



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

March 15, 2016

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

**RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 842873**  
**AT&T Site ID: CT5431**  
**30 Oliver Terrace, Shelton, CT 06484**  
**Latitude: 41° 17' 38.21"/ Longitude: -73° 6' 25.83"**

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 95-foot level of the existing 140-foot self-support tower at 30 Oliver Terrace in Shelton, CT. The tower is owned by Crown Castle. The property is owned by Brennan Realty LLC. AT&T now intends to replace three (3) antennas with three (3) new antennas. These antennas would be installed at the 95-foot level of the tower. AT&T also intends to install three (3) RRH's, and three (3) A2 modules.

This facility was approved by the by the Connecticut Siting Council on in Petition 608 on March 25, 2003. There were no conditions listed in this approval.

This modification complies with the aforementioned condition(s).

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 The Honorable Mark A. Lauretti, Mayor, City of Shelton, as well as the property owner, and Crown Castle is the tower owner.

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

Melanie A. Bachman

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

For the foregoing reasons, AT&T 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: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora  
Real Estate Specialist  
12 Gill Street, Suite 5800, Woburn, MA 01801  
781-729-0053  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@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: The Honorable Mark A. Lauretti, Mayor  
City Hall, Room 202  
54 Hill Street  
Shelton CT, 06484

Brennan Realty LLC  
70 Platt Road  
PO Box 788  
Shelton, CT 06484

**PROJECT INFORMATION**

SCOPE OF WORK:

- REMOVE (1) EXISTING LTE ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- NEW AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW ANTENNAS; (3) EXISTING GSM/UMTS ANTENNAS TO REMAIN (1 PER SECTOR)
- AT&T RRUs: (1) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (1) EXISTING RRU PER SECTOR TO REMAIN, FOR A TOTAL OF (3) EXISTING RRUs.
- (1) NEW A2 MODULE PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW A2 MODULES.

SITE ADDRESS: 30 OLIVER TERRACE  
SHELTON, CT 06484

LATITUDE: 41.2937919 41° 17' 37.65084"N  
LONGITUDE: -73.1072989 -73° 06' 26.27604"W

USID: 24519

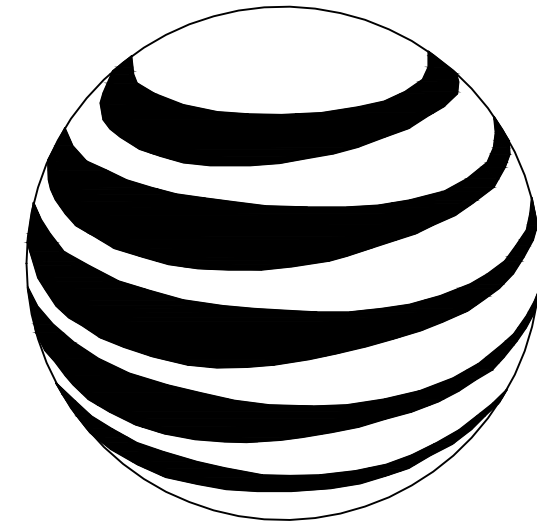
TOWER OWNER:

TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT

MONOPOLE HEIGHT: 140'-0"±  
RAD CENTER: 95'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



**at&t**  
**MOBILITY**

**FA CODE: 10071231**  
**SITE NUMBER: CT5431**  
**SITE NAME: SHELTON NE**

**PROJECT TEAM**

**CLIENT REPRESENTATIVE**

COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: DAVID COOPER  
PHONE: 617-639-4908  
EMAIL: dcooper@empiretelecomm.com

**SITE ACQUISITION:**

COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: DAVID COOPER  
PHONE: 617-639-4908  
EMAIL: dcooper@empiretelecomm.com

**ZONING:**

COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: DAVID COOPER  
PHONE: 617-639-4908  
EMAIL: dcooper@empiretelecomm.com

**ENGINEERING:**

COMPANY: COM-EX CONSULTANTS, LLC  
ADDRESS: 115 ROUTE 46  
SUITE E39  
MOUNTAIN LAKES, NJ 07046  
CONTACT: NICHOLAS D. BARILE, P.E.  
PHONE: 862-209-4300  
EMAIL: nbarile@comexconsultants.com

**RF ENGINEER:**

COMPANY: AT&T MOBILITY – NEW ENGLAND  
ADDRESS: 550 COCHITUATE ROAD  
SUITE 550 13 & 14  
FRAMINGHAM, MA 01701  
CONTACT: CAMERON SYME  
PHONE: 508-596-7146  
EMAIL: cs6970@att.com

**CONSTRUCTION MANAGEMENT:**

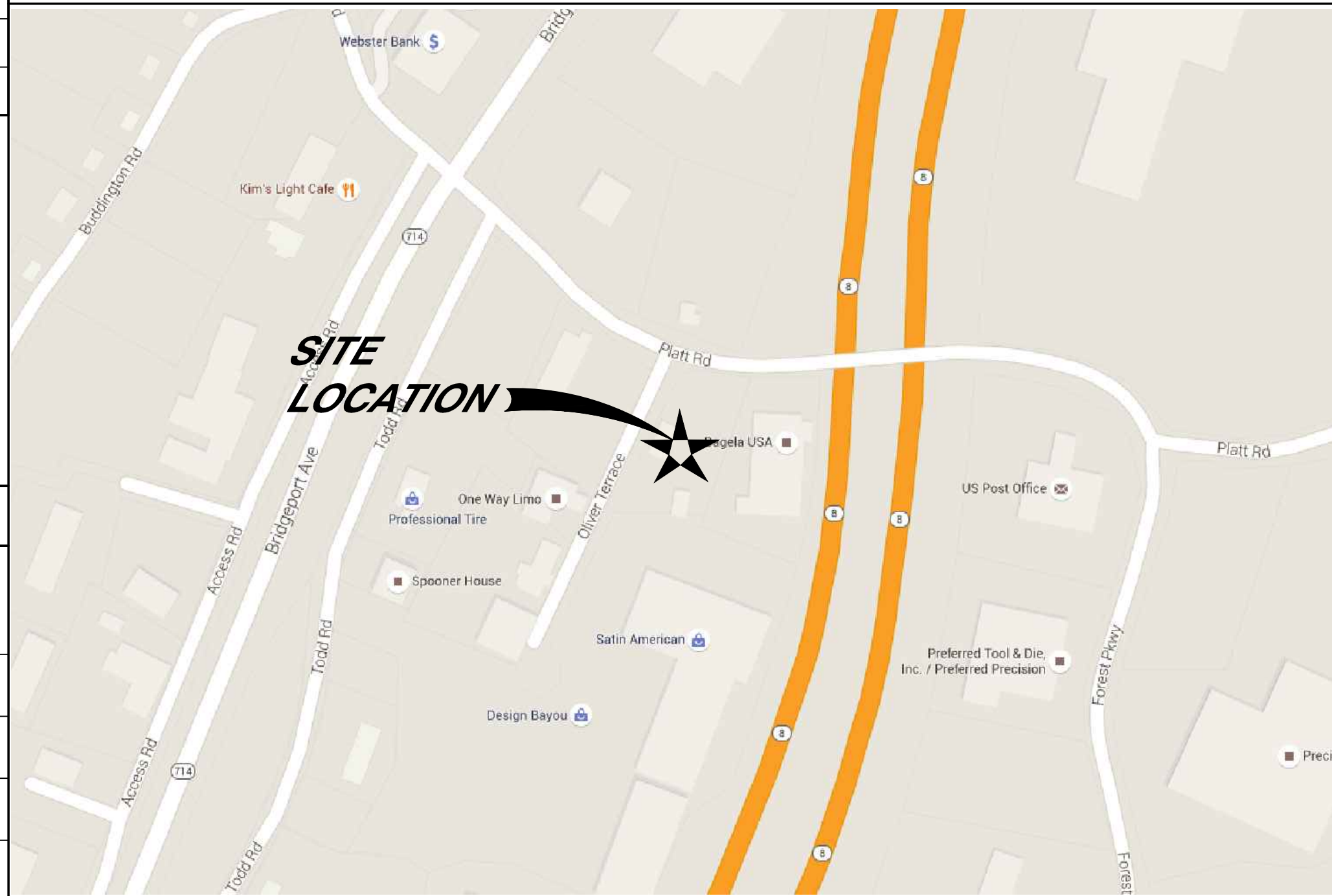
COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: GRZEGORZ "GREG" DORMAN  
PHONE: 484-683-1750  
EMAIL: gdorman@empiretelecomm.com

**DRAWING INDEX**

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**VICINITY MAP**

1. START OUT GOING NE ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD, 0.4MI. 2. TURN LEFT ONTO CAPITAL BLVD, 0.3MI. 3. TURN LEFT ONTO WEST STREET, 0.3MI. 4. MERGE ONTO I-91 S VIA RAMP ON THE LEFT TOWARD NEW HAVEN, 9.7MI. 5. MERGE ONTO CT-15 S/WILBUR CROSS PKWY VIA EXIT 17, 21.8MI. 6. MERGE ONTO CT-34 W VIA EXIT 58 TOWARD DERBY, 3.2MI. 7. TURN LEFT ONTO MAIN STREET/CT-34 W, 0.2MI. 8. MERGE ONTO CT-8 S VIA THE RAMP ON THE LEFT TOWARD BRIDGEPORT, 1.4MI. 9. TAKE THE BRIDGEPORT AVE EXIT, EXIT 13, 0.2MI. 10. TURN LEFT ONTO BRIDGEPORT AVE/CT-714, 0.6MI. 11. TURN LEFT ONTO PLATT RD, 0.1MI. 12. TAKE 2ND IGH ONTO OLIVER TERRACE, 0.05MI. 13. 30 OLIVER TERRACE IS ON THE LEFT.



**GENERAL NOTES**

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

**APPROVALS**

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



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



**SITE NUMBER: CTV5431**  
**SITE NAME: SHELTON NE**

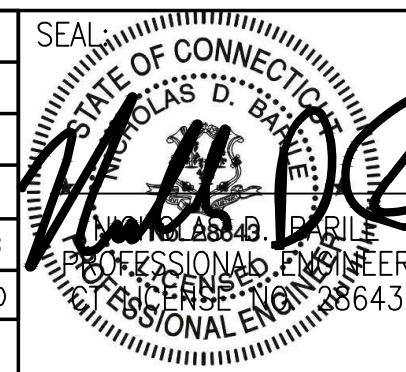
30 OLIVER TERRACE  
SHELTON, CT 06484  
FAIRFIELD COUNTY



550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/14/16	ISSUED AS FINAL	AM	NDB	NDB

SCALE: AS SHOWN      DESIGNED BY: AM      DRAWN BY: AM



AT&T		
DRAWING TITLE:		
JOB NUMBER	DRAWING NUMBER	REV
15156-EMP	T-1	0

**GROUNDING NOTES:**

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
 CONTRACTOR - EMPIRE TELECOM  
 SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER - AT&T MOBILITY  
 OEM - ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

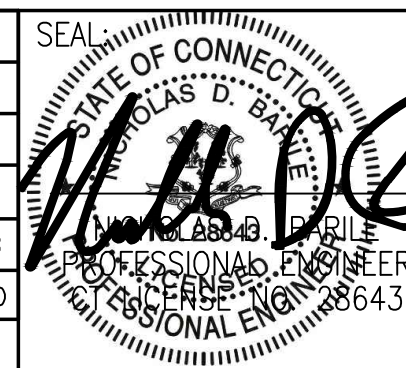
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
  - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
  - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
  - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
  - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
  - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
  - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
  - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
  - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
  - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
  - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
  - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY CENTEK ENGINEERING FOR A RECENT UPGRADE DATED 04/07/2011. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.



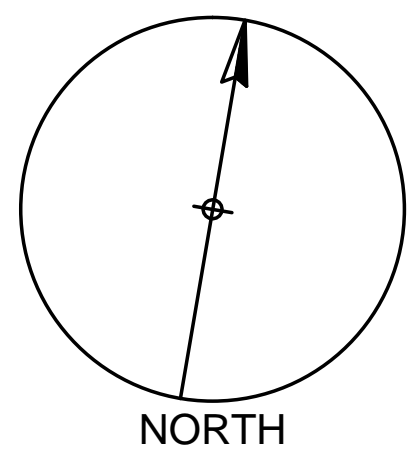
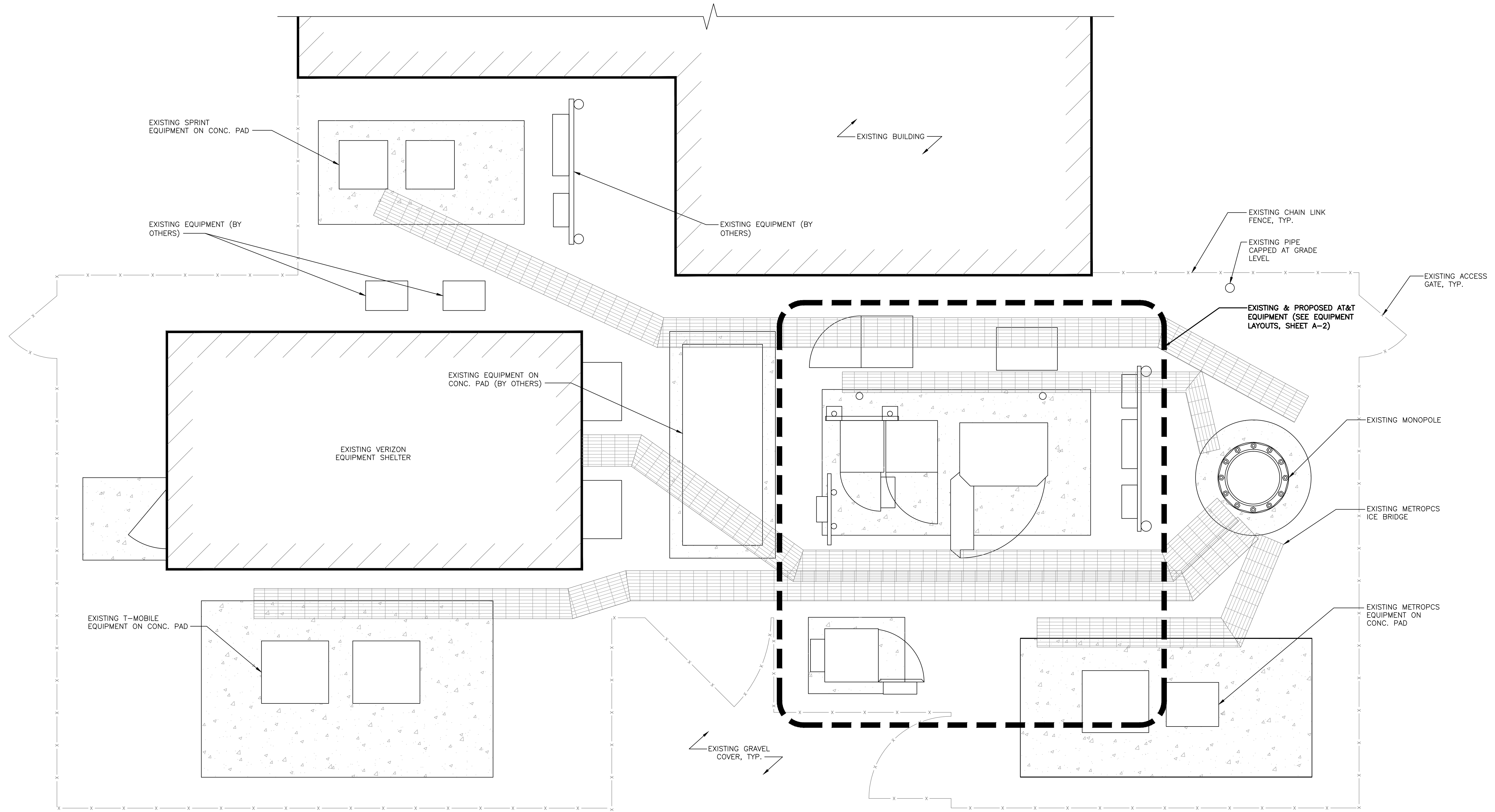
**SITE NUMBER: CTV5431**  
**SITE NAME: SHELTON NE**  
 30 OLIVER TERRACE  
 SHELTON, CT 06484  
 FAIRFIELD COUNTY



0	03/14/16	ISSUED AS FINAL	AM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AM	DRAWN BY: AM		



<b>AT&amp;T</b>		
DRAWING TITLE: <b>GROUNDING &amp; GENERAL NOTES</b>		
JOB NUMBER 15156-EMP	DRAWING NUMBER GN-1	REV 0



**COMPOUND LAYOUT**

SCALE: 1" = 2'-0"



( IN FEET )  
1/2 Inch = 1 Foot

NOTE:  
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

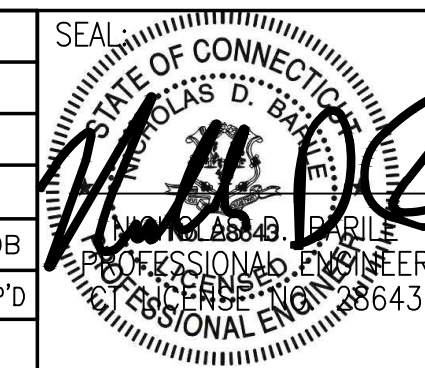
**COM-EX**  
Consultants  
115 ROUTE 46  
SUITE E39  
MOUNTAIN LAKES, NJ 07046  
PHONE: 862.209.4300  
FAX: 862.209.4301

**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

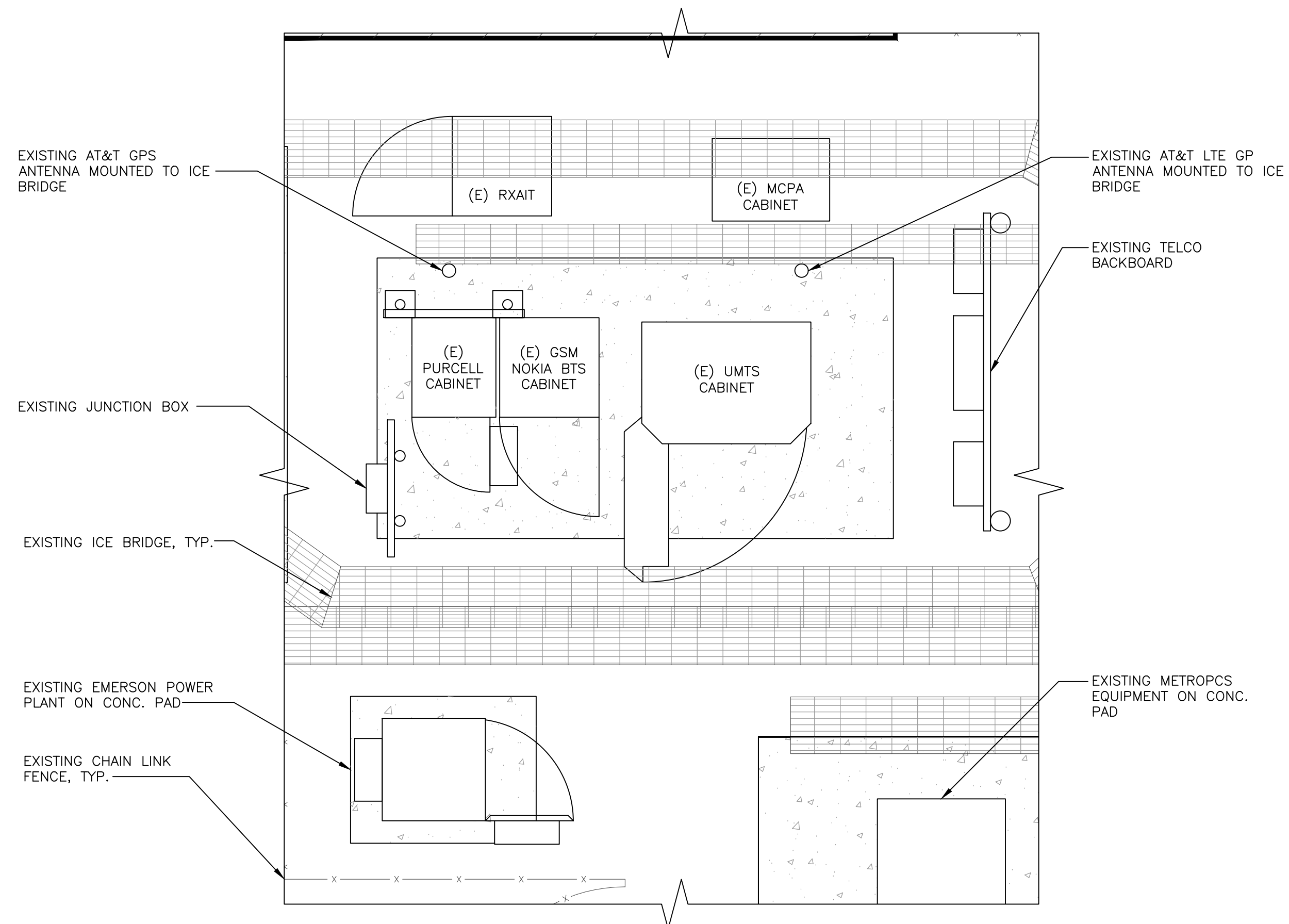
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FAIRFIELD COUNTY

**at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

0	03/14/16	ISSUED AS FINAL	AM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AM	DRAWN BY: AM		



<b>AT&amp;T</b>		
DRAWING TITLE: <b>COMPOUND LAYOUT</b>		
JOB NUMBER 15156-EMP	DRAWING NUMBER A-1	REV 0

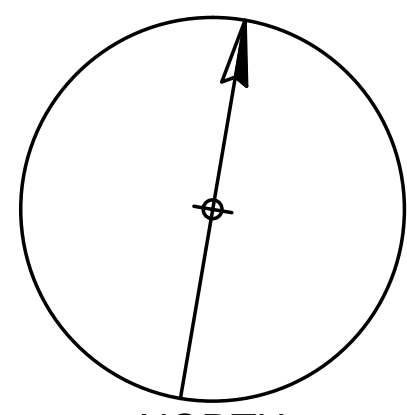


**EXISTING EQUIPMENT LAYOUT**

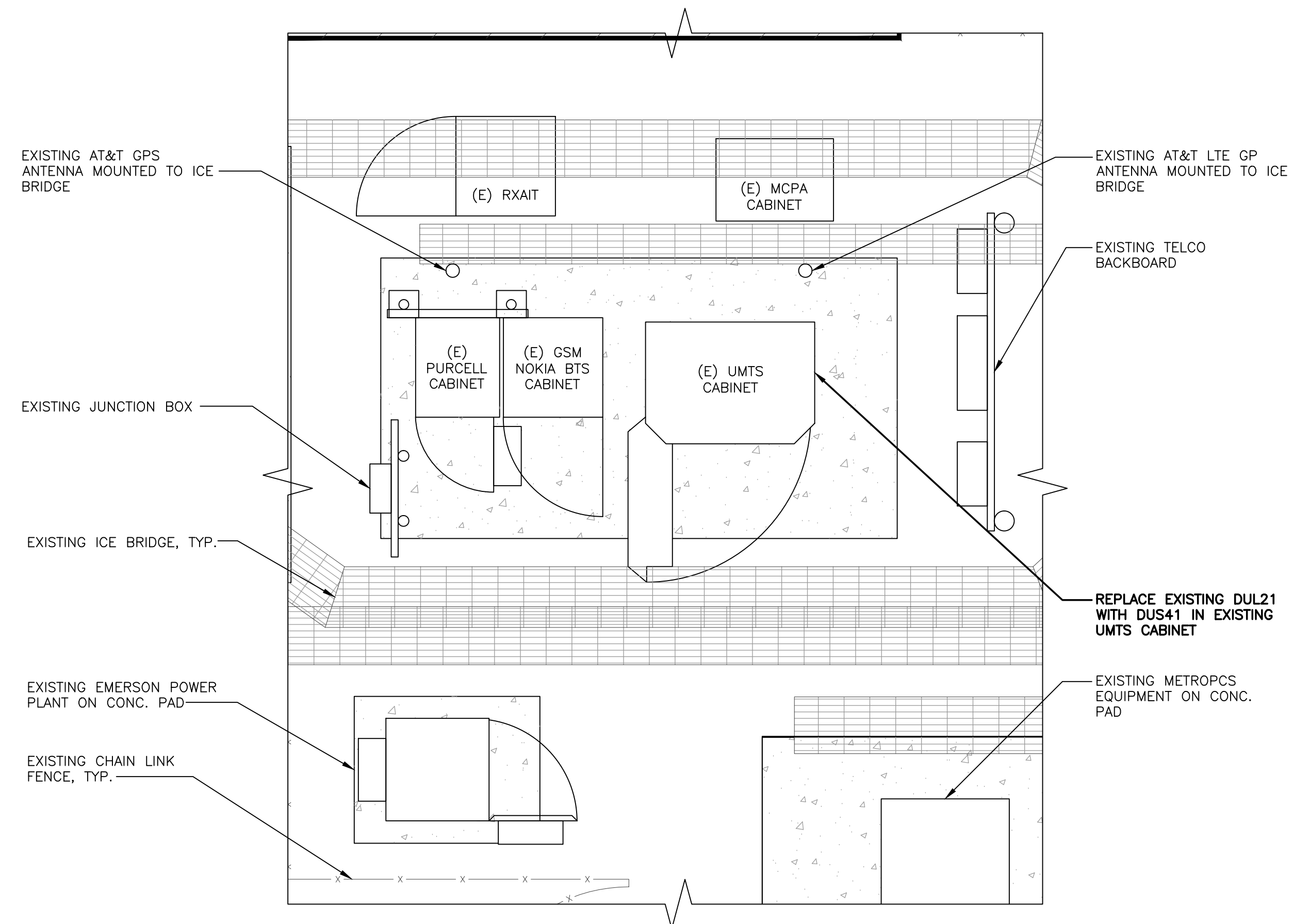
SCALE: 1" = 2'-0"



( IN FEET )  
1/2 Inch = 1 Foot



NORTH

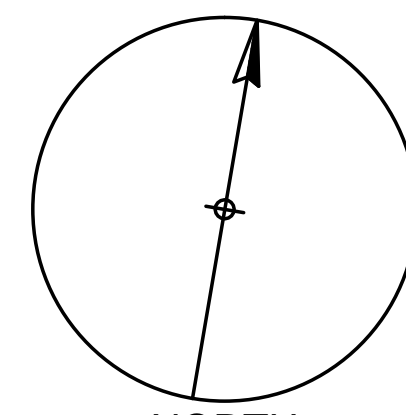


**PROPOSED EQUIPMENT LAYOUT**

SCALE: 1" = 2'-0"



( IN FEET )  
1/2 Inch = 1 Foot



NORTH

**COM-EX**  
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PHONE: 862.209.4300  
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**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

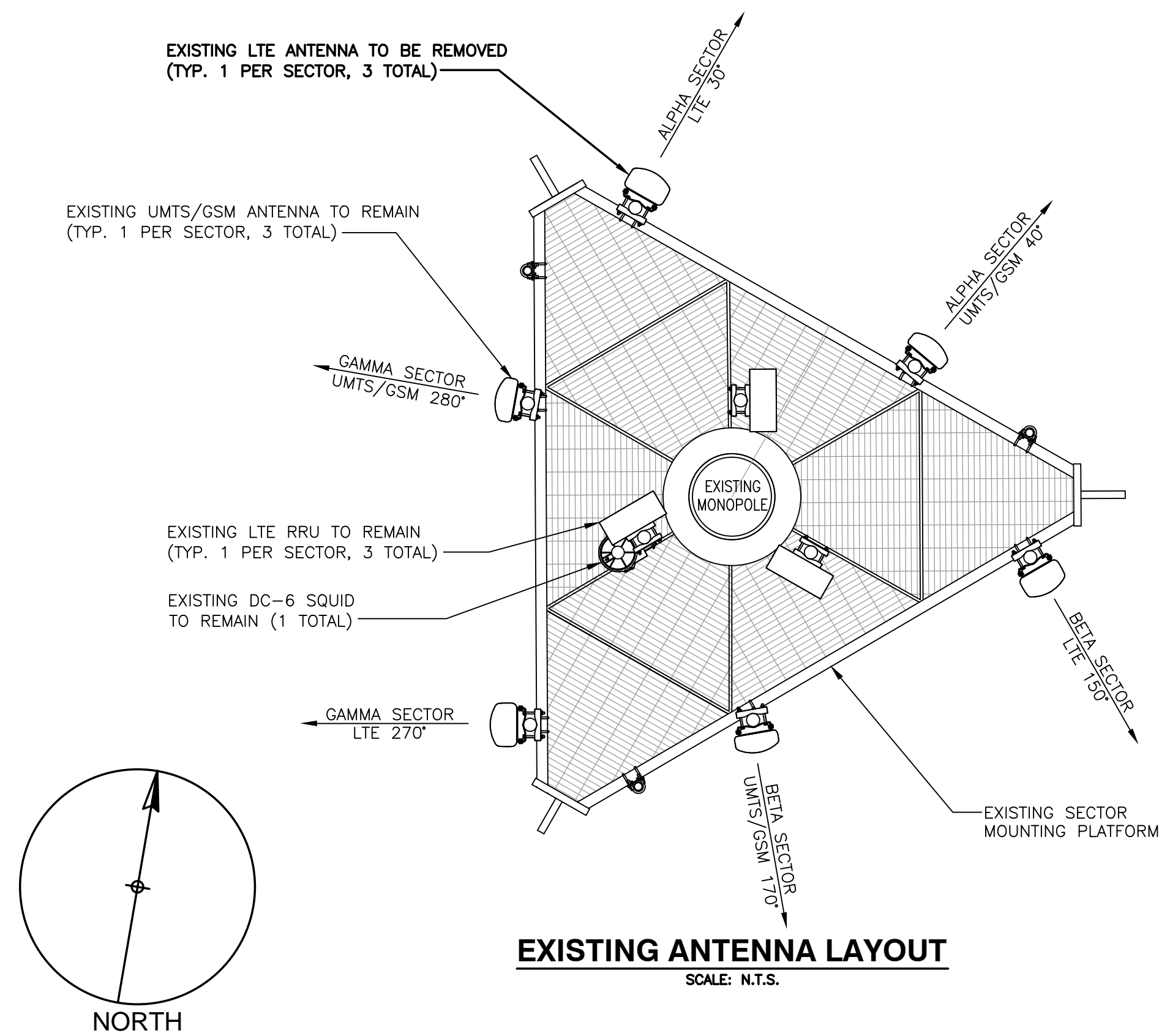
**SITE NUMBER: CTV5431**  
**SITE NAME: SHELTON NE**  
30 OLIVER TERRACE  
SHELTON, CT 06484  
FAIRFIELD COUNTY

**at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

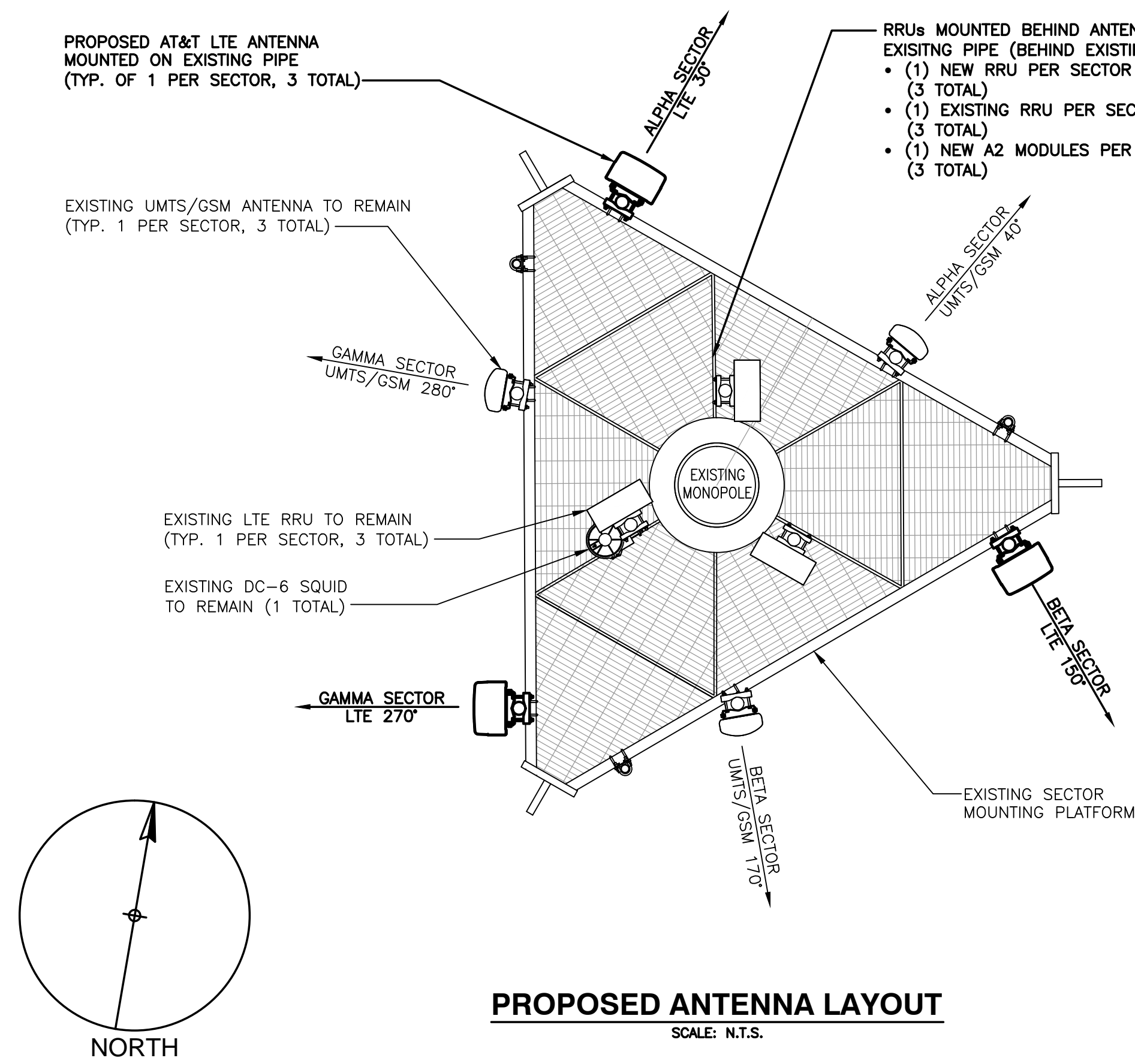
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NO.	DATE	REVISIONS	BY	CHK	APP'D
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SEAL  
STATE OF CONNECTICUT  
PROFESSIONAL ENGINEER  
NO. 38643

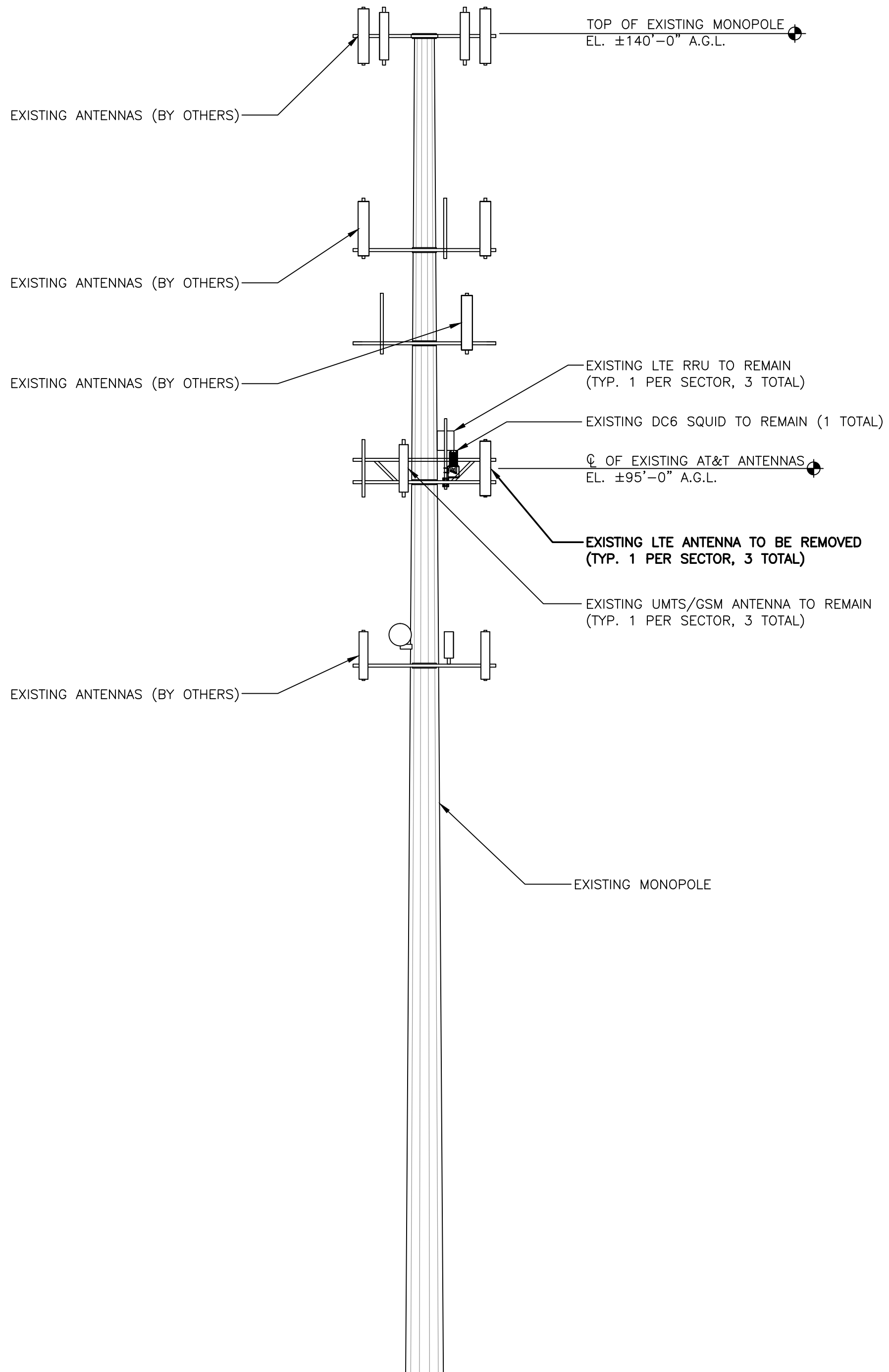
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JOB NUMBER 15156-EMP	DRAWING NUMBER A-2	REV 0



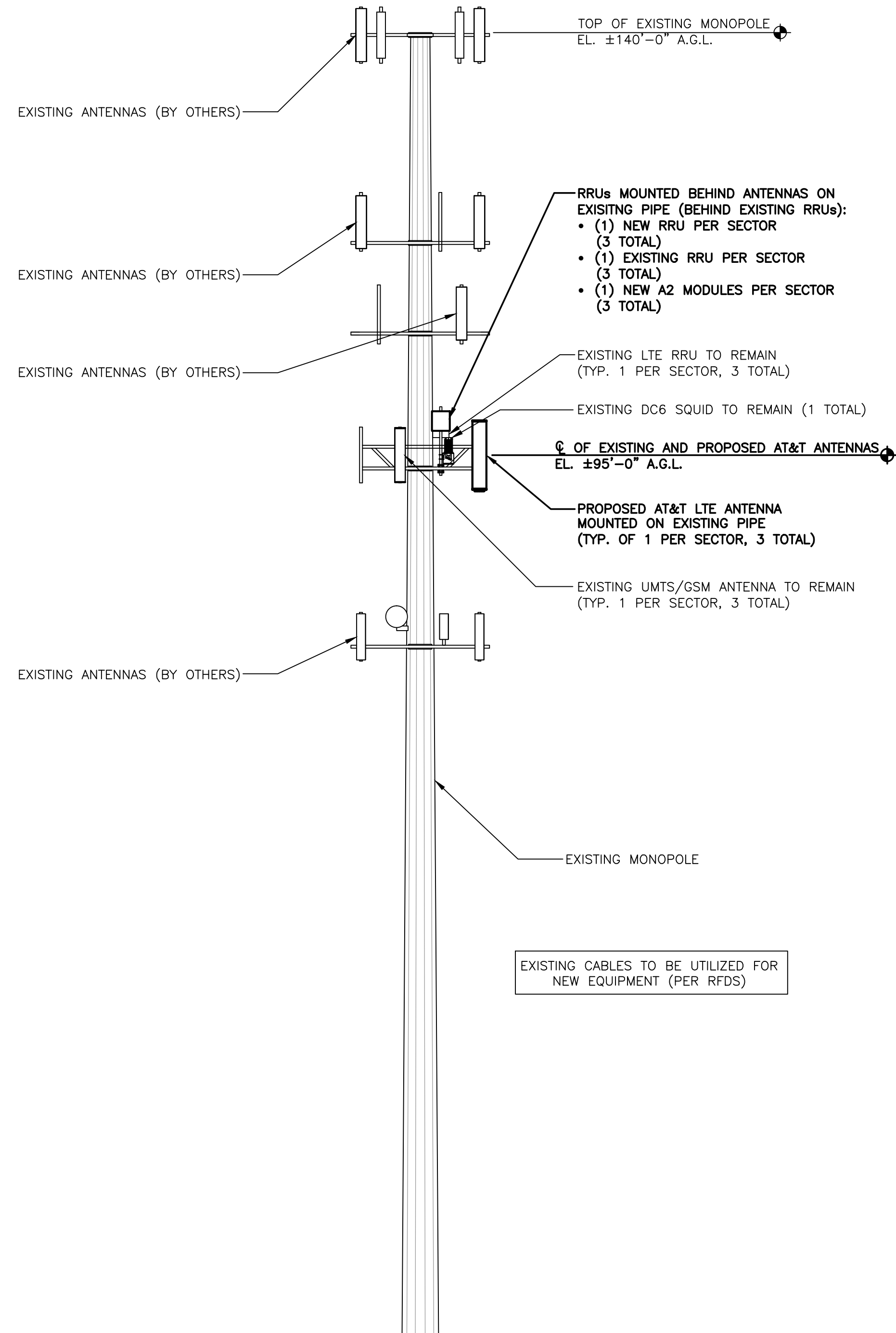
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SCALE: N.T.S.



