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

11/9/18

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: 806362**
T-Mobile Site ID: CT11494B
347 East Street, Wolcott, CT 06716
Latitude: 41.559500 / Longitude: -72.946900

Dear Ms. Bachman:

T-Mobile currently maintains 3 antennas at the 186 foot level of the existing 185-foot Lattice Tower at 347 East Street, Wolcott, CT 06716. The tower is owned by Crown Castle. The property is owned by Agostinho V & Joanne Rodrigues. T-Mobile intends to replace (3) existing panel antennas with (6) proposed panel antennas and to add (3) remote radio units, add (2) hybrid lines and to replace (2) lines of coax.

This facility was approved by the Connecticut Siting Council Petition No. 673 on June 9, 2004. This approval was given without conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mayor Thomas G. Dunn, the Zoning Inspector David Kalinowski 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:

Mayor Thomas G. Dunn
Town Hall
10 Kenea Ave.
Wolcott, CT 06716

David Kalinowski
Zoning Inspector
Town Hall
10 Kenea Ave.
Wolcott, CT 06716

Agostinho V & Joanne Rodrigues
347 East St, Wolcott, CT 06716

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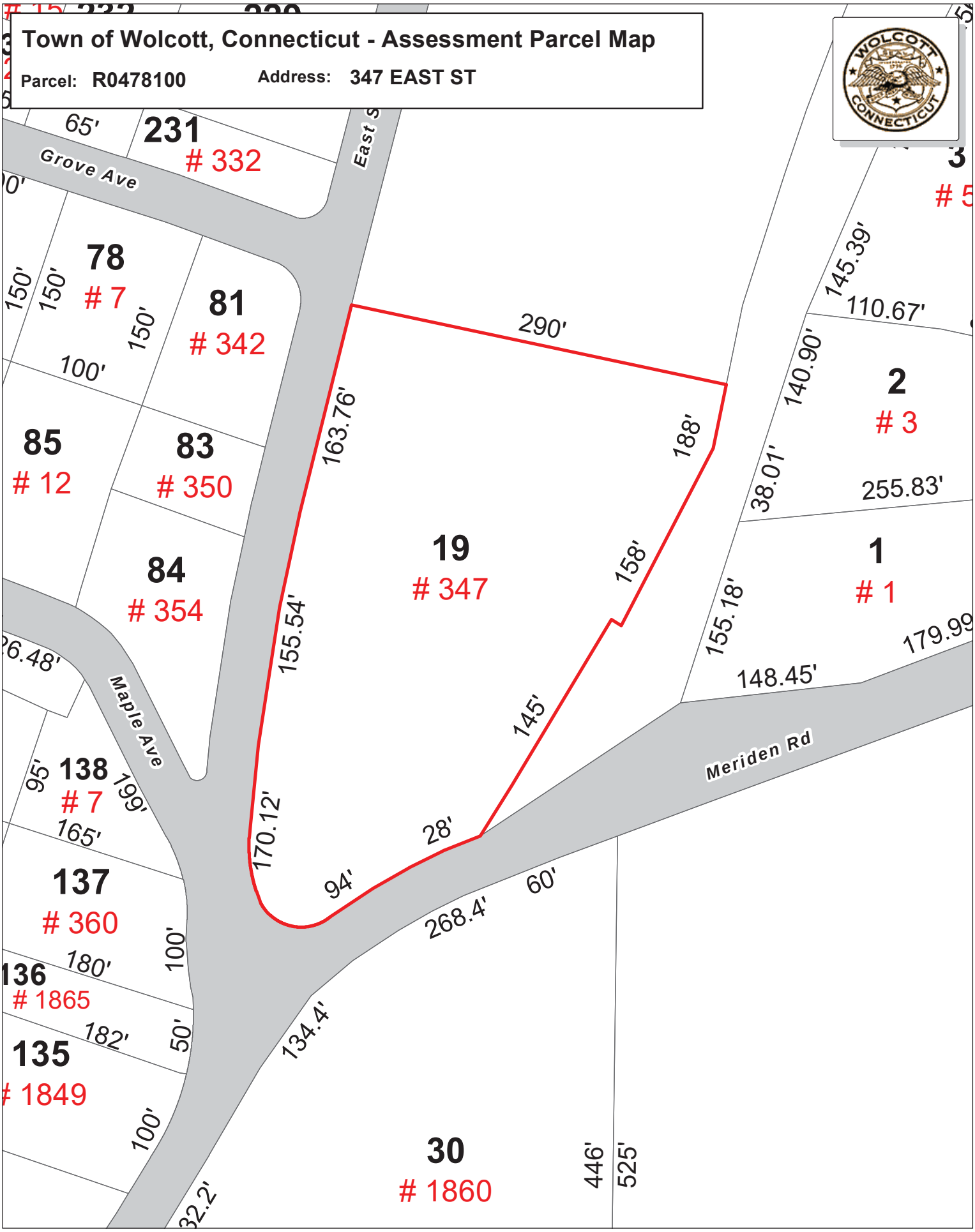


Map Produced June 2018

Approximate Scale: 1 inch = 100 feet

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The Town of Wolcott and its mapping contractors assume no legal responsibility for the information contained herein.

347 EAST ST

Location	347 EAST ST	**Mblu**	131/ 1/ 19/ /
Acct#	R0478100	**Owner**	RODRIGUES AGOSTINHO V &
Assessment	$453,670	**Appraisal**	$648,090
PID	5352	**Building Count**	3

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$401,720	$246,370	$648,090
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$281,210	$172,460	$453,670

Owner of Record

Owner	RODRIGUES AGOSTINHO V &	**Sale Price**	$0
Co-Owner	JOANNE	**Certificate**	
Address	347 EAST ST WOLCOTT, CT 06716	**Book & Page**	131/ 23
		Sale Date	06/27/1980
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
RODRIGUES AGOSTINHO V &	$0		131/ 23	25	06/27/1980

Building Information

Building 1 : Section 1

Year Built:	1930
Living Area:	3,139
Replacement Cost:	$339,418
Building Percent Good:	62
Replacement Cost Less Depreciation:	$210,440

Building Attributes	
Field	**Description**
Style	Colonial
Model	Residential

Building Photo

Petition No. 673
Omnipoint Communications, Inc. (T-Mobile)
347 East Street
Wolcott, CT
Staff Report
June 9, 2004

On May 28, 2004, Connecticut Siting Council (Council) member Edward S. Wilensky and Christina Lepage of the Council staff met with Omnipoint Communications, Inc., a subsidiary of T-Mobile USA, Inc. (T-Mobile) representative Stephen Humes at 347 East Street, Wolcott, Connecticut for the inspection of an existing lattice tower. The structure is owned by Crown Castle. T-Mobile proposes to modify the existing tower by installing antennas and associated equipment for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

T-Mobile proposes to install six flush mounted antennas, which would be mounted to pipe supports attached to the existing 180-foot tower. The pipe mast would extend approximately ten feet above the top of the existing tower. The antennas would be mounted with a centerline at 188 feet above ground level (AGL) bringing the top of the tower to 190 feet three inches AGL. T-Mobile would install GPS and GSM antennas on the ice bridge at 30 feet AGL.

The proposed equipment would be installed on a 17-foot by five-foot concrete slab to be located within the existing fenced area at the base of the tower. Access to the tower is via an existing access drive extending from East Street. Utilities would originate from existing sources.

The tower is located in an industrial zone on property owned by Agostino Rodrigues. The proposed antennas are intended to provide coverage to a portion of Interstate 84, Route 322 and the surrounding area.

The calculated cumulative worst-case radio frequency power density would not exceed the applicable standard.

T-Mobile contends that the proposed project would reduce the need for another telecommunications tower to provide coverage to the area, and that the proposed project would not have a substantial environmental effect.

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

806362

SITE ID

CT11494B

SITE NAME

CT494/CCASTLE-WOLCOTT-SST

SITE ADDRESS

347 EAST ST
WOLCOTT,CT 06716

CONFIGURATION

67D94DB_1XAIR+1OP

PROJECT SITE INFORMATION

SITE ID:	CT11494B
SITE NAME:	CT494/CCASTLE-WOLCOTT-SST
SITE ADDRESS:	347 EAST ST WOLCOTT,CT 06716
PERMITTING JURISDICTION:	TOWN OF WOLCOTT
COUNTY:	NEW HAVEN COUNTY
ZONING:	CSC
SITE COORDINATES: LATITUDE:	41° 33' 34.2" N (41.559500°) (NAD 83)
LONGITUDE:	72° 56' 48.8" W (-72.946900°) (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, PLLC** 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

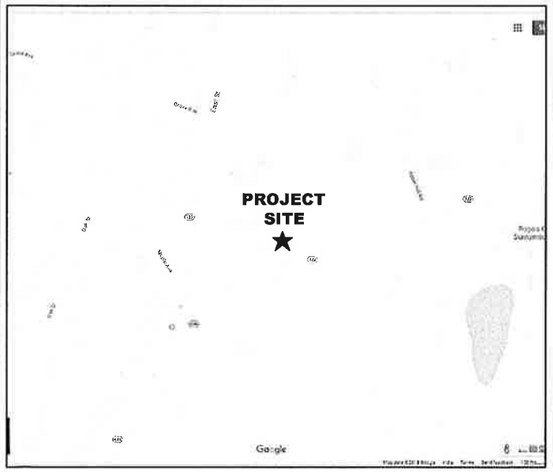
SCOPE OF WORK

SCOPE OF WORK:
TMO L700 4x2 6794DB (UPSTATE NY MARKET)
REPLACING (3) EXISTING ANTENNAS WITH (6) NEW MODELS. ADDING (2) HYBRID FIBER CABLE ADD (3) RRUS. REPLACING (2) COAX.

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
LICENSED PROFESSIONAL ENGINEER
DATE 08-06-2018

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

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11494B
CT494/CCASTLE-WOLCOTT-SST
347 EAST ST
WOLCOTT,CT 06716

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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JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
AUG 06 2018

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Drawn: RCD
Designed: MRL
Checked: AJD

Project Number:
600-007

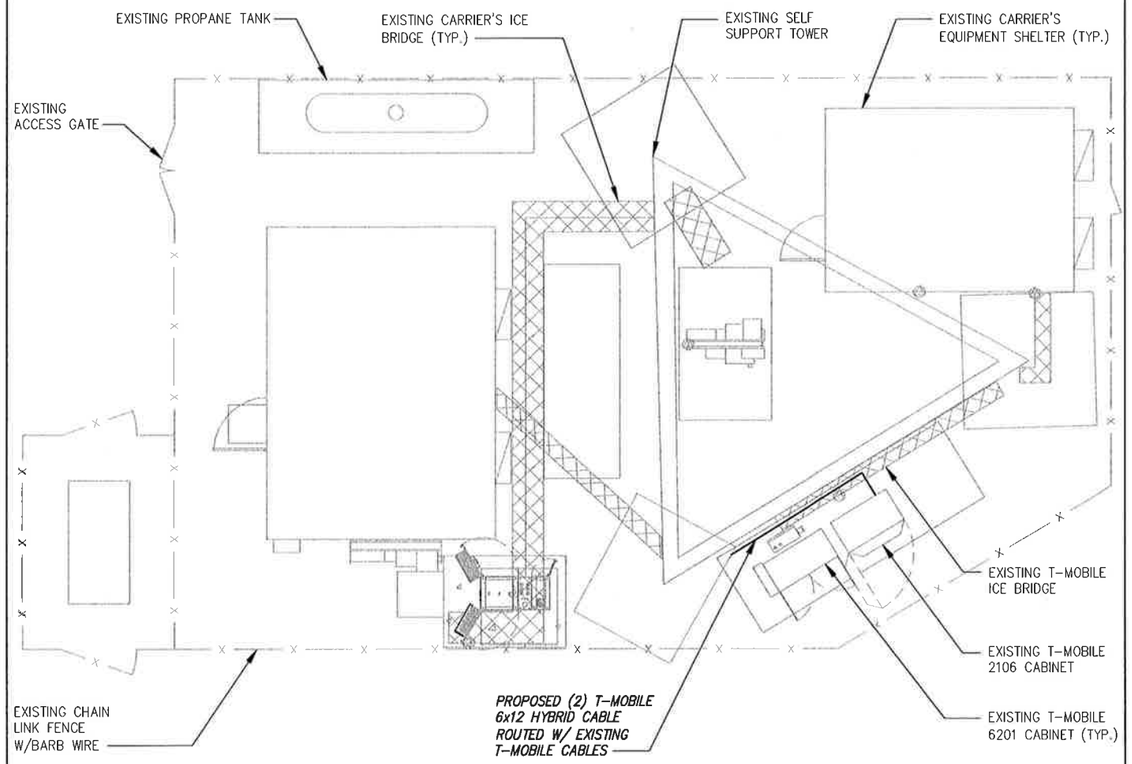
Project Title:
CT11494B
CT494/CCASTLE-WOLCOTT-SST

347 EAST ST
WOLCOTT,CT 06716

Prepared For:
CROWN CASTLE

Drawing Title
NOTES

Drawing Number
N1



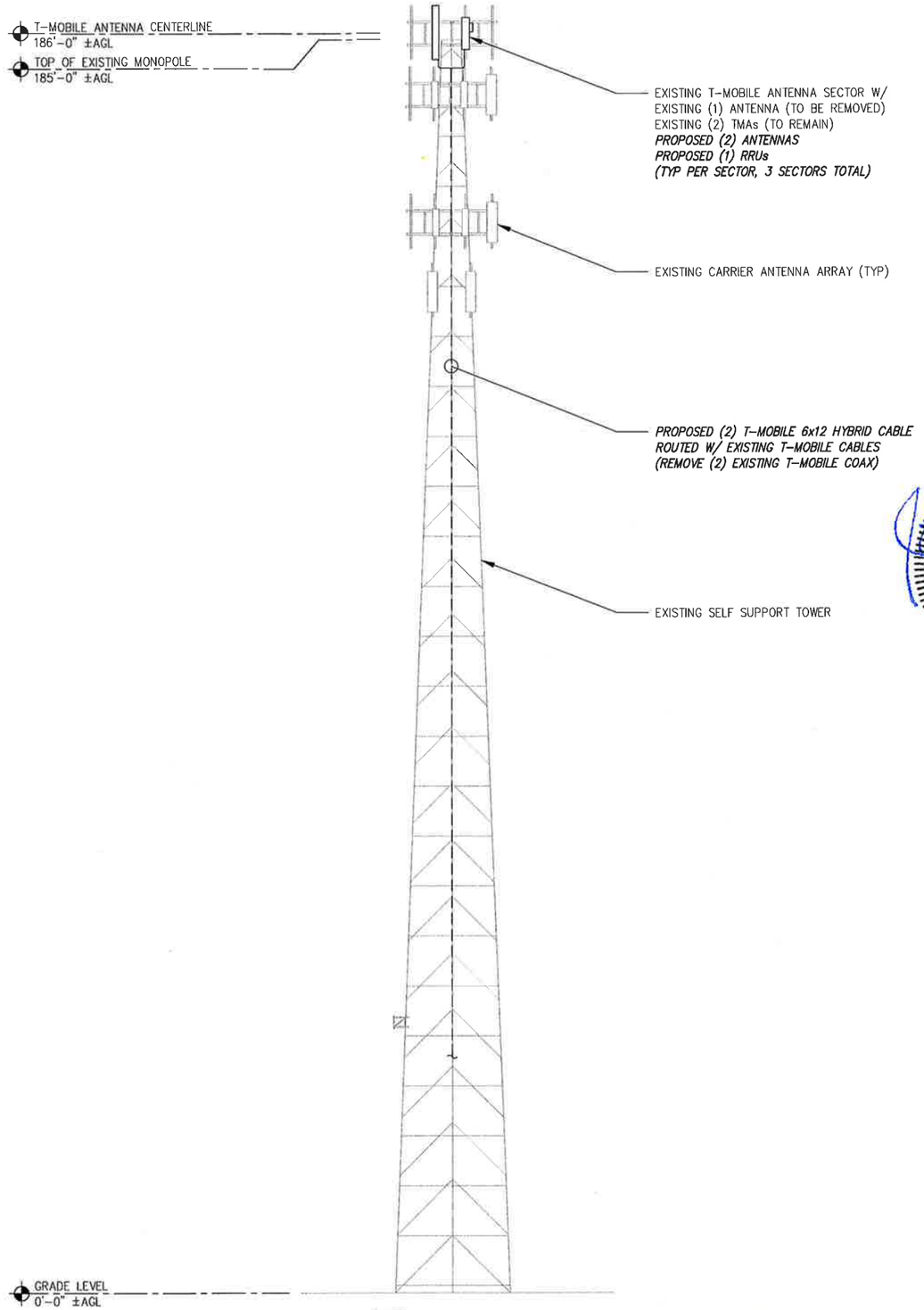
NORTH

1 / C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:

10' 5' 0 5' 10'

SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"



2 / C1 ELEVATION
SCALE: NOT TO SCALE

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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	**AIR32 B66A/B2A**	**ERICSSON**	**30°**	-	--	186'-0"	--	**236'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-2	**APXVAARR24_43-U-NA20**	**RFS**	**30°**	-	--	186'-0"	**4449 B71+B1** TWIN PCS TMA TWIN AWS TMA	205'±/ **236±**	(2) 1-5/8" COAX **(1) 6X12 HCS (SHARED)**
	A-3	--	--	--	-	--	--	-	--	
BETA	B-1	**AIR32 B66A/B2A**	**ERICSSON**	**150°**	-	--	186'-0"	--	**236'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-2	**APXVAARR24_43-U-NA20**	**RFS**	**150°**	-	--	186'-0"	**4449 B71+B1** TWIN PCS TMA TWIN AWS TMA	205'±/ **236±**	(2) 1-5/8" COAX **(1) 6X12 HCS (SHARED)**
	B-3	--	--	--	-	--	--	-	--	
GAMMA	C-1	**AIR32 B66A/B2A**	**ERICSSON**	**270°**	-	--	186'-0"	--	**236'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-2	**APXVAARR24_43-U-NA20**	**RFS**	**270°**	-	--	186'-0"	**4449 B71+B1** TWIN PCS TMA TWIN AWS TMA	205'±/ **236±**	(2) 1-5/8" COAX **(1) 6X12 HCS (SHARED)**
	C-3	--	--	--	-	--	--	-	--	

1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

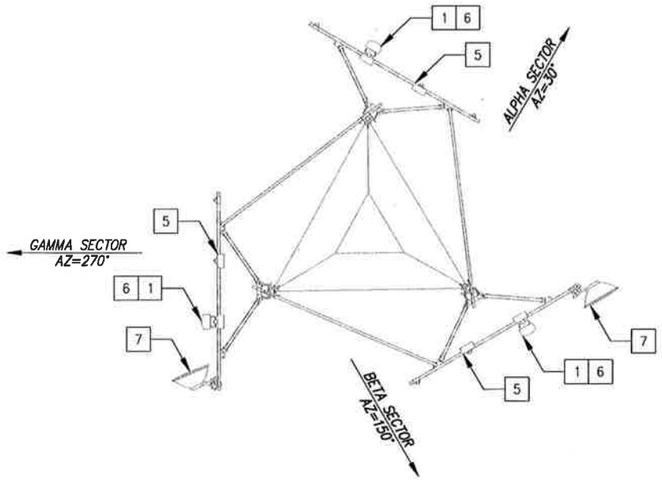
#1 #2

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.

