



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

June 20, 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: 841287
AT&T Site ID: CTL02108
613 Connecticut Avenue, Norwalk, CT 06850
Latitude: 41° 5' 49.45"/ Longitude: -73° 26' 56.61"

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 152-foot level of the existing 150-foot monopole at 613 Connecticut Avenue in Norwalk, CT. The tower is owned by Crown Castle. The property is owned by Home Depot. AT&T now intends to replace three (3) antennas with three (3) new Andrew antennas. AT&T also intends to install three (3) RRU32s and one (1) Raycap, two (2) DC, and 1 (one) fiber line.

This facility was approved by the Connecticut Siting Council in Docket #45 on September 14, 1984. This approval included the conditions that:

1. The towers shall be not taller than necessary to provide the proposed service, and in no event shall exceed:
 - a. 167' at the Norwalk site.
2. A fence not lower than eight feet shall surround each tower and its associated equipment.

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 Harry Rilling, Mayor for the Town of Norwalk, 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.

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4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, 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

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 Harry Rilling, Mayor
Town of Windsor
125 East Avenue
PO Box 5125
Norwalk, CT 06856-5125

Home Depot USA
PO Box 7247-7491.
The Home Depot-Receivables
Philadelphia, PA 19170

DOCKET NO. 45

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN FAIRFIELD COUNTY. : CONNECTICUT SITING COUNCIL : September 14, 1984

DECISION AND ORDER

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut, revisions of 1958, revised to 1983, as amended, be issued to the Southern New England Telephone Company for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Kaechele Place, Bridgeport, Connecticut;
Connecticut Avenue, Norwalk, Connecticut;
Nells Rock Road, Shelton, Connecticut;
Newfield Avenue, Stamford, Connecticut; and
Bayberry Lane, (former Nike site), Westport, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions:

1. The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed
 - a) 167' at the Bridgeport site,
 - b) 167' at the Norwalk site,
 - c) 189.5' at the Shelton site,
 - d) 167' at the Stamford site,
 - e) 117' at the Westport site;
2. A fence not lower than eight feet shall surround each tower and its associated equipment;
3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;

4. The applicant or its successor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;
5. Unless necessary to comply with condition number six, below, no lights shall be installed on any of these towers;
6. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
7. The applicant shall submit a development and management plan (D&M) for the Bridgeport, Stamford, and Westport sites pursuant to sections 16-50j-85 through 16-50j-87 of the regulations of state agencies, except that irrelevant items in section 16-50j-86 need only be identified as such. The D&M plans shall include appropriate evergreen screening of the sites, erosion control measures, reseeding plans, and tree removal plans. The applicant shall consult with the Stamford Environmental Protection Board in the preparation of a drainage and erosion control plan for the Stamford tower. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites;
8. Construction activities shall take place during daylight working hours;
9. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and

removed, or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;

10. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the Bridgeport Post, the Norwalk Hour, the Stamford Advocate, and the Shelton Suburban News, and the Westport News.

The parties to this proceeding are

The Southern New England Telephone Company (Applicant)
Room 314
227 Church Street
New Haven, Connecticut 06506

Attention: Mr. Peter J. Tyrrell (its attorney)
Senior Attorney

Rolnick Observatory represented by:
52 Sawyer Road
Fairfield, Connecticut
Frederick H. Bump
Director

Mr. Adam Norton
40 Highland Road
Westport, Connecticut 06880

Representative John Wayne Fox (service waived)
13 Apple Tree Drive
Stamford, Connecticut 06906

Mr. George C. Lenfest
4 Highland Road
Westport, Connecticut

Mr. William Seiden
First Selectman
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

Mr. Arthur L. Schimel
174 Bayberry Lane
Westport, Connecticut

Mr. Seymour Bendremer
11 Apache Trail
Westport, Connecticut

Ms. Gladys Floch
32 Woody Lane
Westport, Connecticut

Ms. Helen S. Cohen
15 Highland Road
Westport, Connecticut (service waived)

Mr. Jack Braverman
226 Bayberry Lane
Westport, Connecticut

Mr. Kevin Gavin
191 Bayberry Lane
Westport, Connecticut (service waived)

Mr. A.B. Beiser
12 Highland Road
Westport, Connecticut

Mr. Edward V. Polusky
4 Hooper Road
Westport, Connecticut (service waived)

Ms. Lois Schine

represented by:

Mary D. Mix, Esquire
830 Post Road - East
Suite 100
Westport, Connecticut 06880

Mr. Allen Witt
3 Apache Trail
Westport, Connecticut

Ms. Gayle Shiller
5 Apache Trail
Westport, Connecticut (service waived)

Mrs. Ronnie Hammer
3 Hooper Road
Westport, Connecticut

Mr. Paul Rosenblatt
7 Apache Trail
Westport, Connecticut

(service waived)

Mr. Henry J. Wolfson
179 Bayberry Lane
Westport, Connecticut

(service waived)

Mr. Melvin H. Barr
Planning Director
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

(service waived)

Mr. Mark Infeld
6 Apache Trail
Westport, Connecticut

(service waived)

Ms. Barbara Saipe
Representative Town
Meeting Member
District #8
Town Hall
P.O. Box 549
Westport, Connecticut 06881

(service waived)

Ms. Peggy Goldenberg
201 Bayberry Lane
Westport, Connecticut

(service waived)

Ms. Martha Hauhuth
Board of Selectman
Town Hall
P.O. Box 549
Westport, Connecticut 06881

(service waived)

Ms. Meg Coffee
32 Otter Trail
Westport, Connecticut

(service waived)

STATE OF CONNECTICUT

)

COUNTY OF HARTFORD


:

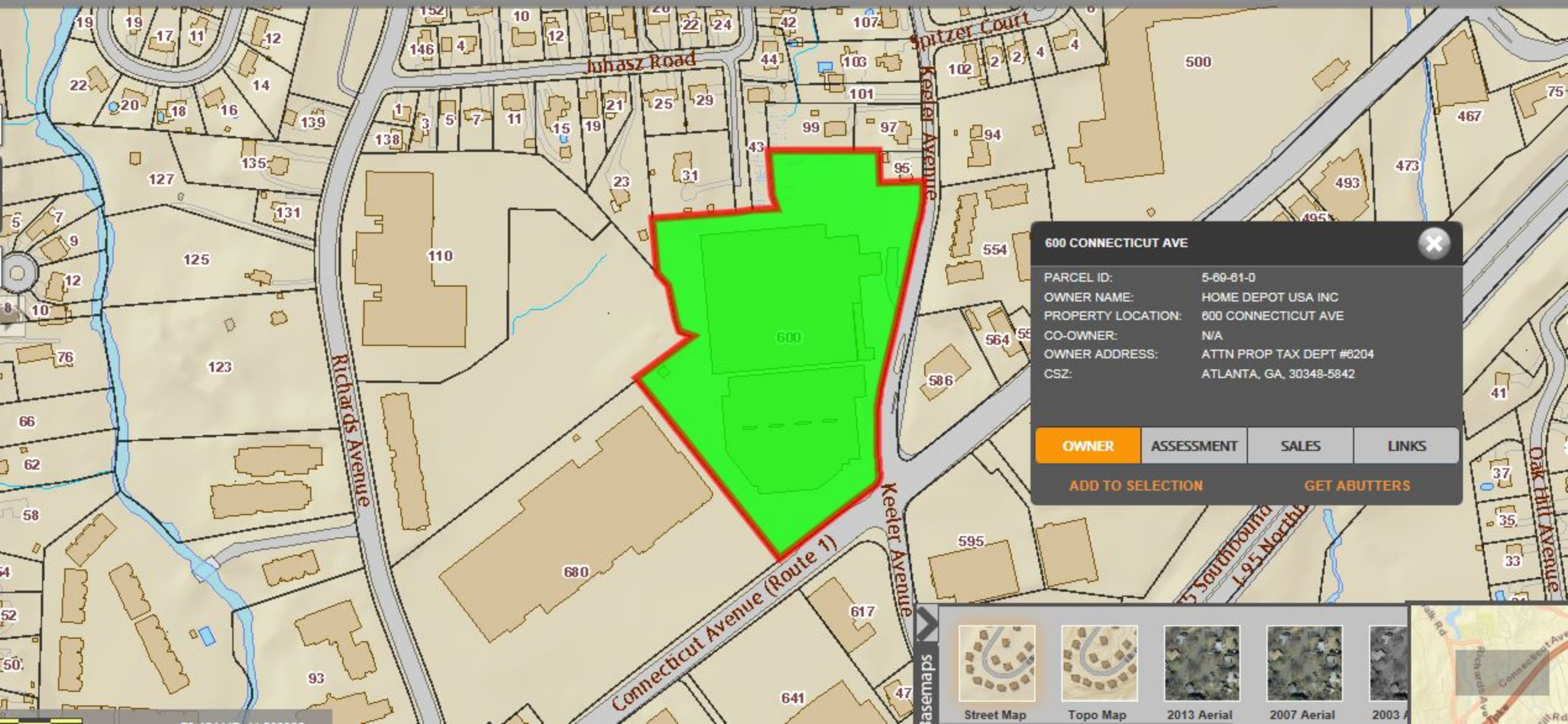
)

ss. New Britain, September 14, 1984

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:


Christopher S. Wood, Executive Director
Connecticut Siting Council



600 CONNECTICUT AVE

PARCEL ID: 5-89-61-0
OWNER NAME: HOME DEPOT USA INC
PROPERTY LOCATION: 600 CONNECTICUT AVE
CO-OWNER: N/A
OWNER ADDRESS: ATTN PROP TAX DEPT #6204
CSZ: ATLANTA, GA, 30348-5842

OWNER	ASSESSMENT	SALES	LINKS
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[ADD TO SELECTION](#) [GET ABUTTERS](#)



PROJECT INFORMATION	
SCOPE OF WORK:	<p><u>ITEMS TO BE MOUNTED ON THE MONOPOLE:</u> (3) 3C LTE ANTENNAS, (3) RRH'S, (1) SURGE SUPPRESSOR, (2) DC POWER CABLES & (1) FIBER LINES.</p> <p><u>ITEMS TO BE INSTALLED INSIDE THE EXISTING AT&T EQUIPMENT AREA:</u> (1) DUS41 WITH XMU, (1) DUS, (1) ARGUS CONVERTER MODULE & (6) TRIPLEXERS</p> <p><u>ITEMS TO REMAIN:</u> (3) UMTS ANTENNAS, (3) 2C LTE ANTENNAS, (6) RRH'S, (6) TMA'S, (1) SURGE SUPPRESSORS, (12) LINES OF 1-5/8" COAX, (2) DC POWER CABLES & (1) FIBER LINE.</p> <p><u>ITEMS TO BE REMOVED:</u> (3) GSM ANTENNAS & (6) TMAS</p>
SITE ADDRESS:	<p><u>PIN:</u> 2051585311 613 CONNECTICUT AVE NORWALK, CT 06850</p>
LATITUDE:	41.097075° N, 41° 5' 49.47" N
LONGITUDE:	-73.449055° N, -73° 26' 56.598" N
USID:	60395
PROPERTY OWNER:	CROWN CASTLE INTERNATIONAL
TYPE OF SITE:	MONOPOLE
MONOPOLE HEIGHT:	150'-0"
RAD CENTER:	152'-0"
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY



FA NUMBER: 10034974
SITE NUMBER: CTL02108

SITE NAME: NORWALK WEST-CT AVE
CROWN CASTLE SITE ID: 841287

PROJECT: LTE 3C

PROJECT TEAM	
CLIENT REPRESENTATIVE	RF ENGINEER
COMPANY: SMARTLINK, LLC	COMPANY: AT&T MOBILITY – NEW ENGLAND
ADDRESS: 1997 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200	ADDRESS: 550 COCHITUATE ROAD SUITE 550 13 AND 14
CITY, STATE, ZIP: ANNAPOLIS, MD 21401	CITY, STATE, ZIP: FRAMINGHAM, MA 01701
CONTACT: TIM BOYCE	CONTACT: CAMERON SYME
PHONE: (908) 333-3640	PHONE: (508) 596-7146
E-MAIL: tboyce@smartlinkllc.com	E-MAIL: cs6970@att.com
SITE ACQUISITION	CONSTRUCTION MANAGER
COMPANY: SMARTLINK, LLC	COMPANY: SMARTLINK, LLC.
ADDRESS: 33 BOSTON POST ROAD WEST SUITE 210	ADDRESS: 33 BOSTON POST ROAD WEST SUITE 210
CITY, STATE, ZIP: MARLBOROUGH, MA 01752	CITY, STATE, ZIP: MARLBOROUGH, MA 01752
CONTACT: TODD OLIVER	CONTACT: ROBERT PICARD
PHONE: (774) 369-3618	PHONE: (774) 369-3618
E-MAIL: todd.oliver@smartlink.com	E-MAIL: robert.picard@smartlinkllc.com
ENGINEERING	
COMPANY: HUDSON DESIGN GROUP, LLC.	
ADDRESS: 1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090	
CITY, STATE, ZIP: NORTH ANDOVER, MA 01845	
CONTACT: DANIEL P. HAMM, PE	
PHONE: (978) 557-5553	
E-MAIL: info@hudsondesigngroupllc.com	

DRAWING INDEX		
SHEET NO.	DESCRIPTION	REV.
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VICINITY MAP

DIRECTIONS TO SITE:
TURN RIGHT ONTO BOSTON POST RD W 1.1MI. TURN RIGHT ONTO BOUNDARY ST 1.0MI. TURN LEFT ONTO HUDSON ST 0.4MI. TURN RIGHT ONTO SOLOMON POND RD 0.7MI. USE LEFT 2 LANES TO TURN LEFT ONTO I-290W 0.4MI. MERGE ONTO I-290W 17.9MI. TAKE EXIT 6B TO MERGE ONTO US-20W TOWARDS STURBRIDGE 0.3MI. MERGE ONTO US-20W 13.4MI. USE THE LEFT LANE TO TAKE THE I-84W RAMP TO HARTFORD CT 0.2MI. MERGE ONTO I-84 (ENTERING CONNECTICUT) 39.7MI. USE LEFT 2 LANES TO TAKE EXIT 57 FOR CT-15S TOWARD I-91S/CHARTER OAK BRIDGE/N.Y.CITY 0.6MI. CONTINUE ONTO CT-15S 0.5MI. CONTINUE ONTO CT-15S/US-5S 0.8MI. TAKE EXIT 86 TO MERGE ONTO I-92S TOWARD NEW HAVEN/NEW YORK CITY 17.1MI. TAKE EXIT 17 TO MERGE ONTO CT-15S/WILBUR CROSS PKWY 30.2MI. TAKE EXIT 52 FOR STATE ROUTE 108S.STATE ROUTE 8S TOWARD BRIDGEPORT 0.6MI. KEEP LEFT, FOLLOW SIGNS FOR CT-8S/BRIDGEPORT AND MERGE ONTO CT-8S 5.2MI. TAKE THE I-95S EXIT TOWARD N.Y. CITY 0.2MI. MERGE ONTO I-95S 14.1MI. TAKE EXIT 14 FOR US-1/CONNECTICUT AVE 0.1MI. USE ANY LANE TO TURN LEFT ONTO US-1S/CONNECTICUT AVE 0.9MI. DESTINATION WILL BE ON THE RIGHT (BEHIND HOME DEPOT).