**PROPOSED ANTENNA LAYOUT**  
SCALE: N.T.S.



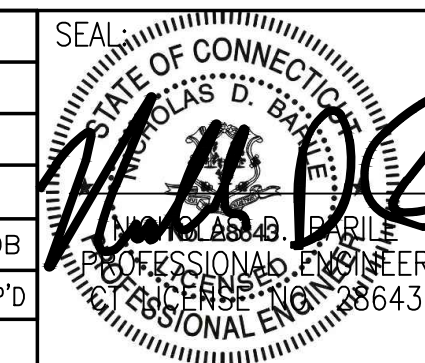
**EXISTING TOWER ELEVATION**  
SCALE: N.T.S.



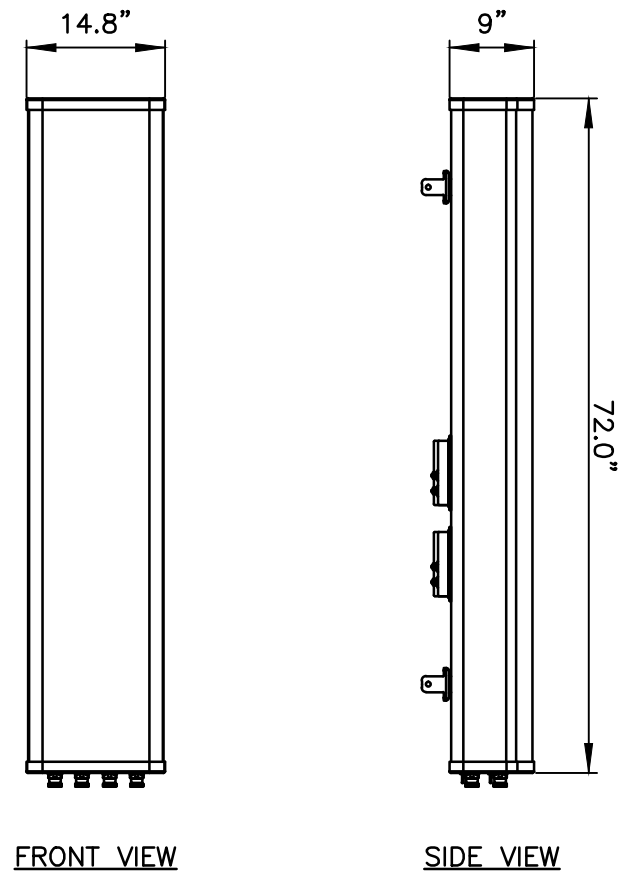
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SCALE: N.T.S.

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AM	DRAWN BY: AM		

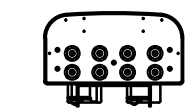


<b>AT&amp;T</b>		
DRAWING TITLE: <b>ANTENNA LAYOUTS &amp; ELEVATIONS</b>		
JOB NUMBER 15156-EMP	DRAWING NUMBER A-3	REV 0



FRONT VIEW

SIDE VIEW

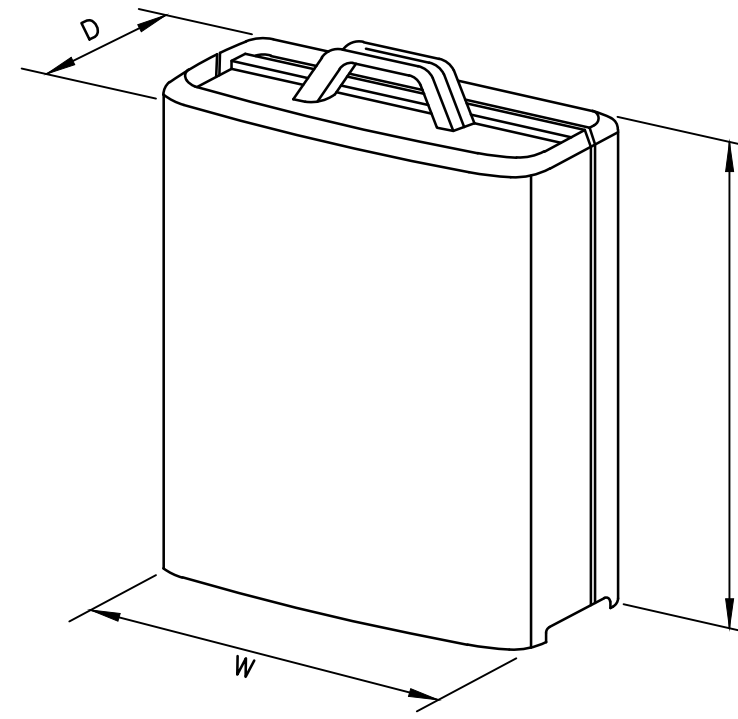


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H6
WEIGHT	50.7 LBS

**LTE ANTENNA DETAIL**

SCALE: N.T.S.



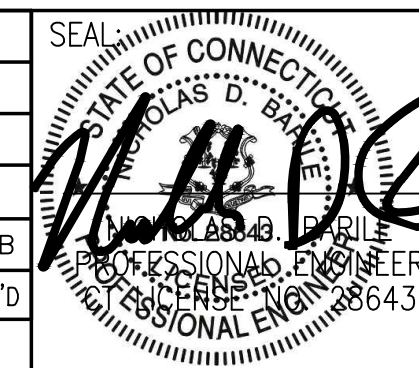
MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

\*DENOTES EXISTING.

**RRUS DETAIL**

SCALE: N.T.S.

0	03/14/16	ISSUED AS FINAL	AM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: AM		DRAWN BY: AM



<b>AT&amp;T</b>		
DRAWING TITLE: <b>DETAILS</b>		
JOB NUMBER 15156-EMP	DRAWING NUMBER A-4	REV 0

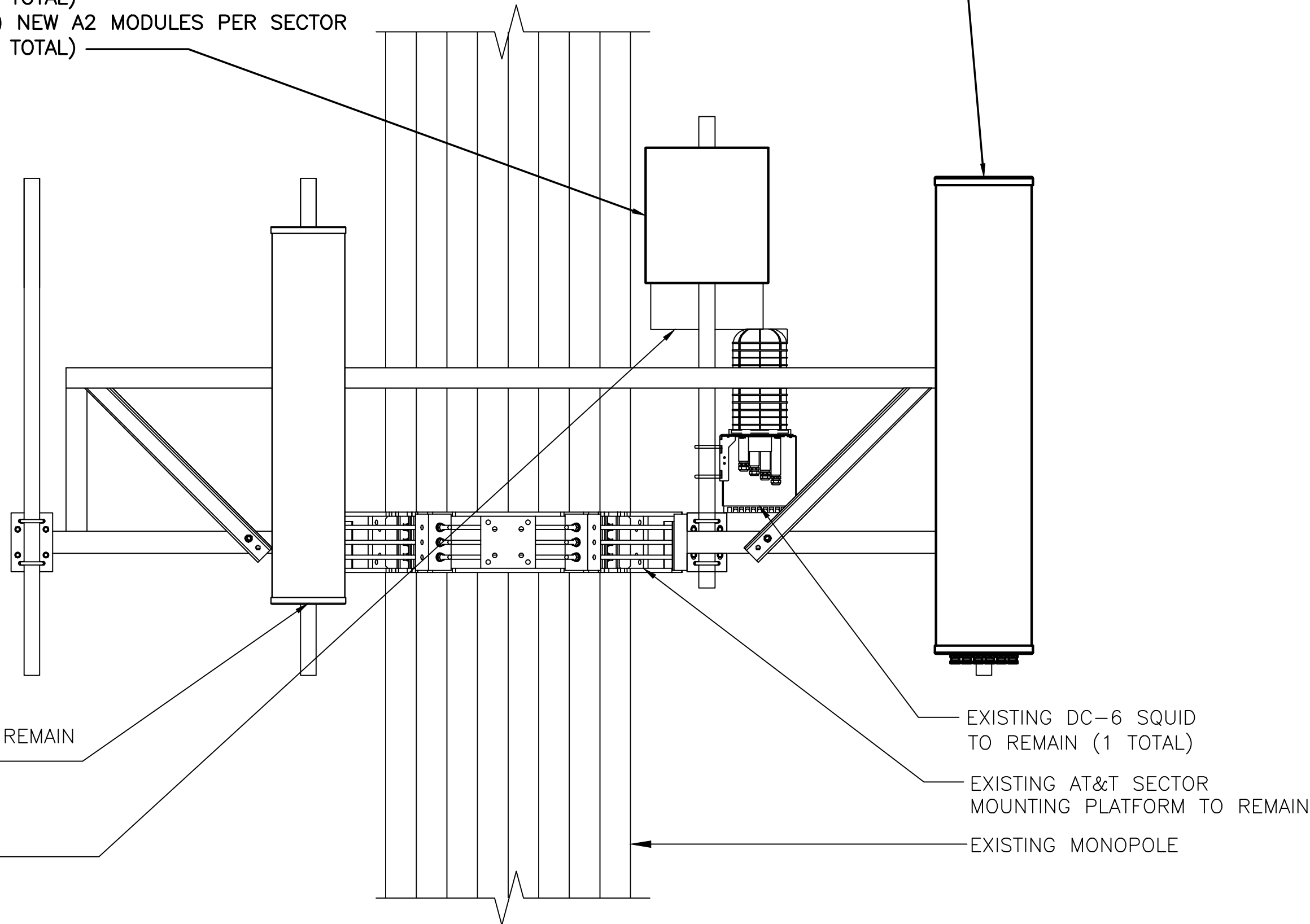


- RRUs MOUNTED BEHIND ANTENNAS ON EXISTING PIPE (BEHIND EXISTING RRUs):
- (1) NEW RRU PER SECTOR (3 TOTAL)
  - (1) EXISTING RRU PER SECTOR (3 TOTAL)
  - (1) NEW A2 MODULES PER SECTOR (3 TOTAL)

PROPOSED AT&T LTE ANTENNA MOUNTED ON EXISTING PIPE (TYP. OF 1 PER SECTOR, 3 TOTAL)

EXISTING UMTS/GSM ANTENNA TO REMAIN (TYP. 1 PER SECTOR, 3 TOTAL)

EXISTING LTE RRU TO REMAIN (TYP. 1 PER SECTOR, 3 TOTAL)



**PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)**

SCALE: N.T.S.

EXISTING MOUNT PIPE, TYP.

PROPOSED AT&T LTE ANTENNA MOUNTED ON EXISTING PIPE (TYP. OF 1 PER SECTOR, 3 TOTAL)

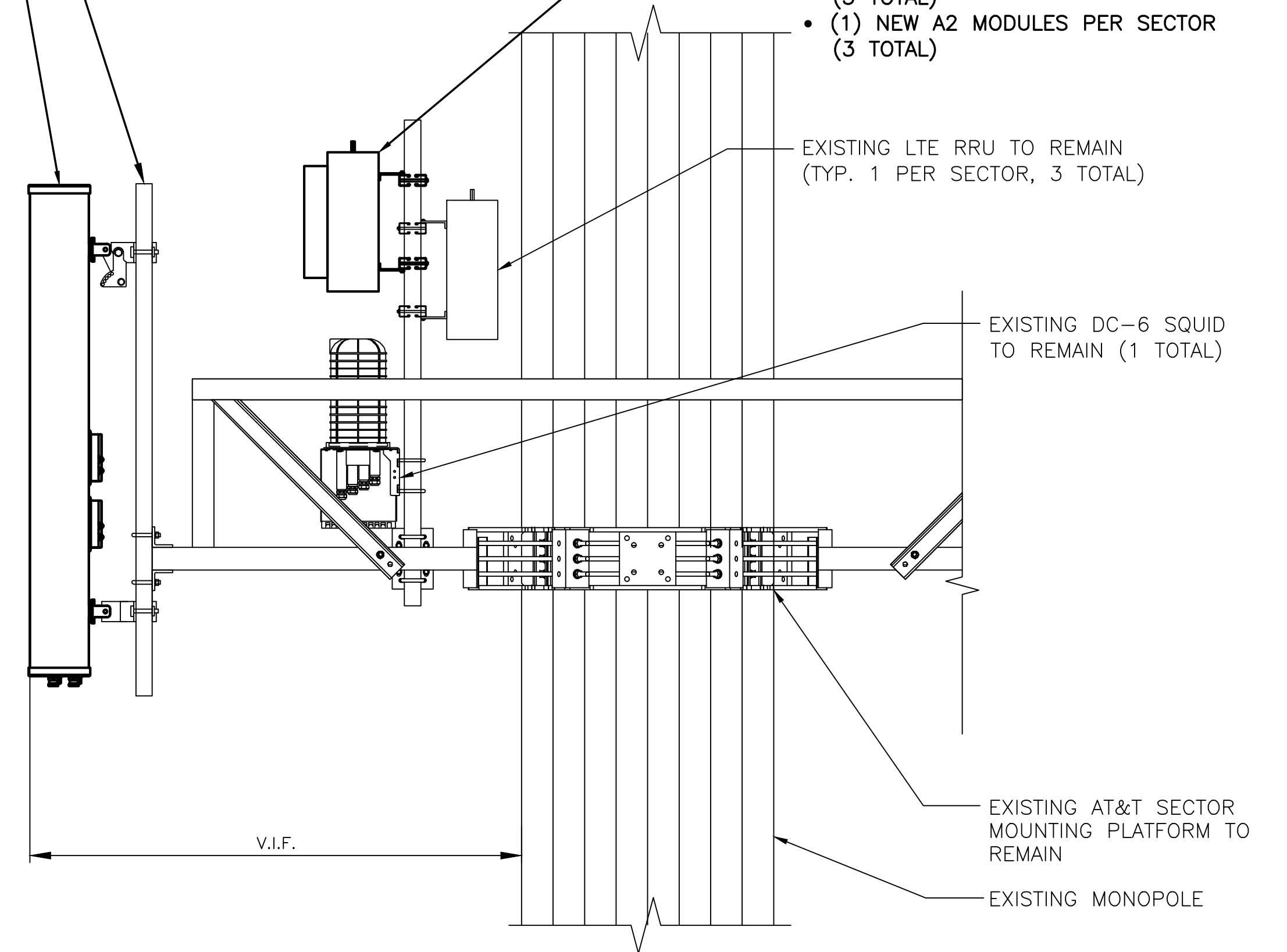
- RRUs MOUNTED BEHIND ANTENNAS ON EXISTING PIPE (BEHIND EXISTING RRUs):
- (1) NEW RRU PER SECTOR (3 TOTAL)
  - (1) EXISTING RRU PER SECTOR (3 TOTAL)
  - (1) NEW A2 MODULES PER SECTOR (3 TOTAL)

EXISTING LTE RRU TO REMAIN (TYP. 1 PER SECTOR, 3 TOTAL)

EXISTING DC-6 SQUID TO REMAIN (1 TOTAL)

EXISTING AT&T SECTOR MOUNTING PLATFORM TO REMAIN

EXISTING MONOPOLE



**PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)**

SCALE: N.T.S.

**EXISTING ANTENNA SCHEDULE**

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A2	-	-	-
	A3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	A4	-	-	-
BETA	B1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B2	-	-	-
	B3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	B4	-	-	-
GAMMA	G1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	G2	-	-	-
	G3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	G4	-	-	-

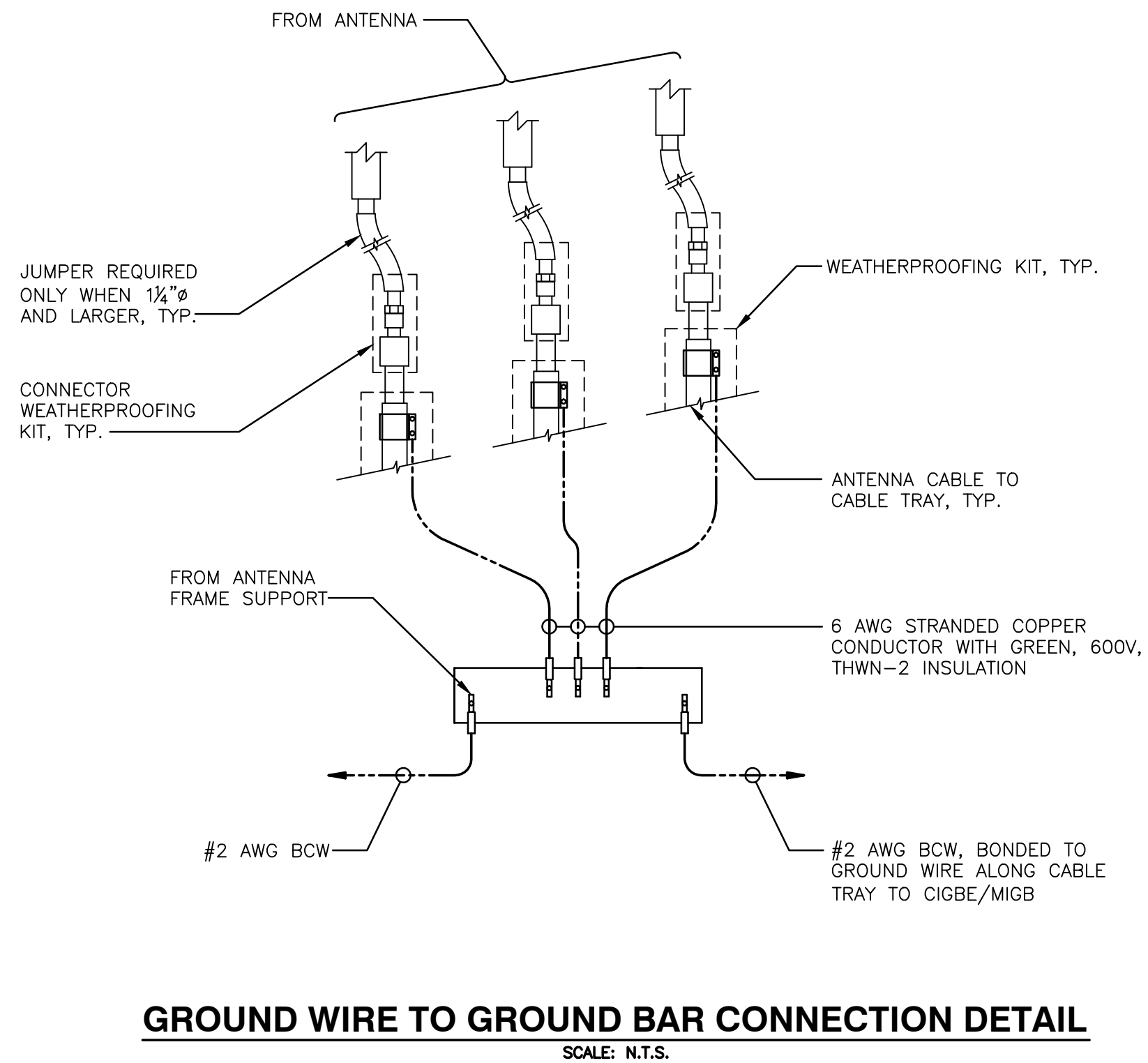
**FINAL ANTENNA SCHEDULE**

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	A2	-	-	-
	A3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	A4	-	-	-
BETA	B1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	B2	-	-	-
	B3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	B4	-	-	-
GAMMA	G1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	G2	-	-	-
	G3	KATHREIN	800 10121@850	54.5"x10.3"x5.9"
	G4	-	-	-

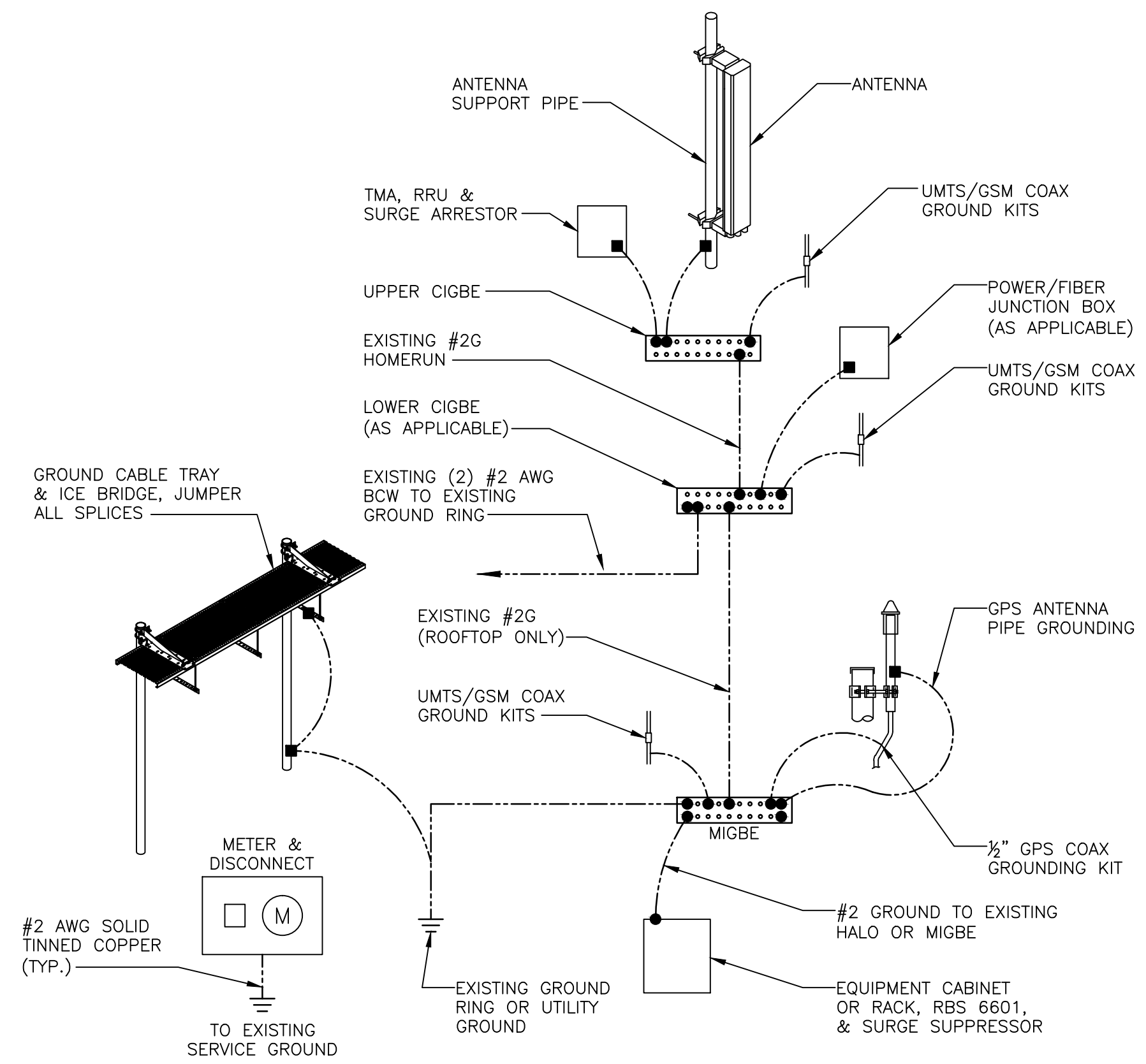
**PROPOSED RRU SCHEDULE**

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

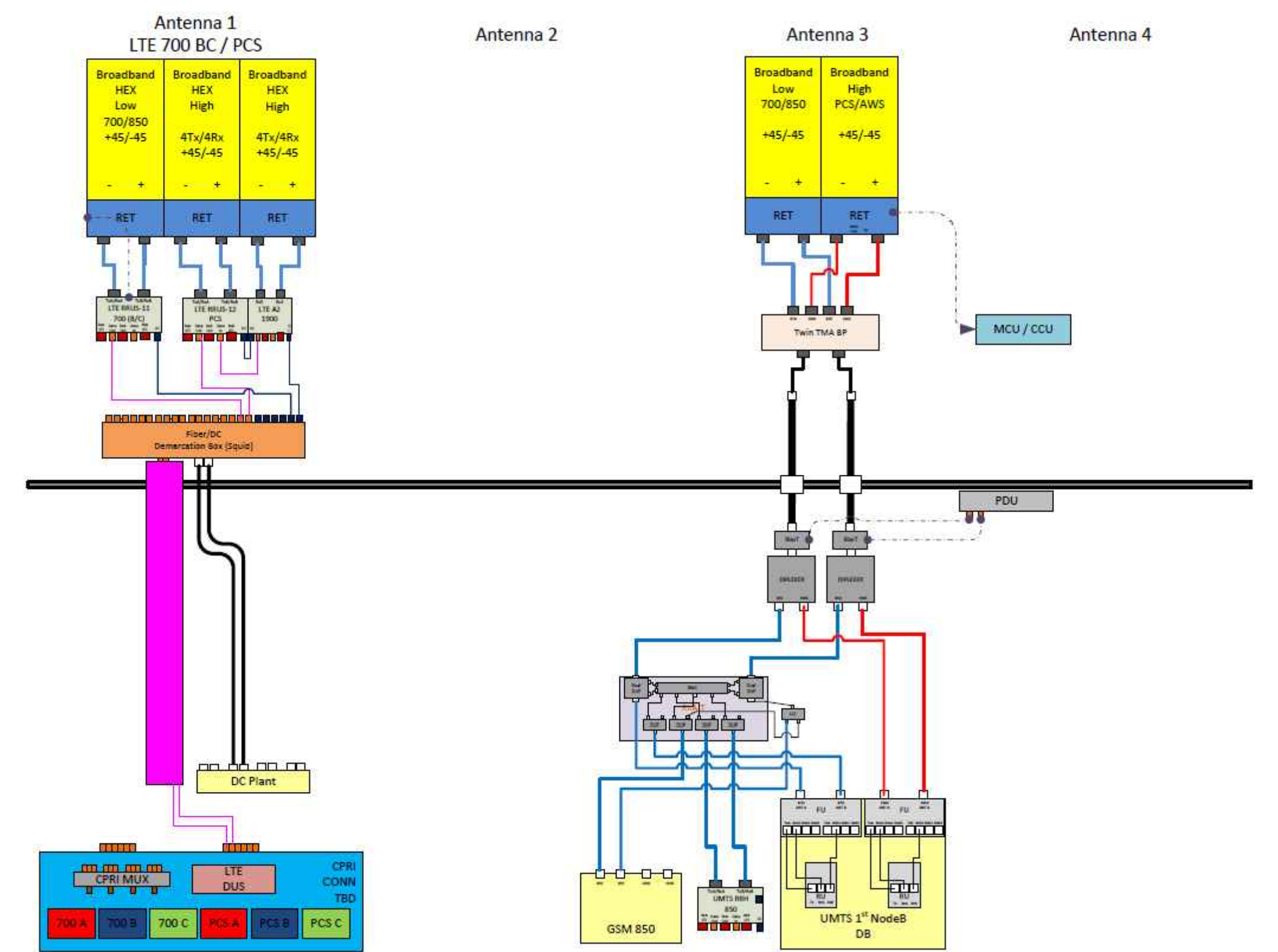
PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.



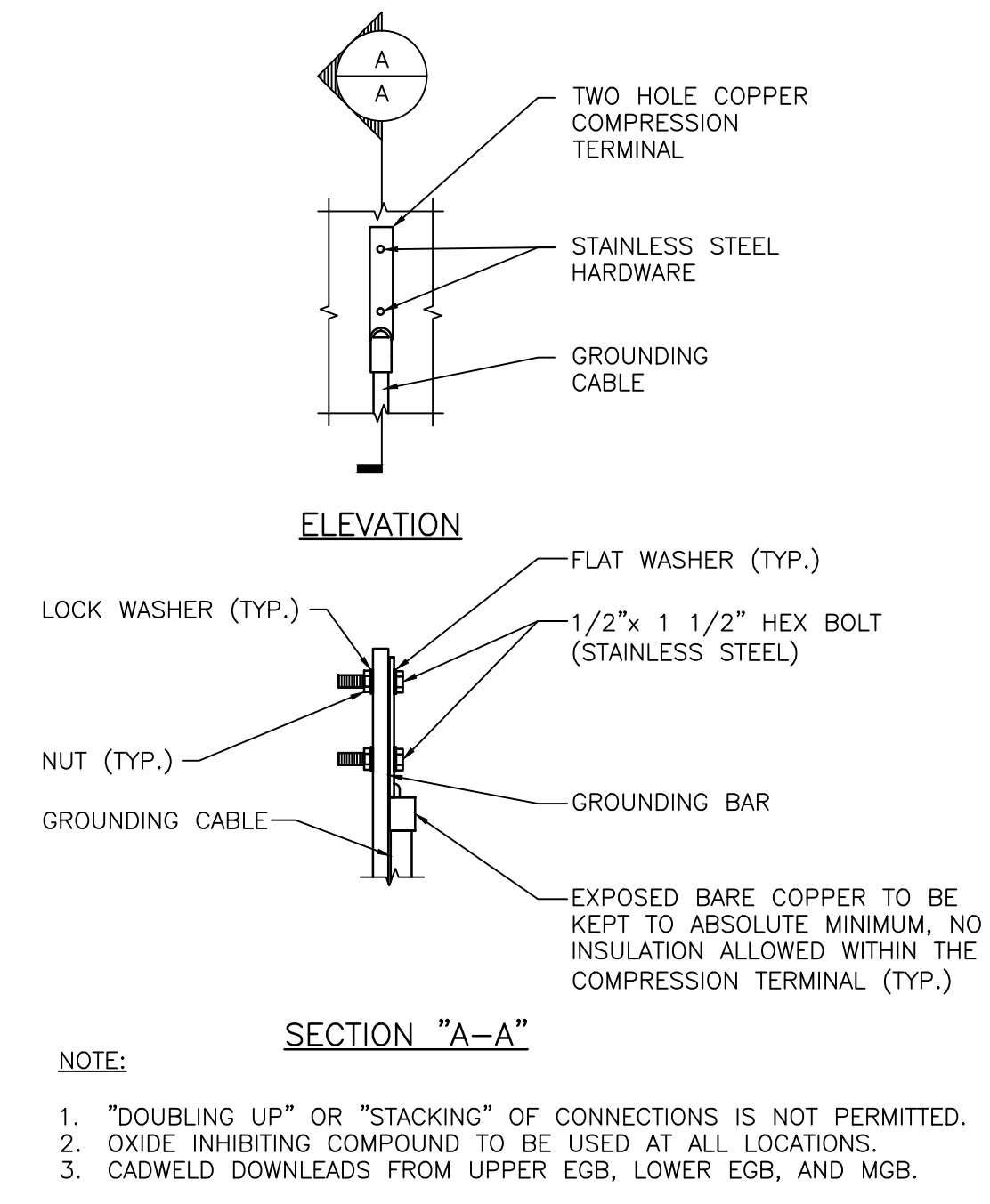
**GROUND WIRE TO GROUND BAR CONNECTION DETAIL**  
SCALE: N.T.S.



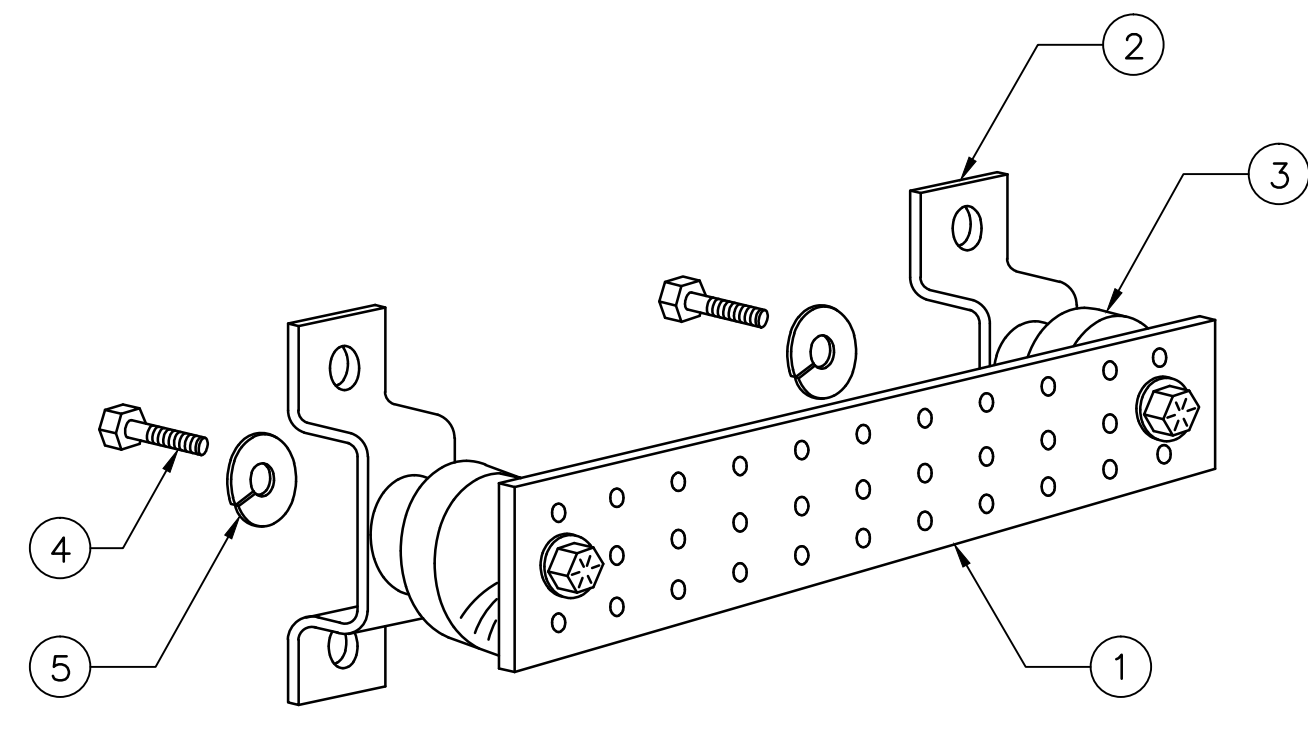
**GROUNDING RISER DIAGRAM**  
SCALE: N.T.S.



**TYPICAL PLUMBING DIAGRAM (PER SECTOR)**  
SCALE: N.T.S.



**TYPICAL GROUND BAR CONNECTION DETAIL**  
SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8"-11x1" H.H.C.S.
5	4	5/8" LOCK WASHER

- NOTES:
- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION
- SECTION "P" - SURGE PRODUCERS**
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
  - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
  - TELCO GROUND BAR
  - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
  - +24V POWER SUPPLY RETURN BAR (#2)
  - -48V POWER SUPPLY RETURN BAR (#2)
  - RECTIFIER FRAMES
- SECTION "A" - SURGE ABSORBERS**
- INTERIOR GROUND RING (#2)
  - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
  - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
  - BUILDING STEEL (IF AVAILABLE) (#2)

**GROUND BAR DETAIL**  
SCALE: N.T.S.

Date: February 04, 2016

Timothy Howell  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277

**JACOBS**<sup>®</sup>  
Jacobs Engineering Group, Inc.  
5449 Bells Ferry Road  
Acworth, GA 30102  
(770) 701-2500

**Subject:** Structural Modification Analysis Report

**Carrier Designation:** AT&T Mobility Co-Locate  
**Carrier Site Number:** CT5431  
**Carrier Site Name:** Shelton NE

**Crown Castle Designation:** **Crown Castle BU Number:** 842873  
**Crown Castle Site Name:** SHELTON NE  
**Crown Castle JDE Job Number:** 358361  
**Crown Castle Work Order Number:** 1182451  
**Crown Castle Application Number:** 323086 Rev. 1

**Engineering Firm Designation:** Jacobs Engineering Group, Inc. **Project Number:** 1182451

**Site Data:** 30 Oliver Terrace, SHELTON, Fairfield County, CT  
Latitude 41° 17' 38.21", Longitude -73° 6' 25.83"  
140 Foot - Monopole Tower

Dear Timothy Howell,

Jacobs Engineering Group, Inc. is pleased to submit this "Structural Modification Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 865518, in accordance with application 323086, revision 1.

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:

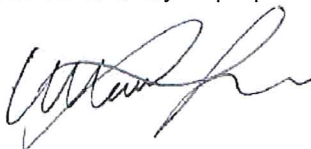
LC4.7: Existing + Reserved + Proposed Equipment w/ Proposed Modifications **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 Connecticut State Building Code based upon a wind speed of 85 mph fastest mile.

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

We at Jacobs Engineering Group, Inc. 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.

