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

8/31/2018

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

RE: **Notice of Exempt Modification for T-Mobile Crown Site BU: 841290**
T-Mobile Site ID: CT11069A
363 Riversville Road, Greenwich, CT 06831
Latitude: 41° 3′ 58.60″/ Longitude: -73° 40′ 17.40″

Dear Ms. Bachman:

T-Mobile currently maintains 9 antennas at the 165 foot level of the existing 160-foot monopole Tower at 363 Riversville Road, Greenwich, CT 06831. The tower is owned by Crown Castle. The property is owned by Greenwich Council Boy Scouts of America. T-Mobile intends to replace (6) existing panel antennas with (6) proposed panel antennas and to swap out (3) remote radio units, add (2) hybrid fiber lines and to remove (2) line of coax.

This facility was approved by the Town of Greenwich on July 9, 1985. There is no copy available of the original approval. Email attached from the Town of Greenwich confirms this.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Peter J. Tesei – First Selectman, Diane Fox – Town Planner, as well as the property owner, and Crown Castle as the tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

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

Attachments:

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

cc:

Mr. Peter J. Tesei
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

Diane Planning and Zoning
Town Planner
101 Field Point Road
Greenwich, CT 06830

Greenwich Council Boy Scouts of America
63 Mason Street
Greenwich, CT 06830

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

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ORIGIN ID:GFLA (518) 373-3547
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 31AUG18
ACTWGT: 3.00 LB
CAD: 104924194/INET4040

BILL SENDER

TO DIANE FOX
ZONING AND PLANNING
101 FIELD POINT ROAD
GREENWICH CT 06830
(203) 307-3261
INV:
PO:
REF: 1734.7680
DEPT:

552J1/3309/DCA5

J182118081601uv

FedEx Express

TUE - 04 SEP 3:00P
STANDARD OVERNIGHT

TRK# 0201 7731 1645 7636

ST CTXA

06830
CT-US SWF

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ORIGIN ID:GFLA (518) 373-3547
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 31AUG18
ACTWGT: 3.00 LB
CAD: 104924194/INET4040

BILL SENDER

TO **PETER J. TESEI**
TOWN OF GREENWICH
101 FIELD POINT ROAD

GREENWICH CT 06830
(203) 307-3261
INV:
PO:
REF: 1734.7680
DEPT:

552J1/3309/DCA5

J182118C81501uv

FedEx Express

TUE - 04 SEP 3:00P
STANDARD OVERNIGHT

TRK# 0201 **7731 1633 3772**

ST CTXA

06830
CT-US **SWF**

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Terry, Dashanna

From: Patrick LaRow <Patrick.LaRow@greenwichct.org>
Sent: Thursday, January 21, 2016 12:08 PM
To: Terry, Dashanna
Cc: Barbadora, Jeff
Subject: Re: Zoning Documents - Tower at 363 Riversville Road

The Planning and Zoning office does not have any documents related to a telecommunications facility at this address.

Patrick LaRow, AICP
Deputy Director / Assistant Town Planner

Town of Greenwich
Planning and Zoning
101 Field Point Road
Greenwich, CT 06830

Phone: (203) 622-7894 Fax: (203) 622-3795
Patrick.LaRow@greenwichct.org

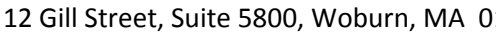
From: "Terry, Dashanna" <Dashanna.Terry@crowncastle.com>
To: "patrick.larow@greenwichct.org" <patrick.larow@greenwichct.org>
Cc: "Barbadora, Jeff" <Jeff.Barbadora@crowncastle.com>
Date: 01/21/2016 10:29 AM
Subject:Zoning Documents - Tower at 363 Riversville Road

Hello Patrick,

Thank you for speaking with me this morning regarding zoning documents for the tower at 363 Riversville Road. Could you please confirm here that you do not have original zoning documents for this tower?

Best,
Dashanna

DASHANNA TERRY
Real Estate Project Coordinator
T: (781) 970-0067| M: (571) 241-0984



12 Gill Street, Suite 5800, Woburn, MA 01801 Crowncastle.com

Headquarters	Greenwich, Connecticut
Country	United States
Founded	1912
Website	reenwichscouting.org

Greenwich Council: Camps

It owns and operates the Ernest Thompson Seton Scout Reservation, a 249-acre (1.01 km) camp located off 363 Riversville Road in Greenwich and named for Ernest Thompson Seton.

Greenwich Council: Order of the Arrow

Achewon Netopalis Lodge No. 427 is the Order of the Arrow lodge for the Greenwich Council. The lodge's name translates to "Spiritual Warrior" in the Algonquian language. The lodge totem is a green witch. Founded in 1949, it is still in existence. In 1977, the lodge received the E. Urner Goodman Award for its effectiveness in promoting and increasing Scout camping in its council.

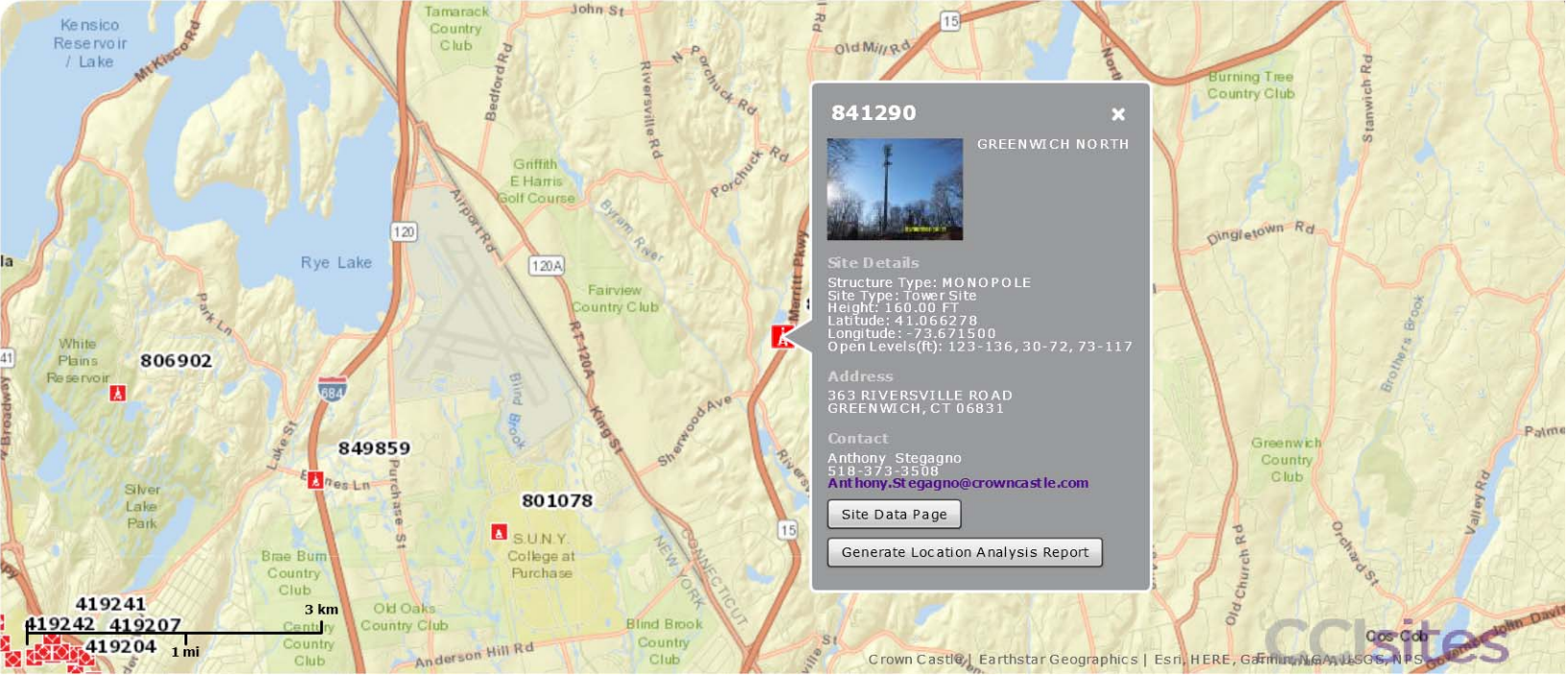
Greenwich Council: See also

- Scouting in Connecticut

Greenwich Council: References

Boy Scouts of America Organization

- Boy Scouts of America
- Cub Scouting
- Boy Scouting
- Varsity Scouting
- Venturing
- Sea Scouting
- Order of the Arrow
- National Eagle Scout Association
- Learning for Life
- Exploring


841290
GREENWICH NORTH
Site Details
Structure Type: MONOPOLE
Site Type: Tower Site
Height: 160.00 FT
Latitude: 41.066278
Longitude: -73.671500
Open Levels(ft): 123-136, 30-72, 73-117
Address
363 RIVERSVILLE ROAD
GREENWICH, CT 06831
Contact
Anthony Stegagno
518-373-3508
Anthony.Stegagno@crowncastle.com
Site Data Page
Generate Location Analysis Report
806902
849859
801078
419241
419242
419207
419204
3 km
1 mi
Rye Lake
Kensico Reservoir / Lake
White Plains Reservoir
Silver Lake Park
Fairview Country Club
Griffith E Harris Golf Course
Tamarack Country Club
Brae Burn Country Club
Old Oaks Country Club
Century Country Club
Blind Brook Country Club
Burning Tree Country Club
Greenwich Country Club
S.U.N.Y. College at Purchase
Crown Castle | Earthstar Geographics | Esri, HERE, Garmin, NGA, USGS, NPS

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE PAGE
N1	NOTES
C1	PLAN & ELEVATION
C2	RF CHART AND ORIENTATION
D1	EQUIPMENT DETAILS
E1	GROUNDING DIAGRAM
E2	RF PLUMBING DIAGRAM

TOWER OWNER NOTIFICATION

ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

T-Mobile

CROWN CASTLE

CBU

841290

SITE ID

CT11069A

SITE NAME

GREENWICH/BOY SCOUTS-2

SITE ADDRESS

363 RIVERSVILLE ROAD. BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

CONFIGURATION

67D92DB_2xAIR+1OP

PROJECT SITE INFORMATION

SITE ID:	CT11069A	
SITE NAME:	GREENWICH/BOY SCOUTS-2	
SITE ADDRESS:	363 RIVERSVILLE ROAD GREENWICH, CT 06831	
PERMITTING JURISDICTION:	TOWN OF GREENWICH	
COUNTY:	FAIRFIELD COUNTY	
ZONING:	CSC	
SITE COORDINATES: LATITUDE:	41.066244°	(NAD 83)
LONGITUDE:	-73.671479°	(NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088	

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING **TOWER** FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS FROM TOWER OWNER PRIOR TO ANY CONSTRUCTION.

ANTENNA MOUNTS

BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY ENGINEERING, PLC** DATED **07/19/2018.** THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
CLIENT REP. CONTACT:	WILL STONE (518) 373-3543
ENGINEER:	INFINIGY 6865 DEERPATH ROAD SUITE 152 ELKRIDGE, MD 21075
ENGINEER CONTACT:	MATTHEW LIVERETTE (518) 690-0790

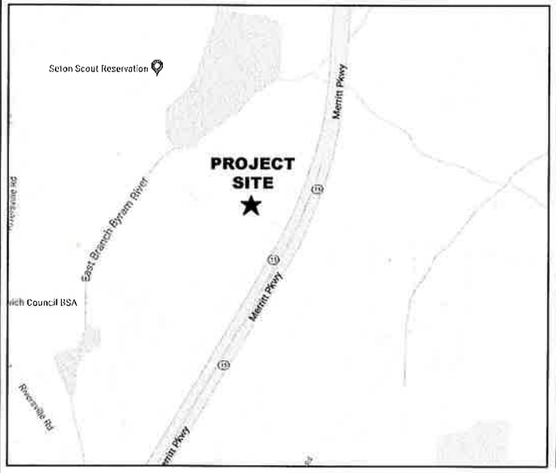
SCOPE OF WORK

SCOPE OF WORK:
TMO L700 67D92DB (UPSTATE NY MARKET)
REPLACING (6) EXISTING ANTENNAS AND (3) RRUS WITH NEW MODELS.
ADDING (6) NEW ANTENNAS (2) HYBRID FIBER CABLE AND (3) RRUS.
REMOVE (2) COAX CABLES.