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 MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS		
DISCIPLINE:	SIGNATURE:	DATE:
THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
SMARTLINK SITE ACQUISITION:		
SMARTLINK CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



72 HOURS

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UNDERGROUND SERVICE ALERT

Hudson Design Group

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845

TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink

1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02108
SITE NAME: NORWALK WEST-CT AVE
CROWN CASTLE SITE ID: 841287
613 CONNECTICUT AVE
NORWALK, CT 06850
FAIRFIELD COUNTY

at&t

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/01/16	ISSUED FOR PERMITTING	MC	HC	OPH
0	01/05/16	ISSUED FOR REVIEW	MC	HC	OPH

SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: MC

DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER	DRAWING NUMBER	REV
CTL02108	T-1	1

AT&T
TITLE SHEET
(LTE 3C)

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.
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 TO 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 SHALL BE 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. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – SMARTLINK
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – AT&T MOBILITY
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.
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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. 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.
9. 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.
10. 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.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. 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.
18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
 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.
 BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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, ASD, FOURTEENTH EDITION;
- TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL
- EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ABBREVIATIONS					
AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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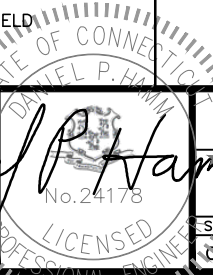
1997 ANNAPOLIS EXCHANGE PKWY
 SUITE 200
 ANNAPOLIS, MD 21401

SITE NUMBER: CTL02108
SITE NAME: NORWALK WEST-CT AVE
CROWN CASTLE SITE ID: 841287
 613 CONNECTICUT AVE
 NORWALK, CT 06850
 FAIRFIELD COUNTY

550 COCHITUATE ROAD
 FRAMINGHAM, MA 01701

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1	02/01/16	ISSUED FOR PERMITTING	MC	HC	OPH
0	01/05/16	ISSUED FOR REVIEW	MC	HC	OPH

SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: MC

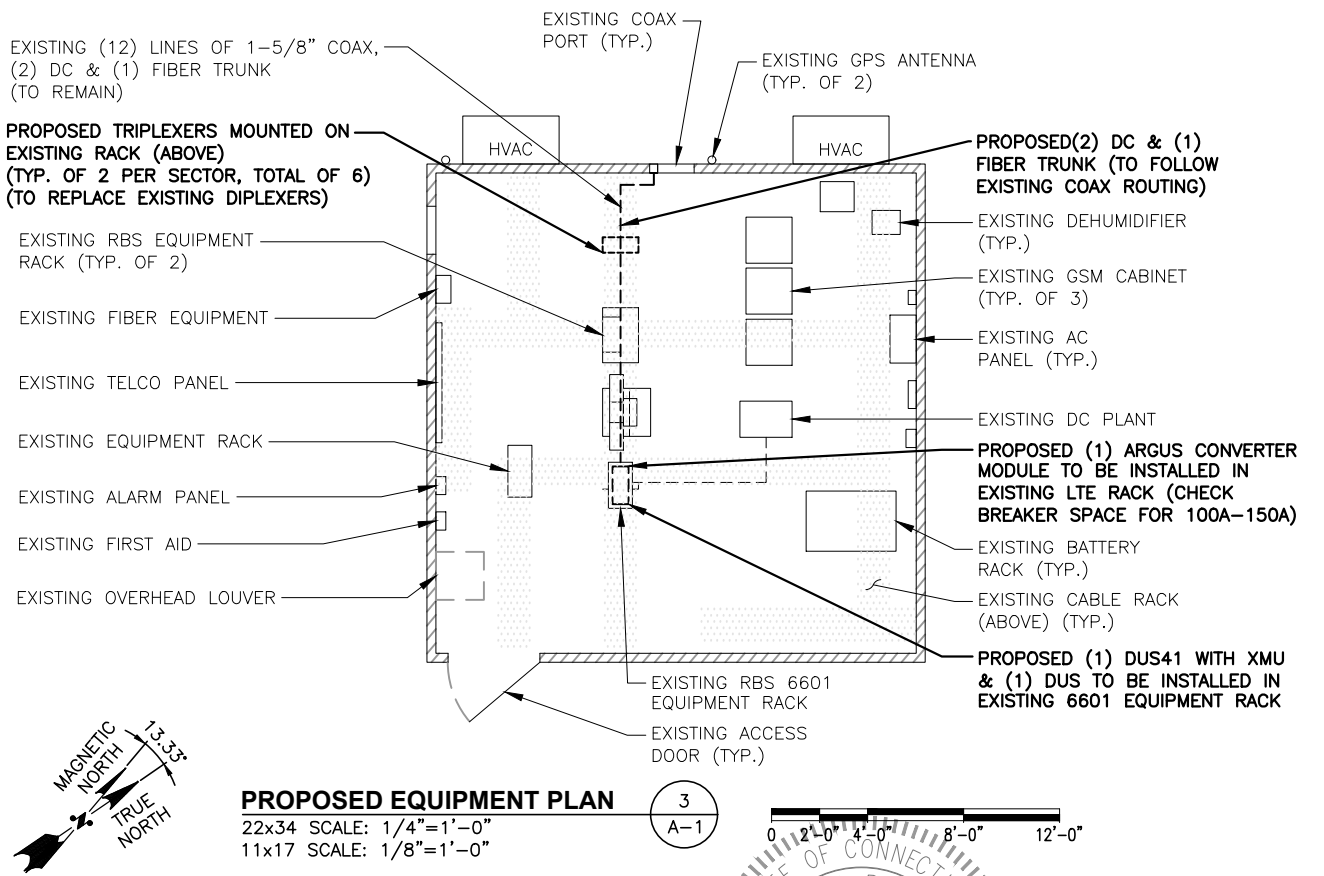
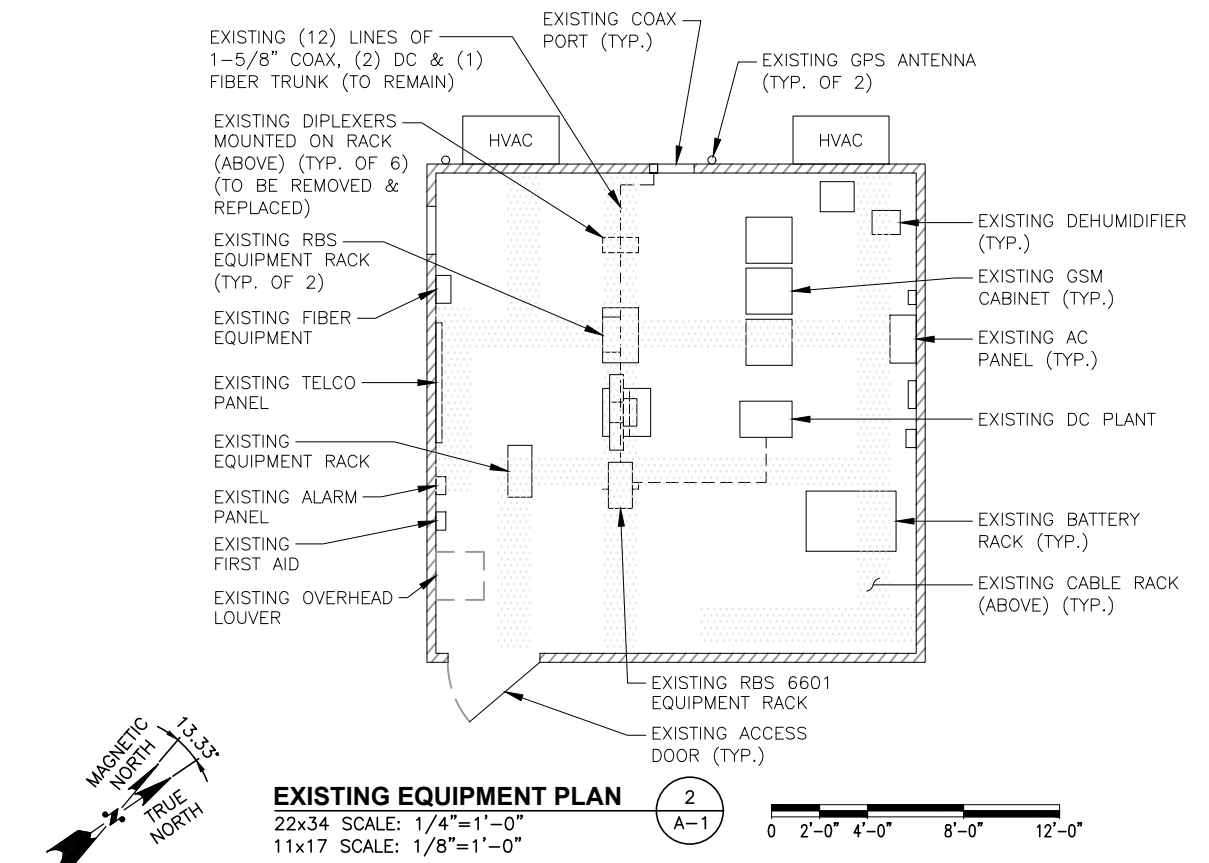
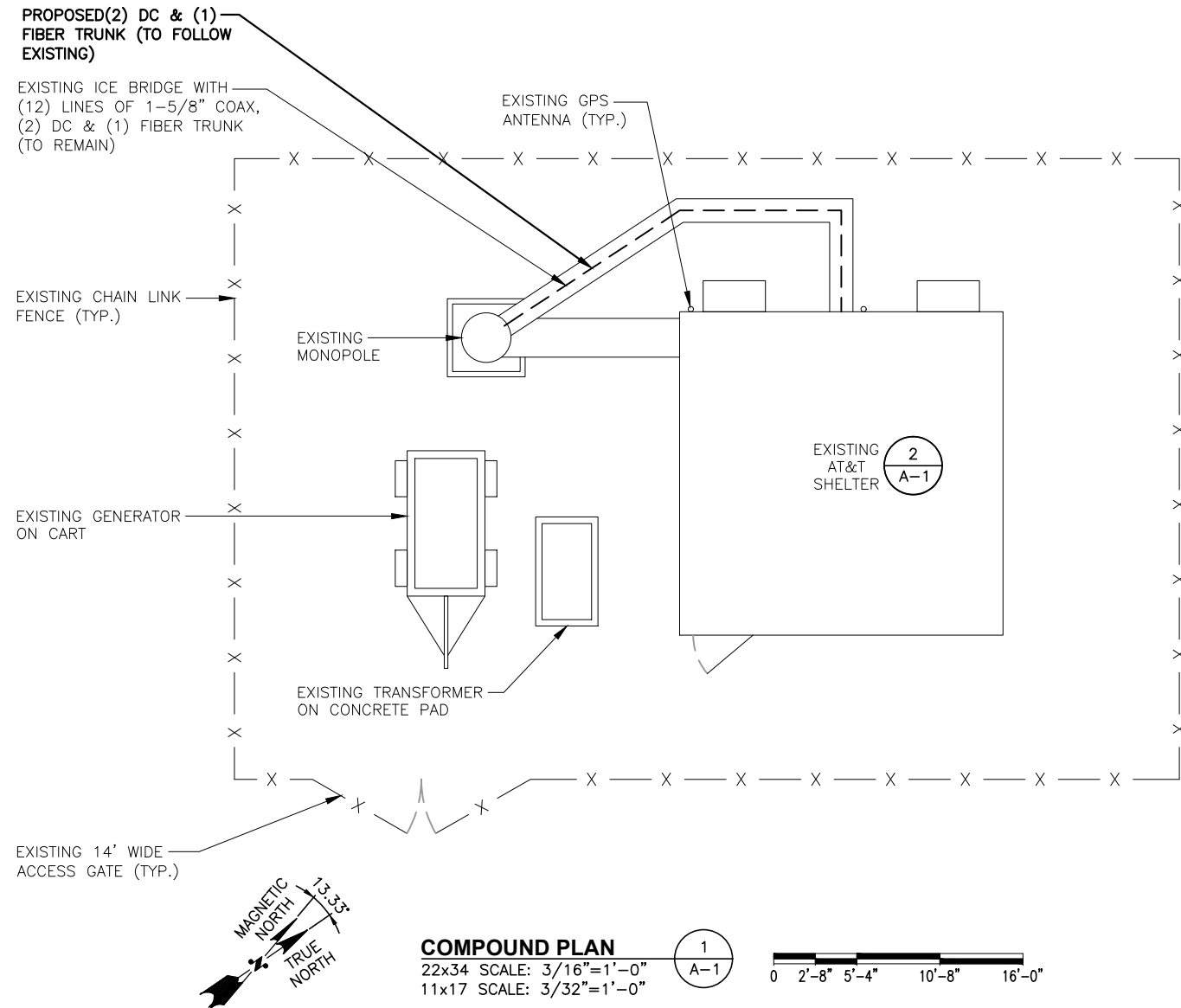


AT&T
 GENERAL NOTES
 (LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02108	GN-1	1