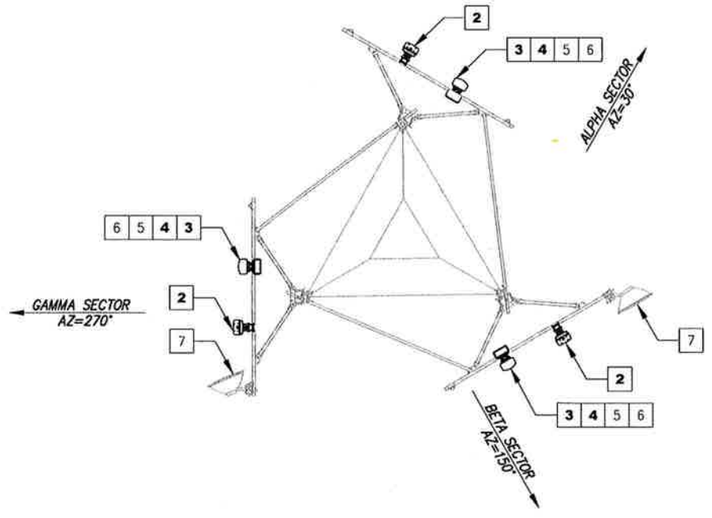
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	SBNHH-1D65A-SR	ANTENNA	3	REMOVED
2	**AIR32 B66A/B2A**	**ANTENNA**	**3**	**PROPOSED**
3	**APXVAARR24_43-U-NA20**	**ANTENNA**	**3**	**PROPOSED**
4	**4449 B71+B1**	**RRUS**	**3**	**PROPOSED**
5	GENERIC TWIN AWS	TMA	3	REMAIN
6	GENERIC TWIN PCS	TMA	3	RELOCATE
7	MICROWAVE	DISH	2	REMAIN



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 LICENSED PROFESSIONAL ENGINEER
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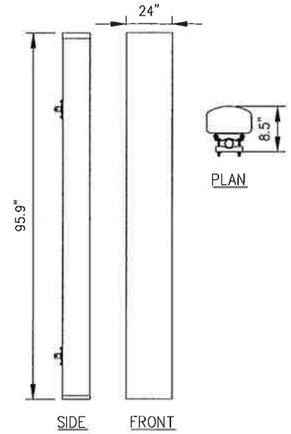
Prepared For: CROWN CASTLE

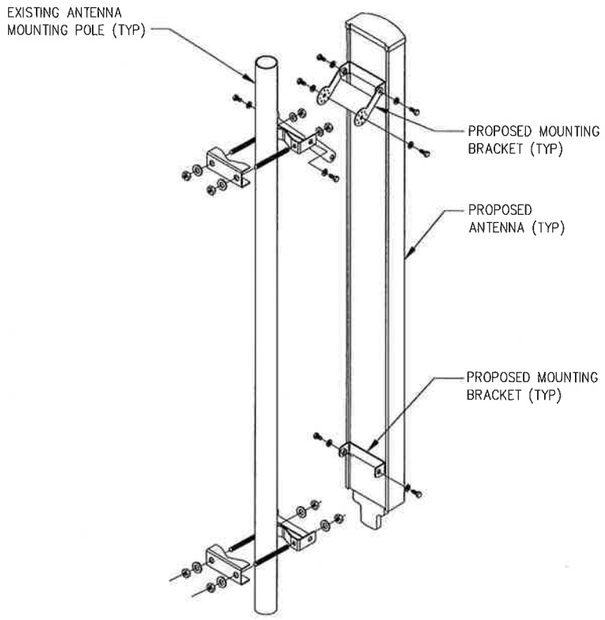
Drawing Title
RF CHART

Drawing Number
C2

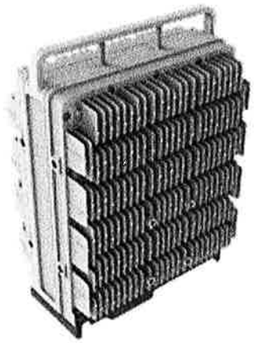


RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.5"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1 / D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE



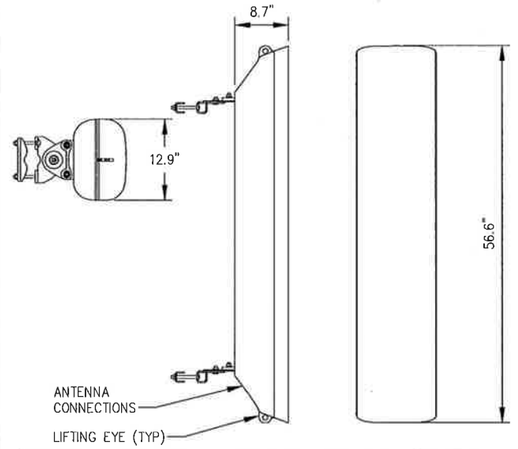
2 / D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



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 ERICSSON ANTENNA DETAIL
SCALE: NOT TO SCALE

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CT494/CCASTLE-WOLCOTT-SST

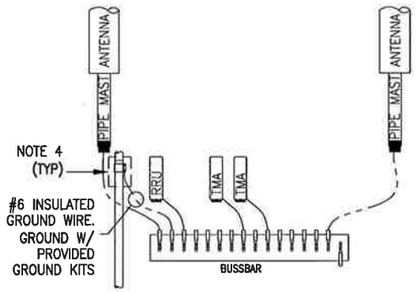
347 EAST ST
WOLCOTT,CT 06716

Prepared For: CROWN CASTLE

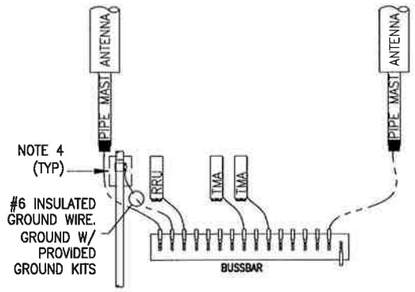
Drawing Title: **EQUIPMENT DETAILS**

Drawing Number: **D1**

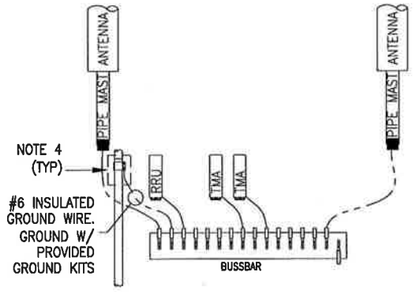
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

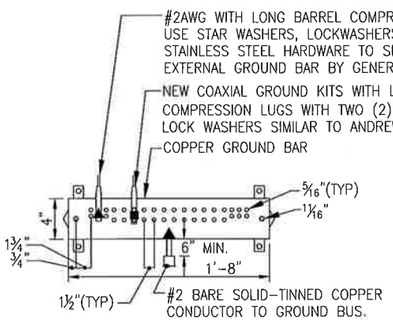


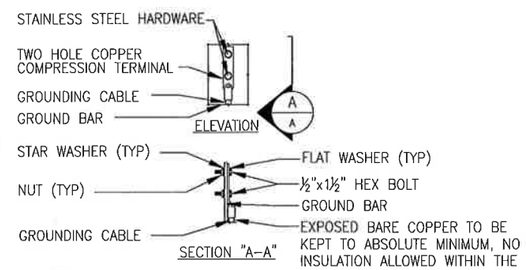
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



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

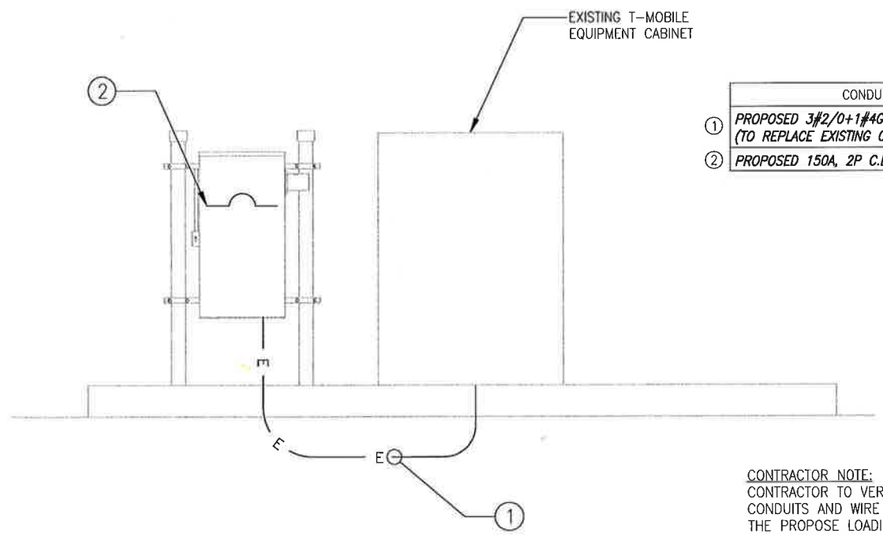




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

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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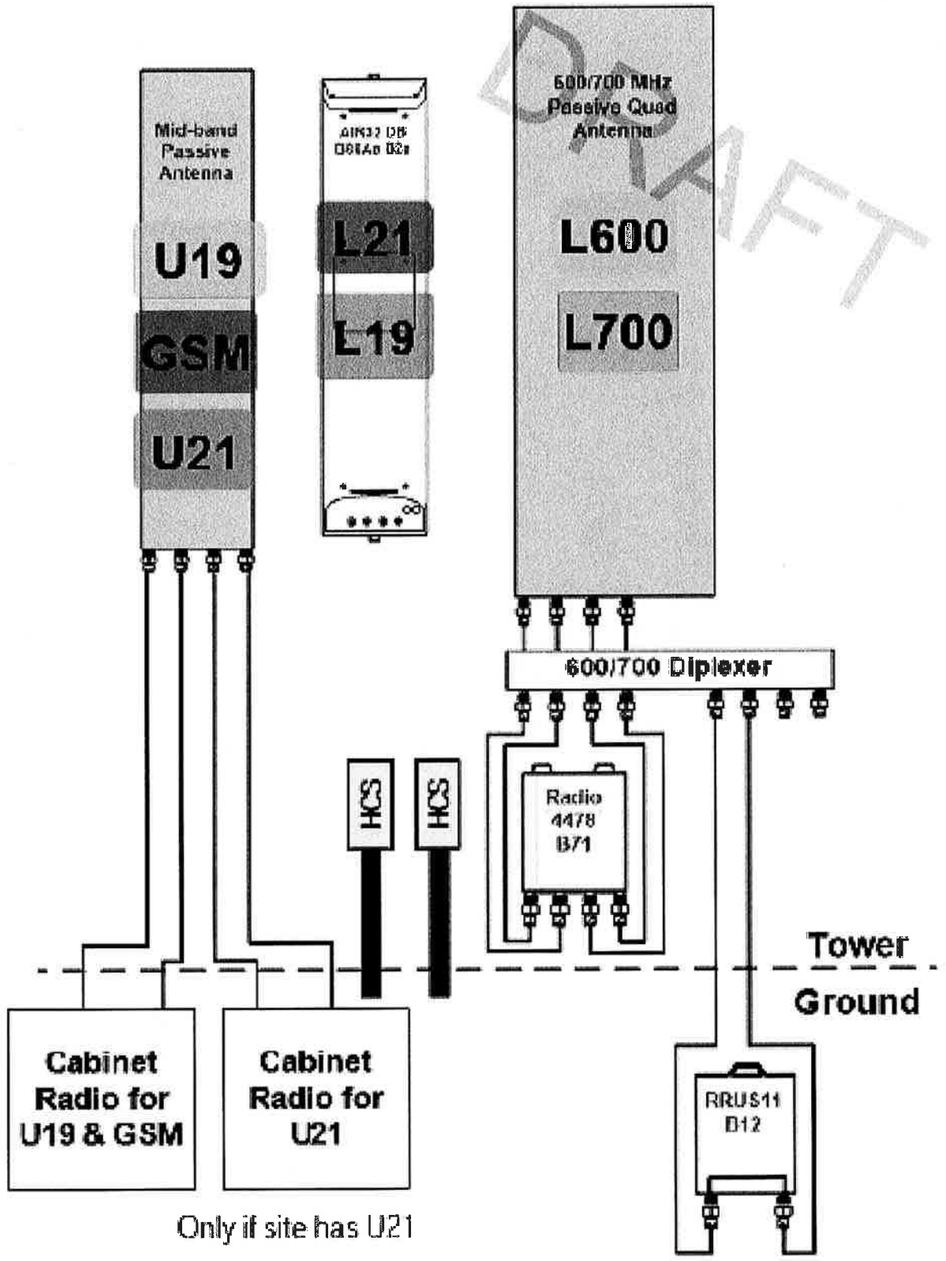
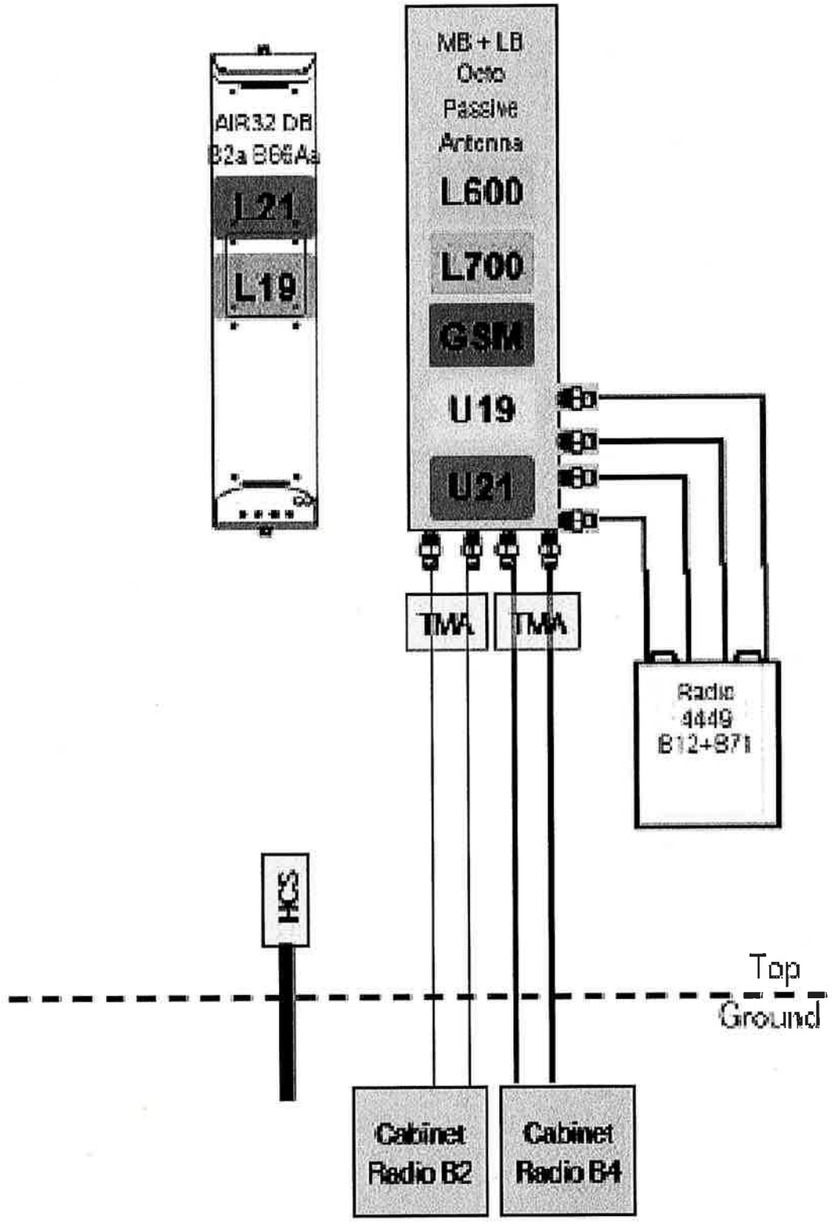
Drawing Title
RISER AND ONE-LINE DIAGRAMS

Drawing Number
E1





1 E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

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Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

Date: **October 10, 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 Modification Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Carrier Site Number:**	 CT11494B
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Order Number:**	806362 NHV 108 943133 512700 1628360 446207 Rev. 1
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1628360
Site Data:	**INTERSECTION OF RTE 322/MERIDIAN RDWOLCOTT SITE, WOLCOTT, New Haven County, CT** **Latitude *41° 33' 34.41"*, Longitude *-72° 56' 49.1"*** **185 Foot - Self Support Tower**	

Dear Charles Trask,

Jacobs Engineering Group, Inc. is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower.

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

LC4: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 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 C and Risk Category II were used in this analysis.

Structural analysis prepared by: Philip Lin

Respectfully submitted by:

Engineer of Record:
Paul L. Mucci, P.E.
Senior Project Engineer

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1) INTRODUCTION

This tower is a 185 ft Self Support tower designed by ROHN. A proposed 5 ft tower extension has been considered in this analysis, bringing the total tower height to 185ft.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	97 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
186.0	186.0	3	commscope	SBNHH-1D65A w/ Mount Pipe	2 16	1-3/8 1-5/8
		3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		6	rfs celwave	ATMAA1412D-1A20		
		3	sitepro1	VFA12-HD		

Table 2 – Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.0	177.0	3	alcatel lucent	RRH2X60-AWS	13	1-5/8
		3	alcatel lucent	RRH2X60-PCS		
		3	alcatel lucent	RRH2x60-700		
		2	andrew	DB846F65ZAXY w/ Mount Pipe		
		2	antel	LPA-80063/6CFx5 w/ Mount Pipe		
		6	commscope	SBNHH-1D45B w/ Mount Pipe		
		3	commscope	SBNHH-1D65B w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		2	swedcom	SC-E 6014 rev2 w/ Mount Pipe		
		1	tower mounts (crown)	Sector Mount [SM 504-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
168.0	168.0	1	dragonwave	A-ANT-18G-2-C	4 1	1-1/4 7983A
		1	andrew	VHLP2-18		
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		6	alcatel lucent	RRH2x50-800		
		3	commscope	NNVV-65B-R4		
		3	nokia	AAHC		
		1	tower mounts (crown)	Sector Mount [SM 402-3]		
158.0	160.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	12 2 4	1-1/4 3/8 3/4
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		6	kaelus	DBC0061F1V51-2		
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		2	quintel technology	QS66512-2 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
	158.0	3	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11		
		3	powerwave technologies	7020.00		
		1	raycap	DC6-48-60-18-8F		
		1	tower mounts (crown)	Sector Mount [SM 504-3]		
40.0	40.0	1	gps	GPS_A	1	1/2
		1	tower mounts (crown)	Side Arm Mount [SO 306-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2303630	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	217670	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	529684	CCISITES
4-EXPOSURE CATEGORY/TOPOGRAPHIC FACTOR	Crown Castle	7872381	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Tower modifications outlined in Appendix D must be installed for this analysis to be valid.
4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically and must be replaced if damaged or cracked. Refer to Crown Castle document ENG-PRC-10012, Base Plate Grout Repair.

