Generic	2.375" Dia., Sch 40, 17-ft Pipe		
		3	Site Pro 1	AHCP Angle Handrail Corner Plate Kits		
		1	Tower Mounts	Platform Mount [LP 405-1]		

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)
160.0	170.0	1	RFI Antennas	OA40-41	1	7/8
150.0	150.0	3	RFS Celwave	APXVSP18-C-A20 w/ Mount Pipe	4	1-1/4
		3	RFS Celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
		3	Alcatel Lucent	PCS 1900 MHz 4x45W-65MHz		
		3	Alcatel Lucent	800MHz 2X50W RRH w/ Filter		
		3	Alcatel Lucent	TD-RRH8x20-25		
		1	Tower Mounts	Platform Mount [LP 1201-1_HR-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	3	Swedcom	SLXW 5512 w/ Mount Pipe	12 1	1-5/8 7/8
		1	GPS	GPS_A		
		4	Swedcom	SC-E 6014 rev2 w/ Mount Pipe		
		3	Antel	BXA-171063/12CF w/ Mount Pipe		
		2	Antel	LPA-80063/6CF w/ Mount Pipe		
		6	RFS Celwave	FD9R6004/2C-3L		
		1	Tower Mounts	Platform Mount [LP 304-1]		
130.0	130.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 1 2	1-5/8 3/8 3/4
		2	CCI Antennas	HPA-65R-BUU-H6 w/ Mount Pipe		
		2	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		1	Andrew	SBNHH-1D65A w/ Mount Pipe		
		1	Kathrein	800 10764 w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 11		
		1	Raycap	DC6-48-60-18-8F		
		1	Tower Mounts	Platform Mount [LP 304-1]		
120.0	120.0	3	RFS Celwave	APXV18-206517-C	6	1-5/8
		1	Tower Mounts	Pipe Mount [PM 601-3]		
100.0	100.0	2	Maxrad	MPRC2449	4	1/4
		2	Tower Mounts	Side Arm Mount [SO 203-1]		
79.0	79.0	1	GPS	GPS_A	1	1/2
		1	Tower Mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Jaworski Geotech, Inc.	3463255	CCISites
Tower Foundation Drawings	Pirot, Inc.	3464896	CCISites
Tower Manufacturer Drawings	Pirot, Inc.	3463264	CCISites

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. 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. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ΦP_{allow} (lb)	% Capacity	Pass / Fail
L1	160 - 140	Pole	P36x0.375	1	-12701	1564605	11.0	Pass
L2	140 - 120	Pole	P42x0.375	2	-22135	1752313	24.0	Pass
L3	120 - 100	Pole	P48x0.375	3	-27927	1939864	33.5	Pass
L4	100 - 80	Pole	P54x0.375	4	-34974	2127300	40.5	Pass
L5	80 - 60	Pole	P60x0.375	5	-41638	2314651	45.3	Pass
L6	60 - 40	Pole	P60x0.5	6	-50140	3281974	42.6	Pass
L7	40 - 20	Pole	P60x0.5	7	-58687	3281974	52.8	Pass
L8	20 - 0	Pole	P60x0.625	8	-69137	4346107	49.6	Pass
							Summary	
						Pole (L7)	52.8	Pass
						RATING =	52.8	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2,3	Flange Connection	140.0	11.9	Pass
1,2,3	Flange Connection	120.0	24.0	Pass
1,2,3	Flange Connection	100.0	34.2	Pass
1,2,3	Flange Connection	80.0	40.5	Pass
1,2,3	Flange Connection	60.0	45.3	Pass
1,2,3	Flange Connection	40.0	52.7	Pass
1,2,3	Flange Connection	20.0	79.1	Pass
1,2	Anchor Rods	-	37.9	Pass
1,2,3	Base Plate	-	49.6	Pass
1,2	Base Foundation Soil Interaction	-	44.1	Pass
1,2	Base Foundation Structural	-	45.8	Pass

Structure Rating (max from all components) =	79.1%
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Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5
- 3) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of design to resist the full capacity of the bolts and shaft.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

tnxTower Tower Engineering Professionals 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Torrington/RT 8 (BU 828540)	Page 1 of 16
	Project TEP No. 218105.427081	Date 10:35:52 06/30/20
	Client Crown Castle	Designed by cdcrook

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 Litchfield County, Connecticut.
- Tower base elevation above sea level: 1027.00 ft.
- Basic wind speed of 120 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.05.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|---|

Pole Section Geometry

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Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	160.00-140.00	20.00	P36x0.375	A53-B-42 (42 ksi)	
L2	140.00-120.00	20.00	P42x0.375	A53-B-42 (42 ksi)	
L3	120.00-100.00	20.00	P48x0.375	A53-B-42 (42 ksi)	
L4	100.00-80.00	20.00	P54x0.375	A53-B-42 (42 ksi)	
L5	80.00-60.00	20.00	P60x0.375	A53-B-42 (42 ksi)	
L6	60.00-40.00	20.00	P60x0.5	A53-B-42 (42 ksi)	
L7	40.00-20.00	20.00	P60x0.5	A53-B-42 (42 ksi)	
L8	20.00-0.00	20.00	P60x0.625	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.00-140.00				1	1	1			
L2 140.00-120.00				1	1	1			
L3 120.00-100.00				1	1	1			
L4 100.00-80.00				1	1	1			
L5 80.00-60.00				1	1	1			
L6 60.00-40.00				1	1	1			
L7 40.00-20.00				1	1	1			
L8 20.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety										
PiRod Ladder	A	No	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.500 0.500	0.5400		2.00
Safety Line 3/8	A	No	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.500 0.500	0.3750		0.22
LDF5-50A(7/8")	B	No	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.250 0.250	1.0900		0.33
140										
LDF5-50A(7/8)	C	No	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.000 0.000	1.0900		0.33
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	140.00 - 0.00	12	12	0.000 0.000	1.9800		0.82
120										

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Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
AVA7-50(1-5/8)	A	No	Surface Ar (CaAa)	120.00 - 0.00	6	6	0.500 0.500	2.0100		0.70
100										
CAT5E(1/4)	B	No	Surface Ar (CaAa)	100.00 - 0.00	4	4	0.250 0.250	0.2638		0.15
79										
LDF4-50A(1/2)	A	No	Surface Ar (CaAa)	79.00 - 0.00	1	1	0.500 0.500	0.6250		0.15
**										

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} ft ² /ft	Weight plf
160									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	160.00 - 0.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
150									
LDF6-50A(1 1/4")	B	No	No	Inside Pole	150.00 - 0.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.66 0.66 0.66 0.66
130									
FB-L98-002-XXX(3/8)	C	No	No	Inside Pole	130.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
WR-VG86T(3/4)	C	No	No	Inside Pole	130.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.53 0.53 0.53 0.53
2" Flexible Conduit	C	No	No	Inside Pole	130.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.34 0.34 0.34 0.34
AVA7-50(1-5/8)	C	No	No	Inside Pole	130.00 - 0.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.70 0.70 0.70 0.70
**									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	160.00-140.00	A	0.000	0.000	1.830	0.000	44

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
		B	0.000	0.000	2.180	0.000	92
		C	0.000	0.000	0.000	0.000	0
L2	140.00-120.00	A	0.000	0.000	1.830	0.000	44
		B	0.000	0.000	2.180	0.000	112
		C	0.000	0.000	49.700	0.000	302
L3	120.00-100.00	A	0.000	0.000	25.950	0.000	128
		B	0.000	0.000	2.180	0.000	112
		C	0.000	0.000	49.700	0.000	401
L4	100.00-80.00	A	0.000	0.000	25.950	0.000	128
		B	0.000	0.000	4.290	0.000	124
		C	0.000	0.000	49.700	0.000	401
L5	80.00-60.00	A	0.000	0.000	27.137	0.000	131
		B	0.000	0.000	4.290	0.000	124
		C	0.000	0.000	49.700	0.000	401
L6	60.00-40.00	A	0.000	0.000	27.200	0.000	131
		B	0.000	0.000	4.290	0.000	124
		C	0.000	0.000	49.700	0.000	401
L7	40.00-20.00	A	0.000	0.000	27.200	0.000	131
		B	0.000	0.000	4.290	0.000	124
		C	0.000	0.000	49.700	0.000	401
L8	20.00-0.00	A	0.000	0.000	27.200	0.000	131
		B	0.000	0.000	4.290	0.000	124
		C	0.000	0.000	49.700	0.000	401

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} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	160.00-140.00	A	1.483	0.000	0.000	13.697	0.000	185
		B		0.000	0.000	8.114	0.000	185
		C		0.000	0.000	0.000	0.000	0
L2	140.00-120.00	A	1.462	0.000	0.000	13.529	0.000	182
		B		0.000	0.000	8.029	0.000	203
		C		0.000	0.000	74.741	0.000	1084
L3	120.00-100.00	A	1.438	0.000	0.000	50.676	0.000	641
		B		0.000	0.000	7.933	0.000	201
		C		0.000	0.000	74.523	0.000	1169
L4	100.00-80.00	A	1.410	0.000	0.000	50.304	0.000	629
		B		0.000	0.000	17.504	0.000	285
		C		0.000	0.000	74.266	0.000	1153
L5	80.00-60.00	A	1.375	0.000	0.000	56.260	0.000	680
		B		0.000	0.000	17.189	0.000	279
		C		0.000	0.000	73.951	0.000	1134
L6	60.00-40.00	A	1.329	0.000	0.000	55.825	0.000	661
		B		0.000	0.000	16.780	0.000	271
		C		0.000	0.000	73.542	0.000	1109
L7	40.00-20.00	A	1.263	0.000	0.000	54.699	0.000	628
		B		0.000	0.000	16.184	0.000	259
		C		0.000	0.000	72.946	0.000	1073
L8	20.00-0.00	A	1.132	0.000	0.000	52.466	0.000	565
		B		0.000	0.000	15.001	0.000	238
		C		0.000	0.000	71.764	0.000	1003

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Feed Line Center of Pressure

Section	Elevation ft	CP _x	CP _z	CP _x Ice	CP _z Ice
		in	in	in	in
L1	160.00-140.00	1.0104	-0.8341	1.5085	-2.5034
L2	140.00-120.00	0.4907	11.0027	0.8719	6.8180
L3	120.00-100.00	0.4252	4.7172	0.7511	2.3222
L4	100.00-80.00	0.8758	4.9635	1.6631	2.3535
L5	80.00-60.00	0.9224	4.9605	1.7133	1.8358
L6	60.00-40.00	0.9220	4.9449	1.6842	1.8511
L7	40.00-20.00	0.9220	4.9449	1.6439	1.9267
L8	20.00-0.00	0.9220	4.9449	1.5609	2.0823

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	2	PiRod Ladder	140.00 - 160.00	1.0000	1.0000
L1	3	Safety Line 3/8	140.00 - 160.00	1.0000	1.0000
L1	6	LDF5-50A(7/8")	140.00 - 160.00	1.0000	1.0000
L2	2	PiRod Ladder	120.00 - 140.00	1.0000	1.0000
L2	3	Safety Line 3/8	120.00 - 140.00	1.0000	1.0000
L2	6	LDF5-50A(7/8")	120.00 - 140.00	1.0000	1.0000
L2	10	LDF5-50A(7/8)	120.00 - 140.00	1.0000	1.0000
L2	11	LDF7-50A(1-5/8)	120.00 - 140.00	1.0000	1.0000
L3	2	PiRod Ladder	100.00 - 120.00	1.0000	1.0000
L3	3	Safety Line 3/8	100.00 - 120.00	1.0000	1.0000
L3	6	LDF5-50A(7/8")	100.00 - 120.00	1.0000	1.0000
L3	10	LDF5-50A(7/8)	100.00 - 120.00	1.0000	1.0000
L3	11	LDF7-50A(1-5/8)	100.00 - 120.00	1.0000	1.0000
L3	18	AVA7-50(1-5/8)	100.00 - 120.00	1.0000	1.0000
L4	2	PiRod Ladder	80.00 - 100.00	1.0000	1.0000
L4	3	Safety Line 3/8	80.00 - 100.00	1.0000	1.0000
L4	6	LDF5-50A(7/8")	80.00 - 100.00	1.0000	1.0000
L4	10	LDF5-50A(7/8)	80.00 - 100.00	1.0000	1.0000
L4	11	LDF7-50A(1-5/8)	80.00 - 100.00	1.0000	1.0000
L4	18	AVA7-50(1-5/8)	80.00 - 100.00	1.0000	1.0000
L4	20	CAT5E(1/4)	80.00 - 100.00	1.0000	1.0000
L5	2	PiRod Ladder	60.00 - 80.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L5	3	Safety Line 3/8	60.00 - 80.00	1.0000	1.0000
L5	6	LDF5-50A(7/8")	60.00 - 80.00	1.0000	1.0000
L5	10	LDF5-50A(7/8)	60.00 - 80.00	1.0000	1.0000
L5	11	LDF7-50A(1-5/8)	60.00 - 80.00	1.0000	1.0000
L5	18	AVA7-50(1-5/8)	60.00 - 80.00	1.0000	1.0000
L5	20	CAT5E(1/4)	60.00 - 80.00	1.0000	1.0000
L5	22	LDF4-50A(1/2)	60.00 - 79.00	1.0000	1.0000
L6	2	PiRod Ladder	40.00 - 60.00	1.0000	1.0000
L6	3	Safety Line 3/8	40.00 - 60.00	1.0000	1.0000
L6	6	LDF5-50A(7/8")	40.00 - 60.00	1.0000	1.0000
L6	10	LDF5-50A(7/8)	40.00 - 60.00	1.0000	1.0000
L6	11	LDF7-50A(1-5/8)	40.00 - 60.00	1.0000	1.0000
L6	18	AVA7-50(1-5/8)	40.00 - 60.00	1.0000	1.0000
L6	20	CAT5E(1/4)	40.00 - 60.00	1.0000	1.0000
L6	22	LDF4-50A(1/2)	40.00 - 60.00	1.0000	1.0000
L7	2	PiRod Ladder	20.00 - 40.00	1.0000	1.0000
L7	3	Safety Line 3/8	20.00 - 40.00	1.0000	1.0000
L7	6	LDF5-50A(7/8")	20.00 - 40.00	1.0000	1.0000
L7	10	LDF5-50A(7/8)	20.00 - 40.00	1.0000	1.0000
L7	11	LDF7-50A(1-5/8)	20.00 - 40.00	1.0000	1.0000
L7	18	AVA7-50(1-5/8)	20.00 - 40.00	1.0000	1.0000
L7	20	CAT5E(1/4)	20.00 - 40.00	1.0000	1.0000
L7	22	LDF4-50A(1/2)	20.00 - 40.00	1.0000	1.0000
L8	2	PiRod Ladder	0.00 - 20.00	1.0000	1.0000
L8	3	Safety Line 3/8	0.00 - 20.00	1.0000	1.0000
L8	6	LDF5-50A(7/8")	0.00 - 20.00	1.0000	1.0000
L8	10	LDF5-50A(7/8)	0.00 - 20.00	1.0000	1.0000
L8	11	LDF7-50A(1-5/8)	0.00 - 20.00	1.0000	1.0000
L8	18	AVA7-50(1-5/8)	0.00 - 20.00	1.0000	1.0000
L8	20	CAT5E(1/4)	0.00 - 20.00	1.0000	1.0000
L8	22	LDF4-50A(1/2)	0.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_{AA} Front	C_{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	lb	
160									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Centroid-Face	4.00	0.0000	160.00	No Ice	6.33	5.64	112
			0.00			1/2" Ice	6.78	6.43	169
			0.00			1" Ice	7.21	7.13	233
			0.00			2" Ice	8.12	8.59	383
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Face	4.00	0.0000	160.00	No Ice	6.33	5.64	112
			0.00			1/2" Ice	6.78	6.43	169
			0.00			1" Ice	7.21	7.13	233
			0.00			2" Ice	8.12	8.59	383
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Face	4.00	0.0000	160.00	No Ice	6.33	5.64	112
			0.00			1/2" Ice	6.78	6.43	169
			0.00			1" Ice	7.21	7.13	233
			0.00			2" Ice	8.12	8.59	383
APXVAARR24_43-U-NA20	A	From	4.00	0.0000	160.00	No Ice	14.69	6.87	186