NOTE:
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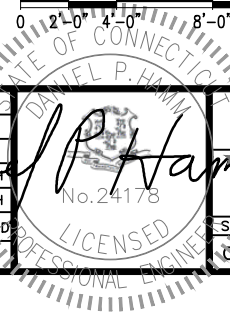
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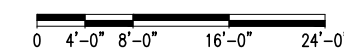
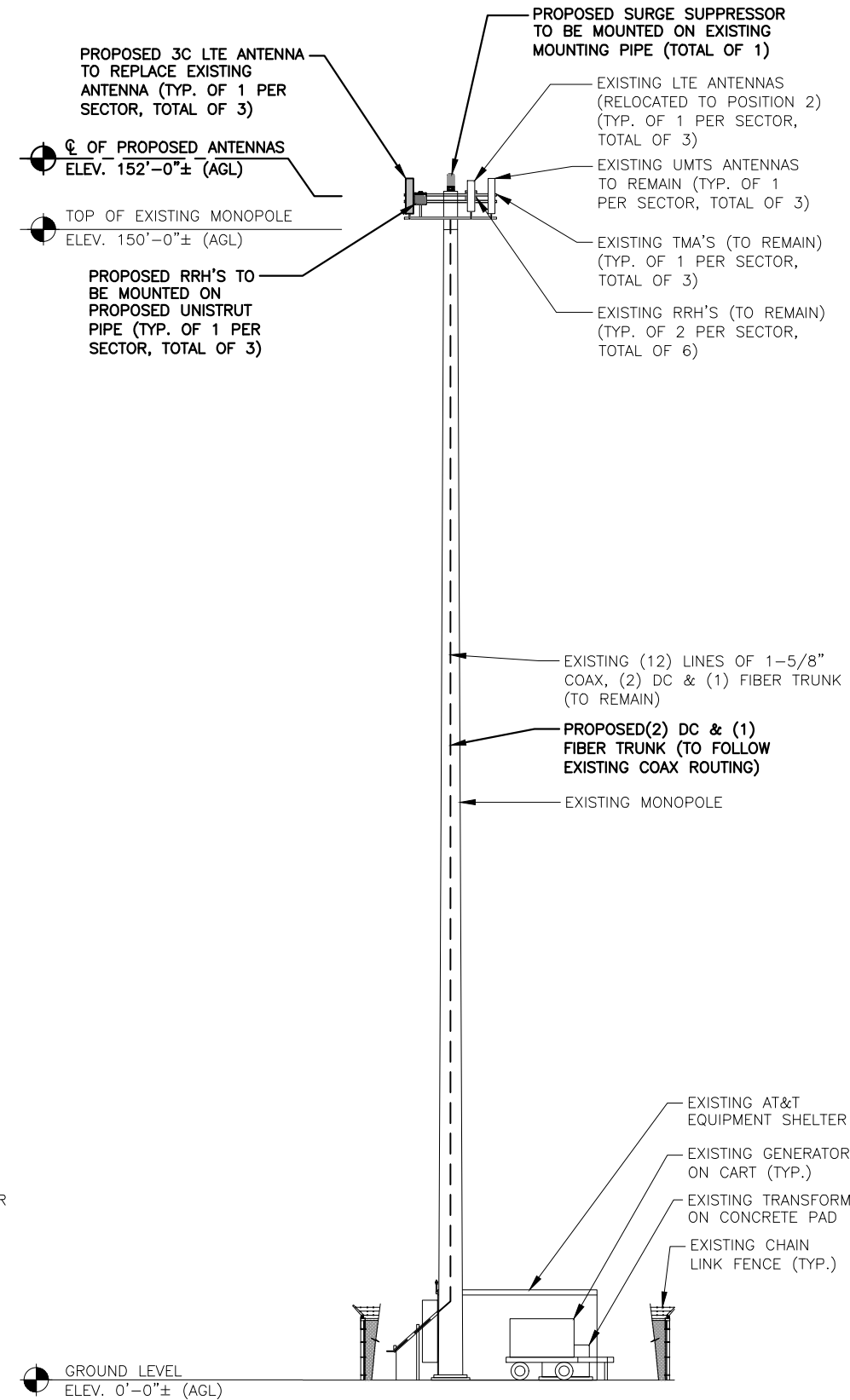
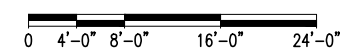
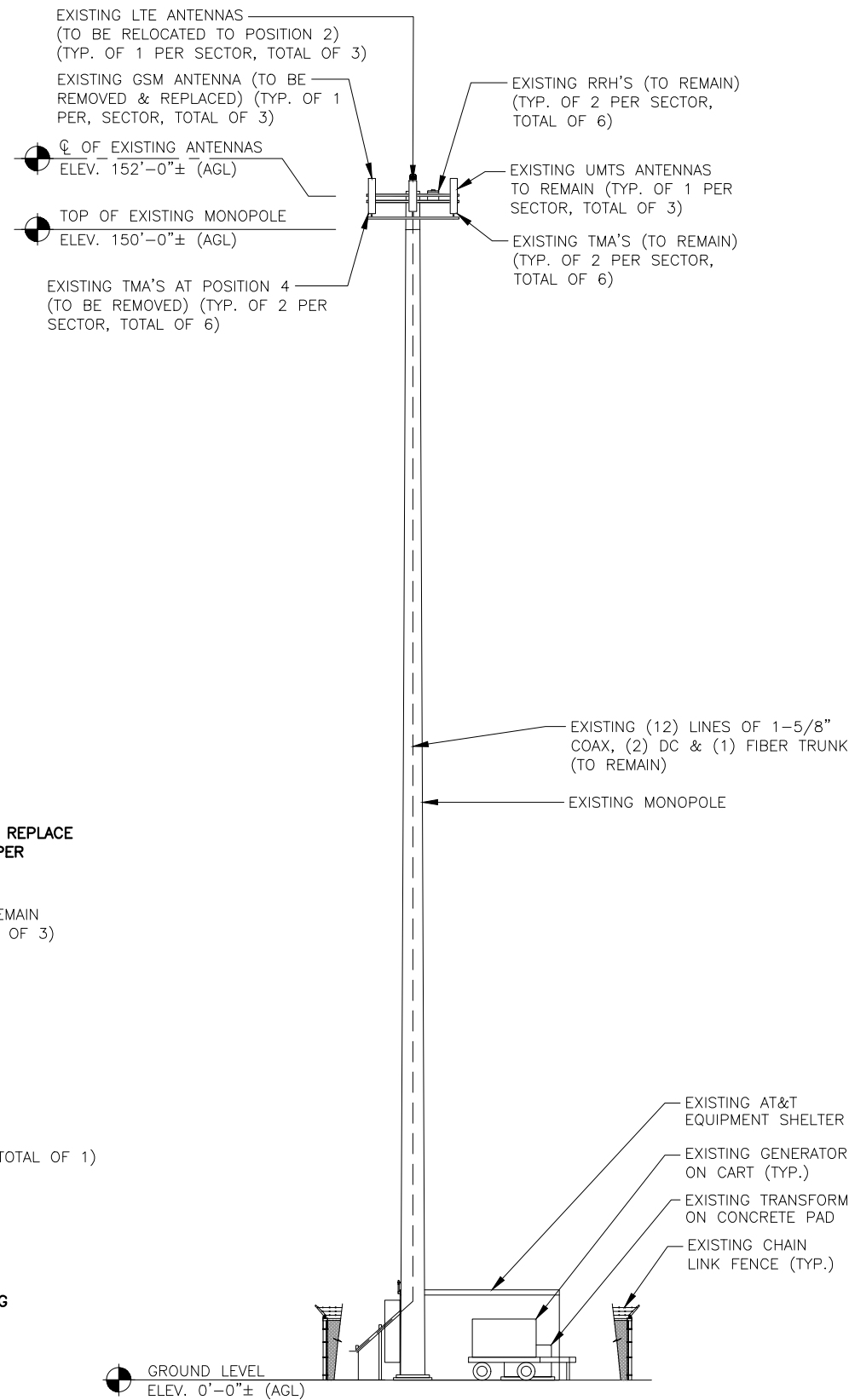
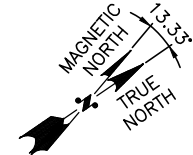
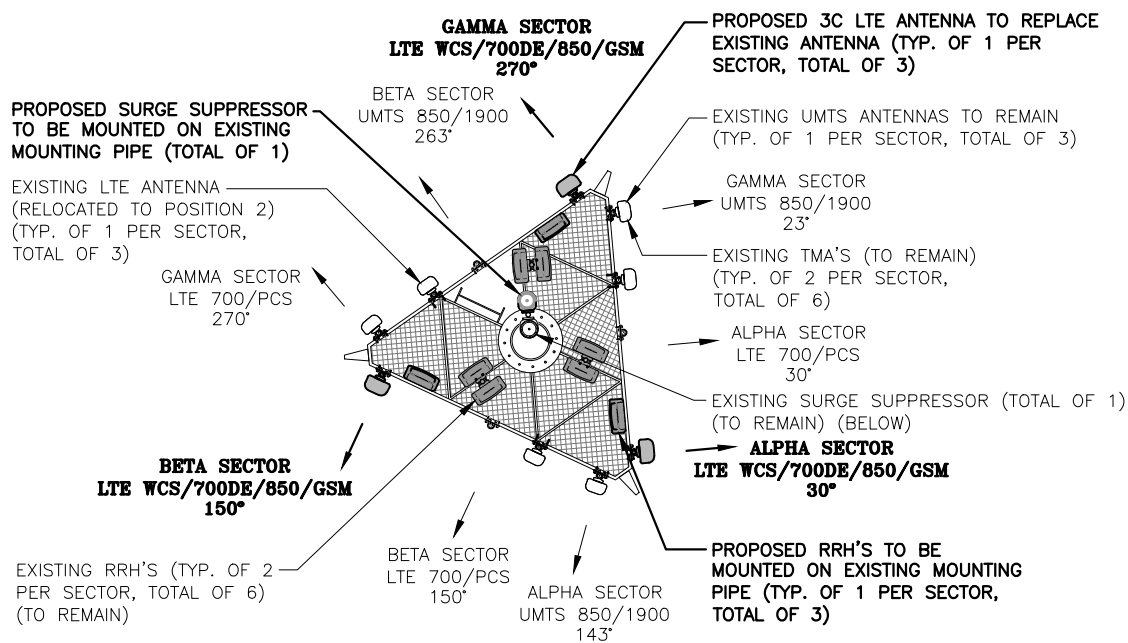
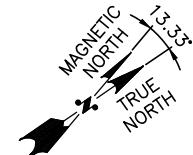
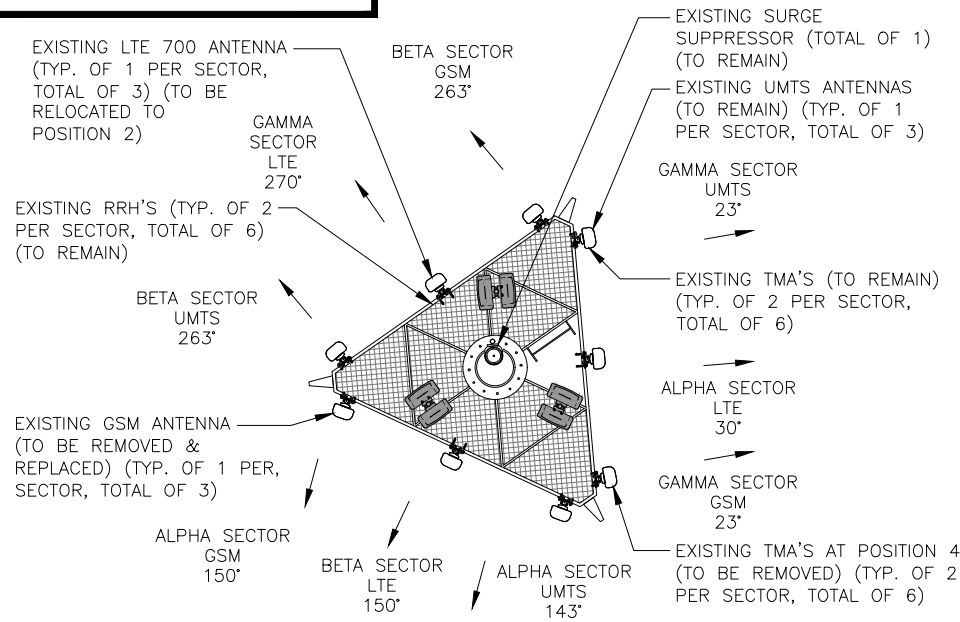
SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: MC



AT&T		
COMPOUND & SHELTER PLANS (LTE 3C)		
SITE NUMBER	DRAWING NUMBER	REV
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NOTE:
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NOTE:
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BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
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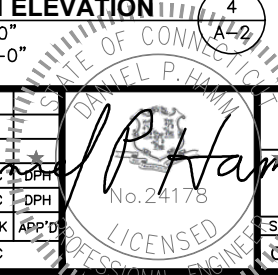
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AT&T
ANTENNA LAYOUTS & ELEVATIONS (LTE 3C)

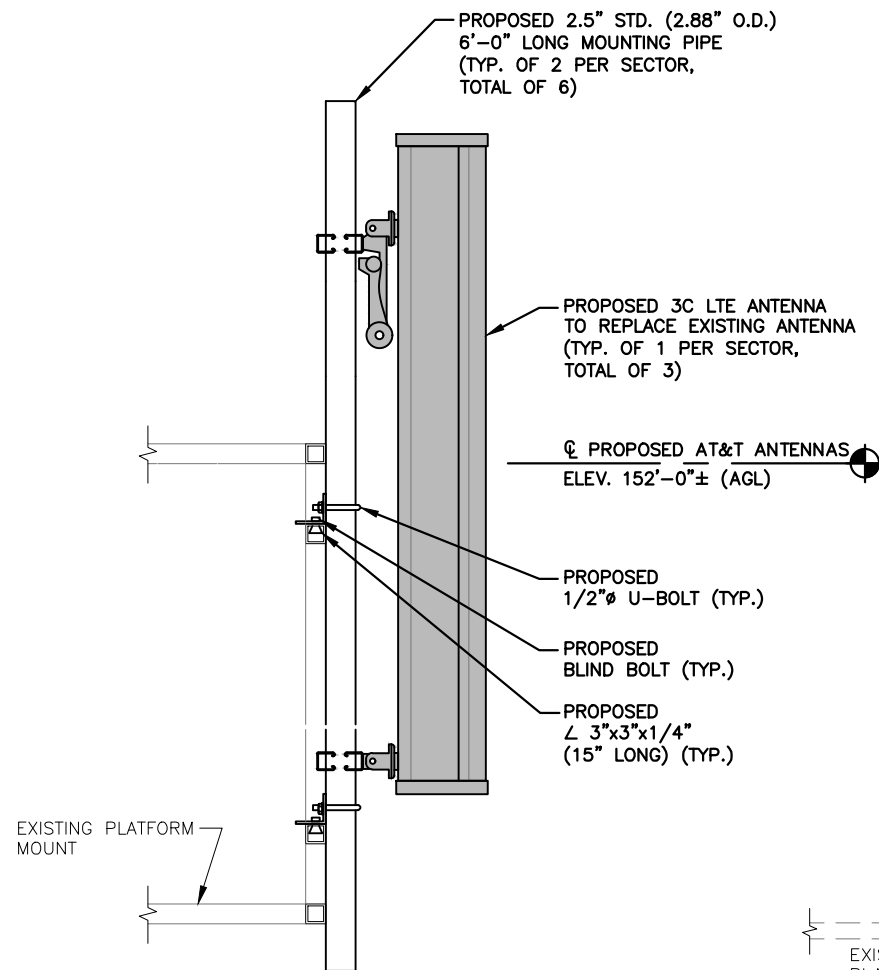
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CTL02108	A-2	1

NOTE:
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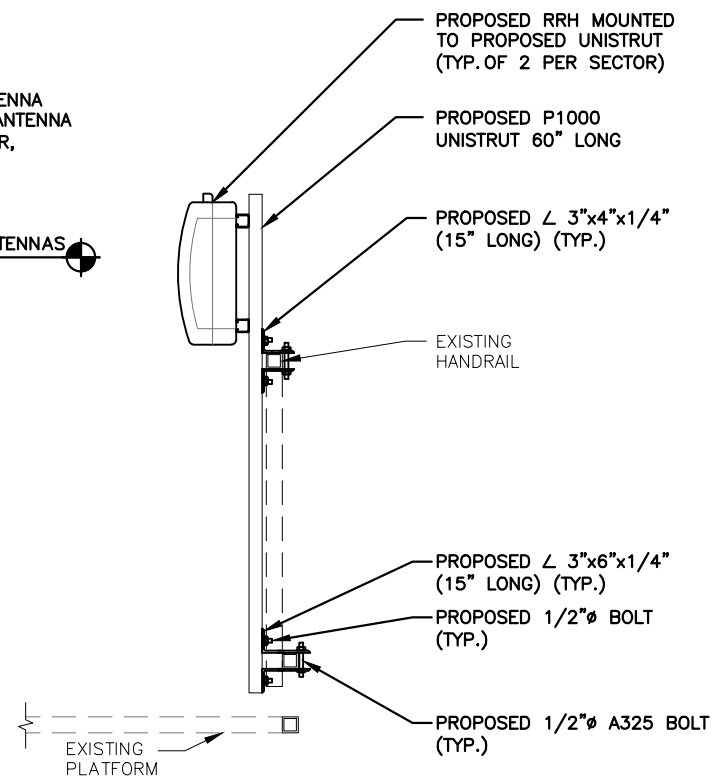
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

EXISTING & PROPOSED ANTENNA SCHEDULE						
SECTOR	EXISTING/PROPOSED	RAD CENTER	AZIMUTH	MAKE	MODEL#	SIZE (INCHES)
ALPHA	EXISTING	152'-0"±	143°	POWERWAVE	7770.00.850.08	55.0x11.0x5.0
	EXISTING	152'-0"±	30°	KMW	AM-X-CD-14-65-00T-RET	48.0x11.8x5.9
	PROPOSED	152'-0"±	30°	ANDREW	SBNHH-165DA	55.0x11.9x7.1
BETA	EXISTING	152'-0"±	263°	POWERWAVE	7770.00.850.08	55.0x11.0x5.0
	EXISTING	152'-0"±	150°	KMW	AM-X-CD-14-65-00T-RET	48.0x11.8x5.9
	PROPOSED	152'-0"±	150°	ANDREW	SBNHH-165DA	55.0x11.9x7.1
GAMMA	EXISTING	152'-0"±	23°	POWERWAVE	7770.00.850.08	55.0x11.0x5.0
	EXISTING	152'-0"±	270°	KMW	AM-X-CD-14-65-00T-RET	48.0x11.8x5.9
	PROPOSED	152'-0"±	270°	ANDREW	SBNHH-165DA	55.0x11.9x7.1

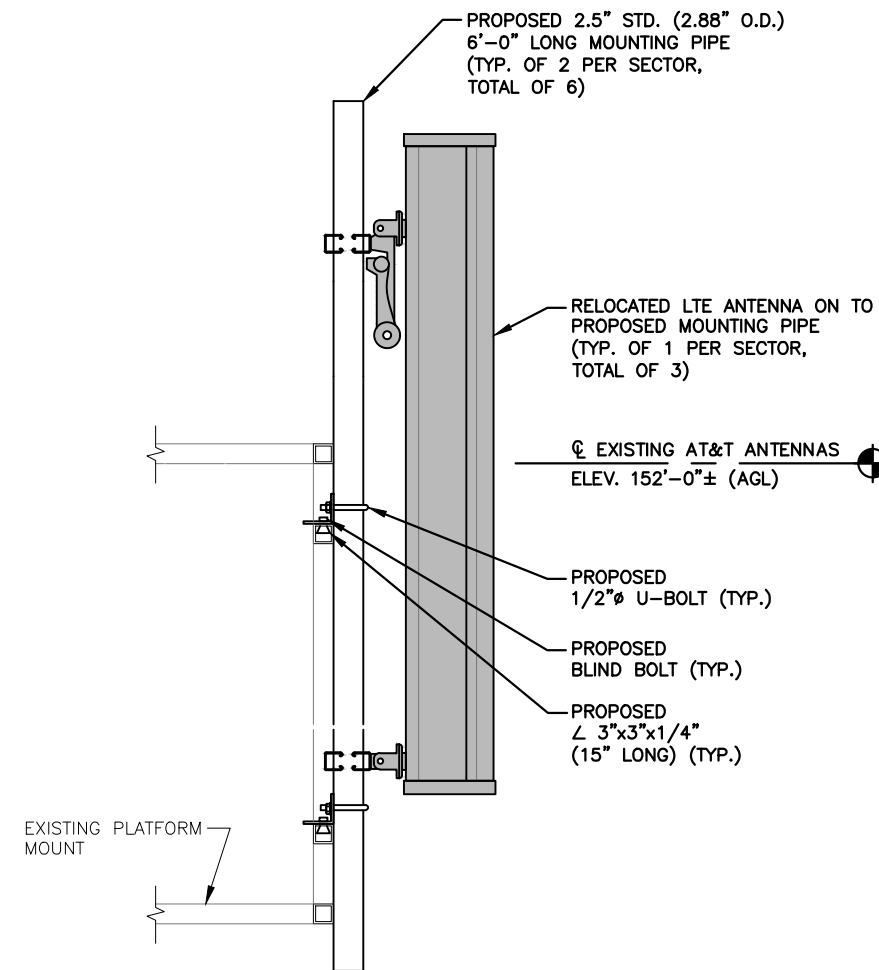
EXISTING & PROPOSED RRU SCHEDULE				
SECTOR	EXISTING/PROPOSED	MAKE	MODEL#	SIZE (INCHES)
ALPHA	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7
BETA	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7
GAMMA	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7



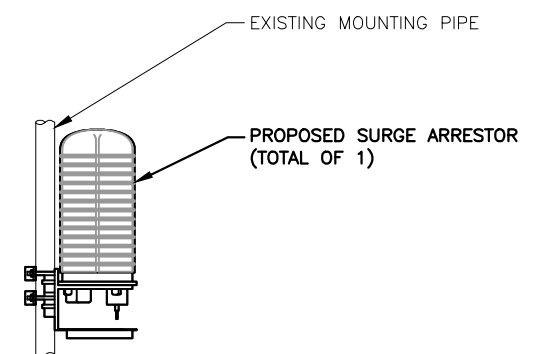
PROPOSED ANTENNA MOUNTING DETAIL 1
SCALE: N.T.S. A-3



PROPOSED RRU MOUNTING DETAIL 2
SCALE: N.T.S. A-3



EXISTING ANTENNA MOUNTING DETAIL 3
SCALE: N.T.S. A-3



ANTENNA DETAIL 4
SCALE: N.T.S. A-3

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N. ANDOVER, MA 01845

TEL: (978) 557-5553
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SITE NUMBER: CTL02108
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CROWN CASTLE SITE ID: 841287
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FAIRFIELD COUNTY

at&t

550 COCHITUATE ROAD
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DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER	DRAWING NUMBER	REV
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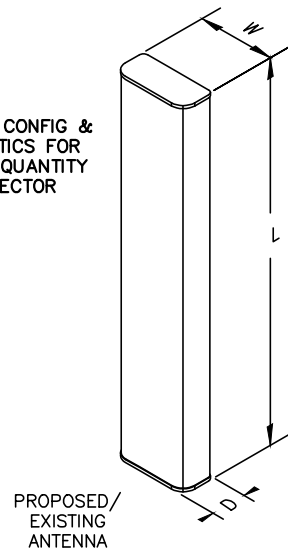
AT&T
DETAILS
(LTE 3C)

NOTE:
ALL LINES AND ANTENNAS TO BE
INSTALLED IN ACCORDANCE WITH PASSING
STRUCTURAL ANALYSIS PROVIDED BY
CROWN CASTLE AND AT&T ANTENNA
DESIGN SHEET RECOMMENDATION.