Structural analysis prepared by:



Matthew Lee, E.I.  
Tower Structural Engineer

Reviewed by:



Matthew E. Watkins, P.E.  
Engineering Project Manager

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Table 6 - Tower Components vs. Capacity

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### 7) APPENDIX C

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Structural Modification Drawings

## 1) INTRODUCTION

This tower is a 101.58-ft Monopole tower designed by FWT, INC. in January of 2003. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. A 38.42-ft tower extension was added by Paul J. Ford and Company in October of 2004 bringing the overall height to 140-ft. The tower has been modified multiple times in the past to accommodate additional loading. Proposed modifications designed by Jacobs Engineering Group, Inc. in November of 2015 were considered in this analysis.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
95.0	95.0	3	CCI Antennas	HPA-65R-BUU-H6 w/ Mount Pipe	2	5/8	-
		3	Ericsson	RRUS 12	1	3/8	
		3	Ericsson	RRUS A2			

**Table 2 - Existing and Reserved Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
138.0	145.0	1	Andrew	DB636-C	12 1	1-5/8 1-1/4	1
	140.0	3	Amphenol	BXA-80063-6BF-EDIN-4 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		3	Alcatel Lucent	AWS4 (B66) 4x45 RRH			
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		6	Andrew	HBXX-6516DS-A2M w/ Mount Pipe	2	1-5/8	2
	3	CSS	X7C-FRO-660-VR0 w/ Mount Pipe				
	1	RFS Celwave	DB-T1-6Z-8AB-0Z				
138.0	138.0	1	Crown Mounts	Platform Mount [LP 403-1]	-	-	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	3	Commscope	ATBT-BOTTOM-24V	18	1-5/8	1
		3	Commscope	LNx-6515DS-VTM w/ Mount Pipe			
		6	Communication Components Inc.	DTMA-1819-DD-12			
		3	RFS Celwave	APX16DWV-16DWVS-E-A20 w/ Mount Pipe			
		3	RFS Celwave	APX16PV-16PVL w/ Mount Pipe			
		1	Crown Mounts	T-Arm Mount [TA 602-3]			
110.0	110.0	3	Kathrein	800 10504 w/ Mount Pipe	6	1-5/8	3
		3	Kathrein	860 10025			
		1	Crown Mounts	T-Arm Mount [TA 702-3]			
99.0	99.0	3	Ericsson	TME-RRUS-11	1	5/8	3
		3	Ericsson	TME-RRUS-11			
		1	Raycap	DC6-48-60-18-8F	2	7/8	1
		1	Crown Mounts	Side Arm Mount [SO 102-3]			
95.0	95.0	3	Powerwave Technologies	P65-16-XLH-RR w/ Mount Pipe	-	-	3
		3	Powerwave Technologies	7770.00 w/ Mount Pipe	6	7/8	1
		6	Powerwave Technologies	LGP21401			
		1	Crown Mounts	Platform Mount [LP 1001-1]			
73.0	75.0	3	Alcatel Lucent	1900MHz 4X40W RRH	3	1-1/4	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ 2X50W RRH			
		3	RFS Celwave	APXVSP18-C-A20 w/ Mount Pipe			
	73.0	1	Crown Mounts	Platform Mount [LP 1201-1]			
50.0	50.0	1	Pctel	GPS-TMG-HR-26NCM	-	-	1
		1	Crown Mounts	Pipe Mount [PM 601-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Existing Equipment To Be Removed; Not Considered In This Analysis

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
100.0	100.0	6	Allgon	7920.XX Dual Band Antenna	-	-
		2	Generic	4' Diam. Std. Dish		
90.0	90.0	9	Generic	4' x 1' x 3" Panel Antenna	-	-
80.0	80.0	9	Generic	4' x 1' x 3" Panel Antenna	-	-

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	4529442	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Dewberry-Goodkind, Inc.	4598376	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT, Inc.	4598387	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	4858944	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates	5461041	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates	-	Project No. 2010266.16
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	FDH Velocitel	5785413	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Jacobs Engineering Group, Inc.	5963243	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group	5095590	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	5994609	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Jacobs Engineering Group, Inc.	1182451	-

#### 3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The existing base plate grout was not considered in this analysis.
- 5) Modifications per reinforcement drawings prepared by Jacobs Engineering Group (CCI Doc No. 5963243) were considered in this analysis.
- 6) Modifications per reinforcement drawings prepared by Jacobs Engineering Group (Project No. 1182451) must be installed for this analysis to be valid.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 135	Pole	TP14.296x13.161x0.1875	Note 1	Note 1	Note 1	26.2	Pass
L2	135 - 130	Pole	TP15.431x14.296x0.1875	Note 1	Note 1	Note 1	46.4	Pass
L3	130 - 125	Pole	TP16.566x15.431x0.1875	Note 1	Note 1	Note 1	61.7	Pass
L4	125 - 120	Pole	TP17.701x16.566x0.1875	Note 1	Note 1	Note 1	73.4	Pass
L5	120 - 115	Pole	TP18.836x17.701x0.1875	Note 1	Note 1	Note 1	91.1	Pass
L6	115 - 114.75	Pole + Reinf.	TP18.893x18.836x0.4625	Note 1	Note 1	Note 1	54.1	Pass
L7	114.75 - 109.75	Pole + Reinf.	TP20.027x18.893x0.45	Note 1	Note 1	Note 1	64.6	Pass
L8	109.75 - 104.75	Pole + Reinf.	TP21.162x20.027x0.425	Note 1	Note 1	Note 1	73.9	Pass
L9	104.75 - 101.48	Pole	TP21.904x21.162x0.3125	Note 1	Note 1	Note 1	75.2	Pass
L10	101.48 - 101.33	Pole	TP21.938x21.904x0.3125	Note 1	Note 1	Note 1	75.4	Pass
L11	101.33 - 96.33	Pole	TP23.073x21.938x0.3125	Note 1	Note 1	Note 1	80.6	Pass
L12	96.33 - 91.33	Pole	TP24.208x23.073x0.3125	Note 1	Note 1	Note 1	88.5	Pass
L13	91.33 - 91	Pole	TP24.284x24.208x0.3125	Note 1	Note 1	Note 1	89.1	Pass
L14	91 - 90.75	Pole + Reinf.	TP24.34x24.284x0.6	Note 1	Note 1	Note 1	62.3	Pass
L15	90.75 - 85.75	Pole + Reinf.	TP25.475x24.34x0.5875	Note 1	Note 1	Note 1	67.8	Pass
L16	85.75 - 80.75	Pole + Reinf.	TP26.61x25.475x0.5625	Note 1	Note 1	Note 1	73.4	Pass
L17	80.75 - 75.75	Pole + Reinf.	TP27.745x26.61x0.55	Note 1	Note 1	Note 1	78.4	Pass
L18	75.75 - 70.75	Pole + Reinf.	TP28.88x27.745x0.5438	Note 1	Note 1	Note 1	85.2	Pass
L19	70.75 - 69.98	Pole + Reinf.	TP29.055x28.88x0.5313	Note 1	Note 1	Note 1	88.1	Pass
L20	69.98 - 69.73	Pole + Reinf.	TP29.111x29.055x0.5313	Note 1	Note 1	Note 1	88.4	Pass
L21	69.73 - 64.73	Pole + Reinf.	TP30.246x29.111x0.525	Note 1	Note 1	Note 1	93.7	Pass
L22	64.73 - 63	Pole + Reinf.	TP30.64x30.246x0.5188	Note 1	Note 1	Note 1	95.3	Pass
L23	63 - 62.75	Pole + Reinf.	TP30.696x30.64x0.7	Note 1	Note 1	Note 1	73.6	Pass
L24	62.75 - 59.08	Pole + Reinf.	TP31.529x30.696x0.6875	Note 1	Note 1	Note 1	76.5	Pass
L25	59.08 - 58.82	Pole + Reinf.	TP31.589x31.529x0.625	Note 1	Note 1	Note 1	78.4	Pass



Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L26	58.82 - 58.67	Pole + Reinf.	TP31.623x31.589x0.625	Note 1	Note 1	Note 1	78.5	Pass
L27	58.67 - 53.67	Pole + Reinf.	TP32.758x31.623x0.6125	Note 1	Note 1	Note 1	82.0	Pass
L28	53.67 - 53	Pole + Reinf.	TP33.913x32.758x0.6125	Note 1	Note 1	Note 1	82.4	Pass
L29	53 - 47.58	Pole + Reinf.	TP33.515x32.285x0.6375	Note 1	Note 1	Note 1	88.1	Pass
L30	47.58 - 42.58	Pole + Reinf.	TP34.65x33.515x0.625	Note 1	Note 1	Note 1	91.1	Pass
L31	42.58 - 40	Pole + Reinf.	TP35.236x34.65x0.6125	Note 1	Note 1	Note 1	92.5	Pass
L32	40 - 39.75	Pole + Reinf.	TP35.293x35.236x0.8125	Note 1	Note 1	Note 1	71.8	Pass
L33	39.75 - 34.75	Pole + Reinf.	TP36.428x35.293x0.7875	Note 1	Note 1	Note 1	74.1	Pass
L34	34.75 - 31.42	Pole + Reinf.	TP37.185x36.428x0.775	Note 1	Note 1	Note 1	75.5	Pass
L35	31.42 - 31.17	Pole + Reinf.	TP37.242x37.185x0.775	Note 1	Note 1	Note 1	75.6	Pass
L36	31.17 - 29	Pole + Reinf.	TP37.733x37.242x0.7625	Note 1	Note 1	Note 1	76.5	Pass
L37	29 - 28.75	Pole + Reinf.	TP37.79x37.733x0.675	Note 1	Note 1	Note 1	91.1	Pass
L38	28.75 - 23.75	Pole + Reinf.	TP38.925x37.79x0.6625	Note 1	Note 1	Note 1	93.1	Pass
L39	23.75 - 23.5	Pole + Reinf.	TP38.982x38.925x0.6625	Note 1	Note 1	Note 1	93.2	Pass
L40	23.5 - 23.25	Pole + Reinf.	TP39.039x38.982x0.65	Note 1	Note 1	Note 1	92.5	Pass
L41	23.25 - 18.25	Pole + Reinf.	TP40.174x39.039x0.6375	Note 1	Note 1	Note 1	94.3	Pass
L42	18.25 - 13.25	Pole + Reinf.	TP41.309x40.174x0.625	Note 1	Note 1	Note 1	96.0	Pass
L43	13.25 - 8.25	Pole + Reinf.	TP42.444x41.309x0.6125	Note 1	Note 1	Note 1	97.6	Pass
L44	8.25 - 5.25	Pole + Reinf.	TP43.125x42.444x0.6125	Note 1	Note 1	Note 1	98.4	Pass
L45	5.25 - 5	Pole + Reinf.	TP43.182x43.125x0.6875	Note 1	Note 1	Note 1	83.5	Pass
L46	5 - 0	Pole + Reinf.	TP44.317x43.182x0.6875	Note 1	Note 1	Note 1	84.9	Pass
							Summary	
						Pole	91.1	Pass
						Reinforcement	98.4	Pass
						<b>Overall</b>	<b>98.4</b>	<b>Pass</b>

**Table 6 - Tower Component Stresses vs. Capacity - LC4.7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	101.58	91.3	Pass
1	Flange Plate		69.1	Pass
1	Anchor Rods	0	88.0	Pass
1	Base Plate	0	81.9	Pass
1	Base Foundation Structural	0	74.9	Pass
1	Base Foundation Soil Interaction	0	68.3	Pass

<b>Structure Rating (max from all components) =</b>	<b>98.4%</b>
---	--------------

Notes:

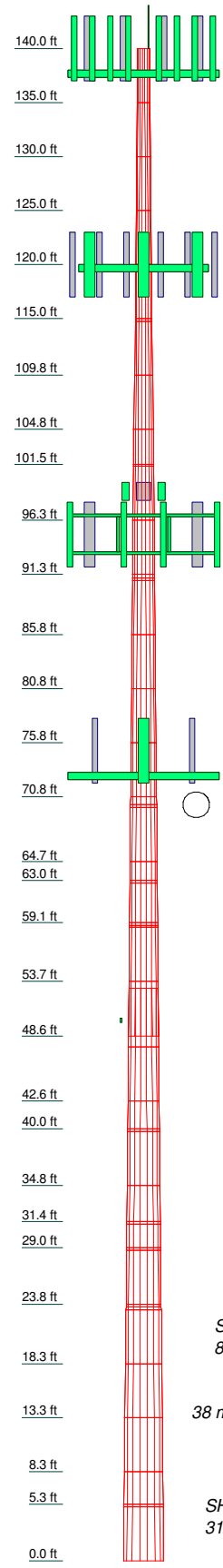
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

#### **4.1) Recommendations**

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.0000	18	0.1875	4.4200	140.0	135.0	A572-65	0.1
2	5.0000	18	0.1875	4.4200	135.0	130.0	A572-65	0.1
3	5.0000	18	0.1875	4.4200	130.0	125.0	A572-65	0.2
4	5.0000	18	0.1875	4.4200	125.0	120.0	A572-65	0.2
5	5.0000	18	0.1875	4.4200	120.0	115.0	A572-65	0.2
6	5.0000	18	0.1875	4.4200	115.0	109.8	A572-65	0.4
7	5.0000	18	0.1875	4.4200	109.8	104.8	A572-65	0.4
8	5.0000	18	0.1875	4.4200	104.8	101.5	A572-65	0.4
9	5.0000	18	0.1875	4.4200	101.5	96.3	A572-65	0.4
10	5.0000	18	0.1875	4.4200	96.3	91.3	A572-65	0.4
11	5.0000	18	0.1875	4.4200	91.3	85.8	A572-65	0.7
12	5.0000	18	0.1875	4.4200	85.8	80.8	A572-65	0.7
13	5.0000	18	0.1875	4.4200	80.8	75.8	A572-65	0.8
14	5.0000	18	0.1875	4.4200	75.8	70.8	A572-65	0.8
15	5.0000	18	0.1875	4.4200	70.8	64.7	A572-65	0.8
16	5.0000	18	0.1875	4.4200	64.7	63.0	A572-65	0.8
17	5.0000	18	0.1875	4.4200	63.0	59.1	A572-65	1.0
18	5.0000	18	0.1875	4.4200	59.1	53.7	A572-65	1.0
19	5.0000	18	0.1875	4.4200	53.7	48.6	A572-65	1.1
20	5.0000	18	0.1875	4.4200	48.6	42.6	A572-65	1.1
21	5.0000	18	0.1875	4.4200	42.6	40.0	A572-65	1.1
22	5.0000	18	0.1875	4.4200	40.0	34.8	A572-65	1.4
23	5.0000	18	0.1875	4.4200	34.8	31.4	A572-65	1.4
24	5.0000	18	0.1875	4.4200	31.4	29.0	A572-65	1.3
25	5.0000	18	0.1875	4.4200	29.0	23.8	A572-65	1.3
26	5.0000	18	0.1875	4.4200	23.8	18.3	A572-65	1.5
27	5.0000	18	0.1875	4.4200	18.3	13.3	A572-65	1.5
28	5.0000	18	0.1875	4.4200	13.3	8.3	A572-65	1.5
29	5.0000	18	0.1875	4.4200	8.3	5.3	A572-65	1.4
30	5.0000	18	0.1875	4.4200	5.3	0.0	A572-65	1.4



### DESIGNED APPURTENANCE LOADING

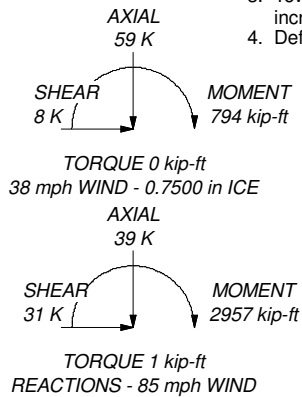
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	140	TME-RRUS-11	99
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	138	DC6-48-60-18-8F	99
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	138	Side Arm Mount [SO 102-3]	99
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	138	6' x 2" Mount Pipe	99
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	138	6' x 2" Mount Pipe	99
DB636-C	138	7770.00 w/ Mount Pipe	95
DB-T1-6Z-8AB-0Z	138	7770.00 w/ Mount Pipe	95
AWS4 (B66) 4x45 RRH	138	(2) LGP21401	95
AWS4 (B66) 4x45 RRH	138	(2) LGP21401	95
AWS4 (B66) 4x45 RRH	138	(2) LGP21401	95
RRH2x60-700	138	HPA-65R-BUU-H6 w/ Mount Pipe	95
RRH2x60-700	138	HPA-65R-BUU-H6 w/ Mount Pipe	95
RRH2x60-700	138	HPA-65R-BUU-H6 w/ Mount Pipe	95
RRH2x60-PCS	138	RRUS 12	95
RRH2x60-PCS	138	RRUS 12	95
RRH2x60-PCS	138	RRUS 12	95
(2) HBXX-6516DS-A2M w/ Mount Pipe	138	RRUS A2	95
(2) HBXX-6516DS-A2M w/ Mount Pipe	138	RRUS A2	95
(2) HBXX-6516DS-A2M w/ Mount Pipe	138	RRUS A2	95
X7C-FRO-660-VR0 w/ Mount Pipe	138	Platform Mount [LP 1001-1]	95
X7C-FRO-660-VR0 w/ Mount Pipe	138	(2) 6' x 2" Mount Pipe	95
X7C-FRO-660-VR0 w/ Mount Pipe	138	(2) 6' x 2" Mount Pipe	95
DB-T1-6Z-8AB-0Z	138	(2) 6' x 2" Mount Pipe	95
Platform Mount [LP 403-1]	138	1900MHz 4X40W RRH	73
(2) DTMA-1819-DD-12	120	1900MHz 4X40W RRH	73
(2) DTMA-1819-DD-12	120	1900MHz 4X40W RRH	73
(2) DTMA-1819-DD-12	120	800 EXTERNAL NOTCH FILTER	73
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	120	800 EXTERNAL NOTCH FILTER	73
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	120	800MHz 2X50W RRH	73
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	120	800MHz 2X50W RRH	73
APX16PV-16PVL w/ Mount Pipe	120	800MHz 2X50W RRH	73
APX16PV-16PVL w/ Mount Pipe	120	APXVSP18-C-A20 w/ Mount Pipe	73
APX16PV-16PVL w/ Mount Pipe	120	APXVSP18-C-A20 w/ Mount Pipe	73
ATBT-BOTTOM-24V	120	Platform Mount [LP 1201-1]	73
ATBT-BOTTOM-24V	120	(2) 6' x 2" Mount Pipe	73
ATBT-BOTTOM-24V	120	(2) 6' x 2" Mount Pipe	73
ATBT-BOTTOM-24V	120	(2) 6' x 2" Mount Pipe	73
LNX-6515DS-VTM w/ Mount Pipe	120	10' x 3" Pipe Mount	73
LNX-6515DS-VTM w/ Mount Pipe	120	10' x 3" Pipe Mount	73
LNX-6515DS-VTM w/ Mount Pipe	120	T-Arm Mount [TA 602-3]	73
T-Arm Mount [TA 602-3]	120	TME-RRUS-11	50
TME-RRUS-11	99	TME-RRUS-11	50
TME-RRUS-11	99	Pipe Mount [PM 601-1]	50

### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.7500 in ICE increase in thickness with height.
4. Deflections are based upon a 50 mph wind.



### Jacobs Engineering Group, Inc.



5449 Bells Ferry Road  
Acworth, GA 30102  
Phone: (770) 701-2500  
FAX: (770) 701-2501

Job: **140-ft Monopole - SHELTON NE**

Project: **BUB42873\_WO1182451**

Client: Crown Castle      Drawn by: LeeMH      App'd:

Code: TIA/EIA-222-F      Date: 02/04/16      Scale: NTS

Path: T:\942873\_SHELTON\_NE\WO1182451\Analysis\LC4\_7\Models\Mod5\CCpole\CCpole.er

Dwg No. E-1

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	1 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

## Options

<ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>√ Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>Add IBC .6D+W Combination</li> </ul>	<ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>√ Autocalc Torque Arm Areas</li> <li>SR Members Have Cut Ends</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Use TIA-222-G Tension Splice Capacity</li> <li>Exemption</li> </ul>	<ul style="list-style-type: none"> <li>Treat Feedline Bundles As Cylinder</li> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feedline Torque</li> <li>Include Angle Block Shear Check</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul>
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## Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	140.0000-135.000	5.0000	0.00	18	13.1610	14.2960	0.1875	0.7500	A572-65 (65 ksi)
L2	135.0000-130.000	5.0000	0.00	18	14.2960	15.4309	0.1875	0.7500	A572-65 (65 ksi)
L3	130.0000-125.000	5.0000	0.00	18	15.4309	16.5659	0.1875	0.7500	A572-65 (65 ksi)
L4	125.0000-120.000	5.0000	0.00	18	16.5659	17.7008	0.1875	0.7500	A572-65 (65 ksi)
L5	120.0000-115.000	5.0000	0.00	18	17.7008	18.8358	0.1875	0.7500	A572-65

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	2 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	115.0000-114.7000	0.2500	0.00	18	18.8358	18.8925	0.4625	1.8500	(65 ksi) A572-65
L7	114.7500-109.7500	5.0000	0.00	18	18.8925	20.0275	0.4500	1.8000	(65 ksi) A572-65
L8	109.7500-104.7500	5.0000	0.00	18	20.0275	21.1624	0.4250	1.7000	(65 ksi) A572-65
L9	104.7500-101.4830	3.2670	0.00	18	21.1624	21.9040	0.3125	1.2500	(65 ksi) A572-65
L10	101.4830-101.3330	0.1500	0.00	18	21.9040	21.9381	0.3125	1.2500	(65 ksi) A572-65
L11	101.3330-96.3300	5.0000	0.00	18	21.9381	23.0731	0.3125	1.2500	(65 ksi) A572-65
L12	96.3330-91.3330	5.0000	0.00	18	23.0731	24.2081	0.3125	1.2500	(65 ksi) A572-65
L13	91.3330-91.0000	0.3330	0.00	18	24.2081	24.2837	0.3125	1.2500	(65 ksi) A572-65
L14	91.0000-90.7500	0.2500	0.00	18	24.2837	24.3404	0.6000	2.4000	(65 ksi) A572-65
L15	90.7500-85.7500	5.0000	0.00	18	24.3404	25.4754	0.5875	2.3500	(65 ksi) A572-65
L16	85.7500-80.7500	5.0000	0.00	18	25.4754	26.6104	0.5625	2.2500	(65 ksi) A572-65
L17	80.7500-75.7500	5.0000	0.00	18	26.6104	27.7454	0.5500	2.2000	(65 ksi) A572-65
L18	75.7500-70.7500	5.0000	0.00	18	27.7454	28.8804	0.5437	2.1750	(65 ksi) A572-65
L19	70.7500-69.9830	0.7670	0.00	18	28.8804	29.0545	0.5313	2.1250	(65 ksi) A572-65
L20	69.9830-69.7330	0.2500	0.00	18	29.0545	29.1113	0.5313	2.1250	(65 ksi) A572-65
L21	69.7330-64.7330	5.0000	0.00	18	29.1113	30.2463	0.5250	2.1000	(65 ksi) A572-65
L22	64.7330-63.0000	1.7330	0.00	18	30.2463	30.6397	0.5188	2.0750	(65 ksi) A572-65
L23	63.0000-62.7500	0.2500	0.00	18	30.6397	30.6964	0.7000	2.8000	(65 ksi) A572-65
L24	62.7500-59.0830	3.6670	0.00	18	30.6964	31.5288	0.6875	2.7500	(65 ksi) A572-65
L25	59.0830-58.8170	0.2660	0.00	18	31.5288	31.5892	0.6250	2.5000	(65 ksi) A572-65
L26	58.8170-58.6670	0.1500	0.00	18	31.5892	31.6233	0.6250	2.5000	(65 ksi) A572-65
L27	58.6670-53.6670	5.0000	0.00	18	31.6233	32.7583	0.6125	2.4500	(65 ksi) A572-65
L28	53.6670-48.5800	5.0870	4.42	18	32.7583	33.9130	0.6125	2.4500	(65 ksi) A572-65
L29	48.5800-47.5800	5.4200	0.00	18	32.2847	33.5151	0.6375	2.5500	(65 ksi) A572-65
L30	47.5800-42.5800	5.0000	0.00	18	33.5151	34.6503	0.6250	2.5000	(65 ksi) A572-65
L31	42.5800-40.0000	2.5800	0.00	18	34.6503	35.2360	0.6125	2.4500	(65 ksi) A572-65
L32	40.0000-39.7500	0.2500	0.00	18	35.2360	35.2927	0.8125	3.2500	(65 ksi) A572-65
L33	39.7500-34.7500	5.0000	0.00	18	35.2927	36.4279	0.7875	3.1500	(65 ksi) A572-65
L34	34.7500-31.4160	3.3340	0.00	18	36.4279	37.1848	0.7750	3.1000	(65 ksi) A572-65
L35	31.4160-31.1660	0.2500	0.00	18	37.1848	37.2415	0.7750	3.1000	(65 ksi) A572-65

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	3 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L36	31.1660-29.0000	2.1660	0.00	18	37.2415	37.7333	0.7625	3.0500	A572-65 (65 ksi)
L37	29.0000-28.7500	0.2500	0.00	18	37.7333	37.7900	0.6750	2.7000	A572-65 (65 ksi)
L38	28.7500-23.7500	5.0000	0.00	18	37.7900	38.9251	0.6625	2.6500	A572-65 (65 ksi)
L39	23.7500-23.5000	0.2500	0.00	18	38.9251	38.9819	0.6625	2.6500	A572-65 (65 ksi)
L40	23.5000-23.2500	0.2500	0.00	18	38.9819	39.0387	0.6500	2.6000	A572-65 (65 ksi)
L41	23.2500-18.2500	5.0000	0.00	18	39.0387	40.1738	0.6375	2.5500	A572-65 (65 ksi)
L42	18.2500-13.2500	5.0000	0.00	18	40.1738	41.3089	0.6250	2.5000	A572-65 (65 ksi)
L43	13.2500-8.2500	5.0000	0.00	18	41.3089	42.4440	0.6125	2.4500	A572-65 (65 ksi)
L44	8.2500-5.2500	3.0000	0.00	18	42.4440	43.1251	0.6125	2.4500	A572-65 (65 ksi)
L45	5.2500-5.0000	0.2500	0.00	18	43.1251	43.1819	0.6875	2.7500	A572-65 (65 ksi)
L46	5.0000-0.0000	5.0000		18	43.1819	44.3170	0.6875	2.7500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	13.3640	7.7209	164.1788	4.6056	6.6858	24.5564	328.5737	3.8612	1.9863	10.594
L1	14.5165	8.3963	211.1466	5.0085	7.2623	29.0742	422.5710	4.1989	2.1861	11.659
L2	14.5165	8.3963	211.1466	5.0085	7.2623	29.0742	422.5710	4.1989	2.1861	11.659
L2	15.6690	9.0717	266.3129	5.4114	7.8389	33.9732	532.9762	4.5367	2.3858	12.724
L3	15.6690	9.0717	266.3129	5.4114	7.8389	33.9732	532.9762	4.5367	2.3858	12.724
L3	16.8214	9.7472	330.3372	5.8143	8.4155	39.2536	661.1090	4.8745	2.5856	13.79
L4	16.8214	9.7472	330.3372	5.8143	8.4155	39.2536	661.1090	4.8745	2.5856	13.79
L4	17.9739	10.4226	403.8790	6.2172	8.9920	44.9153	808.2895	5.2123	2.7853	14.855
L5	17.9739	10.4226	403.8790	6.2172	8.9920	44.9153	808.2895	5.2123	2.7853	14.855
L5	19.1264	11.0981	487.5980	6.6201	9.5686	50.9583	975.8376	5.5501	2.9851	15.921
L6	19.1264	26.9715	1150.3132	6.5225	9.5686	120.2178	2302.1400	13.4883	2.5011	5.408
L6	19.1840	27.0548	1161.0047	6.5427	9.5974	120.9707	2323.5372	13.5300	2.5111	5.429
L7	19.1840	26.3415	1131.9263	6.5471	9.5974	117.9409	2265.3420	13.1732	2.5331	5.629
L7	20.3364	27.9625	1354.0273	6.9500	10.1740	133.0875	2709.8362	13.9839	2.7328	6.073
L8	20.3364	26.4428	1283.7088	6.9589	10.1740	126.1759	2569.1067	13.2239	2.7768	6.534
L8	21.4889	27.9738	1519.8426	7.3618	10.7505	141.3739	3041.6850	13.9895	2.9766	7.004
L9	21.4889	20.6805	1135.8133	7.4017	10.7505	105.6521	2273.1211	10.3422	3.1746	10.159
L9	22.2419	21.4161	1261.3743	7.6650	11.1272	113.3591	2524.4084	10.7101	3.3051	10.576
L10	22.2419	21.4161	1261.3743	7.6650	11.1272	113.3591	2524.4084	10.7101	3.3051	10.576
L10	22.2765	21.4499	1267.3513	7.6771	11.1445	113.7195	2536.3703	10.7270	3.3111	10.596
L11	22.2765	21.4499	1267.3513	7.6771	11.1445	113.7195	2536.3703	10.7270	3.3111	10.596
L11	23.4290	22.5756	1477.5553	8.0800	11.7211	126.0592	2957.0548	11.2900	3.5109	11.235
L12	23.4290	22.5756	1477.5553	8.0800	11.7211	126.0592	2957.0548	11.2900	3.5109	11.235
L12	24.5815	23.7014	1709.8048	8.4829	12.2977	139.0345	3421.8593	11.8530	3.7106	11.874
L13	24.5815	23.7014	1709.8048	8.4829	12.2977	139.0345	3421.8593	11.8530	3.7106	11.874
L13	24.6583	23.7764	1726.0825	8.5098	12.3361	139.9213	3454.4362	11.8905	3.7239	11.917
L14	24.6583	45.1032	3196.2598	8.4077	12.3361	259.0981	6396.7254	22.5559	3.2179	5.363
L14	24.7159	45.2112	3219.2912	8.4278	12.3649	260.3566	6442.8185	22.6099	3.2279	5.38
L15	24.7159	44.2926	3157.2045	8.4323	12.3649	255.3354	6318.5633	22.1505	3.2499	5.532

<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	4 of 45
<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	Iu/Q in <sup>2</sup>	w in	w/t
	25.8684	46.4091	3631.7632	8.8352	12.9415	280.6291	7268.3052	23.2090	3.4497	5.872
L16	25.8684	44.4789	3487.7093	8.8441	12.9415	269.4979	6980.0078	22.2437	3.4937	6.211
	27.0209	46.5053	3986.4429	9.2470	13.5181	294.8969	7978.1313	23.2571	3.6934	6.566
L17	27.0209	45.4937	3903.4695	9.2514	13.5181	288.7590	7812.0754	22.7512	3.7154	6.755
	28.1734	47.4750	4436.0241	9.6544	14.0947	314.7306	8877.8852	23.7420	3.9152	7.119
L18	28.1734	46.9463	4388.6391	9.6566	14.0947	311.3687	8783.0529	23.4776	3.9262	7.221
	29.3259	48.9052	4961.2330	10.0595	14.6712	338.1602	9928.9940	24.4572	4.1260	7.588
L19	29.3259	47.8020	4853.5991	10.0640	14.6712	330.8239	9713.5847	23.9055	4.1480	7.808
	29.5027	48.0956	4943.5759	10.1258	14.7597	334.9375	9893.6567	24.0524	4.1786	7.866
L20	29.5027	48.0956	4943.5759	10.1258	14.7597	334.9375	9893.6567	24.0524	4.1786	7.866
	29.5604	48.1913	4973.1419	10.1459	14.7885	336.2838	9952.8277	24.1002	4.1886	7.884
L21	29.5604	47.6347	4917.8594	10.1481	14.7885	332.5456	9842.1898	23.8219	4.1996	7.999
	30.7129	49.5260	5527.2069	10.5511	15.3651	359.7247	11061.6866	24.7677	4.3993	8.38
L22	30.7129	48.9467	5464.8529	10.5533	15.3651	355.6665	10936.8966	24.4780	4.4103	8.502
	31.1123	49.5945	5684.6895	10.6929	15.5649	365.2238	11376.8590	24.8019	4.4796	8.635
L23	31.1123	66.5199	7533.2608	10.6286	15.5649	483.9888	15076.4341	33.2663	4.1606	5.944
	31.1700	66.6460	7576.1795	10.6487	15.5938	485.8464	15162.3279	33.3293	4.1706	5.958
L24	31.1700	65.4832	7450.1967	10.6532	15.5938	477.7673	14910.1965	32.7478	4.1926	6.098
	32.0152	67.2996	8087.5300	10.9487	16.0166	504.9455	16185.7018	33.6562	4.3391	6.311
L25	32.0152	61.3055	7397.0890	10.9709	16.0166	461.8378	14803.9113	30.6586	4.4491	7.119
	32.0765	61.4252	7440.5326	10.9923	16.0473	463.6622	14890.8556	30.7185	4.4597	7.136
L26	32.0765	61.4252	7440.5326	10.9923	16.0473	463.6622	14890.8556	30.7185	4.4597	7.136
	32.1111	61.4928	7465.1057	11.0044	16.0646	464.6926	14940.0342	30.7522	4.4657	7.145
L27	32.1111	60.2872	7324.6574	11.0088	16.0646	455.9499	14658.9528	30.1493	4.4877	7.327
	33.2636	62.4938	8158.7043	11.4117	16.6412	490.2716	16328.1441	31.2528	4.6875	7.653
L28	33.2636	62.4938	8158.7043	11.4117	16.6412	490.2716	16328.1441	31.2528	4.6875	7.653
	34.4362	64.7387	9069.9048	11.8217	17.2278	526.4690	18151.7440	32.3755	4.8907	7.985
L29	33.8016	64.0357	8102.6819	11.2347	16.4006	494.0477	16216.0255	32.0239	4.5601	7.153
	34.0322	66.5254	9085.0297	11.6716	17.0257	533.6071	18182.0137	33.2690	4.7767	7.493
L30	34.0322	65.2458	8917.0549	11.6760	17.0257	523.7412	17845.8430	32.6291	4.7987	7.678
	35.1848	67.4976	9872.5395	12.0790	17.6023	560.8654	19758.0695	33.7552	4.9984	7.998
L31	35.1848	66.1720	9685.7557	12.0834	17.6023	550.2541	19384.2563	33.0923	5.0204	8.197
	35.7796	67.3107	10194.4299	12.2913	17.8999	569.5250	20402.2738	33.6617	5.1235	8.365
L32	35.7796	88.7739	13290.2267	12.2203	17.8999	742.4756	26597.9410	44.3954	4.7715	5.873
	35.8372	88.9202	13356.0726	12.2405	17.9287	744.9543	26729.7195	44.4686	4.7815	5.885
L33	35.8372	86.2467	12973.2946	12.2494	17.9287	723.6043	25963.6599	43.1316	4.8255	6.128
	36.9898	89.0840	14296.2324	12.6523	18.5054	772.5455	28611.2761	44.5505	5.0253	6.381
L34	36.9898	87.7007	14084.1167	12.6568	18.5054	761.0831	28186.7656	43.8587	5.0473	6.513
	37.7584	89.5626	15000.3024	12.9255	18.8899	794.0926	30020.3426	44.7898	5.1805	6.685
L35	37.7584	89.5626	15000.3024	12.9255	18.8899	794.0926	30020.3426	44.7898	5.1805	6.685
	37.8160	89.7022	15070.5602	12.9456	18.9187	796.5961	30160.9506	44.8596	5.1905	6.697
L36	37.8160	88.2856	14842.7395	12.9501	18.9187	784.5540	29705.0095	44.1512	5.2125	6.836
	38.3154	89.4757	15451.1068	13.1246	19.1685	806.0676	30922.5446	44.7464	5.2991	6.95
L37	38.3154	79.3955	13775.3758	13.1557	19.1685	718.6465	27568.8776	39.7053	5.4531	8.079
	38.3730	79.5171	13838.7655	13.1758	19.1973	720.8692	27695.7405	39.7661	5.4630	8.093
L38	38.3730	78.0708	13596.2201	13.1803	19.1973	708.2349	27210.3305	39.0428	5.4850	8.279
	39.5256	80.4577	14881.7970	13.5832	19.7740	752.5951	29783.1758	40.2365	5.6848	8.581
L39	39.5256	80.4577	14881.7970	13.5832	19.7740	752.5951	29783.1758	40.2365	5.6848	8.581
	39.5833	80.5771	14948.1193	13.6034	19.8028	754.8485	29915.9077	40.2962	5.6948	8.596
L40	39.5833	79.0826	14680.4365	13.6078	19.8028	741.3310	29380.1898	39.5488	5.7168	8.795
	39.6409	79.1996	14745.7430	13.6280	19.8316	743.5463	29510.8889	39.6073	5.7268	8.81
L41	39.6409	77.7019	14476.3030	13.6324	19.8316	729.9599	28971.6544	38.8583	5.7488	9.018
	40.7935	79.9987	15798.3691	14.0354	20.4083	774.1155	31617.5261	40.0070	5.9486	9.331
L42	40.7935	78.4549	15503.2927	14.0398	20.4083	759.6568	31026.9850	39.2349	5.9706	9.553
	41.9462	80.7067	16876.8972	14.4428	20.9849	804.2390	33776.0014	40.3610	6.1704	9.873
L43	41.9462	79.1169	16554.6089	14.4472	20.9849	788.8809	33131.0008	39.5660	6.1924	10.11
	43.0988	81.3237	17978.8566	14.8502	21.5616	833.8379	35981.3703	40.6696	6.3922	10.436
L44	43.0988	81.3237	17978.8566	14.8502	21.5616	833.8379	35981.3703	40.6696	6.3922	10.436
	43.7904	82.6477	18871.3945	15.0920	21.9076	861.4102	37767.6205	41.3317	6.5120	10.632
L45	43.7904	92.6042	21070.2675	15.0654	21.9076	961.7807	42168.2599	46.3109	6.3800	9.28
	43.8480	92.7280	21154.9192	15.0855	21.9364	964.3755	42337.6745	46.3728	6.3900	9.295
L46	43.8480	92.7280	21154.9192	15.0855	21.9364	964.3755	42337.6745	46.3728	6.3900	9.295



<p><b>tnxTower</b></p> <p><b>Jacobs Engineering Group, Inc.</b>  5449 Bells Ferry Road  Acworth, GA 30102  Phone: (770) 701-2500  FAX: (770) 701-2501</p>	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	5 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
	45.0007	95.2050	22895.9033	15.4885	22.5130	1017.0065	45821.9337	47.6116	6.5898	9.585

Tower Elevation	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 140.0000-135.0000				1	1	1		
L2 135.0000-130.0000				1	1	1		
L3 130.0000-125.0000				1	1	1		
L4 125.0000-120.0000				1	1	1		
L5 120.0000-115.0000				1	1	1		
L6 115.0000-114.7500				1	1	0.910459		
L7 114.7500-109.7500				1	1	0.90506		
L8 109.7500-104.7500				1	1	0.928842		
L9 104.7500-101.4830				1	1	1		
L10 101.4830-101.3330				1	1	1		
L11 101.3330-96.330				1	1	1		
L12 96.3330-91.330				1	1	1		
L13 91.3330-91.000				1	1	1		
L14 91.0000-90.7500				1	1	0.925286		
L15 90.7500-85.7500				1	1	0.925661		
L16 85.7500-80.7500				1	1	0.947954		
L17 80.7500-75.7500				1	1	0.952304		
L18 75.7500-70.7500				1	1	0.947475		

<p style="text-align: center;"><b>tnxTower</b></p> <p><b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	6 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

<i>Tower Elevation</i>	<i>Gusset Area (per face)</i>	<i>Gusset Thickness</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A<sub>f</sub></i>	<i>Adjust. Factor A<sub>r</sub></i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals in</i>	<i>Double Angle Stitch Bolt Spacing Horizontals in</i>
<i>ft</i>	<i>ft<sup>2</sup></i>	<i>in</i>						
L19 70.7500-69.98 30				1	1	0.95142		
L20 69.9830-69.73 30				1	1	0.950699		
L21 69.7330-64.73 30				1	1	0.947808		
L22 64.7330-63.00 00				1	1	0.954368		
L23 63.0000-62.75 00				1	1	0.981128		
L24 62.7500-59.08 30				1	1	0.983868		
L25 59.0830-58.81 70				1	1	0.999812		
L26 58.8170-58.66 70				1	1	0.999263		
L27 58.6670-53.66 70				1	1	1.00127		
L28 53.6670-48.58 00				1	1	0.99897		
L29 48.5800-47.58 00				1	1	0.940602		
L30 47.5800-42.58 00				1	1	0.943735		
L31 42.5800-40.00 00				1	1	0.954987		
L32 40.0000-39.75 00				1	1	0.925973		
L33 39.7500-34.75 00				1	1	0.93691		
L34 34.7500-31.41 60				1	1	0.940286		
L35 31.4160-31.16 60				1	1	0.93945		
L36 31.1660-29.00 00				1	1	0.947279		
L37 29.0000-28.75 00				1	1	0.991165		
L38 28.7500-23.75				1	1	0.99357		

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	7 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft <sup>2</sup>	in						
00								
L39				1	1	0.992797		
23.7500-23.5000								
L40				1	1	1.08654		
23.5000-23.2500								
L41				1	1	1.08976		
23.2500-18.2500								
L42				1	1	1.09415		
18.2500-13.2500								
L43				1	1	1.09969		
13.2500-8.2500								
L44				1	1	1.09025		
8.2500-5.2500								
L45				1	1	0.914314		
5.2500-5.0000								
L46				1	1	0.902352		
5.0000-0.0000								

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***										

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_A A_A$ ft <sup>2</sup> /ft	Weight plf
* 138' *								
AVA6-50(1-1/4")	B	No	Inside Pole	138.0000 - 0.0000	1	No Ice	0.0000	0.45
						1/2" Ice	0.0000	0.45
						1" Ice	0.0000	0.45
						2" Ice	0.0000	0.45
						4" Ice	0.0000	0.45
LDF7-50A(1-5/8")	B	No	Inside Pole	138.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8")	B	No	CaAa (Out Of Face)	60.5000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
						2" Ice	0.0000	11.02
						4" Ice	0.0000	30.52
HB158-1-08U8-S8J18(	B	No	CaAa (Out Of	138.0000 - 60.5000	1	No Ice	0.1980	1.30

