



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

VIA ELECTRONIC MAIL

March 22, 2019

Anne Marie Zsamba
Real Estate Specialist
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

RE: **EM-AT&T-154-190304** – AT&T notice of intent to modify an existing telecommunications facility located at 1102 Horse Hill Road, Westbrook, Connecticut.

Dear Ms. Zsamba:

The Connecticut Siting Council (Council) is in receipt of your correspondence of March 19, 2019 submitted in response to the Council's March 12, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr



Robidoux, Evan

From: Zsamba, Anne Marie <AnneMarie.Zsamba@crowncastle.com>
Sent: Thursday, March 21, 2019 9:58 AM
To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-AT&T-154-190304-HorseHillRd-Westbrook
Attachments: CSC AT&T 857011 Response to Notice of Incomplete 3.15.19 - Corrected.pdf

My apologies. Corrected PDF attached. Happy Thursday!

ANNE MARIE ZSAMBA

Real Estate Specialist
T: (201) 236-9224
F: (724) 416-6112

CROWN CASTLE

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

From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Wednesday, March 20, 2019 3:59 PM
To: Zsamba, Anne Marie <AnneMarie.Zsamba@crowncastle.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter for EM-AT&T-154-190304-HorseHillRd-Westbrook

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon,

The Siting Council is in receipt of your response to an incomplete letter for this site.

The RE: line of the cover letter indicates the Brendan Street, Stafford site. We would like to request a corrected cover letter. No hard copies are necessary, an emailed PDF is sufficient.

Thank you and have a good day!

Sincerely,
Evan Robidoux

From: Zsamba, Anne Marie [<mailto:AnneMarie.Zsamba@crowncastle.com>]
Sent: Tuesday, March 19, 2019 10:26 AM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter for EM-AT&T-154-190304-HorseHillRd-Westbrook

Good morning,

Attached please find my response to the Council incomplete letter dated March 12th. Please note that I am experiencing issues with my Adobe removing signatures. The attached document reflects this issue, however I will submit hardcopy materials via Fedex which resolve the Council's noted deficiencies. My apologies for any inconvenience this causes on your end. Fedex will arrive by 10:30am tomorrow morning.

Thank you and have a great day!

ANNE MARIE ZSAMBA

Real Estate Specialist
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F: (724) 416-6112

CROWN CASTLE

3 Corporate Park Drive, Suite 101,
Clifton Park, NY 12065
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From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Monday, March 18, 2019 8:21 AM
To: Zsamba, Anne Marie <AnneMarie.Zsamba@crowncastle.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-AT&T-154-190304-HorseHillRd-Westbrook

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

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

March 19, 2019

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

RE: Notice of Exempt Modification for Crown Site BU: 857011
AT&T Site ID: CT2265
1102 Horse Hill Road, Westbrook, CT 06498
Latitude: 41° 19' 25.71"/ Longitude: -72° 29' 28.10"

Dear Ms. Bachman:

I am in receipt of the Council's Notice of Incomplete Letter dated March 12, 2019. Attached please find both a structural analysis and construction drawings signed and stamped by Professional Engineers licensed in the State of Connecticut. It is our hope that submission of these deliverables will deem our application complete. Please confirm. Thank you kindly.

Sincerely,

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

Enclosures

Robidoux, Evan

From: Zsamba, Anne Marie <AnneMarie.Zsamba@crowncastle.com>
Sent: Tuesday, March 19, 2019 10:26 AM
To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-AT&T-154-190304-HorseHillRd-Westbrook
Attachments: CSC AT&T 857011 Response to Notice of Incomplete 3.19.19.pdf

Good morning,

Attached please find my response to the Council incomplete letter dated March 12th. Please note that I am experiencing issues with my Adobe removing signatures. The attached document reflects this issue, however I will submit hardcopy materials via Fedex which resolve the Council's noted deficiencies. My apologies for any inconvenience this causes on your end. Fedex will arrive by 10:30am tomorrow morning.

Thank you and have a great day!

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

March 19, 2019

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

RE: Notice of Exempt Modification for Sprint Crown Site BU: 806365
AT&T Site ID: 10035240
46 Brendan Street, Brendan & Quinn Streets, Stafford, Tolland County, CT 06076
Latitude: 41° 57' 51.20"/ Longitude: -72° 18' 17.80"

Dear Ms. Bachman:

I am in receipt of the Council's Notice of Incomplete Letter dated March 12, 2019. Attached please find both a structural analysis and construction drawings signed and stamped by Professional Engineers licensed in the State of Connecticut. It is our hope that submission of these deliverables will deem our application complete. Please confirm. Thank you kindly.

Sincerely,

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

Enclosures

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:

- REMOVE (6) EXISTING ANTENNAS, (3) RRH's, (12) DIPLEXER'S
- INSTALL AT&T ANTENNA (800-10991K) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T ANTENNA (800-10965) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 4415 B25 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 4449 B5/B12 (850/700)(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 8843 B2/B66A (PCS/AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 2).
- INSTALL (4) DC TRUNK CABLES & (1) FIBER TRUNK CABLE.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- SWAP DUS WITH 6630
- INSTALL (1) NEW 6630 FOR 5G

ITEMS TO REMAIN:

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

SITE ADDRESS: 1102 HORSE HILL ROAD
WESTBROOK, CT 06498

LATITUDE (NAD 83): N 41° 19' 25.71"

LONGITUDE (NAD 83): W 72° 29' 28.10"

LANDLORD: CROWN CASTLE INTERNATIONAL
500 W. CUMMINGS PARK, STE 3600
WOBURN, MA 01801

TYPE OF SITE: MONOPOLE/INDOOR

TOWER HEIGHT: 159'

RAD CENTER: 163'

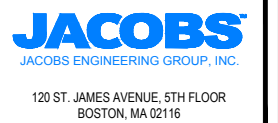
CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



NOTE:

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



SITE NUMBER: CT2265

FA LOCATION CODE: 10105800

SITE NAME: WESTBROOK NORTH HORSE HILL ROAD

CROWN SITE NAME: WESTBROOK NORTH HORSE HILL ROAD

PROJECT: LTE 2C/LTE4C/LTE3C/4TX4RX SOFTWARE RETROFIT

PACE ID: MRCTB035206, MRCTB035179, MRCTB035242,

MRCTB035322

BU#: 857011



PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

SUBMITTALS		
0	02/21/19	ISSUED FOR PERMITTING

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FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

TITLE SHEET

T-1

DRAWING INDEX

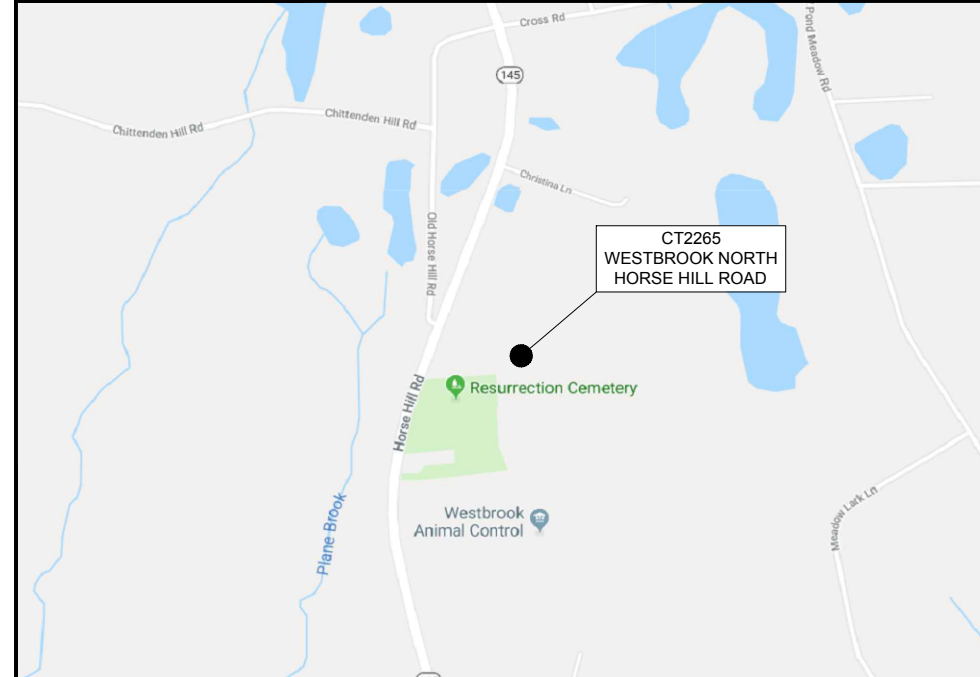
SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
C-1	SITE PLAN
C-2	EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION
C-3	EXISTING & PROPOSED ANTENNA LAYOUT
C-4	EQUIPMENT DETAILS
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 857011
CROWN CASTLE SITE NAME: WESTBROOK NORTH HORSE HILL ROAD

ENGINEERING

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

VICINITY MAP



FROM I-95 SOUTH: 9. TAKE EXIT 64 FOR CT-145(?) HORSE HILL RD TOWARD CLINTON 0.2 MI 10. TURN RIGHT ONTO CT-145 N(?) HORSE HILL RD DESTINATION WILL BE ON THE RIGHT

GENERAL NOTES

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



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

PART 1 - GENERAL

- 1.1 GENERAL CONDITIONS:
 - A. CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION. NOT AFTER THE CONTRACT HAS BEEN AWARDED.
 - B. THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION PERFORMANCE FOR THE WORK UNDER THIS SECTION.
 - C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWING SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.
- 1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.
 - A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.
- 1.3 REFERENCES:
 - A. THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE. THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.
 1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
 2. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
 3. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
 4. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
 5. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
 6. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
 7. UL (UNDERWRITERS LABORATORIES INC.)
 8. AT&T GROUNDING AND BONDING STANDARDS TP-76416
- 1.4 SCOPE OF WORK
 - A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.
 - B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.
 - C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.
 - D. THE CONTRACTOR SHALL FURNISH TO THE OWNER WITH CERTIFICATES OF A FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.
 - E. THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PART 2 - PRODUCTS

- 2.1 GENERAL:
 - A. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.
 - B. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.
 - C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
 - D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.
- 2.2 MATERIALS AND EQUIPMENT:
 - A. CONDUIT:
 1. RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
 2. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.
 3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE. GROUNDING BUSHINGS WITH INSULATED THROATS SHALL BE INSTALLED ON ALL CONDUIT TERMINATIONS.
 4. NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.
 - B. CONDUCTORS AND CABLE:
 1. CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR USED.
 2. #10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
 3. SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.
 4. STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURER'S RECOMMENDATIONS.
 5. ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).
 - C. DISCONNECT SWITCHES:
 1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.
 - D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:
 1. INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES K2-(*)CS OR K2L-(*)CS (*) LENGTH AS REQUIRED.
 2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID

- NUMBERING, AND THE ELECTRICAL POWER SOURCE.
- 3. BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.
- E. SYSTEM GROUNDING:
 1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
 2. GROUNDING BUSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS MGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
 3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS, INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
 4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
 5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEM WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
 6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- F. OTHER MATERIALS:
 6. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.
 7. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.
- G. PANELS AND LOAD CENTERS:
 1. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

PART 3 - EXECUTION

- 3.1 GENERAL:
 - A. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.
- 3.2 LABOR AND WORKMANSHIP:
 - A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.
 - B. ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.
 - C. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.
- 3.3 COORDINATION:
 - A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.
- 3.4 INSTALLATION:
 - A. CONDUIT:
 1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH TRADE SIZE.
 2. PROVIDE RIGID PVC SCHEDULE 80 CONDUITS FOR ALL RISERS, RMC OTHERWISE NOTED. EMT MAY BE INSTALLED FOR EXTERIOR CONDUITS WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
 3. INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2017 NEC, TABLE 300.5).
 4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
 5. A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE QUARTER-BENDS. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
 6. FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
 7. PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
 8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
 9. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUCTORS OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
 10. INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
 11. INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
 12. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
 13. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
 - B. CONDUCTORS AND CABLE:
 1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	208/240/120 VOLT SYSTEMS
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUNDING	GREEN
 2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.

- 3. PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
- 4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES & EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
- C. DISCONNECT SWITCHES:
 1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.
- D. GROUNDING:
 1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-00135, AND THE NATIONAL ELECTRICAL CODE.
 2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
 3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
 4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
 5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
 6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
 7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
 8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
 9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
 10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
 11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
 12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
 13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
 14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
 15. IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
 16. CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
- 3.5 ACCEPTANCE TESTING:
 - A. CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.
 - B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.
 - C. TEST PROCEDURES:
 1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
 2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
 3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
 4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.