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	Client	Crown Castle	Designed by	cdcrook

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
w/ Mount Pipe		Centroid-Fa	0.00		1/2" Ice	15.46	7.55	315
		ce	0.00		1" Ice	16.23	8.25	458
					2" Ice	17.82	9.67	788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	14.69	6.87	186
		ce	0.00		1/2" Ice	15.46	7.55	315
					1" Ice	16.23	8.25	458
					2" Ice	17.82	9.67	788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	14.69	6.87	186
		ce	0.00		1/2" Ice	15.46	7.55	315
					1" Ice	16.23	8.25	458
					2" Ice	17.82	9.67	788
AIR 32 B2A B66AA w/ Mount Pipe	A	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	7.09	6.37	165
		ce	0.00		1/2" Ice	7.56	7.23	228
					1" Ice	8.02	7.97	298
					2" Ice	8.97	9.51	464
AIR 32 B2A B66AA w/ Mount Pipe	B	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	7.09	6.37	165
		ce	0.00		1/2" Ice	7.56	7.23	228
					1" Ice	8.02	7.97	298
					2" Ice	8.97	9.51	464
AIR 32 B2A B66AA w/ Mount Pipe	C	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	7.09	6.37	165
		ce	0.00		1/2" Ice	7.56	7.23	228
					1" Ice	8.02	7.97	298
					2" Ice	8.97	9.51	464
AIR6449 B41 w/ Mount Pipe	A	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	5.95	3.36	119
		ce	0.00		1/2" Ice	6.33	3.83	168
					1" Ice	6.72	4.32	224
					2" Ice	7.52	5.34	353
AIR6449 B41 w/ Mount Pipe	B	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	5.95	3.36	119
		ce	0.00		1/2" Ice	6.33	3.83	168
					1" Ice	6.72	4.32	224
					2" Ice	7.52	5.34	353
AIR6449 B41 w/ Mount Pipe	C	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	5.95	3.36	119
		ce	0.00		1/2" Ice	6.33	3.83	168
					1" Ice	6.72	4.32	224
					2" Ice	7.52	5.34	353
OA40-41	A	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	8.00	8.00	64
		ce	10.00		1/2" Ice	12.36	12.36	99
					1" Ice	16.76	16.76	135
					2" Ice	25.56	25.56	205
KRY 112 144/1	A	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	0.35	0.16	11
		ce	0.00		1/2" Ice	0.43	0.22	14
					1" Ice	0.51	0.28	18
					2" Ice	0.70	0.44	32
KRY 112 144/1	B	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	0.35	0.16	11
		ce	0.00		1/2" Ice	0.43	0.22	14
					1" Ice	0.51	0.28	18
					2" Ice	0.70	0.44	32
KRY 112 144/1	C	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	0.35	0.16	11
		ce	0.00		1/2" Ice	0.43	0.22	14
					1" Ice	0.51	0.28	18
					2" Ice	0.70	0.44	32
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	1.97	1.59	73
		ce	0.00		1/2" Ice	2.15	1.75	93
					1" Ice	2.33	1.92	116
					2" Ice	2.72	2.28	170
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Fa	4.00 0.00	0.0000	160.00 No Ice	1.97	1.59	73
		ce	0.00		1/2" Ice	2.15	1.75	93

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
		ce	0.00			1" Ice	2.33	1.92	116
						2" Ice	2.72	2.28	170
RADIO 4449 B71	C	From	4.00		0.0000	No Ice	1.97	1.59	73
B85A_T-MOBILE		Centroid-Fa	0.00			1/2" Ice	2.15	1.75	93
		ce	0.00			1" Ice	2.33	1.92	116
						2" Ice	2.72	2.28	170
RRUS 4415 B25	A	From	4.00		0.0000	No Ice	1.64	0.68	44
		Centroid-Fa	0.00			1/2" Ice	1.80	0.79	56
		ce	0.00			1" Ice	1.97	0.91	71
						2" Ice	2.33	1.18	109
RRUS 4415 B25	B	From	4.00		0.0000	No Ice	1.64	0.68	44
		Centroid-Fa	0.00			1/2" Ice	1.80	0.79	56
		ce	0.00			1" Ice	1.97	0.91	71
						2" Ice	2.33	1.18	109
RRUS 4415 B25	C	From	4.00		0.0000	No Ice	1.64	0.68	44
		Centroid-Fa	0.00			1/2" Ice	1.80	0.79	56
		ce	0.00			1" Ice	1.97	0.91	71
						2" Ice	2.33	1.18	109
Platform Mount [LP	C	None			0.0000	No Ice	25.33	25.33	2056
405-1_HR-1]						1/2" Ice	33.79	33.79	2634
						1" Ice	42.16	42.16	3360
						2" Ice	58.77	58.77	5254
150									
APXVSP18-C-A20	A	From	4.00		0.0000	No Ice	4.66	3.11	70
		Centroid-Fa	0.00			1/2" Ice	5.12	3.55	121
		ce	0.00			1" Ice	5.60	4.00	180
						2" Ice	6.58	4.94	315
APXVSP18-C-A20	B	From	4.00		0.0000	No Ice	4.66	3.11	70
		Centroid-Fa	0.00			1/2" Ice	5.12	3.55	121
		ce	0.00			1" Ice	5.60	4.00	180
						2" Ice	6.58	4.94	315
APXVSP18-C-A20	C	From	4.00		0.0000	No Ice	4.66	3.11	70
		Centroid-Fa	0.00			1/2" Ice	5.12	3.55	121
		ce	0.00			1" Ice	5.60	4.00	180
						2" Ice	6.58	4.94	315
APXVTM14-ALU-I20	A	From	4.00		0.0000	No Ice	4.12	2.06	56
		Centroid-Fa	0.00			1/2" Ice	4.52	2.42	96
		ce	0.00			1" Ice	4.93	2.80	140
						2" Ice	5.80	3.60	246
APXVTM14-ALU-I20	B	From	4.00		0.0000	No Ice	4.12	2.06	56
		Centroid-Fa	0.00			1/2" Ice	4.52	2.42	96
		ce	0.00			1" Ice	4.93	2.80	140
						2" Ice	5.80	3.60	246
APXVTM14-ALU-I20	C	From	4.00		0.0000	No Ice	4.12	2.06	56
		Centroid-Fa	0.00			1/2" Ice	4.52	2.42	96
		ce	0.00			1" Ice	4.93	2.80	140
						2" Ice	5.80	3.60	246
PCS 1900MHZ	A	From	4.00		0.0000	No Ice	2.32	2.24	60
4X45W-65MHZ		Centroid-Fa	0.00			1/2" Ice	2.53	2.44	83
		ce	0.00			1" Ice	2.74	2.65	110
						2" Ice	3.19	3.09	173
PCS 1900MHZ	B	From	4.00		0.0000	No Ice	2.32	2.24	60
4X45W-65MHZ		Centroid-Fa	0.00			1/2" Ice	2.53	2.44	83
		ce	0.00			1" Ice	2.74	2.65	110
						2" Ice	3.19	3.09	173
PCS 1900MHZ	C	From	4.00		0.0000	No Ice	2.32	2.24	60
4X45W-65MHZ		Centroid-Fa	0.00			1/2" Ice	2.53	2.44	83

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
		ce	0.00			1" Ice 2.74	2.65	110
						2" Ice 3.19	3.09	173
800MHZ 2X50W RRH W/FILTER	A	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice 2.06 1/2" Ice 2.24 1" Ice 2.43	1.93 2.11 2.29	64 86 111
						2" Ice 2.83	2.68	172
800MHZ 2X50W RRH W/FILTER	B	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice 2.06 1/2" Ice 2.24 1" Ice 2.43	1.93 2.11 2.29	64 86 111
						2" Ice 2.83	2.68	172
800MHZ 2X50W RRH W/FILTER	C	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice 2.06 1/2" Ice 2.24 1" Ice 2.43	1.93 2.11 2.29	64 86 111
						2" Ice 2.83	2.68	172
(3) TD-RRH8x20-25	C	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice 3.70 1/2" Ice 3.95 1" Ice 4.20	1.29 1.46 1.64	66 90 117
						2" Ice 4.72	2.02	183
Platform Mount [LP 1201-1_HR-3]	C	None		0.0000	150.00	No Ice 29.96 1/2" Ice 36.80 1" Ice 43.24	29.96 36.80 43.24	2619 3384 4275
						2" Ice 55.52	55.52	6430
140								
SLXW 5512 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.13 1/2" Ice 7.59 1" Ice 8.04	6.12 6.91 7.62	46 109 179
						2" Ice 8.96	9.09	344
SLXW 5512 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.13 1/2" Ice 7.59 1" Ice 8.04	6.12 6.91 7.62	46 109 179
						2" Ice 8.96	9.09	344
SLXW 5512 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.13 1/2" Ice 7.59 1" Ice 8.04	6.12 6.91 7.62	46 109 179
						2" Ice 8.96	9.09	344
SC-E 6014 REV2 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 3.56 1/2" Ice 3.91 1" Ice 4.26	4.22 4.78 5.35	32 71 116
						2" Ice 4.98	6.55	225
(2) SC-E 6014 REV2 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 3.56 1/2" Ice 3.91 1" Ice 4.26	4.22 4.78 5.35	32 71 116
						2" Ice 4.98	6.55	225
SC-E 6014 REV2 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 3.56 1/2" Ice 3.91 1" Ice 4.26	4.22 4.78 5.35	32 71 116
						2" Ice 4.98	6.55	225
LPA-80063/6CF w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 10.06 1/2" Ice 10.75 1" Ice 11.40	10.45 11.74 12.87	56 151 255
						2" Ice 12.62	14.82	493
LPA-80063/6CF w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	140.00	No Ice 10.06 1/2" Ice 10.75 1" Ice 11.40	10.45 11.74 12.87	56 151 255
						2" Ice 12.62	14.82	493
BXA-171063/12CF w/ Mount Pipe	A	From Centroid-Face	4.00 0.00	0.0000	140.00	No Ice 4.79 1/2" Ice 5.24	5.04 5.98	37 80

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	Client Crown Castle	Designed by cdcrook

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
		ce	0.00			1" Ice	5.70	6.80	131	
						2" Ice	6.64	8.48	257	
BXA-171063/12CF w/ Mount Pipe	B	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	4.79	5.04	37
			0.00				1/2" Ice	5.24	5.98	80
			0.00				1" Ice	5.70	6.80	131
							2" Ice	6.64	8.48	257
BXA-171063/12CF w/ Mount Pipe	C	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	4.79	5.04	37
			0.00				1/2" Ice	5.24	5.98	80
			0.00				1" Ice	5.70	6.80	131
							2" Ice	6.64	8.48	257
GPS_A	B	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	0.12	0.12	1
			0.00				1/2" Ice	0.21	0.21	4
			0.00				1" Ice	0.28	0.28	8
							2" Ice	0.44	0.44	20
(2) FD9R6004/2C-3L	A	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	0.31	0.08	3
			0.00				1/2" Ice	0.39	0.12	5
			0.00				1" Ice	0.47	0.17	9
							2" Ice	0.65	0.29	20
(2) FD9R6004/2C-3L	B	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	0.31	0.08	3
			0.00				1/2" Ice	0.39	0.12	5
			0.00				1" Ice	0.47	0.17	9
							2" Ice	0.65	0.29	20
(2) FD9R6004/2C-3L	C	From Centroid-Face	4.00	0.00	0.0000	140.00	No Ice	0.31	0.08	3
			0.00				1/2" Ice	0.39	0.12	5
			0.00				1" Ice	0.47	0.17	9
							2" Ice	0.65	0.29	20
Platform Mount [LP 304-1]	C	None			0.0000	140.00	No Ice	17.49	17.49	1349
							1/2" Ice	21.37	21.37	1709
							1" Ice	25.28	25.28	2131
							2" Ice	33.17	33.17	3164
130										
7770.00 w/ Mount Pipe	A	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	5.75	4.25	55
			0.00				1/2" Ice	6.18	5.01	103
			0.00				1" Ice	6.61	5.71	157
							2" Ice	7.49	7.16	287
7770.00 w/ Mount Pipe	B	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	5.75	4.25	55
			0.00				1/2" Ice	6.18	5.01	103
			0.00				1" Ice	6.61	5.71	157
							2" Ice	7.49	7.16	287
7770.00 w/ Mount Pipe	C	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	5.75	4.25	55
			0.00				1/2" Ice	6.18	5.01	103
			0.00				1" Ice	6.61	5.71	157
							2" Ice	7.49	7.16	287
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	4.63	3.27	74
			0.00				1/2" Ice	5.06	3.69	133
			0.00				1" Ice	5.51	4.12	203
							2" Ice	6.43	5.00	376
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	4.63	3.27	74
			0.00				1/2" Ice	5.06	3.69	133
			0.00				1" Ice	5.51	4.12	203
							2" Ice	6.43	5.00	376
800 10764 w/ Mount Pipe	C	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	4.33	3.12	66
			0.00				1/2" Ice	4.77	3.53	112
			0.00				1" Ice	5.22	3.96	167
							2" Ice	6.15	4.85	306
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Centroid-Left	4.00	0.00	0.0000	130.00	No Ice	9.22	6.25	74
			0.00				1/2" Ice	9.98	6.96	143