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR
www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR-1275
- ANSI T1.311

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

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
AUG 08 2018

No.	Submittal / Revision	Appv.	Date
0	ISSUED FOR CONSTRUCTION	RWF	08/06/18
A	ISSUED FOR REVIEW	SL	07/31/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title: CT11069A
GREENWICH/BOY SCOUTS-2
363 RIVERSVILLE ROAD.
BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

Prepared For: CROWN CASTLE

Drawing Title: **TITLE PAGE**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: T-MOBILE CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE T-MOBILE WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY T-MOBILE TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR T-MOBILE PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO T-MOBILE OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
E	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
AUG 08 2018

No	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	RWF	08/06/18
A	ISSUED FOR REVIEW	SL	07/31/18

Drawn: RCD
Designed: MSL
Checked: AJD

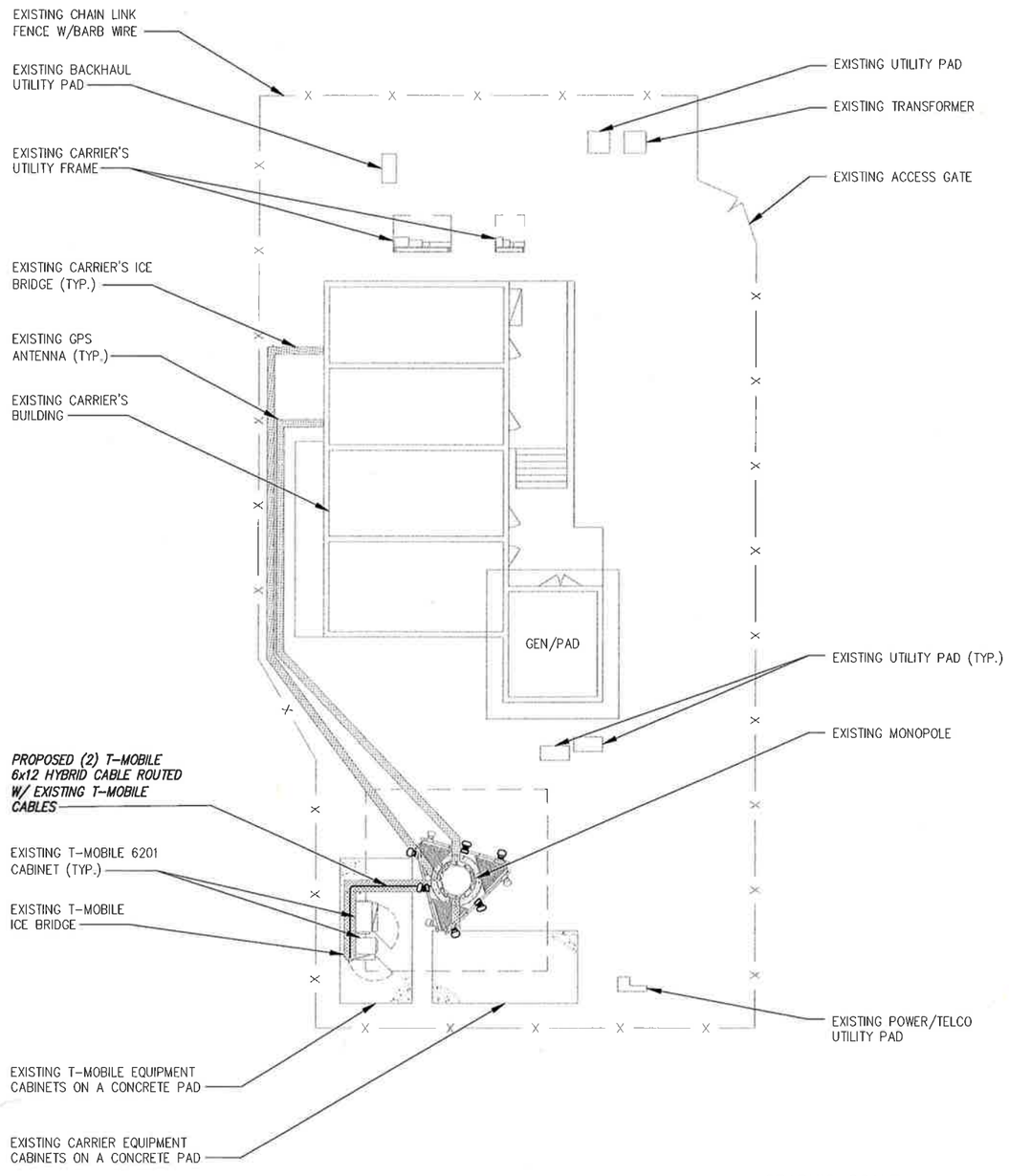
Project Number: 600-007

Project Title:
CT11069A
GREENWICH/BOY SCOUTS-2
363 RIVERSVILLE ROAD
BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

Prepared For: CROWN CASTLE

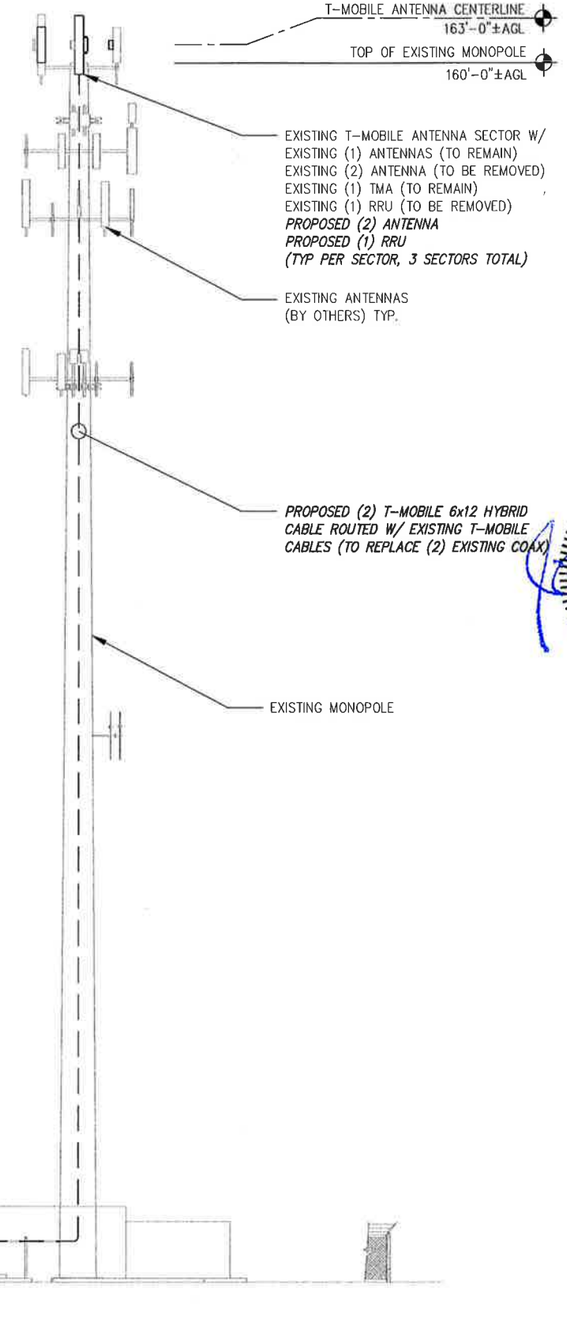
Drawing Title
NOTES

Drawing Number
N1



1 C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:
20' 10' 0 10' 20'
SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"



2 C1 ELEVATION
SCALE: NOT TO SCALE

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Prepared For:
CROWN CASTLE

Drawing Title
PLAN AND ELEVATION

Drawing Number
C1

SECTOR	ANTENNA POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA/RRU MODEL #	CABLE LENGTH	CABLE TYPE AND QUANTITY
ALPHA	A-1	AIR21 B2A/B4P	ERICSSON	40°	0	TBD	163'-0"	(1) TWIN 1B AWS	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	A-2	**APXVA_43_U_NA20**	**RFS**	**40°**	0	TBD	163'-0"	**4449 B71+B12**	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	A-3	**AIR32 B66A/B2A**	**ERICSSON**	**40°**	0	TBD	163'-0"	-	**183'±**	**(1) 6X12 HCS TRUNK (SHARED)**
BETA	B-1	AIR21 B2A/B4P	ERICSSON	185°	0	TBD	163'-0"	(1) TWIN 1B AWS	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	B-2	**APXVA_43_U_NA20**	**RFS**	**185°**	0	TBD	163'-0"	**4449 B71+B12**	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	B-3	**AIR32 B66A/B2A**	**ERICSSON**	**185°**	0	TBD	163'-0"	-	**183'±**	**(1) 6X12 HCS TRUNK (SHARED)**
GAMMA	C-1	AIR21 B2A/B4P	ERICSSON	310°	0	TBD	163'-0"	(1) TWIN 1B AWS	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	C-2	**APXVA_43_U_NA20**	**RFS**	**310°**	0	TBD	163'-0"	**4449 B71+B12**	**183'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)** (2) 1-5/8" COAX
	C-3	**AIR32 B66A/B2A**	**ERICSSON**	**310°**	0	TBD	163'-0"	-	**183'±**	**(1) 6X12 HCS TRUNK (SHARED)**

1 / C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

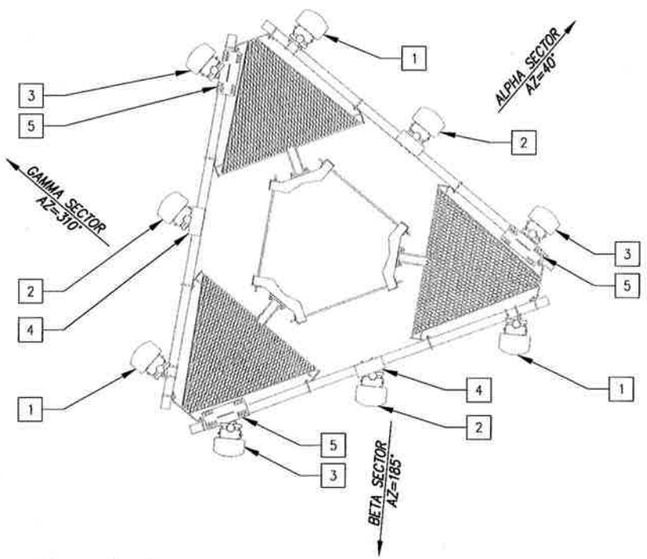
#1 #2 #3

GENERAL NOTES:

1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS FOR ANY PROPOSED CABLES/JUMPERS PRIOR TO CONSTRUCTION.

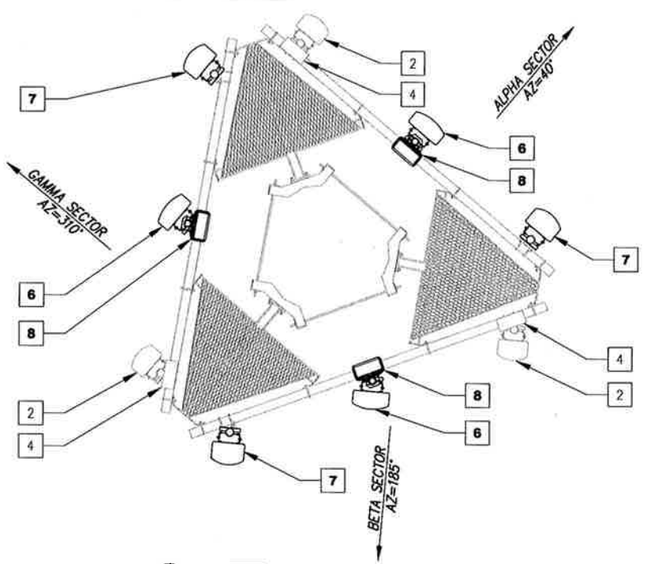
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	AIR21_B2P_B4A	ANTENNA	3	REMOVED
2	AIR21_B2A_B4P	ANTENNA	3	RELOCATED
3	LNX-6515DS-A1M	ANTENNA	3	REMOVED
4	TWIN 1B AWS	TMA	3	RELOCATED
5	RRUS11 B12	RRU	3	REMOVED
6	**APXVA_43_U_NA20**	**ANTENNA**	**3**	**PROPOSED**
7	**AIR32 B66A/B2A**	**ANTENNA**	**3**	**PROPOSED**
8	**4449 B71+B12**	**RRU**	**3**	**PROPOSED**



NORTH

2 / C2 EXISTING ANTENNA ORIENTATION
SCALE: NOT TO SCALE



NORTH

3 / C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER
08/06/2018

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0	ISSUED FOR CONSTRUCTION	RWF	08/06/18
A	ISSUED FOR REVIEW	SL	07/31/18

Drawn: RCD
Designed: MRL
Checked: AJD

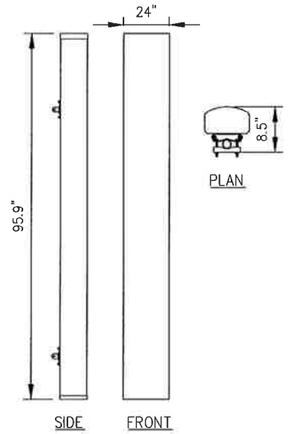
Project Number: 600-007

Project Title:
CT11069A
GREENWICH/BOY SCOUTS-2
363 RIVERSVILLE ROAD.
BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

Prepared For:
CROWN CASTLE

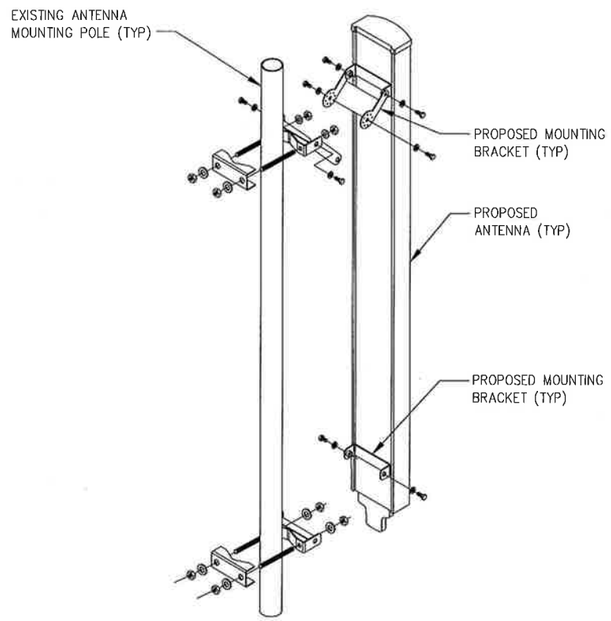
Drawing Title
RF CHART

Drawing Number
C2

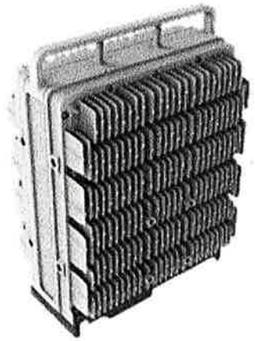


RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.5"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1/D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE



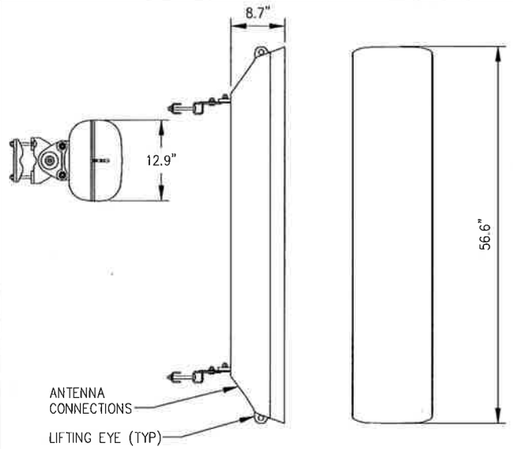
2/D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



ERICSSON 4449 B71+B12 SPECIFICATIONS

- HxWxD, (INCHES) : 17.91"x13.19"x10.63"
- WEIGHT (LBS) : 74.96
- COLOR : GRAY

3/D1 4449 B71+B12 RRU DETAIL
SCALE: NOT TO SCALE



ERICSSON MODEL NO.:	AIR32 B66 B2A
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	56.6"x12.9"x8.7"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	132.2 LBS

4/D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE

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Designed: MRL
Checked: AJD

Project Number: 800-007

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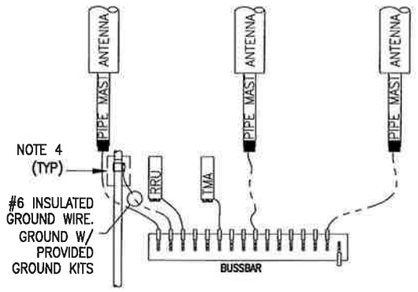
363 RIVERSVILLE ROAD.
BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