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FA# 10105800
 SITE# CT2265
 WESTBROOK NORTH
 HORSE HILL ROAD
 1102 HORSE HILL ROAD
 WESTBROOK, CT 06498

GENERAL NOTES I

GN-1

ANTENNA MOUNTING

- DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANS/ITIA-222 OR APPLICABLE LOCAL CODES.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
- ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
- ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
- PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
- JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
- CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
- TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

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

FIBER & POWER CABLE MOUNTING

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

COAXIAL CABLE NOTES

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

GENERAL CABLE AND EQUIPMENT NOTES

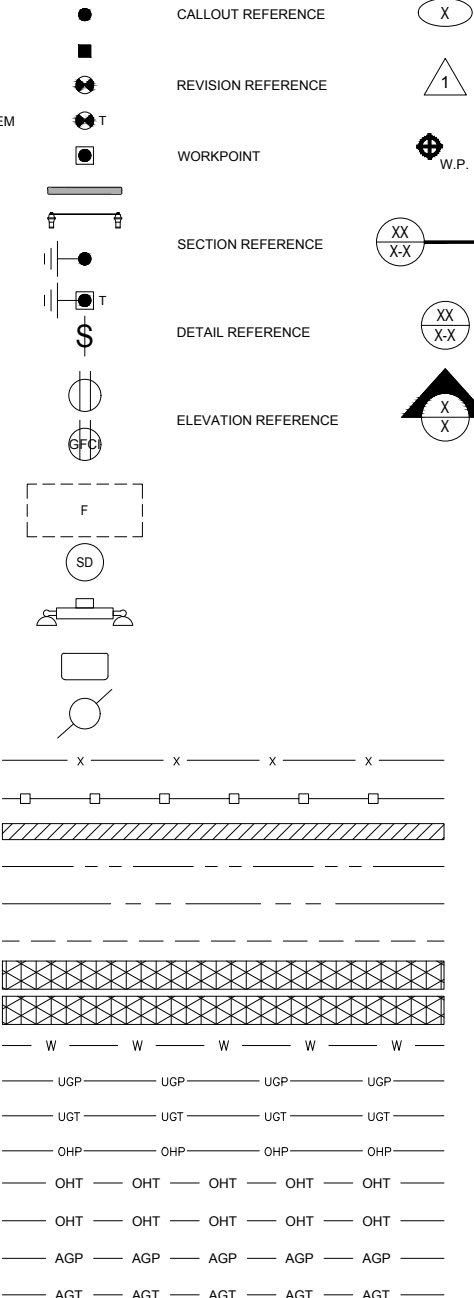
- CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.

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

GROUNDING NOTES

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

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- EXOTHERMIC WITH INSPECTION SLEEVE
- GROUNDING BAR
- SHELTER GROUNDING BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- SINGLE POLE SWITCH
- DUPLEX RECEPTACLE
- DUPLEX GFCI RECEPTACLE
- FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
- EXISTING SMOKE DETECTION (DC)
- EXISTING EMERGENCY LIGHTING (DC)
- SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DOBTXD
- EXISTING UTILITY POLE
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD/WROUGHT IRON FENCE
- EXISTING WALL STRUCTURE
- LEASE AREA
- PROPERTY LINE (PL)
- SETBACKS
- PROPOSED/EXISTING ICE BRIDGE
- PROPOSED/EXISTING CABLE TRAY
- EXISTING WATER LINE
- PROPOSED UNDERGROUND POWER
- PROPOSED UNDERGROUND TELCO
- PROPOSED OVERHEAD POWER
- PROPOSED OVERHEAD TELCO
- PROPOSED OVERHEAD UTILITIES
- PROPOSED ABOVE GROUND POWER
- PROPOSED ABOVE GROUND TELCO



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

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



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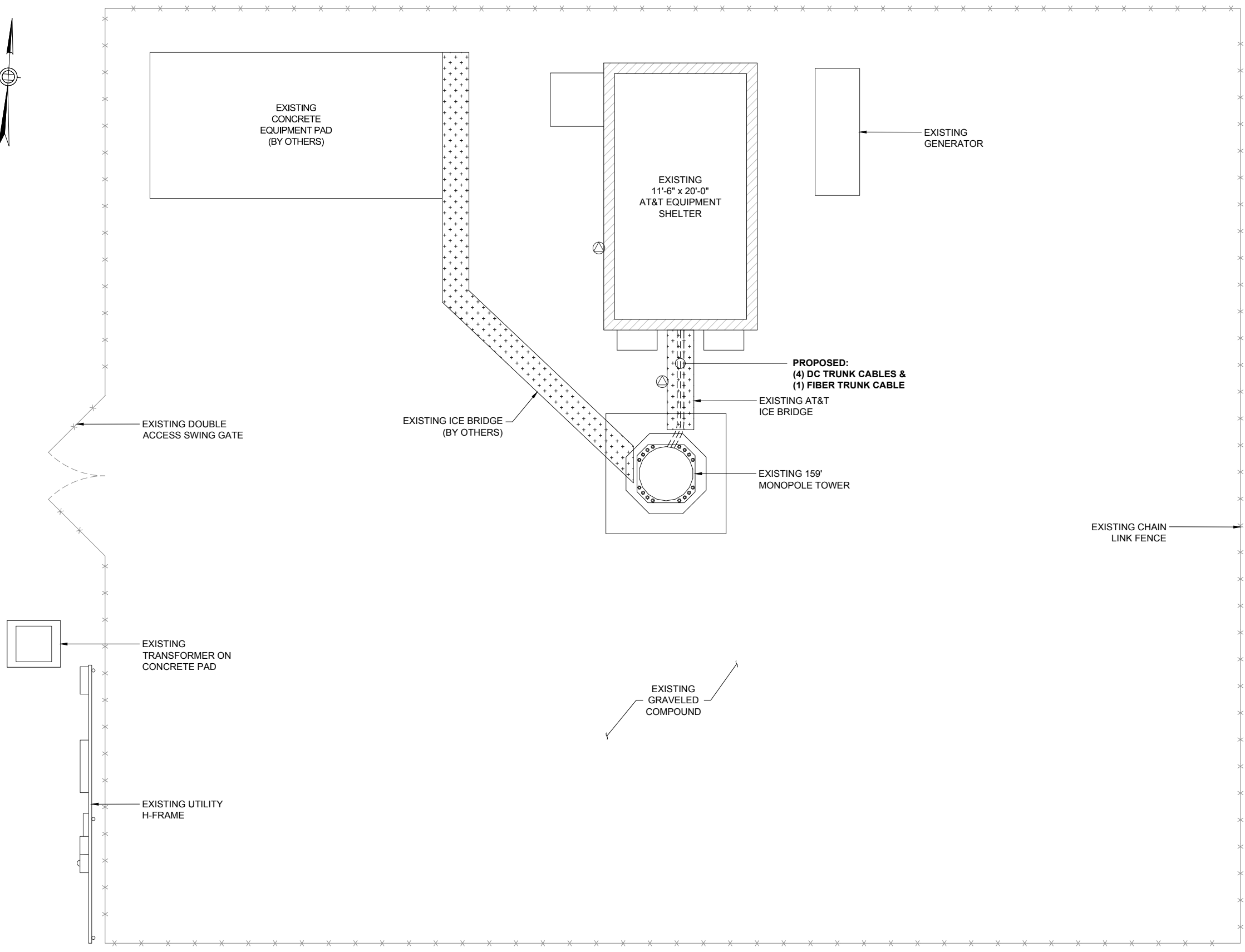
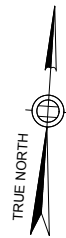
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GENERAL NOTES II

GN-2



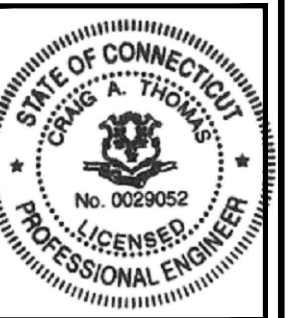
NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY HUDSON ENGINEERING GROUP ON 12/21/2012. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

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

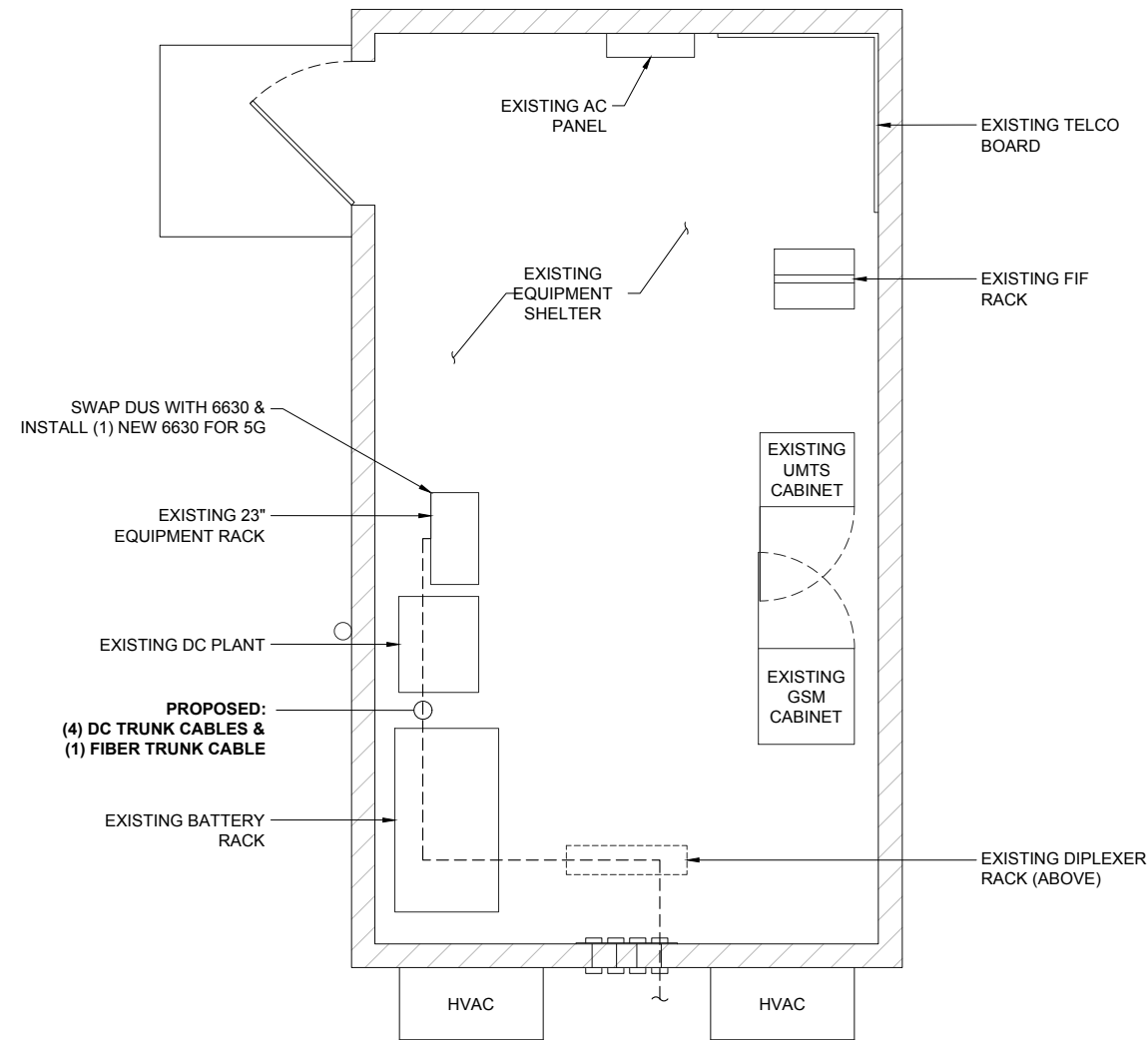
SUBMITTALS		
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FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

SITE PLAN

C-1



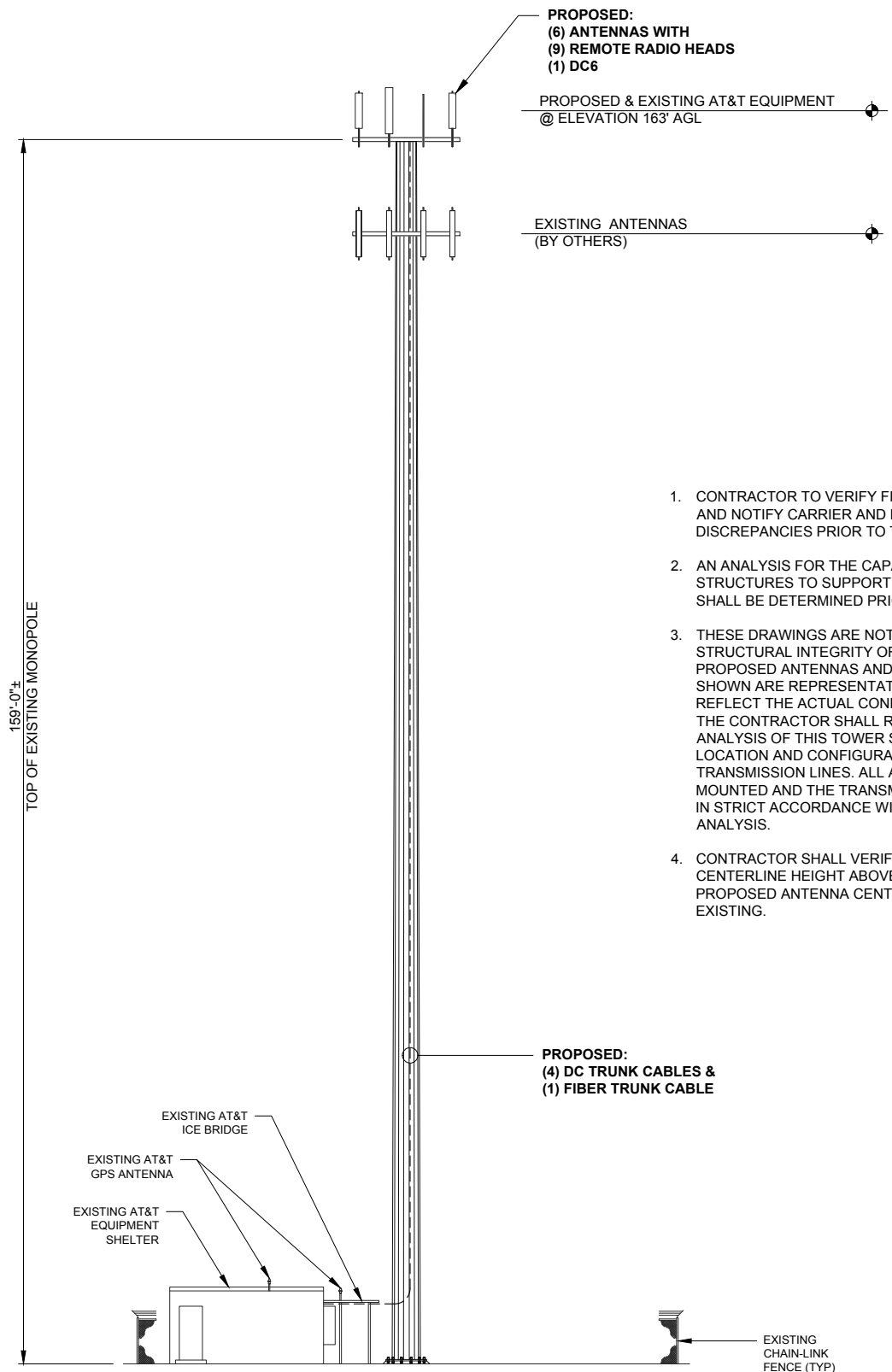
SWAP DUS WITH 6630 &
INSTALL (1) NEW 6630 FOR 5G

