

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

April 23, 2021

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

RE: Notice of Exempt Modification for T-Mobile

Crown Site ID# 876378; T-Mobile Site ID# CT11122B

15 Kluge Road, Prospect, CT 06712

Latitude: 41.471239° / Longitude: -72.971912°

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 180-foot mount on the existing 190-foot Monopole Tower located at 15 Kluge Road. in Prospect. The property is owned by KLUGE, MARIE J L/U and the Tower by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Planned Modifications:

Tower:

Remove and Replace:

- (3) Andrew LNX-6515DS-A1M Antennas (**REMOVE**) (3) RFS APX16DWV-16DWV-S-E-A20 Antennas (**REPLACE**)
- (3) RFS APX18-206517S-C-A20 Antennas (**REMOVE**) (3) RFS APXVAALL24_43-U-NA20 Antennas (**REPLACE**)

Remove:

(6) GENERIC Twin Style 3B – PCS+AWS TMA

Install New:

- (3) Ericson-AIR6449 B41 Antennas
- (3) Ericsson 4449 B71+B85A Radio
- (3) Ericsson 4415 B66A Radio
- (3) Ericsson 4424 B25 Radio
- (1) Site Pro 1 HRK 12 Handrail Kit
- (3) Hybrid Cables (1 5/8")

The Foundation for a Wireless World.

CrownCastle.com

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Ground:

Remove and Replace:

- (1) NORTEL Cabinet (**REMOVE**) (1) 6160 Site Support Cabinet (SSC) Cabinet (**REPLACE**)
- (1) RBS 6201 ODE Cabinet 2 (**REMOVE**) (1) B160 BBU Cabinet (**REPLACE**)

Install New:

- (1) BB 6648 in 6160 SSC
- (1) PSU 4813Voltage Booster in 6160 SSC
- (1) IXRe Router to 6160 SSC
- (2) CSR IXRe V2 (GEN2) in 6160 SSC
- (1) BB 6648 in (E) 6201 ODE Cabinet 1

Remove:

- (1) BB 6630
- (3) RUS01 B2
- (6) RUS01 B4
- (6) RUS01 B12
- (6) DIPLEXERS

The facility was approved by the Town of Prospect Planning and Zoning Commission by way of a Special Permit on June 16th, 1999.

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 Robert J Chatfield, Mayor of the Town of Prospect and E. Gil Graveline, Chairman, Planning and Zoning Commission for the Town of Prospect. A copy will also be sent to the property owner.

- 1. The proposed modifications will not result in an increase in the height of the existing tower.
- 2. The proposed modifications will not require the extension of the site boundary.
- 3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
- 4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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- 5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
- 6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. §16-50j-72(b)(2).

Sincerely,

Colin Robinson

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

cc:

Robert J Chatfield, Mayor (via email only to info@townofprospect.org)
Town of Prospect
36 Center Street
Prospect, CT 06712
203-758-4461

William Scarpati, Building Inspector (via email only to building@townofprospect.org)
Town of Prospect
36 Center Street
Prospect, CT 06712
203-758-4461

Marie J Kluge (*via FedEx*) 15 Kluge Road Prospect, CT 06712

Colin Robinson

From: Colin Robinson

Sent: Friday, April 23, 2021 2:00 PM **To:** info@townofprospect.org

Cc: Colin Robinson

Subject: CSC Exempt Modification Application 15 Kluge Rd Prospect CT 876378

Attachments: CSC Exempt Modification Application 15 Kluge Rd Prospect CT 876378 04232021.pdf

Good Afternoon Mayor Chatfield,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 15 Kluge Rd Prospect CT.

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

Thank you,

Colin

Colin Robinson

Project Manager

NETWORK BUILDING + CONSULTING

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824 M 360.561.3311





Colin Robinson

From: Colin Robinson

Sent: Friday, April 23, 2021 2:00 PM **To:** building@townofprospect.org

Cc: Colin Robinson

Subject: CSC Exempt Modification Application 15 Kluge Rd Prospect CT 876378

Attachments: CSC Exempt Modification Application 15 Kluge Rd Prospect CT 876378 04232021.pdf

Good Afternoon Mr. Scarpati,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 15 Kluge Rd Prospect CT.

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

Thank you,

Colin

Colin Robinson

Project Manager

NETWORK BUILDING + CONSULTING

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824 M 360.561.3311







After printing this label:

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

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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

Exhibit A

Original Facility Approval

NOTICE OF APPROVAL

Property Owner: David T. Kluge Property Location: 15 Kluge Road Date of Approval: June 16, 1999 Date of Notice: June 21, 1999

RESOLVED TO APPROVE, request for Special Permit under Section 300 for a Telecommunications Monopole and supporting equipment within a 100' x 100' parcel of land on property located at 15 Kluge Road in a residential zone and accessed from Kluge Road. Owner: David T. Kluge. Authorized agent: Sprint Spectrum LP, Crossroads Corporate Center, One International Blvd., Suite 800, Mahwah, NJ 07495

PROVIDED THAT:

- 1. The height of the monopole will be approximately 190 feet above ground level. Antennae or other mounted equipment can exceed the 190-foot height, but may not exceed 200 feet above ground elevation.
- 2. The monopole and any attached antennae exceeding the tower's height must be located a distance from the property line at least equal to the tower's height, including attached antennae. No structure, other than those associated with this installation, may be placed within the fall radius of the monopole and monopole attachments.
- 3. Utility connections from the property line to the proposed installation will be below ground.
- 4. The monopole will meet the design standards of the National Standards Institute and meet all pertinent FCC requirements.
- 5. Prior to the initiation of any construction activity all erosion and sedimentation control measures shall be properly installed and fully functioning, and said measures shall be maintained in effective condition throughout the construction process.
- 6. An accessway at least 12 feet wide and secured by a gate and/or other means shall be maintained for passage of police, fire or other emergency equipment. Additional security fencing will be installed at the facility. Town officials must have a means to access the property in the event of an emergency.
- 7. On-site storage of fuel or chemicals for any reason is prohibited.
- 8. All future tenant occupants must apply for and receive a Zoning Permit from the Land Use Inspector prior to their installation of equipment cabinets and antennas. Installation plans must also be submitted to Prospect's Building Official for approval.

9. The above-listed agent will be responsible for, and ensure his facility and his tenants, comply with all FCC standards and guidelines for wireless facilities. Upon termination of the lease, or should the agent abandon use of the facility, Sprint Spectrum LP as agent, shall remove all apparatus and above-ground structures from the site and restore the leased space to its original condition.

Reasons: In granting the above Special Permit, the Planning & Zoning Commission of the Town of Prospect wishes to state upon its records that in the Commission's judgement, the subject project complies with Prospect's zoning regulations, provides an acceptable facility for additional wireless communications providers to co-locate onto and will not exert a detrimental effect on the development of the area nor on the value of nearby properties.

Edward Miller, Chairman

Edward Miller

Planning & Zoning Commission

Exhibit B

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 2020.



www.townofprospect.org

Information on the Property Records for the Municipality of Prospect was last updated on 4/20/2021.

Parcel Information

Location:	15 KLUGE RD	Property Use:	Residential	Primary Use:	Residential
Unique ID:	K0154000	Map Block Lot:	112 74 15	Acres:	35.00
490 Acres:	29.88	Zone:	RA-1	Volume / Page:	0799/0218
Developers Map / Lot:		Census:	3472		

Value Information

	Appraised Value	Assessed Value
Land	213,772	113,870
Buildings	120,226	84,160
Detached Outbuildings	300,000	210,000
Total	633,998	408,030

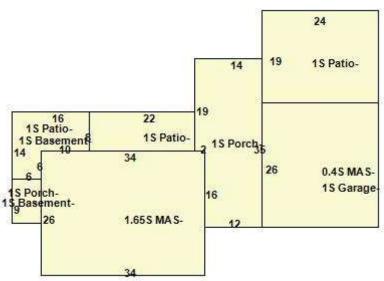
Owner's Information

Owner's Data

KLUGE MARIE J L/U ERICA PERYGA F/K/A/ ERICA KLUGE 15 KLUGE RD PROSPECT, CT 06712

Building 1





Building Use:	Single Family	Style:	Cape	Living Area:	1,708
Stories:	1.65	Construction:	Masonry	Year Built:	1946
Total Rooms:	7	Bedrooms:	3	Full Baths:	1
Half Baths:	1	Fireplaces:	0	Heating:	Hot Water
Fuel:	Oil	Cooling Percent:	0	Basement Area:	0

Basement Finished Area:	0	Basement Garages:	0	Roof Material:	
Siding:	Concrete Block	Units:			

Special Features

ace	1	
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Attached Components

Type:	Year Built:	Area:
Extension Basement	1946	164
Extension Basement	1946	54
Dormer	1946	40
Frame Garage	1946	624
Concrete/Masonry Patio	1946	176
Concrete/Masonry Patio	1946	164
Concrete/Masonry Patio	2008	456
Enclosed Porch	1946	458
Enclosed Porch	1946	54

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Cell Tower	1999	0.00	0.00	1

Owner History - Sales

	Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
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Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
KLUGE MARIE J L/U	0799	0218	02/14/2017	Quit Claim	No	\$0
KLUGE MARIE J	0798	0170	01/18/2017	Quit Claim	No	\$0
PERYGA ERICA F/K/A/ ERICA KLUGE	0781	0115	03/21/2016	Quit Claim	No	\$0
KLUGE MARIE J	0516	0199	03/21/2016	Certificate of Devise	No	\$0
KLUGE MARIE J	0516	0198	01/19/2005	Certificate of Devise	No	\$0
KLUGE DAVID T EST OF	0360	0247	10/26/2000	Probate	No	\$0
KLUGE DAVID T	0049	0177	03/31/1971	Quit Claim	No	\$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
7480	Electrical	01/28/2016		Closed	INSTALL 6 NEW ANTENNAS REPLACE 6 EXISTING TMA S 3 NEW BIAS TEE S 6 NEW COAX
7305	Commercial Addition	06/22/2015		Closed	INSTALLATION OF 3 ANTENNAS 3 BIAS TEES 6 COAX LINES & 1 CABINET
7137	Commercial Addition	10/01/2014		Closed	ADD (3) ANTENNAS 3 REMOTE RADIO HEADS & 1 CABLE TO SPRINTS EXISTING CONFIG
6749	Commercial Addition	12/14/2012		Closed	ANTENNA & APPURTENANCE ADDITION ON EXITING CELL TOWER/ADD'N TO OUTDOOR EQUIP
3851	Commercial Addition	05/15/1900		Closed	ADDED CO-LOCATOR & GROUND EQUIPMENT TO EXISTING MONOPOLE. INCOME INTENSIVE USE WITH TOWER. 350,000 V

Information Published With Permission From The Assessor

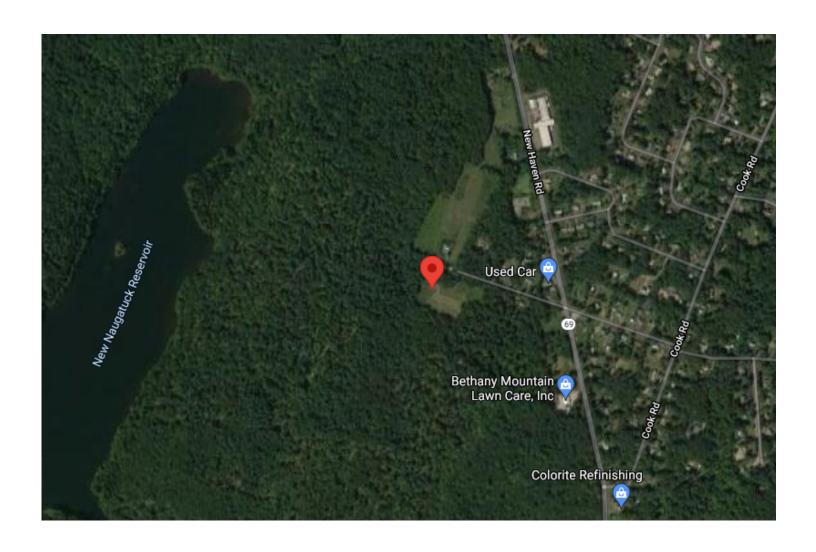


Exhibit C

Construction Drawings

- Mobile - -

T-MOBILE SITE NUMBER: CT11122B

T-MOBILE SITE NAME:

PROSPECT/JCT RT 68 & 69

SITE TYPE:

MONOPOLE

TOWER HEIGHT:

190'-0"

BUSINESS UNIT #:876378

SITE ADDRESS:

15 KLUGE ROAD PROSPECT, CT 06712

NEW HAVEN **COUNTY:**

LOCATION MAP

N. BETHANY / DAVID KLUDGE

Kluge Rd

APPROVAL

CONSTRUCTION MANAGER

TOWN OF PROSPECT JURISDICTION:

T-MOBILE ANCHOR SITE CONFIGURATION: 67D5A998C ODE+6160

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:

N. BETHANY / DAVID KLUDGE

SITE ADDRESS:

15 KLUGE ROAD PROSPECT, CT 06712

NEW HAVEN

EXISTING

41.471239°

-72.971912°

NAD83

788 FT

COUNTY:

112 74 15 MAP/PARCEL #:

AREA OF CONSTRUCTION:

LATITUDE: LONGITUDE:

LAT/LONG TYPE: GROUND ELEVATION:

CURRENT ZONING: JURISDICTION:

OCCUPANCY CLASSIFICATION: U

TYPE OF CONSTRUCTION:

A.D.A. COMPLIANCE:

FACILITY IS UNMANNED AND NOT FOR **HUMAN HABITATION**

PROPERTY OWNER:

15 KLUGE RD PROSPECT, CT 06712

KLUGE MARIE J L/U

RA-1 (RESIDENTIAL)

TOWN OF PROSPECT

TOWER OWNER: CROWN CASTLE

> 2000 CORPORATE DRIVE CANONSBURG, PA 15317

CARRIER/APPLICANT:

T-MOBILE 35 GRIFFIN ROAD

BLOOMFIELD, CT 06002

ELECTRIC PROVIDER:

CONNECTICUT LIGHT AND POWER

TELCO PROVIDER:

N/A

PROJECT TEAM

A&E FIRM:

B+T GROUP

1717 S BOULDER AVE, SUITE 300

TULSA, OK 74119

JENNY PAUL

(918) 587-4630

CROWN CASTLE

USA INC. DISTRICT CONTACTS:

12 GILL STREET, SUITE 5800 WOBURN, MA 01801

PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE

CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

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

DRAWING INDEX

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

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:

- REMOVE (6) ANTENNAS
- REMOVE (6) TMA • INSTALL (1) SITE PRO 1 HRK 12 HANDRAIL KIT
- INSTALL (9) ANTENNAS
- INSTALL (9) RADIOS
- INSTALL (3) 1-5/8" HYBRID CABLES

GROUND SCOPE OF WORK:

- REMOVE (1) RBS 6201 ODE CABINET 2
- REMOVE (1) DEAD NORTEL CABINET
- REMOVE (1) BB 6630 • REMOVE (3) RUS01 B2
- REMOVE (6) RUS01 B4
- REMOVE (6) RUS01 B12
- REMOVE (6) DIPLEXERS
- INSTALL (1) SSC 6160 CABINET • INSTALL (1) B160 BATTERY CABINET
- INSTALL (2) BB 6648
- INSTALL (1) PSU 4813 VOLTAGE BOOSTER
- INSTALL (1) IXRe ROUTER • INSTALL (1) CSR IXRe V2 (GEN 2)

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

NO SCALE APPLICABLE CODES/REFERENCE

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

DOCUMENTS

IBC 2015 / 2018 Connecticut State Building Code BUILDING

2015 IMC **MECHANICAL** ELECTRICAL 2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: MORRISON HERSHFIELD

DATED: 3/14/21

MOUNT ANALYSIS: INGINIGY ENGINEERING, PLLC DATED: 2/28/21

AC ELECTRICAL POWER DESIGN: N/A

DATED: N/A

RFDS REVISION: 3 DATED: 2/17/21 ORDER ID: 544402

REVISION: 0

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

APPROVALS

SIGNATURE

DATE

PROPERTY OWNER OR REP. LAND USE PLANNER T-MOBILE **OPERATIONS** NETWORK BACKHAUL

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



CHARLOTTE, NC 28277

PARSIPPANY, NJ 07054



T-MOBILE SITE NUMBER: CT11122B

BU #: **876378** N. BETHANY / DAVID **KLUDGE**

15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

	ISSUED FOR:							
REV	DATE	DRWN	DESCRIPTION	DES./QA				
0	3/29/21	JTS	CONSTRUCTION	MTJ				



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

IT IS A VIOLATION OF LAW FOR ANY PERSON, INLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

..1-1/2"

GREENFIELD GROUNDING NOTES:

ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

TO BE 1000 psf.

- THE CONTRACTOR SHALL PERFORM IEEE FALL—OF—POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED 11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- 12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS. 13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- 14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- 15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- 16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL. 17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- 18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR. 19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS,
- METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE
- USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT. 20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- 21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

ELECTRICAL INSTALLATION NOTES:

- FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- AND TRIP HAZARDS ARE ELIMINATED.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV
- CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
- 9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- 10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH
- 11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED
- 12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TO CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75°C (90°C IF AVAILABLE). 14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE
- EXPOSED INDOOR LOCATIONS.
- 17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE
- 18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- 19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- 20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND
- 21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
- DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO
- 24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY—COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY—COATED OR NON—CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- 26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY. 29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T-MOBILE".

COND	UCTOR COL	OR CODE		
SYSTEM	CONDUCTOR	COLOR		
	A PHASE	BLACK		
 120/240V, 1Ø	B PHASE	RED		
120/2400, 10	NEUTRAL	WHITE		
	GROUND	GREEN		
	A PHASE	BLACK		
	B PHASE	RED		
120/208V, 3Ø	C PHASE	BLUE		
	NEUTRAL	WHITE		
	GROUND	GREEN		
	A PHASE	BROWN		
	B PHASE	ORANGE OR PURPLE		
277/480V, 3Ø	C PHASE	YELLOW		
	NEUTRAL	GREY		
	GROUND	GREEN		
DC VOLTAGE	POS (+)	RED**		
	NEG (-)	BLACK**		

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

ABBREVIATIONS

ANTENNA **EXISTING** FACILITY INTERFACE FRAME GENERATOR

GEN GPS GLOBAL POSITIONING SYSTEM GSM GLOBAL SYSTEM FOR MOBILE LONG TERM EVOLUTION

MGB MASTER GROUND BAR MICROWAVE MW

NATIONAL ELECTRIC CODE PROPOSED

QUANTITY QTY RECTIFIER RADIO BASE STATION RBS RET REMOTE ELECTRIC TILT

UMTS

W.P.

RADIO FREQUENCY DATA SHEET RFDS REMOTE RADIO HEAD RRU REMOTE RADIO UNIT

WORK POINT

POWER PLANT

SIAD SMART INTEGRATED DEVICE TOWER MOUNTED AMPLIFIER TYP **TYPICAL**

UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED
- WIRING. RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE
- ADOPTED CODE PRE THE GOVERNING JURISDICTION.
- PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA. 6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS
- 8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES
- TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIÉD.
- 13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND
- 15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR
- 16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL) 23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE
- PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED
- MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE
- 27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC.
- 28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE
- 30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

APWA UNIFORM COLOR CODE:	
WHITE PROPOSED EXCAVATION	
PINK TEMPORARY SURVEY MARKINGS	
RED ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES	
YELLOW GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS	

COMMUNICATION, ALARM OR SIGNAL LINES. CABLES, OR CONDUIT AND TRAFFIC LOOPS

RECLAIMED WATER, IRRIGATION, AND

SLURRY LINES SEWERS AND DRAIN LINES

DESCRIPTION

CONSTRUCTION

4 SYLVAN WAY

PARSIPPANY, NJ 07054

CHARLOTTE, NC 28277

T-MOBILE SITE NUMBER:

CT11122B

BU #: **876378**

N. BETHANY / DAVID

KLUDGE

15 KLUGE ROAD

PROSPECT, CT 06712

EXISTING

190'-0" MONOPOLE

ISSUED FOR:

DRWN

CROWN

B+T GRP

1717 S. BOULDER

TULSA, OK 74119

PH: (918) 587-4630

www.btgrp.com

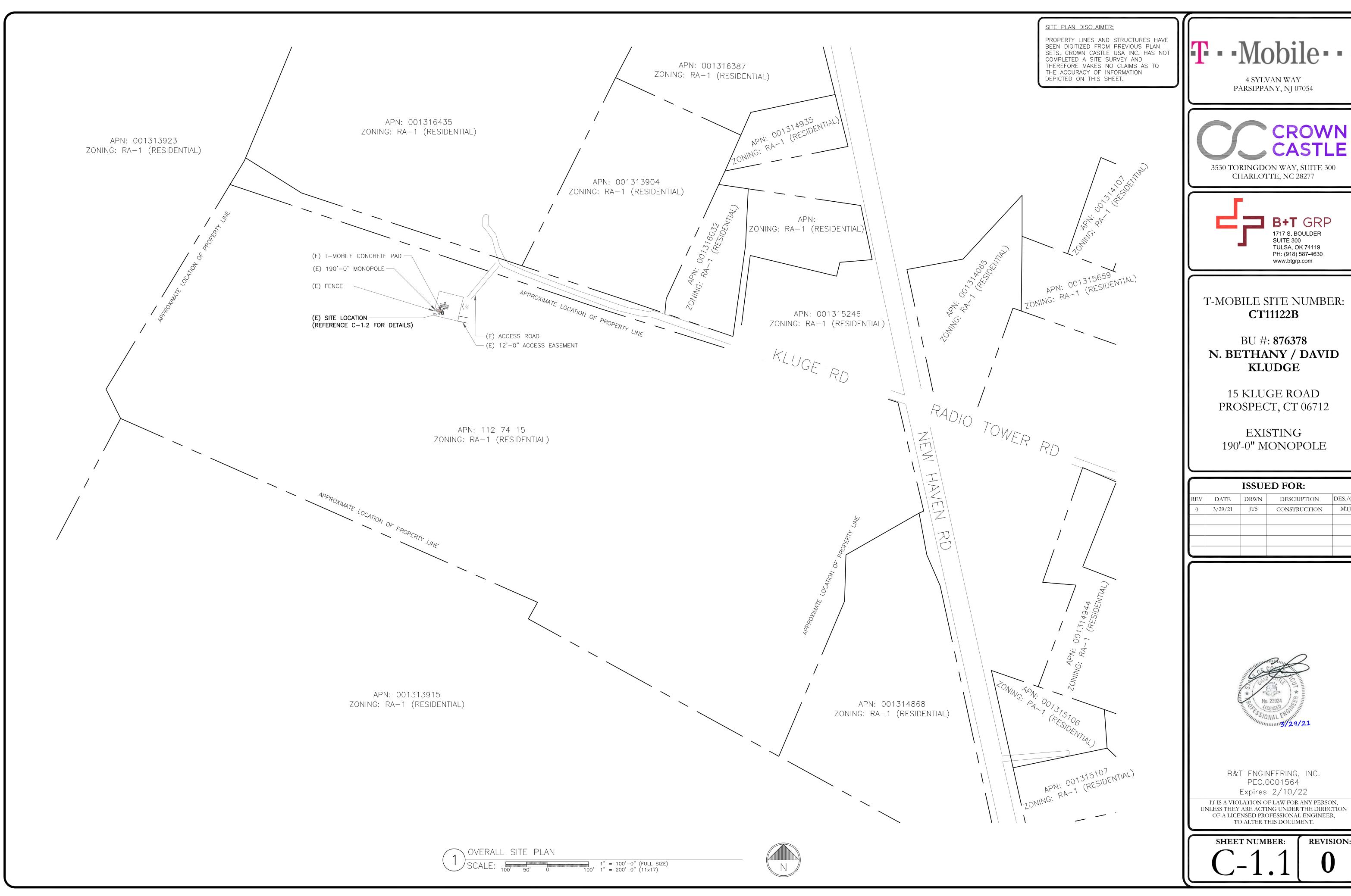
SUITE 300

B&T ENGINEERING, INC. PEC.0001564

Expires 2/10/22 IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER,

TO ALTER THIS DOCUMENT.