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>		140-ft Monopole - SHELTON NE		<b>Page</b>	8 of 45
	<b>Project</b>		BU842873_WO1182451		<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>		Crown Castle		<b>Designed by</b>	LeeMH

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
1-5/8")			Face)			1/2" Ice	0.2980	2.81
						1" Ice	0.3980	4.94
						2" Ice	0.5980	11.02
						4" Ice	0.9980	30.52
HB158-1-08U8-S8J18(1-5/8")	B	No	CaAa (Out Of Face)	138.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
						2" Ice	0.0000	11.02
						4" Ice	0.0000	30.52
* 120' * LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	120.0000 - 0.0000	3	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54
						4" Ice	0.9980	30.04
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	120.0000 - 0.0000	15	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
* 110' * (TBR) * 99' * LDF5-50A(7/8")	A	No	Inside Pole	99.0000 - 0.0000	2	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
* 95' * LDF5-50A(7/8")	A	No	Inside Pole	95.0000 - 0.0000	6	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
9776(5/8")	A	No	CaAa (Out Of Face)	95.0000 - 0.0000	2	No Ice	0.0000	0.28
						1/2" Ice	0.0000	1.03
						1" Ice	0.0000	2.39
						2" Ice	0.0000	6.96
						4" Ice	0.0000	23.41
FB-L98B-034-XXX(3/8")	A	No	CaAa (Out Of Face)	95.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.60
						1" Ice	0.0000	1.76
						2" Ice	0.0000	5.91
						4" Ice	0.0000	21.53
* 73' * LDF6-50A(1-1/4")	A	No	Inside Pole	73.0000 - 0.0000	3	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
*** Safety Line 3/8	C	No	CaAa (Out Of Face)	140.0000 - 0.0000	1	No Ice	0.0375	0.22
						1/2" Ice	0.1375	0.75
						1" Ice	0.2375	1.28
						2" Ice	0.4375	2.34
						4" Ice	0.8375	4.46
* EXISTING MODS * 5.75" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	33.3330 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_{AA}$	Weight
							ft <sup>2</sup> /ft	plf
5.75" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	33.3330 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
5.75" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	33.3330 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
* 5.75" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	50.5830 - 30.5830	1	No Ice	0.0000	0.00
1/2" Ice						0.0000	0.00	
1" Ice						0.0000	0.00	
2" Ice						0.0000	0.00	
4" Ice						0.0000	0.00	
5.75" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	50.5830 - 30.5830	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
5.75" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	50.5830 - 30.5830	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
* 5.75" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	72.0000 - 57.0000	1	No Ice	0.0000	0.00
1/2" Ice						0.0000	0.00	
1" Ice						0.0000	0.00	
2" Ice						0.0000	0.00	
4" Ice						0.0000	0.00	
5.75" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	72.0000 - 57.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
5.75" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	72.0000 - 57.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
*** Aero MP304	A	No	CaAa (Out Of Face)	60.5000 - 0.0000	1	No Ice	0.2680	0.00
1/2" Ice						0.9078	0.00	
1" Ice						1.0189	0.00	
2" Ice						1.2411	0.00	
4" Ice						1.6856	0.00	
Aero MP304	B	No	CaAa (Out Of Face)	60.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
Aero MP304	C	No	CaAa (Out Of Face)	60.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
*** 6" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	41.6670 - 26.6670	1	No Ice	0.0000	0.00
1/2" Ice						0.0000	0.00	

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	<b>Client</b>		Crown Castle		<b>Designed by</b>		LeeMH	

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	42.0000 - 27.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	42.0000 - 27.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
* BEING INSTALLED *								
6" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	25.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	25.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	25.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
*								
6" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	65.0000 - 50.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	65.0000 - 50.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	65.0000 - 50.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
*								
6" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	93.0000 - 68.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	93.0000 - 68.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	93.0000 - 68.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
*								
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	117.0000 - 102.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
4.5" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	117.0000 - 102.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
4.5" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	117.0000 - 102.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
* PROPOSED MODS *								
6" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	31.2500 - 21.2500	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
6" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	31.2500 - 21.2500	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
***								

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	140.0000-135.0000 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.594	0.0387
		C	0.000	0.000	0.000	0.188	0.0011
L2	135.0000-130.0000 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.990	0.0644
		C	0.000	0.000	0.000	0.188	0.0011
L3	130.0000-125.0000 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.990	0.0644
		C	0.000	0.000	0.000	0.188	0.0011
L4	125.0000-120.0000 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.990	0.0644
		C	0.000	0.000	0.000	0.188	0.0011
L5	120.0000-115.0000 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L6	115.0000-114.7500 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.198	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L7	114.7500-109.7500 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L8	109.7500-104.7500 0	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011

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Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L9	104.7500-101.4830	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	2.587	0.0903
		C	0.000	0.000	0.000	0.123	0.0007
L10	101.4830-101.3330	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.119	0.0041
		C	0.000	0.000	0.000	0.006	0.0000
L11	101.3330-96.3330	A	0.000	0.000	0.000	0.000	0.0018
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L12	96.3330-91.3330	A	0.000	0.000	0.000	0.000	0.0128
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L13	91.3330-91.0000	A	0.000	0.000	0.000	0.000	0.0011
		B	0.000	0.000	0.000	0.264	0.0092
		C	0.000	0.000	0.000	0.012	0.0001
L14	91.0000-90.7500	A	0.000	0.000	0.000	0.000	0.0008
		B	0.000	0.000	0.000	0.198	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L15	90.7500-85.7500	A	0.000	0.000	0.000	0.000	0.0162
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L16	85.7500-80.7500	A	0.000	0.000	0.000	0.000	0.0162
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L17	80.7500-75.7500	A	0.000	0.000	0.000	0.000	0.0162
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L18	75.7500-70.7500	A	0.000	0.000	0.000	0.000	0.0207
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L19	70.7500-69.9830	A	0.000	0.000	0.000	0.000	0.0040
		B	0.000	0.000	0.000	0.607	0.0212
		C	0.000	0.000	0.000	0.029	0.0002
L20	69.9830-69.7330	A	0.000	0.000	0.000	0.000	0.0013
		B	0.000	0.000	0.000	0.198	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L21	69.7330-64.7330	A	0.000	0.000	0.000	0.000	0.0261
		B	0.000	0.000	0.000	3.960	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L22	64.7330-63.0000	A	0.000	0.000	0.000	0.000	0.0091
		B	0.000	0.000	0.000	1.373	0.0479
		C	0.000	0.000	0.000	0.065	0.0004
L23	63.0000-62.7500	A	0.000	0.000	0.000	0.000	0.0013
		B	0.000	0.000	0.000	0.198	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L24	62.7500-59.0830	A	0.000	0.000	0.000	0.380	0.0192
		B	0.000	0.000	0.000	2.624	0.1014
		C	0.000	0.000	0.000	0.138	0.0008
L25	59.0830-58.8170	A	0.000	0.000	0.000	0.071	0.0014
		B	0.000	0.000	0.000	0.158	0.0074
		C	0.000	0.000	0.000	0.010	0.0001
L26	58.8170-58.6670	A	0.000	0.000	0.000	0.040	0.0008
		B	0.000	0.000	0.000	0.089	0.0041
		C	0.000	0.000	0.000	0.006	0.0000
L27	58.6670-53.6670	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L28	53.6670-48.5800	A	0.000	0.000	0.000	1.363	0.0266
		B	0.000	0.000	0.000	3.022	0.1407
		C	0.000	0.000	0.000	0.191	0.0011
L29	48.5800-47.5800	A	0.000	0.000	0.000	0.268	0.0052



<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	13 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B	0.000	0.000	0.000	0.594	0.0276
		C	0.000	0.000	0.000	0.037	0.0002
L30	47.5800-42.5800	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L31	42.5800-40.0000	A	0.000	0.000	0.000	0.691	0.0135
		B	0.000	0.000	0.000	1.533	0.0713
		C	0.000	0.000	0.000	0.097	0.0006
L32	40.0000-39.7500	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L33	39.7500-34.7500	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L34	34.7500-31.4160	A	0.000	0.000	0.000	0.893	0.0174
		B	0.000	0.000	0.000	1.980	0.0922
		C	0.000	0.000	0.000	0.125	0.0007
L35	31.4160-31.1660	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L36	31.1660-29.0000	A	0.000	0.000	0.000	0.580	0.0113
		B	0.000	0.000	0.000	1.287	0.0599
		C	0.000	0.000	0.000	0.081	0.0005
L37	29.0000-28.7500	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L38	28.7500-23.7500	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L39	23.7500-23.5000	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L40	23.5000-23.2500	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L41	23.2500-18.2500	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L42	18.2500-13.2500	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L43	13.2500-8.2500	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011
L44	8.2500-5.2500	A	0.000	0.000	0.000	0.804	0.0157
		B	0.000	0.000	0.000	1.782	0.0829
		C	0.000	0.000	0.000	0.113	0.0007
L45	5.2500-5.0000	A	0.000	0.000	0.000	0.067	0.0013
		B	0.000	0.000	0.000	0.148	0.0069
		C	0.000	0.000	0.000	0.009	0.0001
L46	5.0000-0.0000	A	0.000	0.000	0.000	1.340	0.0261
		B	0.000	0.000	0.000	2.970	0.1382
		C	0.000	0.000	0.000	0.188	0.0011

**Feed Line/Linear Appurtenances Section Areas - With Ice**

<p><b>tnxTower</b></p> <p><b>Jacobs Engineering Group, Inc.</b>  5449 Bells Ferry Road  Acworth, GA 30102  Phone: (770) 701-2500  FAX: (770) 701-2501</p>	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	14 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	140.0000-135.0000	A	0.890	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	1.128	0.0577
		C		0.000	0.000	0.000	1.078	0.0058
L2	135.0000-130.0000	A	0.886	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	1.876	0.0960
		C		0.000	0.000	0.000	1.074	0.0058
L3	130.0000-125.0000	A	0.882	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	1.872	0.0958
		C		0.000	0.000	0.000	1.070	0.0058
L4	125.0000-120.0000	A	0.878	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	1.868	0.0957
		C		0.000	0.000	0.000	1.065	0.0058
L5	120.0000-115.0000	A	0.873	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	7.454	0.4485
		C		0.000	0.000	0.000	1.061	0.0057
L6	115.0000-114.7500	A	0.871	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	0.372	0.0224
		C		0.000	0.000	0.000	0.053	0.0003
L7	114.7500-109.7500	A	0.869	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	7.435	0.4465
		C		0.000	0.000	0.000	1.056	0.0057
L8	109.7500-104.7500	A	0.864	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	7.416	0.4445
		C		0.000	0.000	0.000	1.051	0.0057
L9	104.7500-101.4830	A	0.860	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	4.835	0.2893
		C		0.000	0.000	0.000	0.684	0.0037
L10	101.4830-101.3330	A	0.858	0.000	0.000	0.000	0.000	0.0000
	0	B		0.000	0.000	0.000	0.222	0.0133
		C		0.000	0.000	0.000	0.031	0.0002
L11	101.3330-96.3330	A	0.855	0.000	0.000	0.000	0.000	0.0018
		B		0.000	0.000	0.000	7.382	0.4409
		C		0.000	0.000	0.000	1.043	0.0056
L12	96.3330-91.3330	A	0.850	0.000	0.000	0.000	0.000	0.0303
		B		0.000	0.000	0.000	7.361	0.4386
		C		0.000	0.000	0.000	1.038	0.0056
L13	91.3330-91.0000	A	0.847	0.000	0.000	0.000	0.000	0.0027
		B		0.000	0.000	0.000	0.489	0.0291
		C		0.000	0.000	0.000	0.069	0.0004
L14	91.0000-90.7500	A	0.847	0.000	0.000	0.000	0.000	0.0020
		B		0.000	0.000	0.000	0.367	0.0219
		C		0.000	0.000	0.000	0.052	0.0003
L15	90.7500-85.7500	A	0.844	0.000	0.000	0.000	0.000	0.0399
		B		0.000	0.000	0.000	7.336	0.4360
		C		0.000	0.000	0.000	1.031	0.0056
L16	85.7500-80.7500	A	0.838	0.000	0.000	0.000	0.000	0.0397
		B		0.000	0.000	0.000	7.312	0.4335
		C		0.000	0.000	0.000	1.026	0.0055
L17	80.7500-75.7500	A	0.832	0.000	0.000	0.000	0.000	0.0394
		B		0.000	0.000	0.000	7.287	0.4308
		C		0.000	0.000	0.000	1.019	0.0055
L18	75.7500-70.7500	A	0.825	0.000	0.000	0.000	0.000	0.0436
		B		0.000	0.000	0.000	7.261	0.4280
		C		0.000	0.000	0.000	1.013	0.0055
L19	70.7500-69.9830	A	0.821	0.000	0.000	0.000	0.000	0.0075
		B		0.000	0.000	0.000	1.111	0.0654
		C		0.000	0.000	0.000	0.155	0.0008
L20	69.9830-69.7330	A	0.821	0.000	0.000	0.000	0.000	0.0024
		B		0.000	0.000	0.000	0.362	0.0213
		C		0.000	0.000	0.000	0.050	0.0003
L21	69.7330-64.7330	A	0.817	0.000	0.000	0.000	0.000	0.0487

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	15 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B		0.000	0.000	0.000	7.227	0.4245
		C		0.000	0.000	0.000	1.004	0.0054
L22	64.7330-63.0000	A	0.812	0.000	0.000	0.000	0.000	0.0168
		B		0.000	0.000	0.000	2.498	0.1464
		C		0.000	0.000	0.000	0.346	0.0019
L23	63.0000-62.7500	A	0.810	0.000	0.000	0.000	0.000	0.0024
		B		0.000	0.000	0.000	0.360	0.0211
		C		0.000	0.000	0.000	0.050	0.0003
L24	62.7500-59.0830	A	0.807	0.000	0.000	0.000	1.383	0.0355
		B		0.000	0.000	0.000	4.763	0.3083
		C		0.000	0.000	0.000	0.730	0.0039
L25	59.0830-58.8170	A	0.804	0.000	0.000	0.000	0.259	0.0026
		B		0.000	0.000	0.000	0.286	0.0223
		C		0.000	0.000	0.000	0.053	0.0003
L26	58.8170-58.6670	A	0.804	0.000	0.000	0.000	0.146	0.0014
		B		0.000	0.000	0.000	0.161	0.0126
		C		0.000	0.000	0.000	0.030	0.0002
L27	58.6670-53.6670	A	0.799	0.000	0.000	0.000	4.872	0.0480
		B		0.000	0.000	0.000	5.368	0.4170
		C		0.000	0.000	0.000	0.987	0.0053
L28	53.6670-48.5800	A	0.790	0.000	0.000	0.000	4.946	0.0485
		B		0.000	0.000	0.000	5.434	0.4204
		C		0.000	0.000	0.000	0.995	0.0054
L29	48.5800-47.5800	A	0.785	0.000	0.000	0.000	0.972	0.0095
		B		0.000	0.000	0.000	1.068	0.0826
		C		0.000	0.000	0.000	0.196	0.0011
L30	47.5800-42.5800	A	0.779	0.000	0.000	0.000	4.848	0.0472
		B		0.000	0.000	0.000	5.306	0.4082
		C		0.000	0.000	0.000	0.966	0.0052
L31	42.5800-40.0000	A	0.770	0.000	0.000	0.000	2.497	0.0242
		B		0.000	0.000	0.000	2.725	0.2088
		C		0.000	0.000	0.000	0.494	0.0027
L32	40.0000-39.7500	A	0.767	0.000	0.000	0.000	0.242	0.0023
		B		0.000	0.000	0.000	0.264	0.0202
		C		0.000	0.000	0.000	0.048	0.0003
L33	39.7500-34.7500	A	0.761	0.000	0.000	0.000	4.829	0.0466
		B		0.000	0.000	0.000	5.253	0.4007
		C		0.000	0.000	0.000	0.948	0.0051
L34	34.7500-31.4160	A	0.750	0.000	0.000	0.000	3.212	0.0308
		B		0.000	0.000	0.000	3.481	0.2641
		C		0.000	0.000	0.000	0.625	0.0034
L35	31.4160-31.1660	A	0.750	0.000	0.000	0.000	0.241	0.0023
		B		0.000	0.000	0.000	0.261	0.0198
		C		0.000	0.000	0.000	0.047	0.0003
L36	31.1660-29.0000	A	0.750	0.000	0.000	0.000	2.087	0.0200
		B		0.000	0.000	0.000	2.261	0.1716
		C		0.000	0.000	0.000	0.406	0.0022
L37	29.0000-28.7500	A	0.750	0.000	0.000	0.000	0.241	0.0023
		B		0.000	0.000	0.000	0.261	0.0198
		C		0.000	0.000	0.000	0.047	0.0003
L38	28.7500-23.7500	A	0.750	0.000	0.000	0.000	4.817	0.0461
		B		0.000	0.000	0.000	5.220	0.3960
		C		0.000	0.000	0.000	0.938	0.0051
L39	23.7500-23.5000	A	0.750	0.000	0.000	0.000	0.241	0.0023
		B		0.000	0.000	0.000	0.261	0.0198
		C		0.000	0.000	0.000	0.047	0.0003
L40	23.5000-23.2500	A	0.750	0.000	0.000	0.000	0.241	0.0023
		B		0.000	0.000	0.000	0.261	0.0198
		C		0.000	0.000	0.000	0.047	0.0003
L41	23.2500-18.2500	A	0.750	0.000	0.000	0.000	4.817	0.0461
		B		0.000	0.000	0.000	5.220	0.3960

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	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L42	18.2500-13.2500	C	0.750	0.000	0.000	0.000	0.938	0.0051
		A		0.000	0.000	0.000	4.817	0.0461
		B		0.000	0.000	0.000	5.220	0.3960
L43	13.2500-8.2500	C	0.750	0.000	0.000	0.000	0.938	0.0051
		A		0.000	0.000	0.000	4.817	0.0461
		B		0.000	0.000	0.000	5.220	0.3960
L44	8.2500-5.2500	C	0.750	0.000	0.000	0.000	0.938	0.0051
		A		0.000	0.000	0.000	2.890	0.0277
		B		0.000	0.000	0.000	3.132	0.2376
L45	5.2500-5.0000	C	0.750	0.000	0.000	0.000	0.563	0.0030
		A		0.000	0.000	0.000	0.241	0.0023
		B		0.000	0.000	0.000	0.261	0.0198
L46	5.0000-0.0000	C	0.750	0.000	0.000	0.000	0.047	0.0003
		A		0.000	0.000	0.000	4.817	0.0461
		B		0.000	0.000	0.000	5.220	0.3960
		C		0.000	0.000	0.000	0.938	0.0051

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	140.0000-135.0000	0.0952	0.1044	0.0119	0.2202
L2	135.0000-130.0000	0.1752	0.1484	0.1307	0.2773
L3	130.0000-125.0000	0.1772	0.1501	0.1344	0.2844
L4	125.0000-120.0000	0.1790	0.1516	0.1378	0.2907
L5	120.0000-115.0000	0.6344	0.4027	0.7501	0.5768
L6	115.0000-114.7500	0.6416	0.4072	0.7631	0.5866
L7	114.7500-109.7500	0.6484	0.4116	0.7757	0.5961
L8	109.7500-104.7500	0.6608	0.4194	0.7986	0.6134
L9	104.7500-101.4830	0.6703	0.4255	0.8165	0.6268
L10	101.4830-101.3330	0.6740	0.4278	0.8236	0.6322
L11	101.3330-96.3330	0.6796	0.4313	0.8341	0.6400
L12	96.3330-91.3330	0.6897	0.4378	0.8536	0.6546
L13	91.3330-91.0000	0.6949	0.4411	0.8635	0.6620
L14	91.0000-90.7500	0.6954	0.4414	0.8646	0.6628
L15	90.7500-85.7500	0.7003	0.4445	0.8740	0.6697
L16	85.7500-80.7500	0.7091	0.4501	0.8912	0.6824
L17	80.7500-75.7500	0.7174	0.4554	0.9074	0.6943
L18	75.7500-70.7500	0.7252	0.4603	0.9226	0.7053
L19	70.7500-69.9830	0.7295	0.4630	0.9309	0.7113
L20	69.9830-69.7330	0.7302	0.4635	0.9323	0.7124
L21	69.7330-64.7330	0.7340	0.4659	0.9396	0.7176
L22	64.7330-63.0000	0.7386	0.4688	0.9486	0.7240
L23	63.0000-62.7500	0.7400	0.4697	0.9512	0.7258
L24	62.7500-59.0830	0.6614	0.3064	0.8041	0.3111
L25	59.0830-58.8170	0.5387	0.0534	0.5983	-0.2659
L26	58.8170-58.6670	0.5389	0.0534	0.5987	-0.2662
L27	58.6670-53.6670	0.5414	0.0536	0.6033	-0.2694
L28	53.6670-48.5800	0.5461	0.0541	0.6120	-0.2756
L29	48.5800-47.5800	0.5464	0.0541	0.6125	-0.2759
L30	47.5800-42.5800	0.5490	0.0544	0.6165	-0.2809
L31	42.5800-40.0000	0.5523	0.0547	0.6223	-0.2858
L32	40.0000-39.7500	0.5535	0.0548	0.6244	-0.2877
L33	39.7500-34.7500	0.5557	0.0551	0.6280	-0.2912
L34	34.7500-31.4160	0.5590	0.0554	0.6335	-0.2968
L35	31.4160-31.1660	0.5604	0.0555	0.6365	-0.2983

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	17 of 45
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L36	31.1660-29.0000	0.5613	0.0556	0.6385	-0.2992
L37	29.0000-28.7500	0.5622	0.0557	0.6405	-0.3001
L38	28.7500-23.7500	0.5642	0.0559	0.6447	-0.3021
L39	23.7500-23.5000	0.5661	0.0561	0.6489	-0.3041
L40	23.5000-23.2500	0.5662	0.0561	0.6493	-0.3043
L41	23.2500-18.2500	0.5681	0.0563	0.6534	-0.3062
L42	18.2500-13.2500	0.5715	0.0566	0.6610	-0.3097
L43	13.2500-8.2500	0.5748	0.0570	0.6683	-0.3132
L44	8.2500-5.2500	0.5773	0.0572	0.6741	-0.3159
L45	5.2500-5.0000	0.5783	0.0573	0.6763	-0.3169
L46	5.0000-0.0000	0.5799	0.0575	0.6800	-0.3186

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz Lateral	Vert						°
Lightning Rod 5/8x4'	B	From Leg	0.0000	0.0000	0.000	140.0000	No Ice	0.2500	0.2500	0.0310
			0.0000	0.0000			1/2" Ice	0.6635	0.6635	0.0338
			2.0000	0.0000			1" Ice	0.9732	0.9732	0.0393
							2" Ice	1.4936	1.4936	0.0588
							4" Ice	2.6833	2.6833	0.1366
* 138' * BXA-80063-6BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.0000	0.0000	0.000	138.0000	No Ice	7.7073	5.6302	0.0437
			0.0000	0.0000			1/2" Ice	8.3278	6.7191	0.1029
			2.0000	0.0000			1" Ice	8.9190	7.5606	0.1695
							2" Ice	10.1316	9.2937	0.3290
							4" Ice	12.6769	12.9684	0.7856
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.0000	0.0000	0.000	138.0000	No Ice	7.7073	5.6302	0.0437
			0.0000	0.0000			1/2" Ice	8.3278	6.7191	0.1029
			2.0000	0.0000			1" Ice	8.9190	7.5606	0.1695
							2" Ice	10.1316	9.2937	0.3290
							4" Ice	12.6769	12.9684	0.7856
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.0000	0.0000	0.000	138.0000	No Ice	7.7073	5.6302	0.0437
			0.0000	0.0000			1/2" Ice	8.3278	6.7191	0.1029
			2.0000	0.0000			1" Ice	8.9190	7.5606	0.1695
							2" Ice	10.1316	9.2937	0.3290
							4" Ice	12.6769	12.9684	0.7856
DB636-C	A	From Leg	1.0000	0.0000	0.000	138.0000	No Ice	2.3750	2.3750	0.0300
			0.0000	0.0000			1/2" Ice	3.3542	3.3542	0.0477
			7.0000	0.0000			1" Ice	4.3500	4.3500	0.0717
							2" Ice	5.5813	5.5813	0.1388
							4" Ice	8.0298	8.0298	0.3542
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000	0.0000	0.000	138.0000	No Ice	5.6000	2.3333	0.0440
			0.0000	0.0000			1/2" Ice	5.9154	2.5580	0.0801
			2.0000	0.0000			1" Ice	6.2395	2.7914	0.1202
							2" Ice	6.9136	3.2840	0.2130
							4" Ice	8.3654	4.3728	0.4547
AWS4 (B66) 4x45 RRH	A	From Leg	4.0000	0.0000	0.000	138.0000	No Ice	3.1033	1.7586	0.0640
			0.0000	0.0000			1/2" Ice	3.3578	1.9794	0.0844
			2.0000	0.0000			1" Ice	3.6210	2.2088	0.1078
							2" Ice	4.1732	2.6936	0.1650

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>		140-ft Monopole - SHELTON NE		<b>Page</b>		18 of 45	
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	<b>Client</b>		Crown Castle		<b>Designed by</b>		LeeMH	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight	
			Horz	Vert			Front	Side		
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
AWS4 (B66) 4x45 RRH	B	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	5.3814	3.7670	0.3256
							No Ice	3.1033	1.7586	0.0640
							1/2" Ice	3.3578	1.9794	0.0844
							1" Ice	3.6210	2.2088	0.1078
							2" Ice	4.1732	2.6936	0.1650
AWS4 (B66) 4x45 RRH	C	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	5.3814	3.7670	0.3256
							No Ice	3.1033	1.7586	0.0640
							1/2" Ice	3.3578	1.9794	0.0844
							1" Ice	3.6210	2.2088	0.1078
							2" Ice	4.1732	2.6936	0.1650
RRH2x60-700	A	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	5.3814	3.7670	0.3256
							No Ice	3.9569	1.8157	0.0600
							1/2" Ice	4.2724	2.0752	0.0827
							1" Ice	4.5965	2.3603	0.1091
							2" Ice	5.2705	2.9566	0.1734
RRH2x60-700	B	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	6.7224	4.2529	0.3543
							No Ice	3.9569	1.8157	0.0600
							1/2" Ice	4.2724	2.0752	0.0827
							1" Ice	4.5965	2.3603	0.1091
							2" Ice	5.2705	2.9566	0.1734
RRH2x60-700	C	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	6.7224	4.2529	0.3543
							No Ice	3.9569	1.8157	0.0600
							1/2" Ice	4.2724	2.0752	0.0827
							1" Ice	4.5965	2.3603	0.1091
							2" Ice	5.2705	2.9566	0.1734
RRH2X60-PCS	A	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	6.7224	4.2529	0.3543
							No Ice	2.5667	2.0106	0.0550
							1/2" Ice	2.7914	2.2184	0.0754
							1" Ice	3.0247	2.4349	0.0987
							2" Ice	3.5173	2.8938	0.1552
RRH2X60-PCS	B	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	4.6062	3.9152	0.3129
							No Ice	2.5667	2.0106	0.0550
							1/2" Ice	2.7914	2.2184	0.0754
							1" Ice	3.0247	2.4349	0.0987
							2" Ice	3.5173	2.8938	0.1552
RRH2X60-PCS	C	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	4.6062	3.9152	0.3129
							No Ice	2.5667	2.0106	0.0550
							1/2" Ice	2.7914	2.2184	0.0754
							1" Ice	3.0247	2.4349	0.0987
							2" Ice	3.5173	2.8938	0.1552
(2) HBXX-6516DS-A2M w/ Mount Pipe	A	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	4.6062	3.9152	0.3129
							No Ice	6.1758	4.5251	0.0497
							1/2" Ice	6.6547	5.2049	0.0990
							1" Ice	7.1374	5.8987	0.1544
							2" Ice	8.1341	7.3732	0.2870
(2) HBXX-6516DS-A2M w/ Mount Pipe	B	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	10.2560	10.5560	0.6667
							No Ice	6.1758	4.5251	0.0497
							1/2" Ice	6.6547	5.2049	0.0990
							1" Ice	7.1374	5.8987	0.1544
							2" Ice	8.1341	7.3732	0.2870
(2) HBXX-6516DS-A2M w/ Mount Pipe	C	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	10.2560	10.5560	0.6667
							No Ice	6.1758	4.5251	0.0497
							1/2" Ice	6.6547	5.2049	0.0990
							1" Ice	7.1374	5.8987	0.1544
							2" Ice	8.1341	7.3732	0.2870
X7C-FRO-660-VR0 w/	A	From Leg	4.0000	0.0000	0.000	138.0000	4" Ice	10.2560	10.5560	0.6667
							No Ice	10.4575	7.5292	0.0606

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Crown Castle						LeeMH		

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
Mount Pipe			0.0000			1/2" Ice	11.1271	8.7153	0.1387	
			2.0000			1" Ice	11.7635	9.6153	0.2250	
						2" Ice	13.0637	11.4489	0.4259	
						4" Ice	15.7838	15.6025	0.9746	
X7C-FRO-660-VR0 w/ Mount Pipe	B	From Leg	4.0000		0.000	138.0000	No Ice	10.4575	7.5292	0.0606
			0.0000				1/2" Ice	11.1271	8.7153	0.1387
			2.0000				1" Ice	11.7635	9.6153	0.2250
							2" Ice	13.0637	11.4489	0.4259
							4" Ice	15.7838	15.6025	0.9746
X7C-FRO-660-VR0 w/ Mount Pipe	C	From Leg	4.0000		0.000	138.0000	No Ice	10.4575	7.5292	0.0606
			0.0000				1/2" Ice	11.1271	8.7153	0.1387
			2.0000				1" Ice	11.7635	9.6153	0.2250
							2" Ice	13.0637	11.4489	0.4259
							4" Ice	15.7838	15.6025	0.9746
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000		0.000	138.0000	No Ice	5.6000	2.3333	0.0440
			0.0000				1/2" Ice	5.9154	2.5580	0.0801
			2.0000				1" Ice	6.2395	2.7914	0.1202
							2" Ice	6.9136	3.2840	0.2130
							4" Ice	8.3654	4.3728	0.4547
Platform Mount [LP 403-1]	C	None			0.000	138.0000	No Ice	18.8500	18.8500	1.5000
							1/2" Ice	24.3000	24.3000	1.7966
							1" Ice	29.7500	29.7500	2.0931
							2" Ice	40.6500	40.6500	2.6862
							4" Ice	62.4500	62.4500	3.8725
* 120' *										
(2) DTMA-1819-DD-12	A	From Face	4.0000		0.000	120.0000	No Ice	0.7058	0.4107	0.0143
			0.0000				1/2" Ice	0.8314	0.5213	0.0193
			0.0000				1" Ice	0.9655	0.6405	0.0260
							2" Ice	1.2598	0.9050	0.0449
							4" Ice	1.9520	1.5376	0.1107
(2) DTMA-1819-DD-12	B	From Face	4.0000		0.000	120.0000	No Ice	0.7058	0.4107	0.0143
			0.0000				1/2" Ice	0.8314	0.5213	0.0193
			0.0000				1" Ice	0.9655	0.6405	0.0260
							2" Ice	1.2598	0.9050	0.0449
							4" Ice	1.9520	1.5376	0.1107
(2) DTMA-1819-DD-12	C	From Face	4.0000		0.000	120.0000	No Ice	0.7058	0.4107	0.0143
			0.0000				1/2" Ice	0.8314	0.5213	0.0193
			0.0000				1" Ice	0.9655	0.6405	0.0260
							2" Ice	1.2598	0.9050	0.0449
							4" Ice	1.9520	1.5376	0.1107
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	A	From Face	4.0000		0.000	120.0000	No Ice	7.8082	3.7823	0.0637
			0.0000				1/2" Ice	8.3682	4.6432	0.1147
			0.0000				1" Ice	8.9151	5.3818	0.1725
							2" Ice	10.0396	6.9091	0.3119
							4" Ice	12.4108	10.1636	0.7158
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	B	From Face	4.0000		0.000	120.0000	No Ice	7.8082	3.7823	0.0637
			0.0000				1/2" Ice	8.3682	4.6432	0.1147
			0.0000				1" Ice	8.9151	5.3818	0.1725
							2" Ice	10.0396	6.9091	0.3119
							4" Ice	12.4108	10.1636	0.7158
APX16DWV-16DWVS-E-A 20 w/ Mount Pipe	C	From Face	4.0000		0.000	120.0000	No Ice	7.8082	3.7823	0.0637
			0.0000				1/2" Ice	8.3682	4.6432	0.1147
			0.0000				1" Ice	8.9151	5.3818	0.1725
							2" Ice	10.0396	6.9091	0.3119
							4" Ice	12.4108	10.1636	0.7158
APX16PV-16PVL w/ Mount Pipe	A	From Face	4.0000		0.000	120.0000	No Ice	6.8846	3.2678	0.0594
			0.0000				1/2" Ice	7.3867	3.9735	0.1048

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>		140-ft Monopole - SHELTON NE		<b>Page</b>		20 of 45	
	<b>Project</b>		BU842873_WO1182451		<b>Date</b>		09:51:22 02/04/16	
	<b>Client</b>		Crown Castle		<b>Designed by</b>		LeeMH	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral	Vert					
					0.0000					
							1" Ice	7.8887	4.6395	0.1564
							2" Ice	8.9238	6.0214	0.2814
							4" Ice	11.1182	8.9947	0.6470
APX16PV-16PVL w/ Mount Pipe	B	From Face	4.0000	0.000	120.0000	No Ice	6.8846	3.2678	0.0594	
			0.0000			1/2" Ice	7.3867	3.9735	0.1048	
			0.0000			1" Ice	7.8887	4.6395	0.1564	
						2" Ice	8.9238	6.0214	0.2814	
						4" Ice	11.1182	8.9947	0.6470	
APX16PV-16PVL w/ Mount Pipe	C	From Face	4.0000	0.000	120.0000	No Ice	6.8846	3.2678	0.0594	
			0.0000			1/2" Ice	7.3867	3.9735	0.1048	
			0.0000			1" Ice	7.8887	4.6395	0.1564	
						2" Ice	8.9238	6.0214	0.2814	
						4" Ice	11.1182	8.9947	0.6470	
ATBT-BOTTOM-24V	A	From Face	4.0000	0.000	120.0000	No Ice	0.1212	0.0752	0.0029	
			0.0000			1/2" Ice	0.1722	0.1191	0.0040	
			0.0000			1" Ice	0.2319	0.1716	0.0059	
						2" Ice	0.3770	0.3025	0.0129	
						4" Ice	0.7711	0.6681	0.0447	
ATBT-BOTTOM-24V	B	From Face	4.0000	0.000	120.0000	No Ice	0.1212	0.0752	0.0029	
			0.0000			1/2" Ice	0.1722	0.1191	0.0040	
			0.0000			1" Ice	0.2319	0.1716	0.0059	
						2" Ice	0.3770	0.3025	0.0129	
						4" Ice	0.7711	0.6681	0.0447	
ATBT-BOTTOM-24V	C	From Face	4.0000	0.000	120.0000	No Ice	0.1212	0.0752	0.0029	
			0.0000			1/2" Ice	0.1722	0.1191	0.0040	
			0.0000			1" Ice	0.2319	0.1716	0.0059	
						2" Ice	0.3770	0.3025	0.0129	
						4" Ice	0.7711	0.6681	0.0447	
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.0000	0.000	120.0000	No Ice	11.6828	9.8418	0.0833	
			0.0000			1/2" Ice	12.4043	11.3657	0.1729	
			0.0000			1" Ice	13.1351	12.9138	0.2726	
						2" Ice	14.6007	15.2672	0.5061	
						4" Ice	17.8748	20.1392	1.1511	
LNX-6515DS-VTM w/ Mount Pipe	B	From Face	4.0000	0.000	120.0000	No Ice	11.6828	9.8418	0.0833	
			0.0000			1/2" Ice	12.4043	11.3657	0.1729	
			0.0000			1" Ice	13.1351	12.9138	0.2726	
						2" Ice	14.6007	15.2672	0.5061	
						4" Ice	17.8748	20.1392	1.1511	
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.0000	0.000	120.0000	No Ice	11.6828	9.8418	0.0833	
			0.0000			1/2" Ice	12.4043	11.3657	0.1729	
			0.0000			1" Ice	13.1351	12.9138	0.2726	
						2" Ice	14.6007	15.2672	0.5061	
						4" Ice	17.8748	20.1392	1.1511	
T-Arm Mount [TA 602-3]	C	None		0.000	120.0000	No Ice	11.5900	11.5900	0.2581	
						1/2" Ice	15.4400	15.4400	0.3301	
						1" Ice	19.2900	19.2900	0.4222	
						2" Ice	26.9900	26.9900	0.6907	
						4" Ice	42.3900	42.3900	1.8486	
* 110' * (TBR)										
* 99' *										
TME-RRUS-11	A	From Leg	1.0000	0.000	99.0000	No Ice	3.3103	1.7165	0.0549	
			0.0000			1/2" Ice	3.5756	2.0250	0.0812	
			0.0000			1" Ice	3.8546	2.3700	0.1114	
						2" Ice	4.4462	3.1297	0.1852	
						4" Ice	5.7572	4.8863	0.4040	
TME-RRUS-11	B	From Leg	1.0000	0.000	99.0000	No Ice	3.3103	1.7165	0.0549	
			0.0000			1/2" Ice	3.5756	2.0250	0.0812	



<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	21 of 45
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			0.0000						
						1" Ice	3.8546	2.3700	0.1114
						2" Ice	4.4462	3.1297	0.1852
						4" Ice	5.7572	4.8863	0.4040
TME-RRUS-11	C	From Leg	1.0000		0.000	No Ice	3.3103	1.7165	0.0549
			0.0000			1/2" Ice	3.5756	2.0250	0.0812
			0.0000			1" Ice	3.8546	2.3700	0.1114
						2" Ice	4.4462	3.1297	0.1852
						4" Ice	5.7572	4.8863	0.4040
DC6-48-60-18-8F	A	From Leg	1.0000		0.000	No Ice	1.4667	1.4667	0.0328
			0.0000			1/2" Ice	1.6667	1.6667	0.0505
			0.0000			1" Ice	1.8778	1.8778	0.0707
						2" Ice	2.3333	2.3333	0.1192
						4" Ice	3.3778	3.3778	0.2529
Side Arm Mount [SO 102-3]	C	None			0.000	No Ice	3.0000	3.0000	0.0810
						1/2" Ice	3.4800	3.4800	0.1110
						1" Ice	3.9600	3.9600	0.1410
						2" Ice	4.9200	4.9200	0.2010
						4" Ice	6.8400	6.8400	0.3210
6' x 2" Mount Pipe	A	From Leg	1.0000		0.000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
6' x 2" Mount Pipe	B	From Leg	1.0000		0.000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
6' x 2" Mount Pipe	C	From Leg	1.0000		0.000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
* 95' *									
7770.00 w/ Mount Pipe	A	From Leg	4.0000		0.000	No Ice	6.1194	4.2543	0.0554
			0.0000			1/2" Ice	6.6258	5.0137	0.1028
			0.0000			1" Ice	7.1283	5.7109	0.1566
						2" Ice	8.1643	7.1553	0.2866
						4" Ice	10.3599	10.4117	0.6648
7770.00 w/ Mount Pipe	B	From Leg	4.0000		0.000	No Ice	6.1194	4.2543	0.0554
			0.0000			1/2" Ice	6.6258	5.0137	0.1028
			0.0000			1" Ice	7.1283	5.7109	0.1566
						2" Ice	8.1643	7.1553	0.2866
						4" Ice	10.3599	10.4117	0.6648
7770.00 w/ Mount Pipe	C	From Leg	4.0000		0.000	No Ice	6.1194	4.2543	0.0554
			0.0000			1/2" Ice	6.6258	5.0137	0.1028
			0.0000			1" Ice	7.1283	5.7109	0.1566
						2" Ice	8.1643	7.1553	0.2866
						4" Ice	10.3599	10.4117	0.6648
(2) LGP21401	A	From Leg	4.0000		0.000	No Ice	1.2880	0.2326	0.0141
			0.0000			1/2" Ice	1.4453	0.3134	0.0213
			0.0000			1" Ice	1.6112	0.4028	0.0303
						2" Ice	1.9690	0.6076	0.0549
						4" Ice	2.7882	1.1210	0.1353
(2) LGP21401	B	From Leg	4.0000		0.000	No Ice	1.2880	0.2326	0.0141
			0.0000			1/2" Ice	1.4453	0.3134	0.0213
			0.0000			1" Ice	1.6112	0.4028	0.0303