EXISTING 23"
EQUIPMENT RACK

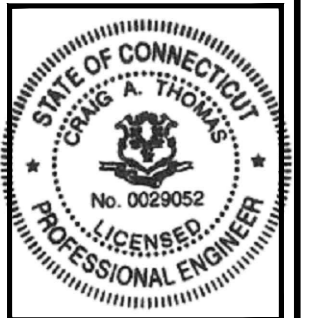
EXISTING DC PLANT

PROPOSED:
(4) DC TRUNK CABLES &
(1) FIBER TRUNK CABLE

EXISTING BATTERY RACK



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



PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

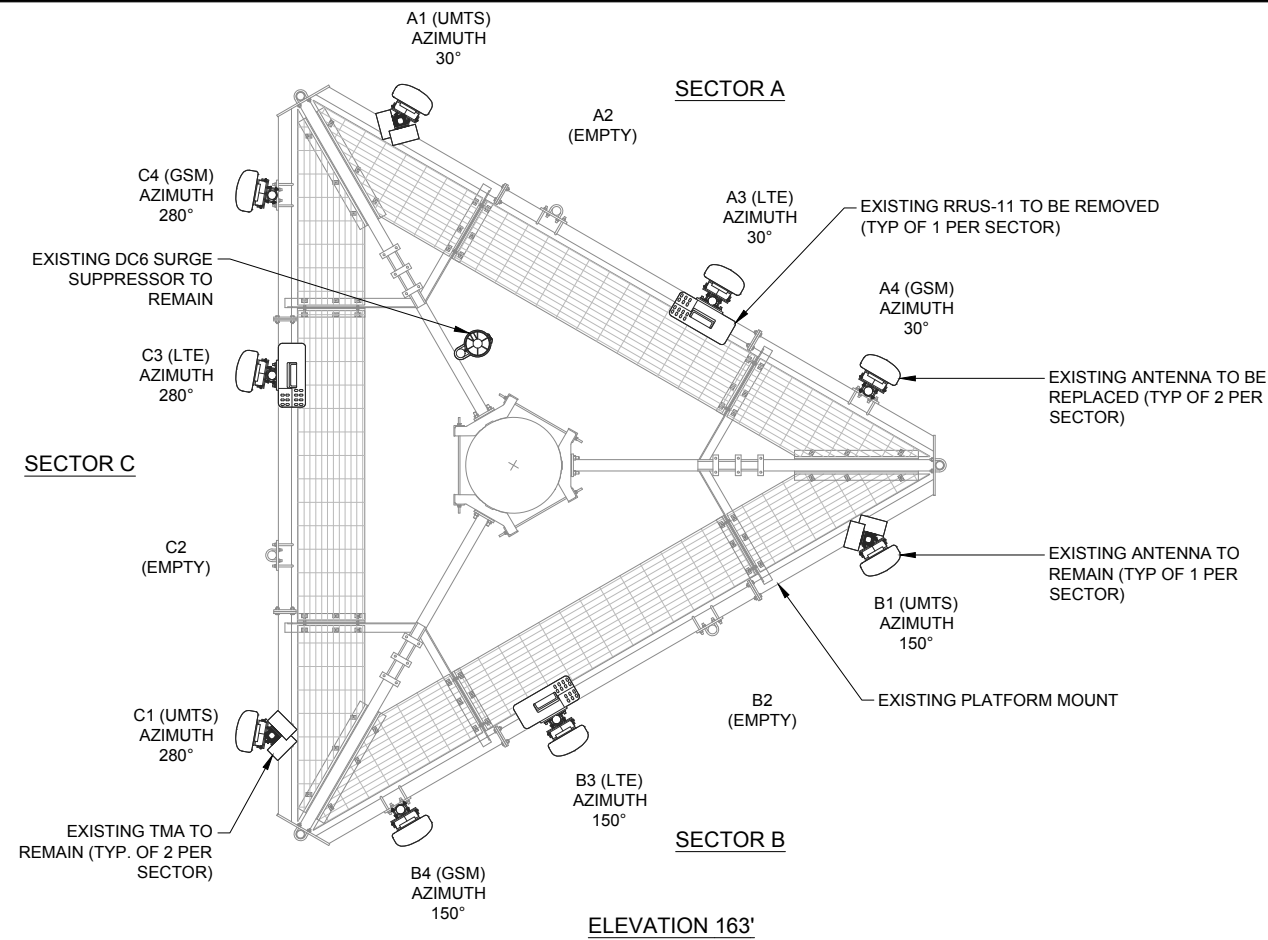
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FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

EQUIPMENT LAYOUT &
PROPOSED TOWER
ELEVATION

C-2



NOTES:

1. CONTRACTOR SHALL REFER TO THE MOUNT MODIFICATION REPORT; SITE NUMBER: CT2265; SITE NAME: WESTBROOK NORTH HORSE HILL ROAD; FA LOCATION: 10105800; CROWN BU NUMBER: 857011; CROWN SITE NAME: WESTBROOK NORTH HORSE HILL ROAD; CROWN ORDER NUMBER: 475297; ISSUED BY INFINIGY. DATED ON 02/11/2019. THE MOUNT MODIFICATIONS MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.
4. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

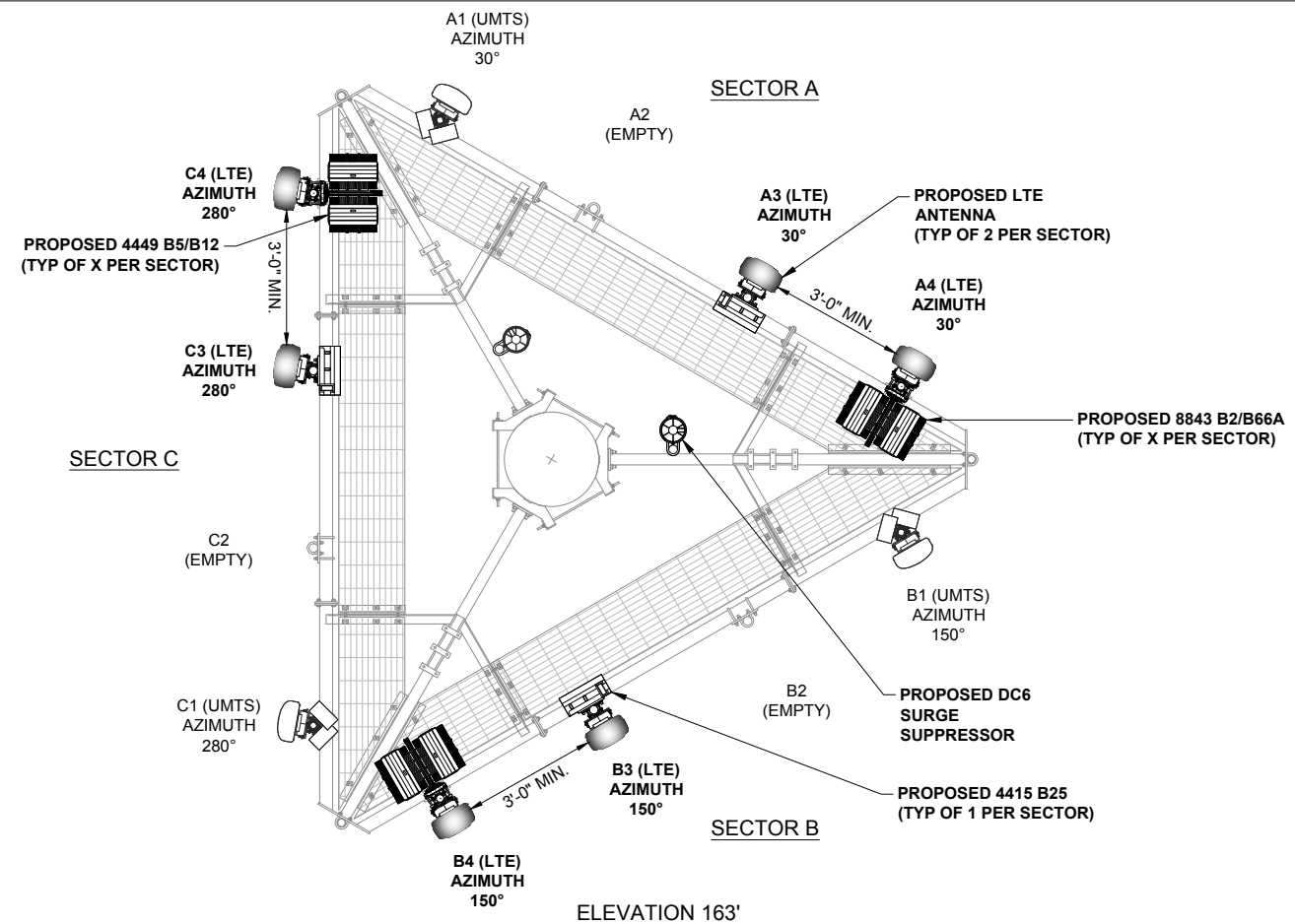


120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



1 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

SUBMITTALS		
0	02/21/19	ISSUED FOR PERMITTING

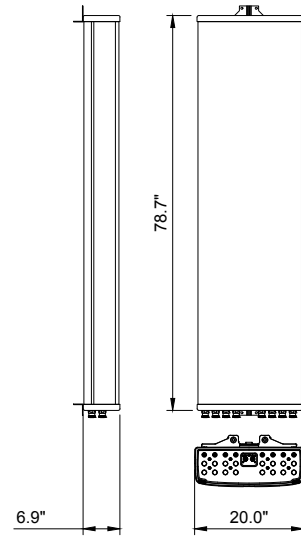
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FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

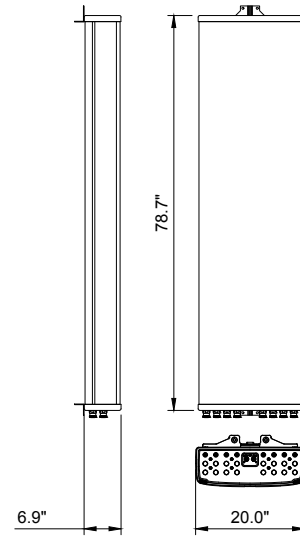
EXISTING & PROPOSED
ANTENNA LAYOUT

C-3

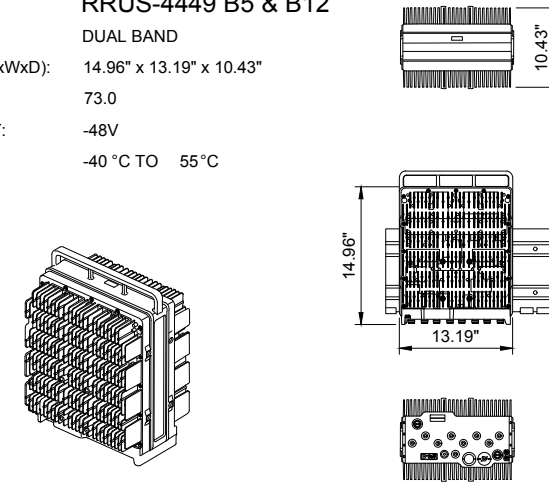
MANUFACTURER: **KATHREIN**
 MODEL NO.: **80010965**
 RADOME MATERIAL: FIBERGLASS, UV RESISTANT
 COLOR: LIGHT GRAY
 DIMENSIONS (LxWxD): 78.7" x 20.0" x 6.9"
 1999mm x 508mm x 175mm
 WEIGHT (lbs): 97.6
 CONNECTOR: 8 x 4.3-10 FEMALE
 FRONT WIND LOAD: 254 LBF @ 93 MPH
 1130 N @ 150 KM/H
 SIDE WIND LOAD: 256 LBF @ 93 MPH
 1140 N @ 150 KM/H
 WIND SPEED MAX.: >150 MPH (>241 KM/H)