SHEET NUMBER:



4 SYLVAN WAY PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277



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

T-MOBILE SITE NUMBER: CT11122B

BU #: **876378** N. BETHANY / DAVID **KLUDGE**

15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

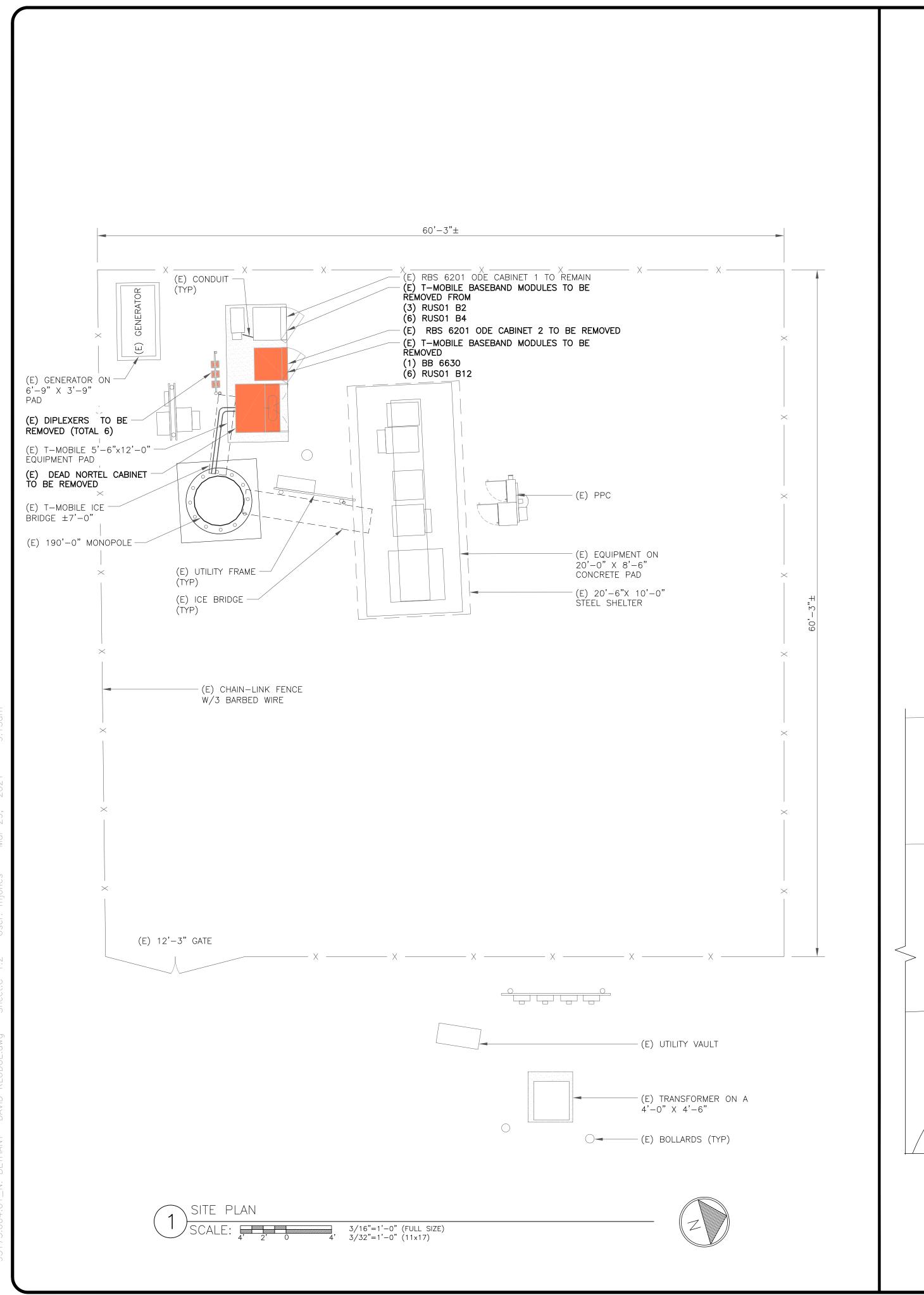
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0	3/29/21	JTS	CONSTRUCTION	MTJ				

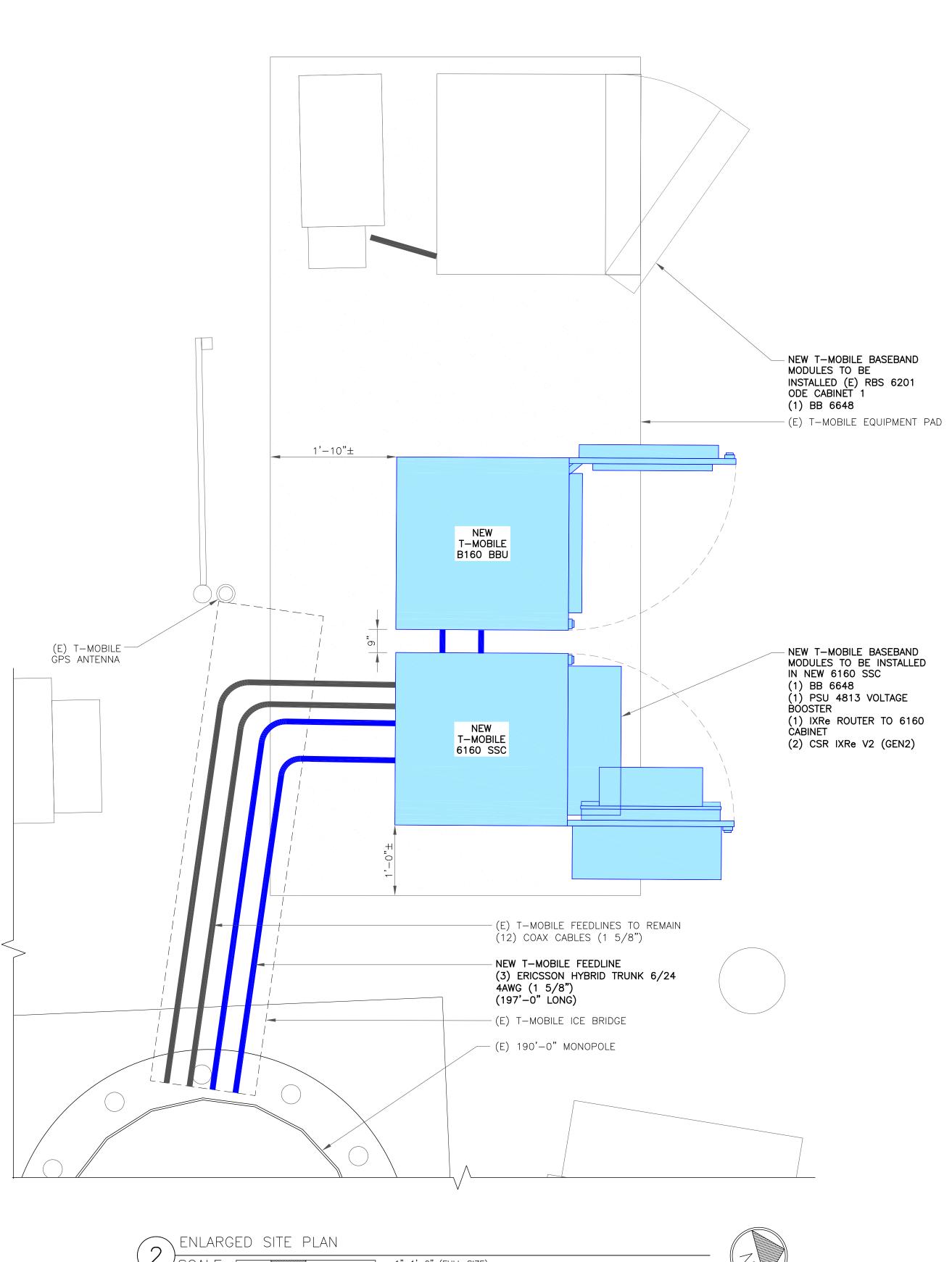


B&T ENGINEERING, INC. PEC.0001564 Expires 2/10/22

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SHEET NUMBER:





NOTES:

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY.

T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

4 SYLVAN WAY PARSIPPANY, NJ 07054



3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277



B+T GRP

1717 S. BOULDER
SUITE 300
TULSA, OK 74119

PH: (918) 587-4630 www.btgrp.com

T-MOBILE SITE NUMBER: **CT11122B**

BU #: 876378 N. BETHANY / DAVID KLUDGE

> 15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

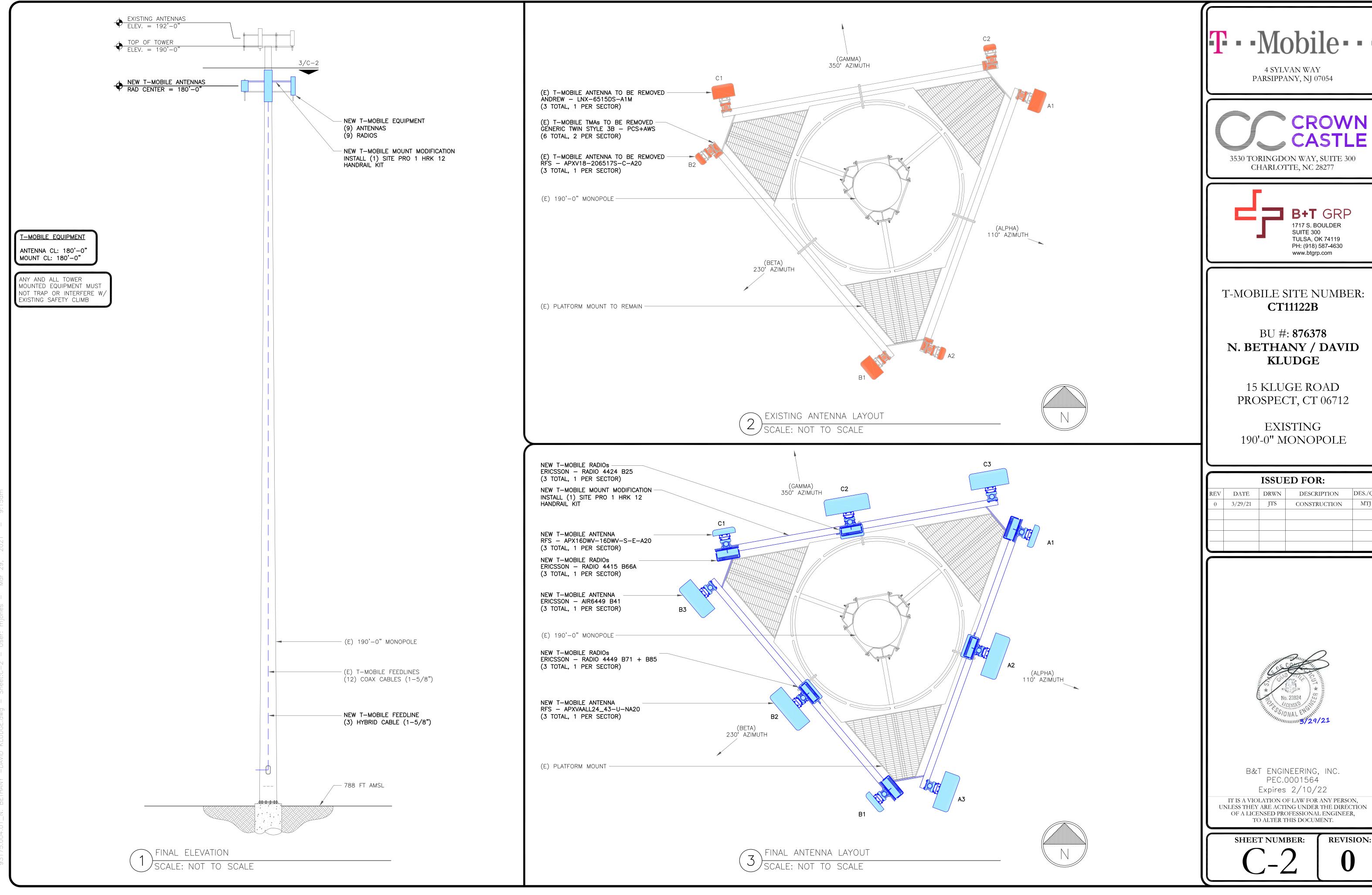
	ISSUED FOR:								
REV	DATE	DRWN	DESCRIPTION	DES./QA					
0	3/29/21	JTS	CONSTRUCTION	МТЈ					



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

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:



T··Mobile··



3530 TORINGDON WAY, SUITE 300

B+T GRP 1717 S. BOULDER

T-MOBILE SITE NUMBER:

N. BETHANY / DAVID

15 KLUGE ROAD PROSPECT, CT 06712

190'-0" MONOPOLE

ISSUED FOR:							
REV	DATE	DRWN	DESCRIPTION	DES./QA			
0	3/29/21	JTS	CONSTRUCTION	MTJ			



Expires 2/10/22

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				RF SYSTEM S	CHE	DULE				
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
	A-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	110°	0.	2° / 2°	180'-0"	(1) RADIO 4415 B66A	(2) 1 5/8" COAX
ALPHA	A-2	L700 / L600 / N600 / L1900 / G1900	RFS	APXVAALL24_43-U-NA20	110°	0.	2° / 2° / 2° / 2°	180'-0"	(1) RADIO 4449 B71 + B85 (1) RADIO 4424 B25	(2) 1 5/8" COAX (1) 1 5/8" HYBRID
	A-3	L2500 / N2500	ERICSSON	AIR6449 B41	110°	0.	2° / 2°	180'-0"	_	_
	B-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	230°	0.	2° / 2°	180'-0"	(1) RADIO 4415 B66A	(2) 1 5/8" COAX
ВЕТА	B-2	L700 / L600 / N600 / L1900 / G1900	RFS	APXVAALL24_43-U-NA20	230°	0.	2° / 2° / 2° / 2°	180'-0"	(1) RADIO 4449 B71 + B85 (1) RADIO 4424 B25	(2) 1 5/8" COAX (1) 1 5/8" HYBRID
	B-3	L2500 / N2500	ERICSSON	AIR6449 B41	230°	0.	2° / 2°	180'-0"	-	_
	C-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	350°	0.	2° / 2°	180'-0"	(1) RADIO 4415 B66A	(2) 1 5/8" COAX
GAMMA	C-2	L700 / L600 / N600 / L1900 / G1900	RFS	APXVAALL24_43-U-NA20	350°	0.	2° / 2° / 2° / 2°	180'-0"	(1) RADIO 4449 B71 + B85 (1) RADIO 4424 B25	(2) 1 5/8" COAX (1) 1 5/8" HYBRID
	C-3	L2500 / N2500	ERICSSON	AIR6449 B41	350°	0.	2° / 2°	180'-0"	_	_

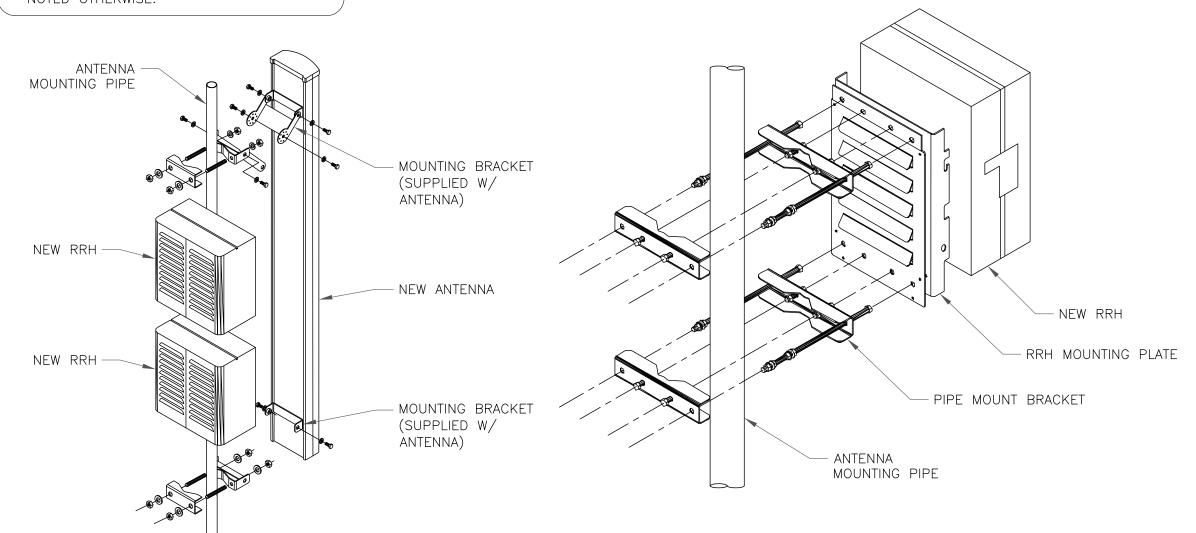
ANTENNA AND CABLE SCHEDULE

SCALE: NOT TO SCALE



1. COMPLY WITH MANUFACTURERS
INSTRUCTIONS TO ENSURE THAT ALL RRHS
RECEIVE ELECTRICAL POWER WITHIN 24
HOURS OF BEING REMOVED FROM THE
MANUFACTURER'S PACKAGING.

2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T - Mobile - - -

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T-MOBILE SITE NUMBER: **CT11122B**

BU #: 876378 N. BETHANY / DAVID KLUDGE

> 15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

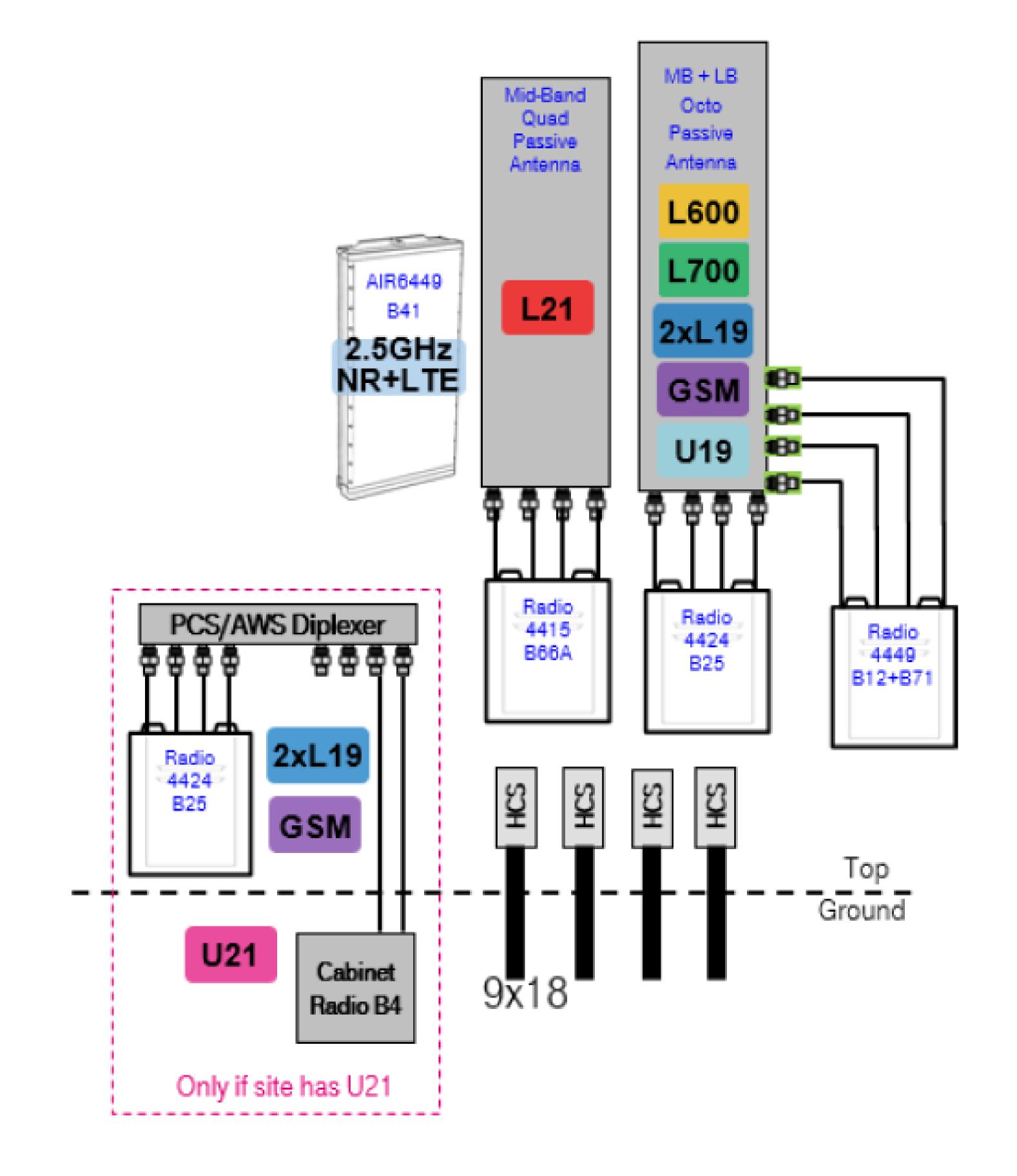
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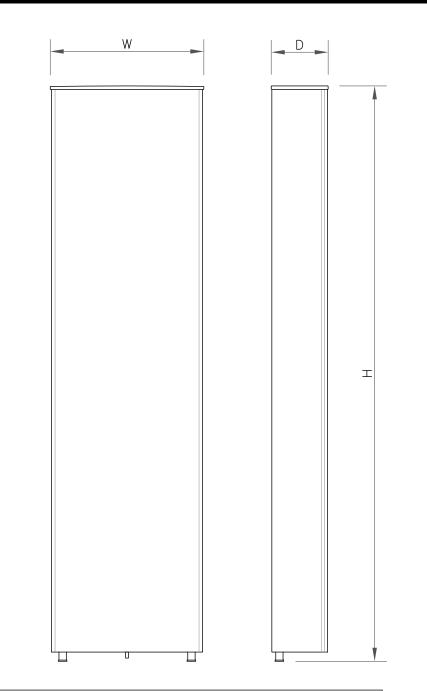
REVISION:

PLUMBING DIAGRAM

SCALE: NOT TO SCALE

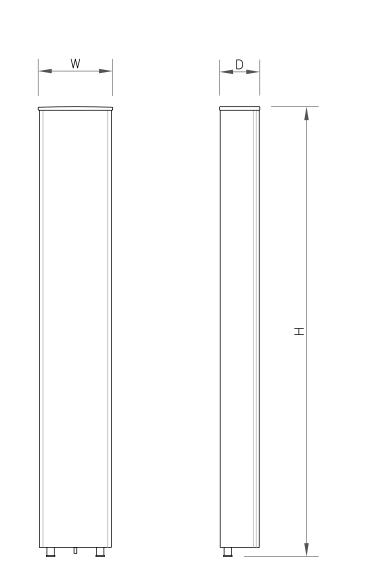
ANTENNA SPECS					
MANUFACTURER	ERICSSON				
MODEL #	AIR6449 B41				
WIDTH	20.51"				
DEPTH	8.54"				
HEIGHT	33.11"				
WEIGHT	114.63 LBS				

ANTENNA SPECS SCALE: NOT TO SCALE



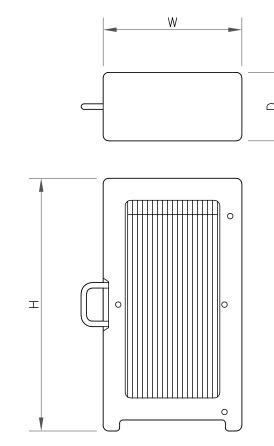
ANTENNA SPECS					
MANUFACTURER	RFS				
MODEL #	APXVAALL24_43-U-NA20				
WIDTH	24"				
DEPTH	8.5"				
HEIGHT	95.9"				
WEIGHT	149.9 LBS				

2 ANTENNA SPECS
SCALE: NOT TO SCALE



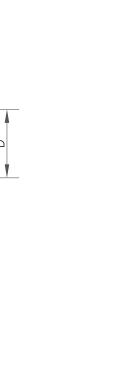
ANTENNA SPECS					
MANUFACTURER RFS					
MODEL #	APX16DWV-16DWV-S-E- A20				
WIDTH	13.3"				
DEPTH	3.15"				
HEIGHT	55.9"				
WEIGHT 40.7 LBS					

3 ANTENNA SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS						
MANUFACTURER	ERICSSON					
MODEL #	RADIO 4449 B71 B85A					
WIDTH	13.2"					
DEPTH	10.63"					
HEIGHT	17.91"					
WEIGHT	73.21 LBS					

RRU SPECS
SCALE: NOT TO SCALE





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15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

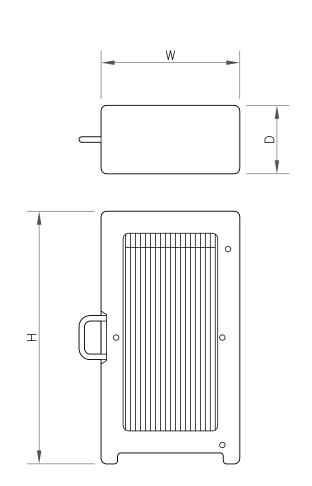
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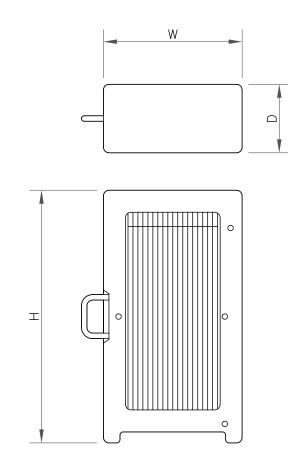
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RRU SPECIFICATIONS							
MANUFACTURER	ERICSSON						
MODEL #	RADIO 4415 B66A						
WIDTH	13.5"						
DEPTH	6.3"						
HEIGHT	16.5"						
WEIGHT	49.6 LBS						

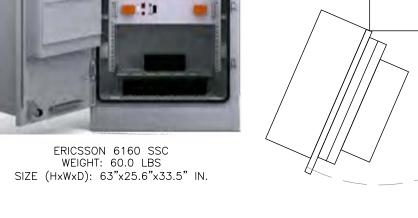
RRU SPECS



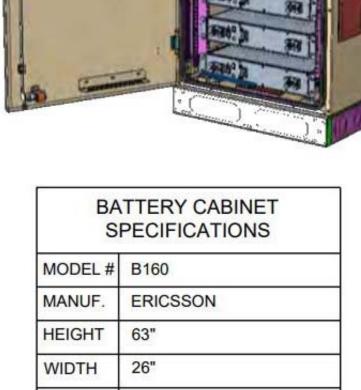
RRU SPECIFICATIONS						
MANUFACTURER ERICSSON						
MODEL #	RADIO 4424 B25					
WIDTH	14.4"					
DEPTH	11.3"					
HEIGHT	17.1"					
WEIGHT	97 LBS					

SCALE: NOT TO SCALE





ERICSSON 6160 SSC SCALE: NOT TO SCALE



ERICSSON B160 BATTERY CABINET SCALE: NOT TO SCALE

DEPTH 26"

WEIGHT

FINAL PANEL SCHEDULE									
1015	DOLEG	4.1 FD0	В	IJS	43.500	DOLES.		LOAD	
LOAD	POLES	AMPS	L1	L2	AMPS	POLES		LOAD	
EQUIPMENT	1	20A	1	2	404	2		DIC	
FIBER	1	10A	3	4	40A			BTS	
6201 CAB 1	2	_	5	6					
EQUIPMENT	1	60A	7	8	60A	2		6201 CAB 2	
EQUIPMENT	1	15A	9	10	20A	1		GFCI	
6160 CABINET	2	100A	11	12					
OTOO CADINET		1004	13	14					
			15	16					
			17	18					
			19	20					
			21	22					
			23	24					
			25	26					
			27	28					
DATED VOLTAGE = 400 /040	DUACE :	7 14105 1	29	30			0 0 10	1.5555.455	
,	PHASE, 3					□24 ■3	<u>0 ⊔42</u>	APPROVED MF'RS	
RATED AMPS: □100 ■200 □400 □ CABINET: ■SURFACE □FLUSH NEMA □1 ■3R □4X									
□MAIN LUGS ONLY MAIN 200 AMPS ■BREAKER □FUSED SWITCH ■HINGED DOOR ■ KEYED DOOR LATCH									
	□FUSED ■CIRCUIT BREAKER BRANCH DEVICES □ TO BE GFCI BREAKERS FULL NEUTRAL BUS GROUND BAR								
ALL BREAKERS MUST BE RATED TO INTERRUPT	A SHORT	CIRCUIT IS	C OF	10,00	00 AMPS S	SYMMETRICA	L		

ADD NEW BREAKER IN POSITION 11 AND 13 WITH A NEW 2P 100A BREAKER ADD NEW BREAKER IN POSITION 10 WITH A NEW 1P 20A BREAKER

ADD NEW BREAKER IN POSITION 10 WITH A NEW 1P 20A BREAKER

REPLACE EXISTING WIRES FOR EXISTING 6201 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #2G AWG. MINIMUM CONDUIT SIZE TO BE 2".

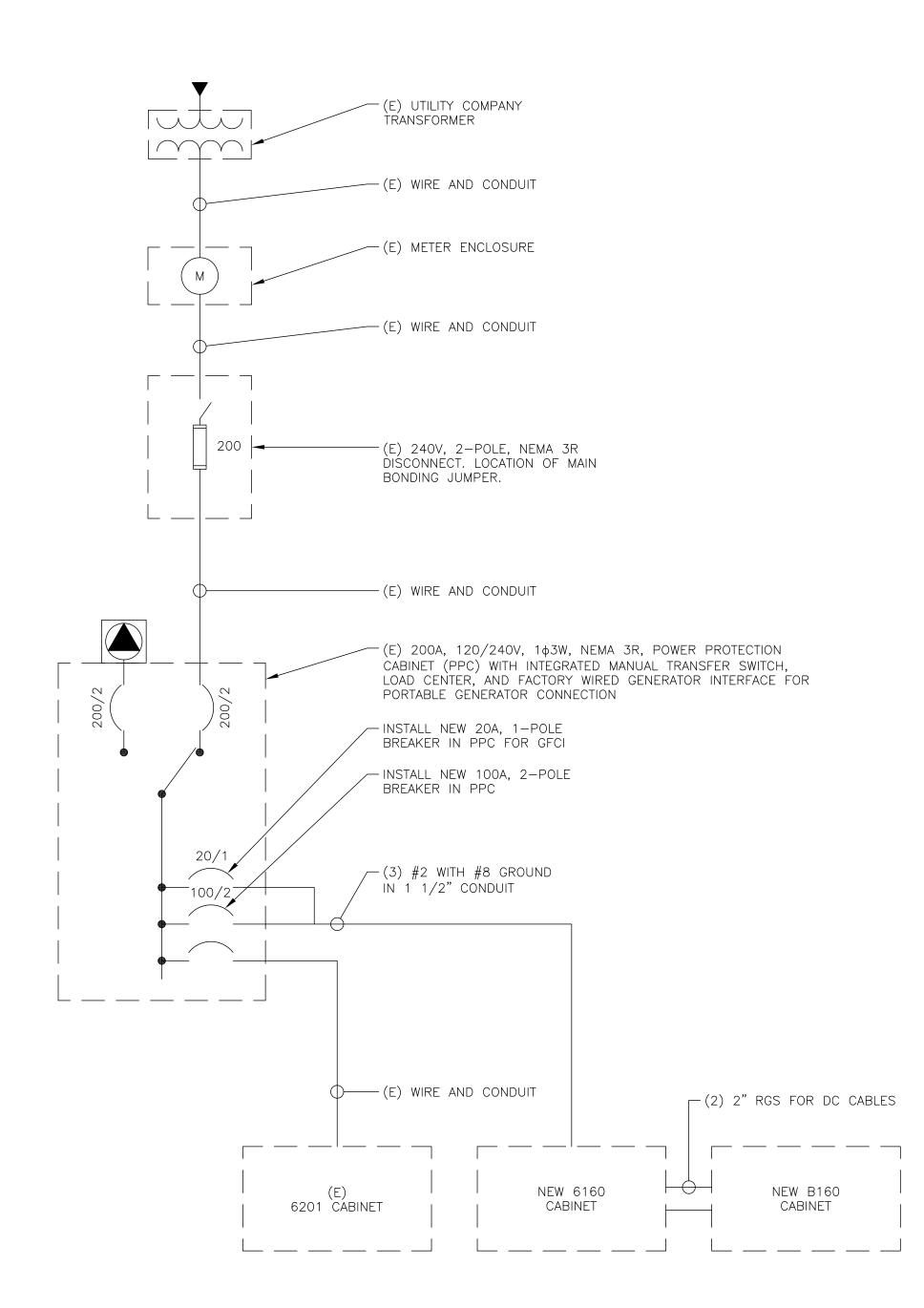
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL Q012040M200RB (OR APPROVED EQUAL).

UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.

FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS

NOTES:

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





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T-MOBILE SITE NUMBER: **CT11122B**

BU #: **876378 N. BETHANY / DAVID KLUDGE**

> 15 KLUGE ROAD PROSPECT, CT 06712

EXISTING 190'-0" MONOPOLE

ISSUED FOR:							
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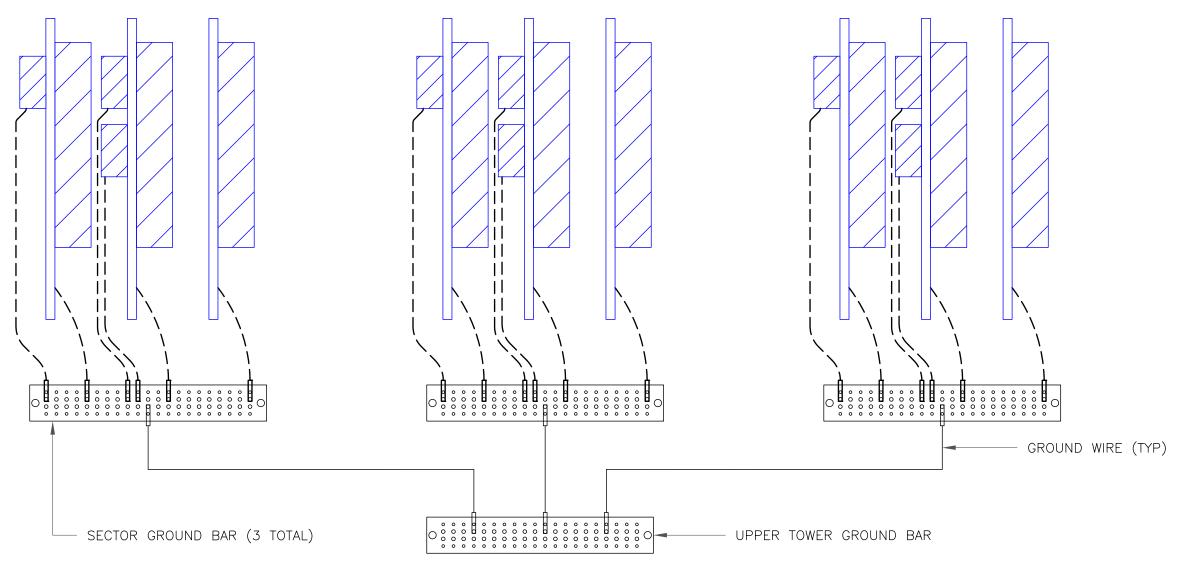
1) AC PANEL SCHEDULE
SCALE: NOT TO SCALE

ONE LINE DIAGRAM

SCALE: NOT TO SCALE

<u>BETA</u>

<u>ALPHA</u>



NOTE:

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

<u>GAMMA</u>

ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE



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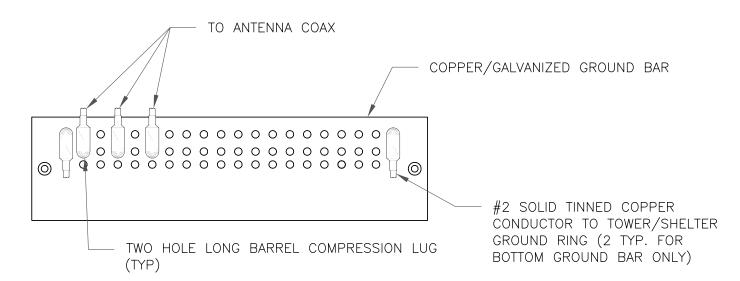
G-1

0

NOTES:

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

ANTENNA SECTOR GROUND BAR DETAIL SCALE: NOT TO SCALE

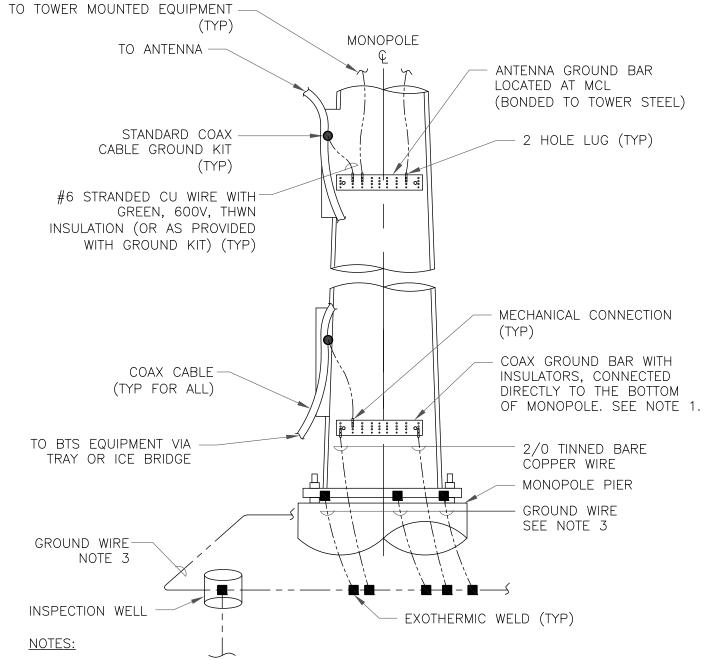


NOTES:

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

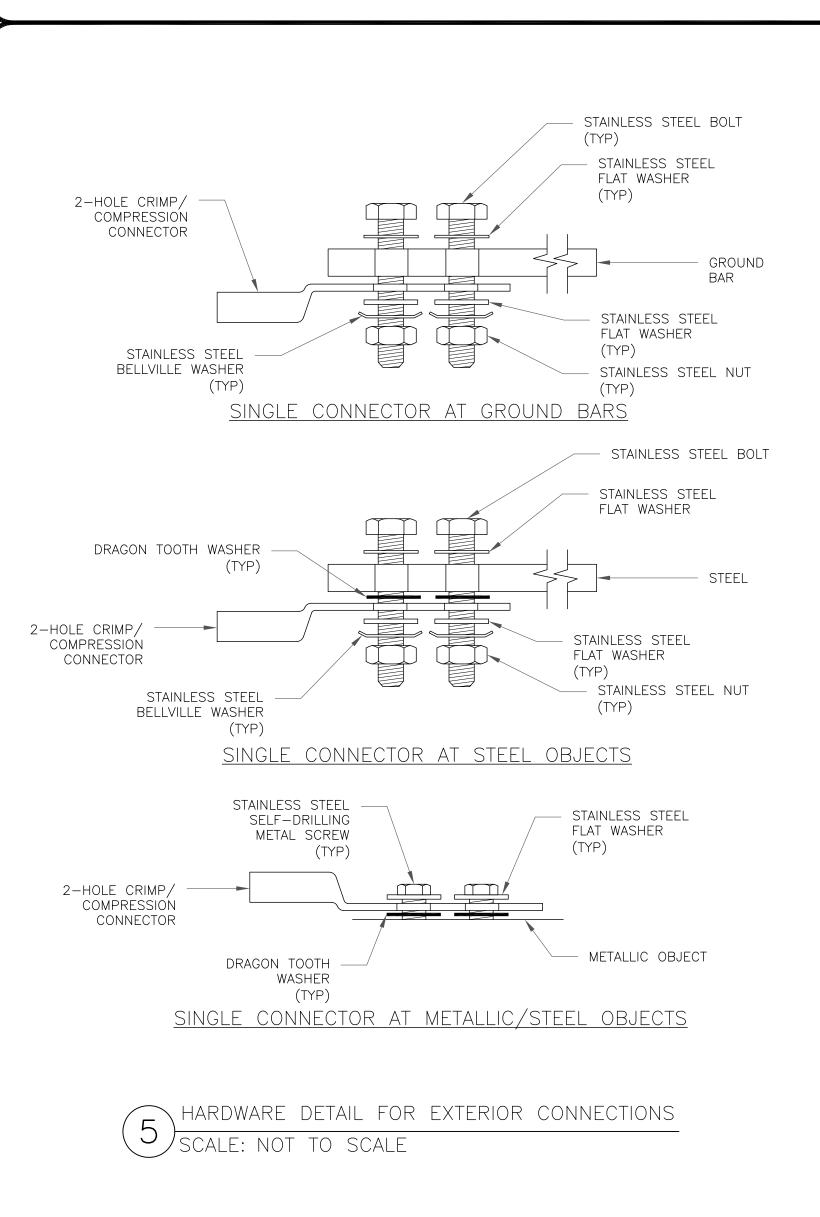


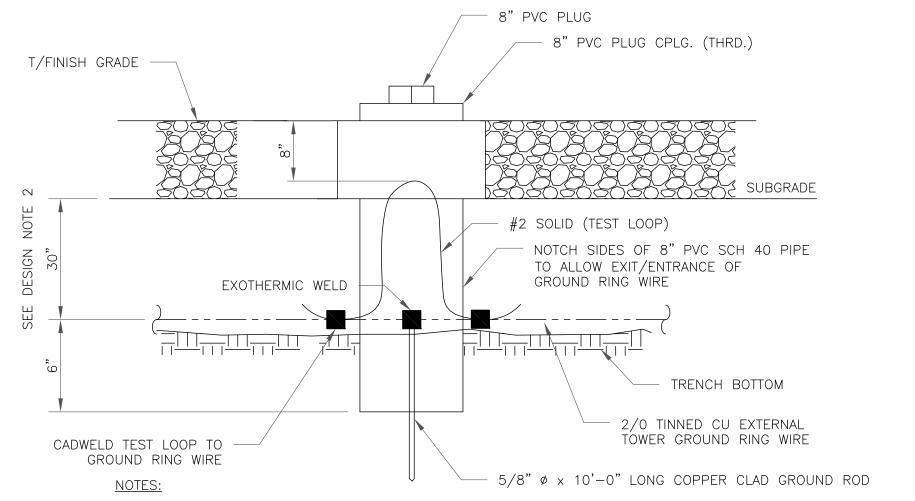




- 1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
- 2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA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

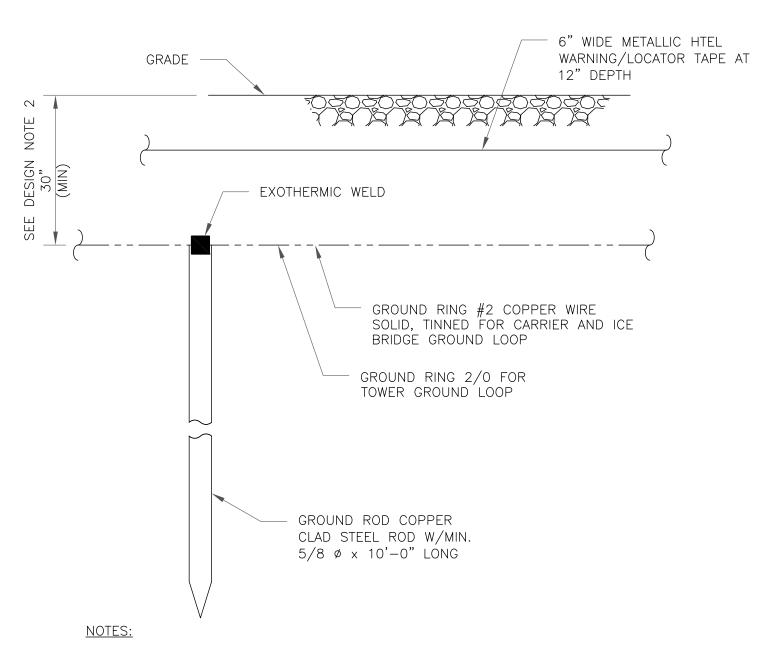




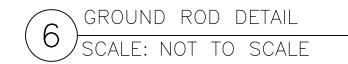


- 1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE
- 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)