Prepared For: CROWN CASTLE

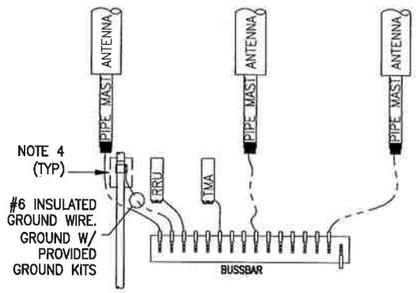
Drawing Title
EQUIPMENT DETAILS

Drawing Number
D1

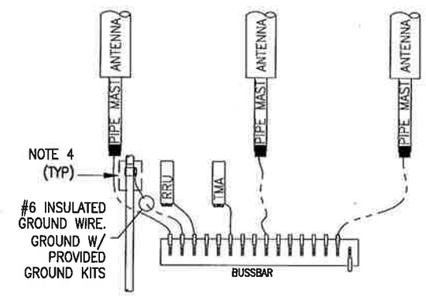
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

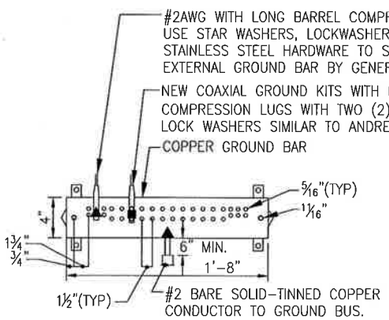


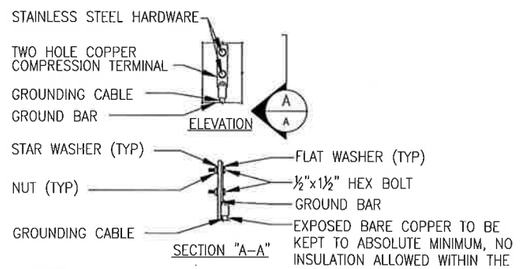
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



NOTES:
1. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
2. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
3. PROVIDE SOLID TINNED BARE COPPER WIRE (BCW) GROUNDING CONDUCTOR.
4. PROVIDE STANDARD COAX OR HYBRID CABLE GROUNDING KIT OR FIELD FABRICATE TO SUIT CONDITIONS. TOTAL LENGTH OF GROUNDING CONDUCTOR SHALL NOT EXCEED 10'-0".
5. PROVIDE GROUNDING ELECTRODES QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
6. LEAVE GROUND WIRE COILED UP ABOVE GRADE. CAP END OF CONDUIT.
7. ADD COAX OR HYBRID CABLE GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF CABLE TRAY (FROM TOWER OR MONOPOLE TO EQUIPMENT) IS GREATER THAN 20'-0".
8. ADD #2/0 GREEN INSULATED CONDUCTOR BETWEEN CABLE TRAY AND GRIPSTRUT/COVER.
9. BUSSBARS ARE TO BE TINNED COPPER BARS (¼"X2"X12") MOUNTED ON INSULATORS, U.O.N.
10. GROUND ALL PROPOSED ANTENNAS, DIPLEXERS, TMAS, AND RRUS PER MANU. SPECS.

1 / E1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE

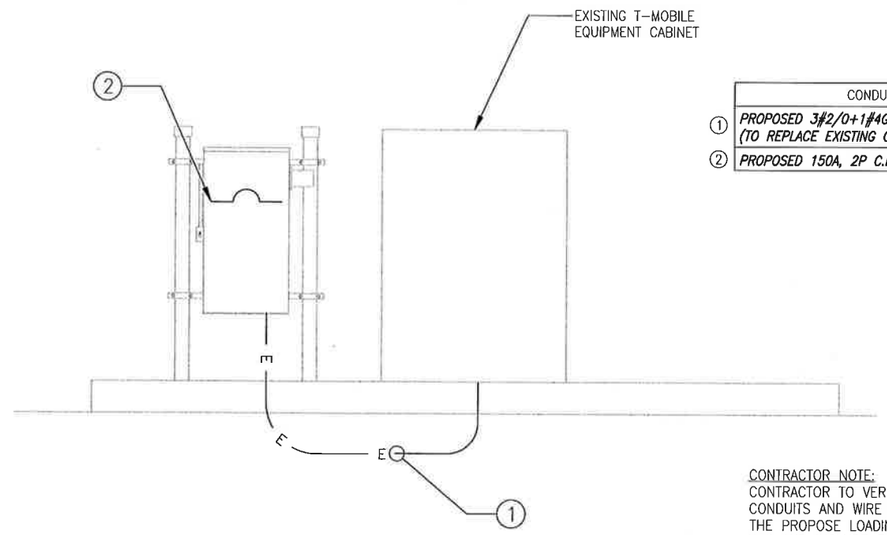




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

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

2 / E1 GROUND BAR CONNECTION DETAIL
SCALE: NOT TO SCALE



CONDUIT SCHEDULE
① *PROPOSED 3#2/0+1#4G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)*
② *PROPOSED 150A, 2P C.B.*

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

3 / E1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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Prepared For:
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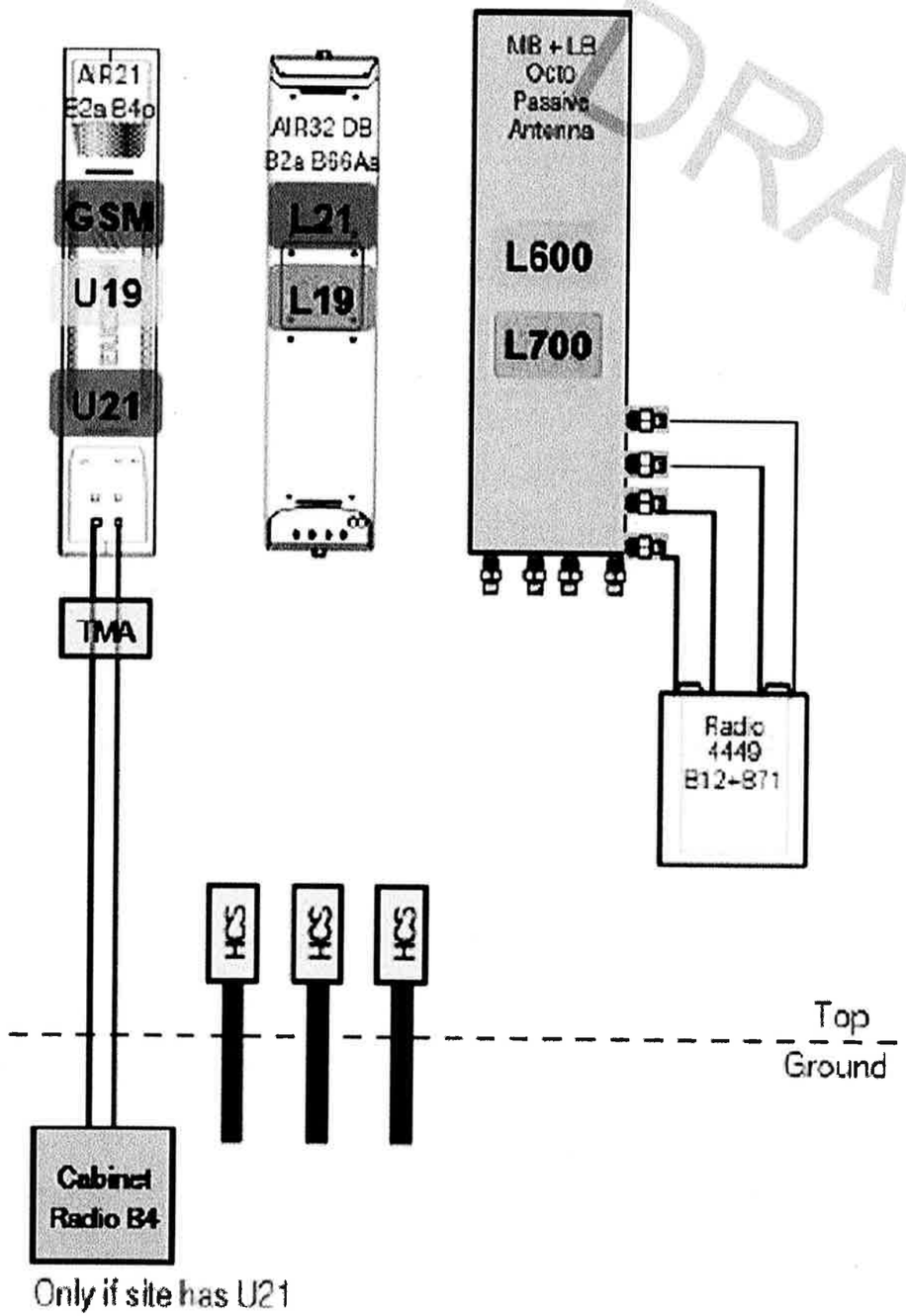
Drawing Title
RISER AND ONE-LINE DIAGRAMS

Drawing Number
E1

COPY/PASTE THE PLUMBING DIAGRAM OUT OF THE RFDS UNDER SECTION 3 "PROPOSED TEMPLATE IMAGES"



1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

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

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
AUG 08 2018

No	Submittal / Revision	Appr	Date
0	ISSUED FOR CONSTRUCTION	RWF	08/06/18
A	ISSUED FOR REVIEW	SL	07/31/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11069A
GREENWICH/BOY SCOUTS-2
363 RIVERSVILLE ROAD.
BOY SCOUTS OF AMERICA
GREENWICH, CT 06831

Prepared For: CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

Date: **August 02, 2018**

Charles Trask
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11069A
Crown Castle Designation:	**Crown Castle BU Number:**	841290
	Crown Castle Site Name:	GREENWICH NORTH
	Crown Castle JDE Job Number:	515659
	Crown Castle Work Order Number:	1600451
	Crown Castle Application Number:	447817 Rev. 0
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:** 1600451	
Site Data:	**363 RIVERSVILLE ROAD, GREENWICH, Fairfield County, CT** **Latitude *41° 3' 58.6"*, Longitude *-73° 40' 17.4"*** **160 Foot - Monopole Tower**	

Dear Charles Trask,

Jacobs Engineering Group, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the *Crown Castle* Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1228789, in accordance with application 447817, revision 0.

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: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

Jacobs Engineering Group, Inc. appreciates the opportunity to provide continuing professional services to you and *Crown Castle*. If you have any questions or need further assistance on this or any other projects, please give us a call.

Structural analysis prepared by:

Don Martin Serrano
Structural Engineer

Engineer of Record:

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

Paul L. Mucci P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in April of 2003. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	2	1-3/8	-
		3	ericsson	RADIO 4449 B12/B71			
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	2	1-5/8	3
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	1-5/8	1
		3	rfs celwave	ATMAA1412D-1A20			
	160.0	1	tower mounts	Platform Mount [LP 1201-1]			
153.0	153.0	3	ericsson	RRUS 11	-	-	1
		3	ericsson	RRUS 32 B2			
		1	tower mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	152.0	1	tower mounts	HRK-14 Handrail Kit	2 4	3/8 3/4	2
	149.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe			
		3	ericsson	RADIO 4426			
		3	ericsson	RRUS 32			
		3	kaelus	DBC0061F1V51-2			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8C			
		1	raycap	DC6-48-60-18-8F			
		3	powerwave technologies	7770.00 w/ Mount Pipe	12	1-5/8	1
		12	powerwave technologies	LGP21401			
		1	tower mounts	Platform Mount [LP 1201-1]			
140.0	142.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8	2
		3	alcatel lucent	RRH2X60-AWS			
		3	amphenol	QUAD656C0000G w/ Mount Pipe			
		3	amphenol	WWX063X19G00 w/ Mount Pipe			
		1	commscope	RC2DC-3315-PF-48			
		3	amphenol	WWX063X19G00 w/ Mount Pipe	18	1-5/8	1
		3	alcatel lucent	RRH2X60-PCS			
		1	commscope	RC2DC-3315-PF-48			
		2	decibel	DB844H80E-XY w/ Mount Pipe			
		4	rfs celwave	APL868013-42T0 w/ Mount Pipe			
	140.0	1	tower mounts	Platform Mount [LP 1201-1]			
120.0	123.0	1	tower mounts	Miscellaneous [NA 510-1]	3 4	1/2 1-1/4	1
	122.0	3	alcatel lucent	TD-RRH8x20-25			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			
	120.0	1	tower mounts	Platform Mount [LP 1201-1]			
119.0	122.0	3	alcatel lucent	1900MHz RRH	-	-	1
		3	alcatel lucent	800MHZ RRH			
	119.0	1	tower mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
72.0	73.0	2	gps	GPS_A	-	-	1
	72.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed; Not Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160.0	160.0	3	generic	Panel Directional Antenna	-	-
150.0	150.0	12	allgon	ALP 11011	-	-
140.0	140.0	12	allgon	ALP 11011	-	-
130.0	130.0	12	allgon	ALP 11011	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI Geotechnical Engineers	5121535	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI Geotechnical Engineers (Mapped)	5121536	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Structural Consulting Services, P.C.	5164738	CCISITES
4-MOUNT ANALYSIS REPORTS	Infinity Engineering, PLLC	7685673	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.2.1), 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 in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) 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. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 152	Pole	TP30.62x29x0.1875	1	-5.23	1128.80	8.5	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-22.79	1923.19	44.5	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-30.98	2876.85	57.6	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-45.48	5001.82	49.8	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-65.84	6569.96	50.0	Pass
							Summary	
						Pole (L3)	57.6	Pass
						Rating =	57.6	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	46.4	Pass
1	Base Plate	0	54.7	Pass
1	Base Foundation Structural	0	72.6	Pass
1	Base Foundation Soil Interaction	0	41.0	Pass
1	Flange Bolts	152.0	11.1	Pass
1	Flange Plate		9.4	Pass

Structure Rating (max from all components) =	72.6%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