MANUFACTURER: **KATHREIN**
 MODEL NO.: **80010991K**
 RADOME MATERIAL: FIBERGLASS, UV RESISTANT
 COLOR: LIGHT GRAY
 DIMENSIONS (LxWxD): 78.7" x 20.0" x 6.9"
 1999mm x 508mm x 175mm
 WEIGHT (lbs): 100.9
 CONNECTOR: 12 x 4.3-10 FEMALE
 FRONT WIND LOAD: 254 LBF @ 93 MPH
 1130 N @ 150 KM/H
 SIDE WIND LOAD: 256 LBF @ 93 MPH
 1140 N @ 150 KM/H
 WIND SPEED MAX.: >150 MPH (>241 KM/H)



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



1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

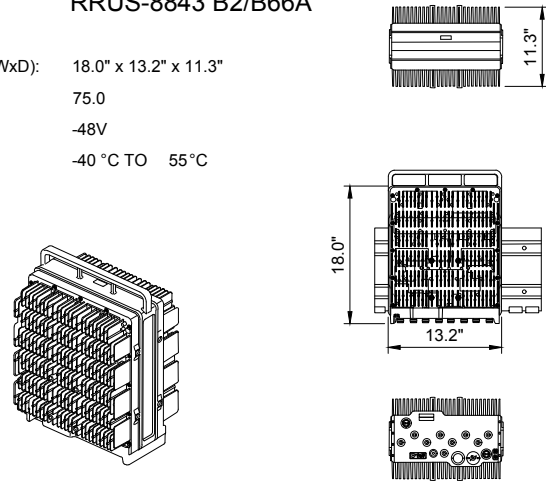
2 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

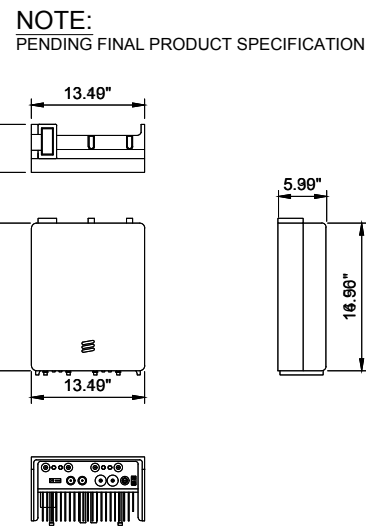
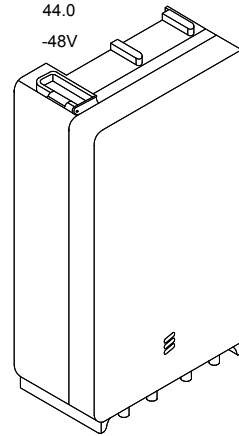
3 RRUS SPECIFICATIONS

SCALE: N.T.S.

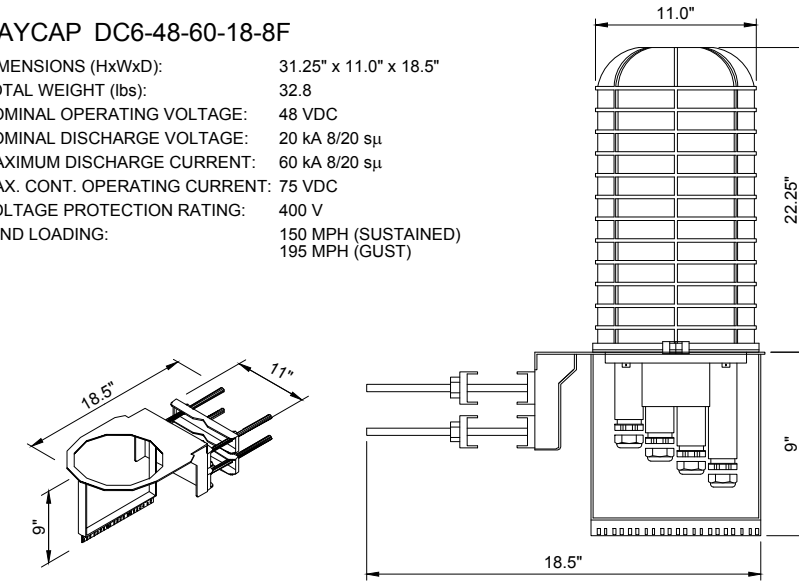
MANUFACTURER: **ERICSSON**
 MODEL NO.: **RRUS-8843 B2/B66A**
 DIMENSIONS (HxWxD): 18.0" x 13.2" x 11.3"
 WEIGHT (lbs): 75.0
 POWER SUPPLY: -48V
 TEMPERATURE: -40 °C TO 55 °C



MANUFACTURER: **ERICSSON**
 MODEL NO.: **RRUS-4415 B25**
 TECHNOLOGY: LTE 1900
 DIMENSIONS (HxWxD): 14.96" x 13.19" x 5.39"
 WEIGHT (lbs): 44.0
 POWER SUPPLY: -48V



RAYCAP DC6-48-60-18-8F
 DIMENSIONS (HxWxD): 31.25" x 11.0" x 18.5"
 TOTAL WEIGHT (lbs): 32.8
 NOMINAL OPERATING VOLTAGE: 48 VDC
 NOMINAL DISCHARGE VOLTAGE: 20 kA 8/20 sμ
 MAXIMUM DISCHARGE CURRENT: 60 kA 8/20 sμ
 MAX. CONT. OPERATING CURRENT: 75 VDC
 VOLTAGE PROTECTION RATING: 400 V
 WIND LOADING: 150 MPH (SUSTAINED)
 195 MPH (GUST)



4 RRUS SPECIFICATIONS

SCALE: N.T.S.

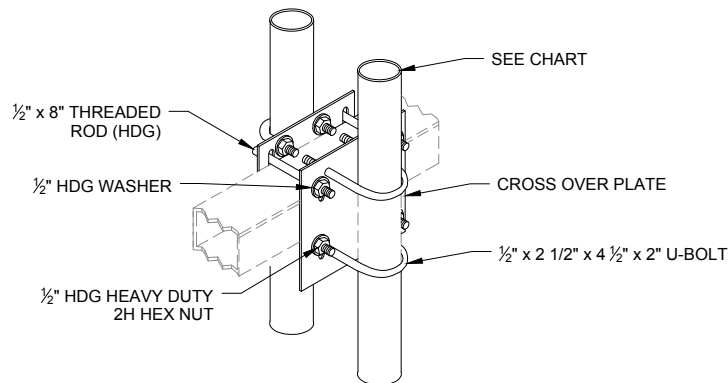
5 RRUS SPECIFICATIONS

SCALE: N.T.S.

6 DC SURGE PROTECTION SPECIFICATIONS

SCALE: N.T.S.

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

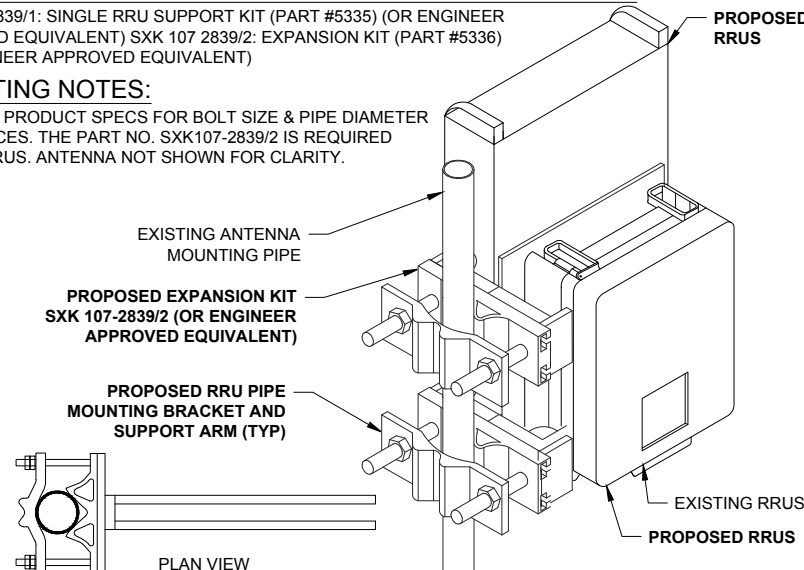


CUE DEE PART # 5335/5336 ERICSSON RRU MOUNTING KIT

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

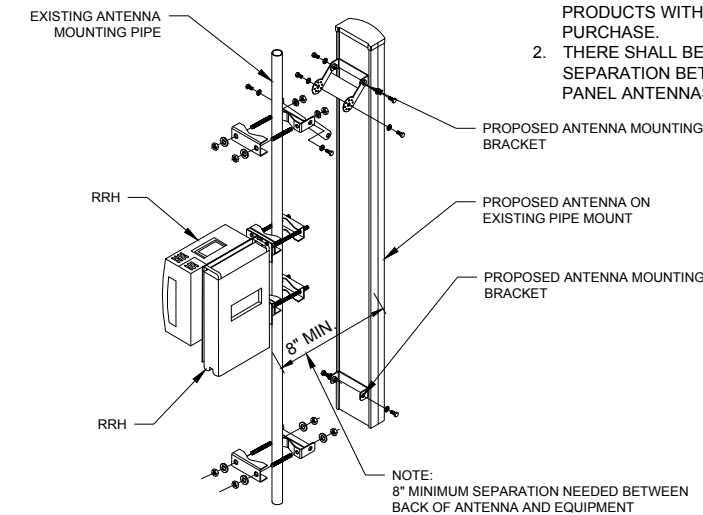
MOUNTING NOTES:

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



NOTES:

1. MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE.
2. THERE SHALL BE A MINIMUM 3'-0" SEPARATION BETWEEN ALL LTE PANEL ANTENNAS.



7 DC6 MOUNTING DETAIL

SCALE: N.T.S.

8 RRU MOUNTING DETAIL

SCALE: N.T.S.

9 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

SUBMITTALS

NO.	DATE	DESCRIPTION
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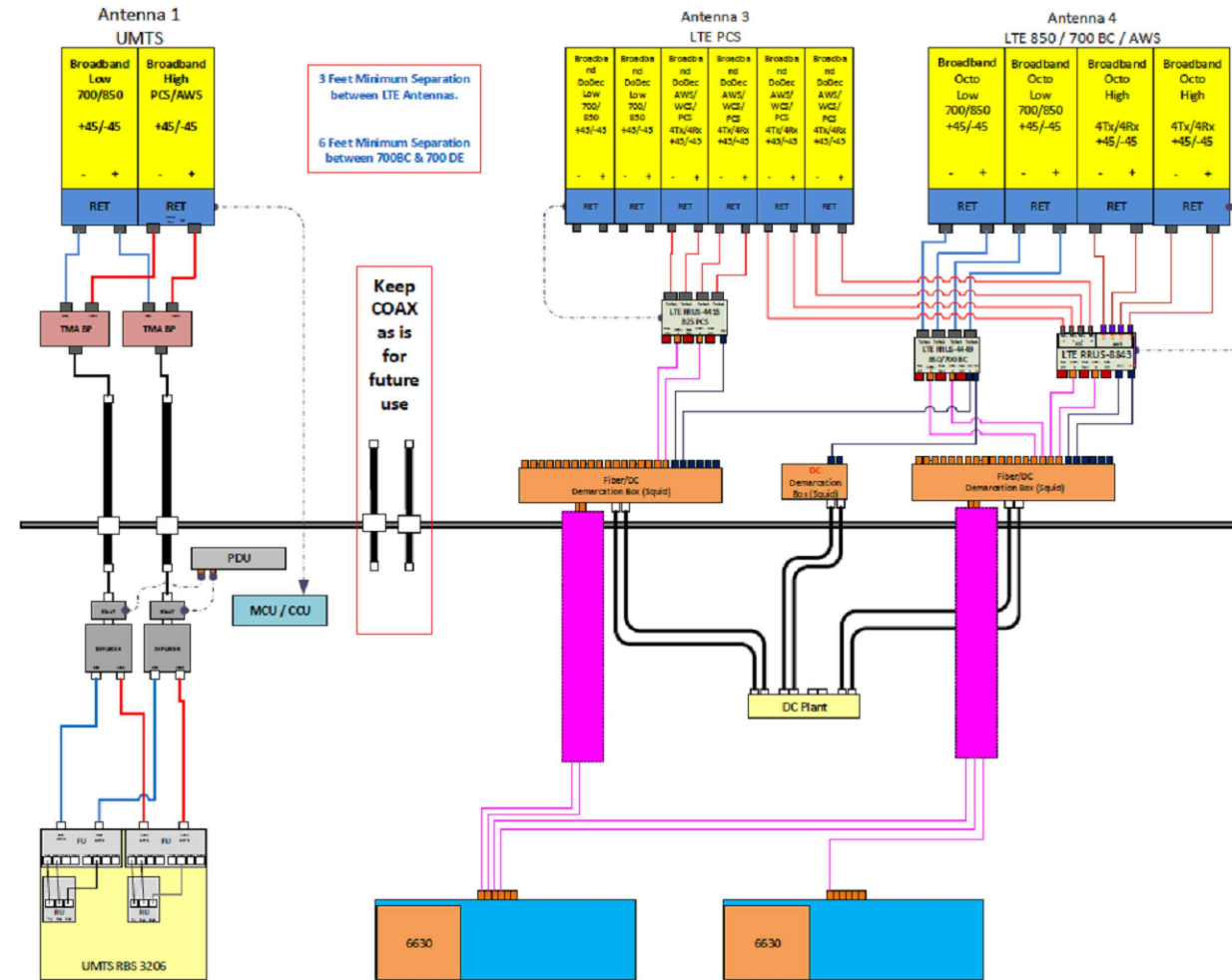
FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