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	22 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
						2" Ice	1.9690	0.6076	0.0549
						4" Ice	2.7882	1.1210	0.1353
(2) LGP21401	C	From Leg	4.0000	0.0000	95.0000	No Ice	1.2880	0.2326	0.0141
			0.0000			1/2" Ice	1.4453	0.3134	0.0213
			0.0000			1" Ice	1.6112	0.4028	0.0303
						2" Ice	1.9690	0.6076	0.0549
						4" Ice	2.7882	1.1210	0.1353
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000	0.0000	95.0000	No Ice	10.5975	8.1125	0.0766
			0.0000			1/2" Ice	11.2684	9.3041	0.1580
			0.0000			1" Ice	11.9061	10.2095	0.2478
						2" Ice	13.2089	12.1748	0.4558
						4" Ice	15.9341	16.3544	1.0198
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000	0.0000	95.0000	No Ice	10.5975	8.1125	0.0766
			0.0000			1/2" Ice	11.2684	9.3041	0.1580
			0.0000			1" Ice	11.9061	10.2095	0.2478
						2" Ice	13.2089	12.1748	0.4558
						4" Ice	15.9341	16.3544	1.0198
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000	0.0000	95.0000	No Ice	10.5975	8.1125	0.0766
			0.0000			1/2" Ice	11.2684	9.3041	0.1580
			0.0000			1" Ice	11.9061	10.2095	0.2478
						2" Ice	13.2089	12.1748	0.4558
						4" Ice	15.9341	16.3544	1.0198
RRUS 12	A	From Leg	4.0000	0.0000	95.0000	No Ice	3.6692	1.4875	0.0580
			0.0000			1/2" Ice	3.9256	1.6727	0.0812
			0.0000			1" Ice	4.1907	1.8665	0.1076
						2" Ice	4.7468	2.2800	0.1709
						4" Ice	5.9627	3.2107	0.3443
RRUS 12	B	From Leg	4.0000	0.0000	95.0000	No Ice	3.6692	1.4875	0.0580
			0.0000			1/2" Ice	3.9256	1.6727	0.0812
			0.0000			1" Ice	4.1907	1.8665	0.1076
						2" Ice	4.7468	2.2800	0.1709
						4" Ice	5.9627	3.2107	0.3443
RRUS 12	C	From Leg	4.0000	0.0000	95.0000	No Ice	3.6692	1.4875	0.0580
			0.0000			1/2" Ice	3.9256	1.6727	0.0812
			0.0000			1" Ice	4.1907	1.8665	0.1076
						2" Ice	4.7468	2.2800	0.1709
						4" Ice	5.9627	3.2107	0.3443
RRUS A2	A	From Leg	4.0000	0.0000	95.0000	No Ice	2.4107	0.5329	0.0220
			0.0000			1/2" Ice	2.6193	0.6652	0.0346
			0.0000			1" Ice	2.8366	0.8062	0.0497
						2" Ice	3.2970	1.1140	0.0880
						4" Ice	4.3216	1.8335	0.2025
RRUS A2	B	From Leg	4.0000	0.0000	95.0000	No Ice	2.4107	0.5329	0.0220
			0.0000			1/2" Ice	2.6193	0.6652	0.0346
			0.0000			1" Ice	2.8366	0.8062	0.0497
						2" Ice	3.2970	1.1140	0.0880
						4" Ice	4.3216	1.8335	0.2025
RRUS A2	C	From Leg	4.0000	0.0000	95.0000	No Ice	2.4107	0.5329	0.0220
			0.0000			1/2" Ice	2.6193	0.6652	0.0346
			0.0000			1" Ice	2.8366	0.8062	0.0497
						2" Ice	3.2970	1.1140	0.0880
						4" Ice	4.3216	1.8335	0.2025
Platform Mount [LP 1001-1]	C	None		0.000	95.0000	No Ice	47.7000	47.7000	3.0170
						1/2" Ice	59.5000	59.5000	3.6210
						1" Ice	71.3000	71.3000	4.2250
						2" Ice	94.9000	94.9000	5.4330
						4" Ice	142.1000	142.1000	7.8490

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	23 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub>		Weight K	
			Horz Lateral ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>		
(2) 6' x 2" Mount Pipe	A	From Leg	4.0000	0.0000	0.000	95.0000	No Ice	1.4250	1.4250	0.0220
			0.0000				1/2" Ice	1.9250	1.9250	0.0328
			0.0000				1" Ice	2.2939	2.2939	0.0477
							2" Ice	3.0596	3.0596	0.0903
							4" Ice	4.7022	4.7022	0.2308
(2) 6' x 2" Mount Pipe	B	From Leg	4.0000	0.0000	0.000	95.0000	No Ice	1.4250	1.4250	0.0220
			0.0000				1/2" Ice	1.9250	1.9250	0.0328
			0.0000				1" Ice	2.2939	2.2939	0.0477
							2" Ice	3.0596	3.0596	0.0903
							4" Ice	4.7022	4.7022	0.2308
(2) 6' x 2" Mount Pipe	C	From Leg	4.0000	0.0000	0.000	95.0000	No Ice	1.4250	1.4250	0.0220
			0.0000				1/2" Ice	1.9250	1.9250	0.0328
			0.0000				1" Ice	2.2939	2.2939	0.0477
							2" Ice	3.0596	3.0596	0.0903
							4" Ice	4.7022	4.7022	0.2308
* 73' *										
1900MHz 4X40W RRH	A	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.7087	2.6087	0.0595
			0.0000				1/2" Ice	2.9477	2.8450	0.0826
			2.0000				1" Ice	3.1953	3.0899	0.1090
							2" Ice	3.7164	3.6057	0.1722
							4" Ice	4.8623	4.7410	0.3459
1900MHz 4X40W RRH	B	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.7087	2.6087	0.0595
			0.0000				1/2" Ice	2.9477	2.8450	0.0826
			2.0000				1" Ice	3.1953	3.0899	0.1090
							2" Ice	3.7164	3.6057	0.1722
							4" Ice	4.8623	4.7410	0.3459
1900MHz 4X40W RRH	C	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.7087	2.6087	0.0595
			0.0000				1/2" Ice	2.9477	2.8450	0.0826
			2.0000				1" Ice	3.1953	3.0899	0.1090
							2" Ice	3.7164	3.6057	0.1722
							4" Ice	4.8623	4.7410	0.3459
800 EXTERNAL NOTCH FILTER	A	From Face	4.0000	0.0000	0.000	73.0000	No Ice	0.7701	0.3747	0.0110
			0.0000				1/2" Ice	0.8898	0.4647	0.0168
			2.0000				1" Ice	1.0181	0.5634	0.0243
							2" Ice	1.3007	0.7868	0.0448
							4" Ice	1.9696	1.3372	0.1140
800 EXTERNAL NOTCH FILTER	B	From Face	4.0000	0.0000	0.000	73.0000	No Ice	0.7701	0.3747	0.0110
			0.0000				1/2" Ice	0.8898	0.4647	0.0168
			2.0000				1" Ice	1.0181	0.5634	0.0243
							2" Ice	1.3007	0.7868	0.0448
							4" Ice	1.9696	1.3372	0.1140
800 EXTERNAL NOTCH FILTER	C	From Face	4.0000	0.0000	0.000	73.0000	No Ice	0.7701	0.3747	0.0110
			0.0000				1/2" Ice	0.8898	0.4647	0.0168
			2.0000				1" Ice	1.0181	0.5634	0.0243
							2" Ice	1.3007	0.7868	0.0448
							4" Ice	1.9696	1.3372	0.1140
800MHZ 2X50W RRH	A	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.4899	2.0685	0.0530
			0.0000				1/2" Ice	2.7061	2.2705	0.0742
			2.0000				1" Ice	2.9310	2.4812	0.0984
							2" Ice	3.4068	2.9284	0.1566
							4" Ice	4.4620	3.9265	0.3178
800MHZ 2X50W RRH	B	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.4899	2.0685	0.0530
			0.0000				1/2" Ice	2.7061	2.2705	0.0742
			2.0000				1" Ice	2.9310	2.4812	0.0984
							2" Ice	3.4068	2.9284	0.1566
							4" Ice	4.4620	3.9265	0.3178
800MHZ 2X50W RRH	C	From Face	4.0000	0.0000	0.000	73.0000	No Ice	2.4899	2.0685	0.0530

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	<b>Project</b>		BU842873_WO1182451		<b>Date</b>		09:51:22 02/04/16	
	<b>Client</b>		Crown Castle		<b>Designed by</b>		LeeMH	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
				0.0000					
				2.0000		1/2" Ice	2.7061	2.2705	0.0742
						1" Ice	2.9310	2.4812	0.0984
						2" Ice	3.4068	2.9284	0.1566
						4" Ice	4.4620	3.9265	0.3178
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000	0.000	73.0000	No Ice	8.4975	6.9458	0.0826
			0.0000			1/2" Ice	9.1490	8.1266	0.1506
			2.0000			1" Ice	9.7672	9.0212	0.2265
						2" Ice	11.0311	10.8440	0.4060
						4" Ice	13.6786	14.8507	0.9089
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000	0.000	73.0000	No Ice	8.4975	6.9458	0.0826
			0.0000			1/2" Ice	9.1490	8.1266	0.1506
			2.0000			1" Ice	9.7672	9.0212	0.2265
						2" Ice	11.0311	10.8440	0.4060
						4" Ice	13.6786	14.8507	0.9089
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000	0.000	73.0000	No Ice	8.4975	6.9458	0.0826
			0.0000			1/2" Ice	9.1490	8.1266	0.1506
			2.0000			1" Ice	9.7672	9.0212	0.2265
						2" Ice	11.0311	10.8440	0.4060
						4" Ice	13.6786	14.8507	0.9089
Platform Mount [LP 1201-1]	C	None		0.000	73.0000	No Ice	23.1000	23.1000	2.1000
						1/2" Ice	26.8000	26.8000	2.5000
						1" Ice	30.5000	30.5000	2.9000
						2" Ice	37.9000	37.9000	3.7000
						4" Ice	52.7000	52.7000	5.3000
(2) 6' x 2" Mount Pipe	A	From Face	4.0000	0.000	73.0000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
(2) 6' x 2" Mount Pipe	B	From Face	4.0000	0.000	73.0000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
(2) 6' x 2" Mount Pipe	C	From Face	4.0000	0.000	73.0000	No Ice	1.4250	1.4250	0.0220
			0.0000			1/2" Ice	1.9250	1.9250	0.0328
			0.0000			1" Ice	2.2939	2.2939	0.0477
						2" Ice	3.0596	3.0596	0.0903
						4" Ice	4.7022	4.7022	0.2308
10' x 3" Pipe Mount	A	From Face	4.0000	0.000	73.0000	No Ice	3.0000	3.0000	0.0800
			0.0000			1/2" Ice	4.0333	4.0333	0.1018
			0.0000			1" Ice	5.0269	5.0269	0.1301
						2" Ice	6.2574	6.2574	0.2072
						4" Ice	8.8296	8.8296	0.4467
10' x 3" Pipe Mount	B	From Face	4.0000	0.000	73.0000	No Ice	3.0000	3.0000	0.0800
			0.0000			1/2" Ice	4.0333	4.0333	0.1018
			0.0000			1" Ice	5.0269	5.0269	0.1301
						2" Ice	6.2574	6.2574	0.2072
						4" Ice	8.8296	8.8296	0.4467
10' x 3" Pipe Mount	C	From Face	4.0000	0.000	73.0000	No Ice	3.0000	3.0000	0.0800
			0.0000			1/2" Ice	4.0333	4.0333	0.1018
			0.0000			1" Ice	5.0269	5.0269	0.1301
						2" Ice	6.2574	6.2574	0.2072
						4" Ice	8.8296	8.8296	0.4467
* 50' *									
GPS-TMG-HR-26NCM	C	From Leg	1.0000	0.000	50.0000	No Ice	0.1556	0.1556	0.0006
			0.0000			1/2" Ice	0.2130	0.2130	0.0024

<p style="text-align: center;"><b>tnxTower</b></p> <p><b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	25 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			0.0000						
						1" Ice	0.2791	0.2791	0.0051
						2" Ice	0.4373	0.4373	0.0141
						4" Ice	0.8573	0.8573	0.0518
Pipe Mount [PM 601-1]	C	From Leg	0.5000	0.000	50.0000	No Ice	3.0000	0.9000	0.0650
			0.0000			1/2" Ice	3.7400	1.1200	0.0791
			0.0000			1" Ice	4.4800	1.3400	0.0933
						2" Ice	5.9600	1.7800	0.1215
						4" Ice	8.9200	2.6600	0.1781
***									

## Load Combinations

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

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	26 of 45
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

<i>Comb. No.</i>	<i>Description</i>
38	Dead+Wind 330 deg - Service

### Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Force K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	140 - 135	Pole	Max Tension	14	0.0000	0.00	0.00
			Max. Compression	14	-5.4720	0.85	-0.43
			Max. Mx	11	-2.0897	32.07	-0.81
			Max. My	8	-2.1227	0.91	-31.12
			Max. Vy	11	-6.8252	32.07	-0.81
			Max. Vx	8	6.6683	0.91	-31.12
			Max. Torque	7			-0.95
L2	135 - 130	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-5.8085	0.83	-0.46
			Max. Mx	11	-2.3044	66.82	-1.51
			Max. My	8	-2.3361	1.60	-65.10
			Max. Vy	11	-7.0823	66.82	-1.51
			Max. Vx	8	6.9251	1.60	-65.10
			Max. Torque	7			-0.95
L3	130 - 125	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-6.1621	0.81	-0.48
			Max. Mx	11	-2.5466	102.87	-2.20
			Max. My	8	-2.5765	2.30	-100.37
			Max. Vy	11	-7.3450	102.87	-2.20
			Max. Vx	8	7.1878	2.30	-100.37
			Max. Torque	7			-0.95
L4	125 - 120	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-6.5327	0.78	-0.51
			Max. Mx	11	-2.8120	140.24	-2.90
			Max. My	8	-2.8397	2.98	-136.97
			Max. Vy	5	7.6137	-139.62	2.59
			Max. Vx	8	7.4563	2.98	-136.97
			Max. Torque	7			-0.95
L5	120 - 115	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-9.4835	0.51	-0.68
			Max. Mx	11	-3.7534	197.79	-3.63
			Max. My	8	-3.7829	3.63	-193.82
			Max. Vy	5	11.7305	-197.28	3.24
			Max. Vx	8	11.5723	3.63	-193.82
			Max. Torque	7			-0.95
L6	115 - 114.75	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-9.5324	0.50	-0.69
			Max. Mx	11	-3.7920	200.72	-3.67
			Max. My	8	-3.8212	3.66	-196.72
			Max. Vy	5	11.7497	-200.22	3.28
			Max. Vx	8	11.5916	3.66	-196.72
			Max. Torque	7			-0.93
L7	114.75 - 109.75	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-10.5116	0.21	-0.86
			Max. Mx	11	-4.3556	260.53	-4.40
			Max. My	8	-4.3837	4.30	-255.83
			Max. Vy	5	12.2038	-260.15	3.93
			Max. Vx	8	12.0453	4.30	-255.83
			Max. Torque	7			-0.93
L8	109.75 - 104.75	Pole	Max Tension	1	0.0000	0.00	0.00

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	27 of 45
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L9	104.75 - 101.483	Pole	Max. Compression	14	-11.5062	-0.09	-1.04
			Max. Mx	11	-4.9453	322.60	-5.13
			Max. My	8	-4.9720	4.94	-317.21
			Max. Vy	5	12.6582	-322.35	4.58
			Max. Vx	8	12.4993	4.94	-317.21
			Max. Torque	7			-0.92
			Max Tension	1	0.0000	0.00	0.00
L10	101.483 - 101.333	Pole	Max. Compression	14	-12.1108	-0.29	-1.17
			Max. Mx	11	-5.2997	364.37	-5.61
			Max. My	8	-5.3250	5.35	-358.53
			Max. Vy	5	12.9463	-364.20	5.01
			Max. Vx	8	12.7873	5.35	-358.53
			Max. Torque	7			-0.91
			Max Tension	1	0.0000	0.00	0.00
L11	101.333 - 96.333	Pole	Max. Compression	14	-12.1388	-0.30	-1.18
			Max. Mx	11	-5.3251	366.31	-5.64
			Max. My	8	-5.3502	5.37	-360.45
			Max. Vy	5	12.9560	-366.15	5.03
			Max. Vx	8	12.7971	5.37	-360.45
			Max. Torque	7			-0.90
			Max Tension	1	0.0000	0.00	0.00
L12	96.333 - 91.333	Pole	Max. Compression	14	-13.7204	-0.63	-1.25
			Max. Mx	11	-6.1760	434.03	-6.32
			Max. My	8	-6.1997	6.00	-427.43
			Max. Vy	5	14.1210	-434.01	5.73
			Max. Vx	8	13.9618	6.00	-427.43
			Max. Torque	7			-0.90
			Max Tension	1	0.0000	0.00	0.00
L13	91.333 - 91	Pole	Max. Compression	14	-20.7086	-0.97	-1.44
			Max. Mx	5	-10.2865	-524.85	6.39
			Max. My	8	-10.3128	6.63	-517.43
			Max. Vy	5	19.7601	-524.85	6.39
			Max. Vx	8	19.5984	6.63	-517.43
			Max. Torque	7			-0.82
			Max Tension	1	0.0000	0.00	0.00
L14	91 - 90.75	Pole	Max. Compression	14	-20.7764	-0.99	-1.45
			Max. Mx	5	-10.3416	-531.44	6.43
			Max. My	8	-10.3674	6.67	-523.96
			Max. Vy	5	19.7821	-531.44	6.43
			Max. Vx	8	19.6205	6.67	-523.96
			Max. Torque	7			-0.81
			Max Tension	1	0.0000	0.00	0.00
L15	90.75 - 85.75	Pole	Max. Compression	14	-20.8427	-1.01	-1.46
			Max. Mx	5	-10.3902	-536.39	6.47
			Max. My	8	-10.4159	6.70	-528.87
			Max. Vy	5	19.8039	-536.39	6.47
			Max. Vx	8	19.6423	6.70	-528.87
			Max. Torque	7			-0.81
			Max Tension	1	0.0000	0.00	0.00
L16	85.75 - 80.75	Pole	Max. Compression	14	-22.1725	-1.37	-1.65
			Max. Mx	5	-11.3055	-636.64	7.12
			Max. My	8	-11.3298	7.33	-628.28
			Max. Vy	5	20.2720	-636.64	7.12
			Max. Vx	8	20.1103	7.33	-628.28
			Max. Torque	7			-0.81
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-23.5239	-1.75	-1.85

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L17	80.75 - 75.75	Pole	Max. Mx	5	-12.2559	-739.20	7.78
			Max. My	8	-12.2786	7.96	-729.99
			Max. Vy	5	20.7323	-739.20	7.78
			Max. Vx	8	20.5706	7.96	-729.99
			Max. Torque	7			-0.79
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-24.8966	-2.14	-2.05
			Max. Mx	5	-13.2332	-844.05	8.43
			Max. My	8	-13.2543	8.58	-834.00
			Max. Vy	5	21.1877	-844.05	8.43
L18	75.75 - 70.75	Pole	Max. Vx	8	21.0262	8.58	-834.00
			Max. Torque	7			-0.78
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-30.9041	-2.54	-2.26
			Max. Mx	5	-17.1539	-961.78	9.09
			Max. My	8	-17.1750	9.20	-950.88
			Max. Vy	5	24.9646	-961.78	9.09
			Max. Vx	8	24.8017	9.20	-950.88
			Max. Torque	7			-0.76
			Max Tension	1	0.0000	0.00	0.00
L19	70.75 - 69.983	Pole	Max. Compression	14	-31.1201	-2.60	-2.30
			Max. Mx	5	-17.3157	-980.96	9.19
			Max. My	8	-17.3364	9.29	-969.93
			Max. Vy	5	25.0290	-980.96	9.19
			Max. Vx	8	24.8662	9.29	-969.93
			Max. Torque	7			-0.75
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-31.1906	-2.62	-2.31
			Max. Mx	5	-17.3741	-987.23	9.22
			Max. My	8	-17.3946	9.32	-976.15
L20	69.983 - 69.733	Pole	Max. Vy	5	25.0463	-987.23	9.22
			Max. Vx	8	24.8835	9.32	-976.15
			Max. Torque	7			-0.74
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-32.6064	-3.04	-2.53
			Max. Mx	5	-18.4147	-1113.59	9.87
			Max. My	8	-18.4335	9.94	-1101.67
			Max. Vy	5	25.4778	-1113.59	9.87
			Max. Vx	8	25.3154	9.94	-1101.67
			Max. Torque	7			-0.74
L21	69.733 - 64.733	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-33.1030	-3.18	-2.60
			Max. Mx	5	-18.7759	-1157.89	10.10
			Max. My	8	-18.7941	10.15	-1145.67
			Max. Vy	5	25.6305	-1157.89	10.10
			Max. Vx	8	25.4682	10.15	-1145.67
			Max. Torque	7			-0.73
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-33.1903	-3.21	-2.62
			Max. Mx	5	-18.8632	-1164.30	10.13
L22	64.733 - 63	Pole	Max. My	8	-18.8810	10.18	-1152.04
			Max. Vy	5	25.6389	-1164.30	10.13
			Max. Vx	8	25.4768	10.18	-1152.04
			Max. Torque	7			-0.72
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-34.4697	-3.52	-2.78
			Max. Mx	5	-19.8466	-1258.99	10.60
			Max. My	8	-19.8635	10.62	-1246.10
			Max. Vy	5	25.9799	-1258.99	10.60



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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L25	59.083 - 58.817	Pole	Max. Vx	8	25.8179	10.62	-1246.10
			Max. Torque	7			-0.72
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-34.5589	-3.54	-2.79
			Max. Mx	5	-19.9250	-1265.91	10.64
			Max. My	8	-19.9417	10.65	-1252.97
			Max. Vy	5	25.9968	-1265.91	10.64
			Max. Vx	8	25.8349	10.65	-1252.97
			Max. Torque	7			-0.71
L26	58.817 - 58.667	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-34.6092	-3.56	-2.80
			Max. Mx	5	-19.9652	-1269.81	10.66
			Max. My	8	-19.9819	10.67	-1256.85
			Max. Vy	5	26.0097	-1269.81	10.66
			Max. Vx	8	25.8477	10.67	-1256.85
			Max. Torque	7			-0.71
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-36.2882	-4.00	-3.03
L27	58.667 - 53.667	Pole	Max. Mx	5	-21.2587	-1401.05	11.30
			Max. My	8	-21.2739	11.27	-1387.24
			Max. Vy	5	26.4584	-1401.05	11.30
			Max. Vx	8	26.2968	11.27	-1387.24
			Max. Torque	7			-0.71
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-36.5147	-4.06	-3.06
			Max. Mx	5	-21.4391	-1418.73	11.39
			Max. My	8	-21.4540	11.35	-1404.80
L28	53.667 - 48.58	Pole	Max. Vy	5	26.5125	-1418.73	11.39
			Max. Vx	8	26.3509	11.35	-1404.80
			Max. Torque	7			-0.69
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-39.5284	-4.39	-3.40
			Max. Mx	5	-23.8201	-1564.13	12.10
			Max. My	8	-23.8355	12.18	-1549.36
			Max. Vy	5	27.1509	-1564.13	12.10
			Max. Vx	8	26.9522	12.18	-1549.36
L29	48.58 - 47.58	Pole	Max. Torque	7			-0.74
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-41.2222	-4.84	-3.64
			Max. Mx	5	-25.1530	-1700.95	12.90
			Max. My	8	-25.1665	12.94	-1685.13
			Max. Vy	5	27.5553	-1700.95	12.90
			Max. Vx	8	27.3572	12.94	-1685.13
			Max. Torque	7			-0.74
			Max Tension	1	0.0000	0.00	0.00
L30	47.58 - 42.58	Pole	Max. Compression	14	-42.1051	-5.08	-3.76
			Max. Mx	5	-25.8486	-1772.33	13.31
			Max. My	8	-25.8613	13.32	-1755.98
			Max. Vy	5	27.7611	-1772.33	13.31
			Max. Vx	8	27.5633	13.32	-1755.98
			Max. Torque	7			-0.72
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-42.2064	-5.10	-3.78
			Max. Mx	5	-25.9440	-1779.27	13.35
L31	42.58 - 40	Pole	Max. My	8	-25.9564	13.36	-1762.87
			Max. Vy	5	27.7700	-1779.27	13.35
			Max. Vx	8	27.5724	13.36	-1762.87
			Max. Torque	7			-0.71
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-42.2064	-5.10	-3.78
			Max. Mx	5	-25.9440	-1779.27	13.35
			Max. My	8	-25.9564	13.36	-1762.87
			Max. Vy	5	27.7700	-1779.27	13.35
L32	40 - 39.75	Pole	Max. Vx	8	27.5724	13.36	-1762.87
			Max. Torque	7			-0.71
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-42.2064	-5.10	-3.78
			Max. Mx	5	-25.9440	-1779.27	13.35
			Max. My	8	-25.9564	13.36	-1762.87
			Max. Vy	5	27.7700	-1779.27	13.35
			Max. Vx	8	27.5724	13.36	-1762.87
			Max. Torque	7			-0.71

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L33	39.75 - 34.75	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-44.2282	-5.55	-4.01
			Max. Mx	5	-27.5812	-1919.25	14.14
			Max. My	8	-27.5923	14.10	-1901.81
			Max. Vy	5	28.1883	-1919.25	14.14
			Max. Vx	8	27.9910	14.10	-1901.81
			Max. Torque	7			-0.71
L34	34.75 - 31.416	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-45.5879	-5.85	-4.16
			Max. Mx	5	-28.6917	-2013.71	14.67
			Max. My	8	-28.7018	14.60	-1995.58
			Max. Vy	5	28.4538	-2013.71	14.67
			Max. Vx	8	28.2568	14.60	-1995.58
			Max. Torque	7			-0.69
L35	31.416 - 31.166	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-45.6907	-5.88	-4.17
			Max. Mx	5	-28.7840	-2020.83	14.71
			Max. My	8	-28.7939	14.63	-2002.65
			Max. Vy	5	28.4655	-2020.83	14.71
			Max. Vx	8	28.2686	14.63	-2002.65
			Max. Torque	12			0.69
L36	31.166 - 29	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-46.5817	-6.07	-4.28
			Max. Mx	5	-29.5052	-2082.72	15.05
			Max. My	8	-29.5147	14.95	-2064.09
			Max. Vy	5	28.6448	-2082.72	15.05
			Max. Vx	8	28.4480	14.95	-2064.09
			Max. Torque	12			0.69
L37	29 - 28.75	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-46.6799	-6.10	-4.29
			Max. Mx	5	-29.5931	-2089.88	15.09
			Max. My	8	-29.6024	14.99	-2071.20
			Max. Vy	5	28.6561	-2089.88	15.09
			Max. Vx	8	28.4594	14.99	-2071.20
			Max. Torque	12			0.68
L38	28.75 - 23.75	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-48.6481	-6.57	-4.53
			Max. Mx	5	-31.1899	-2234.21	15.87
			Max. My	8	-31.1977	15.72	-2214.50
			Max. Vy	5	29.0443	-2234.21	15.87
			Max. Vx	8	28.8483	15.72	-2214.50
			Max. Torque	12			0.68
L39	23.75 - 23.5	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-48.7477	-6.59	-4.54
			Max. Mx	5	-31.2793	-2241.48	15.91
			Max. My	8	-31.2869	15.76	-2221.71
			Max. Vy	5	29.0547	-2241.48	15.91
			Max. Vx	8	28.8589	15.76	-2221.71
			Max. Torque	12			0.67
L40	23.5 - 23.25	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-48.8524	-6.62	-4.56
			Max. Mx	5	-31.3658	-2248.75	15.95
			Max. My	8	-31.3733	15.79	-2228.93
			Max. Vy	5	29.0738	-2248.75	15.95
			Max. Vx	8	28.8780	15.79	-2228.93
			Max. Torque	12			0.67
L41	23.25 - 18.25	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-50.9484	-7.10	-4.81
			Max. Mx	5	-33.0890	-2395.17	16.72
			Max. My	8	-33.0949	16.51	-2374.32

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L42	18.25 - 13.25	Pole	Max. Vy	5	29.4607	-2395.17	16.72
			Max. Vx	8	29.2657	16.51	-2374.32
			Max. Torque	12			0.67
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-53.0692	-7.60	-5.06
			Max. Mx	5	-34.8425	-2543.47	17.50
			Max. My	8	-34.8469	17.23	-2521.60
			Max. Vy	5	29.8366	-2543.47	17.50
L43	13.25 - 8.25	Pole	Max. Vx	8	29.6425	17.23	-2521.60
			Max. Torque	12			0.66
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-55.2146	-8.11	-5.33
			Max. Mx	5	-36.6182	-2693.65	18.26
			Max. My	8	-36.6208	17.94	-2670.75
			Max. Vy	5	30.2101	-2693.65	18.26
			Max. Vx	8	30.0170	17.94	-2670.75
L44	8.25 - 5.25	Pole	Max. Torque	12			0.65
			Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-56.5164	-8.43	-5.49
			Max. Mx	5	-37.6958	-2784.66	18.72
			Max. My	8	-37.6975	18.36	-2761.14
			Max. Vy	5	30.4342	-2784.66	18.72
			Max. Vx	8	30.2418	18.36	-2761.14
			Max. Torque	12			0.64
L45	5.25 - 5	Pole	Max Tension	1	0.0000	0.00	0.00
			Max. Compression	14	-56.6210	-8.45	-5.51
			Max. Mx	5	-37.7897	-2792.27	18.76
			Max. My	8	-37.7912	18.39	-2768.70
			Max. Vy	5	30.4429	-2792.27	18.76
			Max. Vx	8	30.2506	18.39	-2768.70
			Max. Torque	12			0.64
			Max Tension	1	0.0000	0.00	0.00
L46	5 - 0	Pole	Max. Compression	14	-58.7168	-8.99	-5.78
			Max. Mx	5	-39.4887	-2945.57	19.51
			Max. My	8	-39.4889	19.09	-2920.99
			Max. Vy	5	30.8409	-2945.57	19.51
			Max. Vx	8	30.6496	19.09	-2920.99
			Max. Torque	12			0.64

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	58.7168	-0.0000	-0.0000
	Max. H <sub>x</sub>	11	39.4986	30.8283	-0.1656
	Max. H <sub>z</sub>	2	39.4986	-0.1656	30.6370
	Max. M <sub>x</sub>	2	2917.98	-0.1656	30.6370
	Max. M <sub>z</sub>	5	2945.57	-30.8283	0.1656
	Max. Torsion	12	0.63	26.6152	15.1751
	Min. Vert	1	39.4986	0.0000	0.0000
	Min. H <sub>x</sub>	5	39.4986	-30.8283	0.1656
	Min. H <sub>z</sub>	8	39.4986	0.1656	-30.6370
	Min. M <sub>x</sub>	8	-2920.99	0.1656	-30.6370
	Min. M <sub>z</sub>	11	-2941.73	30.8283	-0.1656
	Min. Torsion	6	-0.59	-26.6152	-15.1751

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## Tower Mast Reaction Summary

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overtuning Moment, M <sub>x</sub>	Overtuning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	39.4986	0.0000	0.0000	1.47	-1.89	0.00
Dead+Wind 0 deg - No Ice	39.4986	0.1656	-30.6370	-2917.98	-22.95	-0.35
Dead+Wind 30 deg - No Ice	39.4986	15.5576	-26.6152	-2537.26	-1491.96	-0.06
Dead+Wind 60 deg - No Ice	39.4986	26.7809	-15.4620	-1476.36	-2561.67	0.24
Dead+Wind 90 deg - No Ice	39.4986	30.8283	-0.1656	-19.51	-2945.57	0.47
Dead+Wind 120 deg - No Ice	39.4986	26.6152	15.1751	1443.04	-2540.78	0.59
Dead+Wind 150 deg - No Ice	39.4986	15.2707	26.4496	2519.38	-1455.63	0.56
Dead+Wind 180 deg - No Ice	39.4986	-0.1656	30.6370	2920.99	19.09	0.39
Dead+Wind 210 deg - No Ice	39.4986	-15.5576	26.6152	2540.28	1488.10	0.09
Dead+Wind 240 deg - No Ice	39.4986	-26.7809	15.4620	1479.38	2557.82	-0.24
Dead+Wind 270 deg - No Ice	39.4986	-30.8283	0.1656	22.52	2941.73	-0.51
Dead+Wind 300 deg - No Ice	39.4986	-26.6152	-15.1751	-1440.04	2536.93	-0.63
Dead+Wind 330 deg - No Ice	39.4986	-15.2707	-26.4496	-2516.38	1451.77	-0.56
Dead+Ice+Temp	58.7168	0.0000	0.0000	5.78	-8.99	0.00
Dead+Wind 0 deg+Ice+Temp	58.7168	0.0362	-8.1251	-774.23	-13.62	-0.04
Dead+Wind 30 deg+Ice+Temp	58.7168	4.1147	-7.0546	-672.00	-405.67	0.01
Dead+Wind 60 deg+Ice+Temp	58.7168	7.0908	-4.0939	-388.14	-691.45	0.06
Dead+Wind 90 deg+Ice+Temp	58.7168	8.1669	-0.0362	1.28	-794.39	0.10
Dead+Wind 120 deg+Ice+Temp	58.7168	7.0546	4.0313	391.92	-686.90	0.11
Dead+Wind 150 deg+Ice+Temp	58.7168	4.0521	7.0185	679.11	-397.78	0.09
Dead+Wind 180 deg+Ice+Temp	58.7168	-0.0362	8.1251	785.90	-4.51	0.05
Dead+Wind 210 deg+Ice+Temp	58.7168	-4.1147	7.0546	683.66	387.54	-0.01
Dead+Wind 240 deg+Ice+Temp	58.7168	-7.0908	4.0939	399.81	673.32	-0.06
Dead+Wind 270 deg+Ice+Temp	58.7168	-8.1669	0.0362	10.39	776.25	-0.10
Dead+Wind 300 deg+Ice+Temp	58.7168	-7.0546	-4.0313	-380.25	668.77	-0.11
Dead+Wind 330 deg+Ice+Temp	58.7168	-4.0521	-7.0185	-667.45	379.65	-0.09
Dead+Wind 0 deg - Service	39.4986	0.0573	-10.6010	-1010.00	-9.22	-0.13
Dead+Wind 30 deg - Service	39.4986	5.3832	-9.2094	-878.12	-518.20	-0.03
Dead+Wind 60 deg - Service	39.4986	9.2667	-5.3502	-510.55	-888.85	0.08
Dead+Wind 90 deg - Service	39.4986	10.6672	-0.0573	-5.78	-1021.85	0.17
Dead+Wind 120 deg - Service	39.4986	9.2094	5.2509	500.95	-881.56	0.21
Dead+Wind 150 deg - Service	39.4986	5.2840	9.1521	873.86	-505.58	0.20
Dead+Wind 180 deg - Service	39.4986	-0.0573	10.6010	1013.02	5.36	0.13
Dead+Wind 210 deg - Service	39.4986	-5.3832	9.2094	881.14	514.34	0.03
Dead+Wind 240 deg - Service	39.4986	-9.2667	5.3502	513.57	884.99	-0.08
Dead+Wind 270 deg - Service	39.4986	-10.6672	0.0573	8.80	1017.99	-0.17
Dead+Wind 300 deg - Service	39.4986	-9.2094	-5.2509	-497.93	877.71	-0.22
Dead+Wind 330 deg - Service	39.4986	-5.2840	-9.1521	-870.84	501.72	-0.20

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.0000	-39.4986	0.0000	0.0000	39.4986	0.0000	0.000%
2	0.1656	-39.4986	-30.6370	-0.1656	39.4986	30.6370	0.000%
3	15.5576	-39.4986	-26.6152	-15.5576	39.4986	26.6152	0.000%
4	26.7809	-39.4986	-15.4620	-26.7809	39.4986	15.4620	0.000%
5	30.8283	-39.4986	-0.1656	-30.8283	39.4986	0.1656	0.000%
6	26.6152	-39.4986	15.1751	-26.6152	39.4986	-15.1751	0.000%
7	15.2707	-39.4986	26.4496	-15.2707	39.4986	-26.4496	0.000%
8	-0.1656	-39.4986	30.6370	0.1656	39.4986	-30.6370	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
9	-15.5576	-39.4986	26.6152	15.5576	39.4986	-26.6152	0.000%
10	-26.7809	-39.4986	15.4620	26.7809	39.4986	-15.4620	0.000%
11	-30.8283	-39.4986	0.1656	30.8283	39.4986	-0.1656	0.000%
12	-26.6152	-39.4986	-15.1751	26.6152	39.4986	15.1751	0.000%
13	-15.2707	-39.4986	-26.4496	15.2707	39.4986	26.4496	0.000%
14	0.0000	-58.7168	0.0000	-0.0000	58.7168	-0.0000	0.000%
15	0.0362	-58.7168	-8.1251	-0.0362	58.7168	8.1251	0.000%
16	4.1147	-58.7168	-7.0546	-4.1147	58.7168	7.0546	0.000%
17	7.0908	-58.7168	-4.0939	-7.0908	58.7168	4.0939	0.000%
18	8.1669	-58.7168	-0.0362	-8.1669	58.7168	0.0362	0.000%
19	7.0546	-58.7168	4.0313	-7.0546	58.7168	-4.0313	0.000%
20	4.0521	-58.7168	7.0185	-4.0521	58.7168	-7.0185	0.000%
21	-0.0362	-58.7168	8.1251	0.0362	58.7168	-8.1251	0.000%
22	-4.1147	-58.7168	7.0546	4.1147	58.7168	-7.0546	0.000%
23	-7.0908	-58.7168	4.0939	7.0908	58.7168	-4.0939	0.000%
24	-8.1669	-58.7168	0.0362	8.1669	58.7168	-0.0362	0.000%
25	-7.0546	-58.7168	-4.0313	7.0546	58.7168	4.0313	0.000%
26	-4.0521	-58.7168	-7.0185	4.0521	58.7168	7.0185	0.000%
27	0.0573	-39.4986	-10.6010	-0.0573	39.4986	10.6010	0.000%
28	5.3832	-39.4986	-9.2094	-5.3832	39.4986	9.2094	0.000%
29	9.2667	-39.4986	-5.3502	-9.2667	39.4986	5.3502	0.000%
30	10.6672	-39.4986	-0.0573	-10.6672	39.4986	0.0573	0.000%
31	9.2094	-39.4986	5.2509	-9.2094	39.4986	-5.2509	0.000%
32	5.2840	-39.4986	9.1521	-5.2840	39.4986	-9.1521	0.000%
33	-0.0573	-39.4986	10.6010	0.0573	39.4986	-10.6010	0.000%
34	-5.3832	-39.4986	9.2094	5.3832	39.4986	-9.2094	0.000%
35	-9.2667	-39.4986	5.3502	9.2667	39.4986	-5.3502	0.000%
36	-10.6672	-39.4986	0.0573	10.6672	39.4986	-0.0573	0.000%
37	-9.2094	-39.4986	-5.2509	9.2094	39.4986	5.2509	0.000%
38	-5.2840	-39.4986	-9.1521	5.2840	39.4986	9.1521	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00006565
3	Yes	6	0.00000001	0.00018736
4	Yes	6	0.00000001	0.00018914
5	Yes	5	0.00000001	0.00006651
6	Yes	6	0.00000001	0.00019016
7	Yes	6	0.00000001	0.00018217
8	Yes	5	0.00000001	0.00028794
9	Yes	6	0.00000001	0.00019108
10	Yes	6	0.00000001	0.00018963
11	Yes	5	0.00000001	0.00024981
12	Yes	6	0.00000001	0.00018222
13	Yes	6	0.00000001	0.00018987
14	Yes	4	0.00000001	0.00058637
15	Yes	6	0.00000001	0.00020006
16	Yes	6	0.00000001	0.00024425
17	Yes	6	0.00000001	0.00024505
18	Yes	6	0.00000001	0.00020506
19	Yes	6	0.00000001	0.00024504
20	Yes	6	0.00000001	0.00024330
21	Yes	6	0.00000001	0.00020351