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 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	185 - 180	Leg	ROHN 2.5 STD	2	-5.445	57.192	9.5	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	15	-29.214	45.528	64.2	Pass
T3	160 - 140	Leg	ROHN 3 X-STR	54	-79.112	94.336	83.9	Pass
T4	140 - 120	Leg	ROHN 4 X-STR	93	-122.375	159.904	76.5	Pass
T5	120 - 100	Leg	ROHN 5 X-STR	132	-154.293	201.195	76.7	Pass
T6	100 - 80	Leg	ROHN 5 X-STR	159	-187.502	201.111	93.2	Pass
T7	80 - 60	Leg	ROHN 6 EHS	186	-217.308	243.965	89.1	Pass
T8	60 - 40	Leg	ROHN 6 X-STR	213	-246.654	303.623	81.2	Pass
T9	40 - 20	Leg	ROHN 6 X-STR	240	-274.421	303.585	90.4	Pass
T10	20 - 0	Leg	ROHN 8 EHS	267	-286.162	386.706	74.0	Pass
T1	185 - 180	Diagonal	L2x2x1/4	10	-1.961	10.330	19.0 20.2 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	180 - 160	Diagonal	ROHN 2 STD	21	-10.567	17.637	59.9	Pass
T3	160 - 140	Diagonal	ROHN 2 STD	72	-11.327	15.994	70.8	Pass
T4	140 - 120	Diagonal	ROHN 2 STD	99	-10.156	13.067	77.7	Pass
T5	120 - 100	Diagonal	ROHN 2.5 STD	138	-12.016	16.376	73.4	Pass
T6	100 - 80	Diagonal	ROHN 2.5 STD	165	-10.587	14.297	74.0	Pass
T7	80 - 60	Diagonal	ROHN 2.5 STD	192	-11.071	12.652	87.5	Pass
T8	60 - 40	Diagonal	ROHN 2.5 X-STR	219	-11.361	13.964	81.4	Pass
T9	40 - 20	Diagonal	ROHN 3 STD	246	-11.132	19.132	58.2	Pass
T10	20 - 0	Diagonal	ROHN 3 STD	279	-17.821	32.170	55.4	Pass
T2	180 - 160	Horizontal	ROHN 1.5 STD	19	-5.640	22.564	25.0	Pass
T3	160 - 140	Horizontal	ROHN 1.5 STD	58	-6.597	19.143	34.5	Pass
T4	140 - 120	Horizontal	ROHN 2 STD	97	-6.927	27.195	25.5 28.1 (b)	Pass
T5	120 - 100	Horizontal	ROHN 2 STD	136	-7.131	22.627	31.5	Pass
T6	100 - 80	Horizontal	ROHN 2 STD	163	-6.966	16.764	41.6	Pass
T7	80 - 60	Horizontal	ROHN 2.5 STD	190	-7.732	28.852	26.8 31.2 (b)	Pass
T8	60 - 40	Horizontal	ROHN 2.5 STD	217	-8.260	22.315	37.0	Pass
T9	40 - 20	Horizontal	ROHN 2.5 STD	244	-8.305	17.669	47.0	Pass
T10	20 - 0	Horizontal	ROHN 3 STD	275	-9.450	31.224	30.3	Pass
T1	185 - 180	Top Girt	L2x2x1/4	4	-0.380	3.506	10.8	Pass
T10	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 x 11GA	280	-4.968	5.558	89.4	Pass
T10	20 - 0	Redund Diag 1 Bracing	2L2x2x1/4x1/4	281	-4.525	9.164	49.4	Pass
T10	20 - 0	Redund Hip 1 Bracing	ROHN 1.5 x 11GA	282	-0.031	4.941	0.6	Pass
T10	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	294	-0.085	10.600	0.8	Pass
T2	180 - 160	Inner Bracing	L2x2x1/8	27	-0.006	6.529	0.5	Pass
T3	160 - 140	Inner Bracing	L2x2x1/8	66	-0.006	4.871	0.6	Pass
T4	140 - 120	Inner Bracing	L2x2x1/8	105	-0.007	3.328	0.7	Pass
T5	120 - 100	Inner Bracing	L2x2x1/8	144	-0.009	2.510	0.8	Pass
T6	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	171	-0.011	5.252	0.6	Pass
T7	80 - 60	Inner Bracing	L3x3x3/16	198	-0.013	6.881	0.5	Pass
T8	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	225	-0.015	11.267	0.4	Pass
T9	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	252	-0.017	8.973	0.5	Pass
T10	20 - 0	Inner Bracing	ROHN 3 STD	297	-0.018	29.869	0.2	Pass
							Summary	
						Leg (T6)	93.2	Pass
						Diagonal (T7)	87.5	Pass
						Horizontal (T9)	47.0	Pass
						Top Girt (T1)	10.8	Pass
						Redund Horz 1 Bracing	89.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						(T10)		
						Redund Diag 1 Bracing (T10)	49.4	Pass
						Redund Hip 1 Bracing (T10)	0.6	Pass
						Redund Hip Diagonal 1 Bracing (T10)	0.8	Pass
						Inner Bracing (T5)	0.8	Pass
						Bolt Checks	69.3	Pass
						Rating =	93.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.2	Pass
1	Base Foundation Structure	0	42.6	Pass
1	Base Foundation Soil Interaction	0	34.3	Pass

Structure Rating (max from all components) =	93.2%

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

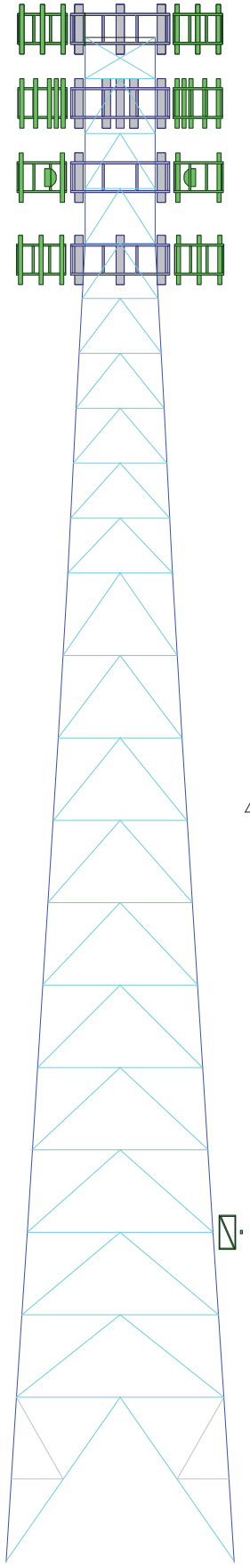
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration, once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	10	9	8	7	6	5	4	3	2	1
Legs	ROHN 8 EHS		ROHN 6 X-STR		ROHN 6 EHS	ROHN 5 X-STR	ROHN 4 X-STR	ROHN 3 X-STR	ROHN 2.5 STD	
Leg Grade					A572-50					
Diagonals		ROHN 3 STD		ROHN 2.5 X-STR		ROHN 2.5 STD		ROHN 2 STD		L2-2x1/4
Diagonal Grade						A572-50				
Top Girts						N.A.				L2-2x1/4
Horizontals	ROHN 3 STD		ROHN 2.5 STD			ROHN 2 STD		ROHN 1.5 STD		N.A.
Red. Horizontals	ROHN 1.5 x 11GA					N.A.				
Red. Diagonals	2L2-2x1.4x1/4					N.A.				
Red. Hips	ROHN 1.5 x 11GA					N.A.				
Inner Bracing	ROHN 3 STD		L3-1/2x3-1/2x1/4		L3x3x3/16	L2-1/2x2-1/2x3/16	L2-2x1/8			N.A.
Face Width (ft) 27.677	25.177		22.5417		20.0417	17.5417	14.9583	12.7083	10.625	8.5417	8.5
# Panels @ (ft)	1 @ 19.9167			10 @ 10					9 @ 6.66667	1 @ 5
Weight (K) 27.8	5.0	4.6	4.4	3.3	2.8	2.6	2.0	1.5	1.2	0.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8"x4'	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	(3) RRH2x50-800	168
(2) ATMAA1412D-1A20	186	(3) RRH2x50-800	168
(2) ATMAA1412D-1A20	186	(3) PCS 1900MHz 4x45W-65MHz	168
(2) ATMAA1412D-1A20	186	Sector Mount [SM 402-3]	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	A-ANT-18G-2-C	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	VHLP2-18	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	AM-X-CD-16-65-00T-RET w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	AM-X-CD-16-65-00T-RET w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	TPA-65R-LCUUUU-H8 w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	SBNH-1D6565C w/ Mount Pipe	158
(2) DB846F65ZAXY w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) LPA-80063/6CFx5 w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) SC-E 6014 rev2 w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
RRH2x60-700	177	RRUS 11	158
RRH2x60-700	177	RRUS 11	158
RRH2x60-700	177	RRUS 11	158
RRH2X60-AWS	177	DC6-48-60-18-8F	158
RRH2X60-AWS	177	DC6-48-60-18-8F	158
RRH2X60-AWS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	Sector Mount [SM 504-3]	158
(2) DB-T1-6Z-8AB-0Z	177	QS66512-2 w/ Mount Pipe	158
Sector Mount [SM 504-3]	177	QS66512-2 w/ Mount Pipe	158
NNVV-65B-R4	168	GPS_A	40
NNVV-65B-R4	168	Side Arm Mount [SO 306-1]	40
NNVV-65B-R4	168		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 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 0.000 ft
8. TOWER RATING: 93.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 313 K
SHEAR: 37 K

UPLIFT: -277 K
SHEAR: 34 K

AXIAL 164 K
SHEAR 18 K *MOMENT 2222 kip-ft*
TORQUE 11 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 68 K
SHEAR 61 K *MOMENT 7053 kip-ft*
TORQUE 53 kip-ft
REACTIONS - 97 mph WIND

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

Job:	***NHV 108 943133***		
Project:	***BU806362_WO1628360***		
Client:	Crown Castle	Drawn by: P Lin	App'd:
Code:	TIA-222-G	Date: 10/08/18	Scale: NTS
Path:			Dwg No. E-1

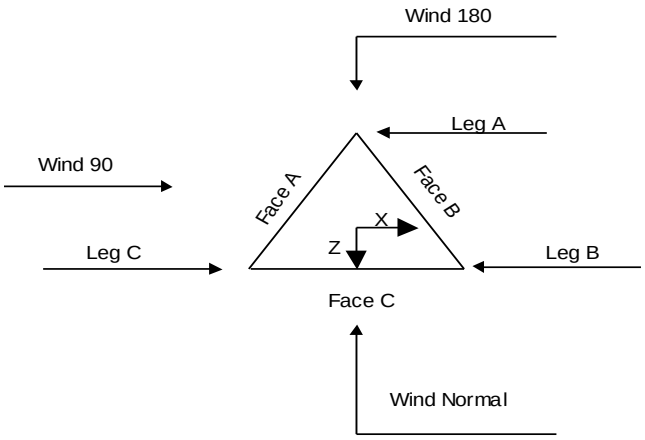
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 185.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 8.500 ft at the top and 27.677 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
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		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	185.000-180.000			8.500	1	5.000
T2	180.000-160.000			8.500	1	20.000
T3	160.000-140.000			8.542	1	20.000
T4	140.000-120.000			10.625	1	20.000
T5	120.000-100.000			12.708	1	20.000
T6	100.000-80.000			14.958	1	20.000
T7	80.000-60.000			17.542	1	20.000
T8	60.000-40.000			20.042	1	20.000
T9	40.000-20.000			22.542	1	20.000
T10	20.000-0.000			25.177	1	20.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	185.000-180.000	5.000	X Brace	No	Yes	0.000	0.000
T2	180.000-160.000	6.667	K Brace Down	No	Yes	0.000	0.000
T3	160.000-140.000	6.667	K Brace Down	No	Yes	0.000	0.000
T4	140.000-120.000	6.667	K Brace Down	No	Yes	0.000	0.000
T5	120.000-100.000	10.000	K Brace Down	No	Yes	0.000	0.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	100.000-80.000	10.000	K Brace Down	No	Yes	0.000	0.000
T7	80.000-60.000	10.000	K Brace Down	No	Yes	0.000	0.000
T8	60.000-40.000	10.000	K Brace Down	No	Yes	0.000	0.000
T9	40.000-20.000	10.000	K Brace Down	No	Yes	0.000	0.000
T10	20.000-0.000	19.917	K1 Down	No	Yes	0.000	1.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 185.000-180.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A572-50 (50 ksi)
T2 180.000-160.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 160.000-140.000	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 140.000-120.000	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 120.000-100.000	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 100.000-80.000	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 80.000-60.000	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 60.000-40.000	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)
T9 40.000-20.000	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 20.000-0.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 185.000-180.000	Equal Angle	L2x2x1/4	A572-50 (50 ksi)	Pipe		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2	None	Pipe		A618-50	Pipe	ROHN 1.5 STD	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
180.000-160.000				(50 ksi)			(50 ksi)
T3 160.000-140.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T4 140.000-120.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 120.000-100.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 100.000-80.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 80.000-60.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 60.000-40.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 40.000-20.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 20.000-0.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 180.000-160.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 160.000-140.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 140.000-120.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 120.000-100.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 100.000-80.000	Pipe		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.000-60.000	Pipe		A572-50 (50 ksi)	Single Angle	L3x3x3/16	A572-50 (50 ksi)
T8 60.000-40.000	Pipe		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 40.000-20.000	Pipe		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 20.000-0.000	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T10 20.000-0.000	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 x 11GA	1
		Diagonal (1)	Double Equal Angle	2L2x2x1/4x1/4	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
		Hip (1)	Pipe	ROHN 1.5 x 11GA	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

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
T1 185.000-180.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T2 180.000-160.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T3 160.000-140.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T4 140.000-120.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T5 120.000-100.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T6 100.000-80.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T7 80.000-60.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T8 60.000-40.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T9 40.000-20.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T10 20.000-0.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 185.000-180.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.0	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
00																	
T4	Yes	No	1	1		1		1		1		1		1		1	
140.000-120.000				1		1		1		1		1		1		1	
T5	Yes	No	1	1		1		1		1		1		1		1	
120.000-100.000				1		1		1		1		1		1		1	
T6	Yes	No	1	1		1		1		1		1		1		1	
100.000-80.000				1		1		1		1		1		1		1	
T7	Yes	No	1	1		1		1		1		1		1		1	
80.000-60.000				1		1		1		1		1		1		1	
T8	Yes	No	1	1		1		1		1		1		1		1	
60.000-40.000				1		1		1		1		1		1		1	
T9	Yes	No	1	1		1		1		1		1		1		1	
40.000-20.000				1		1		1		1		1		1		1	
T10	Yes	No	1	1		1		1		1		1		1		1	
20.000-0.000				1		1		1		1		1		1		1	

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	1	0.000	0.75
185.000-180.000														
T2	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
180.000-160.000														
T3	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
160.000-140.000														
T4	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
140.000-120.000														
T5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
120.000-100.000														
T6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
100.000-80.000														
T7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
80.000-60.000														
T8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
60.000-40.000														
T9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
40.000-20.000														

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T10 20.000-0.000	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 185.000-180.000	Flange	0.625 A325N	4	0.500 A325X	1	0.500 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 180.000-160.000	Flange	0.750 A325N	4	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T3 160.000-140.000	Flange	0.875 A325N	0	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T4 140.000-120.000	Flange	1.000 A325N	4	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T5 120.000-100.000	Flange	1.000 A325N	4	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T6 100.000-80.000	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T7 80.000-60.000	Flange	1.000 A325N	6	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T8 60.000-40.000	Flange	1.000 A325N	6	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T9 40.000-20.000	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T10 20.000-0.000	Flange	1.000 A449	0	0.750 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.750 A325N	2	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Safety Line 3/8 *** FACE A ***	C	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.5	1	1	0.500	0.375		0.000
LDF4-50A(1/	A	No	No	Ar (CaAa)	40.000 -	0.000	-0.44	1	1	0.500	0.630		0.000

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
2")					0.000								
561(1-5/8")	A	No	No	Ar (CaAa)	177.000 - 0.000	0.000	-0.4	12	2	0.500	1.625		0.001
561(1-5/8")	A	No	No	Ar (CaAa)	177.000 - 0.000	0.000	-0.41	1	1	0.500	1.625		0.001
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	177.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
HB114-1-0813U4-M5J(1-1/4)	A	No	No	Ar (CaAa)	168.000 - 0.000	2.000	0.45	4	4	0.500	1.540		0.001
7983A(ELLIPTICAL)	A	No	No	Ar (CaAa)	168.000 - 0.000	0.000	0.41	1	1	0.500	0.573		0.000
Feedline Ladder (Af) *** FACE C ***	A	No	No	Af (CaAa)	168.000 - 0.000	0.000	0.44	1	1	3.000	3.000		0.008
HJ7-50A(1-5/8")	C	No	No	Ar (CaAa)	185.000 - 158.000	-0.500	-0.33	18	12	0.500	1.980		0.001
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	185.000 - 158.000	-0.500	-0.32	1	1	3.000	3.000		0.008
HJ7-50A(1-5/8")	C	No	No	Ar (CaAa)	158.000 - 0.000	-0.500	-0.33	30	12	0.500	1.980		0.001
2" Rigid Conduit	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	2	2	0.500	2.000		0.003
FB-L98B-034-XXX(3/8")	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	2	2	0.500	0.000		0.000
WR-VG86ST-BRD(3/4")	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	4	4	0.500	0.000		0.001
Feedline Ladder (Af) ********** ** ***	C	No	No	Af (CaAa)	158.000 - 0.000	-0.500	-0.34	2	1	3.000	3.000		0.008

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
********** ***								

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

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
T1	185.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	20.320	0.000	0.136
T2	180.000-160.000	A	0.000	0.000	53.799	0.000	0.547
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.030	0.000	0.547
T3	160.000-140.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	140.998	0.000	1.068
T4	140.000-120.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T5	120.000-100.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T6	100.000-80.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T7	80.000-60.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T8	60.000-40.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T9	40.000-20.000	A	0.000	0.000	76.976	0.000	0.788
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T10	20.000-0.000	A	0.000	0.000	76.976	0.000	0.788
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125

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
T1	185.000-180.000	A	1.780	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	25.396	0.000	0.517
T2	180.000-160.000	A	1.767	0.000	0.000	82.625	0.000	1.728
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	109.274	0.000	2.154
T3	160.000-140.000	A	1.745	0.000	0.000	126.216	0.000	2.518
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	174.305	0.000	3.593
T4	140.000-120.000	A	1.720	0.000	0.000	125.491	0.000	2.489
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	180.623	0.000	3.718
T5	120.000-100.000	A	1.692	0.000	0.000	124.657	0.000	2.456
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	179.541	0.000	3.676
T6	100.000-80.000	A	1.658	0.000	0.000	123.675	0.000	2.418
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	178.265	0.000	3.627
T7	80.000-60.000	A	1.617	0.000	0.000	122.473	0.000	2.372
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	176.703	0.000	3.568
T8	60.000-40.000	A	1.564	0.000	0.000	120.911	0.000	2.313

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
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	174.674	0.000	3.491
T9	40.000-20.000	A	1.486	0.000	0.000	125.843	0.000	2.308
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	170.164	0.000	3.381
T10	20.000-0.000	A	1.331	0.000	0.000	120.724	0.000	2.132
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	164.115	0.000	3.170

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	185.000-180.000	14.097	4.622	11.568	4.849
T2	180.000-160.000	5.835	4.444	0.864	4.302
T3	160.000-140.000	5.563	4.074	2.787	3.676
T4	140.000-120.000	6.670	5.075	3.743	4.723
T5	120.000-100.000	7.881	5.885	4.545	5.540
T6	100.000-80.000	9.135	6.703	5.345	6.294
T7	80.000-60.000	10.135	7.277	6.024	6.840
T8	60.000-40.000	11.223	7.951	6.814	7.475
T9	40.000-20.000	11.203	8.578	5.369	8.962
T10	20.000-0.000	12.170	9.339	6.301	9.398