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
		g	0.00			1" Ice	10.76	7.70	224
						2" Ice	12.36	9.22	420
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	9.22 9.98 10.76	6.25 6.96 7.70	74 143 224
						1" Ice	10.76	7.70	224
						2" Ice	12.36	9.22	420
SBNHH-1D65A w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	3.04 3.34 3.65	2.45 2.75 3.05	54 104 162
						1" Ice	3.65	3.05	162
						2" Ice	4.31	3.68	307
(2) LGP21401	A	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14 21 30
						1" Ice	1.38	0.35	30
						2" Ice	1.69	0.52	55
(2) LGP21401	B	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14 21 30
						1" Ice	1.38	0.35	30
						2" Ice	1.69	0.52	55
(2) LGP21401	C	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14 21 30
						1" Ice	1.38	0.35	30
						2" Ice	1.69	0.52	55
RRUS 32 B2	A	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.73 2.95 3.18	1.67 1.86 2.05	53 74 98
						1" Ice	3.18	2.05	98
						2" Ice	3.66	2.46	157
RRUS 32 B2	B	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.73 2.95 3.18	1.67 1.86 2.05	53 74 98
						1" Ice	3.18	2.05	98
						2" Ice	3.66	2.46	157
RRUS 32 B2	C	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.73 2.95 3.18	1.67 1.86 2.05	53 74 98
						1" Ice	3.18	2.05	98
						2" Ice	3.66	2.46	157
RRUS 11	A	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51 72 95
						1" Ice	3.21	1.50	95
						2" Ice	3.67	1.84	153
RRUS 11	B	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51 72 95
						1" Ice	3.21	1.50	95
						2" Ice	3.67	1.84	153
RRUS 11	C	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51 72 95
						1" Ice	3.21	1.50	95
						2" Ice	3.67	1.84	153
DC6-48-60-18-8F	B	From Centroid-Le g	4.00 0.00 0.00		0.0000	130.00 No Ice 1/2" Ice	1.21 1.89 2.11	1.21 1.89 2.11	33 55 80
						1" Ice	2.11	2.11	80
						2" Ice	2.57	2.57	138
Platform Mount [LP 304-1]	C	None			0.0000	130.00 No Ice 1/2" Ice	17.49 21.37 25.28	17.49 21.37 25.28	1349 1709 2131
						1" Ice	25.28	25.28	2131
						2" Ice	33.17	33.17	3164
120									
APXV18-206517-C w/ Mount Pipe	A	From Leg	1.00 0.00		0.0000	120.00 No Ice 1/2" Ice	3.79 4.36	3.16 3.71	56 95

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00				1" Ice 4.94	4.28	144
							2" Ice 6.14	5.47	275
APXV18-206517-C w/ Mount Pipe	B	From Leg	1.00		0.0000	120.00	No Ice 3.79	3.16	56
			0.00				1/2" Ice 4.36	3.71	95
			0.00				1" Ice 4.94	4.28	144
							2" Ice 6.14	5.47	275
APXV18-206517-C w/ Mount Pipe	C	From Leg	1.00		0.0000	120.00	No Ice 3.79	3.16	56
			0.00				1/2" Ice 4.36	3.71	95
			0.00				1" Ice 4.94	4.28	144
							2" Ice 6.14	5.47	275
Pipe Mount [PM 601-3]	C	None			0.0000	120.00	No Ice 3.17	3.17	195
							1/2" Ice 3.79	3.79	232
							1" Ice 4.42	4.42	279
							2" Ice 5.76	5.76	401
100									
10' x 5' Ice Shield	C	From Face	0.00		0.0000	100.00	No Ice 5.00	2.29	600
			0.00				1/2" Ice 6.72	2.84	850
			0.00				1" Ice 8.44	3.38	1100
							2" Ice 11.89	4.48	1600
Side Arm Mount [SO 203-1]	A	From Face	1.50		0.0000	100.00	No Ice 1.78	3.79	125
			0.00				1/2" Ice 2.24	4.47	153
			0.00				1" Ice 2.75	5.21	189
							2" Ice 3.89	6.78	291
Side Arm Mount [SO 203-1]	B	From Face	1.50		0.0000	100.00	No Ice 1.78	3.79	125
			0.00				1/2" Ice 2.24	4.47	153
			0.00				1" Ice 2.75	5.21	189
							2" Ice 3.89	6.78	291
79									
GPS_A	C	From Leg	3.00		0.0000	79.00	No Ice 0.12	0.12	1
			0.00				1/2" Ice 0.21	0.21	4
			0.00				1" Ice 0.28	0.28	8
							2" Ice 0.44	0.44	20
Side Arm Mount [SO 701-1]	C	From Leg	1.50		0.0000	79.00	No Ice 0.85	1.67	65
			0.00				1/2" Ice 1.14	2.34	79
			0.00				1" Ice 1.43	3.01	93
							2" Ice 2.01	4.35	121
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz Lateral	Vert						
			ft	ft	°	°	ft	ft	ft ²	lb	
100											
MPRC2449	A	Paraboloid w/Shroud (HP)	From Face	3.00		3.0000		100.00	2.17	No Ice 3.69	24
				0.00						1/2" Ice 3.98	40
				0.00						1" Ice 4.27	60
										2" Ice 4.84	110
MPRC2449	B	Paraboloid	From	3.00		-53.0000		100.00	2.17	No Ice 3.69	24

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
		w/Shroud (HP)	Face	0.00				1/2" Ice	3.98	40
				0.00				1" Ice	4.27	60
								2" Ice	4.84	110

Load Combinations

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

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Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	8.600	45	0.4261	0.0008
L2	140 - 120	6.833	45	0.4132	0.0005
L3	120 - 100	5.162	45	0.3784	0.0003
L4	100 - 80	3.673	45	0.3280	0.0002
L5	80 - 60	2.411	45	0.2703	0.0002
L6	60 - 40	1.398	45	0.2104	0.0001
L7	40 - 20	0.637	45	0.1503	0.0001
L8	20 - 0	0.161	45	0.0745	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	45	8.600	0.4261	0.0008	193202
150.00	APXVSPP18-C-A20	45	7.710	0.4215	0.0007	96601
140.00	SLXW 5512 w/ Mount Pipe	45	6.833	0.4132	0.0005	48523
130.00	7770.00 w/ Mount Pipe	45	5.979	0.3985	0.0004	33430
120.00	APXV18-206517-C w/ Mount Pipe	45	5.162	0.3784	0.0003	25809
100.00	MPRC2449	45	3.673	0.3280	0.0002	20714
79.00	GPS_A	45	2.355	0.2673	0.0002	19149

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	36.542	14	1.8098	0.0032
L2	140 - 120	29.035	14	1.7552	0.0021
L3	120 - 100	21.940	14	1.6079	0.0012
L4	100 - 80	15.610	14	1.3937	0.0009
L5	80 - 60	10.250	14	1.1490	0.0006
L6	60 - 40	5.943	14	0.8943	0.0004
L7	40 - 20	2.709	14	0.6391	0.0003
L8	20 - 0	0.684	14	0.3166	0.0001

Critical Deflections and Radius of Curvature - Design Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
160.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	14	36.542	1.8098	0.0034	45990
150.00	APXVSP18-C-A20	14	32.763	1.7902	0.0029	22995
140.00	SLXW 5512 w/ Mount Pipe	14	29.035	1.7552	0.0023	11542
130.00	7770.00 w/ Mount Pipe	14	25.412	1.6932	0.0018	7911
120.00	APXV18-206517-C w/ Mount Pipe	14	21.940	1.6079	0.0014	6090
100.00	MPRC2449	14	15.610	1.3937	0.0011	4883
79.00	GPS_A	14	10.010	1.1362	0.0007	4513

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio
	ft		ft	ft		in ²	lb	lb	$\frac{P_u}{\phi P_n}$
L1	160 - 140 (1)	P36x0.375	20.00	0.00	0.0	41.9697	-12701	1490100	0.009
L2	140 - 120 (2)	P42x0.375	20.00	0.00	0.0	49.0383	-22135	1668870	0.013
L3	120 - 100 (3)	P48x0.375	20.00	0.00	0.0	56.1069	-27927	1847490	0.015
L4	100 - 80 (4)	P54x0.375	20.00	0.00	0.0	63.1755	-34974	2026000	0.017
L5	80 - 60 (5)	P60x0.375	20.00	0.00	0.0	70.2440	-41638	2204430	0.019
L6	60 - 40 (6)	P60x0.5	20.00	0.00	0.0	93.4624	-50140	3125690	0.016
L7	40 - 20 (7)	P60x0.5	20.00	0.00	0.0	93.4624	-58687	3125690	0.019
L8	20 - 0 (8)	P60x0.625	20.00	0.00	0.0	116.583	-69137	4139150	0.017
						0			

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{ux}	Ratio	M _{uy}	φM _{uy}	Ratio
	ft		lb-ft	lb-ft	$\frac{M_{ux}}{\phi M_{ux}}$	lb-ft	lb-ft	$\frac{M_{uy}}{\phi M_{uy}}$
L1	160 - 140 (1)	P36x0.375	142850	1338808	0.107	0	1338808	0.000
L2	140 - 120 (2)	P42x0.375	425750	1796558	0.237	0	1796558	0.000
L3	120 - 100 (3)	P48x0.375	777888	2321108	0.335	0	2321108	0.000
L4	100 - 80 (4)	P54x0.375	1180650	2912458	0.405	0	2912458	0.000
L5	80 - 60 (5)	P60x0.375	1620408	3570608	0.454	0	3570608	0.000
L6	60 - 40 (6)	P60x0.5	2094650	4860408	0.431	0	4860408	0.000
L7	40 - 20 (7)	P60x0.5	2597642	4860408	0.534	0	4860408	0.000
L8	20 - 0 (8)	P60x0.625	3124692	6198183	0.504	0	6198183	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	φV _n	Ratio	Actual T _u	φT _n	Ratio
	ft		lb	lb	$\frac{V_u}{\phi V_n}$	lb-ft	lb-ft	$\frac{T_u}{\phi T_n}$

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Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 140 (1)	P36x0.375	9015	454187	0.020	889	1094275	0.001
L2	140 - 120 (2)	P42x0.375	16268	421127	0.039	997	1185508	0.001
L3	120 - 100 (3)	P48x0.375	18468	430233	0.043	997	1384850	0.001
L4	100 - 80 (4)	P54x0.375	20988	443478	0.047	581	1607325	0.000
L5	80 - 60 (5)	P60x0.375	22876	455633	0.050	794	1836150	0.000
L6	60 - 40 (6)	P60x0.5	24500	868592	0.028	794	3492992	0.000
L7	40 - 20 (7)	P60x0.5	25749	868592	0.030	794	3492992	0.000
L8	20 - 0 (8)	P60x0.625	26906	1322050	0.020	794	5746700	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 140 (1)	0.009	0.107	0.000	0.020	0.001	0.116	1.050	4.8.2
L2	140 - 120 (2)	0.013	0.237	0.000	0.039	0.001	0.252	1.050	4.8.2
L3	120 - 100 (3)	0.015	0.335	0.000	0.043	0.001	0.352	1.050	4.8.2
L4	100 - 80 (4)	0.017	0.405	0.000	0.047	0.000	0.425	1.050	4.8.2
L5	80 - 60 (5)	0.019	0.454	0.000	0.050	0.000	0.475	1.050	4.8.2
L6	60 - 40 (6)	0.016	0.431	0.000	0.028	0.000	0.448	1.050	4.8.2
L7	40 - 20 (7)	0.019	0.534	0.000	0.030	0.000	0.554	1.050	4.8.2
L8	20 - 0 (8)	0.017	0.504	0.000	0.020	0.000	0.521	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	160 - 140	Pole	P36x0.375	1	-12701	1564605	11.0	Pass
L2	140 - 120	Pole	P42x0.375	2	-22135	1752313	24.0	Pass
L3	120 - 100	Pole	P48x0.375	3	-27927	1939864	33.5	Pass
L4	100 - 80	Pole	P54x0.375	4	-34974	2127300	40.5	Pass
L5	80 - 60	Pole	P60x0.375	5	-41638	2314651	45.3	Pass
L6	60 - 40	Pole	P60x0.5	6	-50140	3281974	42.6	Pass
L7	40 - 20	Pole	P60x0.5	7	-58687	3281974	52.8	Pass
L8	20 - 0	Pole	P60x0.625	8	-69137	4346107	49.6	Pass
						Summary		
						Pole (L7)		52.8
						RATING =		52.8
								Pass

APPENDIX B
BASE LEVEL DRAWING

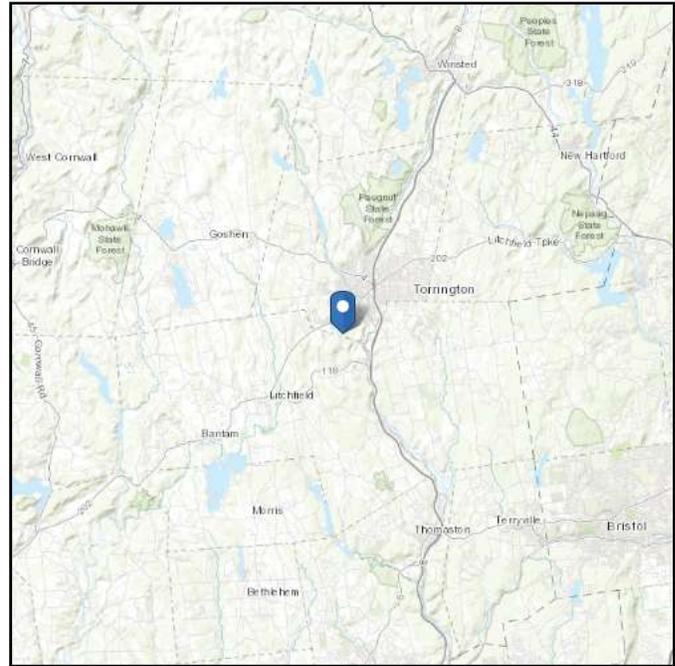
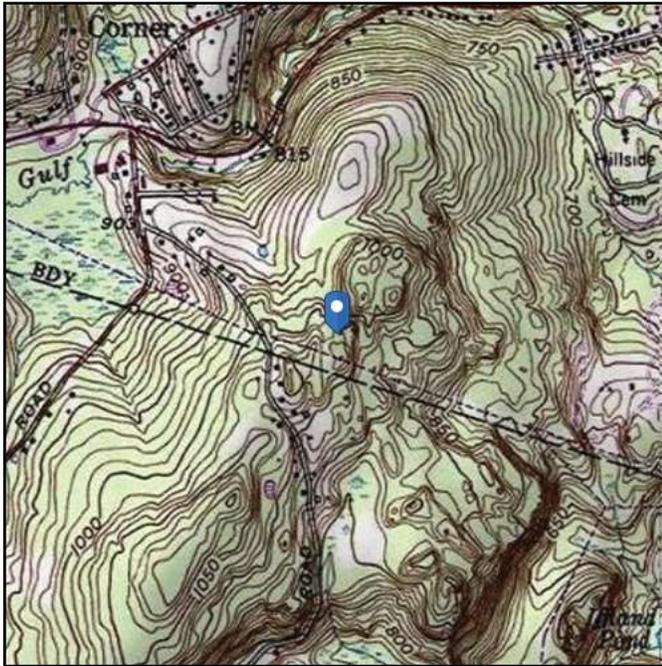
APPENDIX C
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 1026.6 ft (NAVD 88)
Latitude: 41.780647
Longitude: -73.136117



Wind

Results:

Wind Speed:	*116 Vmph	*120 mph per city of Torrington jurisdiction
10-year MRI	76 Vmph	
25-year MRI	85 Vmph	
50-year MRI	90 Vmph	
100-year MRI	96 Vmph	

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Mon Jul 15 2019

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.