NOTE:
REFER TO THE FINAL RF DATA SHEET
FOR FINAL ANTENNA SETTINGS.

NOTES:

1. REFER TO RF CONFIG &
SECTOR SCHEMATICS FOR
MODEL, TYPE & QUANTITY
REQUIRED PER SECTOR



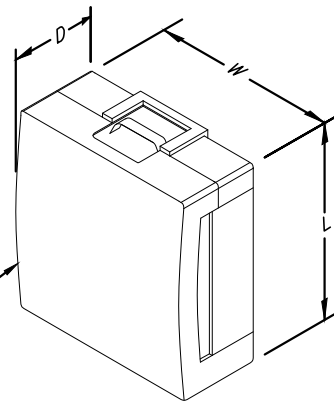
PROPOSED ANTENNA DETAIL
SCALE: N.T.S

1
A-4

NOTE:
SEE RFDS FOR RRH
FREQUENCY AND
MODEL NUMBER

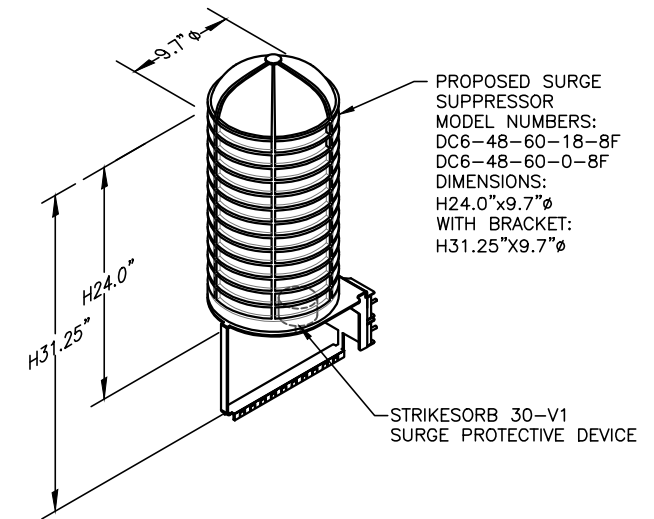
PROPOSED RRH
REFER TO THE FINAL RFDS
AND CHART FOR QUANTITY,
MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S
SPECIFICATIONS.



PROPOSED RRH DETAIL
SCALE: N.T.S

2
A-4



**PROPOSED SURGE
SUPPRESSOR**
MODEL NUMBERS:
DC6-48-60-18-8F
DC6-48-60-0-8F
DIMENSIONS:
H24.0"x9.7"φ
WITH BRACKET:
H31.25"x9.7"φ

STRIKESORB 30-V1
SURGE PROTECTIVE DEVICE

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL
SCALE: N.T.S

3
A-4

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1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
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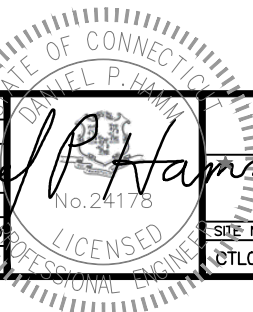
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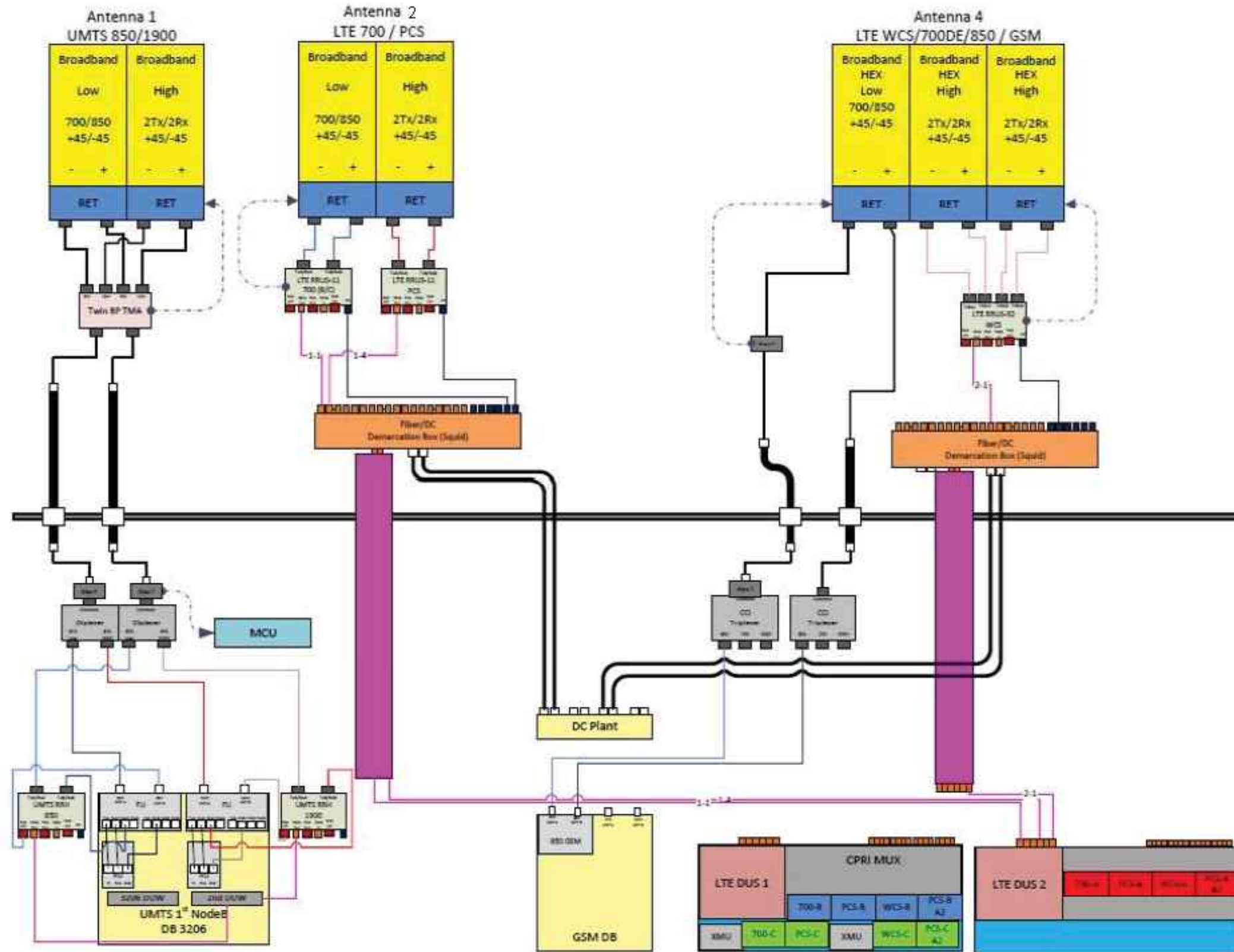
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AT&T
DETAILS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02108	A-4	1



RF PLUMBING DIAGRAM 1
SCALE: N.T.S. RF-1

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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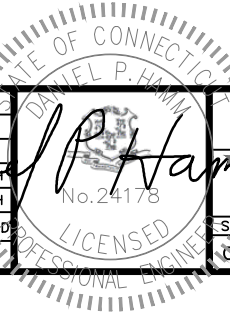
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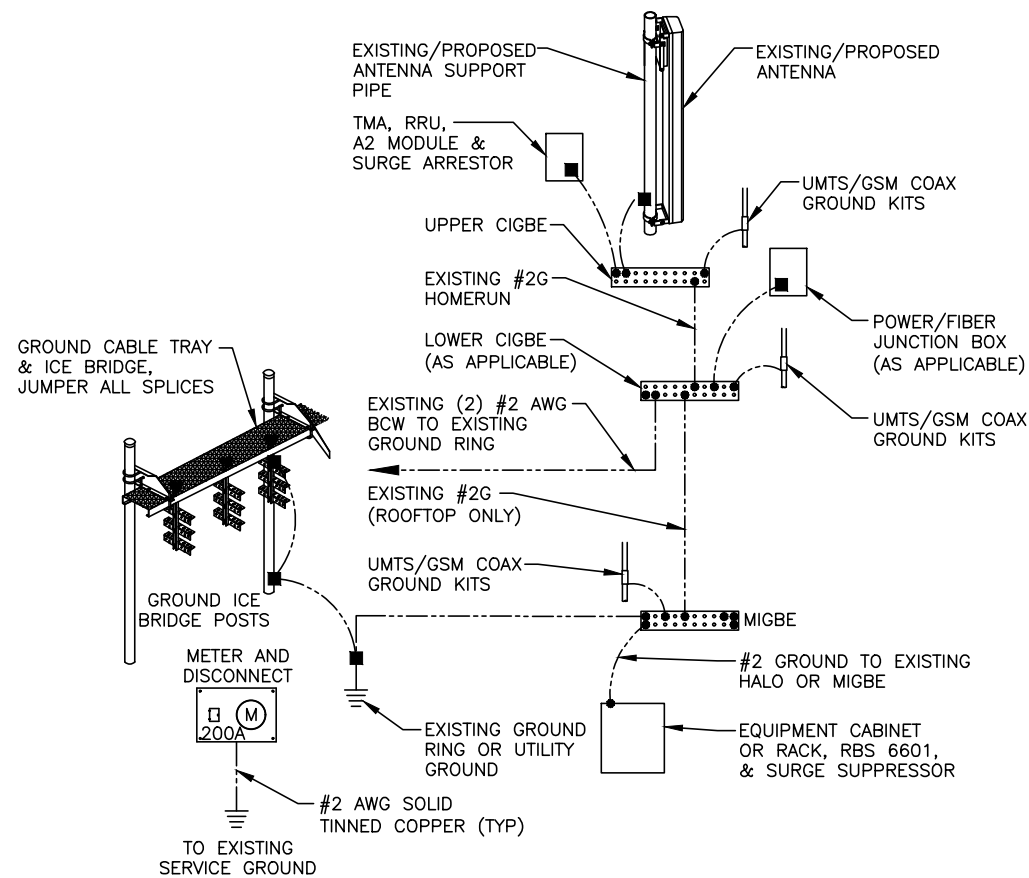
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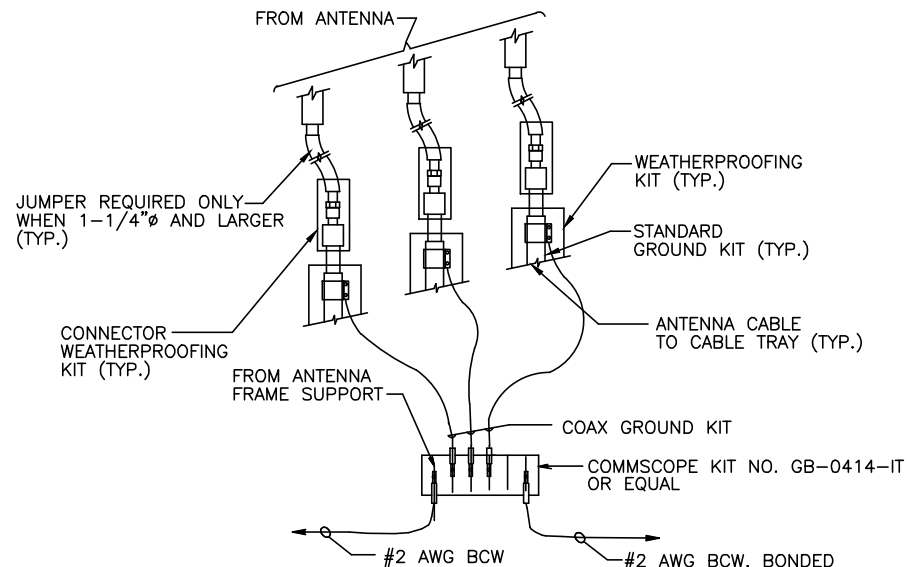


AT&T
RF PLUMBING DIAGRAM
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02108	RF-1	1

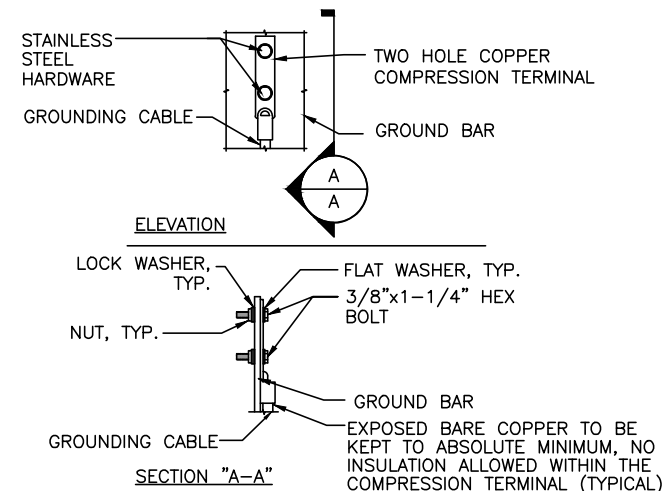


GROUNDING RISER DIAGRAM 1
SCALE: N.T.S. G-1



NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL 2
SCALE: N.T.S. G-1



NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL 3
SCALE: N.T.S. G-1

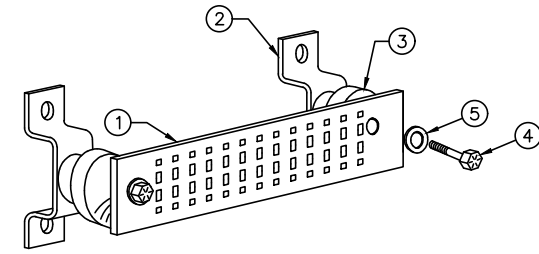
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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 4
SCALE: N.T.S. G-1

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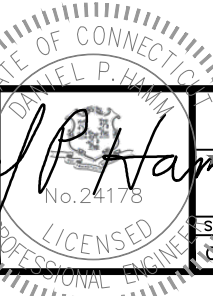
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SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: MC



AT&T
GROUNDING DETAILS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02108	G-1	1

Date: **March 10, 2016**

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

JACOBS[®]
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: CTL02108
Carrier Site Name: Norwalk West – CT Ave

Crown Castle Designation: **Crown Castle BU Number:** 841287
Crown Castle Site Name: NORWALK WEST- CT AVE
Crown Castle JDE Job Number: 361799
Crown Castle Work Order Number: 1193060
Crown Castle Application Number: 326317 Rev. 2

Engineering Firm Designation: **Jacobs Engineering Group, Inc. Project Number:** 1193060_R1

Site Data: **613 CONNECTICUT AVENUE, NORWALK, Fairfield County, CT**
Latitude 41° 5' 49.45", Longitude -73° 26' 56.61"
150 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 872195, in accordance with application 326317, revision 2.

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:

LC4.5: Existing + Proposed Equipment w/ Proposed Modifications **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT 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 4 - Documents Provided
- 3.1) Analysis Method
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- Table 6 - Tower Components vs. Capacity
- 4.1) Recommendations

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- tnxTower Output

6) APPENDIX B

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7) APPENDIX C

- Additional Calculations

8) APPENDIX D

- Structural Modification Drawings

1) INTRODUCTION

This tower is a 150-ft Monopole tower designed by AT&T TECHNOLOGIES, INC. in April of 1984. The original design standard and wind speed are unknown. The tower has been modified per reinforcement drawings prepared by GPD Group in December of 2011.