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	17	HJ7-50A(1-5/8")	180.00 - 185.00	0.6000	0.5911
T1	20	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.5911
T2	1	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T2	4	561(1-5/8")	160.00 - 177.00	0.6000	0.6000
T2	5	561(1-5/8")	160.00 - 177.00	0.6000	0.6000
T2	6	Feedline Ladder (Af)	160.00 - 177.00	0.6000	0.6000
T2	9	HB114-1-0813U4-M5J(1-1/4)	160.00 - 168.00	0.6000	0.6000
T2	12	7983A(ELLIPTICAL)	160.00 - 168.00	0.6000	0.6000
T2	13	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T2	17	HJ7-50A(1-5/8")	160.00 - 180.00	0.6000	0.6000
T2	20	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	1	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	4	561(1-5/8")	140.00 - 160.00	0.6000	0.6000
T3	5	561(1-5/8")	140.00 - 160.00	0.6000	0.6000
T3	6	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	9	HB114-1-0813U4-M5J(1-1/4)	140.00 - 160.00	0.6000	0.6000
T3	12	7983A(ELLIPTICAL)	140.00 - 160.00	0.6000	0.6000
T3	13	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	17	HJ7-50A(1-5/8")	158.00 - 160.00	0.6000	0.6000
T3	20	Feedline Ladder (Af)	158.00 - 160.00	0.6000	0.6000
T3	22	HJ7-50A(1-5/8")	140.00 - 158.00	0.6000	0.6000
T3	23	2" Rigid Conduit	140.00 - 158.00	0.6000	0.6000
T3	24	FB-L98B-034-XXX(3/8")	140.00 - 158.00	0.6000	0.6000
T3	25	WR-VG86ST-BRD(3/4")	140.00 - 158.00	0.6000	0.6000
T3	27	Feedline Ladder (Af)	140.00 - 158.00	0.6000	0.6000
T4	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	4	561(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	5	561(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	9	HB114-1-0813U4-M5J(1-1/4)	120.00 - 140.00	0.6000	0.6000
T4	12	7983A(ELLIPTICAL)	120.00 - 140.00	0.6000	0.6000
T4	13	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	22	HJ7-50A(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	23	2" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	24	FB-L98B-034-XXX(3/8")	120.00 - 140.00	0.6000	0.6000
T4	25	WR-VG86ST-BRD(3/4")	120.00 - 140.00	0.6000	0.6000
T4	27	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T5	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	4	561(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	5	561(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	6	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	9	HB114-1-0813U4-M5J(1-1/4)	100.00 - 120.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	12	7983A(ELLIPTICAL)	100.00 - 120.00	0.6000	0.6000
T5	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	22	HJ7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	23	2" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	24	FB-L98B-034-XXX(3/8")	100.00 - 120.00	0.6000	0.6000
T5	25	WR-VG86ST-BRD(3/4")	100.00 - 120.00	0.6000	0.6000
T5	27	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	4	561(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	5	561(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	6	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	9	HB114-1-0813U4-M5J(1-1/4)	80.00 - 100.00	0.6000	0.6000
T6	12	7983A(ELLIPTICAL)	80.00 - 100.00	0.6000	0.6000
T6	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	22	HJ7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	23	2" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	24	FB-L98B-034-XXX(3/8")	80.00 - 100.00	0.6000	0.6000
T6	25	WR-VG86ST-BRD(3/4")	80.00 - 100.00	0.6000	0.6000
T6	27	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	4	561(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	5	561(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	9	HB114-1-0813U4-M5J(1-1/4)	60.00 - 80.00	0.6000	0.6000
T7	12	7983A(ELLIPTICAL)	60.00 - 80.00	0.6000	0.6000
T7	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	22	HJ7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	23	2" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T7	24	FB-L98B-034-XXX(3/8")	60.00 - 80.00	0.6000	0.6000
T7	25	WR-VG86ST-BRD(3/4")	60.00 - 80.00	0.6000	0.6000
T7	27	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	4	561(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	5	561(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	9	HB114-1-0813U4-M5J(1-1/4)	40.00 - 60.00	0.6000	0.6000
T8	12	7983A(ELLIPTICAL)	40.00 - 60.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	22	HJ7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	23	2" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T8	24	FB-L98B-034-XXX(3/8")	40.00 - 60.00	0.6000	0.6000
T8	25	WR-VG86ST-BRD(3/4")	40.00 - 60.00	0.6000	0.6000
T8	27	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	3	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T9	4	561(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	5	561(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	9	HB114-1-0813U4-M5J(1-1/4)	20.00 - 40.00	0.6000	0.6000
T9	12	7983A(ELLIPTICAL)	20.00 - 40.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	22	HJ7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	23	2" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T9	24	FB-L98B-034-XXX(3/8")	20.00 - 40.00	0.6000	0.6000
T9	25	WR-VG86ST-BRD(3/4")	20.00 - 40.00	0.6000	0.6000
T9	27	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	1	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	3	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T10	4	561(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	5	561(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	9	HB114-1-0813U4-M5J(1-1/4)	0.00 - 20.00	0.6000	0.6000
T10	12	7983A(ELLIPTICAL)	0.00 - 20.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	22	HJ7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	23	2" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T10	24	FB-L98B-034-XXX(3/8")	0.00 - 20.00	0.6000	0.6000
T10	25	WR-VG86ST-BRD(3/4")	0.00 - 20.00	0.6000	0.6000
T10	27	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000

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 5/8"x4'	C	From Leg	0.000		0.000	186.000	No Ice	0.250	0.250	0.031
			0.000				1/2" Ice	0.664	0.664	0.034
			0.000				1" Ice	0.973	0.973	0.039
*** L186 ***										
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
(2) ATMAA1412D-1A20	A	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
(2) ATMAA1412D-1A20	B	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
(2) ATMAA1412D-1A20	C	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000		0.000	186.000	No Ice	20.480	11.024	0.161
			0.000				1/2" Ice	21.231	12.550	0.297
			0.000				1" Ice	21.990	14.099	0.444

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
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	20.480 21.231 21.990	11.024 12.550 14.099	0.161 0.297 0.444
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	20.480 21.231 21.990	11.024 12.550 14.099	0.161 0.297 0.444
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
VFA12-HD	A	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
VFA12-HD	B	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
VFA12-HD	C	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
(2) 6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
*** L180 *** *** L177 ***									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	7.271 7.832 8.348	7.821 9.010 9.912	0.047 0.114 0.189
(2) LPA-80063/6CFx5 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	9.805 10.373 10.907	10.195 11.363 12.246	0.052 0.144 0.245
(2) SC-E 6014 rev2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	3.564 3.905 4.256	4.223 4.780 5.353	0.032 0.071 0.116
(2) SBNHH-1D45B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	11.637 12.228 12.784	6.946 8.127 9.021	0.088 0.172 0.265
(2) SBNHH-1D45B w/	B	From Leg	4.000	0.000	177.000	No Ice	11.637	6.946	0.088

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
Mount Pipe			0.000				1/2" Ice	12.228	8.127	0.172
			0.000				1" Ice	12.784	9.021	0.265
(2) SBNHH-1D45B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	11.637	6.946	0.088
			0.000				1/2" Ice	12.228	8.127	0.172
			0.000				1" Ice	12.784	9.021	0.265
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
RRH2x60-700	A	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2x60-700	B	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2x60-700	C	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	A	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	B	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	C	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-PCS	A	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
RRH2X60-PCS	B	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
RRH2X60-PCS	C	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	0.000	177.000	No Ice	4.800	2.000	0.044
			0.000				1/2" Ice	5.070	2.193	0.080
			0.000				1" Ice	5.348	2.393	0.120
Sector Mount [SM 504-3]	C	None			0.000	177.000	No Ice	34.250	34.250	1.708
							1/2" Ice	48.980	48.980	2.286
							1" Ice	63.710	63.710	2.864
*** L168 ***										
NNVV-65B-R4	A	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228
NNVV-65B-R4	B	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228
NNVV-65B-R4	C	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228

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
AAHC	A	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
AAHC	B	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
AAHC	C	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
(3) RRH2x50-800	A	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.134 2.320	1.789 1.963	0.050 0.071
			0.000			1" Ice	2.512	2.144	0.096
(3) RRH2x50-800	B	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.134 2.320	1.789 1.963	0.050 0.071
			0.000			1" Ice	2.512	2.144	0.096
(3) PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.322 2.527	2.238 2.441	0.060 0.083
			0.000			1" Ice	2.739	2.651	0.110
Sector Mount [SM 402-3]	C	None		0.000	168.000	No Ice 1/2" Ice	18.910 26.780	18.910 26.780	0.851 1.233
						1" Ice	34.650	34.650	1.616
*** L158 ***									
QS66512-2 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.371 8.931	8.463 9.657	0.137 0.212
			2.000			1" Ice	9.457	10.548	0.296
QS66512-2 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.371 8.931	8.463 9.657	0.137 0.212
			2.000			1" Ice	9.457	10.548	0.296
(2) DBC0061F1V51-2	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
(2) DBC0061F1V51-2	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
(2) DBC0061F1V51-2	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
RRUS 32 B2	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.262 8.822	6.304 7.479	0.074 0.139

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	9.346	8.368	0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	158.000	No Ice	8.262	6.304	0.074
			0.000			1/2" Ice	8.822	7.479	0.139
			2.000			1" Ice	9.346	8.368	0.212
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.000	0.000	158.000	No Ice	13.535	10.960	0.114
			0.000			1/2" Ice	14.238	12.486	0.218
			2.000			1" Ice	14.949	14.037	0.331
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.000	0.000	158.000	No Ice	11.683	9.842	0.099
			0.000			1/2" Ice	12.404	11.366	0.189
			2.000			1" Ice	13.135	12.914	0.288
DTMABP7819VG12A	A	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
DTMABP7819VG12A	B	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
DTMABP7819VG12A	C	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
7020.00	A	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
7020.00	B	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
7020.00	C	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
RRUS 32	A	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 32	B	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 32	C	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 11	A	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
RRUS 11	B	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
RRUS 11	C	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
DC6-48-60-18-8F	A	From Leg	4.000	0.000	158.000	No Ice	0.917	0.917	0.033
			0.000			1/2" Ice	1.458	1.458	0.051
			2.000			1" Ice	1.643	1.643	0.071
DC6-48-60-18-8F	A	From Leg	4.000	0.000	158.000	No Ice	0.917	0.917	0.033
			0.000			1/2" Ice	1.458	1.458	0.051
			0.000			1" Ice	1.643	1.643	0.071
(2) 5' x 2' Pipe Mount	A	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
(2) 5' x 2' Pipe Mount	B	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027

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
			0.000			1" Ice	1.807	1.807	0.040
(2) 5' x 2' Pipe Mount	C	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
Sector Mount [SM 504-3]	C	None		0.000	158.000	No Ice	34.250	34.250	1.708
						1/2" Ice	48.980	48.980	2.286
						1" Ice	63.710	63.710	2.864
*** L40 ***									
GPS_A	B	From Leg	4.000	0.000	40.000	No Ice	0.255	0.255	0.001
			0.000			1/2" Ice	0.320	0.320	0.005
			0.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 306-1]	B	From Leg	2.000	0.000	40.000	No Ice	0.980	2.180	0.042
			0.000			1/2" Ice	1.700	3.800	0.062
			0.000			1" Ice	2.420	5.420	0.083
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
***											
A-ANT-18G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	4.000	67.000		168.000	2.175	No Ice	3.720	0.027
				0.000					1/2" Ice	4.010	0.050
				0.000					1" Ice	4.300	0.070
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	4.000	0.000		168.000	2.175	No Ice	3.720	0.031
				0.000					1/2" Ice	4.010	0.050
				0.000					1" Ice	4.300	0.070
***											
***											
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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

Comb. No.	Description
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
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	4.329	45	0.221	0.043
T2	180 - 160	4.096	45	0.220	0.043
T3	160 - 140	3.167	45	0.204	0.038
T4	140 - 120	2.340	45	0.173	0.029
T5	120 - 100	1.654	45	0.141	0.022
T6	100 - 80	1.109	45	0.114	0.017
T7	80 - 60	0.686	45	0.086	0.012
T8	60 - 40	0.376	45	0.059	0.009
T9	40 - 20	0.164	45	0.038	0.006
T10	20 - 0	0.040	39	0.018	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
186.000	Lightning Rod 5/8"x4'	45	4.329	0.221	0.043	127994
177.000	(2) DB846F65ZAXY w/ Mount Pipe	45	3.956	0.219	0.043	180670
168.000	A-ANT-18G-2-C	45	3.533	0.213	0.041	80329
158.000	QS66512-2 w/ Mount Pipe	45	3.078	0.201	0.037	36913
40.000	GPS_A	45	0.164	0.038	0.006	60881

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	17.781	14	0.902	0.180
T2	180 - 160	16.828	14	0.900	0.179
T3	160 - 140	13.020	14	0.835	0.157
T4	140 - 120	9.627	14	0.708	0.122
T5	120 - 100	6.811	14	0.578	0.093
T6	100 - 80	4.571	14	0.468	0.071
T7	80 - 60	2.830	14	0.351	0.052
T8	60 - 40	1.556	14	0.244	0.036
T9	40 - 20	0.681	14	0.158	0.024
T10	20 - 0	0.162	2	0.072	0.012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
186.000	Lightning Rod 5/8"x4'	14	17.781	0.902	0.180	32498
177.000	(2) DB846F65ZAXY w/ Mount Pipe	14	16.252	0.896	0.178	48184
168.000	A-ANT-18G-2-C	14	14.521	0.871	0.169	20366
158.000	QS66512-2 w/ Mount Pipe	14	12.656	0.824	0.154	9104
40.000	GPS_A	14	0.681	0.158	0.024	14885

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	185	Leg	A325N	0.625	4	0.454	20.709	0.022	1	Bolt Tension
		Diagonal	A325X	0.500	1	1.961	9.719	0.202	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.529	7.952	0.067	1	Bolt Shear
T2	180	Leg	A325N	0.750	4	5.500	29.821	0.184	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.625	3	3.522	12.425	0.283	1	Bolt Shear
		Horizontal	A325N	0.625	2	2.854	12.425	0.230	1	Bolt Shear
T3	160	Diagonal	A325N	0.625	3	3.776	12.425	0.304	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.367	12.425	0.271	1	Bolt Shear
T4	140	Leg	A325N	1.000	4	27.122	53.014	0.512	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.488	12.425	0.281	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.486	12.425	0.281	1	Bolt Shear
T5	120	Leg	A325N	1.000	4	34.528	53.014	0.651	1	Bolt Tension
		Diagonal	A325N	0.625	3	4.078	12.425	0.328	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.566	12.425	0.287	1	Bolt Shear
T6	100	Leg	A325N	1.000	6	28.070	53.014	0.529	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.560	12.425	0.286	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.510	12.425	0.282	1	Bolt Shear
T7	80	Leg	A325N	1.000	6	32.502	53.014	0.613	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.690	12.425	0.297	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.877	12.425	0.312	1	Bolt Shear
T8	60	Leg	A325N	1.000	6	36.763	53.014	0.693	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.787	12.425	0.305	1	Bolt Shear
		Horizontal	A325N	0.625	2	4.197	12.425	0.338	1	Bolt Shear
T9	40	Leg	A325N	1.000	8	30.523	53.014	0.576	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.711	12.425	0.299	1	Bolt Shear
		Horizontal	A325N	0.625	2	4.316	12.425	0.347	1	Bolt Shear
T10	20	Diagonal	A325N	0.750	3	5.940	17.892	0.332	1	Bolt Shear
		Horizontal	A325N	0.750	2	4.728	17.892	0.264	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	ROHN 2.5 STD	5.000	5.000	63.3 K=1.00	1.704	-5.445	57.192	0.095 [1]
T2	180 - 160	ROHN 2.5 STD	20.000	6.667	84.4 K=1.00	1.704	-29.214	45.528	0.642 [1]
T3	160 - 140	ROHN 3 X-STR	20.036	6.679	70.5 K=1.00	3.016	-79.112	94.336	0.839 [1]
T4	140 - 120	ROHN 4 X-STR	20.036	6.679	54.3 K=1.00	4.407	-122.375	159.904	0.765 [1]
T5	120 - 100	ROHN 5 X-STR	20.042	10.021	65.4 K=1.00	6.112	-154.293	201.195	0.767 [1]
T6	100 - 80	ROHN 5 X-STR	20.056	10.028	65.4 K=1.00	6.112	-187.502	201.111	0.932 [1]
T7	80 - 60	ROHN 6 EHS	20.052	10.026	54.1 K=1.00	6.713	-217.308	243.965	0.891 [1]
T8	60 - 40	ROHN 6 X-STR	20.052	10.026	54.8 K=1.00	8.405	-246.654	303.623	0.812 [1]
T9	40 - 20	ROHN 6 X-STR	20.058	10.029	54.8 K=1.00	8.405	-274.421	303.585	0.904 [1]
T10	20 - 0	ROHN 8 EHS	20.052	9.984	41.0 K=1.00	9.719	-286.162	386.706	0.740 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	185 - 180	L2x2x1/4	9.862	4.667	143.2 K=1.00	0.938	-1.961	10.330	0.190 [1]
T2	180 - 160	ROHN 2 STD	7.917	7.695	117.3 K=1.00	1.075	-10.567	17.637	0.599 [1]
T3	160 - 140	ROHN 2 STD	8.315	8.081	123.2 K=1.00	1.075	-11.327	15.994	0.708 [1]
T4	140 - 120	ROHN 2 STD	9.212	8.940	136.3 K=1.00	1.075	-10.156	13.067	0.777 [1]
T5	120 - 100	ROHN 2.5 STD	12.492	12.105	153.3 K=1.00	1.704	-12.016	16.376	0.734 [1]
T6	100 - 80	ROHN 2.5 STD	13.307	12.955	164.1 K=1.00	1.704	-10.587	14.297	0.740 [1]
T7	80 - 60	ROHN 2.5 STD	14.162	13.772	174.4 K=1.00	1.704	-11.071	12.652	0.875 [1]
T8	60 - 40	ROHN 2.5 X-STR	15.072	14.703	190.9 K=1.00	2.254	-11.361	13.964	0.814 [1]
T9	40 - 20	ROHN 3 STD	16.082	15.729	162.2 K=1.00	2.228	-11.132	19.132	0.582 [1]
T10	20 - 0	ROHN 3 STD	24.260	12.130	125.1 K=1.00	2.228	-17.821	32.170	0.554 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	180 - 160	ROHN 1.5 STD	8.528	4.144	79.9 K=1.00	0.799	-5.640	22.564	0.250 [1]
T3	160 - 140	ROHN 1.5 STD	9.931	4.819	92.9 K=1.00	0.799	-6.597	19.143	0.345 [1]
T4	140 - 120	ROHN 2 STD	12.014	5.819	88.7 K=1.00	1.075	-6.927	27.195	0.255 [1]
T5	120 - 100	ROHN 2 STD	13.833	6.685	101.9 K=1.00	1.075	-7.131	22.627	0.315 [1]
T6	100 - 80	ROHN 2 STD	16.250	7.893	120.3 K=1.00	1.075	-6.966	16.764	0.416 [1]
T7	80 - 60	ROHN 2.5 STD	18.792	9.120	115.5 K=1.00	1.704	-7.732	28.852	0.268 [1]
T8	60 - 40	ROHN 2.5 STD	21.292	10.370	131.3 K=1.00	1.704	-8.260	22.315	0.370 [1]
T9	40 - 20	ROHN 2.5 STD	23.859	11.654	147.6	1.704	-8.305	17.669	0.470 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 3 STD	25.177	12.313	K=1.00 127.0 K=1.00	2.228	-9.450	31.224	0.303 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4 KL/R > 200 (C) - 4	8.500	8.010	245.8 K=1.00	0.938	-0.380	3.506	0.108 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	5.935	145.4 K=1.00	0.520	-4.968	5.558	0.894 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	2L2x2x1/4x1/4	11.466	10.909	215.0 K=1.00	1.875	-4.525	9.164	0.494 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	6.294	154.2 K=1.00	0.520	-0.031	4.941	0.006 [1]

[1] $P_u / \phi P_n$ controls

Redundant Hip Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 2.5 STD	15.046	15.046	190.6 K=1.00	1.704	-0.085	10.600	0.008 [1]

[1] $P_u / \phi P_n$ controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	4.264	4.264	128.7 K=1.00	0.484	-0.007	6.529	0.001 [1]
T3	160 - 140	L2x2x1/8	4.271	4.271	128.9 K=1.00	0.484	-0.009	6.511	0.001 [1]
T4	140 - 120	L2x2x1/8	6.007	6.007	181.3 K=1.00	0.484	-0.007	3.328	0.002 [1]
T5	120 - 100	L2x2x1/8	6.917	6.917	208.8 K=1.00	0.484	-0.009	2.510	0.004 [1]
T6	100 - 80	L2 1/2x2 1/2x3/16	8.125	8.125	197.0 K=1.00	0.902	-0.011	5.252	0.002 [1]
T7	80 - 60	L3x3x3/16	9.396	9.396	189.2 K=1.00	1.090	-0.013	6.881	0.002 [1]
T8	60 - 40	L3 1/2x3 1/2x1/4	10.646	10.646	184.1 K=1.00	1.690	-0.015	11.267	0.001 [1]
T9	40 - 20	L3 1/2x3 1/2x1/4	11.930	11.930	206.3 K=1.00	1.690	-0.017	8.973	0.002 [1]
T10	20 - 0	ROHN 3 STD	12.589	12.589	129.8 K=1.00	2.228	-0.018	29.869	0.001 [1]