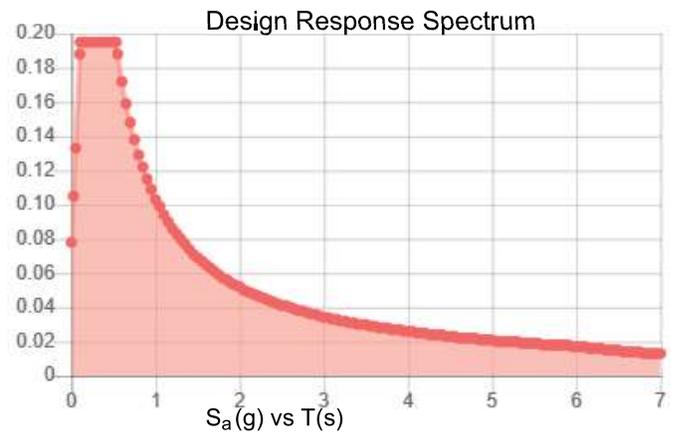
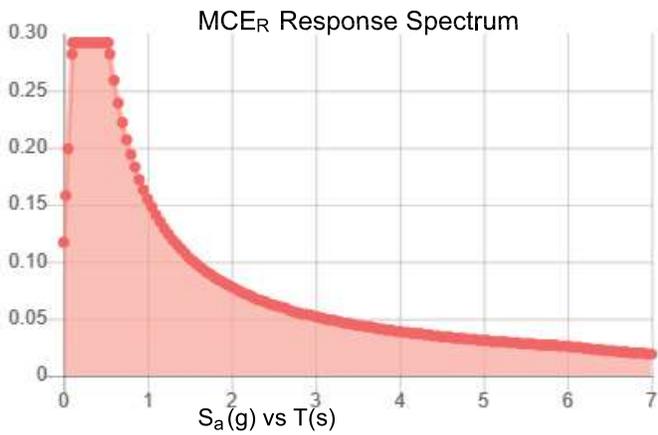
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.183	S_{DS} :	0.195
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.292	PGA _M :	0.148
S_{M1} :	0.155	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon Jul 15 2019

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Mon Jul 15 2019

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

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

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Monopole Flange Plate Connection

Elevation = 140 ft.

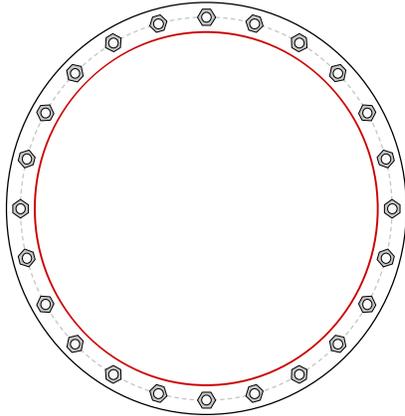


BU #	828540
Site Name	Torrington/RT 8
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	H

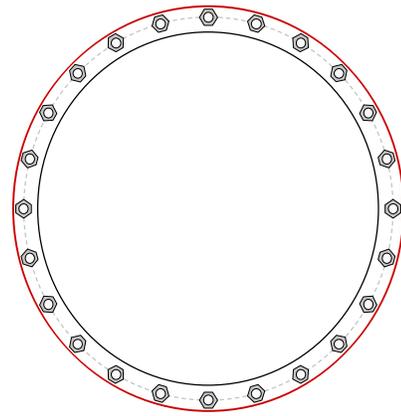
Applied Loads	
Moment (kip-ft)	142.85
Axial Force (kips)	12.70
Shear Force (kips)	9.02

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(24) 1" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 39" BC

Top Plate Data

42" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

36" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	6.79
Allowable (kips)	54.54
Stress Rating:	11.9% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Monopole Flange Plate Connection

Elevation = 120 ft.



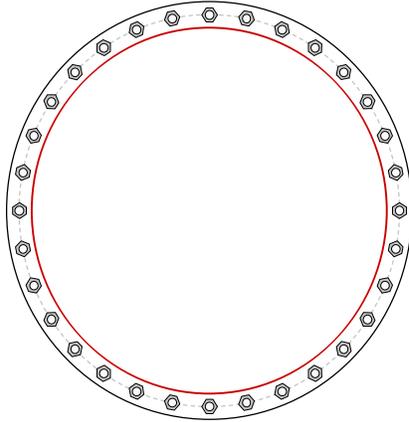
BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3

Applied Loads	
Moment (kip-ft)	425.75
Axial Force (kips)	22.13
Shear Force (kips)	16.27

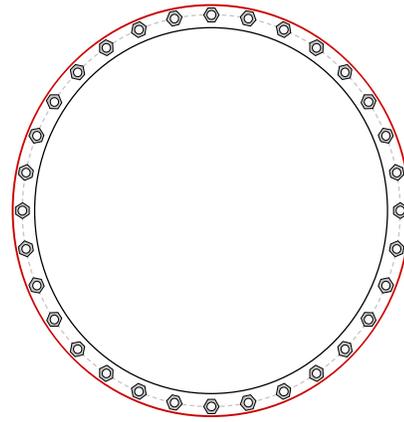
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(32) 1" \varnothing bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 45" BC

Top Plate Data

48" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

42" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	13.50
Allowable (kips)	54.53
Stress Rating:	23.6% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirol OK
Tension Side Stress Rating:	Pirol OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirol OK
Tension Side Stress Rating:	Pirol OK

Monopole Flange Plate Connection

Elevation = 100 ft.

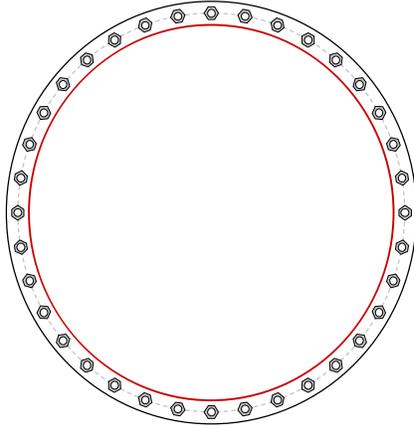


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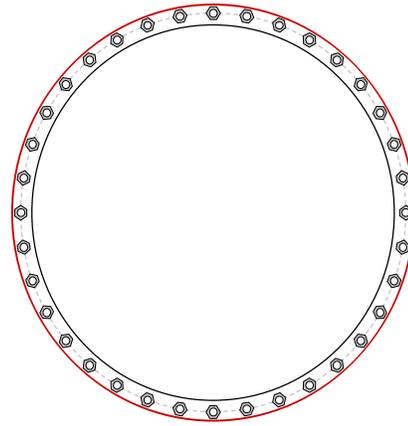
Applied Loads	
Moment (kip-ft)	777.89
Axial Force (kips)	27.93
Shear Force (kips)	18.47

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(36) 1" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 51" BC

Top Plate Data

54" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

48" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

54" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	19.56
Allowable (kips)	54.53
Stress Rating:	34.2% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Monopole Flange Plate Connection

Elevation = 80 ft.



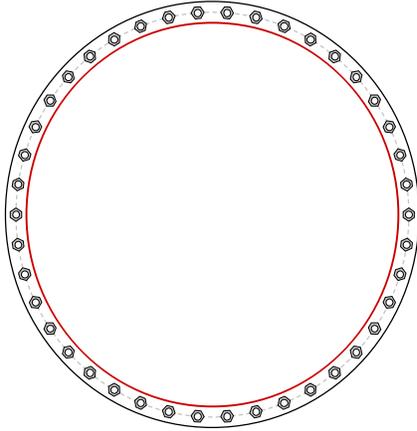
BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3

Applied Loads	
Moment (kip-ft)	1180.65
Axial Force (kips)	34.97
Shear Force (kips)	20.99

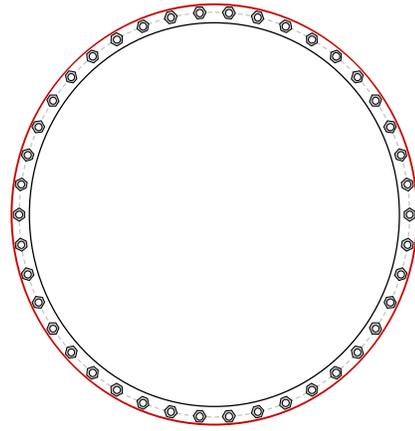
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(42) 1" \varnothing bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 57" BC

Top Plate Data

60" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

54" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

54" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

60" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	22.84
Allowable (kips)	54.53
Stress Rating:	39.9% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirol OK
Tension Side Stress Rating:	Pirol OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirol OK
Tension Side Stress Rating:	Pirol OK

Monopole Flange Plate Connection

Elevation = 60 ft.

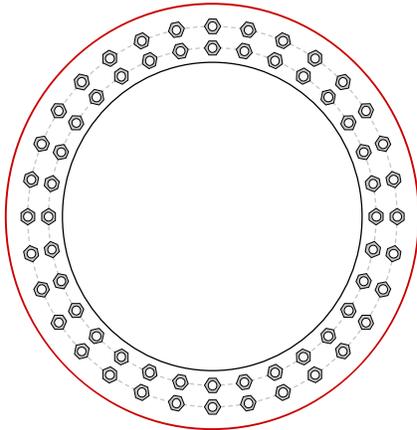


BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3
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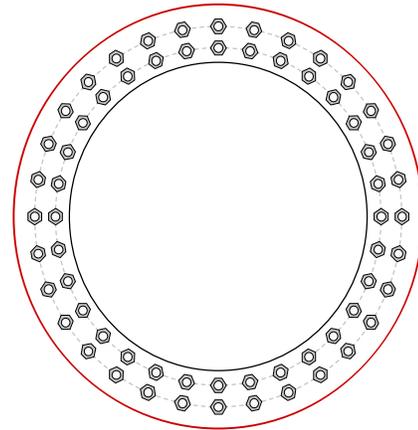
Applied Loads	
Moment (kip-ft)	1620.41
Axial Force (kips)	41.64
Shear Force (kips)	22.88

*TIA-222-H Section 15.5 Applied

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

GROUP 1: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 53" BC
 GROUP 2: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 47" BC

Top Plate Data

43" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

60" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

43" ID x 1.25" Plate (A307; Fy=36 ksi, Fu=60 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	25.02
Allowable (kips)	76.31
Stress Rating:	31.2% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Monopole Flange Plate Connection

Elevation = 40 ft.

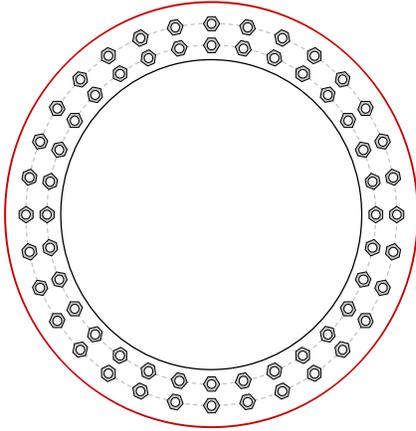


BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3
TIA-222 Revision	
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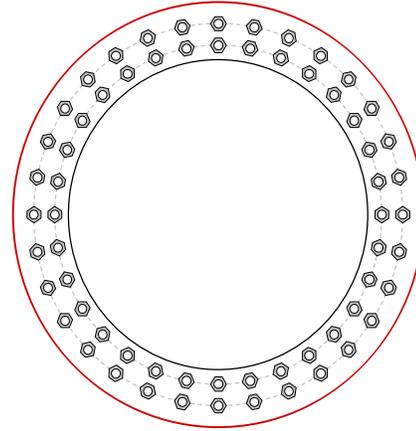
Applied Loads	
Moment (kip-ft)	2094.65
Axial Force (kips)	50.14
Shear Force (kips)	24.50

*TIA-222-H Section 15.5 Applied

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

GROUP 1: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 53" BC
 GROUP 2: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 47" BC

Top Plate Data

43" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

43" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	42.24
Allowable (kips)	76.31
Stress Rating:	52.7% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Monopole Flange Plate Connection

Elevation = 20 ft.