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
152.0	152.0	3	Andrew	SBNHH-1D65A w/ Mount Pipe	2	3/4	-
		3	Ericsson	RRUS 32	1	3/8	
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing 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
152.0	152.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	-	-	2
		6	Powerwave Technologies	LGP21401			
		6	Ericsson	RRUS 11 B12	12 2 3	1-5/8 3/4 3/8	1
		3	KMW Communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		3	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	Crown Mounts	Platform Mount [LP 603-1]			
		1	Crown Mounts	Side Arm Mount [SO 202-3]			

Notes:

- 1) Existing Equipment
- 2) 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)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	5344374	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH Engineering, Inc. (Mapped)	4710140	CCISITES
4-TOWER MANUFACTURER DRAWINGS	AT&T Technologies, Inc.	5968178	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group	5344563	CCISITES
4-POST-MODIFICATION INSPECTION	Centek Engineering, Inc.	6007753	CCISITES
4-POST-MODIFICATION INSPECTION	GPD	6044141	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	GPD Group	4287393	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Jacobs Engineering Group, Inc.	Project No. 1193060	-

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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) The pole geometry, base plate dimensions and material grades were taken from a previous structural analysis report done by GPD Group in June of 2011 (CCI Doc ID 4287393) and were assumed to be correct.
- 6) Modifications per reinforcement drawings prepared by Jacobs Engineering Group (Project No. 1193060) 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	150 - 145	Pole	TP15.254x14.5x0.25	Note 1	Note 1	Note 1	45.8	Pass
L2	145 - 140	Pole	TP16.008x15.254x0.25	Note 1	Note 1	Note 1	73.5	Pass
L3	140 - 139.58	Pole	TP16.071x16.008x0.25	Note 1	Note 1	Note 1	75.7	Pass
L4	139.58 - 139.33	Pole + Reinf.	TP16.109x16.071x0.55	Note 1	Note 1	Note 1	37.1	Pass
L5	139.33 - 134.33	Pole + Reinf.	TP16.863x16.109x0.525	Note 1	Note 1	Note 1	50.1	Pass
L6	134.33 - 129.33	Pole + Reinf.	TP17.617x16.863x0.5125	Note 1	Note 1	Note 1	62.4	Pass
L7	129.33 - 124.33	Pole + Reinf.	TP18.371x17.617x0.5	Note 1	Note 1	Note 1	74.1	Pass
L8	124.33 - 119.33	Pole + Reinf.	TP19.125x18.371x0.4875	Note 1	Note 1	Note 1	85.3	Pass
L9	119.33 - 119	Pole + Reinf.	TP19.176x19.125x0.4875	Note 1	Note 1	Note 1	86.0	Pass
L10	119 - 118.75	Pole + Reinf.	TP19.213x19.176x0.8875	Note 1	Note 1	Note 1	50.5	Pass
L11	118.75 - 113.75	Pole + Reinf.	TP19.967x19.213x0.85	Note 1	Note 1	Note 1	57.3	Pass
L12	113.75 - 110	Pole + Reinf.	TP20.533x19.967x0.825	Note 1	Note 1	Note 1	62.3	Pass
L13	110 - 109.75	Pole + Reinf.	TP20.571x20.533x0.5625	Note 1	Note 1	Note 1	58.8	Pass
L14	109.75 - 104.75	Pole + Reinf.	TP21.325x20.571x0.55	Note 1	Note 1	Note 1	65.1	Pass
L15	104.75 - 99.75	Pole + Reinf.	TP22.079x21.325x0.5375	Note 1	Note 1	Note 1	71.2	Pass
L16	99.75 - 94.75	Pole + Reinf.	TP22.833x22.079x0.525	Note 1	Note 1	Note 1	77.0	Pass
L17	94.75 - 89.75	Pole + Reinf.	TP23.587x22.833x0.5125	Note 1	Note 1	Note 1	82.5	Pass
L18	89.75 - 84.75	Pole + Reinf.	TP24.341x23.587x0.5	Note 1	Note 1	Note 1	87.8	Pass
L19	84.75 - 81.5	Pole + Reinf.	TP24.832x24.341x0.5	Note 1	Note 1	Note 1	91.1	Pass
L20	81.5 - 81.25	Pole + Reinf.	TP24.869x24.832x0.5	Note 1	Note 1	Note 1	91.3	Pass
L21	81.25 - 78	Pole + Reinf.	TP25.36x24.869x0.4875	Note 1	Note 1	Note 1	94.5	Pass
L22	78 - 77.75	Pole + Reinf.	TP25.397x25.36x0.7625	Note 1	Note 1	Note 1	72.1	Pass
L23	77.75 - 72.75	Pole + Reinf.	TP26.151x25.397x0.75	Note 1	Note 1	Note 1	76.1	Pass
L24	72.75 - 70	Pole + Reinf.	TP27.17x26.151x0.7375	Note 1	Note 1	Note 1	78.3	Pass
L25	70 - 65	Pole + Reinf.	TP26.82x26.066x0.7995	Note 1	Note 1	Note 1	77.6	Pass
L26	65 - 60	Pole + Reinf.	TP27.574x26.82x0.787	Note 1	Note 1	Note 1	81.0	Pass
L27	60 - 55	Pole + Reinf.	TP28.329x27.574x0.762	Note 1	Note 1	Note 1	84.3	Pass
L28	55 - 51.25	Pole + Reinf.	TP28.894x28.329x0.7495	Note 1	Note 1	Note 1	86.7	Pass
L29	51.25 - 51	Pole + Reinf.	TP28.932x28.894x0.837	Note 1	Note 1	Note 1	78.3	Pass
L30	51 - 50.75	Pole + Reinf.	TP28.97x28.932x0.5995	Note 1	Note 1	Note 1	90.8	Pass
L31	50.75 - 45.75	Pole + Reinf.	TP29.724x28.97x0.5995	Note 1	Note 1	Note 1	93.7	Pass
L32	45.75 - 42	Pole + Reinf.	TP30.289x29.724x0.587	Note 1	Note 1	Note 1	95.9	Pass
L33	42 - 41.75	Pole + Reinf.	TP30.327x30.289x0.812	Note 1	Note 1	Note 1	83.6	Pass
L34	41.75 - 36.75	Pole + Reinf.	TP31.081x30.327x0.7995	Note 1	Note 1	Note 1	86.4	Pass
L35	36.75 - 31.75	Pole + Reinf.	TP31.835x31.081x0.787	Note 1	Note 1	Note 1	89.0	Pass
L36	31.75 - 30	Pole + Reinf.	TP32.552x31.835x0.7745	Note 1	Note 1	Note 1	90.0	Pass
L37	30 - 26.25	Pole + Reinf.	TP32.041x31.475x0.85	Note 1	Note 1	Note 1	87.3	Pass
L38	26.25 - 26	Pole + Reinf.	TP32.079x32.041x0.85	Note 1	Note 1	Note 1	87.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L39	26 - 21	Pole + Reinf.	TP32.833x32.079x0.825	Note 1	Note 1	Note 1	89.6	Pass
L40	21 - 16	Pole + Reinf.	TP33.587x32.833x0.825	Note 1	Note 1	Note 1	91.7	Pass
L41	16 - 11	Pole + Reinf.	TP34.341x33.587x0.8	Note 1	Note 1	Note 1	93.8	Pass
L42	11 - 10.25	Pole + Reinf.	TP34.454x34.341x0.8	Note 1	Note 1	Note 1	94.1	Pass
L43	10.25 - 10	Pole + Reinf.	TP34.492x34.454x0.7875	Note 1	Note 1	Note 1	81.3	Pass
L44	10 - 5	Pole + Reinf.	TP35.246x34.492x0.775	Note 1	Note 1	Note 1	83.0	Pass
L45	5 - 3.5	Pole + Reinf.	TP35.472x35.246x0.775	Note 1	Note 1	Note 1	83.5	Pass
L46	3.5 - 3.25	Pole + Reinf.	TP35.51x35.472x0.7	Note 1	Note 1	Note 1	83.9	Pass
L47	3.25 - 0	Pole + Reinf.	TP36x35.51x0.7	Note 1	Note 1	Note 1	84.8	Pass
							Summary	
						Pole	86.0	Pass
						Reinforcement	95.9	Pass
						Overall	95.9	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC4.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	110.0	43.8	Pass
1	Existing Anchor Rods	0	93.8	Pass
1	Existing Reinforcing Anchor Rods	0	91.9	Pass
1	Base Plate	0	87.8	Pass
1	Base Foundation Structural	0	41.4	Pass
1	Base Foundation Soil Interaction	0	69.6	Pass

Structure Rating (max from all components) =	95.9%
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Notes:

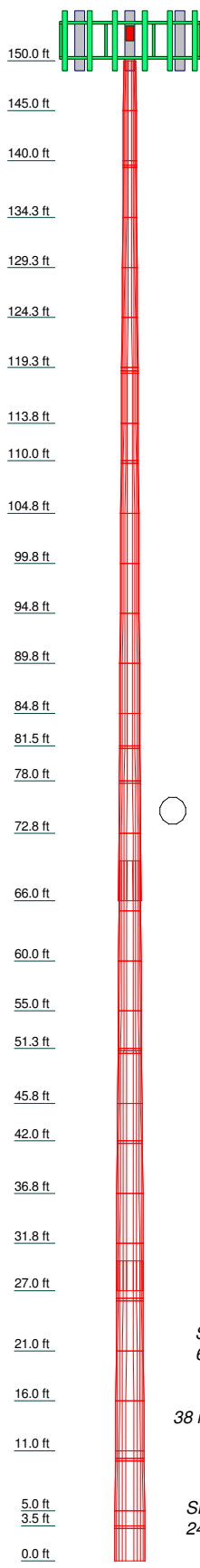
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing 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	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
2	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
3	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
4	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
5	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
6	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
7	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
8	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
9	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
10	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
11	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
12	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
13	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
14	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
15	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
16	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
17	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
18	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
19	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
20	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
21	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
22	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
23	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
24	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
25	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
26	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
27	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
28	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
29	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
30	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
31	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
32	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
33	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
34	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
35	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
36	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
37	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
38	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
39	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
40	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
41	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
42	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
43	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
44	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
45	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
46	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500
47	5.00	12	0.5000	4.00	36.0000	36.0000	A36	0.2500



DESIGNED APPURTENANCE LOADING

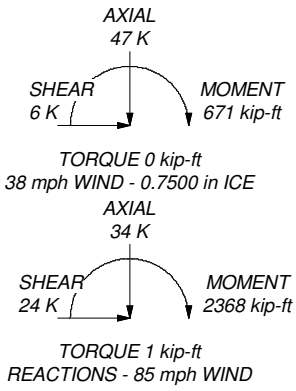
TYPE	ELEVATION	TYPE	ELEVATION
Beacon	152	SBNHH-1D65A w/ Mount Pipe	152
(2) RRUS 11 B12	152	SBNHH-1D65A w/ Mount Pipe	152
(2) RRUS 11 B12	152	SBNHH-1D65A w/ Mount Pipe	152
(2) RRUS 11 B12	152	(2) TPX-070821	152
AM-X-CD-14-65-00T-RET w/ Mount Pipe	152	(2) TPX-070821	152
AM-X-CD-14-65-00T-RET w/ Mount Pipe	152	(2) TPX-070821	152
AM-X-CD-14-65-00T-RET w/ Mount Pipe	152	RRUS 32	152
AM-X-CD-14-65-00T-RET w/ Mount Pipe	152	RRUS 32	152
7770.00 w/ Mount Pipe	152	RRUS 32	152
7770.00 w/ Mount Pipe	152	DC6-48-60-18-8F	152
7770.00 w/ Mount Pipe	152	Platform Mount [LP 603-1]	152
(2) LGP21401	152	Side Arm Mount [SO 202-3]	152
(2) LGP21401	152	Climbing Ladder - 5'	152
(2) LGP21401	152	Bridge Stiffener (95.5"x7.5"x1.25")	110
(2) LGP21401	152	Bridge Stiffener (95.5"x7.5"x1.25")	110
DC6-48-60-18-8F	152	Bridge Stiffener (95.5"x7.5"x1.25")	110
		Bridge Stiffener (95.5"x7.5"x1.25")	110

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	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 0.75 in ice. Ice is considered to 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: **150-ft Monopole - NORWALK WEST- CT AVE**
 Project: **BU841287_WO1193060**

Client: Crown Castle	Drawn by: LeeMH	App'd:
Code: TIA/EIA-222-F	Date: 02/22/16	Scale: NTS
Path: T:\841287 NORWALK WEST, CT AVE\WO1193060\Analysis\LC4.5\Modell\Mod5\CCpole\CCpole.er		Dwg No. E-1

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job 150-ft Monopole - NORWALK WEST- CT AVE	Page 1 of 33
	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by 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 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

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-145.00	5.00	0.00	12	14.5000	15.2541	0.2500	1.0000	A36 (36 ksi)
L2	145.00-140.00	5.00	0.00	12	15.2541	16.0083	0.2500	1.0000	A36 (36 ksi)
L3	140.00-139.58	0.42	0.00	12	16.0083	16.0712	0.2500	1.0000	A36 (36 ksi)
L4	139.58-139.33	0.25	0.00	12	16.0712	16.1089	0.5500	2.2000	A36 (36 ksi)
L5	139.33-134.33	5.00	0.00	12	16.1089	16.8630	0.5250	2.1000	A36

<p>tnxTower</p> <p>Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	2 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	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	134.33-129.33	5.00	0.00	12	16.8630	17.6172	0.5125	2.0500	(36 ksi) A36
L7	129.33-124.33	5.00	0.00	12	17.6172	18.3713	0.5000	2.0000	(36 ksi) A36
L8	124.33-119.33	5.00	0.00	12	18.3713	19.1254	0.4875	1.9500	(36 ksi) A36
L9	119.33-119.00	0.33	0.00	12	19.1254	19.1757	0.4875	1.9500	(36 ksi) A36
L10	119.00-118.75	0.25	0.00	12	19.1757	19.2134	0.8875	3.5500	(36 ksi) A36
L11	118.75-113.75	5.00	0.00	12	19.2134	19.9675	0.8500	3.4000	(36 ksi) A36
L12	113.75-110.00	3.75	0.00	12	19.9675	20.5331	0.8250	3.3000	(36 ksi) A36
L13	110.00-109.75	0.25	0.00	12	20.5331	20.5708	0.5625	2.2500	(36 ksi) A572-65 (65 ksi)
L14	109.75-104.75	5.00	0.00	12	20.5708	21.3249	0.5500	2.2000	(65 ksi) A572-65 (65 ksi)
L15	104.75-99.75	5.00	0.00	12	21.3249	22.0791	0.5375	2.1500	(65 ksi) A572-65 (65 ksi)
L16	99.75-94.75	5.00	0.00	12	22.0791	22.8332	0.5250	2.1000	(65 ksi) A572-65 (65 ksi)
L17	94.75-89.75	5.00	0.00	12	22.8332	23.5874	0.5125	2.0500	(65 ksi) A572-65 (65 ksi)
L18	89.75-84.75	5.00	0.00	12	23.5874	24.3415	0.5000	2.0000	(65 ksi) A572-65 (65 ksi)
L19	84.75-81.50	3.25	0.00	12	24.3415	24.8317	0.5000	2.0000	(65 ksi) A572-65 (65 ksi)
L20	81.50-81.25	0.25	0.00	12	24.8317	24.8694	0.5000	2.0000	(65 ksi) A572-65 (65 ksi)
L21	81.25-78.00	3.25	0.00	12	24.8694	25.3596	0.4875	1.9500	(65 ksi) A572-65 (65 ksi)
L22	78.00-77.75	0.25	0.00	12	25.3596	25.3973	0.7625	3.0500	(65 ksi) A572-65 (65 ksi)
L23	77.75-72.75	5.00	0.00	12	25.3973	26.1514	0.7500	3.0000	(65 ksi) A572-65 (65 ksi)
L24	72.75-66.00	6.75	4.00	12	26.1514	27.1695	0.7375	2.9500	(65 ksi) A572-65 (65 ksi)
L25	66.00-65.00	5.00	0.00	12	26.0662	26.8203	0.7995	3.1980	(65 ksi) A572-65 (65 ksi)
L26	65.00-60.00	5.00	0.00	12	26.8203	27.5745	0.7870	3.1480	(65 ksi) A572-65 (65 ksi)
L27	60.00-55.00	5.00	0.00	12	27.5745	28.3286	0.7620	3.0480	(65 ksi) A572-65 (65 ksi)
L28	55.00-51.25	3.75	0.00	12	28.3286	28.8942	0.7495	2.9980	(65 ksi) A572-65 (65 ksi)
L29	51.25-51.00	0.25	0.00	12	28.8942	28.9319	0.8370	3.3480	(65 ksi) A572-65 (65 ksi)
L30	51.00-50.75	0.25	0.00	12	28.9319	28.9696	0.5995	2.3980	(65 ksi) A572-65 (65 ksi)
L31	50.75-45.75	5.00	0.00	12	28.9696	29.7238	0.5995	2.3980	(65 ksi) A572-65 (65 ksi)
L32	45.75-42.00	3.75	0.00	12	29.7238	30.2894	0.5870	2.3480	(65 ksi) A572-65 (65 ksi)
L33	42.00-41.75	0.25	0.00	12	30.2894	30.3271	0.8120	3.2480	(65 ksi) A572-65 (65 ksi)
L34	41.75-36.75	5.00	0.00	12	30.3271	31.0812	0.7995	3.1980	(65 ksi) A572-65 (65 ksi)
L35	36.75-31.75	5.00	0.00	12	31.0812	31.8354	0.7870	3.1480	(65 ksi) A572-65 (65 ksi)

Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	3 of 33
Project	BU841287_WO1193060	Date	13:10:23 02/22/16
Client	Crown Castle	Designed by	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	31.75-27.00	4.75	3.00	12	31.8354	32.5518	0.7745	3.0980	A572-65 (65 ksi)
L37	27.00-26.25	3.75	0.00	12	31.4753	32.0409	0.8500	3.4000	A572-65 (65 ksi)
L38	26.25-26.00	0.25	0.00	12	32.0409	32.0786	0.8500	3.4000	A572-65 (65 ksi)
L39	26.00-21.00	5.00	0.00	12	32.0786	32.8327	0.8250	3.3000	A572-65 (65 ksi)
L40	21.00-16.00	5.00	0.00	12	32.8327	33.5868	0.8250	3.3000	A572-65 (65 ksi)
L41	16.00-11.00	5.00	0.00	12	33.5868	34.3409	0.8000	3.2000	A572-65 (65 ksi)
L42	11.00-10.25	0.75	0.00	12	34.3409	34.4541	0.8000	3.2000	A572-65 (65 ksi)
L43	10.25-10.00	0.25	0.00	12	34.4541	34.4918	0.7875	3.1500	A572-65 (65 ksi)
L44	10.00-5.00	5.00	0.00	12	34.4918	35.2459	0.7750	3.1000	A572-65 (65 ksi)
L45	5.00-3.50	1.50	0.00	12	35.2459	35.4721	0.7750	3.1000	A572-65 (65 ksi)
L46	3.50-3.25	0.25	0.00	12	35.4721	35.5098	0.7000	2.8000	A572-65 (65 ksi)
L47	3.25-0.00	3.25		12	35.5098	36.0000	0.7000	2.8000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I _t /Q ₂ in ²	w in	w/t
L1	15.0115	11.4713	297.3216	5.1015	7.5110	39.5848	602.4541	5.6458	3.2160	12.864
	15.7922	12.0783	347.0683	5.3715	7.9016	43.9236	703.2545	5.9446	3.4181	13.672
L2	15.7922	12.0783	347.0683	5.3715	7.9016	43.9236	703.2545	5.9446	3.4181	13.672
	16.5730	12.6854	402.0757	5.6415	8.2923	48.4879	814.7144	6.2434	3.6202	14.481
L3	16.5730	12.6854	402.0757	5.6415	8.2923	48.4879	814.7144	6.2434	3.6202	14.481
	16.6381	12.7360	406.9093	5.6640	8.3249	48.8788	824.5086	6.2683	3.6371	14.548
L4	16.6381	27.4880	845.2358	5.5566	8.3249	101.5315	1712.6769	13.5288	2.8331	5.151
	16.6771	27.5548	851.4110	5.5701	8.3444	102.0338	1725.1895	13.5616	2.8432	5.169
L5	16.6771	26.3445	816.6344	5.5790	8.3444	97.8662	1654.7226	12.9660	2.9102	5.543
	17.4579	27.6194	941.0202	5.8490	8.7350	107.7293	1906.7621	13.5934	3.1123	5.928
L6	17.4579	26.9824	920.7250	5.8535	8.7350	105.4059	1865.6386	13.2799	3.1458	6.138
	18.2386	28.2270	1054.0918	6.1235	9.1257	115.5082	2135.8757	13.8924	3.3479	6.532
L7	18.2386	27.5586	1030.6385	6.1279	9.1257	112.9382	2088.3529	13.5635	3.3814	6.763
	19.0194	28.7728	1172.9500	6.3979	9.5163	123.2566	2376.7147	14.1611	3.5835	7.167
L8	19.0194	28.0731	1146.0276	6.4024	9.5163	120.4275	2322.1627	13.8167	3.6170	7.419
	19.8001	29.2569	1297.2069	6.6724	9.9070	130.9388	2628.4929	14.3993	3.8191	7.834
L9	19.8001	29.2569	1297.2069	6.6724	9.9070	130.9388	2628.4929	14.3993	3.8191	7.834
	19.8521	29.3357	1307.7224	6.6904	9.9330	131.6545	2649.8000	14.4382	3.8326	7.862
L10	19.8521	52.2630	2231.1033	6.5472	9.9330	224.6155	4520.8203	25.7222	2.7606	3.111
	19.8911	52.3707	2244.9322	6.5607	9.9525	225.5642	4548.8413	25.7753	2.7707	3.122
L11	19.8911	50.2605	2163.3020	6.5741	9.9525	217.3622	4383.4363	24.7367	2.8712	3.378
	20.6719	52.3246	2440.9216	6.8441	10.3432	235.9937	4945.9689	25.7526	3.0733	3.616
L12	20.6719	50.8520	2378.4363	6.8530	10.3432	229.9525	4819.3568	25.0278	3.1403	3.806
	21.2574	52.3546	2595.5538	7.0555	10.6361	244.0314	5259.2958	25.7673	3.2919	3.99
L13	21.2574	36.1717	1841.3557	7.1495	10.6361	173.1225	3731.0858	17.8026	3.9954	7.103
	21.2965	36.2400	1851.8055	7.1630	10.6557	173.7858	3752.2599	17.8362	4.0055	7.121
L14	21.2965	35.4568	1814.0499	7.1674	10.6557	170.2426	3675.7570	17.4508	4.0390	7.344

Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	4 of 33
Project	BU841287_WO1193060	Date	13:10:23 02/22/16
Client	Crown Castle	Designed by	LeeMH

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L15	22.0772	36.7924	2026.8614	7.4374	11.0463	183.4875	4106.9706	18.1081	4.2411	7.711
	22.0772	35.9779	1984.3739	7.4419	11.0463	179.6412	4020.8796	17.7072	4.2746	7.953
	22.8579	37.2831	2208.2738	7.7119	11.4370	193.0822	4474.5615	18.3496	4.4767	8.329
L16	22.8579	36.4372	2160.6756	7.7164	11.4370	188.9204	4378.1146	17.9333	4.5102	8.591
	23.6387	37.7120	2395.4971	7.9863	11.8276	202.5344	4853.9265	18.5607	4.7123	8.976
L17	23.6387	36.8348	2342.3946	7.9908	11.8276	198.0447	4746.3264	18.1289	4.7458	9.26
	24.4194	38.0793	2587.9297	8.2608	12.2182	211.8086	5243.8473	18.7415	4.9479	9.654
L18	24.4194	37.1706	2528.9149	8.2653	12.2182	206.9785	5124.2672	18.2943	4.9814	9.963
	25.2002	38.3848	2784.9149	8.5353	12.6089	220.8691	5642.9927	18.8918	5.1835	10.367
L19	25.2002	38.3848	2784.9149	8.5353	12.6089	220.8691	5642.9927	18.8918	5.1835	10.367
	25.7076	39.1740	2960.2471	8.7107	12.8628	230.1400	5998.2632	19.2803	5.3149	10.63
L20	25.7076	39.1740	2960.2471	8.7107	12.8628	230.1400	5998.2632	19.2803	5.3149	10.63
	25.7467	39.2347	2974.0310	8.7242	12.8823	230.8611	6026.1930	19.3101	5.3250	10.65
L21	25.7467	38.2735	2904.1445	8.7287	12.8823	225.4361	5884.5842	18.8370	5.3585	10.992
	26.2542	39.0429	3082.8499	8.9042	13.1363	234.6825	6246.6897	19.2157	5.4899	11.261
L22	26.2542	60.3920	4663.7144	8.8058	13.1363	355.0261	9449.9497	29.7231	4.7529	6.233
	26.2932	60.4845	4685.1954	8.8193	13.1558	356.1318	9493.4761	29.7687	4.7630	6.247
L23	26.2932	59.5232	4615.4076	8.8237	13.1558	350.8271	9352.0670	29.2955	4.7965	6.395
	27.0739	61.3444	5052.1573	9.0937	13.5464	372.9511	10237.0403	30.1919	4.9986	6.665
L24	27.0739	60.3517	4975.2924	9.0982	13.5464	367.2769	10081.2913	29.7033	5.0321	6.823
	28.1279	62.7694	5597.4977	9.4627	14.0738	397.7247	11342.0479	30.8932	5.3049	7.193
L25	27.6103	65.0463	5300.3603	9.0455	13.5023	392.5528	10739.9670	32.0138	4.8431	6.058
	27.7665	66.9878	5789.2700	9.3155	13.8929	416.7061	11730.6305	32.9693	5.0452	6.31
L26	27.7665	65.9721	5706.9728	9.3199	13.8929	410.7825	11563.8741	32.4695	5.0787	6.453
	28.5472	67.8832	6217.4421	9.5899	14.2836	435.2861	12598.2233	33.4100	5.2808	6.71
L27	28.5472	65.7882	6036.8080	9.5989	14.2836	422.6398	12232.2097	32.3789	5.3478	7.018
	29.3279	67.6385	6560.6521	9.8688	14.6742	447.0869	13293.6598	33.2896	5.5499	7.283
L28	29.3279	66.5592	6461.8121	9.8733	14.6742	440.3513	13093.3833	32.7584	5.5834	7.45
	29.9135	67.9242	6867.5870	10.0758	14.9672	458.8423	13915.5932	33.4302	5.7350	7.652
L29	29.9135	75.6181	7598.0318	10.0445	14.9672	507.6453	15395.6723	37.2169	5.5005	6.572
	29.9525	75.7198	7628.7067	10.0580	14.9867	509.0305	15457.8280	37.2670	5.5106	6.584
L30	29.9525	54.6926	5603.7953	10.1430	14.9867	373.9170	11354.8085	26.9180	6.1471	10.254
	29.9916	54.7654	5626.1990	10.1565	15.0063	374.9232	11400.2045	26.9539	6.1572	10.271
L31	29.9916	54.7654	5626.1990	10.1565	15.0063	374.9232	11400.2045	26.9539	6.1572	10.271
	30.7723	56.2212	6086.9016	10.4265	15.3969	395.3326	12333.7128	27.6704	6.3593	10.608
L32	30.7723	55.0726	5967.6627	10.4310	15.3969	387.5882	12092.1024	27.1050	6.3928	10.891
	31.3579	56.1417	6321.9870	10.6335	15.6899	402.9336	12810.0595	27.6312	6.5444	11.149
L33	31.3579	77.0727	8547.9980	10.5529	15.6899	544.8090	17320.5615	37.9329	5.9414	7.317
	31.3969	77.1713	8580.8434	10.5664	15.7094	546.2224	17387.1151	37.9814	5.9515	7.329
L34	31.3969	76.0155	8459.4881	10.5709	15.7094	538.4975	17141.2165	37.4125	5.9850	7.486
	32.1777	77.9570	9124.3547	10.8409	16.1001	566.7275	18488.4164	38.3681	6.1871	7.739
L35	32.1777	76.7698	8992.8248	10.8453	16.1001	558.5579	18221.9010	37.7838	6.2206	7.904
	32.9584	78.6809	9681.2809	11.1153	16.4907	587.0745	19616.8998	38.7243	6.4227	8.161
L36	32.9584	77.4624	9539.0240	11.1198	16.4907	578.4480	19328.6488	38.1246	6.4562	8.336
	33.7001	79.2491	10214.4321	11.3763	16.8618	605.7724	20697.2087	39.0040	6.6482	8.584
L37	33.0541	83.8215	10034.6555	10.9639	16.3042	615.4639	20332.9326	41.2544	6.1574	7.244
	33.1712	85.3695	10600.9434	11.1663	16.5972	638.7193	21480.3854	42.0163	6.3090	7.422
L38	33.1712	85.3695	10600.9434	11.1663	16.5972	638.7193	21480.3854	42.0163	6.3090	7.422
	33.2102	85.4727	10639.4354	11.1798	16.6167	640.2850	21558.3805	42.0671	6.3191	7.434
L39	33.2102	83.0252	10351.3312	11.1888	16.6167	622.9468	20974.6035	40.8625	6.3861	7.741
	33.9909	85.0285	11118.8540	11.4588	17.0073	653.7676	22529.8126	41.8484	6.5882	7.986
L40	33.9909	85.0285	11118.8540	11.4588	17.0073	653.7676	22529.8126	41.8484	6.5882	7.986
	34.7717	87.0318	11923.4086	11.7287	17.3980	685.3329	24160.0584	42.8344	6.7903	8.231
L41	34.7717	84.4589	11588.5819	11.7377	17.3980	666.0878	23481.6088	41.5681	6.8573	8.572
	35.5524	86.4015	12406.7448	12.0077	17.7886	697.4544	25139.4287	42.5242	7.0594	8.824
L42	35.5524	86.4015	12406.7448	12.0077	17.7886	697.4544	25139.4287	42.5242	7.0594	8.824
	35.6695	86.6929	12532.6942	12.0482	17.8472	702.2216	25394.6362	42.6676	7.0897	8.862
L43	35.6695	85.3700	12350.6226	12.0526	17.8472	692.0199	25025.7099	42.0165	7.1232	9.045
	35.7085	85.4656	12392.1663	12.0661	17.8667	693.5886	25109.8886	42.0636	7.1333	9.058
L44	35.7085	84.1402	12209.0392	12.0706	17.8667	683.3390	24738.8234	41.4112	7.1668	9.247
	36.4892	86.0221	13046.7055	12.3406	18.2574	714.5994	26436.1626	42.3375	7.3689	9.508
L45	36.4892	86.0221	13046.7055	12.3406	18.2574	714.5994	26436.1626	42.3375	7.3689	9.508

<p style="text-align: center;">tnxTower</p> <p>Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	<p>Job</p> <p style="text-align: center;">150-ft Monopole - NORWALK WEST- CT AVE</p>	<p>Page</p> <p style="text-align: center;">5 of 33</p>
	<p>Project</p> <p style="text-align: center;">BU841287_WO1193060</p>	<p>Date</p> <p style="text-align: center;">13:10:23 02/22/16</p>
	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">LeeMH</p>

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L46	36.7234	86.5867	13305.2738	12.4216	18.3746	724.1139	26960.0919	42.6153	7.4295	9.586
	36.7234	78.3764	12095.7660	12.4484	18.3746	658.2888	24509.3013	38.5745	7.6305	10.901
L47	36.7625	78.4613	12135.1574	12.4619	18.3941	659.7313	24589.1189	38.6163	7.6406	10.915
	36.7625	78.4613	12135.1574	12.4619	18.3941	659.7313	24589.1189	38.6163	7.6406	10.915
	37.2699	79.5662	12655.0533	12.6374	18.6480	678.6279	25642.5689	39.1601	7.7720	11.103

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 ²	in						
L1				1	1	1		
150.00-145.00				1	1	1		
L2				1	1	1		
145.00-140.00				1	1	1		
L3				1	1	1		
140.00-139.58				1	1	0.887801		
L4				1	1	0.907703		
139.58-139.33				1	1	0.909673		
L5				1	1	0.913516		
139.33-134.33				1	1	0.91915		
L6				1	1	0.918058		
134.33-129.33				1	1	0.859031		
L7				1	1	0.87139		
129.33-124.33				1	1	0.879588		
L8				1	1	0.907889		
124.33-119.33				1	1	0.910758		
L9				1	1	0.915055		
119.33-119.00				1	1	0.920745		
L10				1	1	0.927808		
119.00-118.75				1	1	0.936239		
L11				1	1	0.92745		
118.75-113.75				1	1	0.926789		
L12				1	1	0.941448		
113.75-110.00				1	1	0.906232		
L13				1	1	0.903426		
110.00-109.75				1	1	0.908983		
L14				1	1	0.913612		
109.75-104.75				1	1			
L15				1	1			
104.75-99.75				1	1			
L16				1	1			
99.75-94.75				1	1			
L17				1	1			
94.75-89.75				1	1			
L18				1	1			
89.75-84.75				1	1			
L19				1	1			
84.75-81.50				1	1			
L20				1	1			
81.50-81.25				1	1			
L21				1	1			
81.25-78.00				1	1			
L22				1	1			
78.00-77.75				1	1			
L23				1	1			
77.75-72.75				1	1			
L24				1	1			
72.75-66.00				1	1			
L25				1	1			
66.00-65.00				1	1			