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







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EXISTING 190'-0" MONOPOLE

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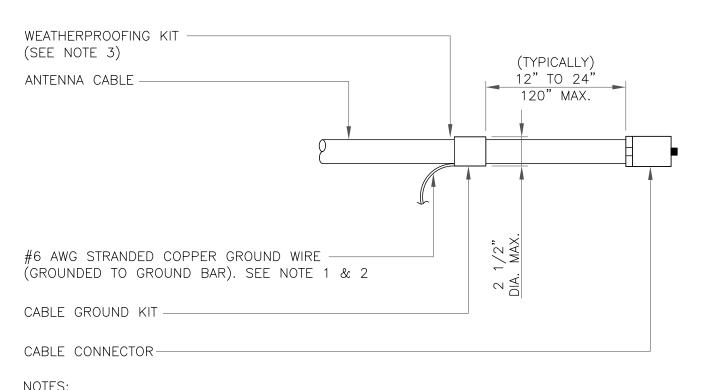
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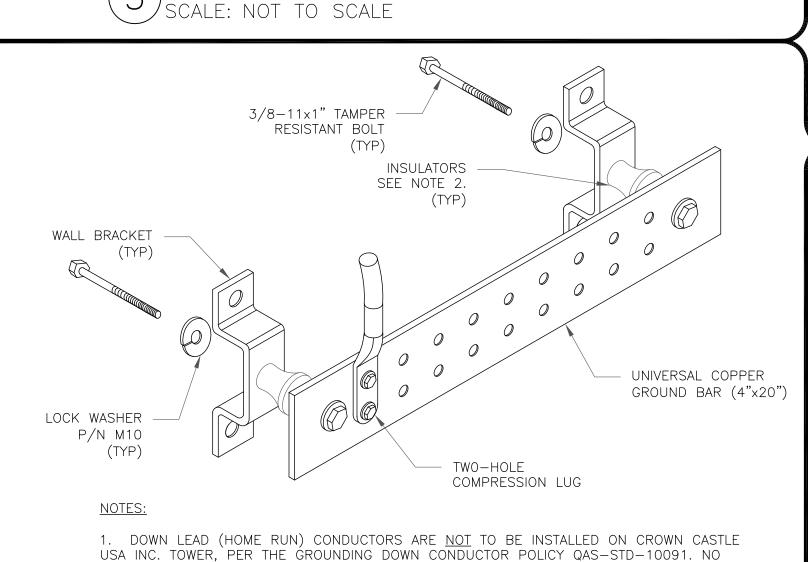
NOTE:

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

CADWELD GROUNDING CONNECTIONS SCALE: NOT TO SCALE



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



MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION,

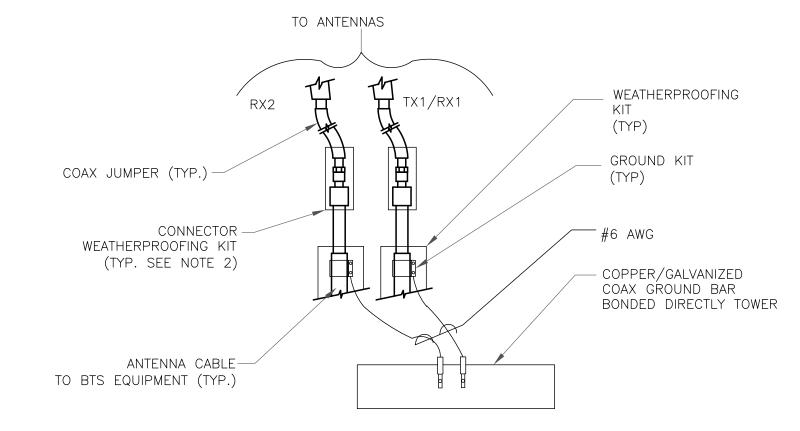
CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

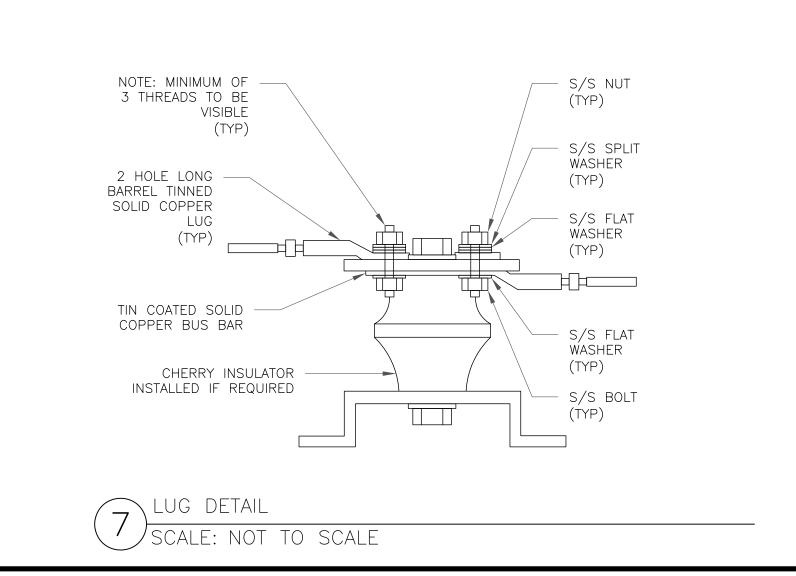
GROUND BAR DETAIL

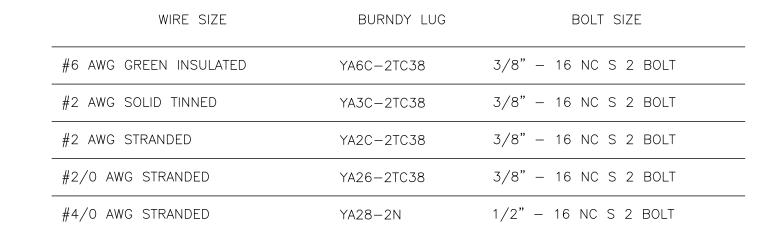
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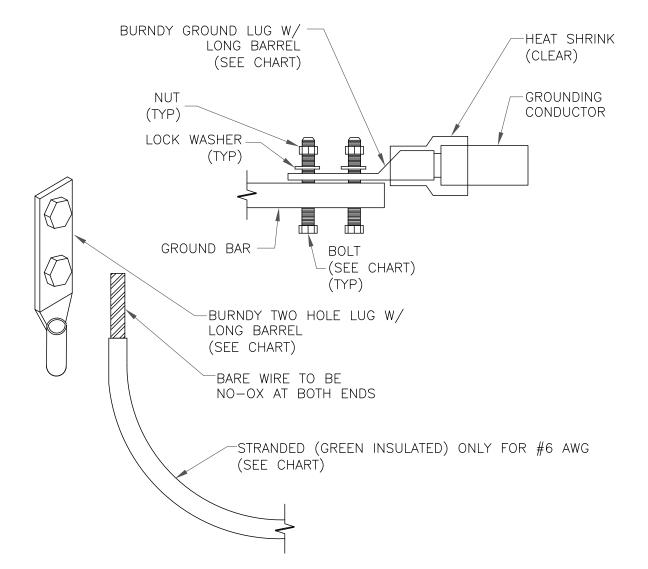
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL



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



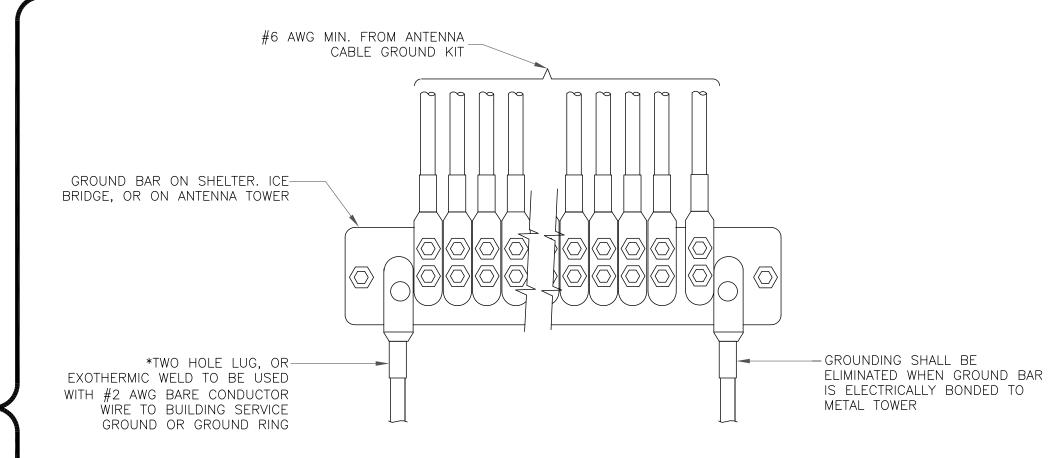




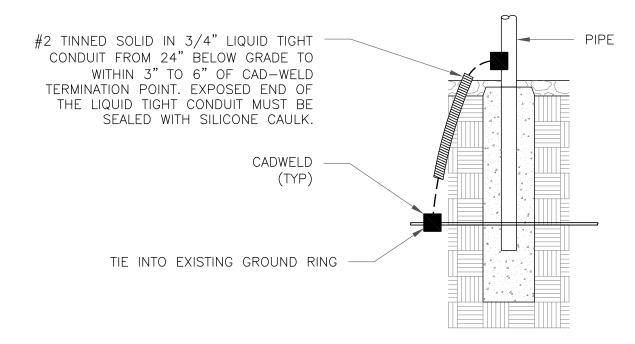
NOTES:

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

MECHANICAL LUG CONNECTION SCALE: NOT TO SCALE



GROUNDWIRE INSTALLATION SCALE: NOT TO SCALE



TRANSITIONING GROUND DETAIL SCALE: NOT TO SCALE

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Exhibit D

Structural Analysis Report



Date: March 14, 2021

Morrison Hershfield 1455 Lincoln Parkway, Suite 500 Atlanta, GA 30346 (770) 379-8500

Subject: Structural Analysis Report

Carrier Designation: *T-Mobile* Co-Locate

> Site Number: CT11122B

Crown Castle Designation: **BU Number:** 876378

> Site Name: N. Bethany / David Kludge

JDE Job Number: 634981 **Work Order Number:** 1931639 **Order Number:** 544402 Rev. 0

Engineering Firm Designation: Morrison Hershfield Project Number: CN7-535 / 2101398

Site Data: 15 Kluge Road, Prospect, New Haven County, CT 06712

Latitude 41° 28′ 16.45″, Longitude -72° 58′ 18.89″

190 Foot – EEI Monopole Tower

Morrison Hershfield is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above-mentioned tower.

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

LC5: Proposed Equipment Configuration

Sufficient Capacity - 78.6%

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria. No. 28133

No. 28133

OENSE ONAL ENGINE

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133) Senior Engineer

G. Lance Cooke 2021.03.14 11:05:29-07'00'

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- 3.2) Assumptions

4) ANALYSIS RESULTS

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4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 190 ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified per reinforcement drawings prepared by Crown Castle, in April of 2015. Reinforcement consists of installing base plate stiffeners. Per the post modification inspection completed by Engineered Tower Solutions, PLLC., in February of 2016, these modifications have been properly installed and were considered in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision: TIA-222-H

Risk Category:

Wind Speed: 125 mph

Exposure Category:CTopographic Factor:1Ice Thickness:1.5 inWind Speed with Ice:50 mphService Wind Speed:60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Antenna Model Manufacturer		Number of Feed Lines	Feed Line Size (in)												
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe														
				3	rfs/celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe												
		3	rfs/celwave	APXVAALL24_43-U-NA20_TMO														
180.0	180.0	3	ericsson	RADIO 4415 B66A	3	1-5/8												
														3	ericsson	RADIO 4424 B25_TMOV1		
											3	ericsson	RADIO 4449 B12/B71					
1						3	-	Pipe Mount [P2.0 STD, 8 ft Long]										
		1	Site pro 1	Handrail Kit [#HRK 12]														
		1	-	Platform Mount [LP 401-1]														

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)									
	1		rfs/celwave	APXV9ERR18-C-A20 w/ Mount Pipe											
			rfs/celwave	APXVSPP18-C-A20 w/ Mount Pipe											
		3	rfs/celwave	APXVTM14-C-120 w/ Mount Pipe											
400.0	400.0	3	alcatel lucent	1900MHZ RRH (65MHZ)	_										
192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	4	1-1/4
		3	alcatel lucent	800MHZ RRH											
		3	alcatel lucent	TD-RRH8X20-25											
				9	rfs/celwave	ACU-A20-N									
		1	tower mounts	Platform Mount [LP 602-1]											

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2192530	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2051620	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2051615	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5657025	CCISITES
4-POST-MODIFICATION INSPECTION	6088222	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

- 1) 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. Morrison Hershfield should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	190 - 163.221	Pole	TP24.4525x19.5x0.1875	1	-7.12	862.97	49.2	Pass
L2	163.221 - 126.831	Pole	TP30.7144x23.4196x0.25	2	-11.12	1446.24	74.0	Pass
L3	126.831 - 86.3984	Pole	TP37.6019x29.4221x0.3125	3	-17.89	2214.00	76.7	Pass
L4	86.3984 - 42.9401	Pole	TP44.9268x36.0268x0.375	4	-28.23	3175.46	73.6	Pass
L5	42.9401 - 0	Pole	TP52x43.0584x0.4375	5	-44.29	4398.09	69.4	Pass
							Summary	
						Pole (L3)	76.7	Pass
						Rating =	76.7	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	67.5	Pass
1	Base Plate	U	57.5	Pass
1	Base Foundation	0	66.7	Pass
1	Base Foundation Soil Interaction	U	78.6	Pass

Structure Rating (max from all components) =	78.6%*

Notes:

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

4.1) Recommendations

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

APPENDIX A TNXTOWER OUTPUT

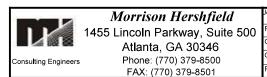
									190,0 f	
-	26.78	18	0.1875	3.56	19.5000	24.4525		1.2		
									. <u>163.2 ft</u>	
2	39.95	18	0.2500	4.34	23.4196	30.7144		2.9		
e	44.77	18	0.3125	5.20	29.4221	37.6019	Ď.	5.0	. <u>126.8 ft</u>	
							A572-65		86.4 ft	
4	48.66	18	0.3750	6.11	36.0268	44.9268		7.9	ALL REACTIONS ARE FACTORED	
w	49.05	18	0.4375		43.0584	52.0000		10.9	AXIAL 69 K SHEAR TORQUE 0 kip-ft 50 mph WIND - 1.5000 in Id AXIAL 44 K SHEAR 29 K 381	2 ki CE ME
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K) 27.9	0.0 ft TORQUE 0 kip-ft REACTIONS - 125 mph WI	

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

- Tower is located in New Haven County, Connecticut. Tower designed for Exposure C to the TIA-222-H Standard.
- Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
 Deflections are based upon a 60 mph wind.
 Tower Risk Category II.
 Topographic Category 1 with Crest Height of 0.00 ft
 TOWER RATING: 76.7%



Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Tower base elevation above sea level: 792.00 ft.

Basic wind speed of 125 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.05.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs 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 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

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 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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	fť	ft	Sides	in	in	in	in	
L1	190.00-163.22	26.78	3.56	18	19.5000	24.4525	0.1875	0.7500	A572 - 65 (65 ksi)
L2	163.22-126.83	39.95	4.34	18	23.4196	30.7144	0.2500	1.0000	A572-65 (65 ksi)
L3	126.83-86.40	44.77	5.20	18	29.4221	37.6019	0.3125	1.2500	À572-65 (65 ksi)
L4	86.40-42.94	48.66	6.11	18	36.0268	44.9268	0.3750	1.5000	À572 - 65 (65 ksi)

Section	Elevation	Section Length	Splice Length	Number of	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft	Sides	in	in	in	in	
L5	42.94-0.00	49.05		18	43.0584	52.0000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia.	Area	I	r	С	I/C	J	It/Q	W	w/t
	in	in²	in⁴	in	in	in³	in⁴	in²	in	
L1	19.7719	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	24.8008	14.4407	1074.2034	8.6141	12.4219	86.4768	2149.8203	7.2217	3.9736	21.193
L2	24.4019	18.3851	1246.9251	8.2252	11.8972	104.8086	2495.4910	9.1943	3.6819	14.727
	31.1497	24.1735	2834.4074	10.8149	15,6029	181.6588	5672,5443	12.0890	4.9657	19.863
L3	30.6327	28.8731	3091.0449	10.3339	14.9465	206.8079	6186.1571	14.4393	4.6283	14.811
	38,1338	36,9864	6497,5642	13,2377	19.1018	340.1552	13003.6781	18.4967	6.0679	19.417
L4	37.4906	42.4345	6814.2526	12.6564	18.3016	372.3312	13637.4717	21.2213	5.6807	15.149
	45,5620	53.0278	13297.5431	15.8159	22,8228	582,6426	26612,5834	26.5189	7.2471	19.326
L5	44.7869	59.1844	13582.8299	15.1304	21.8737	620.9672	27183.5324	29.5978	6.8083	15.562
	52.7347	71.6010	24050.5121	18.3047	26.4160	910.4525	48132.6704	35.8073	8.3820	19.159

Tower	Gusset	Gusset	Gusset Grade Adjust. Factor	Adjust.	Weight Mult.	Double Angle	Double Angle	Double Angle
Elevation	Area	Thickness	\mathcal{A}_f	Factor		Stitch Bolt	Stitch Bolt	Stitch Bolt
	(per face)			A_r		Spacing	Spacing	Spacing
						Diagonals	Horizontals	Redundants
ft	ft ²	in				in	in	in
L1 190.00-			1	1	1			
163.22								
L2 163.22 -			1	1	1			
126.83								
L3 126.83-			1	1	1			
86.40								
L4 86.40-			1	1	1			
42.94								
L5 42 94-0 00			1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude	Componen	Placement	Total	Number	Start/En	Width or	Perimete	Weight
		From	t		Number	Per Row	d	Diamete	r	
		Torque	Type	ft			Position	r		plf
		Calculation	1					in	in	

Safety Line 3/8"	С	No	Surface Ar	190.00 -	1	1	-0.100	0.3750		0.22
•			(CaAa)	11.00			-0.100			
Step Pegs	С	No	Surface Ar	190.00 -	1	1	-0.150	0.7050		1.80
			(CaAa)	12.00			-0.050			
***			,							

Feed Line/Linear Appurtenances - Entered As Area

Description	Face		Exclude	Componen	Placement	Total		C_AA_A	Weight
	or	Shield	From	t		Number			
	Leg		Torque	Type	ft			ft²/ft	plf
			Calculation	1					

HB114-1-0813U4-	В	No	No	Inside Pole	190.00 - 3.00	3	No Ice	0.00	1.20
M5J(1 - 1/4)							1/2" Ice	0.00	1.20
							1" I ce	0.00	1.20
							2" Ice	0.00	1.20
HB114-21U3M12-	В	No	No	Inside Pole	190.00 - 3.00	1	No Ice	0.00	1,22
XXXF(1-1/4)							1/2" Ice	0.00	1.22
							1" Ice	0.00	1.22

Description	Face	Allow	Exclude	Componen	Placement	Total		$C_A A_A$	Weight
	or Leg	Shield	From Torque Calculation	t Type	ft	Number		ft²/ft	plf
****			Caroaratron				2" I ce	0.00	1.22
HB158-21U6S24- xxM_TMO(1-5/8)	В	No	No	Inside Pole	180.00 - 10.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	2.50 2.50 2.50 2.50

Feed Line/Linear Appurtenances Section Areas

Tower	Tower	Face	A_R	A_{F}	$C_{\underline{A}}A_{A}$	$C_A A_A$	Weight
Sectio	Elevation				In Face	Out Face	
n	ft		ft²	ft ²	ft ²	ft ²	K
L1	190.00-163.22	Α	0.000	0.000	0.000	0.000	0.00
		В	0.000	0.000	0.000	0.000	0.25
		С	0.000	0.000	2.892	0.000	0.05
L2	163.22-126.83	Α	0.000	0.000	0.000	0.000	0.00
		В	0.000	0.000	0.000	0.000	0.45
		С	0.000	0.000	3.930	0.000	0.07
L3	126.83-86.40	Α	0.000	0.000	0.000	0.000	0.00
		В	0.000	0.000	0.000	0.000	0.50
		С	0.000	0.000	4.367	0.000	0.08
L4	86 40 42 94	Α	0.000	0.000	0.000	0.000	0.00
		В	0.000	0.000	0.000	0.000	0.54
		С	0.000	0.000	4.694	0.000	0.09
L5	42.94-0.00	Α	0.000	0.000	0.000	0.000	0.00
		В	0.000	0.000	0.000	0.000	0.44
		С	0.000	0.000	3.379	0.000	0.06

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower	Tower	Face	Ice	A_R	A_F	$C_A A_A$	$C_A A_A$	Weight
Sectio	Elevation	or	Thickness			In Face	Out Face	
n	ft	Leg	in	ft²	ft²	ft²	ft²	K
L1	190.00-163.22	Α	1.507	0.000	0.000	0.000	0.000	0.00
		В		0.000	0.000	0.000	0.000	0.25
		С		0.000	0.000	19.039	0.000	0.26
L2	163.22-126.83	Α	1.478	0.000	0.000	0.000	0.000	0.00
		В		0.000	0.000	0.000	0.000	0.45
		С		0.000	0.000	25.873	0.000	0.35
L3	126.83-86.40	Α	1.433	0.000	0.000	0.000	0.000	0.00
		В		0.000	0.000	0.000	0.000	0.50
		С		0.000	0.000	28.267	0.000	0.38
L4	86.40-42.94	Α	1.363	0.000	0.000	0.000	0.000	0.00
		В		0.000	0.000	0.000	0.000	0.54
		С		0.000	0.000	29.602	0.000	0.39
L5	42.94-0.00	Α	1.223	0.000	0.000	0.000	0.000	0.00
		В		0.000	0.000	0.000	0.000	0.44
		С		0.000	0.000	20.521	0.000	0.26

Feed Line Center of Pressure

Section	Elevation	CP_X	CPz	CP _X	CPz
				Ice	Ice
	ft	in	in	in	in
L1	190.00-163.22	0.1731	0.8143	0.5136	2.4165
L2	163.22-126.83	0.1748	0.8222	0.5457	2.5673
L3	126.83-86.40	0.1761	0.8284	0.5660	2.6630
L4	86.40-42.94	0.1771	0.8330	0.5755	2.7075
L5	42.94-0.00	0.1279	0.6018	0.4222	1.9865