EQUIPMENT
DETAILS

C-4

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's	RRH's	FEEDER	RAYCAP
A1	7770 (55"x11"x5")	UMTS	30°	163'	(1) LGP 21401	-	(4) 1-5/8" EXISTING (LENGTH @ 155')	(1) RAYCAP DC6-48-60-18-8F
A2	-	-	-	-	-	-	(1) FIBER (4) DC (LENGTH @ 155')	(1) RAYCAP DC6-48-60-18-8F
A3	800-10991K (78.7"x20"x6.9")	LTE	30°	163'	-	(1) 4415 B25 (PCS)	(1) FIBER (2) DC EXISTING (LENGTH @ 155')	(1) RAYCAP DC6-48-60-18-8F
A4	800-10965 (78.7"x20"x6.9")	LTE	30°	163'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)	-	(1) RAYCAP DC6-48-60-18-8F
B1	7770 (55"x11"x5")	UMTS	150°	163'	(1) LGP 21401	-	(4) 1-5/8" EXISTING (LENGTH @ 155')	(1) RAYCAP DC6-48-60-18-8F
B2	-	-	-	-	-	-	-	(1) RAYCAP DC6-48-60-18-8F
B3	800-10991K (78.7"x20"x6.9")	LTE	150°	163'	-	(1) 4415 B25 (PCS)	-	(1) RAYCAP DC6-48-60-18-8F
B4	800-10965 (78.7"x20"x6.9")	LTE	150°	163'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)	-	(1) RAYCAP DC6-48-60-18-8F
G1	7770 (55"x11"x5")	UMTS	280°	163'	(1) LGP 21401	-	(4) 1-5/8" EXISTING (LENGTH @ 155')	(1) RAYCAP DC6-48-60-18-8F
G2	-	-	-	-	-	-	-	(1) RAYCAP DC6-48-60-18-8F
G3	800-10991K (78.7"x20"x6.9")	LTE	280°	163'	-	(1) 4415 B25 (PCS)	-	(1) RAYCAP DC6-48-60-18-8F
G4	800-10965 (78.7"x20"x6.9")	LTE	280°	163'	-	(1) 4449 B5/B12 (850/700) (1) 8843 B2/B66A (PCS/AWS)	-	(1) RAYCAP DC6-48-60-18-8F

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



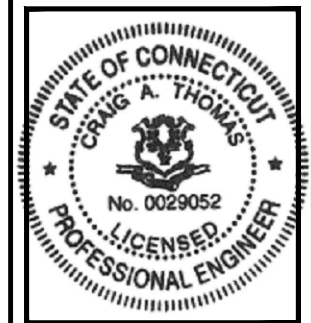
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

SUBMITTALS	
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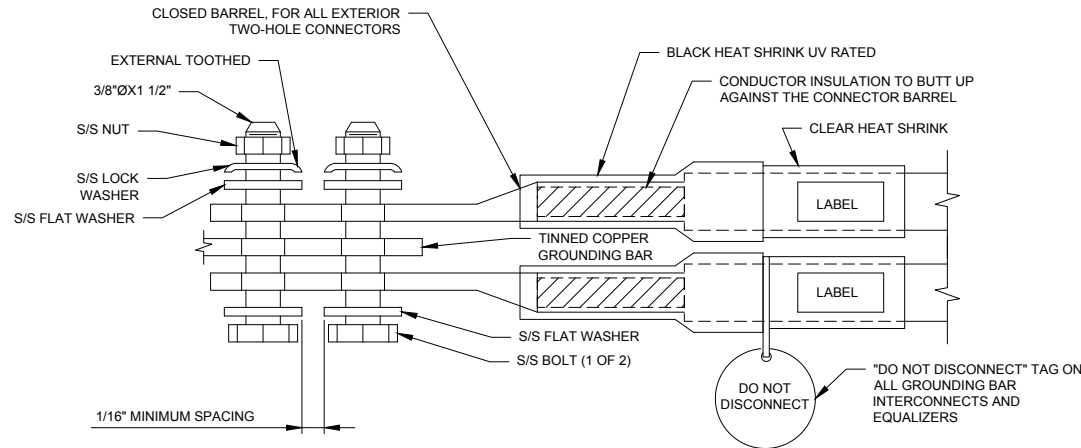
FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

ANTENNA CHART &
RF EQUIPMENT
SCHEMATIC

RF-1

NOTES:

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



1 EXTERIOR TWO HOLE LUG DETAIL

SCALE: NONE

GENERAL NOTES:

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

GROUNDING NOTES:

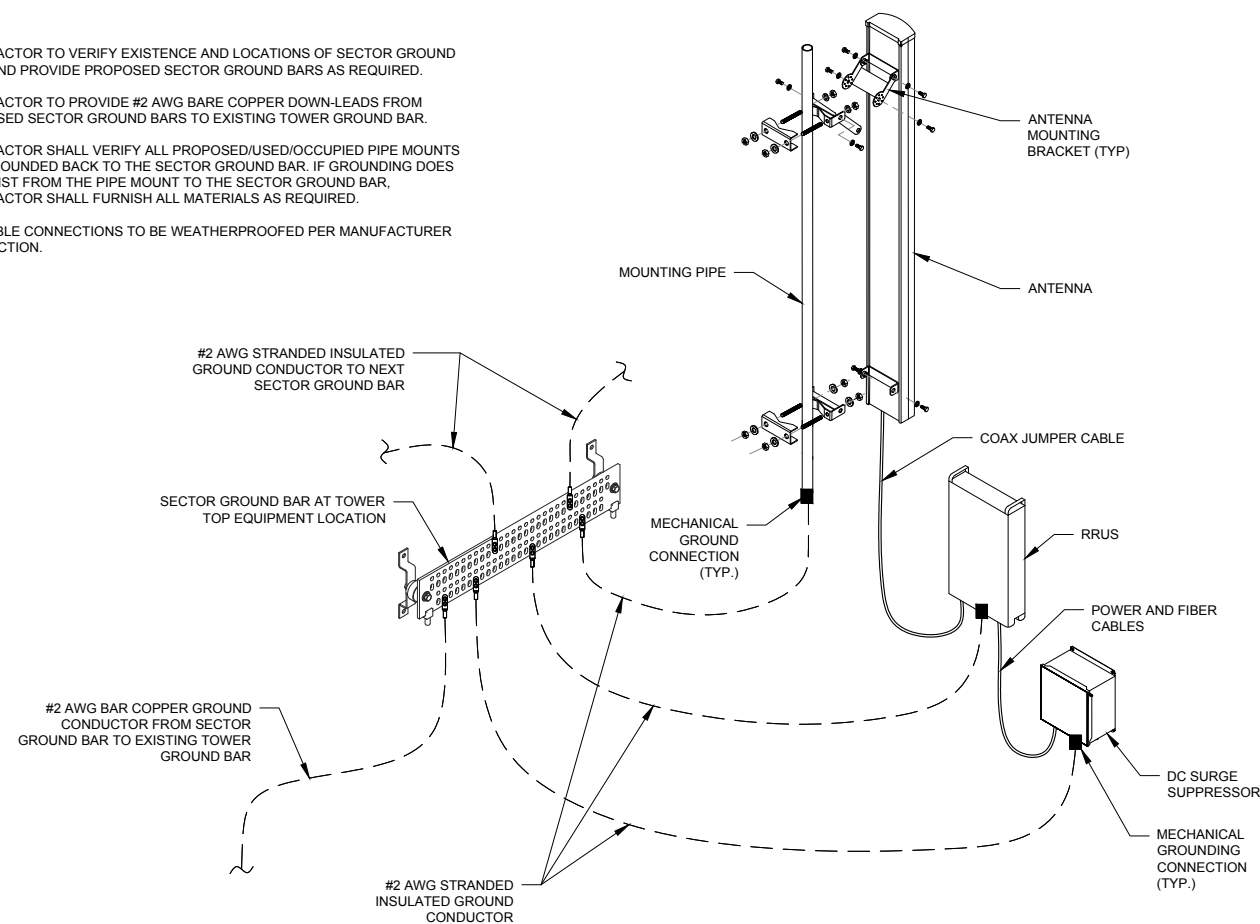
1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUND RING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #351546: INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE.
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAT 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

2 GROUNDING BAR DETAIL

SCALE: NONE

NOTES:

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



3 TYPICAL ANTENNA GROUNDING SCHEMATIC

SCALE: NONE



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO: ERCC0004

DRAWN BY: JB

CHECKED BY: CAT

SUBMITTALS		
0	02/21/19	ISSUED FOR PERMITTING

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FA# 10105800
SITE# CT2265
WESTBROOK NORTH
HORSE HILL ROAD
1102 HORSE HILL ROAD
WESTBROOK, CT 06498

GROUNDING DETAILS

G-1



Date: **January 23, 2019**

Rebecca Klein
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: 10105800
Carrier Site Name: CT2265

Crown Castle Designation: **Crown Castle BU Number:** 857011
Crown Castle Site Name: WESTBROOK NORTH HORSE HILL ROA
Crown Castle JDE Job Number: 553394
Crown Castle Work Order Number: 1683888
Crown Castle Order Number: 475297 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 1683888

Site Data: **1102 HORSE HILL ROAD, WESTBROOK, Middlesex County, CT**
Latitude 41° 19' 25.71", Longitude -72° 29' 28.1"
159.08 Foot - Monopole Tower

Dear Rebecca Klein,

Crown Castle is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower.

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

LC7: Proposed Equipment Configuration

Sufficient Capacity

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Daniel Chen / SM

Respectfully submitted by:

Maham Barimani, P.E.
Senior Project Engineer

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1) INTRODUCTION

This tower is a 159.08 ft. Monopole tower designed by UNKNOWN.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
159.0	163.0	3	ericsson	RRUS 4415 B25	2 4 2 12 2	3/8 3/4 7/8 1-5/8 2" conduit
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A		
		3	kathrein	80010965 w/ Mount Pipe		
		3	kathrein	80010991 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21402		
	2	raycap	DC6-48-60-18-8F			
	159.0	1	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 714-1]		

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)
147.0	147.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8
		3	alcatel lucent	B25 RRH4X30		
		3	alcatel lucent	B66A RRH4X45		
		3	amphenol	QUAD656C0000X w/ Mount Pipe		
		9	commscope	SBNHH-1D65B w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		1	tower mounts	Sector Mount [SM 801-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	GPD Group	4306672	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	GPD Group (Mapping)	4723512	CCISITES
4-TOWER MANUFACTURER DRAWINGS	GPD Group (Mapping)	5177796	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	159.08 - 139.33	Pole	TP24.1x18.43x0.188	1	-7.04	842.55	41.1	Pass
L2	139.33 - 91.24	Pole	TP40.49x22.861x0.313	2	-14.42	2341.50	45.4	Pass
L3	91.24 - 44.66	Pole	TP54.61x38.119x0.375	3	-26.51	3805.71	43.2	Pass
L4	44.66 - 0	Pole	TP69.47x51.679x0.375	4	-45.15	4980.67	48.4	Pass
							Summary	
						Pole (L4)	48.4	Pass
						Rating =	48.4	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	43.3	Pass
1	Base Plate	0	35.3	Pass
1	Base Foundation Structure	0	53.2	Pass
1	Base Foundation Soil Interaction	0	31.3	Pass
Structure Rating (max from all components) =				53.2%

Notes:

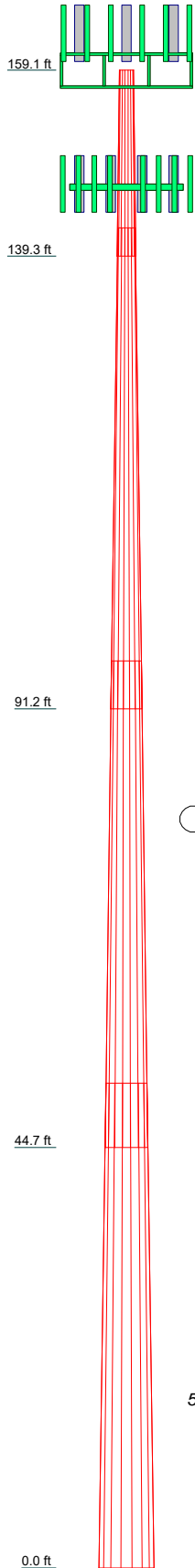
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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