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	ROHN 2.5 STD	5.000	5.000	63.3	1.704	1.306	76.682	0.017 [1]
T2	180 - 160	ROHN 2.5 STD	20.000	6.667	84.4	1.704	22.002	76.682	0.287 [1]
T3	160 - 140	ROHN 3 X-STR	20.036	6.679	70.5	3.016	67.539	135.717	0.498 [1]
T4	140 - 120	ROHN 4 X-STR	20.036	6.679	54.3	4.407	108.488	198.335	0.547 [1]
T5	120 - 100	ROHN 5 X-STR	20.042	10.021	65.4	6.112	138.111	275.039	0.502 [1]
T6	100 - 80	ROHN 5 X-STR	20.056	10.028	65.4	6.112	168.419	275.039	0.612 [1]
T7	80 - 60	ROHN 6 EHS	20.052	10.026	54.1	6.713	195.013	302.097	0.646 [1]
T8	60 - 40	ROHN 6 X-STR	20.052	10.026	54.8	8.405	220.576	378.222	0.583 [1]
T9	40 - 20	ROHN 6 X-STR	20.058	10.029	54.8	8.405	244.186	378.222	0.646 [1]
T10	20 - 0	ROHN 8 EHS	20.052	0.084	0.3	9.719	278.506	437.369	0.637 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4	9.862	4.667	94.4	0.586	1.729	28.583	0.060 [1]
T2	180 - 160	ROHN 2 STD	7.917	7.695	117.3	1.075	10.494	48.354	0.217 [1]
T3	160 - 140	ROHN 2 STD	8.315	8.081	123.2	1.075	11.242	48.354	0.232 [1]
T4	140 - 120	ROHN 2 STD	8.747	8.476	129.2	1.075	10.356	48.354	0.214 [1]
T5	120 - 100	ROHN 2.5 STD	12.163	11.776	149.2	1.704	12.065	76.682	0.157 [1]
T6	100 - 80	ROHN 2.5 STD	12.890	12.539	158.8	1.704	10.464	76.682	0.136 [1]
T7	80 - 60	ROHN 2.5 STD	14.162	13.772	174.4	1.704	10.752	76.682	0.140 [1]
T8	60 - 40	ROHN 2.5 X-STR	15.072	14.703	190.9	2.254	10.905	101.409	0.108 [1]
T9	40 - 20	ROHN 3 STD	16.082	15.729	162.2	2.228	10.604	100.281	0.106 [1]
T10	20 - 0	ROHN 3 STD	24.260	12.130	125.1	2.228	16.855	100.281	0.168 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	ROHN 1.5 STD	8.528	4.144	79.9	0.799	5.708	35.976	0.159 [1]
T3	160 - 140	ROHN 1.5 STD	9.236	4.472	86.2	0.799	6.718	35.976	0.187 [1]
T4	140 - 120	ROHN 2 STD	12.014	5.819	88.7	1.075	6.971	48.354	0.144 [1]
T5	120 - 100	ROHN 2 STD	13.833	6.685	101.9	1.075	7.131	48.354	0.147 [1]
T6	100 - 80	ROHN 2 STD	16.250	7.893	120.3	1.075	6.922	48.354	0.143 [1]
T7	80 - 60	ROHN 2.5 STD	18.792	9.120	115.5	1.704	7.754	76.682	0.101 [1]
T8	60 - 40	ROHN 2.5 STD	21.292	10.370	131.3	1.704	8.394	76.682	0.109 [1]
T9	40 - 20	ROHN 2.5 STD	23.859	11.654	147.6	1.704	8.631	76.682	0.113 [1]
T10	20 - 0	ROHN 3 STD	25.177	12.313	127.0	2.228	9.455	100.281	0.094 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4	8.500	8.010	162.8	0.586	0.529	28.583	0.019 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	5.935	145.4	0.520	4.968	23.411	0.212 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	2L2x2x1/4x1/4	11.466	10.909	215.0	1.875	4.525	84.375	0.054 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	6.294	154.2	0.520	0.019	23.411	0.001 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 2.5 STD	15.046	15.046	190.6	1.704	0.074	76.682	0.001 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	4.264	4.264	81.7	0.484	0.007	15.694	0.000 [1]
T3	160 - 140	L2x2x1/8	4.271	4.271	81.8	0.484	0.007	15.694	0.000 [1]
T4	140 - 120	L2x2x1/8	5.313	5.313	101.8	0.484	0.006	15.694	0.000 [1]
T5	120 - 100	L2x2x1/8	6.354	6.354	121.8	0.484	0.003	15.694	0.000 [1]
T6	100 - 80	L2 1/2x2 1/2x3/16	7.479	7.479	115.4	0.902	0.001	29.225	0.000 [1]
T7	80 - 60	L3x3x3/16	8.771	8.771	112.1	1.090	0.000	49.050	0.000 [1]

[1] P_u / ϕP_n controls

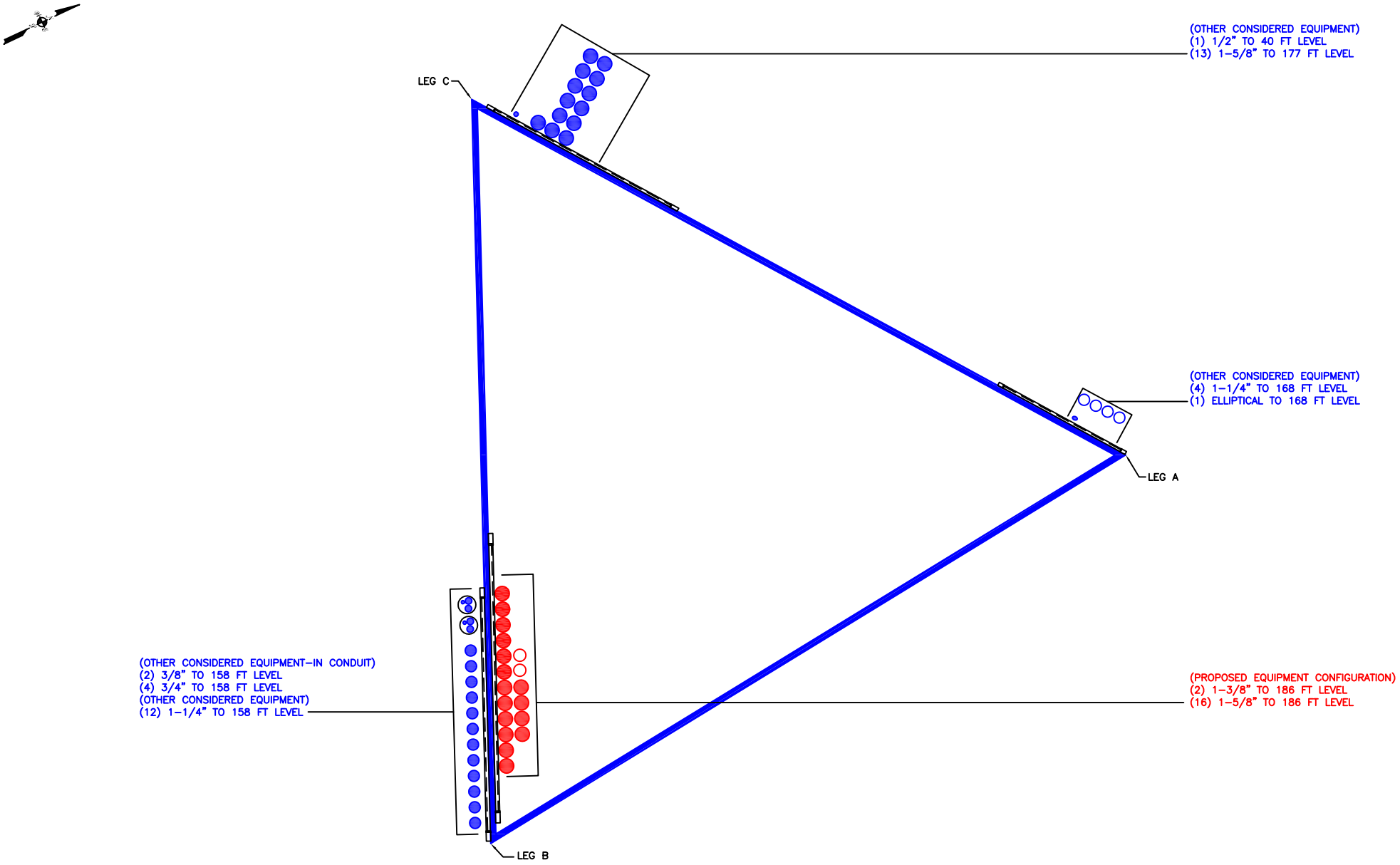
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	185 - 180	Leg	ROHN 2.5 STD	2	-5.445	57.192	9.5	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	15	-29.214	45.528	64.2	Pass
T3	160 - 140	Leg	ROHN 3 X-STR	54	-79.112	94.336	83.9	Pass
T4	140 - 120	Leg	ROHN 4 X-STR	93	-122.375	159.904	76.5	Pass
T5	120 - 100	Leg	ROHN 5 X-STR	132	-154.293	201.195	76.7	Pass
T6	100 - 80	Leg	ROHN 5 X-STR	159	-187.502	201.111	93.2	Pass
T7	80 - 60	Leg	ROHN 6 EHS	186	-217.308	243.965	89.1	Pass
T8	60 - 40	Leg	ROHN 6 X-STR	213	-246.654	303.623	81.2	Pass
T9	40 - 20	Leg	ROHN 6 X-STR	240	-274.421	303.585	90.4	Pass
T10	20 - 0	Leg	ROHN 8 EHS	267	-286.162	386.706	74.0	Pass
T1	185 - 180	Diagonal	L2x2x1/4	10	-1.961	10.330	19.0	Pass
							20.2 (b)	
T2	180 - 160	Diagonal	ROHN 2 STD	21	-10.567	17.637	59.9	Pass
T3	160 - 140	Diagonal	ROHN 2 STD	72	-11.327	15.994	70.8	Pass
T4	140 - 120	Diagonal	ROHN 2 STD	99	-10.156	13.067	77.7	Pass
T5	120 - 100	Diagonal	ROHN 2.5 STD	138	-12.016	16.376	73.4	Pass
T6	100 - 80	Diagonal	ROHN 2.5 STD	165	-10.587	14.297	74.0	Pass
T7	80 - 60	Diagonal	ROHN 2.5 STD	192	-11.071	12.652	87.5	Pass
T8	60 - 40	Diagonal	ROHN 2.5 X-STR	219	-11.361	13.964	81.4	Pass
T9	40 - 20	Diagonal	ROHN 3 STD	246	-11.132	19.132	58.2	Pass
T10	20 - 0	Diagonal	ROHN 3 STD	279	-17.821	32.170	55.4	Pass
T2	180 - 160	Horizontal	ROHN 1.5 STD	19	-5.640	22.564	25.0	Pass
T3	160 - 140	Horizontal	ROHN 1.5 STD	58	-6.597	19.143	34.5	Pass
T4	140 - 120	Horizontal	ROHN 2 STD	97	-6.927	27.195	25.5	Pass
							28.1 (b)	
T5	120 - 100	Horizontal	ROHN 2 STD	136	-7.131	22.627	31.5	Pass
T6	100 - 80	Horizontal	ROHN 2 STD	163	-6.966	16.764	41.6	Pass
T7	80 - 60	Horizontal	ROHN 2.5 STD	190	-7.732	28.852	26.8	Pass
							31.2 (b)	
T8	60 - 40	Horizontal	ROHN 2.5 STD	217	-8.260	22.315	37.0	Pass
T9	40 - 20	Horizontal	ROHN 2.5 STD	244	-8.305	17.669	47.0	Pass
T10	20 - 0	Horizontal	ROHN 3 STD	275	-9.450	31.224	30.3	Pass
T1	185 - 180	Top Girt	L2x2x1/4	4	-0.380	3.506	10.8	Pass
T10	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 x 11GA	280	-4.968	5.558	89.4	Pass
T10	20 - 0	Redund Diag 1	2L2x2x1/4x1/4	281	-4.525	9.164	49.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T10	20 - 0	Bracing Redund Hip 1 Bracing	ROHN 1.5 x 11GA	282	-0.031	4.941	0.6	Pass
T10	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	294	-0.085	10.600	0.8	Pass
T2	180 - 160	Inner Bracing	L2x2x1/8	27	-0.006	6.529	0.5	Pass
T3	160 - 140	Inner Bracing	L2x2x1/8	66	-0.006	4.871	0.6	Pass
T4	140 - 120	Inner Bracing	L2x2x1/8	105	-0.007	3.328	0.7	Pass
T5	120 - 100	Inner Bracing	L2x2x1/8	144	-0.009	2.510	0.8	Pass
T6	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	171	-0.011	5.252	0.6	Pass
T7	80 - 60	Inner Bracing	L3x3x3/16	198	-0.013	6.881	0.5	Pass
T8	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	225	-0.015	11.267	0.4	Pass
T9	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	252	-0.017	8.973	0.5	Pass
T10	20 - 0	Inner Bracing	ROHN 3 STD	297	-0.018	29.869	0.2	Pass
							Summary	
						Leg (T6)	93.2	Pass
						Diagonal (T7)	87.5	Pass
						Horizontal (T9)	47.0	Pass
						Top Girt (T1)	10.8	Pass
						Redund Horz 1 Bracing (T10)	89.4	Pass
						Redund Diag 1 Bracing (T10)	49.4	Pass
						Redund Hip 1 Bracing (T10)	0.6	Pass
						Redund Hip Diagonal 1 Bracing (T10)	0.8	Pass
						Inner Bracing (T5)	0.8	Pass
						Bolt Checks	69.3	Pass
						RATING =	**93.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806362 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIplate

Project Information

BU #	806362
Site Name	NHV 108 943133
Order #	1628360

Tower Information

Tower Type	Self Support
TIA-222 Rev	G

Applied Loads

	Comp.	Uplift
Axial (k)	313.00	277.00
Shear (k)	37.00	37.00

Anchor Rod Data

Quantity:	8
Diameter (in):	1
Material Grade:	A449
Grout Considered:	Yes
l_{ar} (in):	1.5
Eta Factor, η:	0.5
Thread Type:	N-Included
Configuration:	Symmetrical

Bending Int

Anchor Rod Results

Axial, Pu (kips)	39.13
Shear, Vu (kips)	4.63
Moment, Mu (kip-in)	-
Axial Cap., ϕPn (kips)	58.18
Shear Cap., ϕVn (kips)	-
Moment Cap., ϕMn (kip-in)	-
Stress Rating	83.2%

Pass

Pier and Pad Foundation

BU # :	806362
Site Name:	NHV 108 943133
App. Number:	446207 Rev. 1

TIA-222 Revision:	G
Tower Type:	Self Support

Block Foundation?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	313	kips
Compression Shear, Vu_comp:	37	kips
Uplift, P_{uplift}:	277	kips
Uplift Shear, V_{u_uplift}:	34	kips
Tower Height, **H**:	185	ft
Base Face Width, **BW**:	27.68	ft
BP Dist. Above Fdn, bp_{dist}:	0	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Uplift (kips)	944.35	277.00	**29.3%**	**Pass**
Lateral (Sliding) (kips)	445.04	34.00	**7.6%**	**Pass**
Bearing Pressure (ksf)	18.00	6.18	**34.3%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	1153.73	407.00	**35.3%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	878.96	374.00	**42.6%**	**Pass**
Pier Compression (kip)	2325.54	330.82	**14.2%**	**Pass**
*Pad Flexure (kip*ft)*	513.41	149.02	**29.0%**	**Pass**
Pad Shear - 1-way (kips)	169.84	44.51	**26.2%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.066	**39.9%**	**Pass**

Soil Rating:	**34.3%**
Structural Rating:	**42.6%**

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	3	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	16	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	13	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	12.5	ft
Pad Width, **W**:	8.75	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size, **Sp**:	7	
Pad Rebar Quantity, **mp**:	10	
Pad Clear Cover, cc_{pad}:	3	in

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

Soil Properties		
Total Soil Unit Weight, γ:	135	pcf
Ultimate Gross Bearing, Qult:	24.000	ksf
Cohesion, **Cu**:	7.000	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.4	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

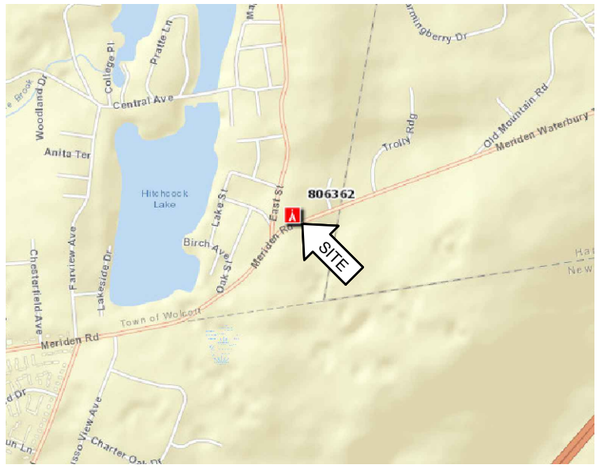
APPENDIX D

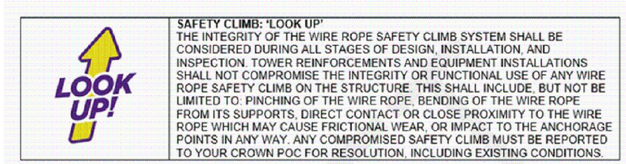
MODIFICATION DRAWINGS

TOWER REINFORCEMENT DRAWINGS PREPARED FOR CROWN CASTLE

SITE NAME: NHV 108 943133
BU NUMBER: 806362

SITE ADDRESS:
INTERSECTION OF RTE 322/ MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA





PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   DAN VADNEY
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   Dan.Vadney@crowncastle.com

2. CROWN CONSTRUCTION MANAGER
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   860-209-0104
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3. DESIGN ENGINEER - MAIN RFI CONTACT
   PHILIP LIN
   919-859-5758
   Philip.Lin@jacobs.com

4. ENGINEER OF RECORD
   PAUL L. MUCCI, PE
   120 ST JAMES AVENUE,
   5TH FLOOR
   BOSTON, MA 02116
   Paul.Mucci@jacobs.com

5. FOR FABRICATION AND CONSTRUCTION RELATED INQUIRIES: CONTACT **MOD_NTP@JACOBS.COM,** DESIGN ENGINEER, AND ENGINEER OF RECORD.

DRAWINGS INCLUDED

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
T-1	TITLE SHEET		
N-1	MODIFICATION INSPECTION CHECKLIST		
N-2	NOTES		
N-2A	NOTES (CONTINUED)		
S-1	TOWER MODIFICATION SCHEDULE		
S-2	REDUNDANT DIAGONAL REPLACEMENT DETAILS		
S-3	EXTENSION INSTALLATION DETAILS I		
S-4	EXTENSION INSTALLATION DETAILS II		
S-5	FABRICATION AND INSTALLATION DETAILS		

TOWER INFORMATION

TOWER MANUFACTURER / DWG #: ROHN / DWG #: A861188

TOWER HEIGHT / TYPE:		180 FT SELF SUPPORT TOWER
TOWER LOCATION:	LAT:	41° 33′ 34.41″
DATUM: (NAD 1983)	LONG:	-72° 56′ 49.10″
STRUCTURAL DESIGN DRAWING:		JACOBS / WO # 1628360
STRUCTURAL ANALYSIS REPORT:		JACOBS / WO # 1600275
STRUCTURAL ANALYSIS DATE:		08/06/2018
ORDER NUMBER:		446207 REV. 1
CCISITES DOCUMENT ID:		7713570

CODE COMPLIANCE

ANSI/TIA-222-G-2005 WITH ADDENDA 1 THROUGH 4

2016 CONNECTICUT STATE BUILDING CODE

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

HOT WORK INCLUDED

N/A	BASE GRINDING ONLY
N/A	BASE WELDING (AND GRINDING)
N/A	AERIAL GRINDING ONLY
N/A	AERIAL WELDING (AND GRINDING)

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133
BU NUMBER: 806362
WO NUMBER: 1628360
SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL
CHECKED BY: DMC
APPROVED BY: PLM
SCALE: N.T.S

TITLE SHEET

T-1 | REV 0

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			
N/A	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
N/A	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
N/A	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
N/A	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
N/A	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 ENG-BUL-10149	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
N/A	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
N/A	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
X	BOLT INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			

MODIFICATION INSPECTION NOTES

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS; IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS; AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

ALL MI'S SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-LST-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (POC).