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job 150-ft Monopole - NORWALK WEST- CT AVE	Page 6 of 33
	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by 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 ²	in						
L26				1	1	0.912721		
65.00-60.00								
L27				1	1	0.927224		
60.00-55.00								
L28				1	1	0.931691		
55.00-51.25								
L29				1	1	0.916682		
51.25-51.00								
L30				1	1	0.938968		
51.00-50.75								
L31				1	1	0.928131		
50.75-45.75								
L32				1	1	0.939568		
45.75-42.00								
L33				1	1	0.917602		
42.00-41.75								
L34				1	1	0.918073		
41.75-36.75								
L35				1	1	0.919255		
36.75-31.75								
L36				1	1	0.929242		
31.75-27.00								
L37				1	1	0.924157		
27.00-26.25								
L38				1	1	0.923573		
26.25-26.00								
L39				1	1	0.939107		
26.00-21.00								
L40				1	1	0.927954		
21.00-16.00								
L41				1	1	0.945263		
16.00-11.00								
L42				1	1	0.943661		
11.00-10.25								
L43				1	1	0.922592		
10.25-10.00								
L44				1	1	0.927209		
10.00-5.00								
L45				1	1	0.924319		
5.00-3.50								
L46				1	1	0.923618		
3.50-3.25								
L47				1	1	0.918232		
3.25-0.00								

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job		150-ft Monopole - NORWALK WEST- CT AVE		Page		7 of 33	
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	Client		Crown Castle		Designed by		LeeMH	

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
150								
LDF2-50(3/8")	B	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	150.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	150.00 - 0.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
FB-L98B-009-XXX(3/8")	B	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	B	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58
FB-L98B-009-XXX(3/8")	B	No	CaAa (Out Of Face)	150.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.61
						1" Ice	0.00	1.76
						2" Ice	0.00	5.91
						4" Ice	0.00	21.53
WR-VG86ST-BRD(3/4")	B	No	CaAa (Out Of Face)	150.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	1.38
						1" Ice	0.00	2.78
						2" Ice	0.00	7.41
						4" Ice	0.00	24.02
2" Rigid Conduit	B	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
142 (DO NOT CONSIDER)								

Safety Line 3/8	C	No	CaAa (Out Of Face)	150.00 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46

EXISTING MODS								
Aero MP305	A	No	CaAa (Out Of Face)	26.25 - 0.00	1	No Ice	0.35	0.00
						1/2" Ice	0.46	0.00
						1" Ice	0.57	0.00
						2" Ice	0.79	0.00
						4" Ice	1.24	0.00
Aero MP305	A	No	CaAa (Out Of Face)	26.25 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	8 of 33
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	Client	Crown Castle	Designed by	LeeMH

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						No Ice	ft ² /ft	
Aero MP305	B	No	CaAa (Out Of Face)	26.25 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
Aero MP305	C	No	CaAa (Out Of Face)	26.25 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
* Aero MP305	A	No	CaAa (Out Of Face)	51.25 - 26.25	1	No Ice	0.35	0.00
						1/2" Ice	0.46	0.00
						1" Ice	0.57	0.00
						2" Ice	0.79	0.00
						4" Ice	1.24	0.00
Aero MP305	A	No	CaAa (Out Of Face)	51.25 - 26.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
Aero MP305	B	No	CaAa (Out Of Face)	51.25 - 26.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
Aero MP305	C	No	CaAa (Out Of Face)	51.25 - 26.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
* Aero MP304	A	No	CaAa (Out Of Face)	81.50 - 51.25	1	No Ice	0.27	0.00
						1/2" Ice	0.91	0.00
						1" Ice	1.02	0.00
						2" Ice	1.24	0.00
						4" Ice	1.69	0.00
Aero MP304	A	No	CaAa (Out Of Face)	81.50 - 51.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
Aero MP304	B	No	CaAa (Out Of Face)	81.50 - 51.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
Aero MP304	C	No	CaAa (Out Of Face)	81.50 - 51.25	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
* Aero MP304	A	No	CaAa (Out Of Face)	110.00 - 81.50	1	No Ice	0.27	0.00
						1/2" Ice	0.91	0.00
						1" Ice	1.02	0.00
						2" Ice	1.24	0.00
						4" Ice	1.69	0.00
Aero MP304	A	No	CaAa (Out Of Face)	110.00 - 81.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job		150-ft Monopole - NORWALK WEST- CT AVE		Page		9 of 33	
	Project		BU841287_WO1193060		Date		13:10:23 02/22/16	
	Client		Crown Castle		Designed by		LeeMH	

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight plf
						ft ² /ft		
Aero MP304	B	No	CaAa (Out Of Face)	110.00 - 81.50	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
Aero MP304	C	No	CaAa (Out Of Face)	110.00 - 81.50	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
* Aero MP303	A	No	CaAa (Out Of Face)	140.75 - 110.75	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.26	0.00
						1/2" Ice	0.79	0.00
						1" Ice	0.90	0.00
Aero MP303	B	No	CaAa (Out Of Face)	140.75 - 110.75	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
Aero MP303	B	No	CaAa (Out Of Face)	140.75 - 110.75	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
Aero MP303	C	No	CaAa (Out Of Face)	140.75 - 110.75	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

PROPOSED MODS								
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	43.50 - 0.00	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	43.50 - 0.00	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	43.50 - 0.00	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	43.50 - 0.00	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
*								
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	79.50 - 49.50	1	2" Ice	0.00	0.00
						4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	79.50 - 49.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	79.50 - 49.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	79.50 - 49.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
*								
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	120.50 - 110.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	A	No	CaAa (Out Of Face)	120.50 - 110.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	B	No	CaAa (Out Of Face)	120.50 - 110.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
4.5" x 1" Flat Plate (F)	C	No	CaAa (Out Of Face)	120.50 - 110.50	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.00-145.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L2	145.00-140.00	A	0.000	0.000	0.000	0.196	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L3	140.00-139.58	A	0.000	0.000	0.000	0.109	0.00
		B	0.000	0.000	0.000	0.165	0.01
		C	0.000	0.000	0.000	0.016	0.00
L4	139.58-139.33	A	0.000	0.000	0.000	0.065	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L5	139.33-134.33	A	0.000	0.000	0.000	1.310	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L6	134.33-129.33	A	0.000	0.000	0.000	1.310	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L7	129.33-124.33	A	0.000	0.000	0.000	1.310	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L8	124.33-119.33	A	0.000	0.000	0.000	1.310	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L9	119.33-119.00	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.132	0.01
		C	0.000	0.000	0.000	0.012	0.00
L10	119.00-118.75	A	0.000	0.000	0.000	0.065	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L11	118.75-113.75	A	0.000	0.000	0.000	1.310	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L12	113.75-110.00	A	0.000	0.000	0.000	0.786	0.00
		B	0.000	0.000	0.000	1.485	0.07
		C	0.000	0.000	0.000	0.141	0.00
L13	110.00-109.75	A	0.000	0.000	0.000	0.067	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L14	109.75-104.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L15	104.75-99.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L16	99.75-94.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L17	94.75-89.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L18	89.75-84.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L19	84.75-81.50	A	0.000	0.000	0.000	0.871	0.00
		B	0.000	0.000	0.000	1.287	0.06
		C	0.000	0.000	0.000	0.122	0.00
L20	81.50-81.25	A	0.000	0.000	0.000	0.067	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L21	81.25-78.00	A	0.000	0.000	0.000	0.871	0.00
		B	0.000	0.000	0.000	1.287	0.06
		C	0.000	0.000	0.000	0.122	0.00
L22	78.00-77.75	A	0.000	0.000	0.000	0.067	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L23	77.75-72.75	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L24	72.75-66.00	A	0.000	0.000	0.000	1.809	0.00
		B	0.000	0.000	0.000	2.673	0.12
		C	0.000	0.000	0.000	0.253	0.00
L25	66.00-65.00	A	0.000	0.000	0.000	0.268	0.00
		B	0.000	0.000	0.000	0.396	0.02
		C	0.000	0.000	0.000	0.037	0.00
L26	65.00-60.00	A	0.000	0.000	0.000	1.340	0.00

<p>tnxTower</p> <p>Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	12 of 33
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	Client	Crown Castle	Designed by	LeeMH

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L27	60.00-55.00	A	0.000	0.000	0.000	1.340	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L28	55.00-51.25	A	0.000	0.000	0.000	1.005	0.00
		B	0.000	0.000	0.000	1.485	0.07
		C	0.000	0.000	0.000	0.141	0.00
L29	51.25-51.00	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L30	51.00-50.75	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L31	50.75-45.75	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L32	45.75-42.00	A	0.000	0.000	0.000	1.306	0.00
		B	0.000	0.000	0.000	1.485	0.07
		C	0.000	0.000	0.000	0.141	0.00
L33	42.00-41.75	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L34	41.75-36.75	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L35	36.75-31.75	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L36	31.75-27.00	A	0.000	0.000	0.000	1.655	0.00
		B	0.000	0.000	0.000	1.881	0.09
		C	0.000	0.000	0.000	0.178	0.00
L37	27.00-26.25	A	0.000	0.000	0.000	0.261	0.00
		B	0.000	0.000	0.000	0.297	0.01
		C	0.000	0.000	0.000	0.028	0.00
L38	26.25-26.00	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L39	26.00-21.00	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L40	21.00-16.00	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L41	16.00-11.00	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L42	11.00-10.25	A	0.000	0.000	0.000	0.261	0.00
		B	0.000	0.000	0.000	0.297	0.01
		C	0.000	0.000	0.000	0.028	0.00
L43	10.25-10.00	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.009	0.00
L44	10.00-5.00	A	0.000	0.000	0.000	1.742	0.00
		B	0.000	0.000	0.000	1.980	0.09
		C	0.000	0.000	0.000	0.188	0.00
L45	5.00-3.50	A	0.000	0.000	0.000	0.523	0.00
		B	0.000	0.000	0.000	0.594	0.03
		C	0.000	0.000	0.000	0.056	0.00
L46	3.50-3.25	A	0.000	0.000	0.000	0.087	0.00
		B	0.000	0.000	0.000	0.099	0.00

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	13 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	LeeMH

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L47	3.25-0.00	C	0.000	0.000	0.000	0.009	0.00
		A	0.000	0.000	0.000	1.132	0.00
		B	0.000	0.000	0.000	1.287	0.06
		C	0.000	0.000	0.000	0.122	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	150.00-145.00	A	0.898	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	3.775	0.31
		C		0.000	0.000	0.000	1.085	0.01
L2	145.00-140.00	A	0.894	0.000	0.000	0.000	0.656	0.00
		B		0.000	0.000	0.000	3.768	0.31
		C		0.000	0.000	0.000	1.081	0.01
L3	140.00-139.58	A	0.892	0.000	0.000	0.000	0.365	0.00
		B		0.000	0.000	0.000	0.314	0.03
		C		0.000	0.000	0.000	0.090	0.00
L4	139.58-139.33	A	0.892	0.000	0.000	0.000	0.219	0.00
		B		0.000	0.000	0.000	0.188	0.02
		C		0.000	0.000	0.000	0.054	0.00
L5	139.33-134.33	A	0.890	0.000	0.000	0.000	4.372	0.00
		B		0.000	0.000	0.000	3.759	0.31
		C		0.000	0.000	0.000	1.077	0.01
L6	134.33-129.33	A	0.886	0.000	0.000	0.000	4.367	0.00
		B		0.000	0.000	0.000	3.751	0.31
		C		0.000	0.000	0.000	1.073	0.01
L7	129.33-124.33	A	0.881	0.000	0.000	0.000	4.363	0.00
		B		0.000	0.000	0.000	3.743	0.30
		C		0.000	0.000	0.000	1.069	0.01
L8	124.33-119.33	A	0.877	0.000	0.000	0.000	4.358	0.00
		B		0.000	0.000	0.000	3.735	0.30
		C		0.000	0.000	0.000	1.065	0.01
L9	119.33-119.00	A	0.875	0.000	0.000	0.000	0.290	0.00
		B		0.000	0.000	0.000	0.248	0.02
		C		0.000	0.000	0.000	0.071	0.00
L10	119.00-118.75	A	0.875	0.000	0.000	0.000	0.218	0.00
		B		0.000	0.000	0.000	0.186	0.02
		C		0.000	0.000	0.000	0.053	0.00
L11	118.75-113.75	A	0.872	0.000	0.000	0.000	4.353	0.00
		B		0.000	0.000	0.000	3.725	0.30
		C		0.000	0.000	0.000	1.060	0.01
L12	113.75-110.00	A	0.868	0.000	0.000	0.000	2.609	0.00
		B		0.000	0.000	0.000	2.788	0.23
		C		0.000	0.000	0.000	0.792	0.00
L13	110.00-109.75	A	0.866	0.000	0.000	0.000	0.247	0.00
		B		0.000	0.000	0.000	0.186	0.01
		C		0.000	0.000	0.000	0.053	0.00
L14	109.75-104.75	A	0.864	0.000	0.000	0.000	4.943	0.00
		B		0.000	0.000	0.000	3.708	0.30
		C		0.000	0.000	0.000	1.051	0.01
L15	104.75-99.75	A	0.859	0.000	0.000	0.000	4.938	0.00
		B		0.000	0.000	0.000	3.698	0.30
		C		0.000	0.000	0.000	1.047	0.01
L16	99.75-94.75	A	0.854	0.000	0.000	0.000	4.932	0.00
		B		0.000	0.000	0.000	3.688	0.30
		C		0.000	0.000	0.000	1.041	0.01

Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	14 of 33
Project	BU841287_WO1193060	Date	13:10:23 02/22/16
Client	Crown Castle	Designed by	LeeMH

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L17	94.75-89.75	A	0.848	0.000	0.000	0.000	4.926	0.00
		B		0.000	0.000	0.000	3.677	0.29
		C		0.000	0.000	0.000	1.036	0.01
L18	89.75-84.75	A	0.843	0.000	0.000	0.000	4.920	0.00
		B		0.000	0.000	0.000	3.666	0.29
		C		0.000	0.000	0.000	1.030	0.01
L19	84.75-81.50	A	0.838	0.000	0.000	0.000	3.194	0.00
		B		0.000	0.000	0.000	2.376	0.19
		C		0.000	0.000	0.000	0.667	0.00
L20	81.50-81.25	A	0.836	0.000	0.000	0.000	0.246	0.00
		B		0.000	0.000	0.000	0.183	0.01
		C		0.000	0.000	0.000	0.051	0.00
L21	81.25-78.00	A	0.834	0.000	0.000	0.000	3.191	0.00
		B		0.000	0.000	0.000	2.371	0.19
		C		0.000	0.000	0.000	0.664	0.00
L22	78.00-77.75	A	0.831	0.000	0.000	0.000	0.245	0.00
		B		0.000	0.000	0.000	0.182	0.01
		C		0.000	0.000	0.000	0.051	0.00
L23	77.75-72.75	A	0.828	0.000	0.000	0.000	4.903	0.00
		B		0.000	0.000	0.000	3.636	0.29
		C		0.000	0.000	0.000	1.015	0.01
L24	72.75-66.00	A	0.820	0.000	0.000	0.000	6.607	0.00
		B		0.000	0.000	0.000	4.887	0.39
		C		0.000	0.000	0.000	1.360	0.01
L25	66.00-65.00	A	0.814	0.000	0.000	0.000	0.979	0.00
		B		0.000	0.000	0.000	0.724	0.06
		C		0.000	0.000	0.000	0.201	0.00
L26	65.00-60.00	A	0.810	0.000	0.000	0.000	4.883	0.00
		B		0.000	0.000	0.000	3.599	0.28
		C		0.000	0.000	0.000	0.997	0.01
L27	60.00-55.00	A	0.802	0.000	0.000	0.000	4.874	0.00
		B		0.000	0.000	0.000	3.583	0.28
		C		0.000	0.000	0.000	0.989	0.01
L28	55.00-51.25	A	0.794	0.000	0.000	0.000	3.649	0.00
		B		0.000	0.000	0.000	2.676	0.21
		C		0.000	0.000	0.000	0.736	0.00
L29	51.25-51.00	A	0.790	0.000	0.000	0.000	0.131	0.00
		B		0.000	0.000	0.000	0.178	0.01
		C		0.000	0.000	0.000	0.049	0.00
L30	51.00-50.75	A	0.790	0.000	0.000	0.000	0.131	0.00
		B		0.000	0.000	0.000	0.178	0.01
		C		0.000	0.000	0.000	0.049	0.00
L31	50.75-45.75	A	0.785	0.000	0.000	0.000	2.614	0.00
		B		0.000	0.000	0.000	3.550	0.28
		C		0.000	0.000	0.000	0.972	0.01
L32	45.75-42.00	A	0.776	0.000	0.000	0.000	1.953	0.00
		B		0.000	0.000	0.000	2.649	0.20
		C		0.000	0.000	0.000	0.723	0.00
L33	42.00-41.75	A	0.772	0.000	0.000	0.000	0.130	0.00
		B		0.000	0.000	0.000	0.176	0.01
		C		0.000	0.000	0.000	0.048	0.00
L34	41.75-36.75	A	0.766	0.000	0.000	0.000	2.592	0.00
		B		0.000	0.000	0.000	3.512	0.27
		C		0.000	0.000	0.000	0.953	0.01
L35	36.75-31.75	A	0.753	0.000	0.000	0.000	2.579	0.00
		B		0.000	0.000	0.000	3.487	0.27
		C		0.000	0.000	0.000	0.941	0.01
L36	31.75-27.00	A	0.750	0.000	0.000	0.000	2.446	0.00
		B		0.000	0.000	0.000	3.306	0.25
		C		0.000	0.000	0.000	0.891	0.00
L37	27.00-26.25	A	0.750	0.000	0.000	0.000	0.386	0.00