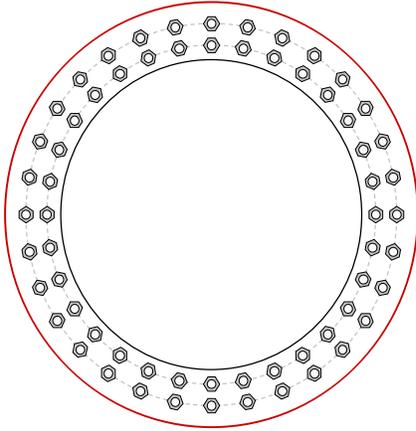


BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3
TIA-222 Revision	
	H

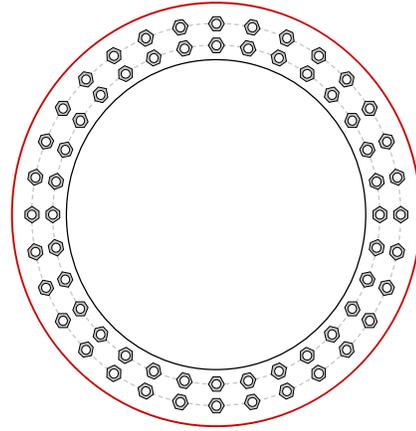
Applied Loads	
Moment (kip-ft)	2597.64
Axial Force (kips)	58.69
Shear Force (kips)	25.75

*TIA-222-H Section 15.5 Applied

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

GROUP 1: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 53" BC
 GROUP 2: (32) 1-1/4" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 47" BC

Top Plate Data

43" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

43" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

60" x 0.625" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	63.36
Allowable (kips)	76.31
Stress Rating:	79.1% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Monopole Base Plate Connection

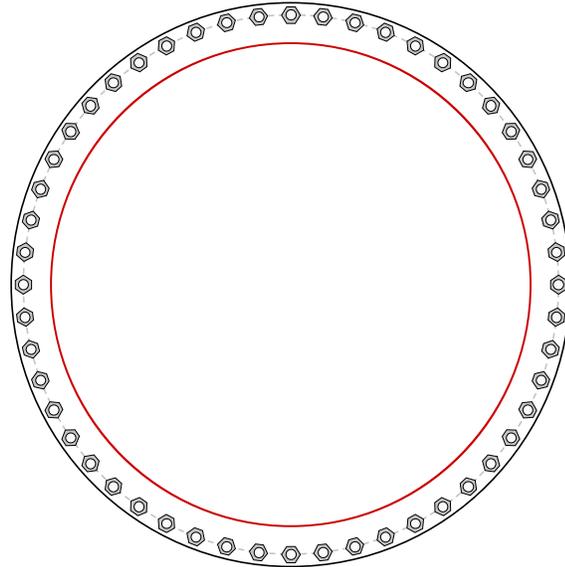


Site Info	
BU #	828540
Site Name	Torrington/RT 8
Order #	494417 Rev. 3

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.375

Applied Loads	
Moment (kip-ft)	3124.70
Axial Force (kips)	69.14
Shear Force (kips)	26.90

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
(52) 1-1/4" ϕ bolts (A687 N; $F_y=105$ ksi, $F_u=125$ ksi) on 67" BC
Base Plate Data
70" OD x 1.25" Plate (A307; $F_y=36$ ksi, $F_u=60$ ksi)
Stiffener Data
N/A
Pole Data
60" x 0.625" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>	
$Pu_c = 44.37$	$\phi Pn_c = 115.97$		Stress Rating
$Vu = 0.52$	$\phi Vn = 52.19$		37.9%
$Mu = 0.46$	$\phi Mn = 30.76$		Pass
Base Plate Summary			
Max Stress (ksi):	-		
Allowable Stress (ksi):	-		
Stress Rating:	Pirod OK		

Pier and Pad Foundation



BU # :	828540
Site Name:	Torrington/RT 8
App. Number:	494417 Rev. 3

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	<input type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Compression, P_{comp} :	69.141	kips
Base Shear, V_{u_comp} :	26.896	kips
Moment, M_u :	3124.695	ft-kips
Tower Height, H :	160	ft
BP Dist. Above Fdn, bp_{dist} :	2.625	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	260.39	26.90	9.8%	Pass
<i>Bearing Pressure (ksf)</i>	12.00	1.59	12.7%	Pass
<i>Overtuning (kip*ft)</i>	7554.07	3332.30	44.1%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	6747.64	3245.73	45.8%	Pass
<i>Pier Compression (kip)</i>	24494.62	100.31	0.4%	Pass
<i>Pad Flexure (kip*ft)</i>	3763.88	1229.12	31.1%	Pass
<i>Pad Shear - 1-way (kips)</i>	1010.06	169.09	15.9%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.035	17.6%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4294.03	1947.44	43.2%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	2.5	ft
Pier Rebar Size, S_c :	9	
Pier Rebar Quantity, mc :	42	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	44.1%
Structural Rating*:	45.8%

Pad Properties		
Depth, D :	5	ft
Pad Width, W :	28	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom), Sp :	7	
Pad Rebar Quantity (Bottom), mp :	45	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Q_{ult} :	16.000	ksf
Cohesion, C_u :		ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :	50	
Base Friction, μ :	0.5	
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

<--Toggle between Gross and Net

Exhibit D

Mount Analysis

Date: **June 23, 2020**

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

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject: **Mount Analysis Report**

Carrier Designation: **T-Mobile Anchor**
Carrier Site Number: CT11369A
Carrier Site Name: Torrington/RT 8

Crown Castle Designation: **Crown Castle BU Number:** 828540
Crown Castle Site Name: Torrington/RT 8
Crown Castle JDE Job Number: 576568
Crown Castle Order Number: 494417 Rev. 3

Engineering Firm Designation: **Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B

Site Data: **218 Wheeler Road, Torrington, Litchfield County, CT 06790**
Latitude 41°46'50.33" Longitude -73°8'10.02"

Structure Information: **Tower Height & Type:** **160.0 ft Monopole**
Mount Elevation: **160.0 ft**
Mount Type: **16.0 ft Platform**

Dear Kevin Morrow,

Infinigy Engineering, PLLC is pleased to submit this "**Mount Analysis Report**" to determine the structural integrity of T-Mobile'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**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

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

Respectfully Submitted by:
John Stevens, P.E.
518-690-0790
jstevens@infinigy.com
CT PE License No. PEN.0024705



6-23-2020

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Additional Calculations

1) INTRODUCTION

This is an existing 3 sector 16.0 ft Platform, mapped by Infinigy Engineering.

The mount has been modified per reinforcement drawings prepared by Infinigy Engineering in September of 2019. Reinforcement consists of the replacement of corner mount pipes and addition of a support rail.

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code / 2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	B
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:	0.182
Seismic S₁:	0.065
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
160.0	160.0	3	Ericsson	AIR 32 B2A B66AA	16.0 ft Platform
		3	Ericsson	AIR6449 B41	
		3	Ericsson	Ericsson AIR 21 B2A B4P	
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		3	Ericsson	KRY 112 144/1	
		3	Ericsson	Radio 4449 B71 B85A_T-Mobile	
		3	Ericsson	RRUS 4415 B25	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	494417 Rev. 3	CCI Sites
Mount Mapping Documents	Infinigy Engineering, PLLC	8506891	CCI Sites
Mount Modification Analysis	Infinigy Engineering, PLLC	8655749	Infinigy

3.1) Analysis Method

RISA-3D (Version 18), 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	Mount Pipe(s)	MP5	160.0	56.2	Pass
	Horizontal(s)	M1		46.0	Pass
	Handrail(s)	M106		39.5	Pass
	Standoff(s)	M54		32.7	Pass
	Horizontals Corner Plate(s)	M6		18.2	Pass
	Handrails Corner Plate(s)	M114		16.5	Pass
	Mount Connection(s)	--		45.2	Pass

Structure Rating (max from all components) =	56.2%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.

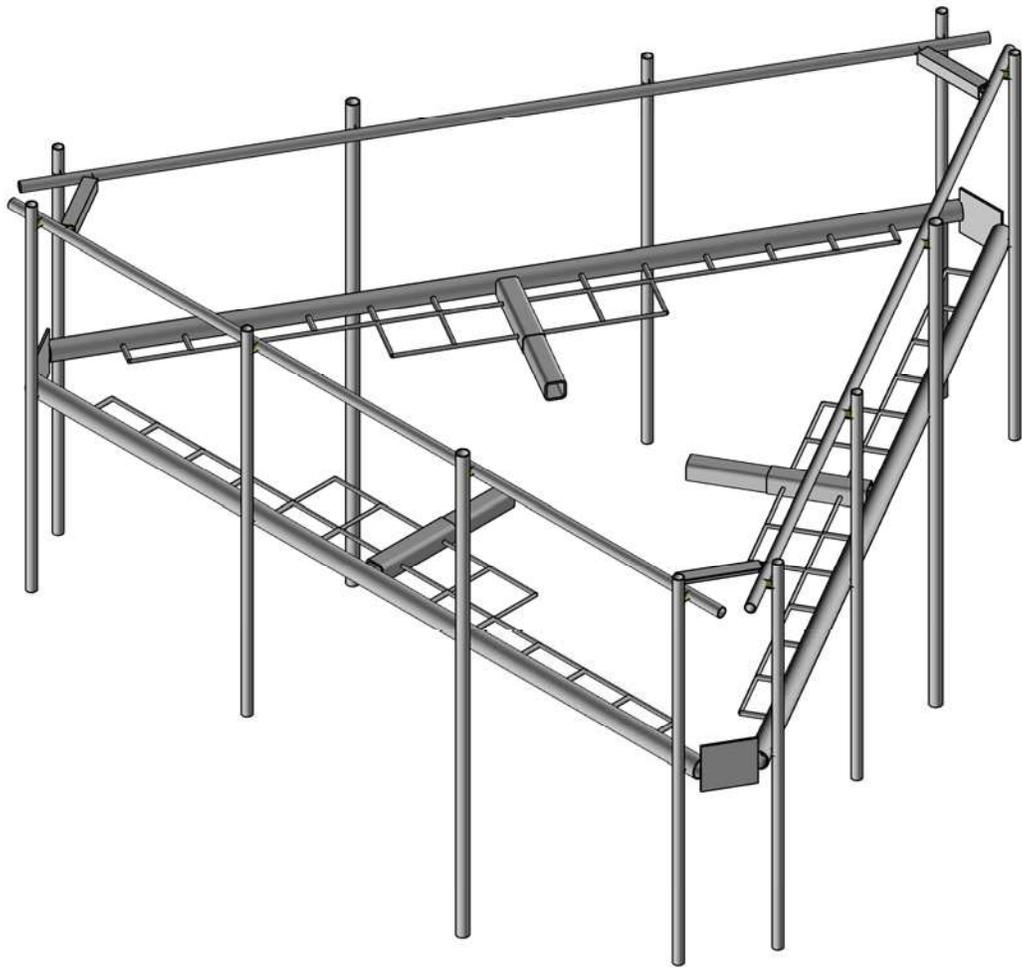
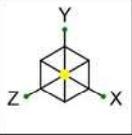
4.1) Recommendations

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 modifications, as noted in the Mount Modification Analysis reference 8655749 prepared by Infinigy Engineering, included in the analysis

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

APPENDIX A
WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy Engineering, PLLC

JG

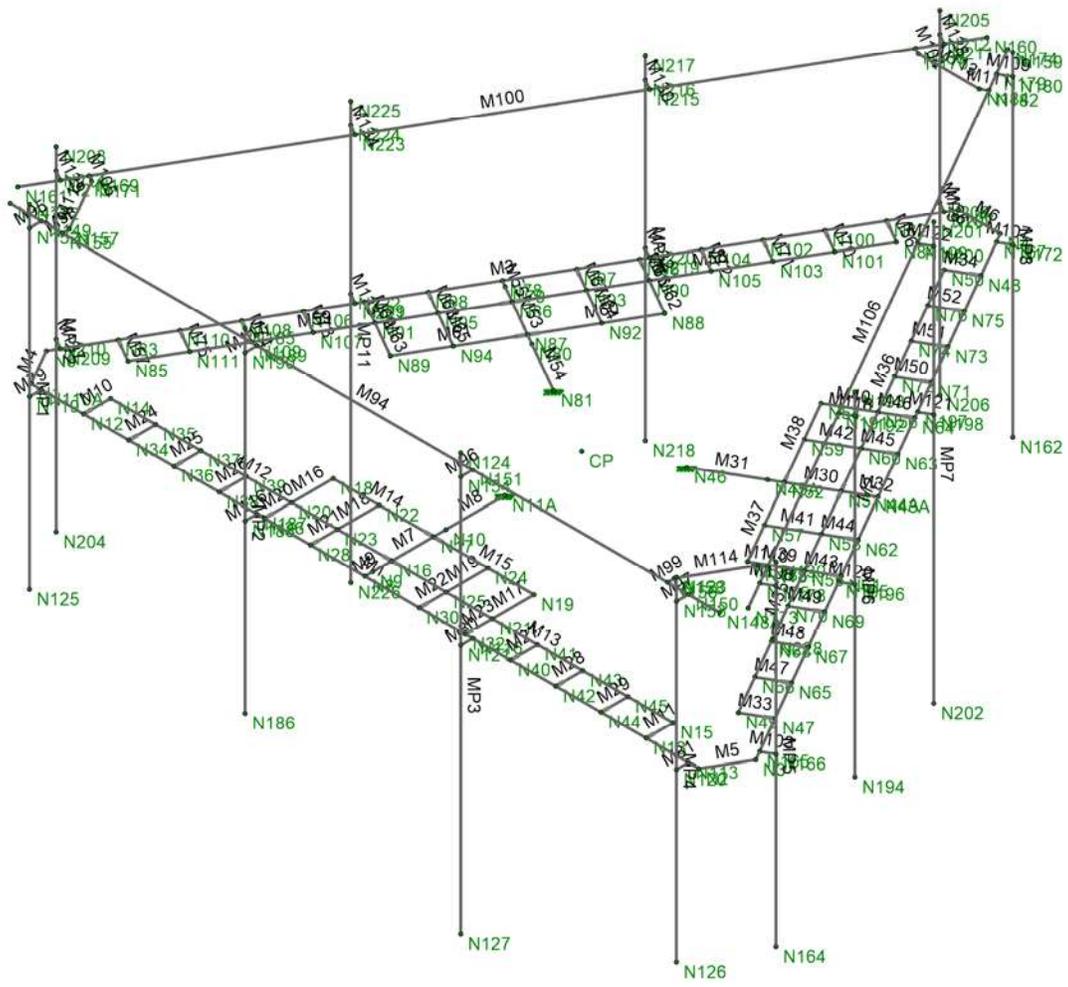
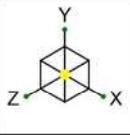
1039-Z0001-B

828540

Rendered1

Jun 24, 2020

828540_loaded.r3d



Envelope Only Solution

Infinigy Engineering, PLLC
 JG
 1039-Z0001-B

828540

Wire Frame1
 Jun 24, 2020
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APPENDIX B
SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	Jacques Grimaldi

SITE INFORMATION	
Risk Category:	II
Exposure Category:	B
Topo Factor Procedure:	Method 1, Category 1
Site Class:	D - Stiff Soil
Ground Elevation:	1027 ft *Rev H

MOUNT INFORMATION	
Mount Type:	Platform
Num Sectors:	3
Centerline AGL:	160.0 ft
Tower Height AGL:	160.0 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_{d1}):	0.95
Ground Ele. Factor (K_g):	0.96 *Rev H Only
Rooftop Speed-Up (K_s):	1.00 *Rev H Only
Topographic Factor (K_{zt}):	1.00
Gust Effect Factor (G_{H1}):	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}):	120 mph
Design Wind (V):	N/A mph
Ice Wind (V_{ice}):	50 mph
Base Ice Thickness (t):	1.5 in
Flat Pressure:	76.28 psf
Round Pressure:	45.77 psf
Ice Wind Pressure:	7.95 psf

SEISMIC DATA	
Short-Period Accel. (S_s):	0.18 g
1-Second Accel. (S_1):	0.07 g
Short-Period Design (S_{ps}):	0.19
1-Second Design (S_{p1}):	0.10
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 Load Calculator V2.1.4