REFER TO CROWN CED-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

SERVICE LEVEL COMMITMENT

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO CROWN DOCUMENT # CED-SOW-10007.

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

SCALE: N.T.S

MODIFICATION INSPECTION CHECKLIST

N-1

REV 0

GENERAL NOTES:

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE (UNO). THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH THE WORK IS TO BE PERFORMED.

2. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

3. THE NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS. STRUCTURAL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET.

4. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTORS PERFORMING THOSE TRADES SHALL BE LICENSED, RESEARCH AND COMPLY WITH LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.

5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE JACOBS ENGINEERING ENGINEER OF RECORD (EOR) AND TOWER OWNER FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST OR OF DIFFICULTIES OF CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS GOVERNING THE WORK.

6. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.

7. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODES. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.

8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

9. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. THESE REGULATIONS INCLUDE BUT ARE NOT LIMITED TO REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATIONS AND TRENCHING, ERECTION OF GUARDS AND BARRIERS, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES DURING CONSTRUCTION.

11. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR. THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.

13. STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE THE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.

14. DO NOT SCALE DRAWINGS.

15. FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.

16. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.

17. THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF YOUR CROWN POC. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE ENGINEER OF RECORD. IF THE GENERAL CONTRACTOR FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GENERAL CONTRACTOR SHALL CONTACT THE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.

18. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GENERAL CONTRACTOR AND/OR FABRICATOR.

19. AT THE TIME OF NTP, THE CONTRACTOR IS RESPONSIBLE FOR ENGAGING A MODIFICATION INSPECTOR TO COORDINATE AN INSPECTION SCHEDULE AND ENSURE PROPER DOCUMENTATION IS MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT. FOUNDATION WORK REQUIRES INSPECTION PRIOR TO POURING CONCRETE. SHOP DRAWINGS ARE TO BE SUBMITTED TO THE EOR PRIOR TO FABRICATION.

20. IF, DURING THE COURSE OF A FOUNDATION MODIFICATION, THE GC ENCOUNTERS EXISTING CONDUIT LOCATED WITHIN THE CONFINES OF THE EXISTING OR PROPOSED FOUNDATION CONCRETE, AND THIS CONDUIT IS NOT IN A LOCATION THAT IS SPECIFIED WITHIN THESE DESIGN DRAWINGS, THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE BEFORE PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATION. IF CONDUIT IS TO BE INSTALLED THROUGH THE EXISTING FOUNDATION OR PROPOSED FOUNDATION MODIFICATION AND HASN'T BEEN SPECIFIED WITHIN THESE DESIGN DRAWINGS THEN THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE PRIOR TO PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATIONS.

STRUCTURAL STEEL NOTES:

1. DESIGN, FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO):

   A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

   B. TIA-322: LOADING, ANALYSIS, AND DESIGN CRITERIA RELATED TO THE INSTALLATION, ALTERATION AND MAINTENANCE OF COMMUNICATION STRUCTURES.

   C. AISC: MANUAL OF STEEL CONSTRUCTION

2. ALL STRUCTURAL STEEL IS TO BE NEW AND CONFORM TO THE FOLLOWING:

   A. MONOPOLE: ASTM A572-65 (FY = 65 KSI), UNO

   B. SELF SUPPORT TOWER AND GUYED TOWER: ASTM A572-50 (FY = 50 KSI), UNO

3. ALL BOLTS SHALL BE HOT-DIP GALVANIZED ASTM A325 ASSEMBLIES, TO INCLUDE BOLT, ASTM A563 HEAVY HEX NUT, F436 FLAT WASHER, AND SPLIT LOCK WASHER, UNO. BOLT THREADS ARE TO BE EXCLUDED FROM THE SHEAR PLANES. USE BEARING TYPE CONNECTIONS. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

4. ALL FASTENERS SHALL NOT BE REUSED.

5. DRILL NO HOLES IN ANY NEW OR EXISTING STRUCTURAL STEEL MEMBERS OTHER THAN THOSE SHOWN ON STRUCTURAL DRAWINGS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD.

6. ALL EXPOSED EXTERIOR STRUCTURAL STEEL (INCLUDING BOLTS, LOCK WASHERS, PINS, ETC.) SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 AND A123. FOR ALL FABRICATED WELDED ASSEMBLIES TO BE HOT-DIP GALVANIZED, PROVIDE WELDS ALL AROUND OR ADD SEAL WELDS WHERE STRUCTURAL WELDS ARE NOT SPECIFIED. FOR HIGH STRENGTH STEEL FASTENERS WHERE HOT-DIP GALVANIZATION IS NOT PERMITTED, MAGNI 565 COATING SHALL BE USED. ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING TOWER STEEL.

7. WHERE SPECIFIED, THE SEALANT BETWEEN STEEL COMPONENTS IS TO BE SILICONE CAULKING THAT IS EXTERIOR GRADE, ABLE TO BE PAINTED, AND ACCEPTABLE TO THE ENGINEER OF RECORD.

8. FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, " TOWER PROTECTIVE COATINGS BULLETIN".

9. AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

10. NO WELDING, TORCH CUTTING, OR OPEN FLAME IS PERMITTED ON THIS CONSTRUCTION SITE UNLESS DIRECTLY SPECIFIED IN THE DRAWINGS.

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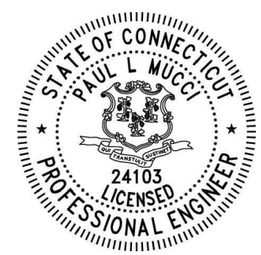

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JACOBS
Jacobs Engineering Group. Inc.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

SCALE: N.T.S

NOTES

N-2

REV 0

WELDING NOTES:

1. ALL WELDING SHALL BE CARRIED OUT UNDER GOOD OPERATOR CONDITIONS AS DEFINED IN SECTION 5.12 OF AWS D1.1

2. ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.

3. THE CWI SHALL INDICATE, IN A WRITTEN WELDING REPORT, THAT ALL WELDING OPERATIONS, PRE-DURING-POST, WERE CONDUCTED IN ACCORDANCE WITH AWS D1.1 INCLUDING PHOTOGRAPHS AND DOCUMENTATION SUPPORTING THE ACCEPTANCE OR REJECTION OF ALL WELDING. FOR INFORMATION, SEE CROWN ENG-STD-10069, "GC INSPECTION STANDARD FOR FABRICATION AND FIELD WELDING OF STRUCTURAL STEEL" AND CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW". ALL CWI WELDING INSPECTION DOCUMENTATION AND PHOTOS SHALL BE SUBMITTED TO THE MI INSPECTOR.

4. FOR ALL WELDING, USE E70XX ELECTRODES, UNO.

5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.

6. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.

7. DO NOT WELD ON WET OR FROST-COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

8. WELDING NDE NOTES: “FIELD NDE MINIMUM REQUIREMENTS:

   A. ALL NDE SHALL BE IN ACCORDANCE WITH AWS D1.1.

   B. FOR NEW BASE STIFFENERS (INCLUSIVE OF TRANSITION STIFFENERS) AND ANCHOR ROD BRACKETS, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT.

   C. FOR NEW FLAT PLATE REINFORCEMENT AT THE BASE OF THE TOWER, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT, BUT MAY BE LIMITED TO A HEIGHT OF 10’-0”.

   D. FOR NDE OF THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, GC SHALL REFERENCE THE MI CHECKLIST FOR APPLICABILITY. PLEASE SEE ENG-SOW-10033: TOWER BASE PLATE NDE, AND ENG-BUL-10051: NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE.

   E. ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT."

BOLT-TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC - "TURN OF THE NUT" METHOD, USING THE CHART BELOW.
   BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETER
   1/2" BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   5/8" BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   3/4" BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   7/8" BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1 1/4" BOLTS UP TO AND INCLUDING 5.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1 1/2" BOLTS UP TO AND INCLUDING 6.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT

   BOLT LENGTHS OVER FOUR DIAMETER BUT NOT EXCEEDING EIGHT DIAMETER
   1/2" BOLTS 2.25 TO 4.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   5/8" BOLTS 2.75 TO 5.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   3/4" BOLTS 3.25 TO 6.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   7/8" BOLTS 3.75 TO 7.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1" BOLTS 4.25 TO 8.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1 1/4" BOLTS 5.5 TO 10.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1 1/2" BOLTS 6.5 TO 12.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(d)(1) OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

   8(d)(1) TURN-OF-THE-NUT TIGHTENING METHOD
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c), UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(d)(1) THROUGH 8(d)(4).

4. ALL OTHER BOLTED CONNECTIONS, INCLUDING U-BOLTS, SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c) OF THE SPECIFICATION.

5. TURN-OF-THE-NUT AND SNUG-TIGHT TIGHTENING METHOD DOES NOT APPLY TO THE FORGBOLT, NEXGEN2, OR AJAX BOLTS.

6. TURN-OF-THE-NUT MARKINGS TO BE INCLUDED IN THE MODIFICATION INSPECTION REPORT.

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Jacobs Engineering Group. Inc.

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APPROVED BY: PLM

SCALE: N.T.S

NOTES
(CONTINUED)

N-2A

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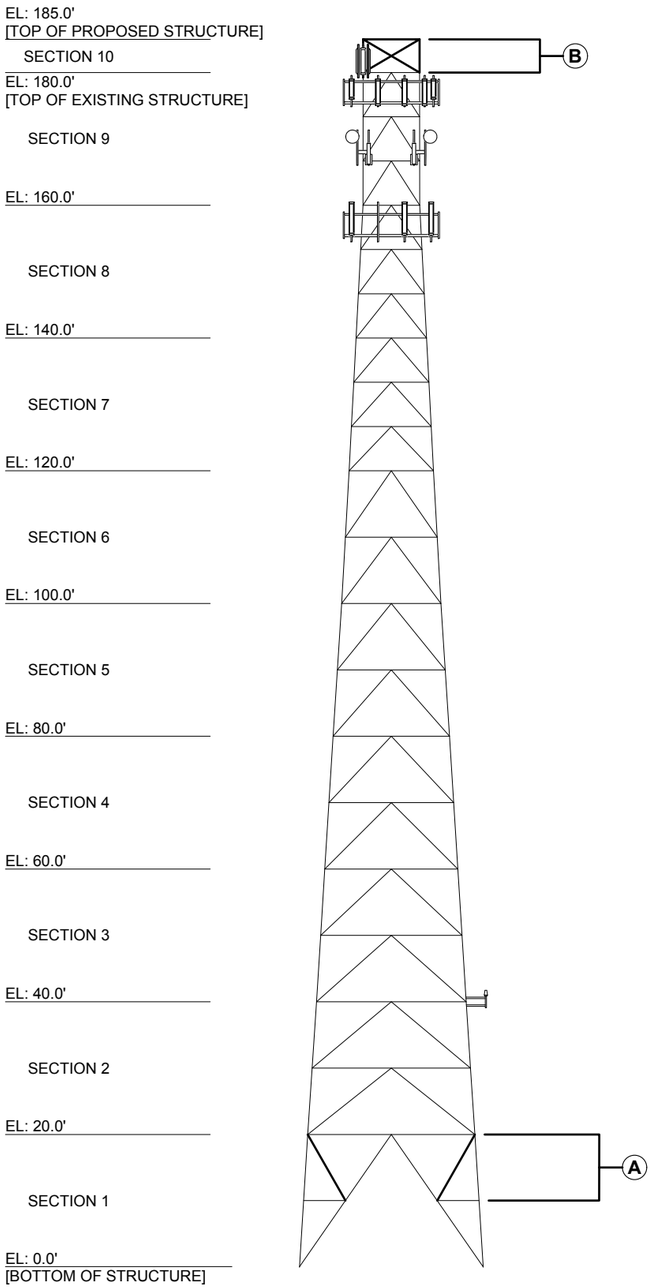
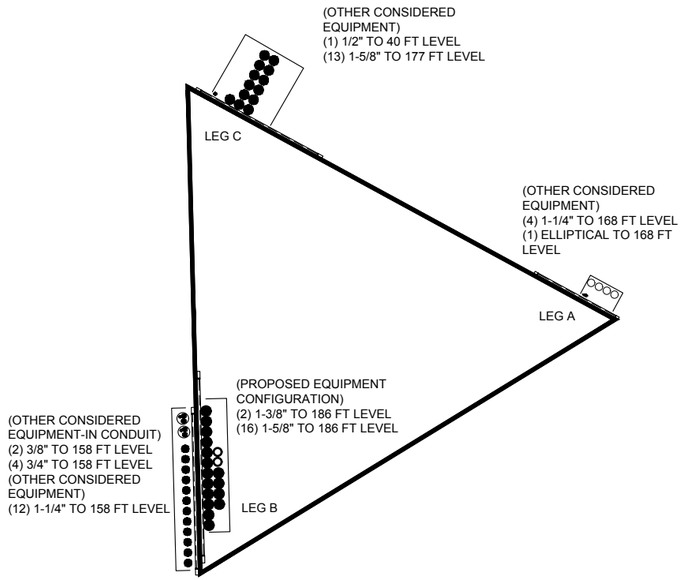


TOWER ELEVATION VIEW



TOWER BASE LEVEL VIEW

MODIFICATION SCHEDULE

LETTER	ELEVATION (FT)	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEET
A	20.0 TO 10.0	**INSTALL NEW REPLACEMENT REDUNDANT DIAGONALS**	S-2 & S-5
B	185.0 TO 180.0	**INSTALL NEW SELF SUPPORT EXTENSION**	S-3 TO S-5
C	185.0 TO 3.0±	**INSTALL NEW 3/8" DIAMETER SAFETY CLIMB**	---

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTHS AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.

NOTES:

1. MODIFICATIONS TYPICAL FOR ALL TOWER FACES.
2. COAXIAL CABLES AND ANTENNAS CONFLICTING WITH PROPOSED REINFORCEMENT TO BE TEMPORARY RELOCATED. THE CONTRACTOR SHALL COORDINATE THE WORK WITH CROWN AND THE OWNER OF THE APPURTENANCES INVOLVED.

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TOWER MODIFICATION SCHEDULE

S-1

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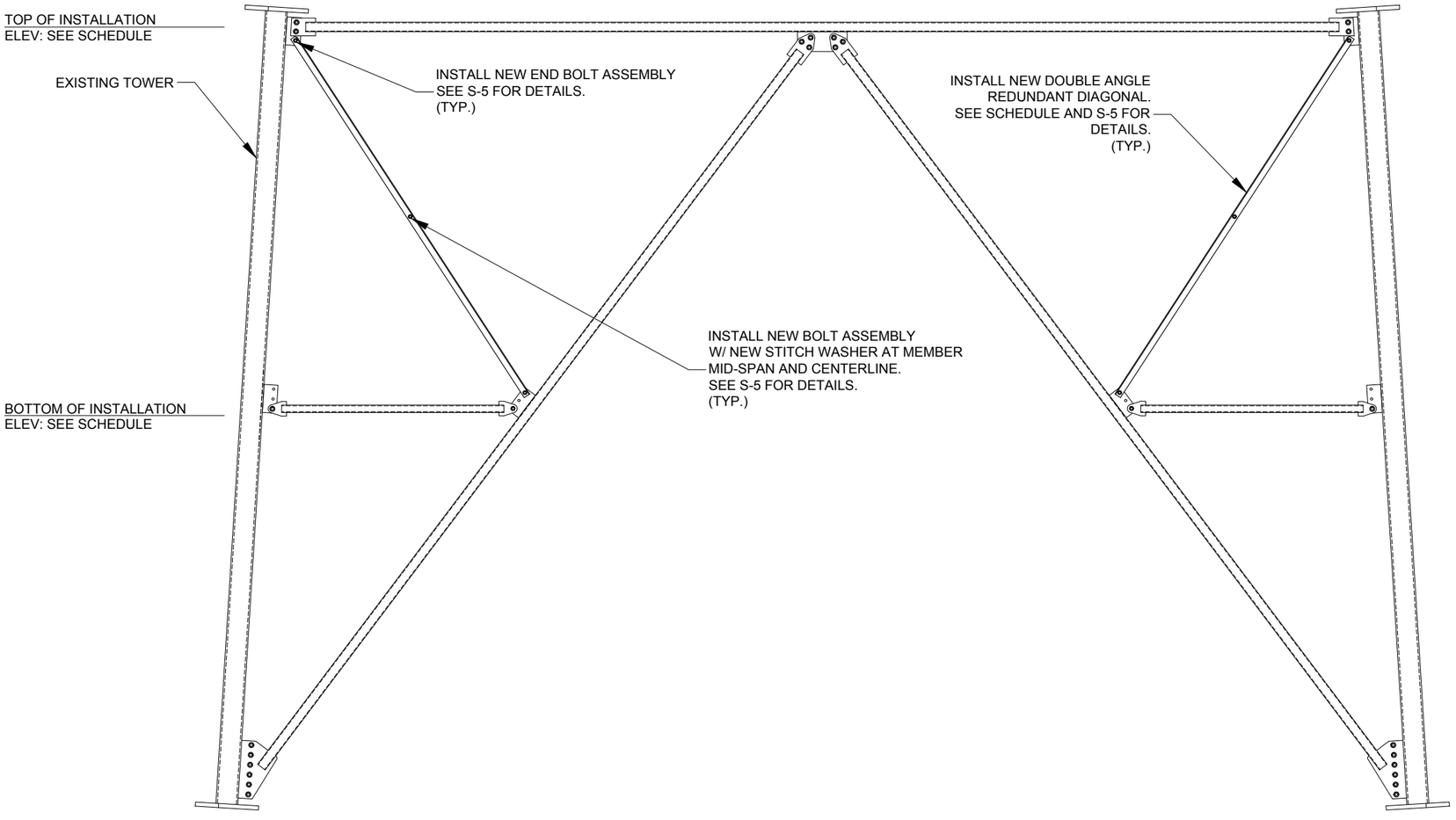
REDUNDANT DIAGONAL SCHEDULE							
ELEVATION	EXISTING MEMBER	NEW MEMBER QTY / SIZE	ESTIMATED LENGTH	END BOLT QTY / SIZE	STITCH BOLT QTY / SIZE	BOLT GRADE	STITCH WASHER SPACER QTY.
20.0' TO 10.0'	PIPE 1.90" OD X 0.145"	(6) 2L 2" X 2" X 1/4"	11'-6"	(12) 5/8"Ø X 2"	(6) 5/8"Ø X 2"	A325X	6