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

Shielding Factor Ka

Tower	Feed Line	Description	Feed Line	Ka	Ka
Section	Record No.	·	Segment Elev.	No Ice	Ice
L1	2	Safety Line 3/8"	163.22 - 190.00	1.0000	1.0000
L1	3	Step Pegs	163.22 - 190.00	1.0000	1.0000
L2	2	Safety Line 3/8"	126.83 - 163.22	1.0000	1.0000
L2	3	Step Pegs	126.83 - 163.22	1.0000	1.0000
L3	2	Safety Line 3/8"	86.40 - 126.83	1.0000	1.0000
L3	3	Step Pegs	86.40 - 126.83	1.0000	1.0000
L4	2	Safety Line 3/8"	42.94 - 86.40	1.0000	1.0000
L4	3	Step Pegs	42.94 - 86.40	1.0000	1.0000
L5	2	Safety Line 3/8"	11.00 - 42.94	1.0000	1.0000
L5	3	Step Pegs	12.00 - 42.94	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	0	ft		ft²	ft²	К
APXVSPP18-C-A20 w/ Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXV9ERR18-C-A20 w/ Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.45 4.89 5.82	0.42 0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVTM14-C-120 w/ Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-C-120 w/ Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-C-120 w/ Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
1900MHZ RRH (65MHZ)	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	o	ft		ft²	ft²	K
1900MHZ RRH (65MHZ)	В	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice	3.19 2.32 2.53 2.74	3.09 2.24 2.44 2.65	0.17 0.06 0.08 0.11
1900MHZ RRH (65MHZ)	С	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice	3.19 2.32 2.53 2.74	3.09 2.24 2.44 2.65	0.17 0.06 0.08 0.11
800 EXTERNAL NOTCH FILTER	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	3.19 0.66 0.76 0.87	3.09 0.32 0.40 0.48	0.17 0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	1.11 0.66 0.76 0.87	0.67 0.32 0.40 0.48	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	С	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice	1.11 0.66 0.76 0.87	0.67 0.32 0.40 0.48	0.04 0.01 0.02 0.02
800MHZ RRH	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice	1.11 2.13 2.32 2.51	0.67 1.77 1.95 2.13	0.04 0.05 0.07 0.10
800MHZ RRH	В	From Leg	4.00 0.00 0.00	0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	2.92 2.13 2.32 2.51 2.92	2.51 1.77 1.95 2.13	0.16 0.05 0.07 0.10 0.16
800MHZ RRH	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.92 2.13 2.32 2.51 2.92	2.51 1.77 1.95 2.13 2.51	0.16 0.05 0.07 0.10 0.16
TD-RRH8X20-25	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.10 0.07 0.10 0.13 0.20
TD-RRH8X20-25	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.20 0.07 0.10 0.13 0.20
TD-RRH8X20-25	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.20 0.07 0.10 0.13 0.20
(3) ACU-A20-N	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.00 0.01
(3) ACU-A20-N	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.20 0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.00 0.01
(3) ACU-A20-N	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.20 0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.00 0.01
(2) 6' x 2" Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05
(2) 6' x 2" Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.09 0.02 0.03 0.05 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	٠	ft		ft²	ft²	К
(2) 6' x 2" Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 602-1]	Α	None		0.0000	192.00	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	3.06 31.07 34.82 38.48 45.60	3.06 31.07 34.82 38.48 45.60	0.09 1.34 1.97 2.67 4.31
Platform Mount [LP 401-1]	В	None		0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.04 28.93 33.88 43.93	24.04 28.93 33.88 43.93	1.65 2.17 2.76 4.16
AIR6449 B41_T-MOBILE w/ Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APXVAALL24_43-U- NA20_TMO	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.67 15.43 16.21 17.81	5.32 5.99 6.68 8.08	0.15 0.26 0.38 0.65
APXVAALL24_43-U- NA20_TMO	В	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.67 15.43 16.21 17.81	5.32 5.99 6.68 8.08	0.15 0.26 0.38 0.65
APXVAALL24_43-U- NA20_TMO	С	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.67 15.43 16.21 17.81	5.32 5.99 6.68 8.08	0.15 0.26 0.38 0.65
RADIO 4415 B66A	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.86 2.03 2.20 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
RADIO 4415 B66A	В	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.86 2.03 2.20 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
RADIO 4415 B66A	С	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.86 2.03 2.20 2.58	0.87 1.00 1.13 1.43	0.05 0.06 0.08 0.12
RADIO 4424 B25_TMOV1	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	2.05 2.23 2.42	1.61 1.77 1.94	0.10 0.12 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		$C_A A_A$ Front	C _A A _A Side	Weight
			Vert ft ft ft	o	ft		ft²	ft²	K
RADIO 4424 B25_TMOV1	В	From Leg	4.00 0.00 0.00	0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice	2.81 2.05 2.23 2.42	2.30 1.61 1.77 1.94	0.20 0.10 0.12 0.14
RADIO 4424 B25_TMOV1	С	From Leg	4.00 0.00 0.00	0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice	2.81 2.05 2.23 2.42	2.30 1.61 1.77 1.94	0.20 0.10 0.12 0.14
RADIO 4449 B12/B71	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice	2.81 1.65 1.81 1.98	2.30 1.16 1.30 1.45	0.20 0.07 0.09 0.11
RADIO 4449 B12/B71	В	From Leg	4.00 0.00 0.00	0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	2.34 1.65 1.81 1.98 2.34	1.76 1.16 1.30 1.45 1.76	0.16 0.07 0.09 0.11
RADIO 4449 B12/B71	С	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.76 1.16 1.30 1.45 1.76	0.16 0.07 0.09 0.11 0.16
Pipe Mount [P2.0 STD, 8 ft Long]	Α	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
Pipe Mount [P2.0 STD, 8 ft Long]	В	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	4.40 1.90 2.73 3.40	4.40 1.90 2.73 3.40	0.12 0.03 0.04 0.06
Pipe Mount [P2.0 STD, 8 ft Long]	С	From Leg	4.00 0.00 0.00	0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice	4.40 1.90 2.73 3.40	4.40 1.90 2.73 3.40	0.12 0.03 0.04 0.06
Handrail Kit [#HRK 12]	В	None		0.0000	180.00	2" Ice No Ice 1/2" Ice 1" Ice	4.40 12.17 16.47 20.42	4.40 12.17 16.47 20.42	0.12 0.51 0.70 0.95
***						2" Ice	27.62	27.62	1.65

Load Combinations

	2
Comb.	Description
No.	
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
	Ç

Comb.	Description
No.	· · · · · · · · · · · · · · · · · · ·
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49 50	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Sectio	Elevation	Component	Condition	Gov.	Axial	Major Axis	Minor Axis
n	ft	Type		Load		Moment	Moment
No.				Comb.	K	kip-ft	kip-ft
L1	190 - 163,221	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.63	0.00	-0.28
			Max. Mx	8	-7.13	-236.20	-0.06
			Max. My	14	-7.12	0.00	-236.26
			Max. Vy	8	13.36	-236.20	-0.06
			Max. Vx	14	13.36	0.00	-236.26
			Max. Torque	30			0.00
L2	163.221 - 126.831	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.78	0.00	-0.80
			Max. Mx	8	-11.12	-769.90	-0.17
			Max. My	14	-11.12	0.00	-770.06
			Max. Vy	8	16.63	-769.90	-0.17
			Max. Vx	14	16.63	0.00	- 770.06
			Max. Torque	30			0.00
L3	126.831 - 86.3984	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.12	0.00	-1.37
			Max. Mx	8	-17.89	-1507.11	-0.32
			Max. My	14	-17.89	0.00	-1507.42
			Max. Vy	8	20.61	-1507.11	-0.32
			Max. Vx	14	20.61	0.00	-1507.42
			Max. Torque	30			0.00
L4	86.3984 - 42.9401	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.45	0.00	-2.05
			Max. Mx	8	-28.23	-2478.56	-0.50
			Max. My	14	-28.23	0.00	-2479.05
			Max. Vy	8	24.95	-2478.56	-0.50

Sectio	Elevation	Component	Condition	Gov.	Axial	Major Axis	Minor Axis
n	ft	Type		Load		Moment	Moment
No.				Comb.	K	kip-ft	kip-ft
			Max. Vx	14	24.95	0.00	-2479.05
			Max. Torque	30			0.00
L5	42.9401 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.90	0.00	-2.69
			Max. Mx	8	-44.29	-3811.33	-0.69
			Max. My	14	-44.29	0.00	-3812.01
			Max. Vy	8	29.08	-3811.33	-0.69
			Max. Vx	14	29.08	0.00	-3812.01
			Max. Torque	30			0.00

Maximum Reactions

Location	Condition	Gov.	Vertical	Horizontal, X	Horizontal, 2
		Load	K	K	K
		Comb.			
Pole	Max. Vert	33	68.90	0.00	-7.71
	Max. H _x	20	44.32	29.04	0.00
	Max. H _z	2	44.32	0.00	29.04
	Max. M _x	2	3810.65	0.00	29.04
	Max. M _z	8	3811.33	-29.04	0.00
	Max. Torsion	30	0.00	- 7.71	-0.00
	Min. Vert	11	33.24	-25.15	-14.52
	Min. H _x	8	44.32	-29.04	0.00
	Min. H _z	14	44.32	0.00	-29.04
	Min. M _x	14	-3812.01	0.00	-29.04
	Min. M _z	20	-3811.33	29.04	0.00
	Min, Torsion	36	-0.00	7.71	-0.00

Tower Mast Reaction Summary

Load Combination	Vertical	Shear _x	Shearz	Overturning Moment, M _x	Overturning Moment, M ₂	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	36.93	0.00	0.00	0.53	0.00	0.00
1.2 Dead+1.0 Wind 0 deg -	44.32	0.00	-29.04	-3810.65	0.00	0.00
No Ice						
0.9 Dead+1.0 Wind 0 deg -	33.24	0.00	-29.04	-3744.30	0.00	0.00
No Ice						
1.2 Dead+1.0 Wind 30 deg -	44.32	14.52	-25.15	-3300.04	-1905.67	-0.00
No Ice						
0.9 Dead+1.0 Wind 30 deg -	33.24	14.52	-25.15	-3242.59	-1872.40	-0.00
No Ice						
1.2 Dead+1.0 Wind 60 deg -	44.32	25.15	-14.52	-1904.99	-3300.72	-0.00
No Ice						
0.9 Dead+1.0 Wind 60 deg -	33.24	25.15	-14.52	-1871.90	-3243.09	-0.00
No Ice						
1.2 Dead+1.0 Wind 90 deg -	44.32	29.04	0.00	0.69	-3811.33	-0.00
No Ice						
0.9 Dead+1.0 Wind 90 deg -	33.24	29.04	0.00	0.50	-3744.80	-0.00
No Ice						
1.2 Dead+1.0 Wind 120 deg	44.32	25.15	14.52	1906.36	-3300.72	-0.00
- No Ice						
0.9 Dead+1.0 Wind 120 deg	33.24	25.15	14.52	1872.90	-3243.09	-0.00
- No Ice						
1.2 Dead+1.0 Wind 150 deg	44.32	14.52	25.15	3301.40	-1905.67	-0.00
- No Ice						
0.9 Dead+1.0 Wind 150 deg	33.24	14.52	25.15	3243.59	-1872.40	-0.00
- No Ice						
1.2 Dead+1.0 Wind 180 deg	44.32	0.00	29.04	3812.01	0.00	0.00
- No Ice						
0.9 Dead+1.0 Wind 180 deg	33.24	0.00	29.04	3745.30	0.00	0.00

Load Combination	Vertical	Shear _x	Shearz	Overturning M_{oment} , M_{x}	Overturning Moment, Mz	Torque
N. I	K	K	K	kip-ft	kip-ft	kip-ft
- No Ice 1.2 Dead+1.0 Wind 210 deg - No Ice	44.32	-14.52	25.15	3301.40	1905.67	0.00
0.9 Dead+1.0 Wind 210 deg - No Ice	33.24	-14.52	25.15	3243.59	1872.40	0.00
1.2 Dead+1.0 Wind 240 deg - No Ice	44.32	-25.15	14.52	1906.36	3300.72	0.00
0.9 Dead+1.0 Wind 240 deg - No Ice	33.24	-25.15	14.52	1872.90	3243.09	0.00
1.2 Dead+1.0 Wind 270 deg - No Ice	44.32	-29.04	0.00	0.69	3811.33	0.00
0.9 Dead+1.0 Wind 270 deg - No Ice	33.24	-29.04	0.00	0.50	3744.80	0.00
1.2 Dead+1.0 Wind 300 deg - No Ice	44.32	-25.15	-14.52	-1904.99	3300.72	0.00
0.9 Dead+1.0 Wind 300 deg - No Ice	33.24	-25.15	-14.52	-1871.90	3243.09	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice	44.32	-14.52	- 25.15	-3300.04	1905.67	0.00
0.9 Dead+1.0 Wind 330 deg - No Ice	33.24	-14.52	- 25.15	-3242.59	1872.40	0.00
1.2 Dead+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 0	68.90 68.90	0.00 0.00	0.00 - 7.71	2.69 - 1056.31	0.00 0.00	0.00 0.00
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.90	3.86	-6.68	-914.42	-529.63	-0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.90	6.68	-3.86	-526.70	- 917.35	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.90	7.71	0.00	2.93	-1059.23	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.90	6.68	3.86	532.56	-917.34	-0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.90	3.86	6.68	920.27	-529.63	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.90	0.00	7.71	1062.16	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.90	-3.86	6.68	920.27	529.63	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.90	-6.68	3.86	532.56	917.34	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.90	- 7.71	0.00	2.93	1059.23	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.90	- 6.68	- 3.86	-526.70	917.35	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.90	-3.86	- 6.68	- 914.42	529.63	0.00
Dead+Wind 0 deg - Service	36.93	0.00	-6.30	-820.08	0.00	0.00
Dead+Wind 30 deg - Service	36.93	3.15	-5.46	-710.15	-410.33	-0.00
Dead+Wind 60 deg - Service	36.93	5.46	-3.15	-409.77	-710.72	-0.00
Dead+Wind 90 deg - Service Dead+Wind 120 deg - Service	36.93 36.93	6.30 5.46	0.00 3.15	0.57 410.90	-820.65 -710.72	-0.00 -0.00
Dead+Wind 150 deg - Service	36.93	3.15	5.46	711.29	- 410.33	-0.00
Dead+Wind 180 deg - Service	36.93	0.00	6.30	821.22	0.00	0.00
Dead+Wind 210 deg - Service	36.93	-3.15	5.46	711.29	410.33	0.00
Dead+Wind 240 deg - Service	36.93	-5.46	3.15	410.90	710.72	0.00
Dead+Wind 270 deg - Service	36.93	-6.30	0.00	0.57	820.65	0.00
Dead+Wind 300 deg - Service	36.93	-5.46	-3.15	-409.77	710.72	0.00
Dead+Wind 330 deg - Service	36.93	-3.15	- 5.46	-710.15	410.33	0.00

Solution Summary

	Sur	n of Applied Force	25		Sum of Reactio	ns	
Load	PX	PY	PZ	PX	PY	PZ	% Error
Comb.	Ŕ	ĸ	ĸ	Ŕ	ĸ	ĸ	70 2.707
1	0.00	-36.93	0.00	0.00	36.93	0.00	0.000%
2	0.00	- 44.32	-29.04	0.00	44.32	29.04	0.000%
3	0.00	-33.24	-29.04	0.00	33.24	29.04	0.000%
4	14.52	- 44.32	-25.15	-14.52	44.32	25.15	0.000%
5	14.52	-33.24	-25.15	-14.52	33.24	25.15	0.000%
6	25.15	-44.32	-14.52	-25.15	44.32	14.52	0.000%
7	25.15	-33.24	-14.52	-25.15	33.24	14.52	0.000%
8	29.04	-44.32	0.00	-29.04	44.32	0.00	0.000%
9	29.04	-33.24	0.00	-29.04	33,24	0.00	0.000%
10	25.15	- 44.32	14.52	-25.15	44.32	-14.52	0.000%
11	25.15	-33.24	14.52	-25.15	33.24	-14.52	0.000%
12	14.52	-44.32	25.15	-14.52	44.32	-25.15	0.000%
13	14.52	-33.24	25.15	-14.52	33.24	-25.15	0.000%
14	0.00	-44.32	29.04	0.00	44.32	-29.04	0.000%
15	0.00	-33.24	29.04	0.00	33,24	-29.04	0.000%
16	-14.52	-44.32	25.15	14.52	44.32	-25.15	0.000%
17	-14.52 -14.52	-33.24	25.15	14.52	33.24	-25.15 -25.15	0.000%
18	-25.15	-44.32	14.52	25.15	44.32	-14.52	0.000%
19	-25.15 -25.15	-33.24	14.52	25.15	33.24	-14.52 -14.52	0.000%
20	-29.04	-44.32	0.00	29.04	44.32	0.00	0.000%
21	-29.04	-33.24	0.00	29.04	33.24	0.00	0.000%
22	-25.15	-44.32	-14.52	25.15	44.32	14,52	0.000%
23	-25.15 -25.15	-33.24	-14.52 -14.52	25.15	33.24	14.52	0.000%
24	-14.52	-44,32	-25.15	14.52	44.32	25.15	0.000%
25	-14.52 -14.52	-33.24	-25.15 -25.15	14.52	33.24	25.15	0.000%
26	0.00	-68.90	0.00	0.00	68.90	-0.00	0.000%
27	0.00	-68.90	-7.71	0.00	68.90	7.71	0.000%
28	3.86	-68.90	-6.68	-3.86	68.90	6.68	0.000%
29	6.68	-68.90	-3.86	-6.68	68.90	3.86	0.000%
30	7,71	-68.90	0.00	-7.71	68.90	-0.00	0.000%
31	6.68	-68.90	3.86	-6.68	68.90	-3.86	0.000%
32	3.86	-68.90	6.68	-3.86	68.90	-6.68	0.000%
33	0.00	-68.90	7.71	0.00	68.90	-7.71	0.000%
34	-3.86	-68.90	6.68	3.86	68.90	-6.68	0.000%
35	-6.68	-68.90	3.86	6.68	68.90	-3.86	0.000%
36	-7.71	-68.90	0.00	7.71	68.90	-0.00	0.000%
36 37	-6.68	-68.90	3.86	6.68	68.90	3.86	0.000%
38	-3.86	-68.90	-6.68	3.86	68.90	6.68	0.000%
39	0.00	-36.93	-6.30	0.00	36.93	6.30	0.000%
40	3.15	-36.93	-5.46	-3.15	36.93	5.46	0.000%
40 41	5.15 5.46	-36.93	-3.45 -3.15	-3.15 -5.46	36.93	3.46 3.15	0.000%
42	5.46 6.30	-36.93	-3.15 0.00	-5.46 -6.30	36.93	0.00	0.000%
42 43	5.46	-36.93	3.15	-5.46	36.93	-3.15	0.000%
43 44	3.15	-36.93	5.46	-3.45 -3.15	36.93	-5.15 -5.46	0.000%
44 45	0.00	-36.93	6.30	0.00	36.93	-5.46 -6.30	0.000%
45 46	-3.15	-36.93	5.46	3.15	36.93	-5.46	0.000%
46 47	-5.15 -5.46	-36.93	3.15	5.46	36.93	-3.15	0.000%
47 48	-6.30	-36.93	0.00	6.30	36.93	0.00	0.000%
46 49	-5.46	-36.93	3.15	5.46	36.93	3.15	0.000%
49 50	-3.46 -3.15	-36.93	-5.15 -5.46	3.46	36.93	5.15 5.46	0.000%
	- 3.13	-30,93	-5.40	J. 10	30,83	J.40	0.00076

Non-Linear Convergence Results

Load	Converged?	Number	Displacement	Force
Combination		of Cycles	Tolerance	Tolerance
1	Yes	4	0.0000001	0.00000001
2	Yes	5	0.0000001	0.00004619
3	Yes	5	0.0000001	0.00001442
4	Yes	7	0.0000001	0.00013638
5	Yes	6	0.0000001	0.00050615
6	Yes	7	0.0000001	0.00013639
7	Yes	6	0.0000001	0.00050620
8	Yes	5	0.0000001	0.00004831

9	Yes	5	0.00000001	0.00001508
10	Yes	7	0.00000001	0.00013641
11	Yes	6	0.0000001	0.00050622
12	Yes	7	0.0000001	0.00013642
13	Yes	6	0.0000001	0.00050626
14	Yes	5	0.0000001	0.00004619
15	Yes	5	0.0000001	0.00001442
16	Yes	7	0.0000001	0.00013642
17	Yes	6	0.00000001	0.00050626
18	Yes	7	0.00000001	0.00013641
19	Yes	6	0.00000001	0.00050622
20	Yes	5	0.0000001	0.00004831
21	Yes	5	0.00000001	0.00001508
22	Yes	7	0.0000001	0.00013639
23	Yes	6	0.0000001	0.00050620
24	Yes	7	0.00000001	0.00013638
25	Yes	6	0.0000001	0.00050615
26	Yes	4	0.00000001	0.00004240
27	Yes	6	0.00004071	0.00051930
28	Yes	7	0.0000001	0.00028228
29	Yes	7	0.0000001	0.00028184
30	Yes	6	0.00004070	0.00052107
31	Yes	7	0.0000001	0.00028564
32	Yes	7	0.0000001	0.00028519
33	Yes	6	0.00004070	0.00052263
34	Yes	7	0.0000001	0.00028519
35	Yes	7	0.0000001	0.00028564
36	Yes	6	0.00004070	0.00052107
37	Yes	7	0.0000001	0.00028184
38	Yes	7	0.0000001	0.00028228
39	Yes	4	0.0000001	0.00040944
40	Yes	5	0.0000001	0.00040242
41	Yes	5	0.0000001	0.00040229
42	Yes	4	0.0000001	0.00041015
43	Yes	5	0.0000001	0.00040384
44	Yes	5	0.0000001	0.00040370
45	Yes	4	0.0000001	0.00041064
46	Yes	5	0.0000001	0.00040370
47	Yes	5	0.0000001	0.00040384
48	Yes	4	0.0000001	0.00041015
49	Yes	5	0.0000001	0.00040229
50	Yes	5	0.0000001	0.00040242

Maximum Tower Deflections - Service Wind

Section	Elevation	Horz.	Gov.	Tilt	Twist
No.		Deflection	Load		
	ft	in	Comb.	۰	0
L1	190 - 163.221	44.902	45	2.2995	0.0000
L2	166.779 - 126.831	34.019	45	2.1222	0.0000
L3	131.169 - 86.3984	20.014	45	1.5804	0.0000
L4	91.599 - 42.9401	9,219	45	0.9976	0.0000
L5	49.0547 - 0	2.548	45	0.4795	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov.	Deflection	Tilt	Twist	Radius of
		Load				Curvature
ft		Comb.	in	0	۰	ft
192.00	APXVSPP18-C-A20 w/ Mount	45	44.902	2.2995	0.0000	19930
	Pipe					
180.00	Platform Mount [LP 401-1]	45	40.127	2.2364	0.0000	9965