APPENDIX C
SOFTWARE ANALYSIS OUTPUT

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2			Horizontals	Beam	Pipe	A53 Gr.B	Typical
2	M2	N3	N4			Horizontals	Beam	Pipe	A53 Gr.B	Typical
3	M3	N6	N5			Horizontals	Beam	Pipe	A53 Gr.B	Typical
4	M4	N1	N6			Corner Plates	Beam	RECT	A36 Gr.36	Typical
5	M5	N2	N3			Corner Plates	Beam	RECT	A36 Gr.36	Typical
6	M6	N4	N5			Corner Plates	Beam	RECT	A36 Gr.36	Typical
7	M7	N9	N10			Standoff 1	Beam	SquareTube	A500 Gr...	Typical
8	M8	N10	N11A			Standoff 2	Beam	SquareTube	A500 Gr...	Typical
9	M9	N8	N9			RIGID	None	None	RIGID	Typical
10	M10	N12	N14			1" SR	Beam	BAR	A36 Gr.36	Typical
11	M11	N13	N15			1" SR	Beam	BAR	A36 Gr.36	Typical
12	M12	N14	N16			.75" SR	Beam	BAR	A36 Gr.36	Typical
13	M13	N16	N15			.75" SR	Beam	BAR	A36 Gr.36	Typical
14	M14	N18	N17			.75" SR	Beam	BAR	A36 Gr.36	Typical
15	M15	N17	N19			.75" SR	Beam	BAR	A36 Gr.36	Typical
16	M16	N18	N20			.75" SR	Beam	BAR	A36 Gr.36	Typical
17	M17	N19	N21			.75" SR	Beam	BAR	A36 Gr.36	Typical
18	M18	N22	N23			.75" SR	Beam	BAR	A36 Gr.36	Typical
19	M19	N24	N25			.75" SR	Beam	BAR	A36 Gr.36	Typical
20	M20	N26	N20			1" SR	Beam	BAR	A36 Gr.36	Typical
21	M21	N28	N23			1" SR	Beam	BAR	A36 Gr.36	Typical
22	M22	N30	N25			1" SR	Beam	BAR	A36 Gr.36	Typical
23	M23	N32	N21			1" SR	Beam	BAR	A36 Gr.36	Typical
24	M24	N34	N35			1" SR	Beam	BAR	A36 Gr.36	Typical
25	M25	N36	N37			1" SR	Beam	BAR	A36 Gr.36	Typical
26	M26	N38	N39			1" SR	Beam	BAR	A36 Gr.36	Typical
27	M27	N40	N41			1" SR	Beam	BAR	A36 Gr.36	Typical
28	M28	N42	N43			1" SR	Beam	BAR	A36 Gr.36	Typical
29	M29	N44	N45			1" SR	Beam	BAR	A36 Gr.36	Typical
30	M30	N44A	N45A			Standoff 1	Beam	SquareTube	A500 Gr...	Typical
31	M31	N45A	N46			Standoff 2	Beam	SquareTube	A500 Gr...	Typical
32	M32	N43A	N44A			RIGID	None	None	RIGID	Typical
33	M33	N47	N49			1" SR	Beam	BAR	A36 Gr.36	Typical
34	M34	N48	N50			1" SR	Beam	BAR	A36 Gr.36	Typical
35	M35	N49	N51			.75" SR	Beam	BAR	A36 Gr.36	Typical
36	M36	N51	N50			.75" SR	Beam	BAR	A36 Gr.36	Typical
37	M37	N53	N52			.75" SR	Beam	BAR	A36 Gr.36	Typical
38	M38	N52	N54			.75" SR	Beam	BAR	A36 Gr.36	Typical
39	M39	N53	N55			.75" SR	Beam	BAR	A36 Gr.36	Typical
40	M40	N54	N56			.75" SR	Beam	BAR	A36 Gr.36	Typical
41	M41	N57	N58			.75" SR	Beam	BAR	A36 Gr.36	Typical
42	M42	N59	N60			.75" SR	Beam	BAR	A36 Gr.36	Typical
43	M43	N61	N55			1" SR	Beam	BAR	A36 Gr.36	Typical
44	M44	N62	N58			1" SR	Beam	BAR	A36 Gr.36	Typical
45	M45	N63	N60			1" SR	Beam	BAR	A36 Gr.36	Typical
46	M46	N64	N56			1" SR	Beam	BAR	A36 Gr.36	Typical
47	M47	N65	N66			1" SR	Beam	BAR	A36 Gr.36	Typical
48	M48	N67	N68			1" SR	Beam	BAR	A36 Gr.36	Typical
49	M49	N69	N70			1" SR	Beam	BAR	A36 Gr.36	Typical
50	M50	N71	N72			1" SR	Beam	BAR	A36 Gr.36	Typical
51	M51	N73	N74			1" SR	Beam	BAR	A36 Gr.36	Typical
52	M52	N75	N76			1" SR	Beam	BAR	A36 Gr.36	Typical
53	M53	N79	N80			Standoff 1	Beam	SquareTube	A500 Gr...	Typical
54	M54	N80	N81			Standoff 2	Beam	SquareTube	A500 Gr...	Typical
55	M55	N78	N79			RIGID	None	None	RIGID	Typical
56	M56	N82	N81			1" SR	Beam	BAR	A36 Gr.36	Typical
57	M57	N83	N85			1" SR	Beam	BAR	A36 Gr.36	Typical
58	M58	N84	N86			.75" SR	Beam	BAR	A36 Gr.36	Typical

Primary Member Properties (Continued)

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
59	M59	N86	N85			.75" SR	Beam	BAR	A36 Gr.36	Typical
60	M60	N88	N87			.75" SR	Beam	BAR	A36 Gr.36	Typical
61	M61	N87	N89			.75" SR	Beam	BAR	A36 Gr.36	Typical
62	M62	N88	N90			.75" SR	Beam	BAR	A36 Gr.36	Typical
63	M63	N89	N91			.75" SR	Beam	BAR	A36 Gr.36	Typical
64	M64	N92	N93			.75" SR	Beam	BAR	A36 Gr.36	Typical
65	M65	N94	N95			.75" SR	Beam	BAR	A36 Gr.36	Typical
66	M66	N96	N90			1" SR	Beam	BAR	A36 Gr.36	Typical
67	M67	N97	N93			1" SR	Beam	BAR	A36 Gr.36	Typical
68	M68	N98	N95			1" SR	Beam	BAR	A36 Gr.36	Typical
69	M69	N99	N91			1" SR	Beam	BAR	A36 Gr.36	Typical
70	M70	N100	N101			1" SR	Beam	BAR	A36 Gr.36	Typical
71	M71	N102	N103			1" SR	Beam	BAR	A36 Gr.36	Typical
72	M72	N104	N105			1" SR	Beam	BAR	A36 Gr.36	Typical
73	M73	N106	N107			1" SR	Beam	BAR	A36 Gr.36	Typical
74	M74	N108	N109			1" SR	Beam	BAR	A36 Gr.36	Typical
75	M75	N110	N111			1" SR	Beam	BAR	A36 Gr.36	Typical
76	MP1	N122	N125			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
77	MP3	N124	N127			Mount Pipe Big	Column	Pipe	A53 Gr.B	Typical
78	MP4	N123	N126			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
79	M79	N110A	N119			RIGID	None	None	RIGID	Typical
80	M80	N116	N121			RIGID	None	None	RIGID	Typical
81	M81	N113	N120			RIGID	None	None	RIGID	Typical
82	M94	N147A	N148A			Proposed Hand...	Beam	Pipe	A53 Gr.B	Typical
83	M95	N149	N152			RIGID	None	None	RIGID	Typical
84	M96	N151	N154			RIGID	None	None	RIGID	Typical
85	M97	N150	N153			RIGID	None	None	RIGID	Typical
86	M98	N155	N157			RIGID	None	None	RIGID	Typical
87	M99	N156	N158			RIGID	None	None	RIGID	Typical
88	M100	N160	N161			Proposed Hand...	Beam	Pipe	A53 Gr.B	Typical
89	M104	N168	N170			RIGID	None	None	RIGID	Typical
90	M105	N169	N171			RIGID	None	None	RIGID	Typical
91	M106	N173	N174			Proposed Hand...	Beam	Pipe	A53 Gr.B	Typical
92	M110	N181	N183			RIGID	None	None	RIGID	Typical
93	M111	N182	N184			RIGID	None	None	RIGID	Typical
94	M112	N157	N171		180	Proposed Hand...	Beam	Single Angle	Q345	Typical
95	M113	N170	N184		180	Proposed Hand...	Beam	Single Angle	Q345	Typical
96	M114	N183	N158		180	Proposed Hand...	Beam	Single Angle	Q345	Typical
97	MP2	N185	N186			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
98	M116	N187	N188			RIGID	None	None	RIGID	Typical
99	M117	N189	N190			RIGID	None	None	RIGID	Typical
100	MP8	N159	N162			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
101	MP5	N130	N164			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
102	M103	N165	N166			RIGID	None	None	RIGID	Typical
103	M107	N167	N172			RIGID	None	None	RIGID	Typical
104	M108	N175	N178			RIGID	None	None	RIGID	Typical
105	M109	N179	N180			RIGID	None	None	RIGID	Typical
106	M118	N191	N192			RIGID	None	None	RIGID	Typical
107	MP6	N193	N194			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
108	M120	N195	N196			RIGID	None	None	RIGID	Typical
109	M121	N197	N198			RIGID	None	None	RIGID	Typical
110	M122	N199	N200			RIGID	None	None	RIGID	Typical
111	MP7	N201	N202			Mount Pipe Big	Column	Pipe	A53 Gr.B	Typical
112	MP12	N203	N204			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
113	MP9	N205	N206			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
114	M126	N207	N208			RIGID	None	None	RIGID	Typical
115	M127	N209	N210			RIGID	None	None	RIGID	Typical
116	M128	N211	N212			RIGID	None	None	RIGID	Typical



Primary Member Properties (Continued)

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
117	M129	N213	N214			RIGID	None	None	RIGID	Typical
118	M130	N215	N216			RIGID	None	None	RIGID	Typical
119	MP10	N217	N218			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
120	M132	N219	N220			RIGID	None	None	RIGID	Typical
121	M133	N221	N222			RIGID	None	None	RIGID	Typical
122	M134	N223	N224			RIGID	None	None	RIGID	Typical
123	MP11	N225	N226			Mount Pipe Big	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length [in]	Weight [lb]
1	General				
2	RIGID		33	101.2	0
3	Total General		33	101.2	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	PL11x1/2	3	36	56.146
7	A36 Gr.36	SR 1	36	198	44.097
8	A36 Gr.36	SR3/4	24	774	96.963
9	A500 Gr.B Rect	HSS4.5x4.5x7	3	51	110.578
10	A500 Gr.B Rect	HSS4.75x4.75x7	3	63	145.002
11	A53 Gr.B	PIPE 2.0	12	1476	426.912
12	A53 Gr.B	PIPE 2.5	3	360	164.354
13	A53 Gr.B	PIPE 4.0	3	576	483.467
14	Q345	L3X3X3	3	52.6	16.26
15	Total HR Steel		90	3586.6	1543.779

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	Self Weight	DL		-1			33		12
2	Wind Load AZI 0	WLZ					66		
3	Wind Load AZI 30	None					66		
4	Wind Load AZI 60	None					66		
5	Wind Load AZI 90	WLX					66		
6	Wind Load AZI 120	None					66		
7	Wind Load AZI 150	None					66		
8	Wind Load AZI 180	None					66		
9	Wind Load AZI 210	None					66		
10	Wind Load AZI 240	None					66		
11	Wind Load AZI 270	None					66		
12	Wind Load AZI 300	None					66		
13	Wind Load AZI 330	None					66		
14	Distr. Wind Load Z	WLZ						123	
15	Distr. Wind Load X	WLX						123	
16	Ice Weight	OL1					33	123	12
17	Ice Wind Load AZI 0	OL2					66		
18	Ice Wind Load AZI 30	None					66		
19	Ice Wind Load AZI 60	None					66		
20	Ice Wind Load AZI 90	OL3					66		
21	Ice Wind Load AZI 120	None					66		
22	Ice Wind Load AZI 150	None					66		
23	Ice Wind Load AZI 180	None					66		
24	Ice Wind Load AZI 210	None					66		
25	Ice Wind Load AZI 240	None					66		
26	Ice Wind Load AZI 270	None					66		
27	Ice Wind Load AZI 300	None					66		
28	Ice Wind Load AZI 330	None					66		
29	Distr. Ice Wind Load Z	OL2						123	



Basic Load Cases (Continued)

BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
30 Distr. Ice Wind Load X	OL3						123	
31 Seismic Load Z	ELZ			-0.097		33		
32 Seismic Load X	ELX	-0.097				33		
33 Service Live Load 1	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 Maintenance Load 10	LL				1			
44 Maintenance Load 11	LL				1			
45 Maintenance Load 12	LL				1			
46 Service Live Load 2	LL				1			
47 Service Live Load 3	LL				1			
48 Service Live Load 4	LL				1			
49 Service Live Load 5	LL				1			
50 Service Live Load 6	LL				1			
51 Service Live Load 7	LL					1		
52 Service Live Load 8	LL					1		
53 Service Live Load 9	LL					1		
54 BLC 1 Transient Area...	None						130	
55 BLC 16 Transient Are...	None						130	

Load Combinations

Description	Solve PD...	S...	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	-0.8...	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	-0.8...	15	-0.5		
10 1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.8...		
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	-0.8...		
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		
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	-0.8...	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	-0.8...	15	-0.5		
22 0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.8...		
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	-0.8...		
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 A...	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28 1.2D + 1.0Di + 1.0Wi A...	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29 1.2D + 1.0Di + 1.0Wi A...	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866

Load Combinations (Continued)

	Description	Solve	PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
30	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	22	1	29	-0.8...	30	0.5
33	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	24	1	29	-0.8...	30	-0.5
35	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	25	1	29	-0.5	30	-0.8...
36	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	27	1	29	0.5	30	-0.8...
38	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-0.8...	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-0.8...	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-0.5	32	-0.8...				
48	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	0.5	32	-0.8...				
50	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	-0.8...	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	-0.8...	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	-0.5	32	-0.8...				
60	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	0.5	32	-0.8...				
62	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	0.861	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	2	0.25	14	0.25	15		33	1.5
64	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	3	0.25	14	0.217	15	0.125	33	1.5
65	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	4	0.25	14	0.125	15	0.217	33	1.5
66	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	5	0.25	14		15	0.25	33	1.5
67	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	6	0.25	14	-0.1...	15	0.217	33	1.5
68	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	7	0.25	14	-0.2...	15	0.125	33	1.5
69	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	8	0.25	14	-0.25	15		33	1.5
70	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	9	0.25	14	-0.2...	15	-0.1...	33	1.5
71	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	10	0.25	14	-0.1...	15	-0.2...	33	1.5
72	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	11	0.25	14		15	-0.25	33	1.5
73	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	12	0.25	14	0.125	15	-0.2...	33	1.5
74	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	13	0.25	14	0.217	15	-0.1...	33	1.5
75	1.2DL + 1.5LL	Yes	Y		1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	2	0.063	14	0.063	15	
77	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	3	0.063	14	0.054	15	0.031
78	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	4	0.063	14	0.031	15	0.054
79	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	5	0.063	14		15	0.063
80	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	6	0.063	14	-0.0...	15	0.054
81	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	7	0.063	14	-0.0...	15	0.031
82	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	8	0.063	14	-0.0...	15	
83	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	9	0.063	14	-0.0...	15	-0.0...
84	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	10	0.063	14	-0.0...	15	-0.0...
85	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	11	0.063	14		15	-0.0...
86	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	12	0.063	14	0.031	15	-0.0...
87	1.2DL + 1.5LM-MP1 +...	Yes	Y		1	1.2	34	1.5	13	0.063	14	0.054	15	-0.0...