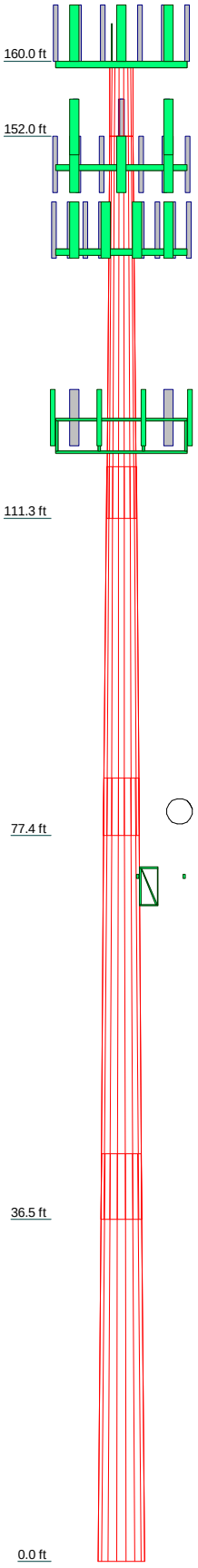
4.1) Recommendations

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	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	8.00	18	0.1875		29.0000	30.6200		0.5
2	40.71	18	0.2500	5.42	30.6200	38.8600		3.8
3	39.29	18	0.3125	6.17	37.2630	45.0900		5.4
4	47.13	18	0.4375	7.08	43.2359	52.6200		10.6
5	43.54	18	0.5000		50.3353	59.0000		12.7
							A572-65	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	160	DBC0061F1V51-2	149
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	DC6-48-60-18-8F	149
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	DC6-48-60-18-8C	149
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	6' x 2" Mount Pipe	149
ATMAA1412D-1A20	160	6' x 2" Mount Pipe	149
ATMAA1412D-1A20	160	6' x 2" Mount Pipe	149
ATMAA1412D-1A20	160	Miscellaneous [NA 510-1]	149
AIR 32 B2A/B66AA w/ Mount Pipe	160	Platform Mount [LP 1201-1]	149
AIR 32 B2A/B66AA w/ Mount Pipe	160	(2) APL868013-42T0 w/ Mount Pipe	140
AIR 32 B2A/B66AA w/ Mount Pipe	160	(2) APL868013-42T0 w/ Mount Pipe	140
RADIO 4449 B12/B71	160	WWX063X19G00 w/ Mount Pipe	140
RADIO 4449 B12/B71	160	WWX063X19G00 w/ Mount Pipe	140
RADIO 4449 B12/B71	160	WWX063X19G00 w/ Mount Pipe	140
APXVAARR24_43-U-NA20 w/ Mount Pipe	160	(2) DB844H80E-XY w/ Mount Pipe	140
APXVAARR24_43-U-NA20 w/ Mount Pipe	160	RRH2X60-PCS	140
APXVAARR24_43-U-NA20 w/ Mount Pipe	160	RRH2X60-PCS	140
Platform Mount [LP 1201-1]	160	RRH2X60-PCS	140
6' x 2" Mount Pipe	160	RC2DC-3315-PF-48	140
6' x 2" Mount Pipe	160	WWX063X19G00 w/ Mount Pipe	140
6' x 2" Mount Pipe	160	WWX063X19G00 w/ Mount Pipe	140
RRUS 32 B2	153	WWX063X19G00 w/ Mount Pipe	140
RRUS 32 B2	153	QUAD656C0000G w/ Mount Pipe	140
RRUS 32 B2	153	QUAD656C0000G w/ Mount Pipe	140
RRUS 11	153	QUAD656C0000G w/ Mount Pipe	140
RRUS 11	153	B13 RRH 4X30	140
RRUS 11	153	B13 RRH 4X30	140
6' x 2" Mount Pipe	153	B13 RRH 4X30	140
6' x 2" Mount Pipe	153	RRH2X60-AWS	140
6' x 2" Mount Pipe	153	RRH2X60-AWS	140
Side Arm Mount [SO 102-3]	153	RRH2X60-AWS	140
7770.00 w/ Mount Pipe	149	RC2DC-3315-PF-48	140
7770.00 w/ Mount Pipe	149	Platform Mount [LP 1201-1]	140
7770.00 w/ Mount Pipe	149	APXVSPP18-C-A20 w/ Mount Pipe	120
(4) LGP21401	149	APXVSPP18-C-A20 w/ Mount Pipe	120
(4) LGP21401	149	APXVSPP18-C-A20 w/ Mount Pipe	120
(4) LGP21401	149	APXVTM14-ALU-I20 w/ Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	APXVTM14-ALU-I20 w/ Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	APXVTM14-ALU-I20 w/ Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	TD-RRH8x20-25	120
QS66512-2 w/ Mount Pipe	149	TD-RRH8x20-25	120
QS66512-2 w/ Mount Pipe	149	TD-RRH8x20-25	120
QS66512-2 w/ Mount Pipe	149	Miscellaneous [NA 510-1]	120
RRUS 32	149	Platform Mount [LP 1201-1]	120
RRUS 32	149	(2) 6' x 2" Mount Pipe	120
RRUS 32	149	(2) 6' x 2" Mount Pipe	120
RADIO 4426	149	(2) 6' x 2" Mount Pipe	120
RADIO 4426	149	800MHZ RRH	119
RADIO 4426	149	800MHZ RRH	119
DBC0061F1V51-2	149	800MHZ RRH	119
DBC0061F1V51-2	149	1900MHz RRH	119
		1900MHz RRH	119
		1900MHz RRH	119
		Side Arm Mount [SO 102-3]	119
		Side Arm Mount [SO 701-1]	72
		(2) GPS_A	72

MATERIAL STRENGTH

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

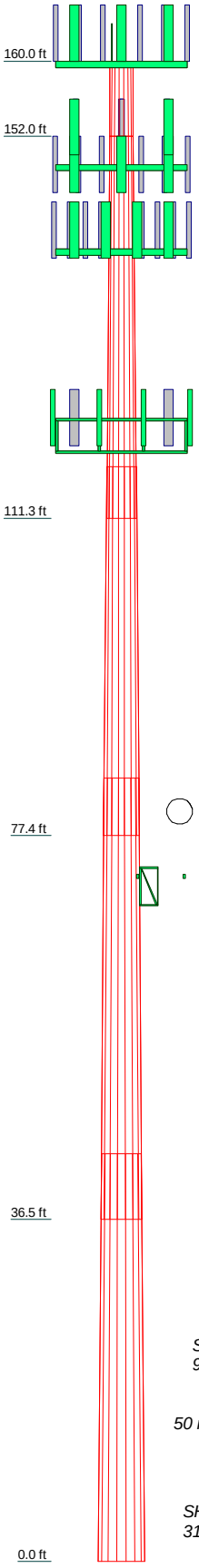
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***GREENWICH NORTH***			
Project: ***BU#841290 WO#1600451***			
Client: Crown Castle	Drawn by: Don Martin Serrano	App'd:	
Code: TIA-222-G	Date: 08/02/18	Scale: NTS	
Path:		Dwg No. E-1	

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	8.00	18	0.1875		29.0000	30.6200		0.5
2	40.71	18	0.2500	5.42	30.6200	38.8600		3.8
3	39.29	18	0.3125	6.17	37.2630	45.0900		5.4
4	47.13	18	0.4375	7.08	43.2359	52.6200		10.6
5	43.54	18	0.5000		50.3353	59.0000		12.7
							A572-65	33.0



ALL REACTIONS ARE FACTORED

AXIAL 105 K

SHEAR 9 K

MOMENT 1149 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 66 K

SHEAR 31 K

MOMENT 3865 kip-ft

TORQUE 0 kip-ft

REACTIONS - 93 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 57.6%

Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***GREENWICH NORTH***			
Project: ***BU#841290 WO#1600451***			
Client: Crown Castle	Drawn by: Don Martin Serrano	App'd:	
Code: TIA-222-G	Date: 08/02/18	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 93 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	160.00-152.00	8.00	0.00	18	29.0000	30.6200	0.1875	0.5625	A572-65 (65 ksi)
L2	152.00-111.29	40.71	5.42	18	30.6200	38.8600	0.2500	0.7500	A572-65 (65 ksi)
L3	111.29-77.42	39.29	6.17	18	37.2630	45.0900	0.3125	0.9375	A572-65 (65 ksi)
L4	77.42-36.46	47.13	7.08	18	43.2359	52.6200	0.4375	1.3125	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
L5	36.46-0.00	43.54		18	50.3353	59.0000	0.5000	1.5000	(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	29.4242	17.1470	1798.4090	10.2284	14.7320	122.0750	3599.1844	8.5751	4.8400	25.813
	31.0692	18.1111	2119.1346	10.8035	15.5550	136.2353	4241.0576	9.0573	5.1251	27.334
L2	31.0615	24.0986	2808.1400	10.7814	15.5550	180.5302	5619.9750	12.0516	5.0371	20.148
	39.4286	30.6370	5770.1059	13.7066	19.7409	292.2922	11547.8043	15.3214	6.4874	25.949
L3	38.8956	36.6502	6321.9882	13.1174	18.9296	333.9740	12652.2950	18.3286	6.1183	19.578
	45.7470	44.4137	11250.5543	15.8960	22.9057	491.1679	22515.9125	22.2111	7.4958	23.987
L4	45.0963	59.4309	13753.2024	15.1934	21.9638	626.1754	27524.5016	29.7211	6.9935	15.985
	53.3778	72.4619	24928.5533	18.5248	26.7310	932.5723	49889.9082	36.2378	8.6451	19.76
L5	52.4808	79.0886	24815.6300	17.6915	25.5703	970.4855	49663.9131	39.5518	8.1550	16.31
	59.8485	92.8395	40140.4258	20.7675	29.9720	1339.2642	80333.6694	46.4286	9.6800	19.36

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.00-152.00				1	1	1			
L2 152.00-111.29				1	1	1			
L3 111.29-77.42				1	1	1			
L4 77.42-36.46				1	1	1			
L5 36.46-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
****									
Safety Line 5/8	B	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.400 0.400	0.8800		0.40
*******									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
160								
LDF7-50A(1-5/8)	A	No	Inside Pole	160.00 - 0.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1-5/8)	A	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
HCS 6X12 6AWG(1-3/8)	A	No	Inside Pole	160.00 - 0.00	2	No Ice	0.00	1.70
						1/2" Ice	0.00	1.70
						1" Ice	0.00	1.70
153								
149								
LDF7-50A(1-5/8)	A	No	Inside Pole	149.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	149.00 - 0.00	4	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
FB-L98B-034-XXX(3/8)	A	No	Inside Pole	149.00 - 0.00	2	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
140								
LDF7-50A(1-5/8)	A	No	Inside Pole	140.00 - 0.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	A	No	Inside Pole	140.00 - 0.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
120								
LDF4-50A(1/2)	C	No	Inside Pole	120.00 - 0.00	3	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
HB114-1-05U3-S3J(1-1/4)	C	No	Inside Pole	120.00 - 0.00	4	No Ice	0.00	0.90
						1/2" Ice	0.00	0.90
						1" Ice	0.00	0.90
*******								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.00-152.00	A	0.000	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.704	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	152.00-111.29	A	0.000	0.000	0.000	0.000	1.48
		B	0.000	0.000	3.582	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.04
L3	111.29-77.42	A	0.000	0.000	0.000	0.000	1.43
		B	0.000	0.000	2.981	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.14
L4	77.42-36.46	A	0.000	0.000	0.000	0.000	1.73
		B	0.000	0.000	3.604	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.17
L5	36.46-0.00	A	0.000	0.000	0.000	0.000	1.54
		B	0.000	0.000	3.208	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.00-152.00	A	1.752	0.000	0.000	0.000	0.000	0.10
		B		0.000	0.000	3.507	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
L2	152.00-111.29	A	1.722	0.000	0.000	0.000	0.000	1.48
		B		0.000	0.000	17.602	0.000	0.24
		C		0.000	0.000	0.000	0.000	0.04
L3	111.29-77.42	A	1.666	0.000	0.000	0.000	0.000	1.43
		B		0.000	0.000	14.644	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.14
L4	77.42-36.46	A	1.584	0.000	0.000	0.000	0.000	1.73
		B		0.000	0.000	17.250	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.17
L5	36.46-0.00	A	1.410	0.000	0.000	0.000	0.000	1.54
		B		0.000	0.000	14.759	0.000	0.19
		C		0.000	0.000	0.000	0.000	0.15

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.00-152.00	0.7439	0.2417	1.6778	0.5451
L2	152.00-111.29	0.7464	0.2425	1.7027	0.5532
L3	111.29-77.42	0.7488	0.2433	1.7485	0.5681
L4	77.42-36.46	0.7507	0.2439	1.7432	0.5664
L5	36.46-0.00	0.7520	0.2443	1.7084	0.5551

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	23	Safety Line 5/8	152.00 - 160.00	1.0000	1.0000
L2	23	Safety Line 5/8	111.29 - 152.00	1.0000	1.0000
L3	23	Safety Line 5/8	77.42 - 111.29	1.0000	1.0000
L4	23	Safety Line 5/8	36.46 - 77.42	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8x4'	C	From Leg	0.00	0.00	0.0000	160.00	No Ice	0.25	0.25	0.03
			0.00	2.00			1/2" Ice	0.66	0.66	0.03
							1" Ice	0.97	0.97	0.04
160										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00	3.00			1/2" Ice	6.78	6.43	0.17
							1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00	3.00			1/2" Ice	6.78	6.43	0.17
							1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00	3.00			1/2" Ice	6.78	6.43	0.17
							1" Ice	7.21	7.13	0.23
ATMAA1412D-1A20	A	From Face	4.00	0.00	0.0000	160.00	No Ice	1.00	0.41	0.01
			0.00	3.00			1/2" Ice	1.13	0.50	0.02
							1" Ice	1.26	0.59	0.03
ATMAA1412D-1A20	B	From Face	4.00	0.00	0.0000	160.00	No Ice	1.00	0.41	0.01
			0.00	3.00			1/2" Ice	1.13	0.50	0.02
							1" Ice	1.26	0.59	0.03
ATMAA1412D-1A20	C	From Face	4.00	0.00	0.0000	160.00	No Ice	1.00	0.41	0.01
			0.00	3.00			1/2" Ice	1.13	0.50	0.02
							1" Ice	1.26	0.59	0.03
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00	3.00			1/2" Ice	7.20	6.87	0.21
							1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00	3.00			1/2" Ice	7.20	6.87	0.21
							1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00	3.00			1/2" Ice	7.20	6.87	0.21
							1" Ice	7.65	7.58	0.28
RADIO 4449 B12/B71	A	From Face	4.00	0.00	0.0000	160.00	No Ice	1.65	1.30	0.08
			0.00	3.00			1/2" Ice	1.81	1.44	0.09
							1" Ice	1.98	1.60	0.11
RADIO 4449 B12/B71	B	From Face	4.00	0.00	0.0000	160.00	No Ice	1.65	1.30	0.08
			0.00	3.00			1/2" Ice	1.81	1.44	0.09
							1" Ice	1.98	1.60	0.11
RADIO 4449 B12/B71	C	From Face	4.00	0.00	0.0000	160.00	No Ice	1.65	1.30	0.08
			0.00	3.00			1/2" Ice	1.81	1.44	0.09
							1" Ice	1.98	1.60	0.11
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	160.00	No Ice	20.48	11.02	0.16
			0.00	3.00			1/2" Ice	21.23	12.55	0.30
							1" Ice	21.99	14.10	0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	160.00	No Ice	20.48	11.02	0.16
			0.00	3.00			1/2" Ice	21.23	12.55	0.30
							1" Ice	21.99	14.10	0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	160.00	No Ice	20.48	11.02	0.16
			0.00	3.00			1/2" Ice	21.23	12.55	0.30
							1" Ice	21.99	14.10	0.44