Section	1	2	3	4	
Length (ft)	19.75	51.10	51.64	51.49	
Number of Sides	18	18	18	18	
Thickness (in)	0.188	0.313	0.375	0.375	
Socket Length (ft)	3.01	5.06	6.83		
Top Dia (in)	18.430	22.861	38.119	51.679	
Bot Dia (in)	24.100	40.490	54.610	69.470	
Grade			A572-65		
Weight (K)	0.8	5.4	9.6	12.6	28.4



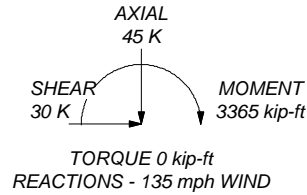
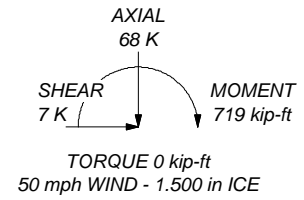
MATERIAL STRENGTH


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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 48.4%

ALL REACTIONS
ARE FACTORED



 <p>Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 The Pathway to Possible Phone: 724-416-2000 FAX: -</p>	Job: BU# 857011		
	Project:		
	Client: Crown Castle	Drawn by: SMandal	App'd:
	Code: TIA-222-H	Date: 01/23/19	Scale: NTS
	Path:	Dwg No. E-1	

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Tower Input Data

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

- 1) Tower is located in Middlesex County, Connecticut.
- 2) Tower base elevation above sea level: 236.00 ft.
- 3) Basic wind speed of 135 mph.
- 4) Risk Category II.
- 5) Exposure Category B.
- 6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 7) Topographic Category: 1.
- 8) Crest Height: 0.00 ft.
- 9) Nominal ice thickness of 1.500 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56.00 pcf.
- 12) A wind speed of 50 mph is used in combination with ice.
- 13) Temperature drop of 50 °F.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) TIA-222-H Annex S.
- 16) A non-linear (P-delta) analysis was used.
- 17) Pressures are calculated at each section.
- 18) Stress ratio used in pole design is 1.05.
- 19) Tower analysis based on target reliabilities in accordance with Annex S.
- 20) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- 21) 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 <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ 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
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Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	159.08-139.33	19.75	3.01	18	18.430	24.100	0.188	0.750	A572-65 (65 ksi)
L2	139.33-91.24	51.10	5.06	18	22.861	40.490	0.313	1.250	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	91.24-44.66	51.64	6.83	18	38.119	54.610	0.375	1.500	(65 ksi) A572-65
L4	44.66-0.00	51.49		18	51.679	69.470	0.375	1.500	(65 ksi) A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	18.685	10.857	456.456	6.476	9.362	48.754	913.512	5.429	2.914	15.54
	24.443	14.231	1028.065	8.489	12.243	83.973	2057.483	7.117	3.912	20.862
L2	24.220	22.365	1436.612	8.005	11.613	123.704	2875.114	11.185	3.474	11.115
	41.066	39.851	8127.241	14.263	20.569	395.122	16265.175	19.929	6.576	21.044
L3	40.290	44.925	8085.949	13.399	19.365	417.563	16182.538	22.467	6.049	16.131
	55.395	64.553	23989.134	19.253	27.742	864.726	48009.834	32.283	8.951	23.87
L4	54.815	61.064	20306.130	18.213	26.253	773.482	40638.979	30.538	8.435	22.495
	70.484	82.240	49603.864	24.529	35.291	1405.577	99272.997	41.128	11.567	30.845

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 159.08- 139.33				1	1	1			
L2 139.33- 91.24				1	1	1			
L3 91.24- 44.66				1	1	1			
L4 44.66-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter r in	Perimete r in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
Level 159								
LDF7-50A(1-5/8)	A	No	No	Inside Pole	159.00 - 0.00	12	No Ice	0.82
							1/2" Ice	0.82
							1" Ice	0.82
							2" Ice	0.82
							FB-L98B-034- XXX(3/8)	A
1/2" Ice	0.06							
1" Ice	0.06							
2" Ice	0.06							
WR-VG86ST- BRD(3/4)	A	No	No	Inside Pole	159.00 - 0.00	4	No Ice	
							1/2" Ice	0.58
							1" Ice	0.58
							2" Ice	0.58

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
WR-VG86ST-BRDA(7/8)	A	No	No	Inside Pole	159.00 - 0.00	2	No Ice	0.00	0.68
							1/2" Ice	0.00	0.68
							1" Ice	0.00	0.68
							2" Ice	0.00	0.68
2" Rigid Conduit	A	No	No	Inside Pole	159.00 - 0.00	2	No Ice	0.00	2.80
							1/2" Ice	0.00	2.80
							1" Ice	0.00	2.80
							2" Ice	0.00	2.80
Level 147									
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	147.00 - 0.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	159.08-139.33	A	0.000	0.000	0.000	0.000	0.38
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L2	139.33-91.24	A	0.000	0.000	0.000	0.000	0.93
		B	0.000	0.000	0.000	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00
L3	91.24-44.66	A	0.000	0.000	0.000	0.000	0.90
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.00
L4	44.66-0.00	A	0.000	0.000	0.000	0.000	0.86
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	159.08-139.33	A	1.482	0.000	0.000	0.000	0.000	0.38
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L2	139.33-91.24	A	1.443	0.000	0.000	0.000	0.000	0.93
		B		0.000	0.000	0.000	0.000	0.13
		C		0.000	0.000	0.000	0.000	0.00
L3	91.24-44.66	A	1.369	0.000	0.000	0.000	0.000	0.90
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	0.000	0.00
L4	44.66-0.00	A	1.222	0.000	0.000	0.000	0.000	0.86
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	159.08-139.33	0.000	0.000	0.000	0.000
L2	139.33-91.24	0.000	0.000	0.000	0.000
L3	91.24-44.66	0.000	0.000	0.000	0.000
L4	44.66-0.00	0.000	0.000	0.000	0.000

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
Level 159									
Platform Mount [LP 714-1]	C	None		0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.47 44.23 50.99 64.51	37.47 44.23 50.99 64.51	1.60 2.04 2.48 3.36
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 4.00	0.000	159.00	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 0.09
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 4.00	0.000	159.00	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 0.09
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 4.00	0.000	159.00	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 0.09
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
80010991 w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	0.13 0.22 0.33 0.57
80010991 w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	0.13 0.22 0.33 0.57
80010991 w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	0.13 0.22 0.33 0.57
80010965 w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice 1/2" Ice 1" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	0.13 0.22 0.33 0.57

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
80010965 w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.000	159.00	2" Ice			
						No Ice	14.05	7.63	0.13
						1/2"	14.69	8.90	0.22
						Ice	15.30	9.96	0.33
80010965 w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.000	159.00	1" Ice	16.53	11.92	0.57
						2" Ice			
						No Ice	14.05	7.63	0.13
						1/2"	14.69	8.90	0.22
(2) LGP21402	A	From Leg	4.00 0.00 4.00	0.000	159.00	Ice	15.30	9.96	0.33
						1" Ice	16.53	11.92	0.57
						2" Ice			
						No Ice	1.05	0.23	0.01
(2) LGP21402	B	From Leg	4.00 0.00 4.00	0.000	159.00	1/2"	1.18	0.30	0.02
						Ice	1.32	0.37	0.03
						1" Ice	1.62	0.55	0.05
						2" Ice			
(2) LGP21402	C	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice	1.05	0.23	0.01
						1/2"	1.18	0.30	0.02
						Ice	1.32	0.37	0.03
						1" Ice	1.62	0.55	0.05
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.000	159.00	2" Ice			
						No Ice	0.79	0.79	0.02
						1/2"	1.27	1.27	0.04
						Ice	1.45	1.45	0.05
RRUS 4415 B25	A	From Leg	4.00 0.00 4.00	0.000	159.00	1" Ice	1.83	1.83	0.10
						2" Ice			
						No Ice	1.64	0.68	0.04
						1/2"	1.80	0.79	0.06
RRUS 4415 B25	B	From Leg	4.00 0.00 4.00	0.000	159.00	Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
						2" Ice			
						No Ice	1.64	0.68	0.04
RRUS 4415 B25	C	From Leg	4.00 0.00 4.00	0.000	159.00	1/2"	1.80	0.79	0.06
						Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
						2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 4.00	0.000	159.00	No Ice	1.64	0.68	0.04
						1/2"	1.80	0.79	0.06
						Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 4.00	0.000	159.00	2" Ice			
						No Ice	1.97	1.41	0.07
						1/2"	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 4.00	0.000	159.00	1" Ice	2.72	2.07	0.16
						2" Ice			
						No Ice	1.97	1.41	0.07
						1/2"	2.14	1.56	0.09
RRUS 8843 B2/B66A	A	From Leg	4.00 0.00 4.00	0.000	159.00	Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
						2" Ice			
						No Ice	1.64	1.35	0.07
						1/2"	1.80	1.50	0.09
						Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
RRUS 8843 B2/B66A	B	From Leg	4.00	0.00	0.000	159.00	2" Ice			
							No Ice	1.64	1.35	0.07
							1/2"	1.80	1.50	0.09
							Ice	1.97	1.65	0.11
							1" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	C	From Leg	4.00	0.00	0.000	159.00	2" Ice			
							No Ice	1.64	1.35	0.07
							1/2"	1.80	1.50	0.09
							Ice	1.97	1.65	0.11
							1" Ice	2.32	1.99	0.16
DC6-48-60-18-8F	A	From Leg	4.00	0.00	0.000	159.00	2" Ice			
							No Ice	0.79	0.79	0.02
							1/2"	1.27	1.27	0.04
							Ice	1.45	1.45	0.05
							1" Ice	1.83	1.83	0.10
DC6-48-60-18-8F	B	From Leg	4.00	0.00	0.000	159.00	2" Ice			
							No Ice	0.79	0.79	0.02
							1/2"	1.27	1.27	0.04
							Ice	1.45	1.45	0.05
							1" Ice	1.83	1.83	0.10
Level 147 Sector Mount [SM 801-3]	C	None			0.000	147.00	No Ice	20.40	20.40	0.88
							1/2"	26.30	26.30	1.25
							Ice	32.20	32.20	1.63
							1" Ice	44.00	44.00	2.39
							2" Ice			
QUAD656C0000X w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	147.00	No Ice	13.48	7.33	0.08
							1/2"	14.10	8.55	0.17
							Ice	14.68	9.50	0.28
							1" Ice	15.87	11.38	0.51
							2" Ice			
QUAD656C0000X w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	147.00	No Ice	13.48	7.33	0.08
							1/2"	14.10	8.55	0.17
							Ice	14.68	9.50	0.28
							1" Ice	15.87	11.38	0.51
							2" Ice			
QUAD656C0000X w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	147.00	No Ice	13.48	7.33	0.08
							1/2"	14.10	8.55	0.17
							Ice	14.68	9.50	0.28
							1" Ice	15.87	11.38	0.51
							2" Ice			
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	147.00	No Ice	8.39	7.08	0.08
							1/2"	8.95	8.28	0.15
							Ice	9.48	9.19	0.22
							1" Ice	10.56	11.03	0.40
							2" Ice			
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	147.00	No Ice	8.39	7.08	0.08
							1/2"	8.95	8.28	0.15
							Ice	9.48	9.19	0.22
							1" Ice	10.56	11.03	0.40
							2" Ice			
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	147.00	No Ice	8.39	7.08	0.08
							1/2"	8.95	8.28	0.15
							Ice	9.48	9.19	0.22
							1" Ice	10.56	11.03	0.40
							2" Ice			
B66A RRH4X45	A	From Leg	4.00	0.00	0.000	147.00	No Ice	2.58	1.63	0.07
							1/2"	2.79	1.81	0.09
							Ice	3.01	2.00	0.11
							1" Ice	3.48	2.40	0.17
							2" Ice			
B66A RRH4X45	B	From Leg	4.00	0.00	0.000	147.00	No Ice	2.58	1.63	0.07
							1/2"	2.79	1.81	0.09
							Ice	3.01	2.00	0.11

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
B66A RRH4X45	C	From Leg	4.00	0.00	0.000	147.00	1" Ice	3.48	2.40	0.17
							2" Ice			
							No Ice	2.58	1.63	0.07
							1/2" Ice	2.79	1.81	0.09
							Ice	3.01	2.00	0.11
B13 RRH 4X30	A	From Leg	4.00	0.00	0.000	147.00	1" Ice	3.48	2.40	0.17
							2" Ice			
							No Ice	2.06	1.32	0.06
							1/2" Ice	2.24	1.48	0.07
							Ice	2.43	1.64	0.09
B13 RRH 4X30	B	From Leg	4.00	0.00	0.000	147.00	1" Ice	2.84	2.00	0.14
							2" Ice			
							No Ice	2.06	1.32	0.06
							1/2" Ice	2.24	1.48	0.07
							Ice	2.43	1.64	0.09
B13 RRH 4X30	C	From Leg	4.00	0.00	0.000	147.00	1" Ice	2.84	2.00	0.14
							2" Ice			
							No Ice	2.06	1.32	0.06
							1/2" Ice	2.24	1.48	0.07
							Ice	2.43	1.64	0.09
B25 RRH4X30	A	From Leg	4.00	0.00	0.000	147.00	1" Ice	3.01	2.50	0.16
							2" Ice			
							No Ice	2.20	1.74	0.06
							1/2" Ice	2.39	1.92	0.08
							Ice	2.59	2.11	0.10
B25 RRH4X30	B	From Leg	4.00	0.00	0.000	147.00	1" Ice	3.01	2.50	0.16
							2" Ice			
							No Ice	2.20	1.74	0.06
							1/2" Ice	2.39	1.92	0.08
							Ice	2.59	2.11	0.10
B25 RRH4X30	C	From Leg	4.00	0.00	0.000	147.00	1" Ice	3.01	2.50	0.16
							2" Ice			
							No Ice	2.20	1.74	0.06
							1/2" Ice	2.39	1.92	0.08
							Ice	2.59	2.11	0.10
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.00	0.000	147.00	1" Ice	5.93	2.81	0.21
							2" Ice			
							No Ice	4.80	2.00	0.04
							1/2" Ice	5.07	2.19	0.08
							Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	C	From Leg	4.00	0.00	0.000	147.00	1" Ice	5.93	2.81	0.21
							2" Ice			
							No Ice	4.80	2.00	0.04
							1/2" Ice	5.07	2.19	0.08
							Ice	5.35	2.39	0.12