Load Combinations (Continued)

	Description	Solve	PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
88	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	2	0.063	14	0.063	15	
89	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	3	0.063	14	0.054	15	0.031
90	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	4	0.063	14	0.031	15	0.054
91	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	5	0.063	14		15	0.063
92	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	6	0.063	14	-0.0...	15	0.054
93	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	7	0.063	14	-0.0...	15	0.031
94	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	8	0.063	14	-0.0...	15	
95	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	9	0.063	14	-0.0...	15	-0.0...
96	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	10	0.063	14	-0.0...	15	-0.0...
97	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	11	0.063	14		15	-0.0...
98	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	12	0.063	14	0.031	15	-0.0...
99	1.2DL + 1.5LM-MP2 +...	Yes	Y		1	1.2	35	1.5	13	0.063	14	0.054	15	-0.0...
100	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	2	0.063	14	0.063	15	
101	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	3	0.063	14	0.054	15	0.031
102	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	4	0.063	14	0.031	15	0.054
103	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	5	0.063	14		15	0.063
104	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	6	0.063	14	-0.0...	15	0.054
105	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	7	0.063	14	-0.0...	15	0.031
106	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	8	0.063	14	-0.0...	15	
107	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	9	0.063	14	-0.0...	15	-0.0...
108	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	10	0.063	14	-0.0...	15	-0.0...
109	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	11	0.063	14		15	-0.0...
110	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	12	0.063	14	0.031	15	-0.0...
111	1.2DL + 1.5LM-MP3 +...	Yes	Y		1	1.2	36	1.5	13	0.063	14	0.054	15	-0.0...
112	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	2	0.063	14	0.063	15	
113	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	3	0.063	14	0.054	15	0.031
114	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	4	0.063	14	0.031	15	0.054
115	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	5	0.063	14		15	0.063
116	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	6	0.063	14	-0.0...	15	0.054
117	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	7	0.063	14	-0.0...	15	0.031
118	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	8	0.063	14	-0.0...	15	
119	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	9	0.063	14	-0.0...	15	-0.0...
120	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	10	0.063	14	-0.0...	15	-0.0...
121	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	11	0.063	14		15	-0.0...
122	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	12	0.063	14	0.031	15	-0.0...
123	1.2DL + 1.5LM-MP4 +...	Yes	Y		1	1.2	37	1.5	13	0.063	14	0.054	15	-0.0...
124	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	2	0.063	14	0.063	15	
125	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	3	0.063	14	0.054	15	0.031
126	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	4	0.063	14	0.031	15	0.054
127	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	5	0.063	14		15	0.063
128	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	6	0.063	14	-0.0...	15	0.054
129	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	7	0.063	14	-0.0...	15	0.031
130	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	8	0.063	14	-0.0...	15	
131	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	9	0.063	14	-0.0...	15	-0.0...
132	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	10	0.063	14	-0.0...	15	-0.0...
133	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	11	0.063	14		15	-0.0...
134	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	12	0.063	14	0.031	15	-0.0...
135	1.2DL + 1.5LM-MP5 +...	Yes	Y		1	1.2	38	1.5	13	0.063	14	0.054	15	-0.0...
136	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	2	0.063	14	0.063	15	
137	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	3	0.063	14	0.054	15	0.031
138	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	4	0.063	14	0.031	15	0.054
139	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	5	0.063	14		15	0.063
140	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	6	0.063	14	-0.0...	15	0.054
141	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	7	0.063	14	-0.0...	15	0.031
142	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	8	0.063	14	-0.0...	15	
143	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	9	0.063	14	-0.0...	15	-0.0...
144	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	10	0.063	14	-0.0...	15	-0.0...
145	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	11	0.063	14		15	-0.0...



Load Combinations (Continued)

	Description	Solve	PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
146	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	12	0.063	14	0.031	15	-0.0...
147	1.2DL + 1.5LM-MP6 +...	Yes	Y		1	1.2	39	1.5	13	0.063	14	0.054	15	-0.0...
148	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	2	0.063	14	0.063	15	
149	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	3	0.063	14	0.054	15	0.031
150	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	4	0.063	14	0.031	15	0.054
151	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	5	0.063	14		15	0.063
152	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	6	0.063	14	-0.0...	15	0.054
153	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	7	0.063	14	-0.0...	15	0.031
154	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	8	0.063	14	-0.0...	15	
155	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	9	0.063	14	-0.0...	15	-0.0...
156	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	10	0.063	14	-0.0...	15	-0.0...
157	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	11	0.063	14		15	-0.0...
158	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	12	0.063	14	0.031	15	-0.0...
159	1.2DL + 1.5LM-MP7 +...	Yes	Y		1	1.2	40	1.5	13	0.063	14	0.054	15	-0.0...
160	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	2	0.063	14	0.063	15	
161	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	3	0.063	14	0.054	15	0.031
162	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	4	0.063	14	0.031	15	0.054
163	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	5	0.063	14		15	0.063
164	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	6	0.063	14	-0.0...	15	0.054
165	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	7	0.063	14	-0.0...	15	0.031
166	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	8	0.063	14	-0.0...	15	
167	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	9	0.063	14	-0.0...	15	-0.0...
168	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	10	0.063	14	-0.0...	15	-0.0...
169	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	11	0.063	14		15	-0.0...
170	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	12	0.063	14	0.031	15	-0.0...
171	1.2DL + 1.5LM-MP8 +...	Yes	Y		1	1.2	41	1.5	13	0.063	14	0.054	15	-0.0...
172	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	2	0.063	14	0.063	15	
173	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	3	0.063	14	0.054	15	0.031
174	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	4	0.063	14	0.031	15	0.054
175	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	5	0.063	14		15	0.063
176	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	6	0.063	14	-0.0...	15	0.054
177	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	7	0.063	14	-0.0...	15	0.031
178	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	8	0.063	14	-0.0...	15	
179	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	9	0.063	14	-0.0...	15	-0.0...
180	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	10	0.063	14	-0.0...	15	-0.0...
181	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	11	0.063	14		15	-0.0...
182	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	12	0.063	14	0.031	15	-0.0...
183	1.2DL + 1.5LM-MP9 +...	Yes	Y		1	1.2	42	1.5	13	0.063	14	0.054	15	-0.0...
184	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	2	0.063	14	0.063	15	
185	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	3	0.063	14	0.054	15	0.031
186	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	4	0.063	14	0.031	15	0.054
187	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	5	0.063	14		15	0.063
188	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	6	0.063	14	-0.0...	15	0.054
189	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	7	0.063	14	-0.0...	15	0.031
190	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	8	0.063	14	-0.0...	15	
191	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	9	0.063	14	-0.0...	15	-0.0...
192	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	10	0.063	14	-0.0...	15	-0.0...
193	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	11	0.063	14		15	-0.0...
194	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	12	0.063	14	0.031	15	-0.0...
195	1.2DL + 1.5LM-MP10...	Yes	Y		1	1.2	43	1.5	13	0.063	14	0.054	15	-0.0...
196	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	2	0.063	14	0.063	15	
197	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	3	0.063	14	0.054	15	0.031
198	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	4	0.063	14	0.031	15	0.054
199	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	5	0.063	14		15	0.063
200	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	6	0.063	14	-0.0...	15	0.054
201	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	7	0.063	14	-0.0...	15	0.031
202	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	8	0.063	14	-0.0...	15	
203	1.2DL + 1.5LM-MP11...	Yes	Y		1	1.2	44	1.5	9	0.063	14	-0.0...	15	-0.0...

Load Combinations (Continued)

	Description	Solve PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
204	1.2DL + 1.5LM-MP11...	Yes	Y	1	1.2	44	1.5	10	0.063	14	-0.0...	15	-0.0...
205	1.2DL + 1.5LM-MP11...	Yes	Y	1	1.2	44	1.5	11	0.063	14		15	-0.0...
206	1.2DL + 1.5LM-MP11...	Yes	Y	1	1.2	44	1.5	12	0.063	14	0.031	15	-0.0...
207	1.2DL + 1.5LM-MP11...	Yes	Y	1	1.2	44	1.5	13	0.063	14	0.054	15	-0.0...
208	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	2	0.063	14	0.063	15	
209	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	3	0.063	14	0.054	15	0.031
210	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	4	0.063	14	0.031	15	0.054
211	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	5	0.063	14		15	0.063
212	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	6	0.063	14	-0.0...	15	0.054
213	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	7	0.063	14	-0.0...	15	0.031
214	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	8	0.063	14	-0.0...	15	
215	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	9	0.063	14	-0.0...	15	-0.0...
216	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	10	0.063	14	-0.0...	15	-0.0...
217	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	11	0.063	14		15	-0.0...
218	1.2DL + 1.5LM-MP12...	Yes	Y	1	1.2	45	1.5	12	0.063	14	0.031	15	-0.0...

Node Reactions

Node Label	X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC		
1	N11A	max	1646.029	5	3638.128	33	1478.971	2	-2731.729	14	3441.956	17	1295.379	109
2		min	-1642....	23	905.896	14	-1377.91	20	-11305.082	33	-3447.044	11	-1486.132	79
3	N81	max	1612.484	17	3632.575	29	1799.418	14	5639.693	28	4107.35	25	-2351.111	23
4		min	-1701.9	11	914.745	22	-1847....	8	1354.277	20	-4112.361	7	-9780.76	30
5	N46	max	1681.425	5	3628.89	37	1790.129	14	5686.21	38	4107.637	21	9740.587	36
6		min	-1595....	23	915.104	18	-1843....	8	1235.532	20	-4114.008	4	2361.935	66
7	Totals:	max	4927.229	17	10830....	35	5054.398	14						
8		min	-4927.23	11	2868.256	53	-5054....	8						

LRFD

Mem...	Shape	Code...	Loc...	LC	Shear...	Loc...	Dir	LC	phi*Pnc...	phi*Pnt...	phi*Mny...	phi*Mnz...	Cb	Eqn	
1	MP5	PIPE 2.0	0.562	48	29	0.06	48	30	14916.0...	32130	1871.625	1871.625	1.85	H1-1b	
2	MP9	PIPE 2.0	0.562	48	32	0.059	48	34	14916.0...	32130	1871.625	1871.625	1.738	H1-1b	
3	MP1	PIPE 2.0	0.558	48	37	0.058	48	38	14916.0...	32130	1871.625	1871.625	1.877	H1-1b	
4	MP6	PIPE 2.0	0.532	48	28	0.085	48	38	14916.0...	32130	1871.625	1871.625	1.779	H1-1b	
5	MP10	PIPE 2.0	0.53	48	32	0.085	48	31	14916.0...	32130	1871.625	1871.625	1.905	H1-1b	
6	MP2	PIPE 2.0	0.524	48	36	0.085	48	34	14916.0...	32130	1871.625	1871.625	1.9	H1-1b	
7	MP12	PIPE 2.0	0.502	48	37	0.067	6	29	14916.0...	32130	1871.625	1871.625	1.853	H1-1b	
8	MP8	PIPE 2.0	0.501	48	33	0.066	6	37	14916.0...	32130	1871.625	1871.625	2.177	H1-1b	
9	MP4	PIPE 2.0	0.498	48	29	0.066	48	32	14916.0...	32130	1871.625	1871.625	1.882	H1-1b	
10	M1	PIPE 4.0	0.46	96	33	0.108	96	27	41111.283	93240	10631.25	10631.25	1.701	H1-1b	
11	M2	PIPE 4.0	0.46	96	37	0.107	96	30	41111.283	93240	10631.25	10631.25	1.702	H1-1b	
12	M3	PIPE 4.0	0.46	96	29	0.107	96	36	41111.283	93240	10631.25	10631.25	1.701	H1-1b	
13	MP11	PIPE 2.5	0.409	47.5	37	0.087	47.5	28	22373.4...	50715	3596.25	3596.25	2.898	H1-1b	
14	MP7	PIPE 2.5	0.406	47.5	34	0.088	47.5	35	22373.4...	50715	3596.25	3596.25	3	H1-1b	
15	MP3	PIPE 2.5	0.403	47.5	29	0.087	47.5	32	22373.4...	50715	3596.25	3596.25	3	H1-1b	
16	M106	PIPE 2.0	0.395	133....	35	0.157	189....	30	3403.667	32130	1871.625	1871.625	2.68	H1-1b	
17	M100	PIPE 2.0	0.395	133....	38	0.157	189....	34	3403.667	32130	1871.625	1871.625	2.688	H1-1b	
18	M94	PIPE 2.0	0.393	133....	31	0.156	189....	38	3403.667	32130	1871.625	1871.625	2.668	H1-1b	
19	M54	HSS4.5x...	0.327	17	32	0.077	17	y	195	292278....	294328....	37510.3...	37510.3...	1.223	H1-1b
20	M31	HSS4.5x...	0.327	17	28	0.077	17	y	143	292278....	294328....	37510.3...	37510.3...	1.224	H1-1b
21	M8	HSS4.5x...	0.32	17	36	0.077	17	y	79	292278....	294328....	37510.3...	37510.3...	1.224	H1-1b
22	M17	SR3/4	0.256	12	31	0.063	12	27	11537.511	14313.8...	178.929	178.929	2.188	H1-1b	
23	M62	SR3/4	0.247	12	30	0.054	12	34	11537.511	14313.8...	178.929	178.929	2.118	H1-1b	
24	M16	SR3/4	0.247	12	33	0.054	12	27	11537.511	14313.8...	178.929	178.929	2.117	H1-1b	
25	M39	SR3/4	0.246	12	38	0.055	12	30	11537.511	14313.8...	178.929	178.929	2.155	H1-1b	
26	M40	SR3/4	0.241	12	35	0.06	12	32	11537.511	14313.8...	178.929	178.929	2.188	H1-1b	
27	M63	SR3/4	0.24	12	27	0.059	12	36	11537.511	14313.8...	178.929	178.929	2.185	H1-1b	
28	M15	SR3/4	0.24	0	28	0.089	26.5	27	4996.61	14313.8...	178.929	178.929	2.106	H1-1b	