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
Platform Mount [LP 1201-1]	C	None		0.0000	160.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
6' x 2" Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
153									
RRUS 32 B2	A	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	B	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	C	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 11	A	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
RRUS 11	B	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
RRUS 11	C	From Face	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
6' x 2" Mount Pipe	A	From Face	1.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Face	1.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Face	1.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Side Arm Mount [SO 102-3]	C	None		0.0000	153.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
149									
7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice			
7770.00 w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	149.00	No Ice	5.75	4.25	0.06
							1/2" Ice	6.18	5.01	0.10
							1" Ice	6.61	5.71	0.16
(4) LGP21401	A	From Face	4.00	0.00	0.0000	149.00	No Ice	1.10	0.21	0.01
							1/2" Ice	1.24	0.27	0.02
							1" Ice	1.38	0.35	0.03
(4) LGP21401	B	From Face	4.00	0.00	0.0000	149.00	No Ice	1.10	0.21	0.01
							1/2" Ice	1.24	0.27	0.02
							1" Ice	1.38	0.35	0.03
(4) LGP21401	C	From Face	4.00	0.00	0.0000	149.00	No Ice	1.10	0.21	0.01
							1/2" Ice	1.24	0.27	0.02
							1" Ice	1.38	0.35	0.03
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	149.00	No Ice	9.90	8.11	0.08
							1/2" Ice	10.47	9.30	0.16
							1" Ice	11.01	10.21	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	149.00	No Ice	9.90	8.11	0.08
							1/2" Ice	10.47	9.30	0.16
							1" Ice	11.01	10.21	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	149.00	No Ice	9.90	8.11	0.08
							1/2" Ice	10.47	9.30	0.16
							1" Ice	11.01	10.21	0.25
QS66512-2 w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	149.00	No Ice	8.37	8.46	0.14
							1/2" Ice	8.93	9.66	0.21
							1" Ice	9.46	10.55	0.30
QS66512-2 w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	149.00	No Ice	8.37	8.46	0.14
							1/2" Ice	8.93	9.66	0.21
							1" Ice	9.46	10.55	0.30
QS66512-2 w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	149.00	No Ice	8.37	8.46	0.14
							1/2" Ice	8.93	9.66	0.21
							1" Ice	9.46	10.55	0.30
RRUS 32	A	From Face	4.00	0.00	0.0000	149.00	No Ice	2.86	1.78	0.06
							1/2" Ice	3.08	1.97	0.08
							1" Ice	3.32	2.17	0.10
RRUS 32	B	From Face	4.00	0.00	0.0000	149.00	No Ice	2.86	1.78	0.06
							1/2" Ice	3.08	1.97	0.08
							1" Ice	3.32	2.17	0.10
RRUS 32	C	From Face	4.00	0.00	0.0000	149.00	No Ice	2.86	1.78	0.06
							1/2" Ice	3.08	1.97	0.08
							1" Ice	3.32	2.17	0.10
RADIO 4426	A	From Face	4.00	0.00	0.0000	149.00	No Ice	1.64	0.73	0.05
							1/2" Ice	1.80	0.84	0.06
							1" Ice	1.97	0.97	0.08
RADIO 4426	B	From Face	4.00	0.00	0.0000	149.00	No Ice	1.64	0.73	0.05
							1/2" Ice	1.80	0.84	0.06
							1" Ice	1.97	0.97	0.08
RADIO 4426	C	From Face	4.00	0.00	0.0000	149.00	No Ice	1.64	0.73	0.05
							1/2" Ice	1.80	0.84	0.06
							1" Ice	1.97	0.97	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DBC0061F1V51-2	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
DBC0061F1V51-2	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
DBC0061F1V51-2	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
DC6-48-60-18-8F	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.03 0.05 0.07
DC6-48-60-18-8C	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.20	2.74 2.96 3.20	0.03 0.05 0.08
6' x 2" Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Miscellaneous [NA 510-1]	C	From Leg	0.00 0.00 3.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	6.00 8.50 8.60	6.00 8.50 8.60	0.26 0.34 0.34
Platform Mount [LP 1201-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
140									
(2) APL868013-42T0 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.85	4.80 5.42 6.04	0.02 0.06 0.11
(2) APL868013-42T0 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.85	4.80 5.42 6.04	0.02 0.06 0.11
WWX063X19G00 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
(2) DB844H80E-XY w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.30 3.67 4.03	4.80 5.42 6.04	0.03 0.07 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRH2X60-PCS	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RC2DC-3315-PF-48	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.30	2.51 2.72 2.94	0.03 0.06 0.10
WWX063X19G00 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
QUAD656C0000G w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000G w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000G w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
B13 RRH 4X30	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
RRH2X60-AWS	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RC2DC-3315-PF-48	A	From Face	4.00	0.0000	140.00	No Ice	3.79	2.51	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	4.04	2.72	0.06
			2.00				1" Ice	4.30	2.94	0.10
Platform Mount [LP 1201-1]	C	None			0.0000	140.00	No Ice	23.10	23.10	2.10
							1/2" Ice	26.80	26.80	2.50
							1" Ice	30.50	30.50	2.90
120										
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00		0.0000	120.00	No Ice	8.26	6.95	0.08
			0.00				1/2" Ice	8.82	8.13	0.15
			2.00				1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00		0.0000	120.00	No Ice	8.26	6.95	0.08
			0.00				1/2" Ice	8.82	8.13	0.15
			2.00				1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	8.26	6.95	0.08
			0.00				1/2" Ice	8.82	8.13	0.15
			2.00				1" Ice	9.35	9.02	0.23
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00		0.0000	120.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			2.00				1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00		0.0000	120.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			2.00				1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			2.00				1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00		0.0000	120.00	No Ice	4.05	1.53	0.07
			0.00				1/2" Ice	4.30	1.71	0.10
			2.00				1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	4.00		0.0000	120.00	No Ice	4.05	1.53	0.07
			0.00				1/2" Ice	4.30	1.71	0.10
			2.00				1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	4.00		0.0000	120.00	No Ice	4.05	1.53	0.07
			0.00				1/2" Ice	4.30	1.71	0.10
			2.00				1" Ice	4.56	1.90	0.13
Miscellaneous [NA 510-1]	C	From Leg	0.00		0.0000	120.00	No Ice	6.00	6.00	0.26
			0.00				1/2" Ice	8.50	8.50	0.34
			3.00				1" Ice	8.60	8.60	0.34
Platform Mount [LP 1201-1]	C	None			0.0000	120.00	No Ice	23.10	23.10	2.10
							1/2" Ice	26.80	26.80	2.50
							1" Ice	30.50	30.50	2.90
(2) 6' x 2" Mount Pipe	A	From Leg	4.00		0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	B	From Leg	4.00		0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
119										

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800MHZ RRH	A	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	B	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	C	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
1900MHz RRH	A	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
1900MHz RRH	B	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
1900MHz RRH	C	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
Side Arm Mount [SO 102-3] ***72***	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
Side Arm Mount [SO 701-1]	B	From Leg	1.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
(2) GPS_A *****	B	From Leg	3.00 0.00 1.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice

Comb. No.	Description
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 152	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-12.12	0.00	-0.06
			Max. Mx	20	-5.23	56.99	-0.03
			Max. My	14	-5.23	0.04	-56.98
			Max. Vy	20	-6.64	56.99	-0.03
			Max. Vx	14	6.64	0.04	-56.98
			Max. Torque	12			-0.02
L2	152 - 111.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.48	0.46	-0.30
			Max. Mx	20	-22.79	642.17	-0.16
			Max. My	14	-22.79	0.57	-640.49
			Max. Vy	20	-23.23	642.17	-0.16
			Max. Vx	14	23.18	0.57	-640.49
			Max. Torque	11			-0.56
L3	111.29 - 77.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.90	0.13	-0.40
			Max. Mx	20	-30.98	1455.27	-0.00
			Max. My	14	-30.98	0.37	-1451.96
			Max. Vy	20	-25.80	1455.27	-0.00
			Max. Vx	14	25.75	0.37	-1451.96
			Max. Torque	13			-0.55
L4	77.42 - 36.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.73	-0.83	-0.85
			Max. Mx	20	-45.49	2552.04	-0.27
			Max. My	14	-45.49	0.23	-2547.55

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-28.82	2552.04	-0.27
			Max. Vx	14	28.78	0.23	-2547.55
			Max. Torque	13			-0.55
L5	36.46 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-104.73	-1.33	-1.01
			Max. Mx	20	-65.84	3865.37	-0.57
			Max. My	14	-65.84	0.47	-3859.42
			Max. Vy	20	-31.38	3865.37	-0.57
			Max. Vx	14	31.34	0.47	-3859.42
			Max. Torque	11			-0.49

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	104.73	-9.37	0.00
	Max. H_x	20	65.86	31.35	-0.01
	Max. H_z	2	65.86	-0.01	31.31
	Max. M_x	2	3858.40	-0.01	31.31
	Max. M_z	8	3864.57	-31.35	0.01
	Max. Torsion	23	0.49	27.14	15.65
	Min. Vert	25	49.39	15.67	27.11
	Min. H_x	8	65.86	-31.35	0.01
	Min. H_z	14	65.86	0.01	-31.31
	Min. M_x	14	-3859.42	0.01	-31.31
	Min. M_z	20	-3865.37	31.35	-0.01
	Min. Torsion	11	-0.49	-27.14	-15.65

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	54.88	0.00	0.00	0.40	0.30	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	65.86	0.01	-31.31	-3858.40	0.34	-0.22
0.9 Dead+1.6 Wind 0 deg - No Ice	49.39	0.01	-31.31	-3817.30	0.23	-0.22
1.2 Dead+1.6 Wind 30 deg - No Ice	65.86	15.68	-27.12	-3341.46	-1932.15	0.03
0.9 Dead+1.6 Wind 30 deg - No Ice	49.39	15.68	-27.12	-3305.87	-1911.60	0.02
1.2 Dead+1.6 Wind 60 deg - No Ice	65.86	27.15	-15.66	-1929.01	-3346.81	0.27
0.9 Dead+1.6 Wind 60 deg - No Ice	49.39	27.15	-15.66	-1908.52	-3311.14	0.27
1.2 Dead+1.6 Wind 90 deg - No Ice	65.86	31.35	-0.01	0.44	-3864.57	0.44
0.9 Dead+1.6 Wind 90 deg - No Ice	49.39	31.35	-0.01	0.31	-3823.37	0.44
1.2 Dead+1.6 Wind 120 deg - No Ice	65.86	27.14	15.65	1929.91	-3346.75	0.49
0.9 Dead+1.6 Wind 120 deg - No Ice	49.39	27.14	15.65	1909.15	-3311.07	0.49
1.2 Dead+1.6 Wind 150 deg - No Ice	65.86	15.67	27.11	3342.41	-1932.04	0.41
0.9 Dead+1.6 Wind 150 deg - No Ice	49.39	15.67	27.11	3306.55	-1911.49	0.42
1.2 Dead+1.6 Wind 180 deg - No Ice	65.86	-0.01	31.31	3859.42	0.47	0.22

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 180 deg - No Ice	49.39	-0.01	31.31	3818.05	0.36	0.22
1.2 Dead+1.6 Wind 210 deg - No Ice	65.86	-15.68	27.12	3342.47	1932.96	-0.03
0.9 Dead+1.6 Wind 210 deg - No Ice	49.39	-15.68	27.12	3306.62	1912.19	-0.03
1.2 Dead+1.6 Wind 240 deg - No Ice	65.86	-27.15	15.66	1930.02	3347.62	-0.27
0.9 Dead+1.6 Wind 240 deg - No Ice	49.39	-27.15	15.66	1909.27	3311.73	-0.27
1.2 Dead+1.6 Wind 270 deg - No Ice	65.86	-31.35	0.01	0.57	3865.37	-0.44
0.9 Dead+1.6 Wind 270 deg - No Ice	49.39	-31.35	0.01	0.44	3823.96	-0.44
1.2 Dead+1.6 Wind 300 deg - No Ice	65.86	-27.14	-15.65	-1928.90	3347.55	-0.49
0.9 Dead+1.6 Wind 300 deg - No Ice	49.39	-27.14	-15.65	-1908.40	3311.66	-0.49
1.2 Dead+1.6 Wind 330 deg - No Ice	65.86	-15.67	-27.11	-3341.39	1932.85	-0.41
0.9 Dead+1.6 Wind 330 deg - No Ice	49.39	-15.67	-27.11	-3305.80	1912.07	-0.41
1.2 Dead+1.0 Ice+1.0 Temp	104.73	0.00	0.00	1.01	-1.33	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	104.73	0.00	-9.36	-1145.83	-1.66	-0.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	104.73	4.69	-8.11	-992.30	-575.59	0.02
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	104.73	8.11	-4.69	-572.58	-995.68	0.10
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	104.73	9.37	-0.00	0.87	-1149.34	0.16
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	104.73	8.11	4.68	574.38	-995.42	0.17
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	104.73	4.68	8.11	994.28	-575.16	0.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	104.73	-0.00	9.36	1148.07	-1.15	0.07
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	104.73	-4.69	8.11	994.54	572.78	-0.02
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	104.73	-8.11	4.69	574.82	992.86	-0.10
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	104.73	-9.37	0.00	1.37	1146.53	-0.16
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	104.73	-8.11	-4.68	-572.14	992.61	-0.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	104.73	-4.68	-8.11	-992.04	572.34	-0.14
Dead+Wind 0 deg - Service	54.88	0.00	-7.29	-892.04	0.32	-0.05
Dead+Wind 30 deg - Service	54.88	3.65	-6.31	-772.48	-446.61	0.01
Dead+Wind 60 deg - Service	54.88	6.32	-3.65	-445.82	-773.78	0.06
Dead+Wind 90 deg - Service	54.88	7.30	-0.00	0.40	-893.53	0.10
Dead+Wind 120 deg - Service	54.88	6.32	3.64	446.64	-773.77	0.12
Dead+Wind 150 deg - Service	54.88	3.65	6.31	773.31	-446.59	0.10
Dead+Wind 180 deg - Service	54.88	-0.00	7.29	892.88	0.35	0.05
Dead+Wind 210 deg - Service	54.88	-3.65	6.31	773.32	447.28	-0.01
Dead+Wind 240 deg - Service	54.88	-6.32	3.65	446.66	774.45	-0.06
Dead+Wind 270 deg - Service	54.88	-7.30	0.00	0.44	894.20	-0.10
Dead+Wind 300 deg - Service	54.88	-6.32	-3.64	-445.80	774.43	-0.11
Dead+Wind 330 deg - Service	54.88	-3.65	-6.31	-772.47	447.25	-0.10