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load	Tilt	Twist
IVO.	ft	in	Comb.	0	•

L1	190 - 163.221	208.059	14	10.6818	0.0000
L2	166.779 - 126.831	157.764	14	9.8613	0.0000
L3	131.169 - 86.3984	92.918	14	7.3472	0.0000
L4	91.599 - 42.9401	42.823	14	4.6380	0.0000
L5	49,0547 - 0	11,835	14	2,2283	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	۰	۰	ft
192.00	APXVSPP18-C-A20 w/ Mount Pipe	14	208.059	10.6818	0.0000	4580
180.00	Platform Mount [LP 401-1]	14	185.997	10.3898	0.0000	2288

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	Lu	KI/r	Α	P_u	ϕP_n	Ratio P _u
	ft		ft	ft		in²	K	K	ΦP_n
L1	190 - 163.221 (1)	TP24.4525x19.5x0.1875	26.78	0.00	0.0	14.0492	- 7.12	821.88	0.009
L2	163.221 - 126.831 (2)	TP30.7144x23.4196x0.25	39.95	0.00	0.0	23.5449	-11.12	1377.37	0.008
L3	126.831 - 86.3984 (3)	TP37.6019x29.4221x0.3125	44.77	0.00	0.0	36.0440	-17.89	2108.57	0.008
L4	86.3984 - 42.9401 (4)	TP44.9268x36.0268x0.375	48.66	0.00	0.0	51.6966	-28.23	3024.25	0.009
L5	42.9401 - 0 (5)	TP52x43.0584x0.4375	49.05	0.00	0.0	71,6010	- 44.29	4188.66	0.011

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	ф М _{пх}	Ratio M _{ux}	M _{uy}	ф <i>М_{пу}</i>	Ratio M _{uy}
	ft		kip-ft	kip-ft	ϕM_{nx}	kip-ft	kip-ft	ϕM_{ny}
L1	190 - 163.221 (1)	TP24.4525x19.5x0.1875	236.26	467.47	0.505	0.00	467.47	0.000
L2	163.221 - 126.831 (2)	TP30.7144x23.4196x0.25	770.06	1003.53	0.767	0.00	1003.53	0.000
L3	126.831 - 86.3984 (3)	TP37.6019x29.4221x0.31 25	1507.42	1893.18	0.796	0.00	1893.18	0.000
L4	86.3984 - 42.9401 (4)	TP44.9268x36.0268x0.37 5	2479.05	3249.27	0.763	0.00	3249.27	0.000
L5	42.9401 - 0 (5)	TP52x43.0584x0.4375	3812.01	5314.63	0.717	0.00	5314.63	0.000

Pole Shear	Design [Data

Section No.	Elevation	Size	Actual V _u	ϕV_n	Ratio V _u	Actual T _u	ϕT_n	Ratio T _u
	ft		K	K	$\frac{1}{\phi V_n}$	kip-ft	kip-ft	$\frac{u}{\phi T_n}$
L1	190 - 163.221 (1)	TP24.4525x19.5x0.1875	13.36	246.56	0.054	0.00	509.74	0.000
L2	163.221 - 126.831 (2)	TP30.7144x23.4196x0.25	16.63	413.21	0.040	0.00	1073.75	0.000
L3	126.831 - 86.3984 (3)	TP37.6019x29.4221x0.31 25	20.61	632.57	0.033	0.00	2013.10	0.000
L4	86.3984`-´ 42.9401 (4)	TP44.9268x36.0268x0.37 5	24.95	907.27	0.028	0.00	3450.98	0.000
L5	42.9401 - Ó (5)	TP52x43.0584x0.4375	29.08	1256.60	0.023	0.00	5674.27	0.000

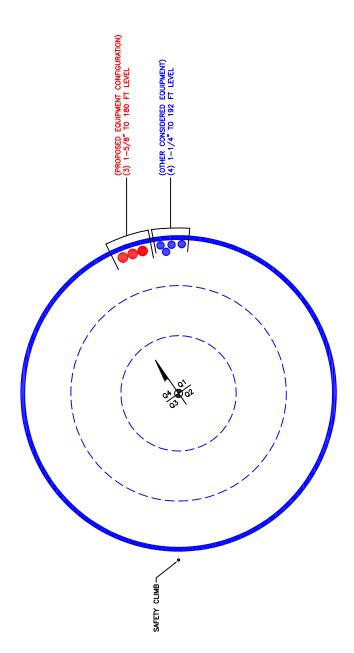
Pole Interaction Design Data

Section No.	Elevation	Ratio P _u	Ratio M _{ux}	Ratio M _{uy}	Ratio V _u	Ratio T _u	Comb. Stress	Allow. Stress	Criteria	
	ft	ϕP_n	φ <i>M</i> _{nx}	ϕM_{ny}	ϕV_n	ϕT_n	Ratio	Ratio		
L1	190 - 163,221 (1)	0.009	0.505	0.000	0.054	0.000	0.517	1.050	4.8.2	
L2	163.221 - 126.831 (2)	0.008	0.767	0.000	0.040	0.000	0.777	1.050	4.8.2	
L3	126.831 - 86.3984 (3)	0.008	0.796	0.000	0.033	0.000	0.806	1.050	4.8.2	
L4	86.3984 - 42.9401 (4)	0.009	0.763	0.000	0.028	0.000	0.773	1.050	4.8.2	
L5	42.9401 - Ó (5)	0.011	0.717	0.000	0.023	0.000	0.728	1.050	4.8.2	

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP _{allow} K	% Capacity	Pass Fail
L1	190 - 163,221	Pole	TP24.4525x19.5x0.1875	1	-7.12	862.97	49.2	Pass
L2	163.221 - 126.831	Pole	TP30.7144x23.4196x0.25	2	-11.12	1446.24	74.0	Pass
L3	126.831 - 86.3984	Pole	TP37.6019x29.4221x0.3125	3	-17.89	2214.00	76.7	Pass
L4	86.3984 - 42.9401	Pole	TP44.9268x36.0268x0.375	4	-28.23	3175.46	73.6	Pass
L5	42.9401 - 0	Pole	TP52x43.0584x0.4375	5	- 44.29	4398.09	69.4 Summary	Pass
						Pole (L3) RATING =	76.7 76.7	Pass Pass

APPENDIX B BASE LEVEL DRAWING



BUSINESS UNIT: 876378 TOWER ID: C_BASELEVEL

APPENDIX C ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

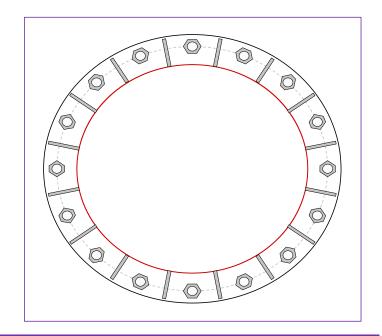


Site Info	
BU#	876378
Site Name	Bethany / David Kludge
Order#	544402 Rev. 0

Analysis Considerations	
TIA-222 Revision	Н
Grout Considered:	No
I _{ar} (in)	0.375

Applied Loads					
Moment (kip-ft)	3812.01				
Axial Force (kips)	44.29				
Shear Force (kips)	29.08				

^{*}TIA-222-H Section 15.5 Applied



_					- 1	10									10		
	o	n	n	е	CI	ш	О	n	ıP	и	o	n	е	п	ш	е	S

Anchor Rod Data	
(16) 2-1/4" a holts (A615-75 N: Ev-75 ksi Eu-100 ksi) on 61" BC	

Base Plate Data

67" OD x 2" Plate (A871-GR60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(16) 21"H x 7"W x 0.75"T, Notch: 0.75" plate: Fy= 50 ksi ; weld: Fy= 80 ksi

horiz. weld: 0.375" groove, 45° dbl bevel, 0.25" fillet vert. weld: 0.25" fillet $^{\circ}$

Pole Data

52" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		(units of kips, kip-in)
Pu_c = 190.14	φPn_c = 268.39	Stress Rating
Vu = 1.82	φVn = 120.77	67.5%
Mu = n/a	φMn = n/a	Pass
Base Plate Summary		
Max Stress (ksi):	31.7	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	55.9%	Pass
Stiffener Summary		
Horizontal Weld:	54.1%	Pass
Vertical Weld:	47.1%	Pass
Plate Flexure+Shear:	14.2%	Pass
Plate Tension+Shear:	55.5%	Pass
Plate Compression:	57.5%	Pass
Pole Summary		
Punching Shear:	8.3%	Pass

CCIplate - Version 4.0.1 Analysis Date: 3/14/2021

Pier and Pad Foundation

BU #: 876378
Site Name: Bethany / David Klu
App. Number: 544402 Rev. 0



TIA-222 Revision: H
Tower Type: Monopole

Top & Bot. Pad Rein. Different?:	7
Block Foundation?:	
Rectangular Pad?:	

Superstructure Analysis Reactions					
Compression, P _{comp} :	44.32	kips			
Base Shear, Vu_comp:	29.04	kips			
Moment, $\mathbf{M}_{\mathbf{u}}$:	3812.01	ft-kips			
Tower Height, H:	190	ft			
BP Dist. Above Fdn, bp _{dist} :	2.625	in			

	ſ	Lateral (Sliding) (kips)	134.21	29.04	20.6%	Pass
		Bearing Pressure (ksf)	11.25	3.09	27.5%	Pass
		Overturning (kip*ft)	5080.19	3992.60	78.6%	Pass
		Pier Flexure (Comp.) (kip*ft)	5881.83	3913.65	63.4%	Pass
	ſ					
		Pier Compression (kip)	24494.62	68.57	0.3%	Pass
		Pad Flexure (kip*ft)	3491.24	1937.59	52.9%	Pass
	ſ	Pad Shear - 1-way (kips)	711.23	301.93	40.4%	Pass
		Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	0.0%	Pass
	ſ	Flexural 2-way (Comp) (kip*ft)	3352.71	2348.19	66.7%	Pass
					-	
_						

Foundation Analysis Checks

Demand

Capacity

Pier Properties					
Pier Shape:	Circular				
Pier Diameter, dpier :	7	ft			
Ext. Above Grade, E :	1	ft			
Pier Rebar Size, Sc :	8				
Pier Rebar Quantity, mc :	46				
Pier Tie/Spiral Size, St :	4				
Pier Tie/Spiral Quantity, mt :	4				
Pier Reinforcement Type:	Tie				
Pier Clear Cover, cc_{pier}:	3	in			

*Rating per TIA-222-H Section 15.5

Soil Rating*:	78.6%
Structural Rating*:	66.7%

Rating*

Check

Pad Properties			
Depth, D:	5	ft	
Pad Width, W ₁:	24.5	ft	
Pad Thickness, T :	2.5	ft	
Pad Rebar Size (Top dir.2), Sp _{top2} :	8		
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	25		
Pad Rebar Size (Bottom dir. 2), Sp ₂ :	8		
Pad Rebar Quantity (Bottom dir. 2), mp ₂ :	40		
Pad Clear Cover, cc_{pad} :	3	in	

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

Soil Properties				
Total Soil Unit Weight, γ :	130	pcf		
Ultimate Gross Bearing, Qult:	15.000	ksf		
Cohesion, Cu :	0.000	ksf		
Friction Angle, $oldsymbol{arphi}$:	39	degrees		
SPT Blow Count, N _{blows} :	46			
Base Friction, μ :	0.3			
Neglected Depth, N:	4.17	ft		
Foundation Bearing on Rock?	No			
Groundwater Depth, gw :	N/A	ft		

<--Toggle between Gross and Net



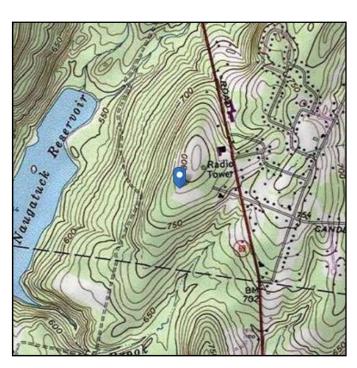
Address:

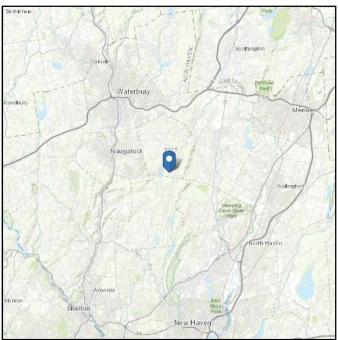
No Address at This Location

ASCE 7 Hazards Report

Standard: ASCE/SEI 7-10 Elevation: 791.71 ft (NAVD 88)

Risk Category: || Latitude: 41.471236 Soil Class: D - Stiff Soil Longitude: -72.971914





Wind

Results:

Wind Speed: Per City Exceptions [Appendix N], Vult = 125 mph

 10-year MRI
 76 Vmph

 25-year MRI
 86 Vmph

 50-year MRI
 92 Vmph

 100-year MRI
 99 Vmph

Date Socessed: S60€ 1472002,1Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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).

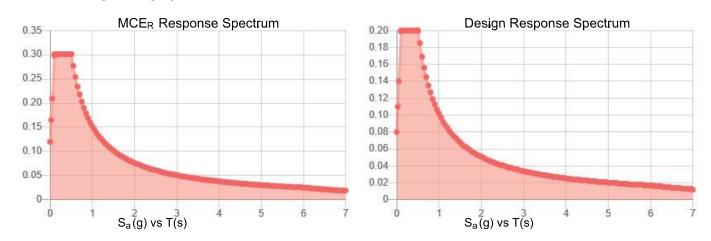
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.



Seismic

Site Soil Class: Results:	D - Stiff Soil			
S _s :	0.188	S _{DS} :	0.2	
S_1 :	0.063	S _{D1} :	0.102	
Fa:	1.6	T_L :	6	
F _v :	2.4	PGA:	0.098	
S _{MS} :	0.301	PGA _M :	0.156	
S _{M1} :	0.152	F _{PGA} :	1.6	
		la :	1	

Seismic Design Category B



Data Accessed: Sun Mar 14 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating

Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with

ASCE/SEI 7-10 Ch. 21 are available from USGS.



Ice

Results:

Ice Thickness: 0.75 in. Design Ice Thickness = 0.75 in. * 2 = 1.5 in

Concurrent Temperature: 15 F Gust Speed: 50 mph

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

Date Accessed: Sun Mar 14 2021

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

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

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Exhibit E

Mount Analysis

Date: February 28, 2021

Darcy Tarr Crown Castle 3530 Toringdon Way, Suite 300 Charlotte, NC 28277 (704) 405-6589 INFINIGY8

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: CT11122B

Carrier Site Name: --

Crown Castle Designation: Crown Castle BU Number: 876378

Crown Castle Site Name: N. BETHANY / DAIVD KLUDGE

Crown Castle JDE Job Number: 634981 Crown Castle Order Number: 544402 Rev.0

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

Site Data: 15 Kludge Road, Prospect, New Haven County, CT, 06712

Latitude 41°28'16.45" Longitude -72°58'18.89"

Structure Information: Tower Height & Type: 189.7 ft Monopole

Mount Elevation: 180.0 ft

Mount Type: 12.5 ft Platform

Dear Darcy Tarr,

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 125 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: Alex Mercado, E.I.T.

Respectfully Submitted by: Emmanuel Poulin, P.E. 518-690-0790 <u>structural@infinigy.com</u> CT PE License No. 22947 COMPANY 22947
CENSE
3/1/21

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1) INTRODUCTION

This is an existing 3 sector 12.5 ft Platform, mapped by Infinigy Engineering.

2) ANALYSIS CRITERIA

Building Code: 2015 IBC / 2018 Connecticut State Building Code

TIA-222 Revision: TIA-222-H

Risk Category:

Ultimate Wind Speed: 125 mph

Exposure Category: С **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: 0.188 Seismic S₁: 0.064 **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
		3	ERICSSON	AIR64449 B41_T-MOBILE	
		3	RFS/CELWAVE	APX16DWV-16DWV-S-E-A20	40 F ft Dlatform /
180.0	180.0	3	RFS/CELWAVE	APXVAALL24_43-U- NA20_TMO	12.5 ft Platform / Installation of (1) 2.0 STD 8' long
100.0	100.0	3	ERICSSON	RADIO 4415 B66A	mount pipe per
		3	ERICSSON	RADIO 4424 B25_TMOV1	sector
		3	ERICSSON	RADIO 4449 B71 B85A_ T-MOBILE	360101

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	544402 Rev.0	CCI Sites
Mount Mapping Report	Infinigy Engineering	8506917	CCI Sites
Loading Documets	T-Mobile	RFDS Version 3	TSA

3.1) Analysis Method

RISA-3D (Version 17.0.4), 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.
- 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

HSS (Rectangular)

Pipe

ASTM A36 (GR 36)

ASTM A500 (GR B-46)

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
	Mount Pipe(s)	MP2		81.2	Pass
	Horizontal(s)	HOR2		23.4	Pass
	Standoff(s)	SA2		42.4	Pass
1,2,3	Braicng Plate(s)	M5	180.0	64.1	Pass
	Handrail(s)	HR2		22.5	Pass
	Connection Plate(s)	M68		39.0	Pass
	Mount Connection(s)			92.0	Pass

Structure Rating (max from all components) =	92.0%
--	-------

Notes:

- See additional documentation in "Appendix C Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D Additional Calculations" for detailed mount connection calculations.
- 3) All sectors are typical

4.1) Recommendations

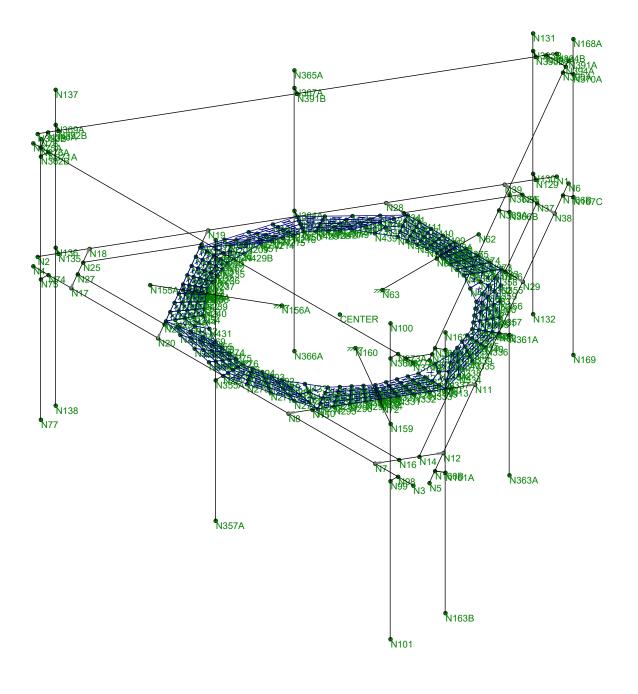
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Installation of (1) Site Pro 1 HRK 12 Handrail Kit.

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

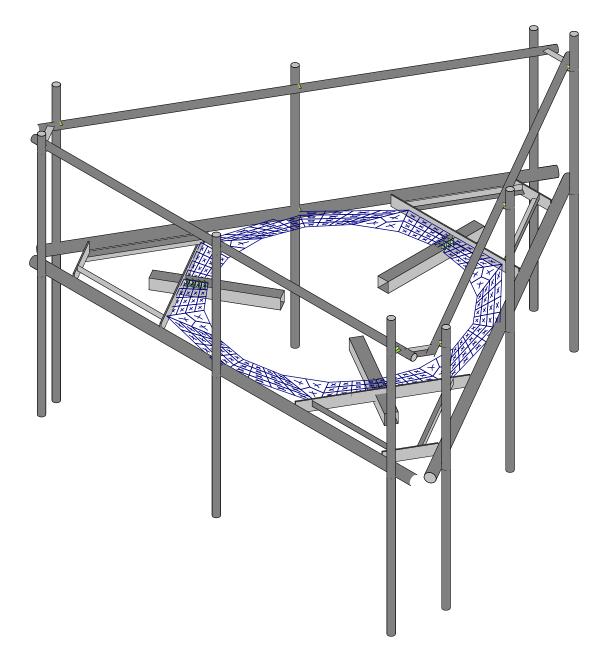
APPENDIX A WIRE FRAME AND RENDERED MODELS





Infinigy Engineering, PLLC		Wireframe
MP	876378	Feb 28, 2021 at 9:14 PM
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Infinigy Engineering, PLLC		Rendered	ı
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APPENDIX B SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION			
Client:	Crown Castle		
Carrier:	T-Mobile		
Engineer:	Alex Mercado		

SITE INFORMATION			
Risk Category:	II		
Exposure Category:	С		
Topo Factor Procedure:	e: Method 1, Category 2		
Site Class:	s: tiff Soil (Assumed)		
Ground Elevation:	791.71	ft *Rev H	

MOUNT INFORMATION							
Mount Type:	ınt Type: Platform						
Num Sectors:	3						
Centerline AGL:	180.00	ft					
Tower Height AGL:	189.70	ft					

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

FACTORS								
Directionality Fact. (K _d):	0.950							
Ground Ele. Factor (K _e):	0.972	*Rev H Only						
Rooftop Speed-Up (K _s):	1.000	*Rev H Only						
Topographic Factor (K _{zt}):	1.000							
Gust Effect Factor (G _h):	1.000							

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

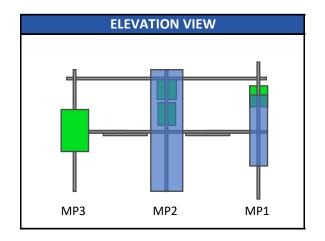
WIND AND ICE DATA								
Ultimate Wind (V _{ult}):	125	mph						
Design Wind (V):	N/A	mph						
Ice Wind (V _{ice}):	50	mph						
Base Ice Thickness (t _i):	1.5	in						
Flat Pressure:	105.782	psf						
Round Pressure:	63.469	psf						
Ice Wind Pressure:	10.155	psf						

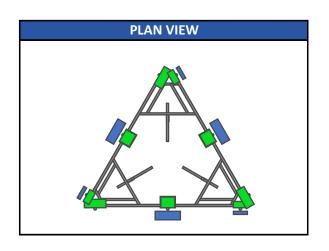
SEISMIC		
Short-Period Accel. (S _s):	0.188	g
1-Second Accel. (S ₁):	0.064	g
Short-Period Design (S _{DS}):	0.201	
1-Second Design (S _{D1}):	0.102	·
Short-Period Coeff. (F _a):	1.600	
1-Second Coeff. (F _v):	2.400	
Amplification Factor (a _p):	1.000	
Response Mod. (R _p):	2.500	
Overstrength (Ω_{o}):	1.000	



Infinigy Load Calculator V2.1.4

Program Inputs







Infinigy Load Calculator V2.1.4

APPURTENANCE INFORMATION											
Appurtenance Name	Elevation	Qty.	K _a	q _z (psf)	EPA _N (ft ²)	EPA _T (ft ²)	Wind F _z (lbs)	Wind F _x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
S/CELWAVE APX16DWV-16DWV-S-E-A	180.0	3	0.90	52.89	6.29	2.76	299.42	131.38	40.70	12.24	MP1
CELWAVE APXVAALL24_43-U-NA20_TI	180.0	3	0.90	52.89	14.67	5.32	698.32	253.24	149.90	45.09	MP2
ERICSSON AIR6449 B41_T-MOBILE	180.0	3	0.90	52.89	5.66	2.48	269.38	117.89	114.63	34.48	MP3
ERICSSON RADIO 4415 B66A	180.0	3	0.90	52.89	1.86	0.87	88.36	41.42	49.60	14.92	MP1
ERICSSON RADIO 4424 B25_TMOV1	180.0	3	0.90	52.89	2.05	1.61	97.68	76.65	97.00	29.18	MP2
ICSSON RADIO 4449 B71 B85A_T-MOBI	180.0	3	0.90	52.89	1.97	1.59	93.78	75.52	73.21	22.02	MP2



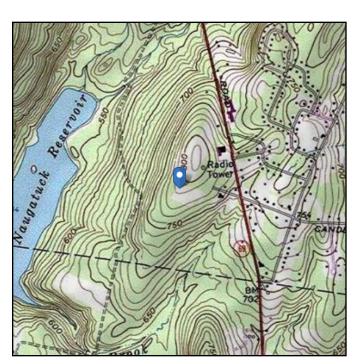
Address:

No Address at This Location

ASCE 7 Hazards Report

Standard: ASCE/SEI 7-10 Elevation: 791.71 ft (NAVD 88)

Risk Category: || Latitude: 41.47124 Soil Class: D - Stiff Soil Longitude: -72.97191





Wind

Results:

Wind Speed: 125 Vmph per the City of Prospect requirements

10-year MRI 76 Vmph 25-year MRI 86 Vmph 50-year MRI 92 Vmph 100-year MRI 99 Vmph

Date Sociessed: **\$60**CE68E2872002,1Fig. 26.5-1A and Figs. CC-1—CC-4, and Section 26.5.2,

incorporating errata of March 12, 2014

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).