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice

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

Maximum Member Forces

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	159.08 - 139.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.56	-0.32	-0.29
			Max. Mx	8	-7.04	-187.97	-0.06
			Max. My	14	-7.06	-0.09	-187.38
			Max. Vy	8	15.16	-187.97	-0.06
			Max. Vx	14	15.05	-0.09	-187.38
			Max. Torque	22			-0.33
L2	139.33 - 91.24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.50	-0.32	-0.29
			Max. Mx	8	-14.42	-977.12	-0.06
			Max. My	14	-14.43	-0.10	-971.15
			Max. Vy	8	19.36	-977.12	-0.06
			Max. Vx	14	19.24	-0.10	-971.15
			Max. Torque	17			0.21
L3	91.24 - 44.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.24	-0.32	-0.29
			Max. Mx	8	-26.51	-1956.99	-0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	44.66 - 0	Pole	Max. My	14	-26.51	-0.10	-1945.78
			Max. Vy	8	24.42	-1956.99	-0.07
			Max. Vx	14	24.31	-0.10	-1945.78
			Max. Torque	17			0.21
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.87	-0.32	-0.29
			Max. Mx	8	-45.15	-3365.20	-0.07
			Max. My	14	-45.15	-0.10	-3348.07
			Max. Vy	8	30.33	-3365.20	-0.07
			Max. Vx	14	30.22	-0.10	-3348.07
			Max. Torque	17			0.21

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	67.87	0.00	0.00
	Max. H _x	20	45.16	30.31	0.00
	Max. H _z	2	45.16	0.00	30.20
	Max. M _x	2	3347.94	0.00	30.20
	Max. M _z	8	3365.20	-30.31	0.00
	Max. Torsion	17	0.21	15.16	-26.15
	Min. Vert	17	33.87	15.16	-26.15
	Min. H _x	8	45.16	-30.31	0.00
	Min. H _z	14	45.16	0.00	-30.20
	Min. M _x	14	-3348.07	0.00	-30.20
	Min. M _z	20	-3364.99	30.31	0.00
	Min. Torsion	5	-0.20	-15.16	26.15

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	37.63	0.00	0.00	0.05	-0.08	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	45.16	0.00	-30.20	-3347.94	-0.10	0.17
0.9 Dead+1.0 Wind 0 deg - No Ice	33.87	0.00	-30.20	-3327.25	-0.08	0.17
1.2 Dead+1.0 Wind 30 deg - No Ice	45.16	15.16	-26.15	-2899.39	-1682.66	0.20
0.9 Dead+1.0 Wind 30 deg - No Ice	33.87	15.16	-26.15	-2881.47	-1672.23	0.20
1.2 Dead+1.0 Wind 60 deg - No Ice	45.16	26.25	-15.10	-1673.93	-2914.37	0.18
0.9 Dead+1.0 Wind 60 deg - No Ice	33.87	26.25	-15.10	-1663.59	-2896.31	0.18
1.2 Dead+1.0 Wind 90 deg - No Ice	45.16	30.31	0.00	0.07	-3365.20	0.11
0.9 Dead+1.0 Wind 90 deg - No Ice	33.87	30.31	0.00	0.05	-3344.36	0.11
1.2 Dead+1.0 Wind 120 deg - No Ice	45.16	26.25	15.10	1674.06	-2914.37	0.01
0.9 Dead+1.0 Wind 120 deg - No Ice	33.87	26.25	15.10	1663.69	-2896.31	0.01
1.2 Dead+1.0 Wind 150 deg - No Ice	45.16	15.16	26.15	2899.52	-1682.66	-0.10
0.9 Dead+1.0 Wind 150 deg - No Ice	33.87	15.16	26.15	2881.57	-1672.23	-0.09
1.2 Dead+1.0 Wind 180 deg	45.16	0.00	30.20	3348.07	-0.10	-0.17

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
- No Ice						
0.9 Dead+1.0 Wind 180 deg	33.87	0.00	30.20	3327.35	-0.08	-0.17
- No Ice						
1.2 Dead+1.0 Wind 210 deg	45.16	-15.16	26.15	2899.52	1682.46	-0.21
- No Ice						
0.9 Dead+1.0 Wind 210 deg	33.87	-15.16	26.15	2881.57	1672.07	-0.21
- No Ice						
1.2 Dead+1.0 Wind 240 deg	45.16	-26.25	15.10	1674.06	2914.16	-0.18
- No Ice						
0.9 Dead+1.0 Wind 240 deg	33.87	-26.25	15.10	1663.69	2896.16	-0.18
- No Ice						
1.2 Dead+1.0 Wind 270 deg	45.16	-30.31	0.00	0.07	3364.99	-0.11
- No Ice						
0.9 Dead+1.0 Wind 270 deg	33.87	-30.31	0.00	0.05	3344.20	-0.11
- No Ice						
1.2 Dead+1.0 Wind 300 deg	45.16	-26.25	-15.10	-1673.93	2914.16	-0.00
- No Ice						
0.9 Dead+1.0 Wind 300 deg	33.87	-26.25	-15.10	-1663.59	2896.16	-0.01
- No Ice						
1.2 Dead+1.0 Wind 330 deg	45.16	-15.16	-26.15	-2899.38	1682.46	0.10
- No Ice						
0.9 Dead+1.0 Wind 330 deg	33.87	-15.16	-26.15	-2881.47	1672.07	0.10
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	67.87	0.00	0.00	0.29	-0.32	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	67.87	0.00	-6.58	-715.42	-0.36	0.05
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	67.87	3.30	-5.70	-619.54	-359.54	0.03
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	67.87	5.72	-3.29	-357.55	-622.48	0.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	67.87	6.60	0.00	0.32	-718.71	-0.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	67.87	5.72	3.29	358.20	-622.48	-0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	67.87	3.30	5.70	620.19	-359.54	-0.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	67.87	0.00	6.58	716.07	-0.36	-0.05
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	67.87	-3.30	5.70	620.19	358.82	-0.04
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	67.87	-5.72	3.29	358.20	621.76	-0.01
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	67.87	-6.60	0.00	0.32	717.99	0.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	67.87	-5.72	-3.29	-357.55	621.76	0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	67.87	-3.30	-5.70	-619.54	358.82	0.05
Dead+Wind 0 deg - Service	37.63	0.00	-5.62	-620.66	-0.09	0.03
Dead+Wind 30 deg - Service	37.63	2.82	-4.87	-537.50	-312.03	0.04
Dead+Wind 60 deg - Service	37.63	4.88	-2.81	-310.30	-540.39	0.03
Dead+Wind 90 deg - Service	37.63	5.64	0.00	0.06	-623.97	0.02
Dead+Wind 120 deg - Service	37.63	4.88	2.81	310.41	-540.39	0.00
Dead+Wind 150 deg - Service	37.63	2.82	4.87	537.61	-312.03	-0.02
Dead+Wind 180 deg - Service	37.63	0.00	5.62	620.77	-0.09	-0.03
Dead+Wind 210 deg - Service	37.63	-2.82	4.87	537.61	311.86	-0.04
Dead+Wind 240 deg - Service	37.63	-4.88	2.81	310.41	540.22	-0.03
Dead+Wind 270 deg - Service	37.63	-5.64	0.00	0.06	623.80	-0.02
Dead+Wind 300 deg - Service	37.63	-4.88	-2.81	-310.30	540.22	-0.00
Dead+Wind 330 deg - Service	37.63	-2.82	-4.87	-537.50	311.86	0.02

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-37.63	0.00	0.00	37.63	0.00	0.000%
2	0.00	-45.16	-30.20	0.00	45.16	30.20	0.000%
3	0.00	-33.87	-30.20	0.00	33.87	30.20	0.000%
4	15.16	-45.16	-26.15	-15.16	45.16	26.15	0.000%
5	15.16	-33.87	-26.15	-15.16	33.87	26.15	0.000%
6	26.25	-45.16	-15.10	-26.25	45.16	15.10	0.000%
7	26.25	-33.87	-15.10	-26.25	33.87	15.10	0.000%
8	30.31	-45.16	0.00	-30.31	45.16	0.00	0.000%
9	30.31	-33.87	0.00	-30.31	33.87	0.00	0.000%
10	26.25	-45.16	15.10	-26.25	45.16	-15.10	0.000%
11	26.25	-33.87	15.10	-26.25	33.87	-15.10	0.000%
12	15.16	-45.16	26.15	-15.16	45.16	-26.15	0.000%
13	15.16	-33.87	26.15	-15.16	33.87	-26.15	0.000%
14	0.00	-45.16	30.20	0.00	45.16	-30.20	0.000%
15	0.00	-33.87	30.20	0.00	33.87	-30.20	0.000%
16	-15.16	-45.16	26.15	15.16	45.16	-26.15	0.000%
17	-15.16	-33.87	26.15	15.16	33.87	-26.15	0.000%
18	-26.25	-45.16	15.10	26.25	45.16	-15.10	0.000%
19	-26.25	-33.87	15.10	26.25	33.87	-15.10	0.000%
20	-30.31	-45.16	0.00	30.31	45.16	0.00	0.000%
21	-30.31	-33.87	0.00	30.31	33.87	0.00	0.000%
22	-26.25	-45.16	-15.10	26.25	45.16	15.10	0.000%
23	-26.25	-33.87	-15.10	26.25	33.87	15.10	0.000%
24	-15.16	-45.16	-26.15	15.16	45.16	26.15	0.000%
25	-15.16	-33.87	-26.15	15.16	33.87	26.15	0.000%
26	0.00	-67.87	0.00	0.00	67.87	0.00	0.000%
27	0.00	-67.87	-6.58	-0.00	67.87	6.58	0.000%
28	3.30	-67.87	-5.70	-3.30	67.87	5.70	0.000%
29	5.72	-67.87	-3.29	-5.72	67.87	3.29	0.000%
30	6.60	-67.87	0.00	-6.60	67.87	-0.00	0.000%
31	5.72	-67.87	3.29	-5.72	67.87	-3.29	0.000%
32	3.30	-67.87	5.70	-3.30	67.87	-5.70	0.000%
33	0.00	-67.87	6.58	-0.00	67.87	-6.58	0.000%
34	-3.30	-67.87	5.70	3.30	67.87	-5.70	0.000%
35	-5.72	-67.87	3.29	5.72	67.87	-3.29	0.000%
36	-6.60	-67.87	0.00	6.60	67.87	-0.00	0.000%
37	-5.72	-67.87	-3.29	5.72	67.87	3.29	0.000%
38	-3.30	-67.87	-5.70	3.30	67.87	5.70	0.000%
39	0.00	-37.63	-5.62	0.00	37.63	5.62	0.000%
40	2.82	-37.63	-4.87	-2.82	37.63	4.87	0.000%
41	4.88	-37.63	-2.81	-4.88	37.63	2.81	0.000%
42	5.64	-37.63	0.00	-5.64	37.63	0.00	0.000%
43	4.88	-37.63	2.81	-4.88	37.63	-2.81	0.000%
44	2.82	-37.63	4.87	-2.82	37.63	-4.87	0.000%
45	0.00	-37.63	5.62	0.00	37.63	-5.62	0.000%
46	-2.82	-37.63	4.87	2.82	37.63	-4.87	0.000%
47	-4.88	-37.63	2.81	4.88	37.63	-2.81	0.000%
48	-5.64	-37.63	0.00	5.64	37.63	0.00	0.000%
49	-4.88	-37.63	-2.81	4.88	37.63	2.81	0.000%
50	-2.82	-37.63	-4.87	2.82	37.63	4.87	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00007762
3	Yes	4	0.00000001	0.00004460
4	Yes	5	0.00000001	0.00015522
5	Yes	5	0.00000001	0.00006681
6	Yes	5	0.00000001	0.00015357
7	Yes	5	0.00000001	0.00006597
8	Yes	4	0.00000001	0.00005125
9	Yes	4	0.00000001	0.00002627