REDUNDANT DIAGONAL REPLACEMENT

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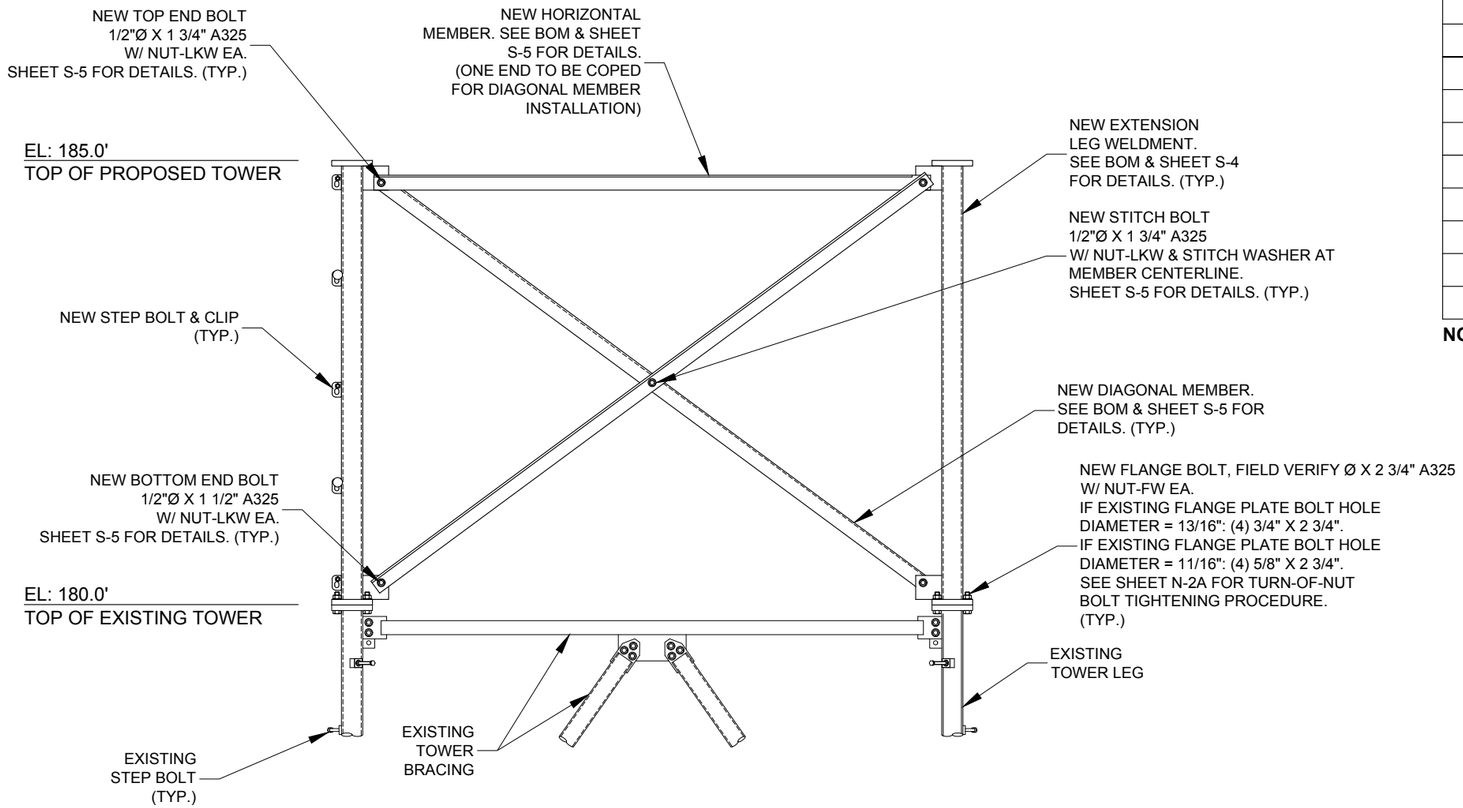
REDUNDANT DIAGONAL REPLACEMENT DETAILS

S-2

REV 0



EXTENSION INSTALLATION DETAILS

EXTENSION BILL OF MATERIAL		
QUANTITY	**DESCRIPTION**	**GRADE**
3	EXTENSION LEG WELDMENT	SEE S-4
3	HORIZONTAL, L 2 X 2 X 1/4" X 8'-6" (APPROX. LENGTH)	A572-50
6	DIAGONAL, L 2 X 2 X 1/4" X 10'-0" (APPROX. LENGTH)	A572-50
6	TOP END BOLT, 1/2"Ø X 1 3/4"	ASTM A325
6	BOTTOM END BOLT, 1/2"Ø X 1 1/2"	ASTM A325
3	STITCH BOLT, 1/2"Ø X 1 3/4"	ASTM A325
5	STEP BOLT ASSEMBLY	SEE S-4
3	STITCH WASHER	ASTM A36
12	FLANGE BOLT, FIELD VERIFY Ø X 2 3/4"	ASTM A325
12	HEAVY HEX NUT	ASTM A563
12	HARDENED FLAT WASHER	ASTM F436

NOTE: ALL MATERIAL TO BE GALVANIZED

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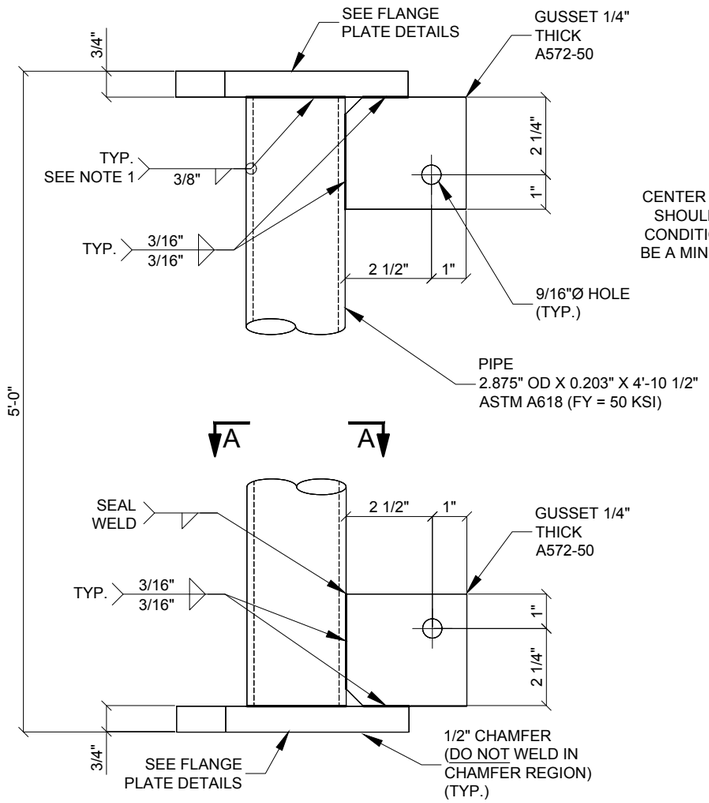
EXTENSION INSTALLATION DETAILS I

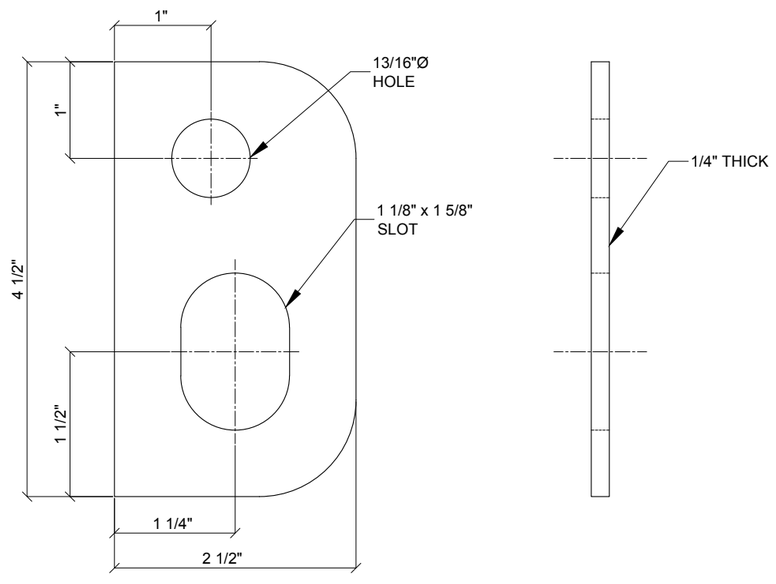
S-3

REV 0



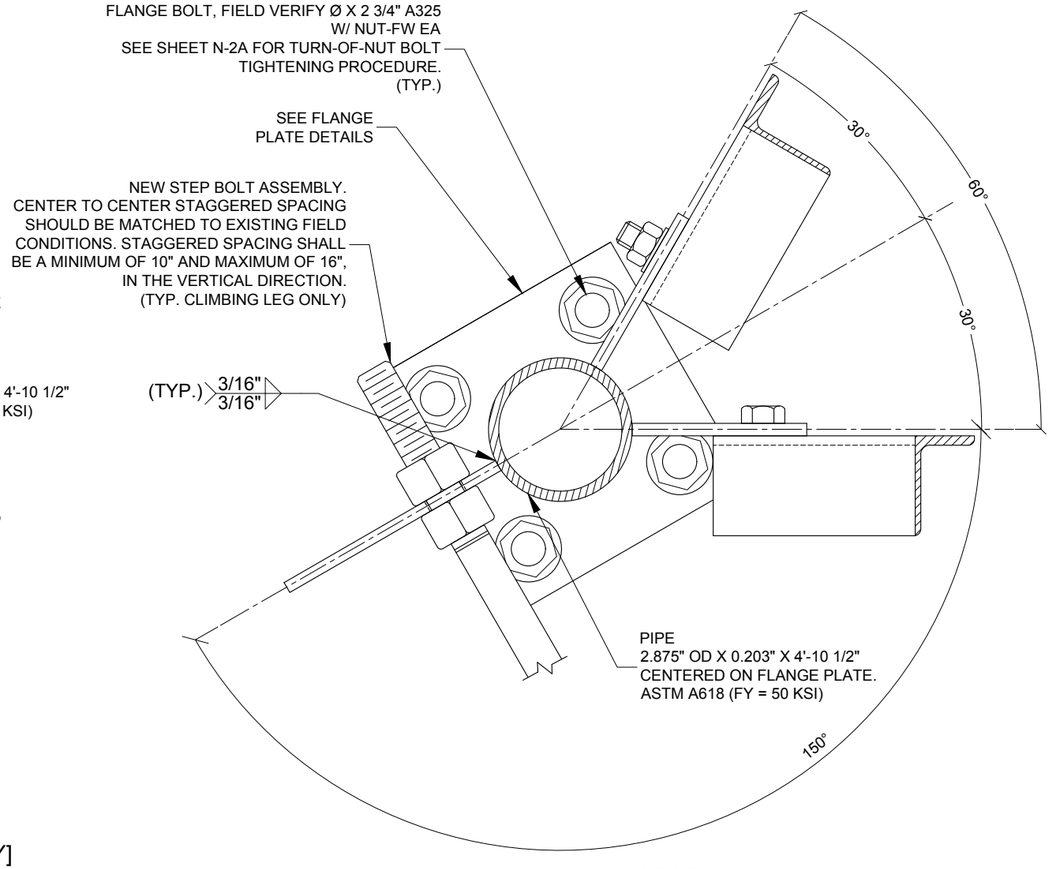
EXTENSION LEG WELDMENT

[NEW STEP BOLT ASSEMBLIES NOT SHOW FOR CLARITY]



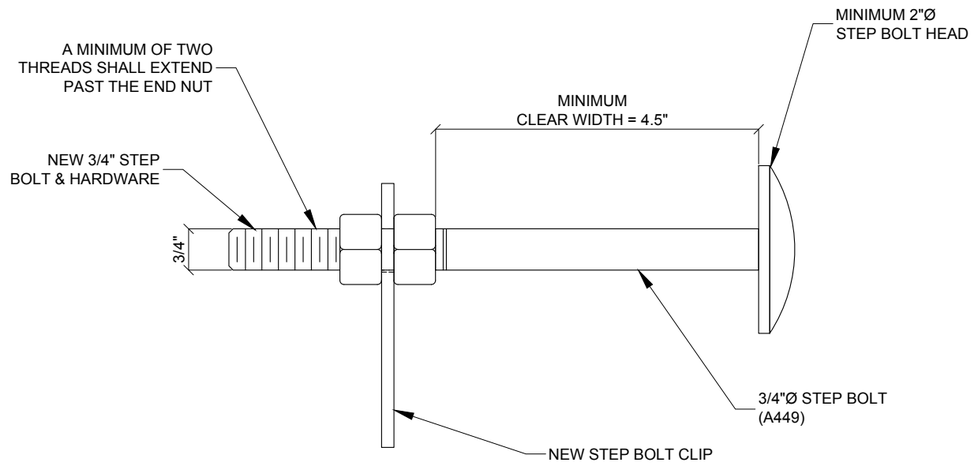
STEP BOLT CLIP WITH ANCHORAGE POINT (A572-50)

(FRONT & SIDE VIEW)



SECTION "A-A"

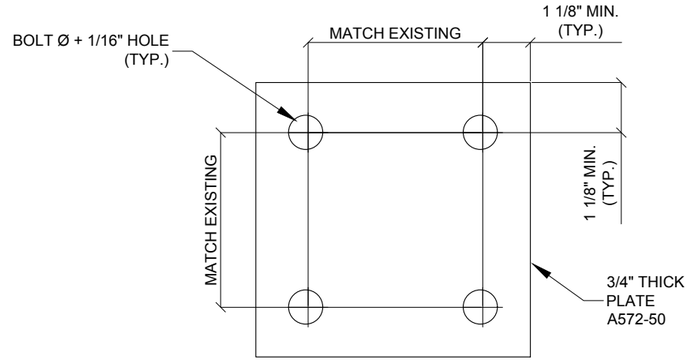
TOWER ORIENTATION DETAIL



STEP BOLT DETAIL

NOTES:

1. VERIFY DURING FABRICATION THAT WELD WILL NOT INTERFERE WITH NEW FLANGE BOLT NUT. CONTACT JACOBS IF INTERFERENCE EXISTS FOR ALTERNATE WELD DETAIL.
2. STEP BOLT CLIPS SHALL BE SHOP WELDED. STEP BOLT CLIP WELDS ARE SUBJECT TO AWS D1.1 AND MUST BE INSPECTED BY A CWI. REFER TO DOCUMENT "ENG-STD-10069 GC CWI REQUIREMENT STANDARD" FOR CWI REQUIREMENTS. STEP BOLT CLIPS SHALL BE WELDED IN PLACE PRIOR TO HOT DIP GALVANIZING THE WELDMENT.
3. CONTRACTOR SHALL USE ALL NEW STEP BOLTS AND HARDWARE. STEP BOLT MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM A449. STEP BOLTS SHALL BE INSTALLED USING DOUBLE NUTS. STEP BOLT NUTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION AND THEN ONE NUT SHALL BE PRETENSIONED BY ROTATING THE NUT AN ADDITIONAL 1/3 TURN. PLATE AND CLIP BOLT HOLES SHALL BE SHOP DRILLED OR PUNCHED.



FLANGE PLATE DETAILS

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EXTENSION INSTALLATION DETAILS II

S-4

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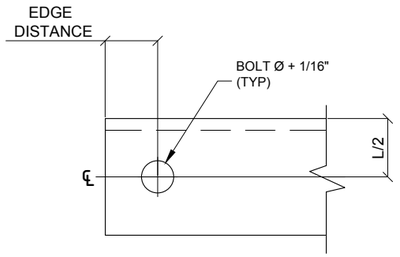
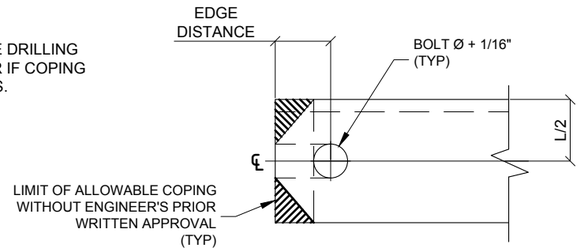


NOTE:
VERIFY FIT UP BEFORE DRILLING HOLES. CONTACT EOR IF COPING INTERFERENCE EXISTS.

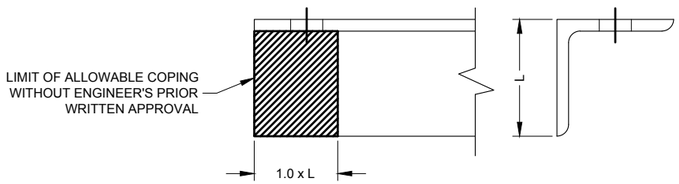
DIAGONAL & HORIZONTAL MEMBER BOLT HOLE PLACEMENT



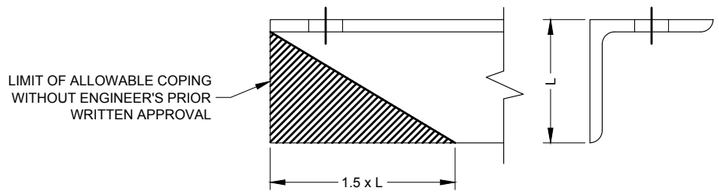
REDUNDANT DIAGONAL MEMBER BOLT HOLE PLACEMENT

NOTES:

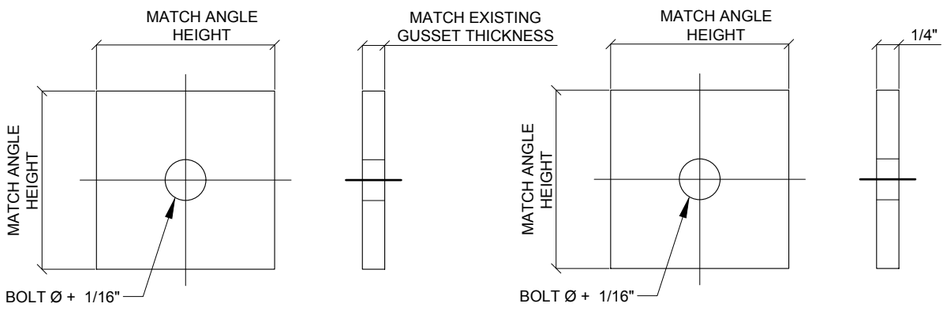
1. ALL HOLES SHALL BE DRILLED.
2. FIELD CUTTING AND DRILLING OF ANGLE MEMBERS IS PERMITTED.
3. ANGLES TO BE ASTM A572-50. MATERIAL TEST REPORTS ARE REQUIRED.
4. ALL STITCH WASHERS ARE TO BE NEW AND CONFORM TO THE FOLLOWING: ASTM A36 OR STRONGER MATERIAL.
5. ALL CONNECTION PLATES ARE TO BE NEW AND CONFORM TO THE FOLLOWING: ASTM A572-50 OR STRONGER MATERIAL.
6. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCI-BAORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN*.
7. ALL BOLTS SHALL BE HOT-DIP GALVANIZED ASTM A325 ASSEMBLIES, TO INCLUDE BOLT, HEAVY HEX NUT, AND SPLIT LOCK WASHER, UNO. USE BEARING TYPE CONNECTIONS, TIGHTEN TO A SNUG TIGHT CONDITION, UNO.



HORIZONTAL MEMBER COPING ALLOWANCES

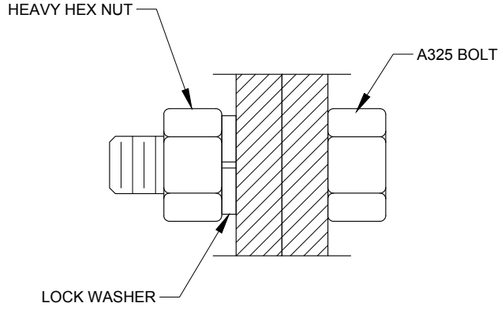


REDUNDANT DIAGONAL MEMBER COPING ALLOWANCES



REDUNDANT DIAGONAL STITCH WASHER

TOWER EXTENSION STITCH WASHER



TYPICAL BOLT ASSEMBLY

BOLT EDGE DISTANCE (UNLESS NOTED OTHERWISE)	
BOLT DIAMETER	MIN. EDGE
1/2"	1"
5/8"	1 1/4"

BOLT EDGE DISTANCE

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133
BU NUMBER: 806362
WO NUMBER: 1628360
SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL
CHECKED BY: DMC
APPROVED BY: PLM
SCALE: N.T.S

FABRICATION AND INSTALLATION DETAILS

S-5

REV 0

Date: **July 19, 2018**

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FROM ZERO TO INFINIGY
the solutions are endless

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

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

Subject:	**Mount Structural Analysis**	
Carrier Designation:	***T-Mobile Change-Out***	
	Carrier Site Number:	CT11494B
	Carrier Site Name:	CT11494B
Crown Castle Designation:	**Crown Castle BU Number:**	806362
	Crown Castle Site Name:	NHV 108 943133
	Crown Castle JDE Job Number:	512700
	Crown Castle Application Number:	446207, Rev.1
Engineering Firm Designation:	**Infinigy Report Designation:**	600-005
Site Data:	**Intersection of RTE 322 / Meridian Road Wolcott Site, Wolcott, New Haven County, CT 06716 Latitude 41° 33' 34.41" Longitude -72° 56' 49.1"**	
Structure Information:	**Tower Height & Type:**	**180 ft Self-Support**
	Mount Elevation:	**186 ft**
	Mount Type:	**12.5 ft Sector Frame**

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:

Sector Frame **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 95 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 C 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
JUL 19 2018
29460
LICENSED
PROFESSIONAL ENGINEER

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

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1) INTRODUCTION

The proposed mount installation will consist of a three (3) 12.5 ft wide Sector Frame at the 186 ft elevation. The existing and proposed antenna loading was obtained from the Application provided by CCI, Application Number 446207, Revision 1 and the Mount Design Drawings provided by Site Pro 1.