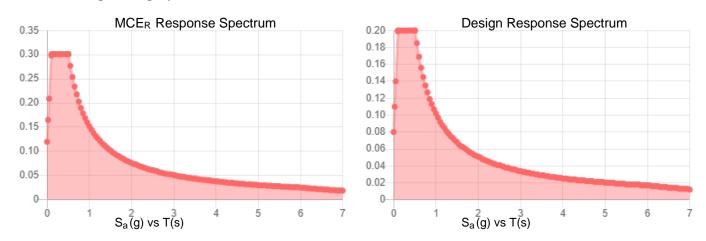
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.



Seismic

Site Soil Class: Results:	D - Stiff Soil			
S _s :	0.188	S _{DS} :	0.2	
S_1 :	0.063	S_{D1} :	0.102	
F_a :	1.6	T _L :	6	
F _v :	2.4	PGA:	0.098	
S _{MS} :	0.301	PGA _M :	0.156	
S _{M1} :	0.152	F _{PGA} :	1.6	
		1. •	1	

Seismic Design Category B



Data Accessed: Sun Feb 28 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating

Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with

Sun Feb 28 2021

ASCE/SEI 7-10 Ch. 21 are available from USGS.



Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Sun Feb 28 2021

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

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

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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APPENDIX C SOFTWARE ANALYSIS OUTPUT



: Infinigy Engineering, PLLC: MP: 1039-Z0001-B

: 876378

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Member Primary Data

IVICIII	Dei Filliai	y Data								
	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	HOR2	N1	N2		J 37	Horizontals	Beam	Pipe	A53 Gr.B	Typical
2	HOR1	N3	N4			Horizontals	Beam	Pipe	A53 Gr.B	Typical
3	HOR3	N5	N6			Horizontals	Beam	Pipe	A53 Gr.B	Typical
4	M4	N7	N12			Bracing Plate		RECT	A36 Gr.36	Typical
5	M5	N11	N8			Bracing Plate	Beam	RECT	A36 Gr.36	Typical
6	M9	N13	N14			Angles	Beam	Single Angle	A36 Gr.36	Typical
7	M10	N15	N16		270	Angles	Beam	Single Angle	A36 Gr.36	Typical
8	M11	N17	N18			Bracing Plate		RECT	A36 Gr.36	Typical
9	M12	N19	N20			Bracing Plate		RECT	A36 Gr.36	Typical
10	M15	N24	N25		270	Angles	Beam	Single Angle		Typical
11	M16	N26	N27			Angles	Beam	Single Angle		Typical
12	M17	N28	N29			Bracing Plate		RECT	A36 Gr.36	Typical
13	M20	N34	N35			Angles	Beam	Single Angle		Typical
14	M21	N36	N37		270	Angles	Beam	Single Angle		Typical
15	M22	N38	N39			Bracing Plate		RECT	A36 Gr.36	Typical
16	SA2	N62	N63			Standoffs	Beam		A500 Gr.B	Typical
17	M19	N64	N71			RIGID	None	None	RIGID	Typical
18	M20A	N53	N69			RIGID	None	None	RIGID	Typical
19	M21A	N47	N68			RIGID	None	None	RIGID	Typical
20	M22A	N94	N73			RIGID	None	None	RIGID	Typical
21	M23A	N59	N70			RIGID	None	None	RIGID	Typical
22	M24	N79	N72			RIGID	None	None	RIGID	Typical
23	M25	N75	N74			RIGID	None	None	RIGID	Typical
24	MP3	N76	N77			Pipe Mounts		Pipe	A53 Gr.B	Typical
25	M37 MP1	N99 N100	N98 N101			RIGID Pipe Mounts	None	None	RIGID A53 Gr.B	Typical
26 27	SA1	N155A	N156A			Standoffs		Pipe Tube	A500 Gr.B	Typical
28	SA3	N159	N160			Standoffs	Beam Beam		A500 Gr.B	Typical Typical
29	M55	N139	N129			RIGID	None	None	RIGID	Typical
30	MP6	N131	N132			Pipe Mounts		Pipe	A53 Gr.B	Typical
31	M58	N136	N135			RIGID	None	None	RIGID	Typical
32	MP4	N137	N138			Pipe Mounts		Pipe	A53 Gr.B	Typical
33	M70B	N161A	N160B			RIGID	None	None	RIGID	Typical
34	MP9	N162C	N163B			Pipe Mounts		Pipe	A53 Gr.B	Typical
35	M73B	N167C	N166B			RIGID	None	None	RIGID	Typical
36	MP7	N168A	N169			Pipe Mounts		Pipe	A53 Gr.B	Typical
37	M77	N224	N421A			RIGID	None	None	RIGID	Typical
38	M78B	N229	N423A			RIGID	None	None	RIGID	Typical
39	M79A	N234	N424A			RIGID	None	None	RIGID	Typical
40	M80	N380	N427A			RIGID	None	None	RIGID	Typical
41	M81A	N385	N428A			RIGID	None	None	RIGID	Typical
42	M82A	N390	N429A			RIGID	None	None	RIGID	Typical
43	M83	N302	N434			RIGID	None	None	RIGID	Typical
44	M84A	N307	N435			RIGID	None	None	RIGID	Typical
45	M85	N312	N436			RIGID	None	None	RIGID	Typical
46	M46	N355A	N22			RIGID	None	None	RIGID	Typical
47	MP2	N356A	N357A			Pipe Mounts		Pipe	A53 Gr.B	Typical
48	M48	N161A	N160B			RIGID	None	None	RIGID	Typical
49	M49	N361A	N32			RIGID	None	None	RIGID	Typical
50	MP8	N362A	N363A			Pipe Mounts		Pipe	A53 Gr.B	
51	<u>M51</u>	N130	N129			RIGID	None	None	RIGID	Typical
52	M52	N364A	N30			RIGID	None	None	RIGID	Typical
53	MP5	N365A	N366A			Pipe Mounts		Pipe	A53 Gr.B	Typical
54	HR1	N375A	N374A			Handrail	Beam	Pipe	A53 Gr.B	Typical
<u>55</u>	M55A	N371A	N362B			RIGID	None	None	RIGID	Typical
56	M56	N372A	N365B			RIGID	None	None	RIGID	Typical



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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
57	M57	N373A	N368A		, 0,	RIGID	None	None	RIGID	Typical
58	HR3	N392A	N391A			Handrail	Beam	Pipe	A53 Gr.B	Typical
59	M59	N388A	N364B			RIGID	None	None	RIGID	Typical
60	M60	N389A	N366B			RIGID	None	None	RIGID	Typical
61	M61	N390A	N370A			RIGID	None	None	RIGID	Typical
62	HR2	N394B	N393B			Handrail	Beam	Pipe	A53 Gr.B	Typical
63	M63	N390B	N363B			RIGID	None	None	RIGID	Typical
64	M64	N391B	N367A			RIGID	None	None	RIGID	Typical
65	M65	N392B	N369A			RIGID	None	None	RIGID	Typical
66	M66	N376A	N396A		90	Connection Pl	Beam	Single Angle	A36 Gr.36	Typical
67	M67	N395A	N394A		90	Connection Pl	Beam	Single Angle	A36 Gr.36	Typical
68	M68	N393A	N377A		90	Connection Pl	Beam	Single Angle	A36 Gr.36	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		35	90	0
3	Total General		35	90	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L2x2x3	3	23	4.719
7	A36 Gr.36	L2x2x4	6	205.5	55.007
8	A36 Gr.36	PL4X3/8	6	199.9	85.036
9	A500 Gr.B Rect	HSS4X4X4	3	114	117.166
10	A53 Gr.B	PIPE 2.0	12	1350	390.469
11	A53 Gr.B	PIPE 3.0	3	450	264.141
12	Total HR Steel		33	2342.5	916.537
13					
14	Plate Elements	Thickness (in)		Volume (yds^3)	
15	gen Steel	.3	210	0	151.364
16	Total Plates		210	0	151.364

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut	Area(Me	Surface(Plate/Wall)
1	Self Weight	DĹ	-	-1			24		3	·
2	Wind Load AZI 0	WLZ					48			
3	Wind Load AZI 30	None					48			
4	Wind Load AZI 60	None					48			
5	Wind Load AZI 90	WLX					48			
6	Wind Load AZI 120	None					48			
7	Wind Load AZI 150	None					48			
8	Wind Load AZI 180	None					48			
9	Wind Load AZI 210	None					48			
10	Wind Load AZI 240	None					48			
11	Wind Load AZI 270	None					48			
12	Wind Load AZI 300	None					48			
13	Wind Load AZI 330	None					48			
14	Distr. Wind Load Z	WLZ						68		
15	Distr. Wind Load X	WLX						68		
16	Ice Weight	OL1					24	68	3	210
17	Ice Wind Load AZI	OL2					48			
18	Ice Wind Load AZI	None					48			
19	Ice Wind Load AZI	None					48			
20	Ice Wind Load AZI	OL3					48			



: Infinigy Engineering, PLLC: MP: 1039-Z0001-B

: 876378

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Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut	Area(Me	Surface(Plate/Wall)
21	Ice Wind Load AZI	None					48		,	,
22	Ice Wind Load AZI	None					48			
23	Ice Wind Load AZI	None					48			
24	Ice Wind Load AZI	None					48			
25	Ice Wind Load AZI	None					48			
26	Ice Wind Load AZI	None					48			
27	Ice Wind Load AZI	None					48			
28	Ice Wind Load AZI	None					48			
29	Distr. Ice Wind Loa	OL2						68		
30	Distr. Ice Wind Loa	OL3						68		
31	Seismic Load Z	ELZ			301		24			
32	Seismic Load X	ELX	301				24			
33	Service Live Loads	LL				1				
34	Maintenance Load 1	LL				2				
35	Maintenance Load 2	LL				2				
36	Maintenance Load 3	LL				2				
37	Maintenance Load 4	LL				2				
38	Maintenance Load 5	LL				2				
39	Maintenance Load 6	LL				2				
40	Maintenance Load 7	LL				2				
41	Maintenance Load 8	LL				2				
42	Maintenance Load 9	LL				2				
43	BLC 1 Transient Ar	None				<u> </u>		36		
44	BLC 16 Transient	None						36		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa	.B	Fa	.B	Fa	В	Fa	.B	Fa								
1	1.4DL	Yes	Υ		1	1.4																		
2	1.2DL + 1WL AZI 0	Yes	Υ		1	1.2	2	1	14	1	15													
3	1.2DL + 1WL AZI 30	Yes	Υ		1	1.2	3	1	14	.866	15	.5												
4	1.2DL + 1WL AZI 60	Yes	Υ		1	1.2	4	1	14	.5	15	.866												
5	1.2DL + 1WL AZI 90	Yes	Υ		1	1.2	5	1	14		15	1												
6	1.2DL + 1WL AZI 120	Yes	Υ		1	1.2	6	1	14	5	15	.866												
7	1.2DL + 1WL AZI 150	Yes	Υ		1	1.2	7	1	14	8	15	.5												
8	1.2DL + 1WL AZI 180	Yes	Υ		1	1.2	8	1	14	-1	15													
9	1.2DL + 1WL AZI 210	Yes	Υ		1	1.2	9	1	14	8	15	5												
10	1.2DL + 1WL AZI 240	Yes	Υ		1	1.2	10	1	14	5	15	8												
11	1.2DL + 1WL AZI 270	Yes	Υ		1	1.2	11	1	14		15	-1												
12	1.2DL + 1WL AZI 300	Yes	Υ		1	1.2	12	1	14	.5	15	8												
13	1.2DL + 1WL AZI 330	Yes	Υ		1	1.2	13	1	14	.866	15	5												
14	0.9DL + 1WL AZI 0	Yes	Υ		1	.9	2	1	14	1	15													
15	0.9DL + 1WL AZI 30	Yes	Υ		1	.9	3	1	14	.866	15	.5												
16	0.9DL + 1WL AZI 60	Yes	Υ		1	.9	4	1	14	.5	15	.866												
17	0.9DL + 1WL AZI 90	Yes	Υ		1	9.	5	1	14		15	1												
18	0.9DL + 1WL AZI 120	Yes	Υ		1	.9	6	1	14	5	15	.866												
19	0.9DL + 1WL AZI 150	Yes	Υ		1	.9	7	1	14	8	15	.5												
20	0.9DL + 1WL AZI 180	Yes	Υ		1	.9	8	1	14	-1	15													
21	0.9DL + 1WL AZI 210	Yes	Υ		1	.9	9	1	14	8	15	5												
22	0.9DL + 1WL AZI 240	Yes	Υ		1	.9	10	1	14	5	15	8												
23	0.9DL + 1WL AZI 270	Yes	Υ		1	.9	11	1	14		15	-1												
24	0.9DL + 1WL AZI 300	Yes	Υ		1	.9	12	1	14	.5	15	8												
25	0.9DL + 1WL AZI 330	Yes	Υ		1	.9	13	1	14	.866														
26	1.2D + 1.0Di	Yes	Υ		1	1.2	16	1																
27	1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16	1	17	1	29	1	30											
28	1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16	1	18	1	29	.866	30	.5										



: Infinigy Engineering, PLLC: MP: 1039-Z0001-B

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Load Combinations (Continued)

Load Combinations (
Description		PDelta	SRSS											<u>В_.Fа.</u>	B	<u>Fa.</u>	. <u>.B</u>	Fa	В	Fa	<u>B</u>	<u>Fa</u>
29 1.2D + 1.0Di +1.0Wi A		Y		_1_	1.2	16		19				30									\square	
30 1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16		20		29		30	1									
31 1.2D + 1.0Di +1.0Wi A	Yes	Υ		_1_	1.2	16	1	21				30										
32 1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16	1	22	1	29	8	30	.5									
33 1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16	1	23	1	29	-1	30										
34 1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16		24				30	5									
35 1.2D + 1.0Di +1.0Wi A	Yes	Υ		1	1.2	16		25				30									\Box	
36 1.2D + 1.0Di +1.0Wi A	Yes	Ý		1	1.2	16		26		29			-1									
37 1.2D + 1.0Di +1.0Wi A		Y		1	1.2	16		27				30									\Box	
38 1.2D + 1.0Di +1.0Wi A	100	Y		1	1.2	16		28				30										
39 (1.2 + 0.2Sds)DL + 1.0		Y		1	1.24	31	1	32	_	23	.000	30	5									_
40 (1.2 + 0.2Sds)DL + 1.0		Y		1	1.24				5													
		Y		1	1.24	31	.5		.866													
42 (1.2 + 0.2Sds)DL + 1.0		Y		1	1.24	31	_	32	1													
43 (1.2 + 0.2Sds)DL + 1.0		Y		1	1.24	31			.866													
44 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24	31			.5												\vdash	
45 (1.2 + 0.2Sds)DL + 1.0		Y		1		31		32							-							
46 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24			32														
47 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24	31	5	32														
48 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24	31			-1													
49 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24	31		32														
50 (1.2 + 0.2Sds)DL + 1.0		Υ		1	1.24	31	.866	32	5													
51 (0.9 - 0.2Sds)DL + 1.0	Yes	Υ		1	.86	31	1	32														
52 (0.9 - 0.2Sds)DL + 1.0	Yes	Υ		1	.86		.866	32	.5													
53 (0.9 - 0.2Sds)DL + 1.0		Υ		1	.86	31			.866													
54 (0.9 - 0.2Sds)DL + 1.0		Ý		1	.86	31		32														
55 (0.9 - 0.2Sds)DL + 1.0	Yes	Ý		1	.86	31	- 5														\Box	\neg
56 (0.9 - 0.2Sds)DL + 1.0		Ý		1	.86			32														
57 (0.9 - 0.2Sds)DL + 1.0		Y		1	.86	31		32	.0													_
58 (0.9 - 0.2Sds)DL + 1.0		Y		1	.86			32	5													
		Y				31		32														
,		Y		1	.86																	
				1	.86	31		32														
61 (0.9 - 0.2Sds)DL + 1.0		Y		_1_	.86	31		32														
62 (0.9 - 0.2Sds)DL + 1.0	Yes	Υ		1	.86			32														
63 1.0DL + 1.5LL + 1.0SW		Υ		1	1	2			.23			33									\vdash	
64 1.0DL + 1.5LL + 1.0SW		Υ		1	1	3		14				33										
65 1.0DL + 1.5LL + 1.0SW		Υ		_1_	1	4			.115													
66 1.0DL + 1.5LL + 1.0SW		Υ		1	1	5		14				33										
67 1.0DL + 1.5LL + 1.0SW		Υ		1	1	6	.23	14	1	15	.2	33	1.5									
68 1.0DL + 1.5LL + 1.0SW	Yes	Υ		1	1	7	.23	14	2	15	115	33	1.5									
69 1.0DL + 1.5LL + 1.0SW	- Yes	Υ		1	1	8	.23	14	23	15		33	1.5									
70 1.0DL + 1.5LL + 1.0SW	- Yes	Υ		1	1	9	.23	14	2	15	1	33	1.5									
71 1.0DL + 1.5LL + 1.0SW		Y		1	1	10			1													
72 1.0DL + 1.5LL + 1.0SW		Ý		1	1	11		14				33										
73 1.0DL + 1.5LL + 1.0SW		Y		1	1	12			.115													
74 1.0DL + 1.5LL + 1.0SW		Y		1	1	13			.2													
75 1.2DL + 1.5LL	Yes	Y		1	1.2	33				. 0		55										
76 1.2DL + 1.5LM-MP1 +		Y		1	1.2	34			058	1/1	058	15										
77 1.2DL + 1.5LM-MP1 +		Y		1		2/	1.5	2	.058	14	ΩE.	15	020									
				1	1.2	34	1.0	J	050 059	14	. <u>სე</u>	15	0E									
		Y			1.2	34	1.5	4	050	14	029	15	050									
79 1.2DL + 1.5LM-MP1 +		Y		1	1.2				.058			15										
80 1.2DL + 1.5LM-MP1 +		Y		1	1.2	34	1.5	6	.058	14	0	15	05									
81 1.2DL + 1.5LM-MP1 +		Y		1	1.2	34							029									
82 1.2DL + 1.5LM-MP1 +		Υ		1	1.2	34	1.5	8	.058	14	0	15										
83 1.2DL + 1.5LM-MP1 +		Υ		1	1.2	34															\square	
84 1.2DL + 1.5LM-MP1 +		Υ		1	1.2	34																
85 1.2DL + 1.5LM-MP1 +	Yes	Υ		1	1.2	34	1.5	11	.058	14		15	0			L						
																					_	



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Load Combinations (Continued)

Description	Solve	PDelta	SRSS R	10	Factor	FaBFaB	Fa R Fa R	Fa	R	Fa	B E	:a F	3 F	ء آ	2 [Fa
86 1.2DL + 1.5LM-MP1 +	Yes	Y		1	1.2	1.5 12 058 14		ı a	.D	1 a	<u> </u>	aL	JI	a	ار	a
87 1.2DL + 1.5LM-MP1 +		Y		1	1.2	1.5 13 .058 14										
88 1.2DL + 1.5LM-MP2 +		Y		1	1.2	1.5 2 .058 14										
89 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 3 .058 14	05 15 029									
90 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 4 .058 14										
91 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 5 .058 14					\neg					
92 1.2DL + 1.5LM-MP2 +		Y		1	1.2	1.5 6 .058 14										
93 1.2DL + 1.5LM-MP2 +		Y		1	1.2	1.5 7 .058 14										
94 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 8 .058 14										
95 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 9 .058 14										
96 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 10 .058 14	101505									
97 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 11 .058 14										
98 1.2DL + 1.5LM-MP2 +		Y		1	1.2	1.5 12 .058 14										
99 1.2DL + 1.5LM-MP2 +		Ý		1	1.2	1.5 13 .058 14	.05 150									
100 1.2DL + 1.5LM-MP3 +		Ý		1	1.2	1.5 2 .058 14										
101 1.2DL + 1.5LM-MP3 +		Ý		1	1.2	1.5 3 .058 14	.05 15 .029									
102 1.2DL + 1.5LM-MP3 +		Υ		1	1.2	1.5 4 .058 14										
103 1.2DL + 1.5LM-MP3 +	Yes	Υ		1	1.2	1.5 5 .058 14										
104 1.2DL + 1.5LM-MP3 +	Yes	Υ		1	1.2	1.5 6 .058 14	1015 .05									
105 1.2DL + 1.5LM-MP3 +		Y		1	1.2	1.5 7 .058 14										
106 1.2DL + 1.5LM-MP3 +		Υ		1	1.2	1.5 8 .058 14	1015									
107 1.2DL + 1.5LM-MP3 +	Yes	Υ		1	1.2	1.5 9 .058 14										
108 1.2DL + 1.5LM-MP3 +	Yes	Υ		1	1.2	1.5 10 .058 14	101505									
109 1.2DL + 1.5LM-MP3 +		Υ		1	1.2	1.5 11 .058 14										
110 1.2DL + 1.5LM-MP3 +		Υ		1	1.2	1.5 12 .058 14										
111 1.2DL + 1.5LM-MP3 +		Υ		1	1.2	1.5 13 .058 14										
112 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 2 .058 14										
113 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 3 .058 14										
114 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 4 .058 14										
115 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 5 .058 14	15.058									
116 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 6 .058 14	1015 .05									
117 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 7 .058 14	105 15 .029									
118 1.2DL + 1.5LM-MP4 +	Yes	Υ		1	1.2	1.5 8 .058 14	I015									
119 1.2DL + 1.5LM-MP4 +		Υ		1	1.2	1.5 9 .058 14	05 15 0									
120 1.2DL + 1.5LM-MP4 +		Υ		1	1.2	1.5 10 .058 14	015 05									
121 1.2DL + 1.5LM-MP4 +		Υ		1	1.2	1.5 11 058 14	150									
122 1.2DL + 1.5LM-MP4 +		Υ		1	1.2	1.5 12 058 14	1.029 1505									
123 1.2DL + 1.5LM-MP4 +		Υ		1	1.2	1.5 13 058 14										
124 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 2 .058 14										
125 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 3 .058 14										
126 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 4 .058 14										
127 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 5 058 14										
128 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 6 .058 14	10 15 .05									
129 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 7 .058 14										
130 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 8 .058 14										
131 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 9 .058 14								_	_	
132 1.2DL + 1.5LM-MP5 +		Υ		1	1.2	1.5 10 .058 14										
133 1.2DL + 1.5LM-MP5 +	1	Υ		1	1.2	1.5 11 058 14					_					
134 1.2DL + 1.5LM-MP5 +	Yes	Y		1	1.2	1.5 12 058 14										
135 1.2DL + 1.5LM-MP5 +		Y		1	1.2	1.5 13 .058 14	1.05 150									
136 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 2 .058 14	1.058 15									
137 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 3 .058 14										
138 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 4 .058 14										
139 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 5 .058 14										
140 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 6 .058 14							4			
141 1.2DL + 1.5LM-MP6 +		Y		1	1.2	1.5 7 .058 14										
142 1.2DL + 1.5LM-MP6 +	Yes	Y		1	1.2	1.5 8 .058 14	10 15									