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22	Yes	6	0.00000001	0.00024460
23	Yes	6	0.00000001	0.00024527
24	Yes	6	0.00000001	0.00020198
25	Yes	6	0.00000001	0.00023597
26	Yes	6	0.00000001	0.00023614
27	Yes	5	0.00000001	0.00004327
28	Yes	5	0.00000001	0.00052750
29	Yes	5	0.00000001	0.00053696
30	Yes	5	0.00000001	0.00003939
31	Yes	5	0.00000001	0.00053289
32	Yes	5	0.00000001	0.00049310
33	Yes	5	0.00000001	0.00005654
34	Yes	5	0.00000001	0.00054548
35	Yes	5	0.00000001	0.00054084
36	Yes	5	0.00000001	0.00005026
37	Yes	5	0.00000001	0.00049063
38	Yes	5	0.00000001	0.00052573

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
L1	140 - 139	TP14.296x13.161x0.1875	5.0000	0.0000	0.0	39.00	7.8559	-0.0580	306.3820	0.000
	139 - 138					39.00	7.9910	-0.0871	311.6500	0.000
	138 - 137					39.00	8.1261	-2.0052	316.9190	0.006
	137 - 136					39.00	8.2612	-2.0383	322.1870	0.006
	136 - 135					39.00	8.3963	-2.0728	327.4560	0.006
L2	135 - 134	TP15.4309x14.296x0.1875	5.0000	0.0000	0.0	39.00	8.5314	-2.1134	332.7240	0.006
	134 - 133					39.00	8.6665	-2.1553	337.9920	0.006
	133 - 132					39.00	8.8016	-2.1983	343.2610	0.006
	132 - 131					39.00	8.9367	-2.2426	348.5290	0.006
	131 - 130					39.00	9.0717	-2.2880	353.7980	0.006
L3	130 - 129	TP16.5659x15.4309x0.1875	5.0000	0.0000	0.0	39.00	9.2068	-2.3346	359.0660	0.007
	129 - 128					39.00	9.3419	-2.3822	364.3350	0.007
	128 - 127					39.00	9.4770	-2.4309	369.6030	0.007
	127 - 126					39.00	9.6121	-2.4805	374.8710	0.007
	126 - 125					39.00	9.7472	-2.5310	380.1400	0.007
L4	125 - 124	TP17.7008x16.5659x0.1875	5.0000	0.0000	0.0	39.00	9.8823	-2.5826	385.4080	0.007
	124 - 123					39.00	10.0174	-2.6351	390.6770	0.007
	123 - 122					39.00	10.1524	-2.6884	395.9450	0.007
	122 - 121					39.00	10.2875	-2.7426	401.2140	0.007
	121 - 120					39.00	10.4226	-2.7976	406.4820	0.007
L5	120 - 119	TP18.8358x17.7008x0.1875	5.0000	0.0000	0.0	39.00	10.5577	-3.4271	411.7500	0.008
	119 - 118					39.00	10.6928	-3.5027	417.0190	0.008
	118 - 117					39.00	10.8279	-3.5797	422.2870	0.008
	117 - 116					39.00	10.9630	-3.6580	427.5560	0.009
	116 - 115					39.00	11.0981	-3.7376	432.8240	0.009
L6	115 - 114.75 (6)	TP18.8925x18.8358x0.4625	0.2500	0.0000	0.0	39.00	27.0548	-3.7765	1055.1400	0.004
L7	114.75 - 113.75	TP20.0275x18.8925x0.45	5.0000	0.0000	0.0	39.00	26.6657	-3.8836	1039.9600	0.004
	113.75 - 112.75					39.00	26.9899	-3.9960	1052.6100	0.004
	112.75 - 111.75					39.00	27.3141	-4.1096	1065.2500	0.004
	111.75 - 110.75					39.00	27.6383	-4.2245	1077.8900	0.004
	110.75 - 109.75					39.00	27.9625	-4.3406	1090.5400	0.004
L8	109.75 - 108.75	TP21.1624x20.0275x0.425	5.0000	0.0000	0.0	39.00	26.7490	-4.4560	1043.2100	0.004

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Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
	108.75 - 107.75					39.00	27.0552	-4.5730	1055.1500	0.004
	107.75 - 106.75					39.00	27.3614	-4.6912	1067.0900	0.004
	106.75 - 105.75					39.00	27.6676	-4.8105	1079.0400	0.004
	105.75 - 104.75					39.00	27.9738	-4.9310	1090.9800	0.005
L9	104.75 - 103.661	TP21.904x21.1624x0.3125	3.2670	0.0000	0.0	39.00	20.9257	-5.0461	816.1020	0.006
	103.661 - 102.572					39.00	21.1709	-5.1655	825.6650	0.006
	102.572 - 101.483					39.00	21.4161	-5.2861	835.2270	0.006
L10	101.483 - 101.333 (10)	TP21.9381x21.904x0.3125	0.1500	0.0000	0.0	39.00	21.4499	-5.3117	836.5450	0.006
L11	101.333 - 100.333	TP23.0731x21.9381x0.3125	5.0000	0.0000	0.0	39.00	21.6750	-5.4162	845.3260	0.006
	100.333 - 99.333					39.00	21.9002	-5.5298	854.1070	0.006
	99.333 - 98.333					39.00	22.1253	-5.9289	862.8880	0.007
	98.333 - 97.333					39.00	22.3505	-6.0456	871.6690	0.007
	97.333 - 96.333					39.00	22.5756	-6.1633	880.4500	0.007
L12	96.333 - 95.333	TP24.2081x23.0731x0.3125	5.0000	0.0000	0.0	39.00	22.8008	-6.2845	889.2310	0.007
	95.333 - 94.333					39.00	23.0260	-9.8770	898.0120	0.011
	94.333 - 93.333					39.00	23.2511	-10.0081	906.7930	0.011
	93.333 - 92.333					39.00	23.4763	-10.1406	915.5740	0.011
	92.333 - 91.333					39.00	23.7014	-10.2743	924.3550	0.011
L13	91.333 - 91 (13)	TP24.2837x24.2081x0.3125	0.3330	0.0000	0.0	39.00	23.7764	-10.3296	927.2790	0.011
L14	91 - 90.75 (14)	TP24.3404x24.2837x0.6	0.2500	0.0000	0.0	39.00	45.2112	-10.3783	1763.2400	0.006
L15	90.75 - 89.75	TP25.4754x24.3404x0.5875	5.0000	0.0000	0.0	39.00	44.7159	-10.5532	1743.9200	0.006
	89.75 - 88.75					39.00	45.1392	-10.7362	1760.4300	0.006
	88.75 - 87.75					39.00	45.5625	-10.9206	1776.9400	0.006
	87.75 - 86.75					39.00	45.9858	-11.1067	1793.4500	0.006
	86.75 - 85.75					39.00	46.4091	-11.2942	1809.9600	0.006
L16	85.75 - 84.75	TP26.6104x25.4754x0.5625	5.0000	0.0000	0.0	39.00	44.8842	-11.4812	1750.4800	0.007
	84.75 - 83.75					39.00	45.2894	-11.6700	1766.2900	0.007
	83.75 - 82.75					39.00	45.6947	-11.8603	1782.0900	0.007
	82.75 - 81.75					39.00	46.1000	-12.0522	1797.9000	0.007
	81.75 - 80.75					39.00	46.5053	-12.2455	1813.7100	0.007
L17	80.75 - 79.75	TP27.7454x26.6104x0.55	5.0000	0.0000	0.0	39.00	45.8899	-12.4380	1789.7100	0.007
	79.75 - 78.75					39.00	46.2862	-12.6318	1805.1600	0.007
	78.75 - 77.75					39.00	46.6825	-12.8274	1820.6200	0.007
	77.75 - 76.75					39.00	47.0788	-13.0246	1836.0700	0.007
	76.75 - 75.75					39.00	47.4750	-13.2231	1851.5300	0.007
L18	75.75 - 74.75	TP28.8804x27.7454x0.5438	5.0000	0.0000	0.0	39.00	47.3381	-13.4217	1846.1900	0.007
	74.75 - 73.75					39.00	47.7299	-13.6219	1861.4600	0.007
	73.75 - 72.75					39.00	48.1216	-16.7299	1876.7400	0.009
	72.75 - 71.75					39.00	48.5134	-16.9361	1892.0200	0.009
	71.75 - 70.75					39.00	48.9052	-17.1438	1907.3000	0.009
L19	70.75 - 69.983 (19)	TP29.0545x28.8804x0.5313	0.7670	0.0000	0.0	39.00	48.0956	-17.3058	1875.7300	0.009
L20	69.983 - 69.733 (20)	TP29.1113x29.0545x0.5313	0.2500	0.0000	0.0	39.00	48.1913	-17.3642	1879.4600	0.009
L21	69.733 - 68.733	TP30.2463x29.1113x0.525	5.0000	0.0000	0.0	39.00	48.0130	-17.5621	1872.5100	0.009
	68.733 - 67.733					39.00	48.3913	-17.7709	1887.2600	0.009
	67.733 - 66.733					39.00	48.7695	-17.9811	1902.0100	0.009
	66.733 - 65.733					39.00	49.1478	-18.1927	1916.7600	0.009
	65.733 - 64.733					39.00	49.5260	-18.4057	1931.5200	0.010
L22	64.733 - 63 (22)	TP30.6397x30.2463x0.5188	1.7330	0.0000	0.0	39.00	49.5945	-18.7672	1934.1800	0.010
L23	63 - 62.75 (23)	TP30.6964x30.6397x0.7	0.2500	0.0000	0.0	39.00	66.6460	-18.8547	2599.2000	0.007
L24	62.75 - 61.5277	TP31.5288x30.6964x0.6875	3.6670	0.0000	0.0	39.00	66.0887	-19.1734	2577.4600	0.007
	61.5277 - 60.3053					39.00	66.6941	-19.5046	2601.0700	0.007

<p style="text-align: center;"><b>tnxTower</b></p> <p><b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	36 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
	60.3053 - 59.083					39.00	67.2996	-19.8385	2624.6900	0.008
L25	59.083 - 58.817 (25)	TP31.5892x31.5288x0.625	0.2660	0.0000	0.0	39.00	61.4252	-19.9170	2395.5800	0.008
L26	58.817 - 58.667 (26)	TP31.6233x31.5892x0.625	0.1500	0.0000	0.0	39.00	61.4928	-19.9573	2398.2200	0.008
L27	58.667 - 57.667	TP32.7583x31.6233x0.6125	5.0000	0.0000	0.0	39.00	60.7285	-20.2052	2368.4100	0.009
	57.667 - 56.667					39.00	61.1698	-20.4643	2385.6200	0.009
	56.667 - 55.667					39.00	61.6111	-20.7251	2402.8300	0.009
	55.667 - 54.667					39.00	62.0524	-20.9875	2420.0500	0.009
	54.667 - 53.667					39.00	62.4938	-21.2514	2437.2600	0.009
L28	53.667 - 53	TP33.913x32.7583x0.6125	5.0870	0.0000	0.0	39.00	62.7881	-21.4320	2448.7400	0.009
	53 - 48.58					39.00	64.7387	-11.7165	2524.8100	0.005
L29	53 - 48.58	TP33.5151x32.2847x0.6375	5.4200	0.0000	0.0	39.00	66.0661	-11.8167	2576.5800	0.005
	48.58 - 47.58					39.00	66.5254	-23.8128	2594.4900	0.009
L30	47.58 - 46.58	TP34.6503x33.5151x0.625	5.0000	0.0000	0.0	39.00	65.6962	-24.0763	2562.1500	0.009
	46.58 - 45.58					39.00	66.1465	-24.3416	2579.7100	0.009
	45.58 - 44.58					39.00	66.5969	-24.6084	2597.2800	0.009
	44.58 - 43.58					39.00	67.0473	-24.8767	2614.8400	0.010
	43.58 - 42.58					39.00	67.4976	-25.1465	2632.4100	0.010
L31	42.58 - 41.29	TP35.236x34.6503x0.6125	2.5800	0.0000	0.0	39.00	66.7413	-25.4914	2602.9100	0.010
	41.29 - 40					39.00	67.3107	-25.8426	2625.1200	0.010
L32	40 - 39.75 (32)	TP35.2927x35.236x0.8125	0.2500	0.0000	0.0	39.00	88.9202	-25.9381	3467.8900	0.007
L33	39.75 - 38.75	TP36.4279x35.2927x0.7875	5.0000	0.0000	0.0	39.00	86.8142	-26.2562	3385.7500	0.008
	38.75 - 37.75					39.00	87.3816	-26.5834	3407.8800	0.008
	37.75 - 36.75					39.00	87.9491	-26.9124	3430.0100	0.008
	36.75 - 35.75					39.00	88.5165	-27.2432	3452.1500	0.008
	35.75 - 34.75					39.00	89.0840	-27.5759	3474.2800	0.008
L34	34.75 - 33.6387	TP37.1848x36.4279x0.775	3.3340	0.0000	0.0	39.00	88.3213	-27.9432	3444.5300	0.008
	33.6387 - 32.5273					39.00	88.9420	-28.3139	3468.7400	0.008
	32.5273 - 31.416					39.00	89.5626	-28.6868	3492.9400	0.008
L35	31.416 - 31.166 (35)	TP37.2415x37.1848x0.775	0.2500	0.0000	0.0	39.00	89.7022	-28.7792	3498.3900	0.008
L36	31.166 - 30.083	TP37.7333x37.2415x0.7625	2.1660	0.0000	0.0	39.00	88.8807	-29.1348	3466.3500	0.008
	30.083 - 29					39.00	89.4757	-29.5007	3489.5500	0.008
L37	29 - 28.75 (37)	TP37.79x37.7333x0.675	0.2500	0.0000	0.0	39.00	79.5171	-29.5887	3101.1700	0.010
L38	28.75 - 27.75	TP38.9251x37.79x0.6625	5.0000	0.0000	0.0	39.00	78.5482	-29.8982	3063.3800	0.010
	27.75 - 26.75					39.00	79.0256	-30.2178	3082.0000	0.010
	26.75 - 25.75					39.00	79.5030	-30.5389	3100.6200	0.010
	25.75 - 24.75					39.00	79.9804	-30.8617	3119.2300	0.010
	24.75 - 23.75					39.00	80.4577	-31.1862	3137.8500	0.010
L39	23.75 - 23.5 (39)	TP38.9819x38.9251x0.6625	0.2500	0.0000	0.0	39.00	80.5771	-31.2757	3142.5100	0.010
L40	23.5 - 23.25 (40)	TP39.0387x38.9819x0.65	0.2500	0.0000	0.0	39.00	79.1996	-31.3622	3088.7900	0.010
L41	23.25 - 22.25	TP40.1738x39.0387x0.6375	5.0000	0.0000	0.0	39.00	78.1612	-31.6967	3048.2900	0.010
	22.25 - 21.25					39.00	78.6206	-32.0415	3066.2000	0.010
	21.25 - 20.25					39.00	79.0800	-32.3880	3084.1200	0.011
	20.25 - 19.25					39.00	79.5393	-32.7362	3102.0300	0.011
	19.25 - 18.25					39.00	79.9987	-33.0861	3119.9500	0.011
L42	18.25 - 17.25	TP41.3089x40.1738x0.625	5.0000	0.0000	0.0	39.00	78.9053	-33.4335	3077.3100	0.011
	17.25 - 16.25					39.00	79.3556	-33.7827	3094.8700	0.011
	16.25 - 15.25					39.00	79.8060	-34.1336	3112.4300	0.011
	15.25 - 14.25					39.00	80.2564	-34.4862	3130.0000	0.011
	14.25 - 13.25					39.00	80.7067	-34.8405	3147.5600	0.011
L43	13.25 - 12.25	TP42.444x41.3089x0.6125	5.0000	0.0000	0.0	39.00	79.5582	-35.1923	3102.7700	0.011
	12.25 - 11.25					39.00	79.9996	-35.5459	3119.9800	0.011
	11.25 - 10.25					39.00	80.4409	-35.9013	3137.2000	0.011
	10.25 - 9.25					39.00	80.8823	-36.2583	3154.4100	0.011
	9.25 - 8.25					39.00	81.3237	-36.6169	3171.6200	0.012



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	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
L44	8.25 - 7.25	TP43.1251x42.444x0.6125	3.0000	0.0000	0.0	39.00	81.7650	-36.9746	3188.8400	0.012
	7.25 - 6.25					39.00	82.2064	-37.3340	3206.0500	0.012
	6.25 - 5.25					39.00	82.6477	-37.6950	3223.2600	0.012
L45	5.25 - 5 (45)	TP43.1819x43.1251x0.6875	0.2500	0.0000	0.0	39.00	92.7280	-37.7890	3616.3900	0.010
L46	5 - 4	TP44.317x43.1819x0.6875	5.0000	0.0000	0.0	39.00	93.2234	-38.1198	3635.7100	0.010
	4 - 3					39.00	93.7188	-38.4597	3655.0300	0.011
	3 - 2					39.00	94.2142	-38.8012	3674.3600	0.011
	2 - 1					39.00	94.7096	-39.1442	3693.6800	0.011
	1 - 0					39.00	95.2050	-39.4887	3713.0000	0.011

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
L1	140 - 139	TP14.296x13.161x0.1875	0.08	0.04	39.00	0.001	0.00	0.00	39.00	0.000
	139 - 138		0.16	0.07	39.00	0.002	0.00	0.00	39.00	0.000
	138 - 137		18.78	8.28	39.00	0.212	0.00	0.00	39.00	0.000
	137 - 136		25.61	10.92	39.00	0.280	0.00	0.00	39.00	0.000
	136 - 135		32.49	13.41	39.00	0.344	0.00	0.00	39.00	0.000
L2	135 - 134	TP15.4309x14.296x0.1875	39.42	15.76	39.00	0.404	0.00	0.00	39.00	0.000
	134 - 133		46.40	17.97	39.00	0.461	0.00	0.00	39.00	0.000
	133 - 132		53.43	20.06	39.00	0.514	0.00	0.00	39.00	0.000
	132 - 131		60.51	22.03	39.00	0.565	0.00	0.00	39.00	0.000
	131 - 130		67.64	23.89	39.00	0.613	0.00	0.00	39.00	0.000
L3	130 - 129	TP16.5659x15.4309x0.1875	74.83	25.66	39.00	0.658	0.00	0.00	39.00	0.000
	129 - 128		82.06	27.32	39.00	0.701	0.00	0.00	39.00	0.000
	128 - 127		89.35	28.90	39.00	0.741	0.00	0.00	39.00	0.000
	127 - 126		96.69	30.40	39.00	0.780	0.00	0.00	39.00	0.000
	126 - 125		104.09	31.82	39.00	0.816	0.00	0.00	39.00	0.000
L4	125 - 124	TP17.7008x16.5659x0.1875	111.53	33.17	39.00	0.850	0.00	0.00	39.00	0.000
	124 - 123		119.03	34.44	39.00	0.883	0.00	0.00	39.00	0.000
	123 - 122		126.59	35.65	39.00	0.914	0.00	0.00	39.00	0.000
	122 - 121		134.20	36.81	39.00	0.944	0.00	0.00	39.00	0.000
	121 - 120		141.86	37.90	39.00	0.972	0.00	0.00	39.00	0.000
L5	120 - 119	TP18.8358x17.7008x0.1875	153.29	39.91	39.00	1.023	0.00	0.00	39.00	0.000
	119 - 118		164.80	41.82	39.00	1.072	0.00	0.00	39.00	0.000
	118 - 117		176.40	43.65	39.00	1.119	0.00	0.00	39.00	0.000
	117 - 116		188.07	45.39	39.00	1.164	0.00	0.00	39.00	0.000
	116 - 115		199.83	47.06	39.00	1.207	0.00	0.00	39.00	0.000
L6	115 - 114.75 (6)	TP18.8925x18.8358x0.4625	202.78	20.12	39.00	0.516	0.00	0.00	39.00	0.000
L7	114.75 - 113.75	TP20.0275x18.8925x0.45	214.65	21.31	39.00	0.546	0.00	0.00	39.00	0.000
	113.75 - 112.75		226.60	21.95	39.00	0.563	0.00	0.00	39.00	0.000
	112.75 - 111.75		238.65	22.56	39.00	0.579	0.00	0.00	39.00	0.000
	111.75 - 110.75		250.79	23.15	39.00	0.594	0.00	0.00	39.00	0.000
	110.75 - 109.75		263.01	23.71	39.00	0.608	0.00	0.00	39.00	0.000
L8	109.75 - 108.75	TP21.1624x20.0275x0.425	275.33	25.58	39.00	0.656	0.00	0.00	39.00	0.000
	108.75 - 107.75		287.74	26.13	39.00	0.670	0.00	0.00	39.00	0.000

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	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
	107.75 - 106.75		300.24	26.65	39.00	0.683	0.00	0.00	39.00	0.000
	106.75 - 105.75		312.83	27.15	39.00	0.696	0.00	0.00	39.00	0.000
	105.75 - 104.75		325.51	27.63	39.00	0.708	0.00	0.00	39.00	0.000
L9	104.75 - 103.661	TP21.904x21.1624x0.3125	339.42	37.65	39.00	0.965	0.00	0.00	39.00	0.000
	103.661 - 102.572		353.44	38.29	39.00	0.982	0.00	0.00	39.00	0.000
	102.572 - 101.483		367.56	38.91	39.00	0.998	0.00	0.00	39.00	0.000
L10	101.483 - 101.333 (10)	TP21.9381x21.904x0.3125	369.51	38.99	39.00	1.000	0.00	0.00	39.00	0.000
L11	101.333 - 100.333	TP23.0731x21.9381x0.3125	382.58	39.53	39.00	1.014	0.00	0.00	39.00	0.000
	100.333 - 99.333		395.74	40.05	39.00	1.027	0.00	0.00	39.00	0.000
	99.333 - 98.333		409.43	40.59	39.00	1.041	0.00	0.00	39.00	0.000
	98.333 - 97.333		423.49	41.13	39.00	1.055	0.00	0.00	39.00	0.000
	97.333 - 96.333		437.63	41.66	39.00	1.068	0.00	0.00	39.00	0.000
L12	96.333 - 95.333	TP24.2081x23.0731x0.3125	451.86	42.16	39.00	1.081	0.00	0.00	39.00	0.000
	95.333 - 94.333		469.66	42.97	39.00	1.102	0.00	0.00	39.00	0.000
	94.333 - 93.333		489.27	43.89	39.00	1.125	0.00	0.00	39.00	0.000
	93.333 - 92.333		508.97	44.78	39.00	1.148	0.00	0.00	39.00	0.000
	92.333 - 91.333		528.76	45.64	39.00	1.170	0.00	0.00	39.00	0.000
L13	91.333 - 91 (13)	TP24.2837x24.2081x0.3125	535.36	45.91	39.00	1.177	0.00	0.00	39.00	0.000
L14	91 - 90.75 (14)	TP24.3404x24.2837x0.6	540.33	24.90	39.00	0.639	0.00	0.00	39.00	0.000
L15	90.75 - 89.75	TP25.4754x24.3404x0.5875	560.25	25.83	39.00	0.662	0.00	0.00	39.00	0.000
	89.75 - 88.75		580.26	26.25	39.00	0.673	0.00	0.00	39.00	0.000
	88.75 - 87.75		600.36	26.65	39.00	0.683	0.00	0.00	39.00	0.000
	87.75 - 86.75		620.56	27.03	39.00	0.693	0.00	0.00	39.00	0.000
	86.75 - 85.75		640.85	27.40	39.00	0.703	0.00	0.00	39.00	0.000
L16	85.75 - 84.75	TP26.6104x25.4754x0.5625	661.24	28.91	39.00	0.741	0.00	0.00	39.00	0.000
	84.75 - 83.75		681.71	29.27	39.00	0.750	0.00	0.00	39.00	0.000
	83.75 - 82.75		702.28	29.61	39.00	0.759	0.00	0.00	39.00	0.000
	82.75 - 81.75		722.93	29.94	39.00	0.768	0.00	0.00	39.00	0.000
	81.75 - 80.75		743.69	30.26	39.00	0.776	0.00	0.00	39.00	0.000
L17	80.75 - 79.75	TP27.7454x26.6104x0.55	764.53	31.22	39.00	0.801	0.00	0.00	39.00	0.000
	79.75 - 78.75		785.46	31.52	39.00	0.808	0.00	0.00	39.00	0.000
	78.75 - 77.75		806.51	31.81	39.00	0.816	0.00	0.00	39.00	0.000
	77.75 - 76.75		827.64	32.09	39.00	0.823	0.00	0.00	39.00	0.000
	76.75 - 75.75		848.87	32.37	39.00	0.830	0.00	0.00	39.00	0.000
L18	75.75 - 74.75	TP28.8804x27.7454x0.5438	870.18	32.98	39.00	0.846	0.00	0.00	39.00	0.000
	74.75 - 73.75		891.59	33.23	39.00	0.852	0.00	0.00	39.00	0.000
	73.75 - 72.75		917.05	33.62	39.00	0.862	0.00	0.00	39.00	0.000
	72.75 - 71.75		941.97	33.97	39.00	0.871	0.00	0.00	39.00	0.000
	71.75 - 70.75		966.98	34.31	39.00	0.880	0.00	0.00	39.00	0.000
L19	70.75 - 69.983 (19)	TP29.0545x28.8804x0.5313	986.21	35.33	39.00	0.906	0.00	0.00	39.00	0.000
L20	69.983 -	TP29.1113x29.0545x0.5313	992.49	35.42	39.00	0.908	0.00	0.00	39.00	0.000

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	39 of 45
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
L21	69.733 (20) 69.733 - 68.733 68.733 - 67.733 67.733 - 66.733 66.733 - 65.733 65.733 - 64.733	TP30.2463x29.1113x0.525	1017.67	36.14	39.00	0.927	0.00	0.00	39.00	0.000
L22	64.733 - 63 (22)	TP30.6397x30.2463x0.5188	1163.65	38.23	39.00	0.980	0.00	0.00	39.00	0.000
L23	63 - 62.75 (23)	TP30.6964x30.6397x0.7	1170.08	28.90	39.00	0.741	0.00	0.00	39.00	0.000
L24	62.75 - 61.5277 61.5277 - 60.3053 60.3053 - 59.083	TP31.5288x30.6964x0.6875	1201.59	29.62	39.00	0.760	0.00	0.00	39.00	0.000
L25	59.083 - 58.817 (25)	TP31.5892x31.5288x0.625	1271.97	32.92	39.00	0.844	0.00	0.00	39.00	0.000
L26	58.817 - 58.667 (26)	TP31.6233x31.5892x0.625	1275.88	32.95	39.00	0.845	0.00	0.00	39.00	0.000
L27	58.667 - 57.667 57.667 - 56.667 56.667 - 55.667 55.667 - 54.667 54.667 - 53.667	TP32.7583x31.6233x0.6125	1302.03	33.77	39.00	0.866	0.00	0.00	39.00	0.000
L28	53.667 - 53 53 - 48.58	TP33.913x32.7583x0.6125	1425.21	34.55	39.00	0.886	0.00	0.00	39.00	0.000
L29	53 - 48.58	TP33.5151x32.2847x0.6375	779.75	17.77	39.00	0.456	0.00	0.00	39.00	0.000
L30	48.58 - 47.58 47.58 - 46.58 46.58 - 45.58 45.58 - 44.58 44.58 - 43.58 43.58 - 42.58	TP34.6503x33.5151x0.625	1571.03	35.33	39.00	0.906	0.00	0.00	39.00	0.000
L31	42.58 - 41.29 41.29 - 40	TP35.236x34.6503x0.6125	1598.33	36.12	39.00	0.926	0.00	0.00	39.00	0.000
L32	40 - 39.75 (32)	TP35.2927x35.236x0.8125	1744.04	37.38	39.00	0.959	0.00	0.00	39.00	0.000
L33	39.75 - 38.75 38.75 - 37.75 37.75 - 36.75 36.75 - 35.75 35.75 - 34.75	TP36.4279x35.2927x0.7875	1779.92	37.50	39.00	0.962	0.00	0.00	39.00	0.000
L34	34.75 - 33.6387 33.6387 - 32.5273 32.5273 - 31.416	TP37.1848x36.4279x0.775	1870.88	29.82	39.00	0.765	0.00	0.00	39.00	0.000
L35	31.416 - 31.166 (35)	TP37.2415x37.1848x0.775	1899.05	29.88	39.00	0.766	0.00	0.00	39.00	0.000
L36	31.166 -	TP37.7333x37.2415x0.7625	1927.30	29.94	39.00	0.768	0.00	0.00	39.00	0.000
			1958.79	30.45	39.00	0.781	0.00	0.00	39.00	0.000
			1990.38	30.50	39.00	0.782	0.00	0.00	39.00	0.000
			2022.07	30.56	39.00	0.784	0.00	0.00	39.00	0.000
			2029.21	30.57	39.00	0.784	0.00	0.00	39.00	0.000
			2060.20	31.09	39.00	0.797	0.00	0.00	39.00	0.000

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	40 of 45
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
	30.083									
L37	29 - 28.75 (37)	TP37.79x37.7333x0.675	2091.28	31.13	39.00	0.798	0.00	0.00	39.00	0.000
L38	28.75 - 27.75	TP38.9251x37.79x0.6625	2098.47	34.93	39.00	0.896	0.00	0.00	39.00	0.000
	27.75 - 26.75		2127.28	35.60	39.00	0.913	0.00	0.00	39.00	0.000
	26.75 - 25.75		2156.15	35.65	39.00	0.914	0.00	0.00	39.00	0.000
	25.75 - 24.75		2185.11	35.69	39.00	0.915	0.00	0.00	39.00	0.000
	24.75 - 23.75		2214.13	35.73	39.00	0.916	0.00	0.00	39.00	0.000
L39	23.75 - 23.5 (39)	TP38.9819x38.9251x0.6625	2243.24	35.77	39.00	0.917	0.00	0.00	39.00	0.000
L40	23.5 - 23.25 (40)	TP39.0387x38.9819x0.65	2250.53	35.78	39.00	0.917	0.00	0.00	39.00	0.000
L41	23.25 - 22.25	TP40.1738x39.0387x0.6375	2257.82	36.44	39.00	0.934	0.00	0.00	39.00	0.000
	22.25 - 21.25		2287.05	37.15	39.00	0.953	0.00	0.00	39.00	0.000
	21.25 - 20.25		2316.34	37.19	39.00	0.954	0.00	0.00	39.00	0.000
	20.25 - 19.25		2345.71	37.22	39.00	0.954	0.00	0.00	39.00	0.000
	19.25 - 18.25		2375.16	37.25	39.00	0.955	0.00	0.00	39.00	0.000
L42	18.25 - 17.25	TP41.3089x40.1738x0.625	2404.68	37.28	39.00	0.956	0.00	0.00	39.00	0.000
	17.25 - 16.25		2434.28	38.01	39.00	0.975	0.00	0.00	39.00	0.000
	16.25 - 15.25		2463.95	38.04	39.00	0.975	0.00	0.00	39.00	0.000
	15.25 - 14.25		2493.70	38.06	39.00	0.976	0.00	0.00	39.00	0.000
	14.25 - 13.25		2523.53	38.08	39.00	0.976	0.00	0.00	39.00	0.000
L43	13.25 - 12.25	TP42.444x41.3089x0.6125	2553.42	38.10	39.00	0.977	0.00	0.00	39.00	0.000
	12.25 - 11.25		2583.39	38.86	39.00	0.996	0.00	0.00	39.00	0.000
	11.25 - 10.25		2613.44	38.88	39.00	0.997	0.00	0.00	39.00	0.000
	10.25 - 9.25		2643.56	38.89	39.00	0.997	0.00	0.00	39.00	0.000
	9.25 - 8.25		2673.76	38.90	39.00	0.998	0.00	0.00	39.00	0.000
L44	8.25 - 7.25	TP43.1251x42.444x0.6125	2704.03	38.91	39.00	0.998	0.00	0.00	39.00	0.000
	7.25 - 6.25		2734.38	38.92	39.00	0.998	0.00	0.00	39.00	0.000
	6.25 - 5.25		2764.79	38.93	39.00	0.998	0.00	0.00	39.00	0.000
L45	5.25 - 5 (45)	TP43.1819x43.1251x0.6875	2795.29	38.94	39.00	0.998	0.00	0.00	39.00	0.000
L46	5 - 4	TP44.317x43.1819x0.6875	2802.93	34.88	39.00	0.894	0.00	0.00	39.00	0.000
	4 - 3		2833.52	34.88	39.00	0.894	0.00	0.00	39.00	0.000
	3 - 2		2864.18	34.88	39.00	0.894	0.00	0.00	39.00	0.000
	2 - 1		2894.93	34.89	39.00	0.895	0.00	0.00	39.00	0.000
	1 - 0		2925.75	34.89	39.00	0.895	0.00	0.00	39.00	0.000
			2956.65	34.89	39.00	0.895	0.00	0.00	39.00	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V$ K	Actual $f_v$ ksi	Allow. $F_v$ ksi	Ratio $\frac{f_v}{F_v}$	Actual $T$ kip-ft	Actual $f_{vt}$ ksi	Allow. $F_{vt}$ ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	140 - 139	TP14.296x13.161x0.1875	0.0609	0.01	26.00	0.001	0.00	0.00	26.00	0.000
	139 - 138		0.1067	0.01	26.00	0.001	0.00	0.00	26.00	0.000
	138 - 137		6.8106	0.84	26.00	0.064	0.15	0.03	26.00	0.001
	137 - 136		6.8570	0.83	26.00	0.064	0.15	0.03	26.00	0.001
	136 - 135		6.9039	0.82	26.00	0.063	0.15	0.03	26.00	0.001
L2	135 - 134	TP15.4309x14.296x0.1875	6.9543	0.82	26.00	0.063	0.15	0.03	26.00	0.001
	134 - 133		7.0053	0.81	26.00	0.062	0.15	0.03	26.00	0.001
	133 - 132		7.0567	0.80	26.00	0.062	0.15	0.03	26.00	0.001
	132 - 131		7.1086	0.80	26.00	0.061	0.15	0.03	26.00	0.001
	131 - 130		7.1610	0.79	26.00	0.061	0.15	0.02	26.00	0.001
L3	130 - 129	TP16.5659x15.4309x0.1875	7.2126	0.78	26.00	0.060	0.14	0.02	26.00	0.001
	129 - 128		7.2647	0.78	26.00	0.060	0.14	0.02	26.00	0.001
	128 - 127		7.3172	0.77	26.00	0.059	0.14	0.02	26.00	0.001
	127 - 126		7.3703	0.77	26.00	0.059	0.14	0.02	26.00	0.001



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	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	Actual V K	Actual $f_v$ ksi	Allow. $F_v$ ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual $f_{vt}$ ksi	Allow. $F_{vt}$ ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L13	91.333 - 91 (13)	TP24.2837x24.2081x0.3125	19.8626	0.84	26.00	0.064	0.10	0.00	26.00	0.000
L14	91 - 90.75 (14)	TP24.3404x24.2837x0.6	19.8847	0.44	26.00	0.034	0.09	0.00	26.00	0.000
L15	90.75 - 89.75	TP25.4754x24.3404x0.5875	19.9794	0.45	26.00	0.034	0.09	0.00	26.00	0.000
	89.75 - 88.75		20.0718	0.44	26.00	0.034	0.09	0.00	26.00	0.000
	88.75 - 87.75		20.1648	0.44	26.00	0.034	0.08	0.00	26.00	0.000
	87.75 - 86.75		20.2583	0.44	26.00	0.034	0.08	0.00	26.00	0.000
	86.75 - 85.75		20.3523	0.44	26.00	0.034	0.07	0.00	26.00	0.000
L16	85.75 - 84.75	TP26.6104x25.4754x0.5625	20.4435	0.46	26.00	0.035	0.07	0.00	26.00	0.000
	84.75 - 83.75		20.5350	0.45	26.00	0.035	0.06	0.00	26.00	0.000
	83.75 - 82.75		20.6270	0.45	26.00	0.035	0.05	0.00	26.00	0.000
	82.75 - 81.75		20.7196	0.45	26.00	0.035	0.05	0.00	26.00	0.000
	81.75 - 80.75		20.8126	0.45	26.00	0.034	0.04	0.00	26.00	0.000
L17	80.75 - 79.75	TP27.7454x26.6104x0.55	20.9028	0.46	26.00	0.035	0.04	0.00	26.00	0.000
	79.75 - 78.75		20.9937	0.45	26.00	0.035	0.03	0.00	26.00	0.000
	78.75 - 77.75		21.0847	0.45	26.00	0.035	0.03	0.00	26.00	0.000
	77.75 - 76.75		21.1762	0.45	26.00	0.035	0.02	0.00	26.00	0.000
	76.75 - 75.75		21.2683	0.45	26.00	0.034	0.01	0.00	26.00	0.000
L18	75.75 - 74.75	TP28.8804x27.7454x0.5438	21.3575	0.45	26.00	0.035	0.01	0.00	26.00	0.000
	74.75 - 73.75		21.4471	0.45	26.00	0.035	0.00	0.00	26.00	0.000
	73.75 - 72.75		24.8700	0.52	26.00	0.040	0.01	0.00	26.00	0.000
	72.75 - 71.75		24.9577	0.51	26.00	0.040	0.02	0.00	26.00	0.000
	71.75 - 70.75		25.0457	0.51	26.00	0.039	0.02	0.00	26.00	0.000
L19	70.75 - 69.983 (19)	TP29.0545x28.8804x0.5313	25.1101	0.52	26.00	0.040	0.03	0.00	26.00	0.000
L20	69.983 - 69.733 (20)	TP29.1113x29.0545x0.5313	25.1275	0.52	26.00	0.040	0.03	0.00	26.00	0.000
L21	69.733 - 68.733	TP30.2463x29.1113x0.525	25.2180	0.53	26.00	0.040	0.03	0.00	26.00	0.000
	68.733 - 67.733		25.3026	0.52	26.00	0.040	0.04	0.00	26.00	0.000
	67.733 - 66.733		25.3876	0.52	26.00	0.040	0.04	0.00	26.00	0.000
	66.733 - 65.733		25.4729	0.52	26.00	0.040	0.05	0.00	26.00	0.000
	65.733 - 64.733		25.5586	0.52	26.00	0.040	0.06	0.00	26.00	0.000
L22	64.733 - 63 (22)	TP30.6397x30.2463x0.5188	25.7113	0.52	26.00	0.040	0.07	0.00	26.00	0.000
L23	63 - 62.75 (23)	TP30.6964x30.6397x0.7	25.7199	0.39	26.00	0.030	0.07	0.00	26.00	0.000
L24	62.75 - 61.5277	TP31.5288x30.6964x0.6875	25.8375	0.39	26.00	0.030	0.07	0.00	26.00	0.000
	61.5277 - 60.3053		25.9488	0.39	26.00	0.030	0.08	0.00	26.00	0.000
	60.3053 - 59.083		26.0607	0.39	26.00	0.030	0.09	0.00	26.00	0.000
L25	59.083 - 58.817 (25)	TP31.5892x31.5288x0.625	26.0776	0.42	26.00	0.033	0.09	0.00	26.00	0.000
L26	58.817 - 58.667 (26)	TP31.6233x31.5892x0.625	26.0906	0.42	26.00	0.033	0.09	0.00	26.00	0.000
L27	58.667 - 57.667	TP32.7583x31.6233x0.6125	26.1848	0.43	26.00	0.033	0.09	0.00	26.00	0.000
	57.667 - 56.667		26.2728	0.43	26.00	0.033	0.09	0.00	26.00	0.000
	56.667 - 55.667		26.3612	0.43	26.00	0.033	0.09	0.00	26.00	0.000
	55.667 - 54.667		26.4499	0.43	26.00	0.033	0.10	0.00	26.00	0.000
	54.667 -		26.5389	0.42	26.00	0.033	0.10	0.00	26.00	0.000