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-54.88	0.00	0.00	54.88	0.00	0.000%
2	0.01	-65.86	-31.31	-0.01	65.86	31.31	0.000%
3	0.01	-49.39	-31.31	-0.01	49.39	31.31	0.000%
4	15.68	-65.86	-27.12	-15.68	65.86	27.12	0.000%
5	15.68	-49.39	-27.12	-15.68	49.39	27.12	0.000%
6	27.15	-65.86	-15.66	-27.15	65.86	15.66	0.000%
7	27.15	-49.39	-15.66	-27.15	49.39	15.66	0.000%
8	31.35	-65.86	-0.01	-31.35	65.86	0.01	0.000%
9	31.35	-49.39	-0.01	-31.35	49.39	0.01	0.000%
10	27.14	-65.86	15.65	-27.14	65.86	-15.65	0.000%
11	27.14	-49.39	15.65	-27.14	49.39	-15.65	0.000%
12	15.67	-65.86	27.11	-15.67	65.86	-27.11	0.000%
13	15.67	-49.39	27.11	-15.67	49.39	-27.11	0.000%
14	-0.01	-65.86	31.31	0.01	65.86	-31.31	0.000%
15	-0.01	-49.39	31.31	0.01	49.39	-31.31	0.000%
16	-15.68	-65.86	27.12	15.68	65.86	-27.12	0.000%
17	-15.68	-49.39	27.12	15.68	49.39	-27.12	0.000%
18	-27.15	-65.86	15.66	27.15	65.86	-15.66	0.000%
19	-27.15	-49.39	15.66	27.15	49.39	-15.66	0.000%
20	-31.35	-65.86	0.01	31.35	65.86	-0.01	0.000%
21	-31.35	-49.39	0.01	31.35	49.39	-0.01	0.000%
22	-27.14	-65.86	-15.65	27.14	65.86	15.65	0.000%
23	-27.14	-49.39	-15.65	27.14	49.39	15.65	0.000%
24	-15.67	-65.86	-27.11	15.67	65.86	27.11	0.000%
25	-15.67	-49.39	-27.11	15.67	49.39	27.11	0.000%
26	0.00	-104.73	0.00	0.00	104.73	0.00	0.000%
27	0.00	-104.73	-9.36	-0.00	104.73	9.36	0.000%
28	4.69	-104.73	-8.11	-4.69	104.73	8.11	0.000%
29	8.11	-104.73	-4.69	-8.11	104.73	4.69	0.000%
30	9.37	-104.73	-0.00	-9.37	104.73	0.00	0.000%
31	8.11	-104.73	4.68	-8.11	104.73	-4.68	0.000%
32	4.68	-104.73	8.11	-4.68	104.73	-8.11	0.000%
33	-0.00	-104.73	9.36	0.00	104.73	-9.36	0.000%
34	-4.69	-104.73	8.11	4.69	104.73	-8.11	0.000%
35	-8.11	-104.73	4.69	8.11	104.73	-4.69	0.000%
36	-9.37	-104.73	0.00	9.37	104.73	-0.00	0.000%
37	-8.11	-104.73	-4.68	8.11	104.73	4.68	0.000%
38	-4.68	-104.73	-8.11	4.68	104.73	8.11	0.000%
39	0.00	-54.88	-7.29	-0.00	54.88	7.29	0.000%
40	3.65	-54.88	-6.31	-3.65	54.88	6.31	0.000%
41	6.32	-54.88	-3.65	-6.32	54.88	3.65	0.000%
42	7.30	-54.88	-0.00	-7.30	54.88	0.00	0.000%
43	6.32	-54.88	3.64	-6.32	54.88	-3.64	0.000%
44	3.65	-54.88	6.31	-3.65	54.88	-6.31	0.000%
45	-0.00	-54.88	7.29	0.00	54.88	-7.29	0.000%
46	-3.65	-54.88	6.31	3.65	54.88	-6.31	0.000%
47	-6.32	-54.88	3.65	6.32	54.88	-3.65	0.000%
48	-7.30	-54.88	0.00	7.30	54.88	-0.00	0.000%
49	-6.32	-54.88	-3.64	6.32	54.88	3.64	0.000%
50	-3.65	-54.88	-6.31	3.65	54.88	6.31	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	0.00040811
3	Yes	4	0.00000001	0.00022332
4	Yes	6	0.00000001	0.00005122
5	Yes	5	0.00000001	0.00048874
6	Yes	6	0.00000001	0.00005118
7	Yes	5	0.00000001	0.00048831
8	Yes	4	0.00000001	0.00043092
9	Yes	4	0.00000001	0.00024128
10	Yes	6	0.00000001	0.00005189
11	Yes	5	0.00000001	0.00049519
12	Yes	6	0.00000001	0.00005094
13	Yes	5	0.00000001	0.00048586
14	Yes	4	0.00000001	0.00040336
15	Yes	4	0.00000001	0.00021941
16	Yes	6	0.00000001	0.00005150
17	Yes	5	0.00000001	0.00049124
18	Yes	6	0.00000001	0.00005161
19	Yes	5	0.00000001	0.00049222
20	Yes	4	0.00000001	0.00042584
21	Yes	4	0.00000001	0.00023720
22	Yes	6	0.00000001	0.00005097
23	Yes	5	0.00000001	0.00048606
24	Yes	6	0.00000001	0.00005186
25	Yes	5	0.00000001	0.00049485
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00045785
28	Yes	5	0.00000001	0.00057090
29	Yes	5	0.00000001	0.00057095
30	Yes	5	0.00000001	0.00045924
31	Yes	5	0.00000001	0.00057397
32	Yes	5	0.00000001	0.00057151
33	Yes	5	0.00000001	0.00045895
34	Yes	5	0.00000001	0.00057205
35	Yes	5	0.00000001	0.00057248
36	Yes	5	0.00000001	0.00045867
37	Yes	5	0.00000001	0.00056952
38	Yes	5	0.00000001	0.00057149
39	Yes	4	0.00000001	0.00006196
40	Yes	4	0.00000001	0.00030916
41	Yes	4	0.00000001	0.00030819
42	Yes	4	0.00000001	0.00006250
43	Yes	4	0.00000001	0.00032096
44	Yes	4	0.00000001	0.00030439
45	Yes	4	0.00000001	0.00006203
46	Yes	4	0.00000001	0.00031493
47	Yes	4	0.00000001	0.00031647
48	Yes	4	0.00000001	0.00006262
49	Yes	4	0.00000001	0.00030484
50	Yes	4	0.00000001	0.00032086

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	17.602	48	0.9659	0.0005
L2	152 - 111.29	15.990	48	0.9569	0.0005
L3	116.71 - 77.42	9.385	48	0.7893	0.0003
L4	83.59 - 36.46	4.696	48	0.5342	0.0001
L5	43.54 - 0	1.275	48	0.2635	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 5/8x4'	48	17.602	0.9659	0.0005	52257
153.00	RRUS 32 B2	48	16.191	0.9585	0.0005	37863
149.00	7770.00 w/ Mount Pipe	48	15.390	0.9509	0.0005	25686
140.00	(2) APL868013-42T0 w/ Mount Pipe	48	13.620	0.9221	0.0005	15652
120.00	APXVSPP18-C-A20 w/ Mount Pipe	48	9.942	0.8120	0.0003	8388
119.00	800MHZ RRH	48	9.771	0.8052	0.0003	8217
72.00	Side Arm Mount [SO 701-1]	48	3.448	0.4499	0.0001	7768

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	76.133	20	4.1788	0.0023
L2	152 - 111.29	69.164	20	4.1404	0.0023
L3	116.71 - 77.42	40.603	20	3.4160	0.0013
L4	83.59 - 36.46	20.319	20	2.3123	0.0006
L5	43.54 - 0	5.515	20	1.1399	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 5/8x4'	20	76.133	4.1788	0.0023	12286
153.00	RRUS 32 B2	20	70.031	4.1472	0.0023	8898
149.00	7770.00 w/ Mount Pipe	20	66.570	4.1143	0.0022	6026
140.00	(2) APL868013-42T0 w/ Mount Pipe	20	58.915	3.9900	0.0020	3659
120.00	APXVSPP18-C-A20 w/ Mount Pipe	20	43.013	3.5141	0.0014	1954
119.00	800MHZ RRH	20	42.273	3.4848	0.0014	1914
72.00	Side Arm Mount [SO 701-1]	20	14.917	1.9469	0.0005	1799

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	f P_n K	Ratio $\frac{P_u}{f P_n}$
L1	160 - 152 (1)	TP30.62x29x0.1875	8.00	0.00	0.0	18.1111	-5.23	1128.80	0.005
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	40.71	0.00	0.0	29.7665	-22.79	1923.19	0.012
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	39.29	0.00	0.0	43.1945	-30.98	2876.85	0.011
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	47.13	0.00	0.0	70.5044	-45.48	5001.82	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	f P_n K	Ratio $\frac{P_u}{f P_n}$
L5	36.46 - 0 (5)	TP59x50.3353x0.5	43.54	0.00	0.0	92.8395	-65.84	6569.96	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	f M_{nx} kip-ft	Ratio $\frac{M_{ux}}{f M_{nx}}$	M_{uy} kip-ft	f M_{ny} kip-ft	Ratio $\frac{M_{uy}}{f M_{ny}}$
L1	160 - 152 (1)	TP30.62x29x0.1875	57.00	707.58	0.081	0.00	707.58	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	642.17	1485.29	0.432	0.00	1485.29	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	1455.27	2577.96	0.565	0.00	2577.96	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	2552.04	5218.26	0.489	0.00	5218.26	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	3865.38	7897.96	0.489	0.00	7897.96	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	f V_n K	Ratio $\frac{V_u}{f V_n}$	Actual T_u kip-ft	f T_n kip-ft	Ratio $\frac{T_u}{f T_n}$
L1	160 - 152 (1)	TP30.62x29x0.1875	6.64	564.40	0.012	0.00	1417.96	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	23.23	961.60	0.024	0.31	2976.61	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	25.80	1438.42	0.018	0.31	5166.69	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	28.82	2500.91	0.012	0.44	10460.17	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	31.38	3284.98	0.010	0.44	15831.50	0.000

Pole Interaction Design Data

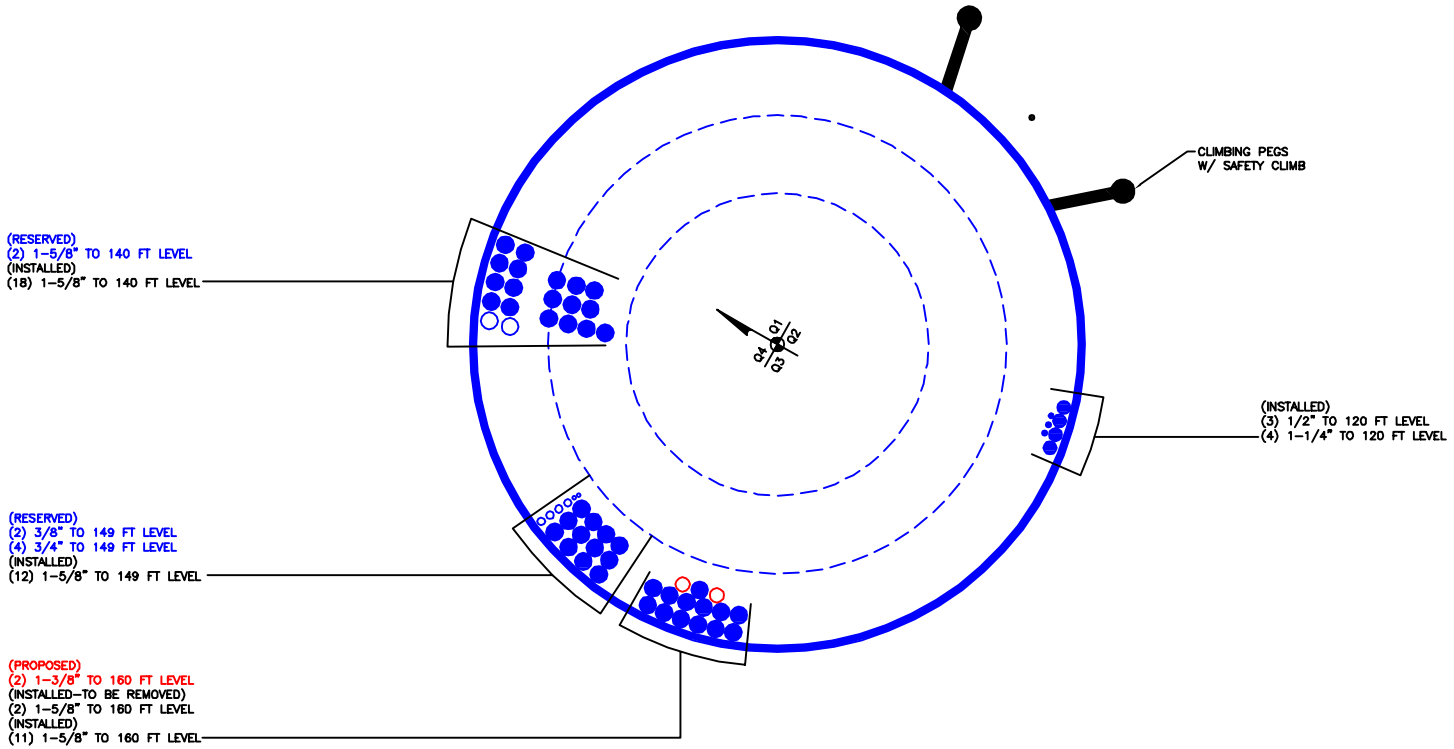
Section No.	Elevation ft	Ratio $\frac{P_u}{f P_n}$	Ratio $\frac{M_{ux}}{f M_{nx}}$	Ratio $\frac{M_{uy}}{f M_{ny}}$	Ratio $\frac{V_u}{f V_n}$	Ratio $\frac{T_u}{f T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 152 (1)	0.005	0.081	0.000	0.012	0.000	0.085	1.000	4.8.2
L2	152 - 111.29 (2)	0.012	0.432	0.000	0.024	0.000	0.445	1.000	4.8.2
L3	111.29 - 77.42 (3)	0.011	0.565	0.000	0.018	0.000	0.576	1.000	4.8.2
L4	77.42 - 36.46 (4)	0.009	0.489	0.000	0.012	0.000	0.498	1.000	4.8.2
L5	36.46 - 0 (5)	0.010	0.489	0.000	0.010	0.000	0.500	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 152	Pole	TP30.62x29x0.1875	1	-5.23	1128.80	8.5	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-22.79	1923.19	44.5	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-30.98	2876.85	57.6	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-45.48	5001.82	49.8	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-65.84	6569.96	50.0	Pass
							Summary	
						Pole (L3)	57.6	Pass
						RATING =	**57.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841290 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