10	Yes	5	0.00000001	0.00015404
11	Yes	5	0.00000001	0.00006621
12	Yes	5	0.00000001	0.00015493
13	Yes	5	0.00000001	0.00006666
14	Yes	4	0.00000001	0.00007760
15	Yes	4	0.00000001	0.00004460
16	Yes	5	0.00000001	0.00015304
17	Yes	5	0.00000001	0.00006576
18	Yes	5	0.00000001	0.00015504
19	Yes	5	0.00000001	0.00006670
20	Yes	4	0.00000001	0.00005124
21	Yes	4	0.00000001	0.00002627
22	Yes	5	0.00000001	0.00015457
23	Yes	5	0.00000001	0.00006646
24	Yes	5	0.00000001	0.00015331
25	Yes	5	0.00000001	0.00006591
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00091866
28	Yes	5	0.00000001	0.00007047
29	Yes	5	0.00000001	0.00007056
30	Yes	4	0.00000001	0.00092482
31	Yes	5	0.00000001	0.00007062
32	Yes	5	0.00000001	0.00007067
33	Yes	4	0.00000001	0.00092073
34	Yes	5	0.00000001	0.00007032
35	Yes	5	0.00000001	0.00007046
36	Yes	4	0.00000001	0.00092194
37	Yes	5	0.00000001	0.00007041
38	Yes	5	0.00000001	0.00007013
39	Yes	4	0.00000001	0.00000866
40	Yes	4	0.00000001	0.00004992
41	Yes	4	0.00000001	0.00004800
42	Yes	4	0.00000001	0.00000836
43	Yes	4	0.00000001	0.00004856
44	Yes	4	0.00000001	0.00004963
45	Yes	4	0.00000001	0.00000866
46	Yes	4	0.00000001	0.00004754
47	Yes	4	0.00000001	0.00004962
48	Yes	4	0.00000001	0.00000835
49	Yes	4	0.00000001	0.00004903
50	Yes	4	0.00000001	0.00004779

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	159.08 - 139.33	13.09	42	0.909	0.001
L2	142.34 - 91.24	10.07	42	0.794	0.000
L3	96.3 - 44.66	4.11	42	0.437	0.000
L4	51.49 - 0	1.10	42	0.202	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	Platform Mount [LP 714-1]	42	13.08	0.908	0.001	20400
147.00	Sector Mount [SM 801-3]	42	10.88	0.827	0.000	8444

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	159.08 - 139.33	70.61	8	4.900	0.003
L2	142.34 - 91.24	54.33	8	4.286	0.001
L3	96.3 - 44.66	22.17	8	2.360	0.000
L4	51.49 - 0	5.94	8	1.089	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	Platform Mount [LP 714-1]	8	70.53	4.897	0.003	3836
147.00	Sector Mount [SM 801-3]	8	58.69	4.464	0.002	1587

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	159.08 - 139.33 (1)	TP24.1x18.43x0.188	19.75	0.00	0.0	13.717	-7.04	802.42	0.009
L2	139.33 - 91.24 (2)	TP40.49x22.861x0.313	51.10	0.00	0.0	38.120	-14.42	2230.00	0.006
L3	91.24 - 44.66 (3)	TP54.61x38.119x0.375	51.64	0.00	0.0	61.957	-26.51	3624.49	0.007
L4	44.66 - 0 (4)	TP69.47x51.679x0.375	51.49	0.00	0.0	82.240	-45.15	4743.50	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	159.08 - 139.33 (1)	TP24.1x18.43x0.188	187.97	449.12	0.419	0.00	449.12	0.000
L2	139.33 - 91.24 (2)	TP40.49x22.861x0.313	977.12	2080.90	0.470	0.00	2080.90	0.000
L3	91.24 - 44.66 (3)	TP54.61x38.119x0.375	1956.98	4389.49	0.446	0.00	4389.49	0.000
L4	44.66 - 0 (4)	TP69.47x51.679x0.375	3365.20	6755.96	0.498	0.00	6755.96	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u kip-ft	φT _n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	159.08 -	TP24.1x18.43x0.188	15.16	240.73	0.063	0.11	485.90	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	139.33 (1) 139.33 - 91.24 (2)	TP40.49x22.861x0.313	19.36	669.00	0.029	0.11	2251.63	0.000
L3	91.24 - 44.66 (3)	TP54.61x38.119x0.375	24.42	1087.35	0.022	0.11	4956.81	0.000
L4	44.66 - 0 (4)	TP69.47x51.679x0.375	30.33	1443.32	0.021	0.11	8733.50	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	159.08 - 139.33 (1)	0.009	0.419	0.000	0.063	0.000	0.431	1.050	4.8.2
L2	139.33 - 91.24 (2)	0.006	0.470	0.000	0.029	0.000	0.477	1.050	4.8.2
L3	91.24 - 44.66 (3)	0.007	0.446	0.000	0.022	0.000	0.454	1.050	4.8.2
L4	44.66 - 0 (4)	0.010	0.498	0.000	0.021	0.000	0.508	1.050	4.8.2

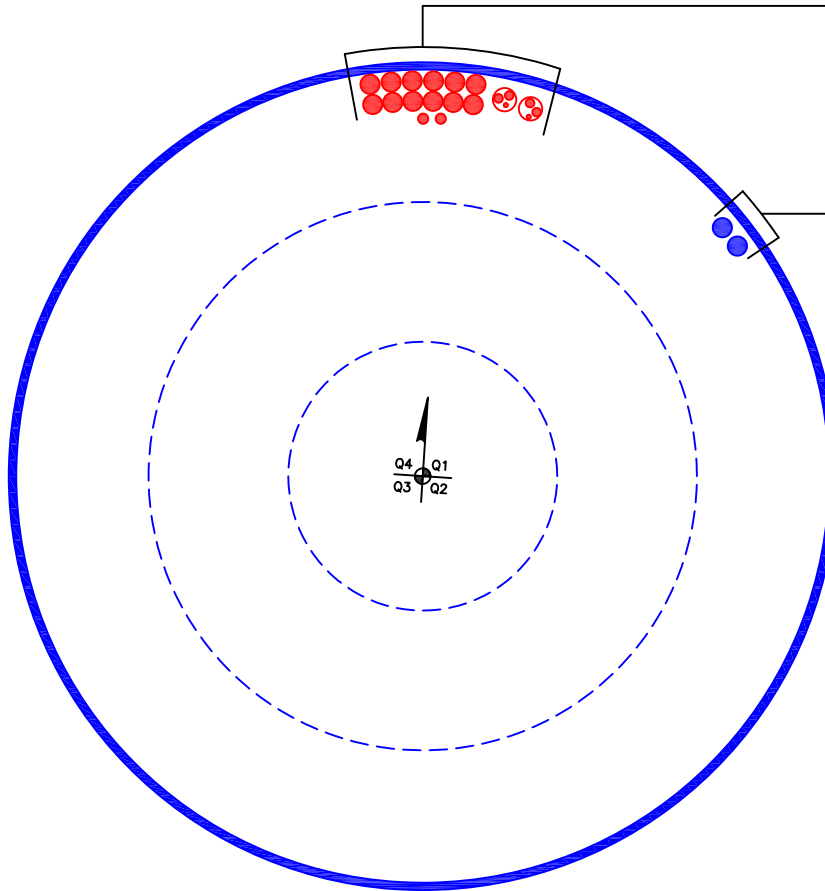
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	159.08 - 139.33	Pole	TP24.1x18.43x0.188	1	-7.04	842.55	41.1	Pass
L2	139.33 - 91.24	Pole	TP40.49x22.861x0.313	2	-14.42	2341.50	45.4	Pass
L3	91.24 - 44.66	Pole	TP54.61x38.119x0.375	3	-26.51	3805.71	43.2	Pass
L4	44.66 - 0	Pole	TP69.47x51.679x0.375	4	-45.15	4980.67	48.4	Pass
Summary								
Pole (L4)							48.4	Pass
RATING =							48.4	Pass

APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION—IN (2) 2"
CONDUITS)
(2) 3/8" TO 159 FT LEVEL
(4) 3/4" TO 159 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(2) 7/8" TO 159 FT LEVEL
(12) 1-5/8" TO 159 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(2) 1-5/8" TO 147 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

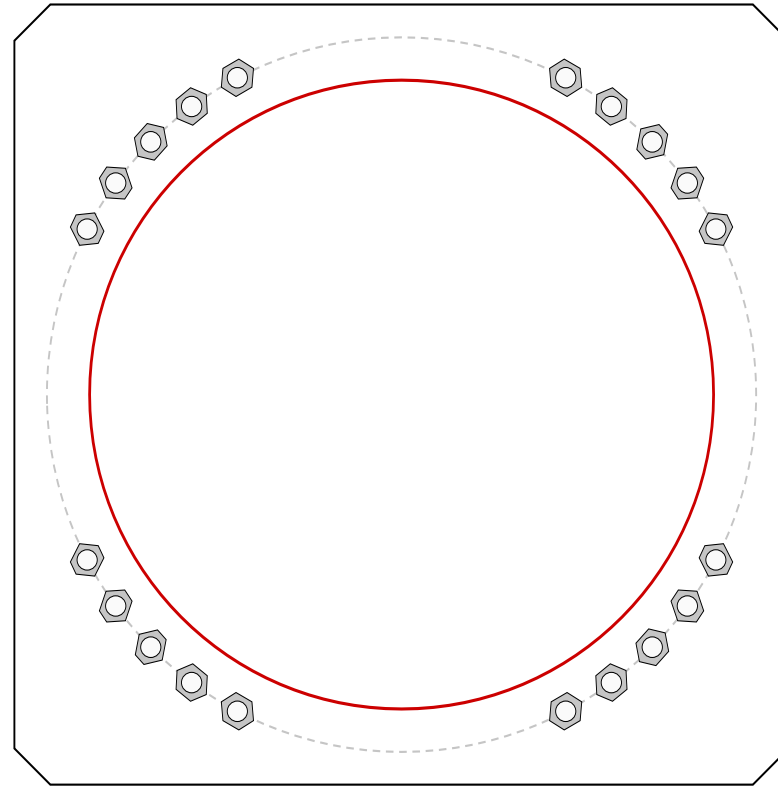


Site Info	
BU #	857011
Site Name	brook North Horse Hill
Order #	475297 Rev 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.5

Applied Loads	
Moment (kip-ft)	3365.20
Axial Force (kips)	45.15
Shear Force (kips)	30.33

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(20) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 78.97" BC
Base Plate Data
86.21" OD x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi)
Stiffener Data
N/A
Pole Data
69.47" x 0.375" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$P_{u_c} = 104.5$	$\phi P_{n_c} = 243.75$	Stress Rating
$V_u = 1.52$	$\phi V_n = 73.13$	43.3%
$M_u = 2.46$	$\phi M_n = 94.7$	Pass
Base Plate Summary		
Max Stress (ksi):	16.69	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	35.3%	Pass

Pier and Pad Foundation



BU #: 857011
 Site Name: Westbrook North H
 App. Number: 475297 Rev 0

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	45	kips
Base Shear, Vu_{comp} :	30	kips
Moment, M_u :	3365	ft-kips
Tower Height, H :	159	ft
BP Dist. Above Fdn, bp_{dist} :	4.75	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	439.74	30.00	6.5%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	2.10	22.2%	Pass
<i>Overtuning (kip*ft)</i>	11600.20	3631.88	31.3%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	11967.50	3530.00	28.1%	Pass
<i>Pier Compression (kip)</i>	38666.16	125.19	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	3023.23	1070.48	33.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	864.26	159.66	17.6%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.027	15.7%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3793.12	2118.00	53.2%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	9	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	74	
Pier Tie/Spiral Size, St :	3	
Pier Tie/Spiral Quantity, mt :	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	31.3%
Structural Rating*:	53.2%

Pad Properties		
Depth, D :	8	ft
Pad Width, W :	28	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom), Sp :	9	
Pad Rebar Quantity (Bottom), mp :	22	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60000	psi
Concrete Compressive Strength, $F'c$:	3000	psi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	130	pcf
Ultimate Gross Bearing, $Qult$:	12.000	ksf
Cohesion, Cu :	0.000	ksf
Friction Angle, ϕ :	38	degrees
SPT Blow Count, N_{blows} :	35	
Base Friction, μ :	0.35	
Neglected Depth, N :	5.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

<--Toggle between Gross and Net



BU: 857011
 WO: 1683888
 Order: 475297

Structure: A
 Rev: 0

Location

	Decimal Degrees	Deg	Min	Sec	
Lat:	41.323808	+	41	19	25.71
Long:	-72.491139	-	72	29	28.10

Code and Site Parameters

Seismic Design Code:	TIA-222-H*	
Site Soil:	D	Dense Soil/Soft Rock
Risk Category:	II	
<u>USGS Seismic Reference</u>		
S _s :	0.1670	g
S ₁ :	0.0590	g
T _L :	6	s

Seismic Design Category Determination

Importance Factor, I _e :	1
Acceleration-based site coefficient, F _a :	1.6000
Velocity-based site coefficient, F _v :	2.4000
Design spectral response acceleration short period, S _{DS} :	0.1781 g
Design spectral response acceleration 1 s period, S _{D1} :	0.0944 g
Seismic Design Category Based on S _{DS} :	B
Seismic Design Category Based on S _{D1} :	B
Seismic Design Category Based on S ₁ :	N/A
Controlling Seismic Design Category:	B

*Using ASCE 7-10 Seismic Parameters