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Section No.	Elevation ft	Size	Actual V K	Actual f <sub>v</sub> ksi	Allow. F <sub>v</sub> ksi	Ratio f <sub>v</sub> / F <sub>v</sub>	Actual T kip-ft	Actual f <sub>vt</sub> ksi	Allow. F <sub>vt</sub> ksi	Ratio f <sub>vt</sub> / F <sub>vt</sub>
	53.667									
L28	53.667 - 53	TP33.913x32.7583x0.6125	26.5929	0.42	26.00	0.033	0.10	0.00	26.00	0.000
	53 - 48.58		13.8876	0.21	26.00	0.016	0.06	0.00	26.00	0.000
L29	53 - 48.58	TP33.5151x32.2847x0.6375	13.2921	0.20	26.00	0.015	0.05	0.00	26.00	0.000
	48.58 - 47.58		27.2499	0.41	26.00	0.032	0.12	0.00	26.00	0.000
L30	47.58 - 46.58	TP34.6503x33.5151x0.625	27.3303	0.42	26.00	0.032	0.12	0.00	26.00	0.000
	46.58 - 45.58		27.4108	0.41	26.00	0.032	0.12	0.00	26.00	0.000
	45.58 - 44.58		27.4916	0.41	26.00	0.032	0.12	0.00	26.00	0.000
	44.58 - 43.58		27.5727	0.41	26.00	0.032	0.13	0.00	26.00	0.000
	43.58 - 42.58		27.6541	0.41	26.00	0.032	0.13	0.00	26.00	0.000
L31	42.58 - 41.29	TP35.236x34.6503x0.6125	27.7584	0.42	26.00	0.032	0.13	0.00	26.00	0.000
	41.29 - 40		27.8597	0.41	26.00	0.032	0.13	0.00	26.00	0.000
L32	40 - 39.75 (32)	TP35.2927x35.236x0.8125	27.8686	0.31	26.00	0.024	0.13	0.00	26.00	0.000
L33	39.75 - 38.75	TP36.4279x35.2927x0.7875	27.9569	0.32	26.00	0.025	0.14	0.00	26.00	0.000
	38.75 - 37.75		28.0390	0.32	26.00	0.025	0.14	0.00	26.00	0.000
	37.75 - 36.75		28.1213	0.32	26.00	0.025	0.14	0.00	26.00	0.000
	36.75 - 35.75		28.2039	0.32	26.00	0.025	0.14	0.00	26.00	0.000
	35.75 - 34.75		28.2867	0.32	26.00	0.024	0.15	0.00	26.00	0.000
L34	34.75 - 33.6387	TP37.1848x36.4279x0.775	28.3757	0.32	26.00	0.025	0.15	0.00	26.00	0.000
	33.6387 - 32.5273		28.4637	0.32	26.00	0.025	0.15	0.00	26.00	0.000
	32.5273 - 31.416		28.5520	0.32	26.00	0.025	0.16	0.00	26.00	0.000
L35	31.416 - 31.166 (35)	TP37.2415x37.1848x0.775	28.5636	0.32	26.00	0.024	0.16	0.00	26.00	0.000
L36	31.166 - 30.083	TP37.7333x37.2415x0.7625	28.6572	0.32	26.00	0.025	0.16	0.00	26.00	0.000
	30.083 - 29		28.7429	0.32	26.00	0.025	0.16	0.00	26.00	0.000
L37	29 - 28.75 (37)	TP37.79x37.7333x0.675	28.7540	0.36	26.00	0.028	0.16	0.00	26.00	0.000
L38	28.75 - 27.75	TP38.9251x37.79x0.6625	28.8380	0.37	26.00	0.028	0.16	0.00	26.00	0.000
	27.75 - 26.75		28.9137	0.37	26.00	0.028	0.17	0.00	26.00	0.000
	26.75 - 25.75		28.9896	0.36	26.00	0.028	0.17	0.00	26.00	0.000
	25.75 - 24.75		29.0658	0.36	26.00	0.028	0.17	0.00	26.00	0.000
	24.75 - 23.75		29.1421	0.36	26.00	0.028	0.17	0.00	26.00	0.000
L39	23.75 - 23.5 (39)	TP38.9819x38.9251x0.6625	29.1523	0.36	26.00	0.028	0.18	0.00	26.00	0.000
L40	23.5 - 23.25 (40)	TP39.0387x38.9819x0.65	29.1714	0.37	26.00	0.028	0.18	0.00	26.00	0.000
L41	23.25 - 22.25	TP40.1738x39.0387x0.6375	29.2557	0.37	26.00	0.029	0.18	0.00	26.00	0.000
	22.25 - 21.25		29.3310	0.37	26.00	0.029	0.18	0.00	26.00	0.000
	21.25 - 20.25		29.4065	0.37	26.00	0.029	0.18	0.00	26.00	0.000
	20.25 - 19.25		29.4822	0.37	26.00	0.029	0.19	0.00	26.00	0.000
	19.25 - 18.25		29.5581	0.37	26.00	0.028	0.19	0.00	26.00	0.000
L42	18.25 - 17.25	TP41.3089x40.1738x0.625	29.6330	0.38	26.00	0.029	0.19	0.00	26.00	0.000
	17.25 - 16.25		29.7079	0.37	26.00	0.029	0.19	0.00	26.00	0.000
	16.25 - 15.25		29.7829	0.37	26.00	0.029	0.20	0.00	26.00	0.000
	15.25 - 14.25		29.8582	0.37	26.00	0.029	0.20	0.00	26.00	0.000
	14.25 - 13.25		29.9335	0.37	26.00	0.029	0.20	0.00	26.00	0.000
L43	13.25 - 12.25	TP42.444x41.3089x0.6125	30.0080	0.38	26.00	0.029	0.21	0.00	26.00	0.000
	12.25 - 11.25		30.0824	0.38	26.00	0.029	0.21	0.00	26.00	0.000
	11.25 - 10.25		30.1570	0.37	26.00	0.029	0.21	0.00	26.00	0.000
	10.25 - 9.25		30.2317	0.37	26.00	0.029	0.21	0.00	26.00	0.000
	9.25 - 8.25		30.3066	0.37	26.00	0.029	0.22	0.00	26.00	0.000
L44	8.25 - 7.25	TP43.1251x42.444x0.6125	30.3810	0.37	26.00	0.029	0.22	0.00	26.00	0.000
	7.25 - 6.25		30.4556	0.37	26.00	0.028	0.22	0.00	26.00	0.000
	6.25 - 5.25		30.5304	0.37	26.00	0.028	0.23	0.00	26.00	0.000
L45	5.25 - 5 (45)	TP43.1819x43.1251x0.6875	30.5390	0.33	26.00	0.025	0.23	0.00	26.00	0.000
L46	5 - 4	TP44.317x43.1819x0.6875	30.6255	0.33	26.00	0.025	0.23	0.00	26.00	0.000
	4 - 3		30.7030	0.33	26.00	0.025	0.23	0.00	26.00	0.000

<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	44 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

Section No.	Elevation ft	Size	Actual V K	Actual $f_v$ ksi	Allow. $F_v$ ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual $f_{vt}$ ksi	Allow. $F_{vt}$ ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	3 - 2		30.7806	0.33	26.00	0.025	0.23	0.00	26.00	0.000
	2 - 1		30.8585	0.33	26.00	0.025	0.24	0.00	26.00	0.000
	1 - 0		30.9366	0.32	26.00	0.025	0.24	0.00	26.00	0.000



<b>tnxTower</b>  <b>Jacobs Engineering Group, Inc.</b> 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	<b>Job</b>	140-ft Monopole - SHELTON NE	<b>Page</b>	45 of 45
	<b>Project</b>	BU842873_WO1182451	<b>Date</b>	09:51:22 02/04/16
	<b>Client</b>	Crown Castle	<b>Designed by</b>	LeeMH

## Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	140 - 135	Pole	TP14.296x13.161x0.1875	Note 1	Note 1	Note 1	26.2	Pass
L2	135 - 130	Pole	TP15.431x14.296x0.1875	Note 1	Note 1	Note 1	46.4	Pass
L3	130 - 125	Pole	TP16.566x15.431x0.1875	Note 1	Note 1	Note 1	61.7	Pass
L4	125 - 120	Pole	TP17.701x16.566x0.1875	Note 1	Note 1	Note 1	73.4	Pass
L5	120 - 115	Pole	TP18.836x17.701x0.1875	Note 1	Note 1	Note 1	91.1	Pass
L6	115 - 114.75	Pole + Reinf.	TP18.893x18.836x0.4625	Note 1	Note 1	Note 1	54.1	Pass
L7	114.75 - 109.75	Pole + Reinf.	TP20.027x18.893x0.45	Note 1	Note 1	Note 1	64.6	Pass
L8	109.75 - 104.75	Pole + Reinf.	TP21.162x20.027x0.425	Note 1	Note 1	Note 1	73.9	Pass
L9	104.75 - 101.48	Pole	TP21.904x21.162x0.3125	Note 1	Note 1	Note 1	75.2	Pass
L10	101.48 - 101.33	Pole	TP21.938x21.904x0.3125	Note 1	Note 1	Note 1	75.4	Pass
L11	101.33 - 96.33	Pole	TP23.073x21.938x0.3125	Note 1	Note 1	Note 1	80.6	Pass
L12	96.33 - 91.33	Pole	TP24.208x23.073x0.3125	Note 1	Note 1	Note 1	88.5	Pass
L13	91.33 - 91	Pole	TP24.284x24.208x0.3125	Note 1	Note 1	Note 1	89.1	Pass
L14	91 - 90.75	Pole + Reinf.	TP24.34x24.284x0.6	Note 1	Note 1	Note 1	62.3	Pass
L15	90.75 - 85.75	Pole + Reinf.	TP25.475x24.34x0.5875	Note 1	Note 1	Note 1	67.8	Pass
L16	85.75 - 80.75	Pole + Reinf.	TP26.61x25.475x0.5625	Note 1	Note 1	Note 1	73.4	Pass
L17	80.75 - 75.75	Pole + Reinf.	TP27.745x26.61x0.55	Note 1	Note 1	Note 1	78.4	Pass
L18	75.75 - 70.75	Pole + Reinf.	TP28.88x27.745x0.5438	Note 1	Note 1	Note 1	85.2	Pass
L19	70.75 - 69.98	Pole + Reinf.	TP29.055x28.88x0.5313	Note 1	Note 1	Note 1	88.1	Pass
L20	69.98 - 69.73	Pole + Reinf.	TP29.111x29.055x0.5313	Note 1	Note 1	Note 1	88.4	Pass
L21	69.73 - 64.73	Pole + Reinf.	TP30.246x29.111x0.525	Note 1	Note 1	Note 1	93.7	Pass
L22	64.73 - 63	Pole + Reinf.	TP30.64x30.246x0.5188	Note 1	Note 1	Note 1	95.3	Pass
L23	63 - 62.75	Pole + Reinf.	TP30.696x30.64x0.7	Note 1	Note 1	Note 1	73.6	Pass
L24	62.75 - 59.08	Pole + Reinf.	TP31.529x30.696x0.6875	Note 1	Note 1	Note 1	76.5	Pass
L25	59.08 - 58.82	Pole + Reinf.	TP31.589x31.529x0.625	Note 1	Note 1	Note 1	78.4	Pass
L26	58.82 - 58.67	Pole + Reinf.	TP31.623x31.589x0.625	Note 1	Note 1	Note 1	78.5	Pass
L27	58.67 - 53.67	Pole + Reinf.	TP32.758x31.623x0.6125	Note 1	Note 1	Note 1	82.0	Pass
L28	53.67 - 53	Pole + Reinf.	TP33.913x32.758x0.6125	Note 1	Note 1	Note 1	82.4	Pass
L29	53 - 47.58	Pole + Reinf.	TP33.515x32.285x0.6375	Note 1	Note 1	Note 1	88.1	Pass
L30	47.58 - 42.58	Pole + Reinf.	TP34.65x33.515x0.625	Note 1	Note 1	Note 1	91.1	Pass
L31	42.58 - 40	Pole + Reinf.	TP35.236x34.65x0.6125	Note 1	Note 1	Note 1	92.5	Pass
L32	40 - 39.75	Pole + Reinf.	TP35.293x35.236x0.8125	Note 1	Note 1	Note 1	71.8	Pass
L33	39.75 - 34.75	Pole + Reinf.	TP36.428x35.293x0.7875	Note 1	Note 1	Note 1	74.1	Pass
L34	34.75 - 31.42	Pole + Reinf.	TP37.185x36.428x0.775	Note 1	Note 1	Note 1	75.5	Pass
L35	31.42 - 31.17	Pole + Reinf.	TP37.242x37.185x0.775	Note 1	Note 1	Note 1	75.6	Pass
L36	31.17 - 29	Pole + Reinf.	TP37.733x37.242x0.7625	Note 1	Note 1	Note 1	76.5	Pass
L37	29 - 28.75	Pole + Reinf.	TP37.79x37.733x0.675	Note 1	Note 1	Note 1	91.1	Pass
L38	28.75 - 23.75	Pole + Reinf.	TP38.925x37.79x0.6625	Note 1	Note 1	Note 1	93.1	Pass
L39	23.75 - 23.5	Pole + Reinf.	TP38.982x38.925x0.6625	Note 1	Note 1	Note 1	93.2	Pass
L40	23.5 - 23.25	Pole + Reinf.	TP39.039x38.982x0.65	Note 1	Note 1	Note 1	92.5	Pass
L41	23.25 - 18.25	Pole + Reinf.	TP40.174x39.039x0.6375	Note 1	Note 1	Note 1	94.3	Pass
L42	18.25 - 13.25	Pole + Reinf.	TP41.309x40.174x0.625	Note 1	Note 1	Note 1	96.0	Pass
L43	13.25 - 8.25	Pole + Reinf.	TP42.444x41.309x0.6125	Note 1	Note 1	Note 1	97.6	Pass
L44	8.25 - 5.25	Pole + Reinf.	TP43.125x42.444x0.6125	Note 1	Note 1	Note 1	98.4	Pass
L45	5.25 - 5	Pole + Reinf.	TP43.182x43.125x0.6875	Note 1	Note 1	Note 1	83.5	Pass
L46	5 - 0	Pole + Reinf.	TP44.317x43.182x0.6875	Note 1	Note 1	Note 1	84.9	Pass
<b>Summary</b>								
Pole							91.1	Pass
Reinforcement							98.4	Pass
<b>Overall</b>							<b>98.4</b>	<b>Pass</b>

Notes:

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

**APPENDIX B**  
**BASE LEVEL DRAWING**



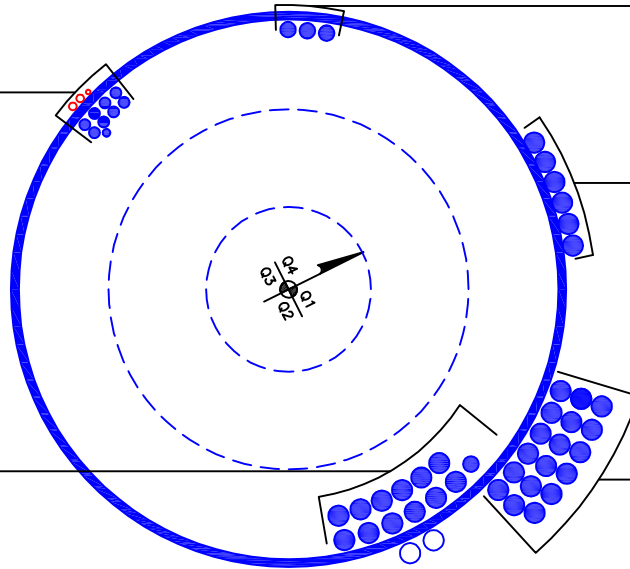
- (PROPOSED)
- (1) 3/8" TO 95 FT LEVEL
- (2) 5/8" TO 95 FT LEVEL
- (INSTALLED-TO BE REMOVED)
- (1) 5/8" TO 99 FT LEVEL
- (INSTALLED)
- (6) 7/8" TO 95 FT LEVEL
- (2) 7/8" TO 99 FT LEVEL

- (INSTALLED)
- (3) 1-1/4" TO 73 FT LEVEL

- (INSTALLED-TO BE REMOVED)
- (6) 1-5/8" TO 110 FT LEVEL

- (RESERVED)
- (2) 1-5/8" TO 138 FT LEVEL
- (INSTALLED)
- (12) 1-5/8" TO 138 FT LEVEL
- (1) 1-1/4" TO 138 FT LEVEL

- (INSTALLED)
- (18) 1-5/8" TO 120 FT LEVEL



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# Additional Calculations



Site BU: 842873  
Work Order: 1182451



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## Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	140	38.42	0	18	13.161	21.882	0.1875	0.75	A572-65
2	101.58	53	4.42	18	21.88	33.913	0.3125	1.25	A572-65
3	53	53	0	18	32.28	44.317	0.3125	1.25	A572-65

## Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	31.416	plate	PL 5.75" x 1"	2	x												x					
2	5.25	31.416	plate	PL 5.75" x 1"	1							x											
3	31.416	48.667	plate	PL 5.75" x 1"	3						x						x						x
4	58.917	70.083	plate	PL 5.75" x 1"	3						x						x						x
5	0	59.083	channel	MP3-04 (1.25")	2										x							x	
6	5.25	59.083	channel	MP3-04 (1.25")	1				x														
7	29	40	plate	CCI-SFP-060100	3			x						x							x		
8	5.25	23.5	plate	CCI-SFP-060100	3		x							x									x
9	52	63	plate	CCI-SFP-060100	3			x						x					x				
10	70	91	plate	CCI-SFP-060100	3		x						x						x				
11	101.583	115	plate	CCI-AFP-045100	3		x						x						x				
12	0	5.25	plate	(ts) 1.25" x 6"	3			x					x								x		
13	23.5	29	plate	CCI-SFP-060100	2					x						x							
14																							

## Reinforcement Details

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L <sub>y</sub> (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	5.75	1	5.75	0.5	23.000	23.000	14.000	4.438	1.2500	A572-65
2	5.75	1	5.75	0.5	23.000	23.000	14.000	4.438	1.2500	A572-65
3	5.75	1	5.75	0.5	23.000	23.000	14.000	4.438	1.2500	A572-65
4	5.75	1	5.75	0.5	23.000	23.000	14.000	4.438	1.2500	A572-65
5	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.566	1.2500	A572-65
6	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.566	1.2500	A572-65
7	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
8	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
9	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
10	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
11	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
12	1.25	6	7.5	3	n/a	n/a	0.750	7.500	0.0000	A572-65
13	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65

# TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	140 - 135	5		18	13.161	14.296	0.1875	A572-65	1.000
2	135 - 130	5		18	14.296	15.431	0.1875	A572-65	1.000
3	130 - 125	5		18	15.431	16.566	0.1875	A572-65	1.000
4	125 - 120	5		18	16.566	17.701	0.1875	A572-65	1.000
5	120 - 115	5		18	17.701	18.836	0.1875	A572-65	1.000
6	115 - 114.75	0.25		18	18.836	18.893	0.4625	A572-65	0.910
7	114.75 - 109.75	5		18	18.893	20.027	0.45	A572-65	0.905
8	109.75 - 104.75	5	0	18	20.027	21.162	0.425	A572-65	0.929
9	104.75 - 101.483	3.267		18	21.162	21.904	0.3125	A572-65	1.000
10	101.483 - 101.333	0.15		18	21.904	21.938	0.3125	A572-65	1.000
11	101.333 - 96.333	5		18	21.938	23.073	0.3125	A572-65	1.000
12	96.333 - 91.333	5		18	23.073	24.208	0.3125	A572-65	1.000
13	91.333 - 91	0.333		18	24.208	24.284	0.3125	A572-65	1.000
14	91 - 90.75	0.25		18	24.284	24.340	0.6	A572-65	0.925
15	90.75 - 85.75	5		18	24.340	25.475	0.5875	A572-65	0.926
16	85.75 - 80.75	5		18	25.475	26.610	0.5625	A572-65	0.948
17	80.75 - 75.75	5		18	26.610	27.745	0.55	A572-65	0.952
18	75.75 - 70.75	5		18	27.745	28.880	0.54375	A572-65	0.947
19	70.75 - 69.983	0.767		18	28.880	29.055	0.53125	A572-65	0.951
20	69.983 - 69.733	0.25		18	29.055	29.111	0.53125	A572-65	0.951
21	69.733 - 64.733	5		18	29.111	30.246	0.525	A572-65	0.948
22	64.733 - 63	1.733		18	30.246	30.640	0.51875	A572-65	0.954
23	63 - 62.75	0.25		18	30.640	30.696	0.7	A572-65	0.981
24	62.75 - 59.083	3.667		18	30.696	31.529	0.6875	A572-65	0.984
25	59.083 - 58.817	0.266		18	31.529	31.589	0.625	A572-65	1.000
26	58.817 - 58.667	0.15		18	31.589	31.623	0.625	A572-65	0.999
27	58.667 - 53.667	5		18	31.623	32.758	0.6125	A572-65	1.001
28	53.667 - 53	5.087	4.42	18	32.758	33.913	0.6125	A572-65	0.999
29	53 - 47.58	5.42		18	32.285	33.515	0.6375	A572-65	0.941
30	47.58 - 42.58	5		18	33.515	34.650	0.625	A572-65	0.944
31	42.58 - 40	2.58		18	34.650	35.236	0.6125	A572-65	0.955
32	40 - 39.75	0.25		18	35.236	35.293	0.8125	A572-65	0.926
33	39.75 - 34.75	5		18	35.293	36.428	0.7875	A572-65	0.937
34	34.75 - 31.416	3.334		18	36.428	37.185	0.775	A572-65	0.940
35	31.416 - 31.166	0.25		18	37.185	37.242	0.775	A572-65	0.939
36	31.166 - 29	2.166		18	37.242	37.733	0.7625	A572-65	0.947
37	29 - 28.75	0.25		18	37.733	37.790	0.675	A572-65	0.991
38	28.75 - 23.75	5		18	37.790	38.925	0.6625	A572-65	0.994
39	23.75 - 23.5	0.25		18	38.925	38.982	0.6625	A572-65	0.993
40	23.5 - 23.25	0.25		18	38.982	39.039	0.65	A572-65	1.087
41	23.25 - 18.25	5		18	39.039	40.174	0.6375	A572-65	1.090
42	18.25 - 13.25	5		18	40.174	41.309	0.625	A572-65	1.094
43	13.25 - 8.25	5		18	41.309	42.444	0.6125	A572-65	1.100
44	8.25 - 5.25	3		18	42.444	43.125	0.6125	A572-65	1.090
45	5.25 - 5	0.25		18	43.125	43.182	0.6875	A572-65	0.914
46	5 - 0	5		18	43.182	44.317	0.6875	A572-65	0.902

## TNX Section Forces

Increment (ft): 5		TNX Output		
	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1	140 - 135	2.0728	32.493	6.9039
2	135 - 130	2.288	67.642	7.161
3	130 - 125	2.531	104.09	7.4238
4	125 - 120	2.7976	141.86	7.6925
5	120 - 115	3.7376	199.83	11.81
6	115 - 114.75	3.7765	202.78	11.829
7	114.75 - 109.75	4.3406	263.01	12.283
8	109.75 - 104.75	4.931	325.51	12.738
9	104.75 - 101.483	5.2861	367.56	13.026
10	101.483 - 101.333	5.3117	369.51	13.036
11	101.333 - 96.333	6.1633	437.63	14.2
12	96.333 - 91.333	10.274	528.76	19.84
13	91.333 - 91	10.33	535.36	19.863
14	91 - 90.75	10.378	540.33	19.885
15	90.75 - 85.75	11.294	640.85	20.352
16	85.75 - 80.75	12.245	743.69	20.813
17	80.75 - 75.75	13.223	848.87	21.268
18	75.75 - 70.75	17.144	966.97	25.046
19	70.75 - 69.983	17.306	986.21	25.11
20	69.983 - 69.733	17.364	992.49	25.127
21	69.733 - 64.733	18.406	1119.2	25.559
22	64.733 - 63	18.767	1163.6	25.711
23	63 - 62.75	18.855	1170.1	25.72
24	62.75 - 59.083	19.839	1265	26.061
25	59.083 - 58.817	19.917	1272	26.078
26	58.817 - 58.667	19.957	1275.9	26.091
27	58.667 - 53.667	21.251	1407.5	26.539
28	53.667 - 53	21.432	1425.2	26.593
29	53 - 47.58	23.813	1571	27.25
30	47.58 - 42.58	25.147	1708.3	27.654
31	42.58 - 40	25.843	1779.9	27.86
32	40 - 39.75	25.938	1786.9	27.869
33	39.75 - 34.75	27.576	1927.3	28.287
34	34.75 - 31.416	28.687	2022.1	28.552
35	31.416 - 31.166	28.779	2029.2	28.564
36	31.166 - 29	29.501	2091.3	28.743
37	29 - 28.75	29.589	2098.5	28.754
38	28.75 - 23.75	31.186	2243.2	29.142
39	23.75 - 23.5	31.3	2250.5	29.2
40	23.5 - 23.25	31.4	2257.8	29.2
41	23.25 - 18.25	33.1	2404.7	29.6
42	18.25 - 13.25	34.8	2553.4	29.9
43	13.25 - 8.25	36.6	2704.0	30.3
44	8.25 - 5.25	37.7	2795.3	30.5
45	5.25 - 5	37.8	2802.9	30.5
46	5 - 0	39.5	2956.7	30.9

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP14.296x13.161x0.1875	Pole	26.2%	Pass
135 - 130	Pole	TP15.431x14.296x0.1875	Pole	46.4%	Pass
130 - 125	Pole	TP16.566x15.431x0.1875	Pole	61.7%	Pass
125 - 120	Pole	TP17.701x16.566x0.1875	Pole	73.4%	Pass
120 - 115	Pole	TP18.836x17.701x0.1875	Pole	91.1%	Pass
115 - 114.75	Pole + Reinf.	TP18.893x18.836x0.4625	Reinf. 11 Compression	54.1%	Pass
114.75 - 109.75	Pole + Reinf.	TP20.027x18.893x0.45	Reinf. 11 Compression	64.6%	Pass
109.75 - 104.75	Pole + Reinf.	TP21.162x20.027x0.425	Reinf. 11 Compression	73.9%	Pass
104.75 - 101.48	Pole	TP21.904x21.162x0.3125	Pole	75.2%	Pass
101.48 - 101.33	Pole	TP21.938x21.904x0.3125	Pole	75.4%	Pass
101.33 - 96.33	Pole	TP23.073x21.938x0.3125	Pole	80.6%	Pass
96.33 - 91.33	Pole	TP24.208x23.073x0.3125	Pole	88.5%	Pass
91.33 - 91	Pole	TP24.284x24.208x0.3125	Pole	89.1%	Pass
91 - 90.75	Pole + Reinf.	TP24.34x24.284x0.6	Reinf. 10 Bolt Shear	62.3%	Pass
90.75 - 85.75	Pole + Reinf.	TP25.475x24.34x0.5875	Reinf. 10 Compression	67.8%	Pass
85.75 - 80.75	Pole + Reinf.	TP26.61x25.475x0.5625	Reinf. 10 Compression	73.4%	Pass
80.75 - 75.75	Pole + Reinf.	TP27.745x26.61x0.55	Reinf. 10 Compression	78.4%	Pass
75.75 - 70.75	Pole + Reinf.	TP28.88x27.745x0.5438	Reinf. 10 Bolt Shear	85.2%	Pass
70.75 - 69.98	Pole + Reinf.	TP29.055x28.88x0.5313	Reinf. 4 Tension Rupture	88.1%	Pass
69.98 - 69.73	Pole + Reinf.	TP29.111x29.055x0.5313	Reinf. 4 Tension Rupture	88.4%	Pass
69.73 - 64.73	Pole + Reinf.	TP30.246x29.111x0.525	Reinf. 4 Tension Rupture	93.7%	Pass
64.73 - 63	Pole + Reinf.	TP30.64x30.246x0.5188	Reinf. 4 Tension Rupture	95.3%	Pass
63 - 62.75	Pole + Reinf.	TP30.696x30.64x0.7	Reinf. 4 Tension Rupture	73.6%	Pass
62.75 - 59.08	Pole + Reinf.	TP31.529x30.696x0.6875	Reinf. 4 Tension Rupture	76.5%	Pass
59.08 - 58.82	Pole + Reinf.	TP31.589x31.529x0.625	Reinf. 5 Tension Rupture	78.4%	Pass
58.82 - 58.67	Pole + Reinf.	TP31.623x31.589x0.625	Reinf. 5 Tension Rupture	78.5%	Pass
58.67 - 53.67	Pole + Reinf.	TP32.758x31.623x0.6125	Reinf. 5 Tension Rupture	82.0%	Pass
53.67 - 53	Pole + Reinf.	TP33.913x32.758x0.6125	Reinf. 5 Tension Rupture	82.4%	Pass
53 - 47.58	Pole + Reinf.	TP33.515x32.285x0.6375	Reinf. 3 Tension Rupture	88.1%	Pass
47.58 - 42.58	Pole + Reinf.	TP34.65x33.515x0.625	Reinf. 3 Tension Rupture	91.1%	Pass
42.58 - 40	Pole + Reinf.	TP35.236x34.65x0.6125	Reinf. 3 Tension Rupture	92.5%	Pass
40 - 39.75	Pole + Reinf.	TP35.293x35.236x0.8125	Reinf. 3 Tension Rupture	71.8%	Pass
39.75 - 34.75	Pole + Reinf.	TP36.428x35.293x0.7875	Reinf. 3 Tension Rupture	74.1%	Pass
34.75 - 31.42	Pole + Reinf.	TP37.185x36.428x0.775	Reinf. 3 Tension Rupture	75.5%	Pass
31.42 - 31.17	Pole + Reinf.	TP37.242x37.185x0.775	Reinf. 1 Tension Rupture	75.6%	Pass
31.17 - 29	Pole + Reinf.	TP37.733x37.242x0.7625	Reinf. 1 Tension Rupture	76.5%	Pass
29 - 28.75	Pole + Reinf.	TP37.79x37.733x0.675	Reinf. 1 Tension Rupture	91.1%	Pass
28.75 - 23.75	Pole + Reinf.	TP38.925x37.79x0.6625	Reinf. 1 Tension Rupture	93.1%	Pass
23.75 - 23.5	Pole + Reinf.	TP38.982x38.925x0.6625	Reinf. 1 Tension Rupture	93.2%	Pass
23.5 - 23.25	Pole + Reinf.	TP39.039x38.982x0.65	Reinf. 1 Tension Rupture	92.5%	Pass
23.25 - 18.25	Pole + Reinf.	TP40.174x39.039x0.6375	Reinf. 1 Tension Rupture	94.3%	Pass
18.25 - 13.25	Pole + Reinf.	TP41.309x40.174x0.625	Reinf. 1 Tension Rupture	96.0%	Pass
13.25 - 8.25	Pole + Reinf.	TP42.444x41.309x0.6125	Reinf. 1 Tension Rupture	97.6%	Pass
8.25 - 5.25	Pole + Reinf.	TP43.125x42.444x0.6125	Reinf. 1 Tension Rupture	98.4%	Pass
5.25 - 5	Pole + Reinf.	TP43.182x43.125x0.6875	Reinf. 1 Tension Rupture	83.5%	Pass
5 - 0	Pole + Reinf.	TP44.317x43.182x0.6875	Reinf. 1 Tension Rupture	84.9%	Pass
				Summary	
			Pole	91.1%	Pass
			Reinforcement	98.4%	Pass
			Overall	98.4%	Pass



# Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity													
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13
140 - 135	211	n/a	211	8.40	n/a	8.40	26.2%													
135 - 130	266	n/a	266	9.07	n/a	9.07	46.4%													
130 - 125	330	n/a	330	9.75	n/a	9.75	61.7%													
125 - 120	404	n/a	404	10.42	n/a	10.42	73.4%													
120 - 115	487	n/a	487	11.10	n/a	11.10	91.1%													
115 - 114.75	492	680	1172	11.13	13.50	24.63	38.1%											54.1%		
114.75 - 109.75	587	758	1345	11.81	13.50	25.31	45.6%											64.6%		
109.75 - 104.75	694	841	1534	12.48	13.50	25.98	52.2%											73.8%		
104.75 - 101.48	1261	n/a	1261	21.42	n/a	21.42	75.2%													
101.48 - 101.33	1267	n/a	1267	21.45	n/a	21.45	75.4%													
101.33 - 96.33	1477	n/a	1477	22.57	n/a	22.57	80.8%													
96.33 - 91.33	1709	n/a	1709	23.70	n/a	23.70	88.5%													
91.33 - 91	1726	n/a	1726	23.78	n/a	23.78	89.1%													
91 - 90.75	1738	1473	3210	23.83	18.00	41.83	47.8%											62.3%		
90.75 - 85.75	1996	1605	3601	24.96	18.00	42.96	52.9%											67.8%		
85.75 - 80.75	2278	1743	4021	26.08	18.00	44.08	57.4%											73.4%		
80.75 - 75.75	2586	1887	4473	27.21	18.00	45.21	61.4%											78.4%		
75.75 - 70.75	2921	2037	4957	28.33	18.00	46.33	65.5%											85.2%		
70.75 - 69.98	2974	1972	4947	28.51	17.25	45.76	67.6%				88.1%									
69.98 - 69.73	2992	1980	4972	28.56	17.25	45.81	67.8%				88.4%									
69.73 - 64.73	3360	2130	5490	29.69	17.25	46.94	72.0%				93.7%									
64.73 - 63	3494	2183	5677	30.08	17.25	47.33	73.3%				95.3%									
63 - 62.75	3520	4069	7589	30.14	35.25	65.39	57.5%				73.6%							69.1%		
62.75 - 59.08	3817	4282	8100	30.96	35.25	66.21	59.8%				76.5%							70.8%		
59.08 - 58.82	3836	3576	7411	31.02	30.39	61.41	65.2%					78.3%	69.4%					76.8%		
58.82 - 58.67	3848	3583	7431	31.06	30.39	61.45	65.3%					78.5%	69.5%					77.0%		
58.67 - 53.67	4282	3833	8115	32.18	30.39	62.57	68.3%					82.0%	72.8%					80.5%		
53.67 - 53	4342	3867	8209	32.33	30.39	62.72	68.7%					82.4%	73.2%					82.2%		
53 - 47.58	4585	4469	9054	32.93	29.64	62.57	67.9%			88.1%		82.7%	82.7%							
47.58 - 42.58	5072	4764	9836	34.06	29.64	63.70	70.3%			91.1%		85.4%	85.4%							
42.58 - 40	5336	4921	10256	34.64	29.64	64.28	71.4%			92.5%		86.8%	86.8%							
40 - 39.75	5362	7927	13289	34.69	47.64	82.33	55.4%			71.8%		67.4%	67.4%	71.4%						
39.75 - 34.75	5901	8427	14327	35.82	47.64	83.46	57.2%			74.1%		69.5%	69.5%	72.5%						
34.75 - 31.42	6280	8768	15048	36.57	47.64	84.21	58.4%			75.5%		70.8%	70.8%	73.9%						
31.42 - 31.17	6309	8794	15102	36.63	47.64	84.27	58.5%	75.6%	75.6%			70.9%	70.9%	74.0%						
31.17 - 29	6564	9019	15584	37.12	47.64	84.76	59.2%	76.5%	76.5%			71.7%	71.7%	76.1%						
29 - 28.75	6655	7158	13813	37.17	41.64	78.81	72.5%	91.0%	82.7%			89.7%	71.4%							76.6%
28.75 - 23.75	7276	7581	14857	38.30	41.64	79.94	74.2%	93.1%	84.6%			91.6%	73.1%							77.3%
23.75 - 23.5	7308	7603	14911	38.35	41.64	79.99	74.3%	93.2%	84.7%			91.7%	73.2%							78.6%
23.5 - 23.25	7285	7392	14677	38.41	47.64	86.05	72.6%	92.5%	82.7%			75.7%	82.5%	74.2%						
23.25 - 18.25	7944	7812	15757	39.54	47.64	87.18	74.2%	94.3%	84.5%			77.4%	84.2%	74.7%						
18.25 - 13.25	8642	8244	16886	40.66	47.64	88.30	75.5%	96.0%	86.1%			78.8%	85.7%	76.2%						
13.25 - 8.25	9380	8688	18068	41.79	47.64	89.43	76.8%	97.6%	87.6%			80.2%	87.1%	77.6%						
8.25 - 5.25	9842	8960	18802	42.46	47.64	90.10	77.5%	98.4%	88.4%			81.0%	87.9%	79.7%						
5.25 - 5	9878	11455	21333	42.52	42.26	84.78	68.5%	83.5%				82.0%								78.6%
5 - 0	10683	12020	22703	43.65	42.26	85.91	69.6%	84.9%				83.3%								79.7%

Note: Section capacity checked in 5 degree increments.

# Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

## Site Data

BU#: 842873  
 Site Name: SHELTON NE  
 App #: 323086 Rev. 1

## Reactions

Moment:	367.56	ft-kips
Axial:	5.29	kips
Shear:	13.03	kips
Elevation:	101.58	feet

Pole Manufacturer: Other

## Bolt Data

Qty:	16		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		Bolt Fty:	44.00
N/A:			
Circle (in.):	26		

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

## Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips	
Max Bolt directly applied T:	42.08 Kips	
Min. PL "tc" for B cap. w/o Pry:	1.416 in	
Min PL "treq" for actual T w/ Pry:	1.247 in	
Min PL "t1" for actual T w/o Pry:	1.354 in	
T allowable w/o Prying:	46.07 kips	$\alpha' < 0$ case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	42.08 kips	
Non-Prying Bolt Stress Ratio, T/B:	91.3% Pass	

Rigid
Service, ASD
Fty*ASIF

## Plate Data

Diam:	30	in
Thick, t:	1.5	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	4.34	in

## Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	32.8 ksi
Allowable Plate Stress:	50.0 ksi
Compression Plate Stress Ratio:	65.5% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	69.1% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
14.04

## Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

## Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

## Pole Results

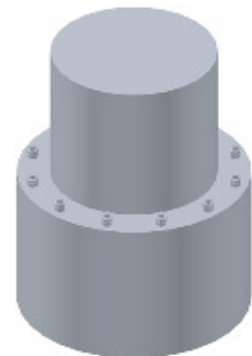
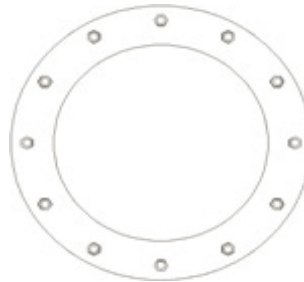
Pole Punching Shear Check: n/a

## Pole Data

Diam:	21.882	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

## Stress Increase Factor

ASIF: 1.333



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

# Stiffened or Unstiffened, UngROUTED, Circular Base Plate - Any Rod Material

## TIA Rev F

### Site Data

BU#:	842873
Site Name:	SHELTON NE
App #:	323086 Rev. 1
Pole Manufacturer:	Other

Reactions		
Moment:	2957	ft-kips
Axial:	39	kips
Shear:	31	kips

### Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	51	in

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

### Anchor Rod Results

Maximum Rod Tension: 171.5 Kips  
 Allowable Tension: 195.0 Kips  
 Anchor Rod Stress Ratio: 88.0% **Pass**

Rigid
Service ASD
Fty*ASIF

### Plate Data

Diam:	57	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.79	in

### Base Plate Results

Base Plate Stress: 49.1 ksi  
 Allowable Plate Stress: 60.0 ksi  
 Base Plate Stress Ratio: 81.9% **Pass**

### Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
25.24

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

### Stiffener Results

Horizontal Weld : n/a  
 Vertical Weld: n/a  
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a  
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a  
 Plate Comp. (AISC Bracket): n/a

### Pole Results

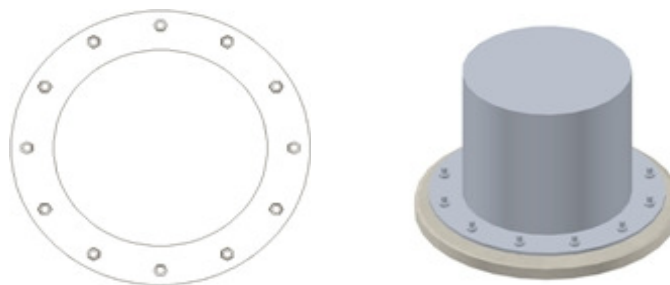
Pole Punching Shear Check: n/a

### Pole Data

Diam:	44.317	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Stress Increase Factor

ASIF:	1.333
-------	-------



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BU:	842873
Site Name:	SHELTON NE
App Number:	323086 Rev. 1
Work Order:	1182451

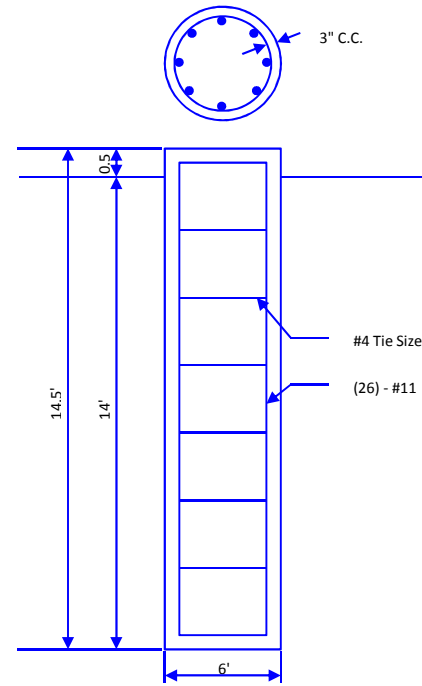


**Monopole Drilled Pier**

**Input**

Criteria	
TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B
Forces	
Compression	39 kips
Shear	31 kips
Moment	2957 k-ft
Swelling Force	0 kips
Foundation Dimensions	
Pier Diameter:	6 ft
Ext. above grade:	0.5 ft
Depth below grade:	14 ft
Material Properties	
Number of Rebar:	26
Rebar Size:	11
Tie Size	4
Rebar tensile strength:	60 ksi
Concrete Strength:	4000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	3 in

Soil Profile: Soil



Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Friction (ksf)	Ultimate Comp. Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3	0	3	100	0	0				0
2	5.5	3	8.5	130	4000	0				0
3	5.5	8.5	14	130	12000	0				11

**Analysis Results**

Soil Lateral Capacity

Depth to Zero Shear:	3.47 ft
Max Moment, Mu:	3087.13 k-ft
Soil Safety Factor:	2.93
Safety Factor Req'd:	2
<b>RATING:</b>	<b>68.3%</b>

Soil Axial Capacity

Skin Friction (k):	292.36 kips
End Bearing (k):	87.97 kips
Comp. Capacity (k), φCn:	380.33 kips
Comp. (k), Cu:	50.70 kips
<b>RATING:</b>	<b>13.3%</b>

Concrete/Steel Check

Mu (from soil analysis)	4013.27 k-ft
φMn	5361.10 k-ft
<b>RATING:</b>	<b>74.9%</b>

rho provided	1.00
rho required	0.33 OK

Rebar Spacing	6.27
Spacing required	22.56 OK

Dev. Length required	10.28
Dev. Length provided	53.51 OK

**Overall Foundation Rating: 74.9%**

**APPENDIX D**  
**STRUCTURAL MODIFICATION DRAWINGS**

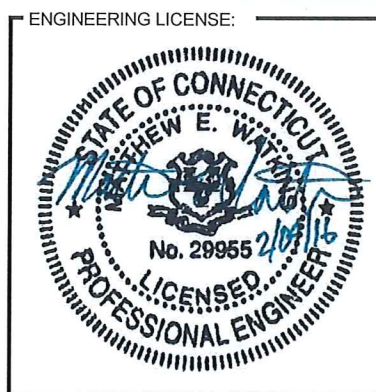
# CROWN CASTLE

SITE NAME: SHELTON NE  
 BU NUMBER: 842873  
 SITE ADDRESS: 30 OLIVER TERRACE  
 SHELTON, CT 06484  
 TOWER TYPE: 140 FT MONOPOLE TOWER

PLANS PREPARED FOR:  
**CROWN CASTLE**

PLANS PREPARED BY:  
**JACOBS**  
 Jacobs Engineering Group, Inc.  
 5449 BELLS FERRY ROAD  
 ACWORTH, GEORGIA 30102  
 770-701-2500, FAX: 770-701-2501

OEM:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	02/03/16	JMB	0

DRAWN BY: JMB  
 CHECKED BY: MHL  
 APPROVED BY: MEW  
 JACOBS PROJECT NO.: 1182451

SITE NAME:  
**SHELTON NE**

SITE BU NUMBER:  
**842873**

SITE ADDRESS:  
**30 OLIVER TERRACE  
 SHELTON, CT  
 06484**

SHEET DESCRIPTION:  
**TITLE SHEET**

SHEET NUMBER:  
**T-1**

SITE INFORMATION	VICINITY MAP	PROJECT DESCRIPTION	DRAWING INDEX																																
<p><u>LATITUDE (NAD83):</u> 41° 17' 38.21"</p> <p><u>LONGITUDE (NAD83):</u> -73° 6' 25.83"</p> <p><u>COUNTY:</u> FAIRFIELD</p>		<ul style="list-style-type: none"> <li>EXISTING MONOPOLE TOWER TO BE MODIFIED PER SHEET S-3.</li> </ul>	<table border="1"> <thead> <tr> <th>SHEET NO:</th> <th>SHEET TITLE</th> <th>REV</th> <th>DESIGNER</th> </tr> </thead> <tbody> <tr> <td>T-1</td> <td>TITLE SHEET</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>N-1</td> <td>GENERAL NOTES</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>N-2</td> <td>MODIFICATION INSPECTION CHECKLIST</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>S-1</td> <td>NexGen2™ BOLT SPECS &amp; TIGHTENING PROCEDURE</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>S-2</td> <td>FORGBolt™ BOLT SPECS &amp; TIGHTENING PROCEDURE</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>S-3</td> <td>POLE MODIFICATION SCHEDULE</td> <td>0</td> <td>JMB</td> </tr> <tr> <td>S-4</td> <td>TOWER SECTION VIEW</td> <td>0</td> <td>JMB</td> </tr> </tbody> </table>	SHEET NO:	SHEET TITLE	REV	DESIGNER	T-1	TITLE SHEET	0	JMB	N-1	GENERAL NOTES	0	JMB	N-2	MODIFICATION INSPECTION CHECKLIST	0	JMB	S-1	NexGen2™ BOLT SPECS & TIGHTENING PROCEDURE	0	JMB	S-2	FORGBolt™ BOLT SPECS & TIGHTENING PROCEDURE	0	JMB	S-3	POLE MODIFICATION SCHEDULE	0	JMB	S-4	TOWER SECTION VIEW	0	JMB
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<p><b>TOWER INFORMATION</b></p> <p><u>FAILING STRUCTURAL ANALYSIS</u>          STRUCTURAL ANALYSIS BY: PAUL J. FORD AND COMPANY          PROJECT NO.: 37515-3482.001.7805          WORK ORDER NO.: 1163525          APPLICATION &amp; REV. NO.: 323086, REV. 1          DATE: 12/10/2015</p> <p><u>PASSING STRUCTURAL ANALYSIS</u>          STRUCTURAL ANALYSIS BY: JACOBS ENGINEERING GROUP, INC.          PROJECT NO.: 1182451          WORK ORDER NO.: 1182451          CARRIER NAME: AT&amp;T MOBILITY          APPLICATION &amp; REV. NO.: 323086, REV. 1          DATE: 02/04/2016</p>		<p><b>ENGINEERS COMMENTS</b></p> <p>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.</p>																																	
		<p><b>APPLICABLE CODES</b></p> <p>ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.</p> <p>- ANSI/TIA/EIA-222-F-1996 STANDARD, "STRUCTURAL STANDARD FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES"</p> <p>- 2005 CONNECTICUT STATE BUILDING CODE</p>																																	
<p><b>PROJECT CONTACTS</b></p> <p><u>DESIGN ENGINEER - MAIN RFI CONTACT</u>          MATTHEW LEE          919-859-5758          111 CORNING RD. STE 200          CARY, NC 27518          Matthew.Lee@jacobs.com</p> <p><u>ENGINEER OF RECORD</u>          MATTHEW WATKINS          770-701-2501          5449 BELLS FERRY ROAD          ACWORTH, GA 30102          Matt.Watkins@jacobs.com</p> <p><u>CROWN TOWER MOD PM</u>          DAN VADNEY          518-373-3510          Dan.Vadney@crowncastle.com</p> <p><u>CROWN CM INFO</u>          JASON D'AMICO          860-209-0104          Jason.D'Amico@crowncastle.com</p>		<p>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.</p>																																	

1.0 CONSTRUCTION TO CONFORM TO CONSTRUCTION STANDARDS:

1.1 PURPOSE AND INTENT

- (A) THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH. SHOULD THERE BE ANY DISCREPANCIES BETWEEN REQUIREMENTS SHOWN IN BOTH, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
- (B) THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
- (C) THE PURPOSE OF THESE CONSTRUCTION SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

1.2 WORK

ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE (UNO). 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.

1.3 CONFLICTS

- (A) CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND POSSIBLE INTERFERENCES AT THE SITE BEFORE ORDERING MATERIAL OR DOING ANY WORK. ANY AND ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER OF RECORD (EOR) AND APPROPRIATE FIELD PERSONNEL IMMEDIATELY. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. SUBMIT NOTICE OF ANY DISCREPANCY IN DIMENSIONS OR OTHERWISE TO JACOBS FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.
- (B) 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.

1.4 CODES

UNLESS NOTED OTHERWISE USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL LAWS, REGULATIONS AND RULES PROMULGATED BY FEDERAL STATE AND LOCAL AUTHORITIES WITH JURISDICTION OVER THE SITE. THIS RESPONSIBILITY IS IN EFFECT REGARDLESS OF WHETHER THE LAW, ORDINANCE, REGULATION OR RULE IS MENTIONED IN THESE SPECIFICATIONS.

1.5 LICENSING

THE CONTRACTOR SHALL MAINTAIN A VALID CONTRACTOR'S LICENSE FOR THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED. 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.

1.6 OSHA

FOLLOW ALL APPLICABLE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND STATE LAWS BASED IN THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT. 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. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS/ OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK BEING INSTALLED.

1.7 PHOTOS

PROVIDE PHOTOGRAPHIC EVIDENCE OF ALL FOUNDATION INSTALLATION, GROUNDING AND TRENCHING AFTER PLACEMENT OF UTILITIES PRIOR TO BACKFILL.

1.8 BUILDING PERMITS

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.

1.9 ZONING REGULATIONS AND CONDITIONAL USE PERMITS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENT OF THE PERMITS, INCLUDING BUT NOT LIMITED TO NOISE REGULATIONS, HOURS OF WORK, ACCESS LIMITATIONS, ETC.

1.10 MATERIALS AND EQUIPMENT

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. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.

1.11 CLIMBING FACILITIES

THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

1.12 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/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

1.13 FAA PERMIT AND TOWER LIGHTING

REFER TO CONSTRUCTION DOCUMENTS AND CONSTRUCTION MANAGER FOR FAA AND STATE LIGHTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE TEMPORARY FM APPROVED LIGHTING UNTIL PERMANENT LIGHTING IS OPERATIONAL.

1.14 TOWER SECURITY

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.

1.15 MODIFICATION PROCESS

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. MODIFICATION WORK IS NOT TO BE PERFORMED WHEN THE WIND SPEED EXCEEDS 30 MPH.

1.16 OWNERSHIP

THE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF JACOBS ENGINEERING GROUP, INC. THEY MAY NOT BE REPRODUCED IN ANY FORM WITHOUT THE EXPRESSED WRITTEN CONSENT/PERMISSION OF JACOBS.

1.17 SITE ASSUMPTIONS

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.

1.18 SITE CONTROL

- (A) 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 TEMPORARY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
- (B) 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.
- (C) 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.

1.19 DO NOT SCALE DRAWINGS.

2.0 STRUCTURAL STEEL NOTES:

UNLESS OTHERWISE NOTED, DESIGN, FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING:

- A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
- B. TIA-1019-A: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
- C. AISC: MANUAL OF STEEL CONSTRUCTION

UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

- A. STRUCTURAL STEEL, ASTM DESIGNATION A572 GRADE 65 (FY = 65 KSI), UNO
- B. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
- C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
- D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.

U.N.O. = UNLESS NOTED OTHERWISE.

2.3 ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION

2.4 HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER.

2.5 HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE.

2.6 REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL.

2.7 A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS

2.8 ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.

2.9 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.

2.10 ALL FASTENERS SHALL NOT BE REUSED.

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

2.12 AFTER FINAL INSPECTION, ALL STRUCTURAL STEEL EXPOSED AS A RESULT OF THIS SCOPE OF WORK, INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE) SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE 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.

3.0 BOLT-TIGHTENING PROCEDURE:

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

BOLT LENGTHS OVER FOUR DIAMETER BUT NOT EXCEEDING EIGHT DIAMETER  
3/8" BOLTS 4.25 TO 6.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT  
1/2" BOLTS 3.75 TO 7.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT  
5/8" BOLTS 4.25 TO 8.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT

3.2 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.

3.3 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).

3.4 ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c) OF THE SPECIFICATION.

3.5 TURN-OF-THE-NUT TIGHTENING METHOD DOES NOT APPLY TO THE FORGBOLT OR NEXGEN2 BOLTS.

4.0 WELDING NOTES:

4.1 ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND SHALL BE DONE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2010 "STRUCTURAL WELDING CODE - STEEL".

4.2 UNLESS OTHERWISE NOTED, ALL WELDING SHALL BE DONE UTILIZING E80XX ELECTRODES.

4.3 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.

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

4.5 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.

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

4.7 FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.

PLANS PREPARED FOR:

CROWN CASTLE

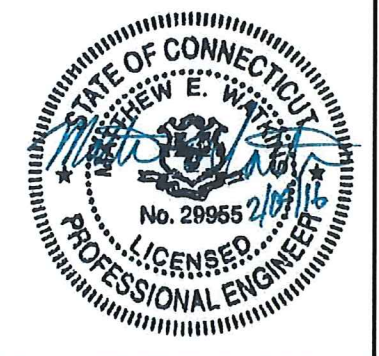
PLANS PREPARED BY:



5449 BELLS FERRY ROAD  
ACWORTH, GEORGIA 30102  
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OEM:

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SITE BU NUMBER:

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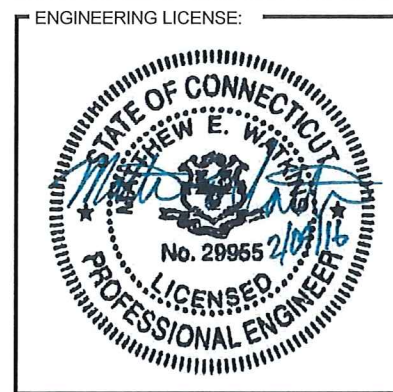
30 OLIVER TERRACE  
SHELTON, CT  
06484

SHEET DESCRIPTION:

GENERAL NOTES

SHEET NUMBER:

N-1



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REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	02/03/16	JMB	0

DRAWN BY:	JMB
CHECKED BY:	MHL
APPROVED BY:	MEW
JACOBS PROJECT NO:	1182451

SITE NAME:  
**SHELTON NE**

SITE BU NUMBER:  
**842873**

SITE ADDRESS:  
**30 OLIVER TERRACE  
SHELTON, CT  
06484**

SHEET DESCRIPTION:  
**MODIFICATION INSPECTION CHECKLIST**

SHEET NUMBER:  
**N-2**

**MODIFICATION INSPECTION NOTES:**

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF 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 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, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

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

- IT IS SUGGESTED THAT THE GC 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.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY 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.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

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 (IF APPLICABLE)
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
<b>PRE-CONSTRUCTION</b>	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
<b>CONSTRUCTION</b>	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
<b>POST-CONSTRUCTION</b>	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT  
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT



# NEXGEN2

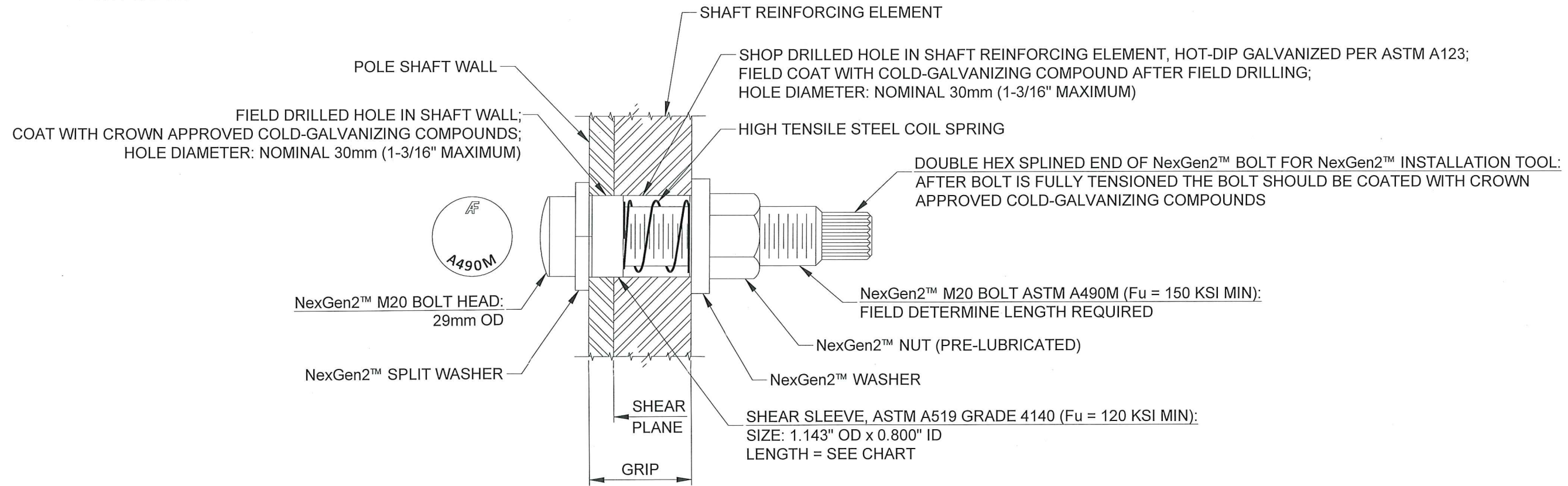
BLIND BOLT ASSEMBLY

- PATENT PENDING -



INTERIOR OF POLE SHAFT

EXTERIOR OF POLE SHAFT



TYPICAL **NG2** BOLT DETAIL

MANUFACTURER:  
 ALLFASTENERS  
 15401 COMMERCE PARK DRIVE, BROOKPARK, OHIO, USA 44142  
 PHONE: 440-232-6060  
 WEBSITE: [WWW.ALLFASTENERS.COM](http://WWW.ALLFASTENERS.COM)

NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.

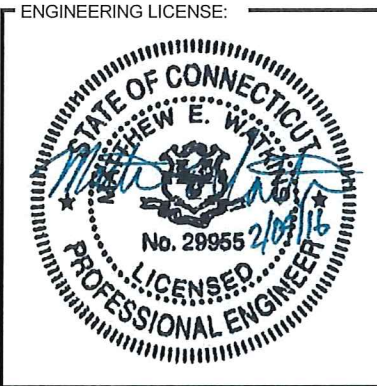
NOTE: INSTALL PER MANUFACTURER'S INSTRUCTIONS.

	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
M20x95	3/4"	1-1/16"	2-3/16"
M20x135	1-7/8"	2-1/16"	3-11/16"
M20x165	2-7/8"	3-3/16"	4-15/16"
M20x250	4"	4-5/16"	8-5/16"

PLANS PREPARED FOR:  
**CROWN CASTLE**

PLANS PREPARED BY:  
**JACOBS**  
 Jacobs Engineering Group, Inc.  
 5449 BELLS FERRY ROAD  
 ACWORTH, GEORGIA 30102  
 770-701-2500, FAX: 770-701-2501

OEM:



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DRAWN BY: JMB  
 CHECKED BY: MHL  
 APPROVED BY: MEW  
 JACOBS PROJECT NO: 1182451

SITE NAME:  
**SHELTON NE**

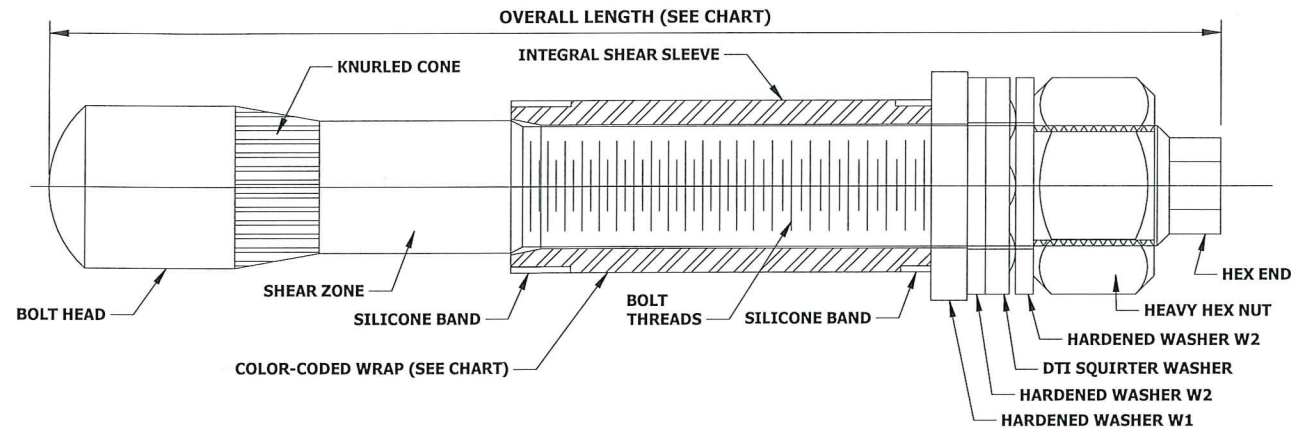
SITE BU NUMBER:  
 842873

SITE ADDRESS:  
 30 OLIVER TERRACE  
 SHELTON, CT  
 06484

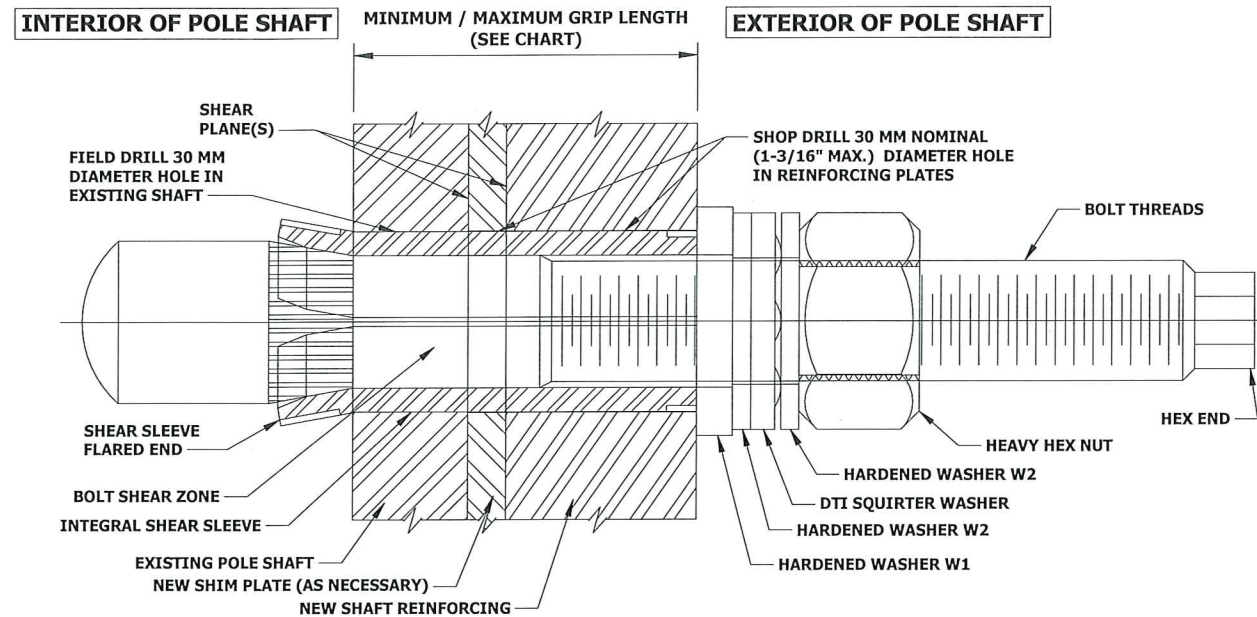
SHEET DESCRIPTION:  
 NexGen2™ BOLT SPECS & TIGHTENING PROCEDURE

SHEET NUMBER:  
**S-1**

- NOTES:** 1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.



**PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1**



**INSTALLED FORGBolt™ ASSEMBLY DETAIL 2**

**BOLT HOLE NOTES:**

- ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".
- ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.

**DISTRIBUTOR CONTACT:**

**PRECISION TOWER PRODUCTS**

PHONE: 440-214-2372

EMAIL: info@precisiontowerproducts.com

WEB: www.precisiontowerproducts.com

**CONTAINS  
PROPRIETARY INFORMATION  
PATENT PENDING**

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<b>FORGBolt™</b>		<b>AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)</b>				
<b>GROUP</b>	<b>FORGBolt™ Size (mm)</b>	<b>Overall Length (inches)</b>	<b>Estimated Weight Each (lbs)</b>	<b>Grip Range (inch)</b>	<b>Comment</b>	<b>Color Code</b>
<b>FORGBolt™ A325 - PC8.8</b>	1 <b>135</b>	5.31	1.3	3/8" to 1"	--	<b>RED</b>
	2 <b>160</b>	6.30	1.6	3/4" to 1-1/2"	--	<b>GREEN</b>
	3 <b>195</b>	7.68	1.9	1-1/4" to 2-1/4"	--	<b>BLUE</b>
	4 <b>260</b>	10.24	2.6	2" to 3-1/2"	Splice Bolt	<b>YELLOW</b>
	5 <b>365</b>	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	<b>ORANGE</b>
	6 <b>440</b>	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	<b>BLACK</b>
<b>DTI Note</b>	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

**FORGBolt™ Installation**

**Follow all Manufacturer/Distributor Recommendations for Installation, Tightening, and Inspection.**

- FIELD DRILL HOLES TO 30 MM DIAMETER.
- SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
- INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
- HAND TIGHTEN NUT TO FINGER TIGHT.
- TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
- PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

PLANS PREPARED FOR:

**CROWN  
CASTLE**

PLANS PREPARED BY:

**JACOBS**  
Jacobs Engineering Group, Inc.

5449 BELLS FERRY ROAD  
ACWORTH, GEORGIA 30102  
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:



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JACOBS PROJECT NO:	1182451

SITE NAME:

SHELTON NE

SITE BU NUMBER:

842873

SITE ADDRESS:

30 OLIVER TERRACE  
SHELTON, CT  
06484

SHEET DESCRIPTION:

FORGBolt™ BOLT SPECS & TIGHTENING PROCEDURE

SHEET NUMBER:

S-2

REVISIONS:

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**842873**

SITE ADDRESS:  
**30 OLIVER TERRACE  
SHELTON, CT  
06484**

SHEET DESCRIPTION:  
**POLE MODIFICATION SCHEDULE**

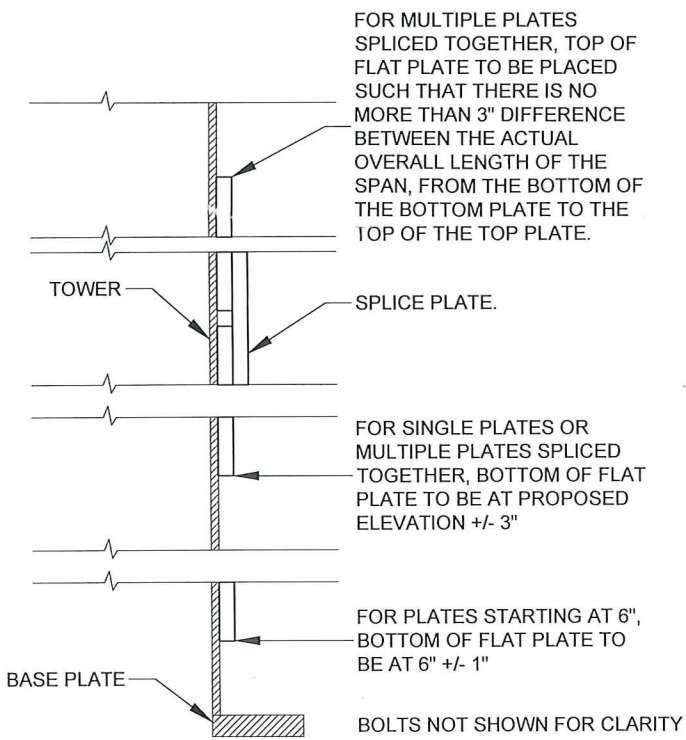
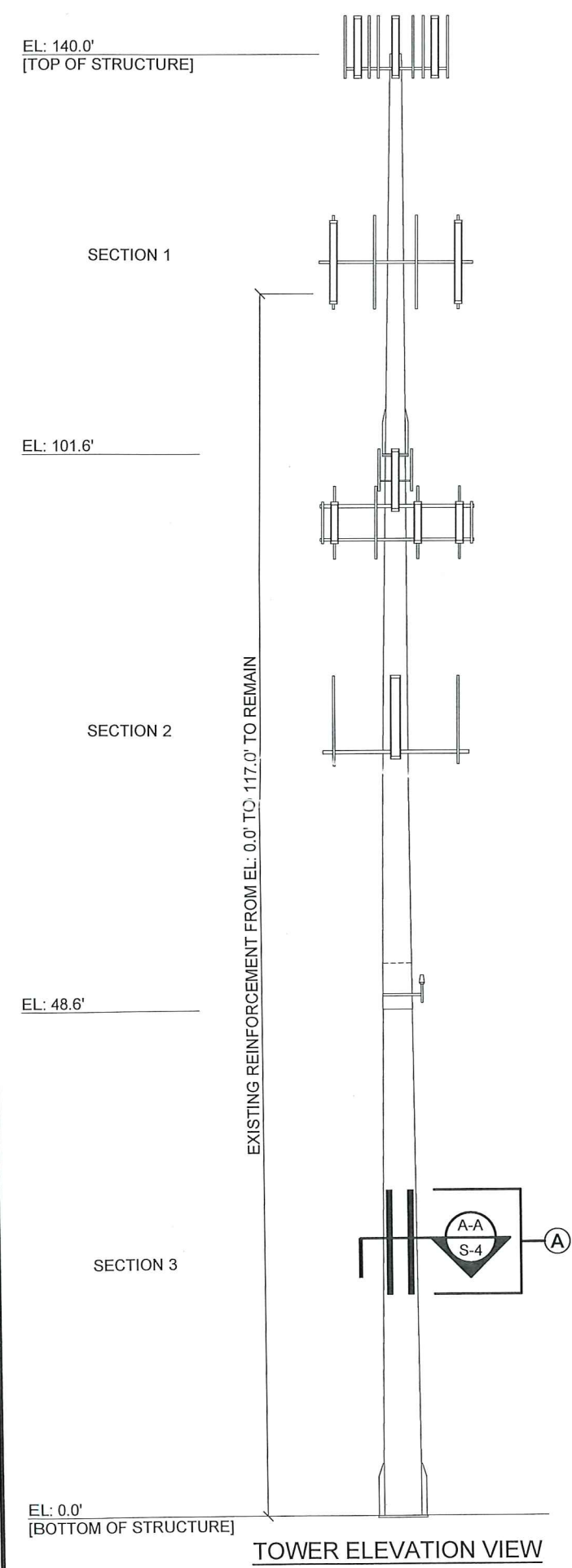
SHEET NUMBER:  
**S-3**

### CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLAT / DEGREES (°)	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAX INTERMEDIATE BOLT SPACING	BOLT QUANTITY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT QUANTITY	TOTAL STEEL WEIGHT (BLACK)
21.25'	31.25'	CCI-SFP-06010010	5, 11	8	8	1'-4"	20	204.0	40	408.0
<b>TOTAL</b>									<b>40</b>	<b>408.0</b>

**NOTES FOR CROWN REINFORCING (65 KSI) MATERIAL:**

- DO NOT WELD WITHOUT APPROVAL FROM THE EOR.
- SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESS SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.
- ALL FLAT PLATE REINFORCEMENT IS TO BE INSTALLED CENTERED ON ITS DESIGNATED FLAT, UNO.
- SEE CMRP 65 KSI PARTS CATALOG 2nd EDITION FOR PART DETAILS.
- ON MULTISIDED POLES, EXISTING SAFETY CLIMB IS CONSIDERED FLAT 1 THEN FLATS ARE NUMBERED COUNTER CLOCKWISE.
- CLIMBING PEGS TO BE RELOCATED IF REQUIRED.



**FLAT PLATE ELEVATION TOLERANCE DETAIL**

### POLE MODIFICATION SCHEDULE

LETTER	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
(A)	31.25 - 21.25	INSTALL NEW FLAT PLATE REINFORCEMENT	S-3 & S-4

### POLE SPECIFICATIONS

POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.227 IN/FT
SHAFT STEEL:	A572 GR. 65
BASE PL STEEL:	ASTM A633 (60 KSI)
ANCHOR RODS:	2.25"Ø #18J ASTM A615 GRADE 75

### SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	38.42	0.1875		13.161	21.882
2	53.00	0.3125	53.00	21.880	33.913
3	53.00	0.3125		32.290	44.317

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

PLANS PREPARED FOR:

# CROWN CASTLE

PLANS PREPARED BY:



5449 BELLS FERRY ROAD  
ACWORTH, GEORGIA 30102  
770-701-2500, FAX: 770-701-2501

OEM:

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SITE BU NUMBER:

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SITE ADDRESS:

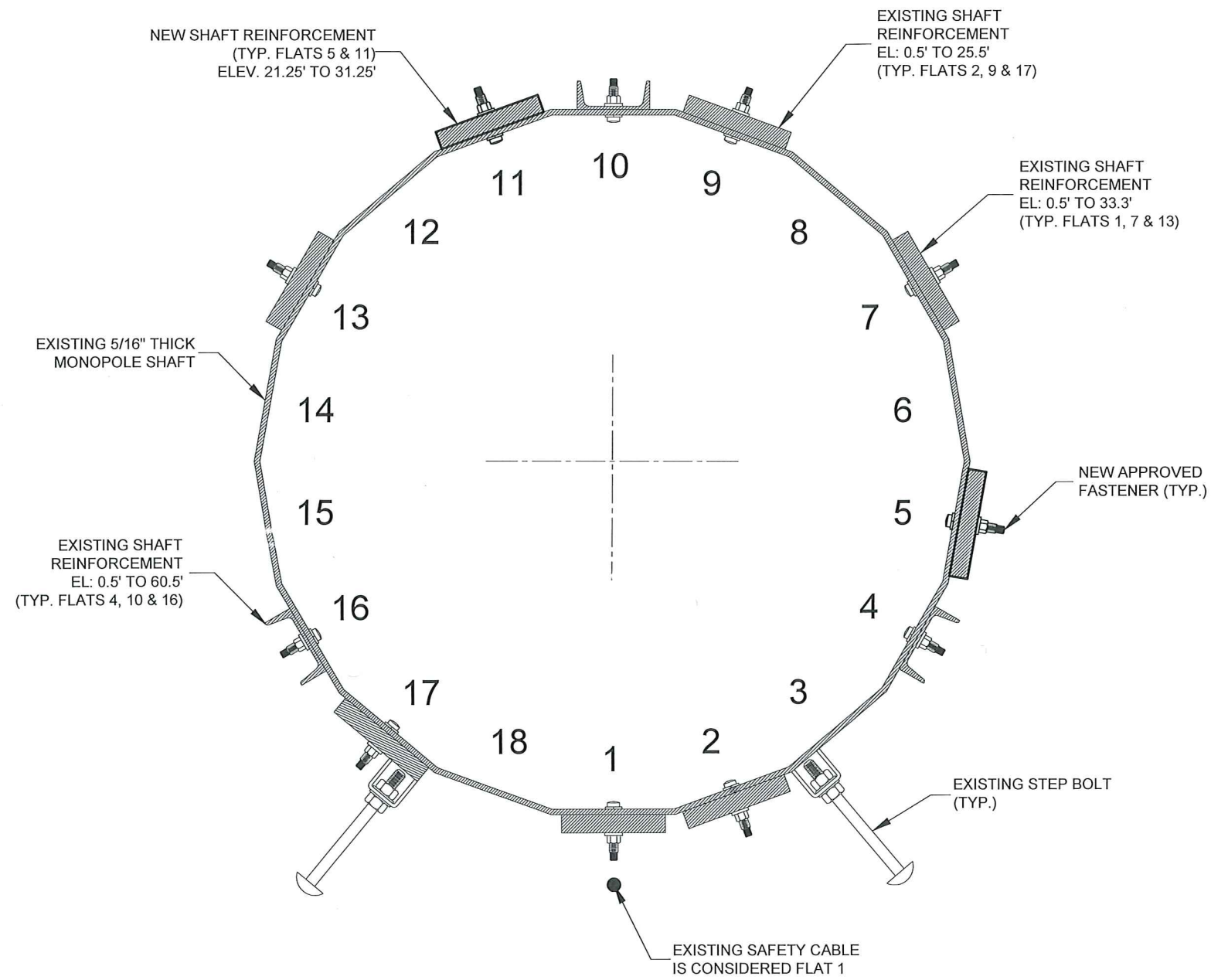
30 OLIVER TERRACE  
SHELTON, CT  
06484

SHEET DESCRIPTION:

TOWER SECTION VIEW

SHEET NUMBER:

S-4



A-A TOWER SECTION VIEW  
S-4 SECTION CUT AT 23.5'

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

AT&T Existing Facility

Site ID: CT5431

Shelton NE  
30 Oliver Terrace  
Shelton, CT 6484

**February 28, 2016**

**EBI Project Number: 6216000906**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>17.55 %</b>

February 28, 2016

AT&T Mobility – New England  
Attn: Cameron Syme, RF Manager  
550 Cochituate Road  
Suite 550 – 13&14  
Framingham, MA 06040

Emissions Analysis for Site: **CT5431 – Shelton NE**

EBI Consulting was directed to analyze the proposed AT&T facility located at **30 Oliver Terrace, Shelton, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general public 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 public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 700 and 850 MHz Bands are approximately  $467 \mu\text{W}/\text{cm}^2$  and  $567 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed AT&T Wireless antenna facility located at **30 Oliver Terrace, Shelton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 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.
- 7) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB 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.
- 8) The antennas used in this modeling are the **CCI HPA-65R-BUU-H6 and the Powerwave 7770.00** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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.
- 9) The antenna mounting height centerline of the proposed antennas is **95 feet** above ground level (AGL).
- 10) 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.

All calculations were done with respect to uncontrolled / general public threshold limits.



**AT&T Site Inventory and Power Data**

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	CCI OPA-65R-BUU-H6	Make / Model:	CCI OPA-65R-BUU-H6	Make / Model:	CCI OPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A1 MPE%	3.45	Antenna B1 MPE%	3.45	Antenna C1 MPE%	3.45
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	2,969.12	ERP (W):	2,969.12	ERP (W):	2,969.12
Antenna A2 MPE%	1.92	Antenna B2 MPE%	1.92	Antenna C2 MPE%	1.92

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	5.37 %
MetroPCS	0.44 %
T-Mobile	3.35 %
J. Brennan Constrcn	2.20 %
Nextel	0.93 %
Clearwire	0.39 %
Sprint	2.64 %
Verizon Wireless	2.23 %
<b>Site Total MPE %:</b>	<b>17.55 %</b>

AT&T Sector 1 Total:	5.37 %
AT&T Sector 2 Total:	5.37 %
AT&T Sector 3 Total:	5.37 %
<b>Site Total:</b>	<b>17.55 %</b>

AT&T _ Max Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
AT&T 700 MHz LTE	2	940.05	95	8.53	700	467	1.83 %
AT&T 1900 MHz (PCS) LTE	2	1791.23	95	16.26	1900	1000	1.63 %
AT&T 850 MHz UMTS	2	414.12	95	3.76	850	567	0.66 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	95	5.96	1900	1000	0.60 %
AT&T 850 MHz GSM	2	414.12	95	3.76	850	567	0.66 %
						Total:	5.37 %

## Summary

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

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

AT&T Sector	Power Density Value (%)
Sector 1:	5.37%
Sector 2:	5.37%
Sector 3 :	5.37%
AT&T Maximum Total (per sector):	5.37%
Site Total:	17.55 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **17.55%** of the allowable FCC established general public 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.



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