20/04/14	UPDATED PER WORK ORDER 1215280, 1213173	ADE
14/10/16	UPDATED PER WORK ORDER 1314116	JMP
17/10/16	UPDATED PER WORK ORDER 1227365	GM
01/11/16	UPDATED PER WORK ORDER 1326863	SF
02/11/16	UPDATED PER WORK ORDER 1321761, 1321767	RMT
12/06/17	UPDATED PER WORK ORDER 1417401	CJK
20/11/17	UPDATED PER WORK ORDER 1484287	SAM
24/01/18	UPDATED PER WORK ORDER 1517669	CJR
09/07/18	UPDATED PER WORK ORDER 1603450	JS

DRAWN BY: RJC
CHECKED BY:
DRAWING DATE: 20/03/14

SITE NUMBER:
SITE NAME:

SITE NAME

GREENWICH NORTH

BUSINESS UNIT NUMBER

841290

SITE ADDRESS

363 RIVERSVILLE ROAD
GREENWICH, CT 06831
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING | 1" = 1'-0" | 1

PLOT DATE: 11/2/2016 FILE NAME: 841290_BASELEVEL.dwg
(ref R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-VER 5.1.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

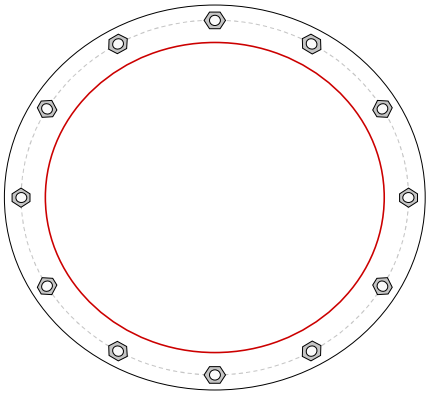
Monopole Flange Plate Connection

Elevation = 152 ft.

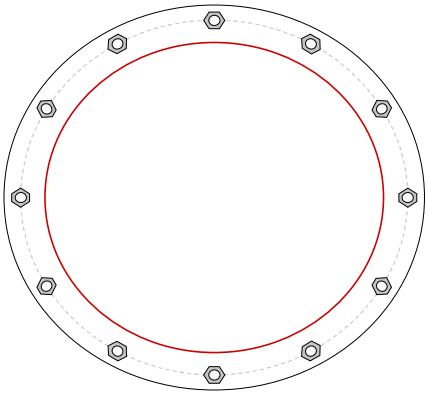
BU #	841290
Site Name	GREENWICH NORTH
Order #	447817 Rev. 0
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	57.00
Axial Force (kips)	5.23
Shear Force (kips)	6.64

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 35" BC

Top Plate Data

38" OD x 1" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Bottom Plate Data

38" OD x 1" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

30.62" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

30.62" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	6.08	
Allowable (kips)	54.53	
Stress Ratio:	11.1%	Pass

Top Plate Capacity

Max Stress (ksi):	5.06	
Allowable Stress (ksi):	54.00	
Stress Ratio:	9.4%	Pass
Tension Side Stress Ratio:	4.1%	Pass

Bottom Plate Capacity

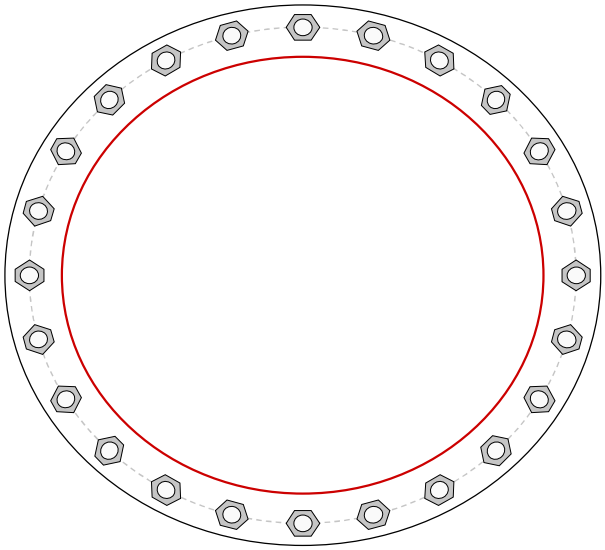
Max Stress (ksi):	5.06	
Allowable Stress (ksi):	54.00	
Stress Ratio:	9.4%	Pass
Tension Side Stress Ratio:	4.1%	Pass

Monopole Base Plate Connection

Site Info	
BU #	841290
Site Name	GREENWICH NORTH
Order #	447817 Rev. 0

Analysis Considerations	
TIA-222 Revision	G
l_{ar} (in)	0
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	3865.37
Axial Force (kips)	65.84
Shear Force (kips)	31.38



Connection Properties

Anchor Rod Data

(24) 2-1/4" ø bolts (A615-75; Fy=75 ksi, Fu=100 ksi) on 67" BC

Base Plate Data

73" OD x 2.25" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

59" x 0.5" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-ft)*
Pu = 118.07	ϕPn = 260	Stress Rating
Vu = 1.31	ϕVn = n/a	46.4%
Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary		
Max Stress (ksi):	29.53	
Allowable Stress (ksi):	54	
Stress Ratio:	54.7%	Pass

Pier and Pad Foundation

BU # :	841290
Site Name:	GREENWICH NORTH
App. Number:	447817 Rev.0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?: ☐

Superstructure Analysis Reactions

Compression, P_{comp}:	66	kips
Base Shear, Vu_comp:	31	kips
Moment, M_u:	3865	ft-kips
Tower Height, **H**:	160	ft
BP Dist. Above Fdn, bp_{dist}:	0	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	22	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	9.5	ft
Pad Width, **W**:	25	ft
Pad Thickness, **T**:	4.5	ft
Pad Rebar Size, **Sp**:	10	
Pad Rebar Quantity, **mp**:	24	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	30.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:	16	
Base Friction, **μ**:	0.55	
Neglected Depth, **N**:	5.00	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	None	ft

Foundation Analysis Checks

	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	580.00	31.00	**5.3%**	**Pass**
Bearing Pressure (ksf)	22.50	3.79	**16.9%**	**Pass**
*Overturning (kip*ft)*	10174.05	4175.00	**41.0%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5559.99	4035.50	**72.6%**	**Pass**
Pier Compression (kip)	31187.52	114.51	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	6610.91	1368.33	**20.7%**	**Pass**
Pad Shear - 1-way (kips)	1397.27	174.95	**12.5%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.020	**10.6%**	**Pass**

Soil Rating:	**41.0%**
Structural Rating:	**72.6%**

<--Toggle between Gross and Net

Version 3.0.0

Date: **July 19, 2018**

Christine Trotta
Crown Castle
3 Corporate Dr., St 101
Clifton Park, NY 12065

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

Subject:	**Mount Structural Analysis**	
Carrier Designation:	***T-Mobile Change-Out***	
	Carrier Site Number:	CT11069A
	Carrier Site Name:	CT11069A
Crown Castle Designation:	**Crown Castle BU Number:**	841290
	Crown Castle Site Name:	Greenwich North
	Crown Castle JDE Job Number:	515659
	Crown Castle Application Number:	447817, Rev.0
Engineering Firm Designation:	**Infinigy Report Designation:**	600-005
Site Data:	**363 Riversville Road, Greenwich, Fairfield County, CT 06831**	
	Latitude 41° 3' 58.6" Longitude -73° 40' 17.40"	
Structure Information:	**Tower Height & Type:**	**160 ft Self-Support**
	Mount Elevation:	**160 ft**
	Mount Type:	**13 ft Platform**

Dear Christine Trotta,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the existing and proposed loading to be:

Platform	**Sufficient**

This analysis has been performed in accordance with the 2012 International Building Code and 2016 Connecticut State Building Code and the Infinigy Engineering, PLLC wind speed requirement of a 91 mph nominal 3-second gust wind speed as required for use in the ANSI/TIA-222-G Standard per Exception #5 of Section 1609.1. Exposure Category B and Risk Category II were used in this analysis.

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

Mount structural analysis prepared by: Dmitriy Albul, P.E.

Respectfully Submitted by:

Joseph R. Johnston

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
29460
JUL 19 2018
LICENSED PROFESSIONAL ENGINEER

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

TABLE OF CONTENTS

1) INTRODUCTION

The mount consists of a 13 ft Sector Frame at the 160 ft elevation**.** The existing and proposed antenna loading was obtained from the Application provided by CCI, Application Number 447817, Revision 0 and the Mount Photo.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of TIA 222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 91 mph with no ice, 50 mph with 0.75 inch escalated ice thickness, Exposure Category B and Topographic Category 1. In addition, the Sector Frame been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
160.0	163.0	3	Ericsson	AIR 32 B2A/B66AA	-	1
		3	RFS	APXVAARR24_43-U-NA20		
		3	Ericsson	Radio 4449 B12/B71		

Notes:
1) Proposed equipment

Table 2 - Existing Antenna and Cable Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
160.0	163.0	3	Ericsson	AIR 21 B2A B4P	13 ft Platform	1
		3	RFS/Celwave	ATMAA1412D-1A20		
		3	Ericsson	AIR 21 B2A B4P	-	2
		2	Communication Components Inc.	DTMA-1819-DD-12		

Notes:
1) Existing equipment to remain
2) Existing equipment to be removed, not considered in this analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	447817, Rev.0	CCI Sites
Mount Photos	Photos	841290	Infinigy
Mount Design Drawing	EEI 12'-0" Low Profile Platform	K10994A	EEI

3.1) Analysis Method

RISA-3D (Version 16.0.5), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool 3.0.2, a tool internally developed by Infinigy, was used to calculate member loading for various load cases. Selected output from the analysis is included in Appendix B.

3.2) Assumptions

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

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 4 - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe	163.0	60.1%	Pass
	Arm		68.5%	Pass
	Frame Rail		29.4%	Pass

Structure Rating (max from all components) =	68.5%

Notes:

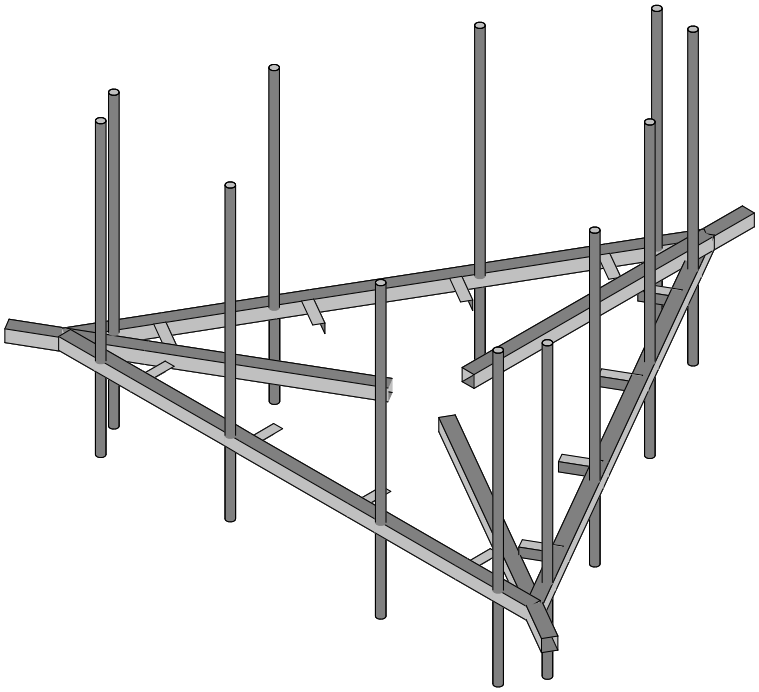
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

The platform has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

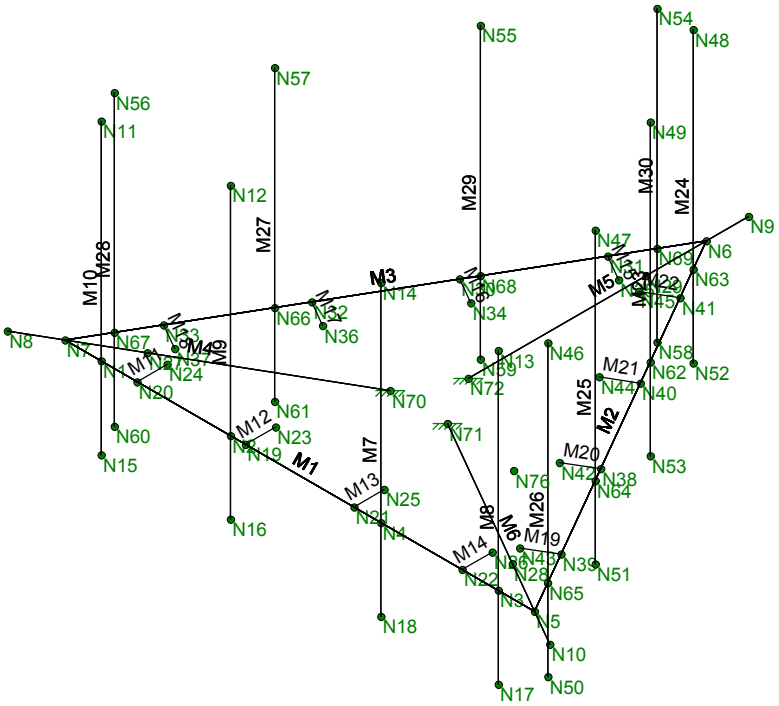
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy Engineering	Greenwich North	Rendered Model
DVA		July 18, 2018 at 2:47 PM
600-005		841290.r3d