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Load Combinations (Continued)

Description	Solve	PDelta	SRSS BLO	Eactor	r BI C	Fa	В	Fa	В	Fa	В	Fa B	Fa	В	Fa	В	Fa	В	Fa	В	Fa
143 1.2DL + 1.5LM-MP6 +		Υ	1	1.2	39	1.5	9	.058	14	05	15	0									
144 1.2DL + 1.5LM-MP6 +	Yes	Υ	1	1.2	39	1.5	10	.058	14	0	15	05									
145 1.2DL + 1.5LM-MP6 +	Yes	Υ	1	1.2				.058				0									
146 1.2DL + 1.5LM-MP6 +	Yes	Υ	1	1.2						.029											
147 1.2DL + 1.5LM-MP6 +	Yes	Υ	1	1.2	39	1.5	13	.058	14	.05	15	0									
148 1.2DL + 1.5LM-MP7 +		Υ	1	1.2	40	1.5	2	.058	14	.058	15										
149 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	3	.058	14	.05	15	.029									
150 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2						.029											
151 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	5	.058	14			.058									
152 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	6	.058	14	0	15	.05									
153 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	7	.058	14	05	15	.029									
154 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	8	.058	14	0	15										
155 1.2DL + 1.5LM-MP7 +		Υ	1	1.2						05											
156 1.2DL + 1.5LM-MP7 +		Υ	1	1.2						0	15	05									
157 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2	40	1.5	11	.058	14			0									
158 1.2DL + 1.5LM-MP7 +	Yes	Υ	1	1.2						.029											
159 1.2DL + 1.5LM-MP7 +		Υ	1	1.2						.05		0									
160 1.2DL + 1.5LM-MP8 +		Υ	1	1.2		1.5				.058											
161 1.2DL + 1.5LM-MP8 +		Υ	1	1.2						.05											
162 1.2DL + 1.5LM-MP8 +		Υ	1	1.2	41	1.5	4	.058	14	.029	15	.05									
163 1.2DL + 1.5LM-MP8 +	Yes	Υ	1	1.2	41			.058				.058									
164 1.2DL + 1.5LM-MP8 +		Υ	1	1.2	41					0											
165 1.2DL + 1.5LM-MP8 +		Υ	1	1.2	41	1.5				05		.029									
166 1.2DL + 1.5LM-MP8 +	Yes	Υ	1	1.2						0											
167 1.2DL + 1.5LM-MP8 +		Υ	1	1.2						05											
168 1.2DL + 1.5LM-MP8 +		Υ	1	1.2						0	15	05									
169 1.2DL + 1.5LM-MP8 +	Yes	Υ	1	1.2	41			.058				0									
170 1.2DL + 1.5LM-MP8 +	Yes	Υ	1	1.2	41					.029											
171 1.2DL + 1.5LM-MP8 +		Υ	1	1.2						.05		0									
172 1.2DL + 1.5LM-MP9 +		Υ	1	1.2		1.5				.058											
173 1.2DL + 1.5LM-MP9 +		Υ	1	1.2						.05											
174 1.2DL + 1.5LM-MP9 +	Yes	Υ	1	1.2	42					.029											
175 1.2DL + 1.5LM-MP9 +	Yes	Υ	1	1.2	42			.058				.058									
176 1.2DL + 1.5LM-MP9 +		Υ	1	1.2						0											
177 1.2DL + 1.5LM-MP9 +		Υ	1	1.2		1.5				05		.029									
178 1.2DL + 1.5LM-MP9 +		Υ	1	1.2						0											
179 1.2DL + 1.5LM-MP9 +		Υ	1	1.2						05											
180 1.2DL + 1.5LM-MP9 +		Υ	1	1.2						0											
181 1.2DL + 1.5LM-MP9 +		Υ	1	1.2				.058				0									ш
182 1.2DL + 1.5LM-MP9 +	Yes	Υ	1	1.2	42	1.5	12	.058	14	.029	15	05									

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N63	max	1930.982	17	2976.056	27	1392.773	14	6475.111	27	2133.856	11	597.125	11
2		min	-1931.148	23	412.465	20	-4239.632	33	362.171	20	-2133.491	5	-599.225	5
3	N156A	max	1112.06	18	2968.214	31	2392.335	2	-144.461	25	1939.696	3	-364.839	24
4		min	-3637.528	37	430.831	24	-1190.79	20	-3251.067	32	-1939.201	21	-5586.611	31
5	N160	max	3638.867	29	2969.175	35	2451.259	2	-102.412	15	1939.612	7	5583.899	35
6		min	-1143.828	22	430.744	16	-1250.09	20	-3260.869	34	-1939.332	25	384.095	16
7	Totals:	max	5735.751	5	8667.071	32	5892.349	2						
8		min	-5735.743	23	2294.052	62	-5892.345	20						

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

	Member Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi* phi* phi* phi* Eqn
1	MP2 PIPE	.812	48	8	.065	48		13	149132130 18711871 H1
2	MP8 PIPE	.811	48	12	.067	48		5	149132130 18711871 H1
3	MP5 PIPE	.811	48	4	.064	48		9	149132130 18711871 H1
4	M5 PL4X3/8	.641	25.221	34	.205	4.729	٧	34	441548600 379 3939 H1
5	M12 PL4X3/8	.641	25.223	32	.205	4.729	ý	32	441648600 379 3936 H1
6	M17 PL4X3/8	.641	25.223	38	.206	4.729	У	38	441648600 379 3940 H1
7	SA2 HSS4X	.424	38	37	.094	38	Z	5	1337139516181618H1
8	SA3 HSS4X	.421	38	33	.090	38	Z	13	1337139516181618H1
9	SA1 HSS4X	.420	38	33	.090	38	Z	9	1337139516181618H1
10	M68 L2x2x3	.390	0	8	.094	7.683	Z	7	229123395571239H2-1
11	M66 L2x2x3	.373	0	4	.094	7.683	Z	3	229123395571239H2-1
12	MP1 PIPE	.372	54	7	.142	54		7	121432130 18711871 H1
13	MP7 PIPE	.367	54	34	.140	54		11	121432130 18711871 H1
14	MP4 PIPE	.367	54	38	.140	54		3	121432130 18711871 H1
15	M67 L2x2x3	.362	0	12	.096	7.683	Z	11	229123395571239H2-1
16	M11 PL4X3/8	.360	10.967	9	.069	0	У	2	151348600 379 4050 H1
17	M4 PL4X3/8	.357	5.229	13	.067	16.194	y	6	151448600 3794050 H1
18	M22 PL4X3/8	.353	5.23	5	.068	16.197	У	10	151348600 3794050 H1
19	MP9 PIPE	.349	48	28	.131	48		13	149132130 18711871 H1
20	MP6 PIPE	.349	48	32	.132	48		5	149132130 18711871 H1
21	MP3 PIPE	.346	48	85	.134	48		9	149132130 18711871 H1
22	HOR2 PIPE	.234	48.438	27	.138	48.438		36	282565205 57485748 H1
23	HOR3 PIPE	.234	101.563	27	.138	48.438		32	282565205 57485748 H1
24	HOR1 PIPE	.234	101.562	31	.137	101.562		28	2825 65205 5748 5748 H1
25	HR2 PIPE	.225	75	5	.127	143.75		4	629532130 18711871 H1
26	HR3 PIPE	.225	75	11	.124	143.75		12	629532130 18711871 H1
27	HR1 PIPE	.221	75	9	.130	143.75		8	629532130 18711871 H1
28	M9 L2x2x4	.187	34.248	7	.027	0	У	33	202530586901576H2-1
29	M15 L2x2x4	.187	34.248	9	.027	0	Ž	33	202530586901576H2-1
30	M16 L2x2x4	.184	34.248	3	.027	0	У	29	202530586901576H2-1
31	M20 L2x2x4	.183	34.248	11	.027	0	y	37	202530586901576H2-1
32	M10 L2x2x4	.183	34.248	13	.027	0	Z	37	202530586901576H2-1
33	M21 L2x2x4	.183	34.248	5	.027	0	Z	29	202530586901576H2-1

APPENDIX D ADDITIONAL CALCUATIONS



Welded Calculation Tool, V1.0

PROJECT DATA		
Site Name:	N. BETHANY / DAVID KLUDGE	
Site Number:	876378	
Job Code: 1039-Z0001-B		
Date: 2/28/2021		

WELD INFORMATION			
Design:	LRFD	-	
Weld Strength (F_EXX):	70	ksi	
Weld Thickness:	0.188	in	

MAIN SHAPE INFORMATION			
Main Shape: Rectangle -			
Main Shape Material:	A 500 Gr. B Rect.	-	
Main Shape Thickness:	0.250	in	
Main Shape Size:	4X4	in	

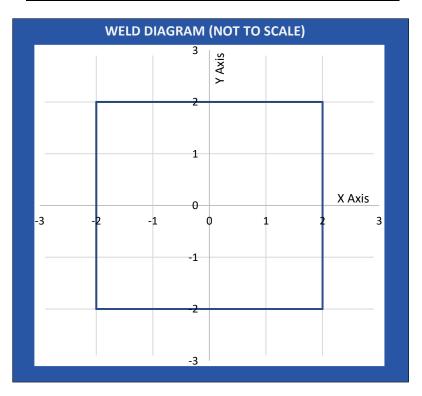
TOTAL SUM OF LINES PROPERTIES			
Polar Moment of Inertia:	85.333	in^3	
Section Modulus X-X dir.:	21.333	in^2	
Section Modulus Y-Y dir.:	21.333	in^2	
Critical Usage Mode*:	Weld Critical	-	
Critical Thickness Used:	0.188	in	

SECONDARY SHAPE INFORMATION			
Secondary Shape:	N/A	-	
Secondary Shape Material:	N/A	-	
Secondary Shape Thickness:	N/A	in	
Secondary Shape Size:	N/A	in	

WELD DESCRIPTION

Platform to Tower

RESULTS			
Critical Risa Combination:	LC 27	-	
Critical Member Label:	SA2	-	
Member End:	j	-	
Weld Strength (Phi*Rn):	4187.486	lb/in	
Weld Demand (Ru):	3851.118	lb/in	
Usage ratio:	92.0%	ОК	



NOTES

*The strength of the weld governs the design compared to the effective strength of the welded object.

Exhibit F

Power Density/RF Emissions Report

INFINIGY8

Non-Ionizing Radiation Report

Compiled For: Northeast Site Solutions on behalf of T-Mobile

Site Name: CT11122B

Site ID: CT11122B

15 Kluge Road, Prospect, CT 06712

Latitude: 41.47122100; Longitude: -72.9718900

Structure Type: Self-Support

Report Date: March 24, 2021

Report Written By: Tim Harris

Status: T-Mobile will be compliant with FCC rules on RF Exposure.

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1. Executive Summary:

Northeast Site Solutions on behalf of T-Mobile has contracted Infinigy Solutions, LLC to determine whether the site CT11122B located at 15 Kluge Road in Prospect, CT Will Be Compliant with all Federal Communications Commission (FCC) rules and regulations for radio frequency (RF) exposure as indicated in 47CFR§1.1310.

The report incorporates a theoretical RF field analysis in accordance with the FCC Rules and Regulations for all individuals classified as "Occupational or Controlled" and "General Public or Uncontrolled" (see Appendix A and B).

This document and the conclusions herein are based on information provided by Northeast Site Solutions on behalf of T-Mobile.

As a result of the analysis, **T-Mobile Will Be Compliant with FCC rules**.

T-Mobile, All Bands Cumulative Exposure %				
Uncontrolled /	Exposure values at the site (mW/cm²)	0.0090		
General Population	% Exposure	1.19 %		
Controlled / Occupational	Exposure values at the site (mW/cm²)	0.0090		
	% Exposure	0.24 %		

2. Site Summary:

Site Information		
Site Name: CT11122B		
Site Address: 15 Kluge Road, Prospe	ect, CT 06712	
Site Type: Self-Support		
Compliance Status Will Be Compliant		
Mitigation Required No		
Signage Required Yes		
Barriers Required	No	
Access Locked	No	
Area Controlled or Uncontrolled	Uncontrolled	

3. Site Compliance

This report also incorporates overview of the site information:

- Antenna Inventory Table
- Calculation Tables showing exposure for each carrier transmit frequency
- Total exposure for all carriers existing and proposed at ground level considering the centerline of all antennas and horizontal distance from the tower.
- Maximum Effective Radiated Power Assumed as Worst Case for Calculations used in this study
- Calculations based on flat ground around base of the structure

4. Site Compliance Recommendations

Infinigy recommends the following upon the installation of antennas at the site:

Base of tower

Install an RF caution sign. Note: The recommendation for alerting signage is moot if there is an RF caution, or greater already installed.

INFINIGY8

5. Antenna Inventory Table

Ant	Sector	Operator	Antenna manufacturer	Antenna Model	Operating	Rad	Az	Total
ID					Frequency/Technology	Ctr	(Deg)	ERP
						(Ft)		Power
								(Watts)
1	Alpha	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	180	110	4308
2a	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	180	110	2256
2b	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	180	110	1128
2c	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	180	110	1128
2d	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	180	110	1583
2e	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz GSM	180	110	1583
3a	Alpha	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	180	110	3590
3b	Alpha	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	180	110	3591
4	Beta	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	180	230	4308
5a	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	180	230	2256
5b	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	180	230	1128
5c	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	180	230	1128
5d	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	180	230	1583
5e	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz GSM	180	230	1583
6a	Beta	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	180	230	3590
6b	Beta	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	180	230	3591
7	Gamma	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	180	350	4308
8a	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	180	350	2256
8b	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	180	350	1128
8c	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	180	350	1128
8d	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	180	350	1583
8e	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz GSM	180	350	1583
9a	Gamma	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	180	350	3590
9b	Gamma	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	180	350	3591

6. RF Guidelines

To ensure safety of company workers, the following points need to be taken into consideration and implemented at wireless sites in accordance with the Carriers policies:

- a) Worksite: Any employee at the site should avoid working directly in front of the antenna or in areas predicted to exceed general population exposure limits by 100%. Workers should insist that the transmitters be switched off during the work period.
- b) RF Safety Training and Awareness: All employees working in areas exceeding the general population limits should have a basic awareness of RF safety measures. Videos, classroom lectures and online courses are all appropriate training methods on these topics.
- c) Site Access: Restricting access to transmitting antenna locations is one of the most important elements of RF safety. This can be done with:
 - Locked doors/gates/ladder access
 - Alarmed doors
 - Restrictive barriers
- d) Three-foot Buffer: There is an inverse relationship between the strength of the field and the distance from the antenna. The RF field diminishes with distance from the antenna. Workers should maintain a three-foot distance from the antennas.
- e) Antennas: Workers should always assume that the antenna is transmitting and should never stop right in front of the antenna. If someone must pass by an antenna, he/she should move quickly, thus reducing RF exposure.

7. T-Mobile Exposure Analysis By Band and Technology

T-Mobile 600 MHz LTE			
	FCC's exposure limits (mW/cm²)	0.4	
Uncontrolled /	Exposure values at the site		
General	General (mW/cm^2) 0.0006		
Population % Exposure 0.15%		0.15%	
	FCC's Exposure limits(mW/cm²)	2.0	
Controlled /	Exposure values at the site		
Occupational (mW/cm²)		0.0006	
	% Exposure	0.03%	

T-Mobile 600 MHz 5G		
	FCC's exposure limits (mW/cm²)	0.4
Uncontrolled /	Exposure values at the site	
General	(mW/cm ²)	0.0006
Population	% Exposure	0.15%
	FCC's Exposure limits(mW/cm²)	2.0
Controlled /	Exposure values at the site	
Occupational	(mW/cm ²)	0.0006
	% Exposure	0.03%

	T-Mobile 700 MHz LTE	
	FCC's exposure limits (mW/cm²)	0.5
Uncontrolled /	Exposure values at the site	
General	General (mW/cm^2) 0.0012	
Population	% Exposure	0.23%
	FCC's Exposure limits(mW/cm²)	2.3
Controlled / Exposure values at the site		
Occupational	(mW/cm ²)	0.0012
	% Exposure	0.05%

	T-Mobile 1900 MHz GSM	
	FCC's exposure limits (mW/cm²)	1.0
Uncontrolled /	Exposure values at the site	
General (mW/cm^2) 0.0008		0.0008
Population	% Exposure	0.08%
	FCC's Exposure limits(mW/cm²)	5.0
Controlled /	Exposure values at the site	
Occupational	(mW/cm ²)	0.0008
	% Exposure	0.02%

	T-Mobile 1900 MHz LTE	
	FCC's exposure limits (mW/cm²)	1.0
Uncontrolled /	Exposure values at the site	
General (mW/cm^2) 0.000		0.0008
Population	% Exposure	0.08%
	FCC's Exposure limits(mW/cm²)	5.0
Controlled /	Exposure values at the site	
Occupational	(mW/cm ²)	0.0008
	% Exposure	0.02%

	T-Mobile 2100 MHz LTE	
	FCC's exposure limits (mW/cm²)	1.0
Uncontrolled /	Exposure values at the site	
General		
Population	% Exposure 0.22%	
	FCC's Exposure limits(mW/cm²)	5.0
Controlled / Exposure values at the site		
Occupational	(mW/cm ²)	0.0022
	% Exposure	0.04%

	T-Mobile 2500 MHz LTE	
	FCC's exposure limits (mW/cm²)	1.0
Uncontrolled /	Exposure values at the site	
General	General (mW/cm^2) 0.0018	
Population	% Exposure	0.18%
	FCC's Exposure limits(mW/cm²)	5.0
Controlled /	Exposure values at the site	
Occupational	(mW/cm ²)	0.0018
	% Exposure	0.04%

	T-Mobile 2500 MHz 5G	
	FCC's exposure limits (mW/cm²)	1.0
Uncontrolled /	Exposure values at the site	
General (mW/cm^2) 0.0018		0.0018
Population	% Exposure	0.18%
	FCC's Exposure limits(mW/cm²)	5.0
Controlled / Exposure values at the site		
Occupational	(mW/cm ²)	0.0018
	% Exposure	0.04%

8. Appendix A: FCC Guidelines

FCC Policies

The Federal Communications Commission (FCC) in 1996 implemented regulations and policies for analysis of RF propagation to evaluate RF emissions. All the analysis and results of this report are compared with FCC's (Federal Communications Commission) rules to determine whether a site is compliant for Occupational/Controlled or General Public/Uncontrolled exposure. All the analysis of RF propagation is done in terms of a percentage. The limits primarily indicate the power density and are generally expressed in terms of milliwatts per centimeter square, mW/cm².

FCC guidelines incorporate two separate tiers of exposure limits that are dependent on the scenario/ situation in which that exposure takes place or the status of the individuals who are subjected to that exposure. The decision as to which tier is applied to a scenario is based on the following definitions:

Occupational / Controlled

These limits apply in situations when someone is exposed to RF energy through his/her occupation, is fully aware of the harmful effects of the RF exposure and has an ability to exercise control over this exposure. Occupational / controlled exposure limits also apply when 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. limits for Occupational/Controlled exposure can be found on Table 1 (A).

General Population / Uncontrolled

These limits apply to situations in which the general public may be exposed or in which persons who are exposed because of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure to RF. Therefore, members of the general public would always be considered under this category, for example, in the case of a telecommunications tower that exposes people in a nearby residential area. Exposure limits for General Population/Uncontrolled can be found on Table 1(B).

Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational/Controlled Exposure

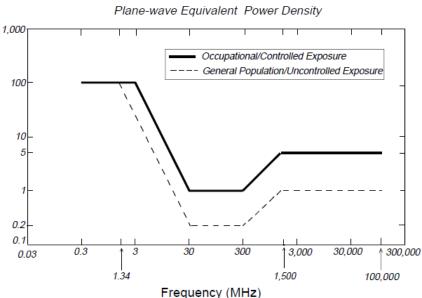
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f²)*	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100.000			5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)*$	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz

^{*}Plane-wave equivalent power density



<u>Figure 1.</u> FCC Limits for Maximum Permissible Exposure (MPE)

OSHA Statement:

The objective of the OSHA Act is to ensure the safety and health of the working men and women by enforcing certain standards. The act also assists and encourages the states in their efforts to ensure safe and healthy working conditions through means of research, information, education and training in the field of occupational safety and health and for other purposes.

According to OSHA Act section 5, important duties to be considered are:

(a) Each employer

- Shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees
- 2) Shall comply with occupational safety and health standards promulgated under this act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

9. Preparer Certification

I, Tim Harris, preparer of this report, certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commission and the Occupational Safety and Heath Administration regarding Human Exposure to Radio Frequency Radiation. In addition, I have been trained in RF safety practices, rules, and regulations.

I certify that the information contained in this report is true and correct to the best of my knowledge.

Timothy A. Harris

3/24/2021

Signature Date