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 95 mph with no ice, 50 mph with 0.75 inch escalated ice thickness, Exposure Category C 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
186.0	186.0	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
186.0	186.0	3	Commscope	SBNHH-1D65A	12.5 ft Sector Frame	1
		6	RFS	ATMAA1412D-1A20		
		3	Commscope	ATBT-BOTTOM-24V	-	2
		3	Ericsson	AIR 21		

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	446207, Rev.1	CCI Sites
Site Visit	Photos	806362	CCI Sites
Mount Assembly Drawings	SitePro1 Drawing	No. VFA12-RRH	On File

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 (Sector Frame)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1,2	Frame Rail	186.0	66.0%	Pass
	Bracing		64.7%	Pass
	Mount Pipe		61.5%	Pass
	Arm		33.6%	Pass
	Bolts		13.4%	Pass

Tieback End Reaction	1449.5 lb

Structure Rating (max from all components) =	66.0%

Notes:

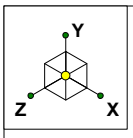
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

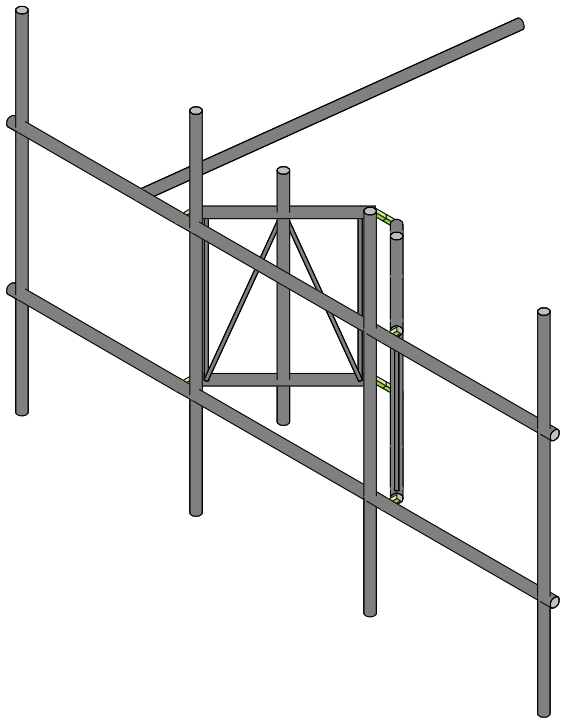
4.1) Recommendations

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

APPENDIX A

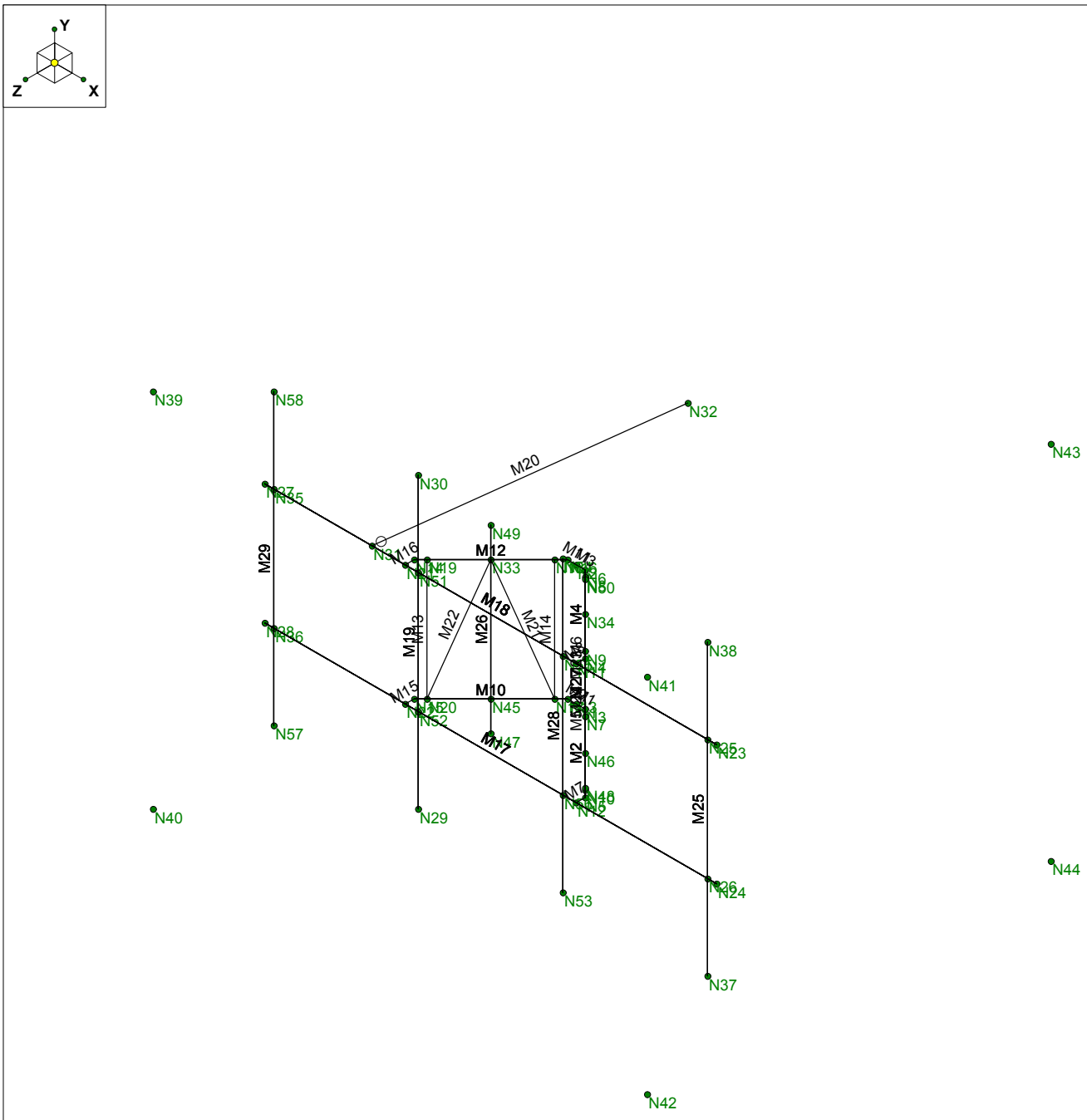
WIRE FRAME AND RENDERED MODELS





Envelope Only Solution

Infinigy Engineering, PLLC	NHV 108 943133	Rendered Model
DVA		July 17, 2018 at 10:47 AM
600-005		CT11494B.R3D



Envelope Only Solution

Infinigy Engineering, PLLC	NHV 108 943133	Wire Frame Model
DVA		July 17, 2018 at 10:49 AM
600-005		CT11494B.R3D

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	NHV 108 943133
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	DVA
Date:	7/17/2018

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INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2012 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Mount - Sector
Number of Sectors:	3
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	95	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	186.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	C	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
31.66	1.00	**37.99**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
8.77	1.00	**31.89**

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	186.0	3	1.00	Flat	Flat	31.66	6.51	206.08	149.17	163.40	191.85
RFS APXVAARR24_43-UNA20	186.0	3	1.00	Flat	Flat	31.66	20.24	640.80	281.37	371.23	550.94
Commscope SBNHH-1D65A	186.0	3	1.00	Flat	Flat	31.66	5.96	188.58	123.90	140.07	172.41
Ericsson Radio 4449 B12/B71	186.0	3	1.00	Flat	Flat	31.66	1.64	52.02	36.48	40.36	48.13
RFS ATMAA1412D-1A20	186.0	6	1.00	Flat	Flat	31.66	1.00	31.66	12.90	17.59	26.97

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	N1	N3			RIGID	None	None	RIGID	Typical
2	M2	N3	N5			Arm	Beam	Pipe	A53 Gr.B	Typical
3	M3	N2	N6			RIGID	None	None	RIGID	Typical
4	M4	N6	N4			Arm	Beam	Pipe	A53 Gr.B	Typical
5	M5	N10	N9			Bracing	VBrace	BAR	A36 Gr.36	Typical
6	M6	N7	N8			Bracing	VBrace	BAR	A36 Gr.36	Typical
7	M7	N5	N12			RIGID	None	None	RIGID	Typical
8	M8	N4	N11			RIGID	None	None	RIGID	Typical
9	M9	N1	N13			RIGID	None	None	RIGID	Typical
10	M10	N13	N15			Arm	Beam	Pipe	A53 Gr.B	Typical
11	M11	N2	N16			RIGID	None	None	RIGID	Typical
12	M12	N16	N14			Arm	Beam	Pipe	A53 Gr.B	Typical
13	M13	N20	N19			Bracing	VBrace	BAR	A36 Gr.36	Typical
14	M14	N17	N18			Bracing	VBrace	BAR	A36 Gr.36	Typical
15	M15	N15	N22			RIGID	None	None	RIGID	Typical
16	M16	N14	N21			RIGID	None	None	RIGID	Typical
17	M17	N28	N24			Frame Rail	Beam	Pipe	A53 Gr.B	Typical
18	M18	N27	N23			Frame Rail	Beam	Pipe	A53 Gr.B	Typical
19	M19	N29	N30			Mount Pipes	Column	Pipe	A53 Gr.B	Typical
20	M20	N32	N31			Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
21	M21	N17	N33			Bracing	VBrace	BAR	A36 Gr.36	Typical
22	M22	N33	N20			Bracing	VBrace	BAR	A36 Gr.36	Typical
23	M23	N7	N34			Bracing	VBrace	BAR	A36 Gr.36	Typical
24	M24	N34	N10			Bracing	VBrace	BAR	A36 Gr.36	Typical
25	M25	N37	N38			Mount Pipes	Column	Pipe	A53 Gr.B	Typical
26	M26	N47	N49			Mount Pipes	Column	Pipe	A53 Gr.B	Typical
27	M27	N48	N50			Mount Pipes	Column	Pipe	A53 Gr.B	Typical
28	M28	N53	N54			Mount Pipes	Column	Pipe	A53 Gr.B	Typical
29	M29	N57	N58			Mount Pipes	Column	Pipe	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		8	23.7	0
3	Total General		8	23.7	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	0.75" S.R. HRA	8	330.9	0
7	A53 Gr.B	PIPE 2.0	13	1042.1	.3
8	Total HR Steel		21	1373	.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL		-1			10			
2	Wind Load AZI 000	WLZ					10		1	
3	Wind Load AZI 090	WLX					10		1	
4	Ice Weight	OL1					10	29		
5	Wind + Ice Load AZI 000	OL2					10		1	
6	Wind + Ice Load AZI 090	OL3					10		1	
7	Service Live 1	LL				2				
8	BLC 2 Transient Area Loads	None						16		
9	BLC 3 Transient Area Loads	None						14		
10	BLC 5 Transient Area Loads	None						16		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
11	BLC 6 Transient Area Loads	None						14		

Load Combinations

	Description	So...	PDelta	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		DL	1.4																		
2	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	1.6																
3	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	1.3...	W...	.8														
4	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	.8	W...	1.3...														
5	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2			W...	1.6														
6	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	-.8	W...	1.3...														
7	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	-1.3...	W...	.8														
8	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	-1.6																
9	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	-1.3...	W...	-.8														
10	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	-.8	W...	-1.3...														
11	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2			W...	-1.6														
12	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	.8	W...	-1.3...														
13	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	W...	1.3...	W...	-.8														
14	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	1.6																
15	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	1.3...	W...	.8														
16	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	.8	W...	1.3...														
17	0.9D + 1.6W AZI ...	Yes	Y		DL	.9			W...	1.6														
18	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	-.8	W...	1.3...														
19	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	-1.3...	W...	.8														
20	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	-1.6																
21	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	-1.3...	W...	-.8														
22	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	-.8	W...	-1.3...														
23	0.9D + 1.6W AZI ...	Yes	Y		DL	.9			W...	-1.6														
24	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	.8	W...	-1.3...														
25	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	W...	1.3...	W...	-.8														
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1																
27	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	1														
28	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5												
29	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866												
30	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1			OL3	1												
31	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866												
32	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5												
33	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-1														
34	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5												
35	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866												
36	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1			OL3	-1												
37	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866												
38	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5												
39	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	.114														
40	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	.098	W...	.057												
41	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	.057	W...	.098												
42	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5			W...	.114												
43	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	-.057	W...	.098												
44	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	-.098	W...	.057												
45	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	-.114														
46	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	-.098	W...	-.057												
47	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	-.057	W...	-.098												
48	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5			W...	-.114												
49	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	.057	W...	-.098												
50	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	W...	.098	W...	-.057												

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	N2	max	1202.399	5	858.987	32	888.853	24	0	1	0	1	0	1
2		min	-1848.389	48	197.408	24	-2123.476	31	0	1	0	1	0	1
3	N1	max	1839.184	42	1887.311	38	2088.173	27	0	1	0	1	0	1
4		min	-1064.152	11	449.208	18	-979.909	20	0	1	0	1	0	1
5	N32	max	163.979	10	52.289	35	1347.107	4	0	1	0	1	0	1
6		min	-164.337	4	12.04	16	-1349.975	10	0	1	0	1	0	1
7	Totals:	max	1595.398	5	2789.362	31	2751.292	14						
8		min	-1595.398	23	679.029	23	-2751.292	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[i..	Dir	LC	phi*Pnc..	phi*Pnt ..	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M17	PIPE_2.0	.660	104.688	40	.263	46.8...		8	6295.422	32130	1.872	1.872	2...	H1-1b
2	M23	0.75" S.R._HRA	.647	42.72	41	.017	0		10	3923.813	14313....	.179	.179	2...	H1-1a
3	M25	PIPE_2.0	.615	28	43	.075	28		40	14916....	32130	1.872	1.872	4...	H1-1b
4	M18	PIPE_2.0	.604	104.688	44	.264	46.8...		2	6295.422	32130	1.872	1.872	2...	H1-1b
5	M21	0.75" S.R._HRA	.573	42.72	35	.019	0		40	3923.813	14313....	.179	.179	1...	H1-1a
6	M5	0.75" S.R._HRA	.352	40	40	.024	0		41	4475.599	14313....	.179	.179	2...	H1-1a
7	M2	PIPE_2.0	.336	33	39	.227	33		43	28843....	32130	1.872	1.872	2...	H1-1b
8	M4	PIPE_2.0	.283	33	45	.218	33		40	28843....	32130	1.872	1.872	2...	H1-1b
9	M13	0.75" S.R._HRA	.263	0	27	.027	0		10	4475.599	14313....	.179	.179	2...	H1-1a
10	M19	PIPE_2.0	.254	28	2	.119	68		9	14916....	32130	1.872	1.872	4...	H1-1b
11	M29	PIPE_2.0	.252	68	29	.039	68		29	14916....	32130	1.872	1.872	4...	H1-1b
12	M12	PIPE_2.0	.231	36	6	.119	33		38	28843....	32130	1.872	1.872	2...	H1-1b
13	M10	PIPE_2.0	.230	36	2	.154	0		35	28843....	32130	1.872	1.872	2...	H1-1b
14	M28	PIPE_2.0	.185	68	47	.078	28		41	14916....	32130	1.872	1.872	4...	H1-1b
15	M24	0.75" S.R._HRA	.175	42.72	45	.016	42.72		43	3923.813	14313....	.179	.179	2...	H1-1b
16	M22	0.75" S.R._HRA	.124	42.72	36	.020	42.72		40	3923.813	14313....	.179	.179	2...	H1-1b
17	M6	0.75" S.R._HRA	.104	0	41	.021	0		10	4475.599	14313....	.179	.179	2...	H1-1b
18	M14	0.75" S.R._HRA	.096	0	41	.019	0		10	4475.599	14313....	.179	.179	2...	H1-1b
19	M27	PIPE_2.0	.073	50	48	.080	10		41	23808.54	32130	1.872	1.872	1...	H1-1b
20	M20	PIPE_2.0	.068	47.073	29	.005	94.1...		26	15360....	32130	1.872	1.872	1...	H1-1b
21	M26	PIPE_2.0	.036	50	3	.072	10		41	23808.54	32130	1.872	1.872	2...	H1-1b

APPENDIX D

REFERENCE DOCUMENTS

Date:	7/17/2018
Client	Crown Castle
Carrier	T-Mobile
Engineer:	DVA
Site:	NHV 108 943133
Job #:	600-005

Code:	LRFD	
Axial:	1887.30	lbs
Shear:	2088.20	lbs

Bolt Capacity (5/8" A307 Thru Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	8284.0	6213.0	1	6213
Shear(lb)	13560.0	10170.0	1	10170

Interaction Check	
T /ϕT_n	30.4%
V /ϕVn	20.5%
≤1.0	13.4%
	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: CT11494B

CT494/CCastle-Wolcott-SST
347 East Street
Wolcott, CT 06716

August 20, 2018

EBI Project Number: 6218005664

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	4.45%

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

EBI Consulting
environmental | engineering | due diligence

August 20, 2018

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

Emissions Analysis for Site: **CT11494B – CT494/CCastle-Wolcott-SST**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **347 East Street, Wolcott, 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 **347 East Street, Wolcott, 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 channel (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 (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 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.

4) 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.

5) 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.

6) 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.

7) 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.

8) 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.

9) 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.

10) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **RFS APXVAARR24_43-U-NA20** for 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) 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.

11) The antenna mounting height centerline of the proposed antennas is **186 feet** above ground level (AGL).

12) 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.

13) 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 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	186 feet	Height (AGL):	186 feet	Height (AGL):	186 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%	**0.87**	Antenna B1 MPE%	**0.87**	Antenna C1 MPE%	**0.87**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	15.95 / 16.35 / 12.95 / 13.35 dBd	Gain:	15.95 / 16.35 / 12.95 / 13.35 dBd	Gain:	15.95 / 16.35 / 12.95 / 13.35 dBd
Height (AGL):	186 feet	Height (AGL):	186 feet	Height (AGL):	186 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz
Channel Count	7	Channel Count	7	Channel Count	7
Total TX Power(W):	215	Total TX Power(W):	215	Total TX Power(W):	215
ERP (W):	6,189.15	ERP (W):	6,189.15	ERP (W):	6,189.15
Antenna A2 MPE%	**1.06**	Antenna B2 MPE%	**1.06**	Antenna C2 MPE%	**1.06**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.93%**
AT&T	**0.91 %**
Clearwire	**0.07 %**
Verizon Wireless	**1.54 %**
Site Total MPE %:	**4.45 %**

T-Mobile Sector A Total:	1.93 %
T-Mobile Sector B Total:	1.93 %
T-Mobile Sector C Total:	1.93 %
Site Total:	4.45%

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	186	3.45	PCS - 1900 MHz	1000.00	0.35%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	186	5.18	AWS - 2100 MHz	1000.00	0.52%
T-Mobile PCS - 1900 MHz UMTS	1	1,469.13	186	1.63	PCS - 1900 MHz	1000.00	0.16%
T-Mobile AWS - 2100 MHz UMTS	1	1,726.08	186	1.92	AWS - 2100 MHz	1000.00	0.19%
T-Mobile PCS - 1900 MHz GSM	1	550.92	186	0.61	PCS - 1900 MHz	1000.00	0.06%
T-Mobile 600 MHz LTE	2	788.97	186	1.75	600 MHz	400.00	0.44%
T-Mobile 700 MHz LTE	2	432.54	186	0.96	700 MHz	467.00	0.21%
						Total:	**1.93%**

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:	1.93 %
Sector B:	1.93 %
Sector C:	1.93 %
T-Mobile Maximum MPE % (Per Sector):	1.93 %
Site Total:	4.45 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.44%** 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.