Envelope Only Solution

Infinigy Engineering	Greenwich North	Wire Frame Model
DVA		July 18, 2018 at 2:47 PM
600-005		841290.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	Greenwich North
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	DVA
Date:	7/18/2018

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INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

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

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	91	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	163.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
22.88	1.00	**45.77**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.91	1.00	**18.18**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	0.75	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Ericsson AIR 32 B2A/B66AA	163.0	3	1.00	Flat	Flat	22.88	6.51	148.97	107.84	118.12	138.69
Ericsson AIR 21 B2A B4P	163.0	3	1.00	Flat	Flat	22.88	6.09	139.40	98.32	108.59	129.13
RFS/Celwave APXVAARR24_43-U-NA20	163.0	3	1.00	Flat	Flat	22.88	20.24	463.23	203.40	268.36	398.27
Ericsson Radio 4449 B12/B71	163.0	3	1.00	Flat	Flat	22.88	1.64	37.60	26.37	29.18	34.80
RFS/Celwave ATMAA1412D-1A20	163.0	3	1.00	Flat	Flat	22.88	1.00	22.88	9.32	12.71	19.49

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N7	N5			Frame Rail	Beam	Tube	A500 Gr.B...	Typical
2	M2	N5	N6			Frame Rail	Beam	Tube	A500 Gr.B...	Typical
3	M3	N6	N7			Frame Rail	Beam	Tube	A500 Gr.B...	Typical
4	M4	N70	N8			Arm	Beam	Tube	A500 Gr.B...	Typical
5	M5	N72	N9			Arm	Beam	Tube	A500 Gr.B...	Typical
6	M6	N71	N10			Arm	Beam	Tube	A500 Gr.B...	Typical
7	M7	N18	N14			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
8	M8	N17	N13			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
9	M9	N16	N12			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
10	M10	N15	N11			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
11	M11	N20	N24		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
12	M12	N19	N23		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
13	M13	N21	N25		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
14	M14	N22	N26		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
15	M15	N31	N35		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
16	M16	N30	N34		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
17	M17	N32	N36		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
18	M18	N33	N37		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
19	M19	N39	N43		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
20	M20	N38	N42		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N40	N44		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
22	M22	N41	N45		90	Angle	Beam	Single Angle	A36 Gr.36	Typical
23	M23	N53	N49			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
24	M24	N52	N48			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
25	M25	N51	N47			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
26	M26	N50	N46			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
27	M27	N61	N57			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
28	M28	N60	N56			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
29	M29	N59	N55			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
30	M30	N58	N54			Mount Pipe	Column	Pipe	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	L3x3x4	12	120	0
3	A500 Gr.B Rect	HSS4x4x4	6	747.3	.8
4	A53 Gr.B	PIPE_2.0	12	1152	.3
5	Total HR Steel		30	2019.3	1.2

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
1	Self Weight	DL		-1			24		3	
2	Wind Load AZI 000	WLZ					24		1	
3	Wind Load AZI 090	WLX					24		1	
4	Ice Weight	OL1					24	30	3	
5	Wind + Ice Load AZI 000	OL2					24		1	
6	Wind + Ice Load AZI 090	OL3					24		1	
7	Service Live 1	LL				2				
8	BLC 1 Transient Area Loads	None						98		
9	BLC 2 Transient Area Loads	None						26		
10	BLC 3 Transient Area Loads	None						29		
11	BLC 4 Transient Area Loads	None						98		
12	BLC 5 Transient Area Loads	None						26		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
13	BLC 6 Transient Area Loads	None						29		

Load Combinations

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		DL	1.4																		
2	1.2D + 1W AZI 000	Yes	Y		DL	1.2	W...	1																
3	1.2D + 1W AZI 030	Yes	Y		DL	1.2	W...	.866	W...	.5														
4	1.2D + 1W AZI 060	Yes	Y		DL	1.2	W...	.5	W...	.866														
5	1.2D + 1W AZI 090	Yes	Y		DL	1.2			W...	1														
6	1.2D + 1W AZI 120	Yes	Y		DL	1.2	W...	-.5	W...	.866														
7	1.2D + 1W AZI 150	Yes	Y		DL	1.2	W...	-.8...	W...	.5														
8	1.2D + 1W AZI 180	Yes	Y		DL	1.2	W...	-1																
9	1.2D + 1W AZI 210	Yes	Y		DL	1.2	W...	-.8...	W...	-.5														
10	1.2D + 1W AZI 240	Yes	Y		DL	1.2	W...	-.5	W...	-.8...														
11	1.2D + 1W AZI 270	Yes	Y		DL	1.2			W...	-1														
12	1.2D + 1W AZI 300	Yes	Y		DL	1.2	W...	.5	W...	-.8...														
13	1.2D + 1W AZI 330	Yes	Y		DL	1.2	W...	.866	W...	-.5														
14	0.9D + 1W AZI 000	Yes	Y		DL	.9	W...	1																
15	0.9D + 1W AZI 030	Yes	Y		DL	.9	W...	.866	W...	.5														
16	0.9D + 1W AZI 060	Yes	Y		DL	.9	W...	.5	W...	.866														
17	0.9D + 1W AZI 090	Yes	Y		DL	.9			W...	1														
18	0.9D + 1W AZI 120	Yes	Y		DL	.9	W...	-.5	W...	.866														
19	0.9D + 1W AZI 150	Yes	Y		DL	.9	W...	-.8...	W...	.5														
20	0.9D + 1W AZI 180	Yes	Y		DL	.9	W...	-1																
21	0.9D + 1W AZI 210	Yes	Y		DL	.9	W...	-.8...	W...	-.5														
22	0.9D + 1W AZI 240	Yes	Y		DL	.9	W...	-.5	W...	-.8...														
23	0.9D + 1W AZI 270	Yes	Y		DL	.9			W...	-1														
24	0.9D + 1W AZI 300	Yes	Y		DL	.9	W...	.5	W...	-.8...														
25	0.9D + 1W AZI 330	Yes	Y		DL	.9	W...	.866	W...	-.5														
26	1.2D + 1.0Di	Yes	Y		DL	1.2	O...	1																
27	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	1														
28	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	.5												
29	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	.866												
30	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1			O...	1												
31	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	.866												
32	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.8...	O...	.5												
33	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-1														
34	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.8...	O...	-.5												
35	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	-.8...												
36	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1			O...	-1												
37	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	-.8...												
38	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	-.5												
39	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.066														
40	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.057	W...	.033												
41	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.033	W...	.057												
42	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5			W...	.066												
43	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	.057												
44	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	.033												
45	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...														
46	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	-.0...												
47	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	-.0...												
48	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5			W...	-.0...												
49	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.033	W...	-.0...												
50	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.057	W...	-.0...												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N70	max	1639.781	18	2847.299	31	1046.815	12	-.16	25	.598	2	-.606	24
2		min	-1639.583	24	348.27	24	-1049.148	6	-5.533	32	-.599	8	-9.412	31
3	N72	max	476.23	5	2847.135	27	1882.63	2	10.859	27	1.275	23	.796	23
4		min	-476.218	23	348.486	20	-1881.214	20	.765	20	-1.275	17	-.828	5
5	N71	max	1623.346	4	2847.328	35	1071.134	3	-.135	15	.692	20	9.425	35
6		min	-1623.405	10	348.288	16	-1073.834	21	-5.513	34	-.69	14	.622	16
7	Totals:	max	3414.057	17	7997.46	32	3425.222	14						
8		min	-3414.057	11	2360.515	25	-3425.222	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Loc.....	L..	phi*Pn..	phi*Pn..	phi*M...	phi*M...	...	Eqn
1	M6	HSS4x4x4	.685	0	35	.095	0	y	38	10844...	139518	16.181	16.181	2..	H1-1b
2	M4	HSS4x4x4	.684	0	31	.095	0	y	34	10844...	139518	16.181	16.181	2..	H1-1b
3	M5	HSS4x4x4	.681	0	28	.095	0	y	30	10844...	139518	16.181	16.181	2..	H1-1b
4	M7	PIPE_2.0	.601	27	8	.030	27		8	14916...	32130	1.872	1.872	1..	H1-1b
5	M23	PIPE_2.0	.529	27	11	.026	27		11	14916...	32130	1.872	1.872	2..	H1-1b
6	M27	PIPE_2.0	.529	27	5	.026	27		5	14916...	32130	1.872	1.872	2..	H1-1b
7	M10	PIPE_2.0	.313	27	8	.016	27		8	14916...	32130	1.872	1.872	1..	H1-1b
8	M9	PIPE_2.0	.302	24	8	.017	24		8	14916...	32130	1.872	1.872	1..	H1-1b
9	M1	HSS4x4x4	.294	156	35	.100	0	z	2	68779...	139518	16.181	16.181	3..	H1-1b
10	M26	PIPE_2.0	.292	27	11	.015	27		11	14916...	32130	1.872	1.872	2..	H1-1b
11	M30	PIPE_2.0	.292	27	5	.015	27		5	14916...	32130	1.872	1.872	2..	H1-1b
12	M3	HSS4x4x4	.291	156.0...	31	.089	0	z	10	68775...	139518	16.181	16.181	3..	H1-1b
13	M2	HSS4x4x4	.289	0	35	.088	0	z	6	68775...	139518	16.181	16.181	3..	H1-1b
14	M29	PIPE_2.0	.287	24	5	.016	24		5	14916...	32130	1.872	1.872	1..	H1-1b
15	M25	PIPE_2.0	.286	24	11	.016	24		11	14916...	32130	1.872	1.872	1..	H1-1b
16	M13	L3x3x4	.192	0	48	.026	0	z	39	45943...	46656	1.688	3.756	1..	H2-1
17	M8	PIPE_2.0	.081	27	8	.005	27		8	14916...	32130	1.872	1.872	1..	H1-1b
18	M28	PIPE_2.0	.081	27	4	.005	27		4	14916...	32130	1.872	1.872	2..	H1-1b
19	M24	PIPE_2.0	.081	27	12	.005	27		12	14916...	32130	1.872	1.872	2..	H1-1b
20	M16	L3x3x4	.007	0	33	.002	0	z	33	45943...	46656	1.688	3.756	2..	H2-1
21	M12	L3x3x4	.007	0	36	.002	0	z	26	45943...	46656	1.688	3.756	2..	H2-1
22	M21	L3x3x4	.007	0	27	.002	0	z	33	45943...	46656	1.688	3.756	2..	H2-1
23	M20	L3x3x4	.007	0	27	.002	0	z	33	45944...	46656	1.688	3.756	2..	H2-1
24	M17	L3x3x4	.007	0	33	.002	0	z	33	45944...	46656	1.688	3.756	2..	H2-1
25	M15	L3x3x4	.007	0	33	.002	0	z	33	45943...	46656	1.688	3.756	2..	H2-1
26	M14	L3x3x4	.006	0	36	.002	0	z	27	45943...	46656	1.688	3.756	2..	H2-1
27	M11	L3x3x4	.006	0	36	.002	0	z	29	45943...	46656	1.688	3.756	2..	H2-1
28	M22	L3x3x4	.006	0	27	.002	0	z	33	45943...	46656	1.688	3.756	2..	H2-1
29	M19	L3x3x4	.006	0	27	.002	0	z	33	45944...	46656	1.688	3.756	2..	H2-1
30	M18	L3x3x4	.006	0	33	.002	0	z	33	45944...	46656	1.688	3.756	2..	H2-1

APPENDIX D

REFERENCE DOCUMENTS

Date:	7/19/2018
Client	Crown
Carrier	T-Mobile
Engineer:	ATE
Site:	841290
Job #:	600-005

Code:	LRFD	
Axial:	1639.78	lbs
Shear:	2847.33	lbs

Bolt Capacity (5/8" A325 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	13106.7	9830.0	1	9830
Shear(lb)	8013.3	6010.0	1	6010

Interaction Check	
T /ϕT_n	16.7%
V /ϕVn	47.4%
≤1.0	25.2%
	OK

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

T-Mobile Existing Facility

Site ID: CT11069A

Greenwich/Boy Scouts-2
363 Riversville Road
Greenwich, CT 06831

August 28, 2018

EBI Project Number: 6218005884

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	12.29 %

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

EBI Consulting
environmental | engineering | due diligence

August 28, 2018

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

Emissions Analysis for Site: **CT11069A – Greenwich/Boy Scouts-2**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **363 Riversville Road, Greenwich, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **363 Riversville Road, Greenwich, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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

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

9) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66AA** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels, the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **163 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163 feet	Height (AGL):	163 feet	Height (AGL):	163 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**1.13**	Antenna B1 MPE%	**1.13**	Antenna C1 MPE%	**1.13**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163 feet	Height (AGL):	163 feet	Height (AGL):	163 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**0.31**	Antenna B2 MPE%	**0.31**	Antenna C2 MPE%	**0.31**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	163 feet	Height (AGL):	163 feet	Height (AGL):	163 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**0.85**	Antenna B3 MPE%	**0.85**	Antenna C3 MPE%	**0.85**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.29 %**
AT&T	**3.57** %
Verizon Wireless	**2.11** %
Nextel	**0.37** %
Sprint	**3.95** %
Site Total MPE %:	**12.29 %**

T-Mobile Sector A Total:	2.29 %
T-Mobile Sector B Total:	2.29 %
T-Mobile Sector C Total:	2.29 %
Site Total:	12.29 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	163	4.54	PCS - 1900 MHz	1000.00	0.45%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	163	6.81	AWS - 2100 MHz	1000.00	0.68%
T-Mobile PCS - 1900 MHz GSM	1	583.57	163	0.85	PCS - 1900 MHz	1000.00	0.08%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	163	2.27	AWS - 2100 MHz	1000.00	0.23%
T-Mobile 600 MHz LTE	2	788.97	163	2.30	600 MHz	400.00	0.58%
T-Mobile 700 MHz LTE	2	432.54	163	1.26	700 MHz	467.00	0.27%
						Total:	**2.29%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	2.29 %
Sector B:	2.29 %
Sector C:	2.29 %
T-Mobile Maximum MPE % (Per Sector):	2.29 %
Site Total:	12.29 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.29%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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