LRFD (Continued)

Mem...	Shape	Code...	Loc...	LC	Shear...	Loc...	Dir	LC	phi*Pnc...	phi*Pnt...	phi*Mny...	phi*Mnz...	Cb	Eqn	
29	M38	SR3/4	0.233	0	28	0.084	13.25		31	4996.61	14313.8...	178.929	178.929	2.12	H1-1b
30	M61	SR3/4	0.233	0	36	0.084	26.5		36	4996.61	14313.8...	178.929	178.929	2.116	H1-1b
31	M14	SR3/4	0.227	26.5	27	0.084	0		27	4996.61	14313.8...	178.929	178.929	2.09	H1-1b
32	M60	SR3/4	0.227	26.5	37	0.083	0		35	4996.61	14313.8...	178.929	178.929	2.09	H1-1b
33	M37	SR3/4	0.224	26.5	31	0.082	0		30	4996.61	14313.8...	178.929	178.929	2.093	H1-1b
34	M69	SR 1	0.224	0	11	0.029	5.5		11	24806.6...	25446.8...	424.112	424.112	1.271	H1-1b
35	M23	SR 1	0.22	0	3	0.029	5.5		3	24806.6...	25446.8...	424.112	424.112	1.268	H1-1b
36	M46	SR 1	0.219	0	7	0.028	5.5		7	24806.6...	25446.8...	424.112	424.112	1.27	H1-1b
37	M43	SR 1	0.211	0	5	0.027	5.5		5	24806.6...	25446.8...	424.112	424.112	1.267	H1-1b
38	M49	SR 1	0.21	0	5	0.025	5.5		5	24806.6...	25446.8...	424.112	424.112	1.6	H1-1b
39	M20	SR 1	0.208	0	13	0.027	5.5		13	24806.6...	25446.8...	424.112	424.112	1.274	H1-1b
40	M66	SR 1	0.206	0	9	0.027	5.5		9	24806.6...	25446.8...	424.112	424.112	1.272	H1-1b
41	M72	SR 1	0.205	0	9	0.024	5.5		9	24806.6...	25446.8...	424.112	424.112	1.602	H1-1b
42	M26	SR 1	0.204	0	13	0.024	5.5		13	24806.6...	25446.8...	424.112	424.112	1.606	H1-1b
43	M68	SR 1	0.203	0	11	0.058	0		36	24806.6...	25446.8...	424.112	424.112	1.042	H1-1b
44	M22	SR 1	0.201	0	3	0.06	0		27	24806.6...	25446.8...	424.112	424.112	1.046	H1-1b
45	M70	SR 1	0.199	0	8	0.024	5.5		8	24806.6...	25446.8...	424.112	424.112	1.763	H1-1b
46	M45	SR 1	0.198	0	7	0.058	5.5		32	24806.6...	25446.8...	424.112	424.112	1.055	H1-1b
47	M47	SR 1	0.198	0	4	0.024	5.5		10	24806.6...	25446.8...	424.112	424.112	1.765	H1-1b
48	M73	SR 1	0.198	0	11	0.026	5.5		11	24806.6...	25446.8...	424.112	424.112	1.571	H1-1b
49	M48	SR 1	0.196	0	4	0.024	5.5		4	24806.6...	25446.8...	424.112	424.112	1.716	H1-1b
50	M71	SR 1	0.195	0	8	0.024	5.5		8	24806.6...	25446.8...	424.112	424.112	1.717	H1-1b
51	M34	SR 1	0.195	0	3	0.021	5.5		9	24806.6...	25446.8...	424.112	424.112	2.288	H1-1b
52	M50	SR 1	0.193	0	7	0.025	5.5		7	24806.6...	25446.8...	424.112	424.112	1.567	H1-1b
53	M27	SR 1	0.192	0	3	0.025	5.5		3	24806.6...	25446.8...	424.112	424.112	1.558	H1-1b
54	M25	SR 1	0.188	0	13	0.023	5.5		13	24806.6...	25446.8...	424.112	424.112	1.719	H1-1b
55	M52	SR 1	0.187	0	8	0.024	5.5		8	24806.6...	25446.8...	424.112	424.112	1.775	H1-1b
56	M74	SR 1	0.187	0	12	0.024	5.5		12	24806.6...	25446.8...	424.112	424.112	1.721	H1-1b
57	M57	SR 1	0.186	0	7	0.02	5.5		7	24806.6...	25446.8...	424.112	424.112	1.49	H1-1b
58	M56	SR 1	0.186	0	13	0.02	5.5		7	24806.6...	25446.8...	424.112	424.112	1.696	H1-1b
59	M75	SR 1	0.186	0	12	0.024	5.5		12	24806.6...	25446.8...	424.112	424.112	1.772	H1-1b
60	M51	SR 1	0.186	0	8	0.025	5.5		8	24806.6...	25446.8...	424.112	424.112	1.72	H1-1b
61	M24	SR 1	0.183	0	12	0.022	5.5		12	24806.6...	25446.8...	424.112	424.112	1.762	H1-1b
62	M33	SR 1	0.182	0	10	0.02	5.5		4	24806.6...	25446.8...	424.112	424.112	1.708	H1-1b
63	M6	PL11x1/2	0.182	12	5	0.031	0	y	175	123844...	178200	1856.25	40837.5	2.124	H1-1b
64	M44	SR 1	0.177	0	5	0.051	0		30	24806.6...	25446.8...	424.112	424.112	1.114	H1-1b
65	M5	PL11x1/2	0.176	12	13	0.031	0	y	135	123844...	178200	1856.25	40837.5	2.123	H1-1b
66	M4	PL11x1/2	0.176	0	9	0.031	12	y	107	123844...	178200	1856.25	40837.5	2.129	H1-1b
67	M21	SR 1	0.175	0	13	0.052	0		27	24806.6...	25446.8...	424.112	424.112	1.109	H1-1b
68	M28	SR 1	0.174	0	4	0.023	5.5		4	24806.6...	25446.8...	424.112	424.112	1.729	H1-1b
69	M11	SR 1	0.172	0	11	0.019	5.5		11	24806.6...	25446.8...	424.112	424.112	1.075	H1-1b
70	M67	SR 1	0.172	0	9	0.051	0		34	24806.6...	25446.8...	424.112	424.112	1.086	H1-1b
71	M29	SR 1	0.171	0	4	0.022	5.5		4	24806.6...	25446.8...	424.112	424.112	1.806	H1-1b
72	M59	SR3/4	0.167	13.901	11	0.038	13.901		36	11113.589	14313.8...	178.929	178.929	3	H1-1b
73	M10	SR 1	0.166	0	6	0.018	5.5		12	24806.6...	25446.8...	424.112	424.112	1.703	H1-1b
74	M114	L3X3X3	0.165	17.536	27	0.019	17.536	y	7	28004.3...	35316	1320.097	2905.206	1.01	H2-1
75	M113	L3X3X3	0.165	17.536	31	0.019	17.536	y	11	28004.3...	35316	1320.097	2905.206	1.008	H2-1
76	M13	SR3/4	0.163	13.901	3	0.04	13.901		28	11113.589	14313.8...	178.929	178.929	3	H1-1b
77	M36	SR3/4	0.163	26.167	7	0.038	13.901		32	11113.589	14313.8...	178.929	178.929	3	H1-1b
78	M112	L3X3X3	0.162	17.536	35	0.019	17.536	y	3	28004.3...	35316	1320.097	2905.206	1.013	H2-1
79	M35	SR3/4	0.161	64.599	5	0.036	39.25		37	11113.589	14313.8...	178.929	178.929	3	H1-1b
80	M12	SR3/4	0.157	64.599	13	0.036	39.25		33	11113.589	14313.8...	178.929	178.929	3	H1-1b
81	M58	SR3/4	0.157	64.599	9	0.036	39.25		29	11113.589	14313.8...	178.929	178.929	3	H1-1b
82	M53	HSS4.75...	0.154	21	31	0.069	21	y	195	309494...	312440...	42250.7...	42250.7...	1.661	H1-1b
83	M30	HSS4.75...	0.153	21	28	0.069	21	y	143	309494...	312440...	42250.7...	42250.7...	1.668	H1-1b
84	M7	HSS4.75...	0.151	21	35	0.069	21	y	79	309494...	312440...	42250.7...	42250.7...	1.661	H1-1b
85	M18	SR3/4	0.09	12	33	0.084	12		27	11537.511	14313.8...	178.929	178.929	1.635	H1-1b
86	M64	SR3/4	0.09	12	30	0.084	12		35	11537.511	14313.8...	178.929	178.929	1.636	H1-1b



Company : Infinigy Engineering, PLLC
Designer : JG
Job Number : 1039-Z0001-B
Model Name : 828540

6/24/2020
12:40:09 AM
Checked By : _____

LRFD (Continued)

Mem...	Shape	Code...	Loc...	LC	Shear...	Loc...	Dir	LC	phi*Pnc...	phi*Pnt...	phi*Mny...	phi*Mnz...	Cb	Eqn	
87	M41	SR3/4	0.088	12	37	0.082	12		31	11537.511	14313.8...	178.929	178.929	1.633	H1-1b
88	M19	SR3/4	0.086	12	31	0.09	12		27	11537.511	14313.8...	178.929	178.929	1.609	H1-1b
89	M42	SR3/4	0.082	12	35	0.085	12		32	11537.511	14313.8...	178.929	178.929	1.609	H1-1b
90	M65	SR3/4	0.081	12	27	0.085	12		36	11537.511	14313.8...	178.929	178.929	1.61	H1-1b

APPENDIX D
ADDITIONAL CALCUATIONS

Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	Torrington/RT 8
Site Number:	828540
Job Code:	1039-Z0001-B
Connection Description:	Standoff Anchorage

APPLIED LOADS	
Bolt Tension:	9187.27 lbs
Bolt Shear:	944.38 lbs

BOLT PROPERTIES	
Bolt Type:	Bolt -
Bolt Diameter:	0.625 in
Bolt Grade:	A325 -
# of Bolts:	4 -
Threads Excluded?	No -

BOLT CHECK	
Tensile Strength	20340.15
Shear Strength	13805.83
Tensile Usage	45.2%
Shear Usage	6.8%
Interaction Check	0.21
Result	Pass

≤1.05

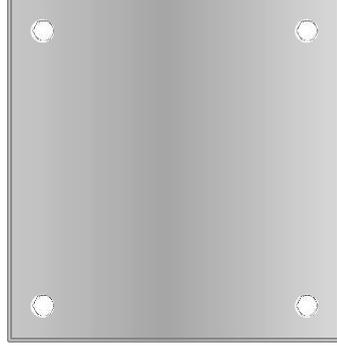


Exhibit E

Power Density/RF Emissions Report



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

T-Mobile Existing Facility

Site ID: CT11369A

Torrington/RT 8
218 Wheeler Road
Torrington, Connecticut 06790

July 27, 2020

EBI Project Number: 6220003387

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.52%

July 27, 2020

T-Mobile

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

Emissions Analysis for Site: CT11369A - Torrington/RT 8

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **218 Wheeler Road in Torrington, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. 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 218 Wheeler Road in Torrington, 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 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 UMTS 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.

- 6) 4 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.
- 7) 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.
- 8) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 9) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 10) 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.
- 11) 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.
- 12) The antennas used in this modeling are the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B4I for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz channel(s) in Sector A, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B4I for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz channel(s) in Sector B, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B4I for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 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



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environmental | engineering | due diligence

- 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.
- 13) The antenna mounting height centerline of the proposed antennas is 160 feet above ground level (AGL).
 - 14) 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.
 - 15) 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:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts
ERP (W):	6,169.82	ERP (W):	6,169.82	ERP (W):	6,169.82
Antenna A1 MPE %:	0.87%	Antenna B1 MPE %:	0.87%	Antenna C1 MPE %:	0.87%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20
Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz
Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts
ERP (W):	8,466.41	ERP (W):	8,466.41	ERP (W):	8,466.41
Antenna A2 MPE %:	1.98%	Antenna B2 MPE %:	1.98%	Antenna C2 MPE %:	1.98%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A3 MPE %:	3.60%	Antenna B3 MPE %:	3.60%	Antenna C3 MPE %:	3.60%
Antenna #:	4	Antenna #:	4	Antenna #:	4
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	2100 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz
Gain:	15.85 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	8,728.31	ERP (W):	8,728.31	ERP (W):	8,728.31
Antenna A4 MPE %:	1.23%	Antenna B4 MPE %:	1.23%	Antenna C4 MPE %:	1.23%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	7.67%
Sprint	0.0256%
Metro PCS	0.94%
Verizon	1.61%
AT&T	3.27%
Site Total MPE % :	13.52%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.67%
T-Mobile Sector B Total:	7.67%
T-Mobile Sector C Total:	7.67%
Site Total MPE % :	13.52%

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 1900 MHz UMTS	2	1028.30	160.0	2.89	1900 MHz UMTS	1000	0.29%
T-Mobile 1900 MHz GSM	4	1028.30	160.0	5.78	1900 MHz GSM	1000	0.58%
T-Mobile 700 MHz LTE	2	648.82	160.0	1.82	700 MHz LTE	467	0.39%
T-Mobile 600 MHz LTE	2	591.73	160.0	1.66	600 MHz LTE	400	0.42%
T-Mobile 600 MHz NR	1	1577.94	160.0	2.22	600 MHz NR	400	0.55%
T-Mobile 1900 MHz LTE	2	2203.69	160.0	6.19	1900 MHz LTE	1000	0.62%
T-Mobile 2500 MHz LTE	2	6412.98	160.0	18.01	2500 MHz LTE	1000	1.80%
T-Mobile 2500 MHz NR	2	6412.98	160.0	18.01	2500 MHz NR	1000	1.80%
T-Mobile 2100 MHz LTE	2	2307.55	160.0	6.48	2100 MHz LTE	1000	0.65%
T-Mobile 1900 MHz LTE	2	2056.61	160.0	5.78	1900 MHz LTE	1000	0.58%
						Total:	7.67%

• 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:	7.67%
Sector B:	7.67%
Sector C:	7.67%
T-Mobile Maximum MPE % (Sector A):	7.67%
Site Total:	13.52%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **13.52%** 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.