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	15 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	LeeMH

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		B		0.000	0.000	0.000	0.522	0.04
		C		0.000	0.000	0.000	0.141	0.00
L38	26.25-26.00	A	0.750	0.000	0.000	0.000	0.129	0.00
		B		0.000	0.000	0.000	0.174	0.01
		C		0.000	0.000	0.000	0.047	0.00
L39	26.00-21.00	A	0.750	0.000	0.000	0.000	2.575	0.00
		B		0.000	0.000	0.000	3.480	0.27
		C		0.000	0.000	0.000	0.938	0.01
L40	21.00-16.00	A	0.750	0.000	0.000	0.000	2.575	0.00
		B		0.000	0.000	0.000	3.480	0.27
		C		0.000	0.000	0.000	0.938	0.01
L41	16.00-11.00	A	0.750	0.000	0.000	0.000	2.575	0.00
		B		0.000	0.000	0.000	3.480	0.27
		C		0.000	0.000	0.000	0.938	0.01
L42	11.00-10.25	A	0.750	0.000	0.000	0.000	0.386	0.00
		B		0.000	0.000	0.000	0.522	0.04
		C		0.000	0.000	0.000	0.141	0.00
L43	10.25-10.00	A	0.750	0.000	0.000	0.000	0.129	0.00
		B		0.000	0.000	0.000	0.174	0.01
		C		0.000	0.000	0.000	0.047	0.00
L44	10.00-5.00	A	0.750	0.000	0.000	0.000	2.575	0.00
		B		0.000	0.000	0.000	3.480	0.27
		C		0.000	0.000	0.000	0.938	0.01
L45	5.00-3.50	A	0.750	0.000	0.000	0.000	0.772	0.00
		B		0.000	0.000	0.000	1.044	0.08
		C		0.000	0.000	0.000	0.281	0.00
L46	3.50-3.25	A	0.750	0.000	0.000	0.000	0.129	0.00
		B		0.000	0.000	0.000	0.174	0.01
		C		0.000	0.000	0.000	0.047	0.00
L47	3.25-0.00	A	0.750	0.000	0.000	0.000	1.674	0.00
		B		0.000	0.000	0.000	2.262	0.17
		C		0.000	0.000	0.000	0.609	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	150.00-145.00	0.3451	0.2409	0.3669	0.3828
L2	145.00-140.00	0.3417	0.1944	0.3561	0.2686
L3	140.00-139.58	0.3063	-0.0446	0.2800	-0.2352
L4	139.58-139.33	0.3066	-0.0447	0.2806	-0.2357
L5	139.33-134.33	0.3092	-0.0451	0.2846	-0.2394
L6	134.33-129.33	0.3138	-0.0457	0.2921	-0.2462
L7	129.33-124.33	0.3181	-0.0464	0.2992	-0.2528
L8	124.33-119.33	0.3223	-0.0470	0.3061	-0.2593
L9	119.33-119.00	0.3244	-0.0473	0.3097	-0.2627
L10	119.00-118.75	0.3246	-0.0473	0.3101	-0.2630
L11	118.75-113.75	0.3266	-0.0476	0.3135	-0.2663
L12	113.75-110.00	0.3372	0.0084	0.3350	-0.1574
L13	110.00-109.75	0.3304	-0.0545	0.3114	-0.3465
L14	109.75-104.75	0.3322	-0.0548	0.3146	-0.3505
L15	104.75-99.75	0.3355	-0.0554	0.3204	-0.3580
L16	99.75-94.75	0.3387	-0.0559	0.3261	-0.3653
L17	94.75-89.75	0.3418	-0.0564	0.3315	-0.3724
L18	89.75-84.75	0.3446	-0.0569	0.3367	-0.3794
L19	84.75-81.50	0.3469	-0.0573	0.3409	-0.3851

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job 150-ft Monopole - NORWALK WEST- CT AVE	Page 16 of 33
	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by LeeMH

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L20	81.50-81.25	0.3479	-0.0574	0.3426	-0.3875
L21	81.25-78.00	0.3488	-0.0576	0.3443	-0.3899
L22	78.00-77.75	0.3497	-0.0577	0.3460	-0.3922
L23	77.75-72.75	0.3511	-0.0579	0.3484	-0.3957
L24	72.75-66.00	0.3539	-0.0584	0.3538	-0.4035
L25	66.00-65.00	0.3542	-0.0585	0.3543	-0.4041
L26	65.00-60.00	0.3556	-0.0587	0.3566	-0.4090
L27	60.00-55.00	0.3579	-0.0591	0.3607	-0.4155
L28	55.00-51.25	0.3598	-0.0594	0.3642	-0.4212
L29	51.25-51.00	0.3516	-0.1490	0.4070	-0.0638
L30	51.00-50.75	0.3517	-0.1491	0.4072	-0.0638
L31	50.75-45.75	0.3529	-0.1496	0.4090	-0.0646
L32	45.75-42.00	0.3548	-0.1504	0.4120	-0.0660
L33	42.00-41.75	0.3556	-0.1507	0.4134	-0.0666
L34	41.75-36.75	0.3567	-0.1512	0.4150	-0.0675
L35	36.75-31.75	0.3587	-0.1520	0.4180	-0.0692
L36	31.75-27.00	0.3606	-0.1528	0.4213	-0.0701
L37	27.00-26.25	0.3601	-0.1526	0.4203	-0.0699
L38	26.25-26.00	0.3603	-0.1527	0.4207	-0.0700
L39	26.00-21.00	0.3613	-0.1531	0.4225	-0.0703
L40	21.00-16.00	0.3631	-0.1539	0.4260	-0.0709
L41	16.00-11.00	0.3649	-0.1547	0.4294	-0.0714
L42	11.00-10.25	0.3659	-0.1551	0.4313	-0.0717
L43	10.25-10.00	0.3661	-0.1552	0.4316	-0.0718
L44	10.00-5.00	0.3670	-0.1555	0.4334	-0.0721
L45	5.00-3.50	0.3680	-0.1560	0.4354	-0.0724
L46	3.50-3.25	0.3683	-0.1561	0.4360	-0.0725
L47	3.25-0.00	0.3689	-0.1564	0.4371	-0.0727

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
Beacon	C	None			0.0000	152.00	No Ice	2.00	2.00	0.02
							1/2" Ice	2.50	2.50	0.03
							1" Ice	3.00	3.00	0.04
							2" Ice	4.00	4.00	0.06
							4" Ice	6.00	6.00	0.10
152 (2) RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice	3.31	1.36	0.05	
						1/2" Ice	3.55	1.54	0.07	
						1" Ice	3.80	1.73	0.10	
						2" Ice	4.33	2.13	0.15	
						4" Ice	5.50	3.04	0.31	
(2) RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice	3.31	1.36	0.05	
						1/2" Ice	3.55	1.54	0.07	
						1" Ice	3.80	1.73	0.10	
						2" Ice	4.33	2.13	0.15	
						4" Ice	5.50	3.04	0.31	
(2) RRUS 11 B12	C	From Leg	4.00 0.00	0.0000	152.00	No Ice	3.31	1.36	0.05	
						1/2" Ice	3.55	1.54	0.07	

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job		150-ft Monopole - NORWALK WEST- CT AVE		Page		17 of 33	
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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	4.00	0.0000	152.00	No Ice	5.74	4.02	0.03
			0.00			1/2" Ice	6.20	4.63	0.08
			0.00			1" Ice	6.66	5.28	0.13
						2" Ice	7.62	6.68	0.25
						4" Ice	9.67	9.74	0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.0000	152.00	No Ice	5.74	4.02	0.03
			0.00			1/2" Ice	6.20	4.63	0.08
			0.00			1" Ice	6.66	5.28	0.13
						2" Ice	7.62	6.68	0.25
						4" Ice	9.67	9.74	0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.0000	152.00	No Ice	5.74	4.02	0.03
			0.00			1/2" Ice	6.20	4.63	0.08
			0.00			1" Ice	6.66	5.28	0.13
						2" Ice	7.62	6.68	0.25
						4" Ice	9.67	9.74	0.61
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	152.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	152.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	152.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) LGP21401	A	From Leg	4.00	0.0000	152.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Leg	4.00	0.0000	152.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(2) LGP21401	C	From Leg	4.00	0.0000	152.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	152.00	No Ice	1.47	1.47	0.03
			0.00			1/2" Ice	1.67	1.67	0.05
			0.00			1" Ice	1.88	1.88	0.07
						2" Ice	2.33	2.33	0.12
						4" Ice	3.38	3.38	0.25
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00	0.0000	152.00	No Ice	6.45	5.19	0.07
			0.00			1/2" Ice	6.91	5.85	0.12
			0.00			1" Ice	7.38	6.56	0.19
						2" Ice	8.36	8.08	0.33

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			0.00							
			-2.00			1/2" Ice	2.41	2.41	0.06	
						1" Ice	2.78	2.78	0.08	
						2" Ice	3.53	3.53	0.13	
						4" Ice	5.13	5.13	0.28	
142 (DO NOT CONSIDER)										

Bridge Stiffener (95.5"x7.5"x1.25")	A	From Face	0.50		0.0000	110.00	No Ice	1.66	7.91	0.25
			0.00				1/2" Ice	2.56	8.50	0.29
			0.00				1" Ice	3.47	9.10	0.32
							2" Ice	5.34	10.32	0.42
							4" Ice	7.73	12.84	0.71
Bridge Stiffener (95.5"x7.5"x1.25")	B	From Face	0.50		0.0000	110.00	No Ice	1.66	7.91	0.25
			0.00				1/2" Ice	2.56	8.50	0.29
			0.00				1" Ice	3.47	9.10	0.32
							2" Ice	5.34	10.32	0.42
							4" Ice	7.73	12.84	0.71
Bridge Stiffener (95.5"x7.5"x1.25")	B	From Leg	0.50		0.0000	110.00	No Ice	1.66	7.91	0.25
			0.00				1/2" Ice	2.56	8.50	0.29
			0.00				1" Ice	3.47	9.10	0.32
							2" Ice	5.34	10.32	0.42
							4" Ice	7.73	12.84	0.71
Bridge Stiffener (95.5"x7.5"x1.25")	C	From Face	0.50		0.0000	110.00	No Ice	1.66	7.91	0.25
			0.00				1/2" Ice	2.56	8.50	0.29
			0.00				1" Ice	3.47	9.10	0.32
							2" Ice	5.34	10.32	0.42
							4" Ice	7.73	12.84	0.71

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

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Comb. No.	Description
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
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 145	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-6.91	-0.26	-0.04
			Max. Mx	5	-2.95	-47.53	-0.01
			Max. My	8	-2.95	-0.02	-47.52
			Max. Vy	5	7.22	-47.53	-0.01
			Max. Vx	8	7.22	-0.02	-47.52
			Max. Torque	7			0.08
L2	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.52	-0.43	-0.14
			Max. Mx	5	-3.23	-84.77	-0.02
			Max. My	8	-3.22	-0.05	-84.75
			Max. Vy	5	7.67	-84.77	-0.02
			Max. Vx	8	7.67	-0.05	-84.75
			Max. Torque	8			0.09
L3	140 - 139.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.57	-0.44	-0.15
			Max. Mx	5	-3.25	-87.98	-0.02
			Max. My	8	-3.25	-0.05	-87.96
			Max. Vy	5	7.71	-87.98	-0.02
			Max. Vx	8	7.71	-0.05	-87.96
			Max. Torque	8			0.09
L4	139.583 - 139.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.62	-0.45	-0.16
			Max. Mx	5	-3.28	-89.91	-0.02
			Max. My	8	-3.27	-0.05	-89.89
			Max. Vy	5	7.74	-89.91	-0.02
			Max. Vx	8	7.74	-0.05	-89.89
			Max. Torque	8			0.09
L5	139.333 - 134.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-8.44	-0.63	-0.26

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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
L6	134.333 - 129.333	Pole	Max. Mx	5	-3.74	-129.99	-0.03
			Max. My	8	-3.74	-0.08	-129.97
			Max. Vy	5	8.28	-129.99	-0.03
			Max. Vx	8	8.29	-0.08	-129.97
			Max. Torque	8			0.10
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.28	-0.82	-0.38
			Max. Mx	5	-4.23	-172.80	-0.04
			Max. My	8	-4.22	-0.11	-172.77
			Max. Vy	5	8.83	-172.80	-0.04
L7	129.333 - 124.333	Pole	Max. Vx	8	8.84	-0.11	-172.77
			Max. Torque	8			0.12
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-10.13	-1.01	-0.49
			Max. Mx	5	-4.73	-218.37	-0.05
			Max. My	8	-4.73	-0.14	-218.34
			Max. Vy	5	9.39	-218.37	-0.05
			Max. Vx	8	9.39	-0.14	-218.34
			Max. Torque	8			0.13
			Max Tension	1	0.00	0.00	0.00
L8	124.333 - 119.333	Pole	Max. Compression	14	-11.00	-1.22	-0.61
			Max. Mx	5	-5.26	-266.71	-0.06
			Max. My	8	-5.25	-0.16	-266.68
			Max. Vy	5	9.94	-266.71	-0.06
			Max. Vx	8	9.95	-0.16	-266.68
			Max. Torque	8			0.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.06	-1.23	-0.62
			Max. Mx	5	-5.30	-270.03	-0.07
			Max. My	8	-5.29	-0.17	-270.00
L9	119.333 - 119	Pole	Max. Vy	5	9.98	-270.03	-0.07
			Max. Vx	8	9.98	-0.17	-270.00
			Max. Torque	8			0.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.11	-1.24	-0.63
			Max. Mx	5	-5.34	-272.53	-0.07
			Max. My	8	-5.33	-0.17	-272.50
			Max. Vy	5	10.01	-272.53	-0.07
			Max. Vx	8	10.01	-0.17	-272.50
			Max. Torque	8			0.15
L10	119 - 118.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.29	-1.45	-0.75
			Max. Mx	5	-6.16	-324.11	-0.08
			Max. My	8	-6.15	-0.20	-324.08
			Max. Vy	5	10.61	-324.11	-0.08
			Max. Vx	8	10.62	-0.20	-324.08
			Max. Torque	8			0.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.19	-1.61	-0.85
			Max. Mx	5	-6.79	-364.76	-0.08
L11	118.75 - 113.75	Pole	Max. My	8	-6.78	-0.22	-364.73
			Max. Vy	5	11.06	-364.76	-0.08
			Max. Vx	8	11.06	-0.22	-364.73
			Max. Torque	8			0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.49	-1.99	-1.07
			Max. Mx	5	-7.74	-368.04	-0.20
			Max. My	8	-6.78	-0.22	-364.73
			Max. Vy	5	11.06	-364.76	-0.08
			Max. Vx	8	11.06	-0.22	-364.73
L12	113.75 - 110	Pole	Max. Torque	8			0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.49	-1.99	-1.07
			Max. Mx	5	-7.74	-368.04	-0.20
			Max. My	8	-6.78	-0.22	-364.73
			Max. Vy	5	11.06	-364.76	-0.08
			Max. Vx	8	11.06	-0.22	-364.73
			Max. Torque	8			0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.49	-1.99	-1.07
L13	110 - 109.75	Pole	Max. Mx	5	-7.74	-368.04	-0.20

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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
L14	109.75 - 104.75	Pole	Max. My	8	-7.72	-0.44	-367.93
			Max. Vy	5	11.96	-368.04	-0.20
			Max. Vx	8	12.10	-0.44	-367.93
			Max. Torque	9			0.63
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.47	-2.22	-1.20
			Max. Mx	5	-8.39	-429.29	0.39
			Max. My	8	-8.37	0.13	-429.87
			Max. Vy	5	12.53	-429.29	0.39
			Max. Vx	8	12.67	0.13	-429.87
L15	104.75 - 99.75	Pole	Max. Torque	9			0.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.47	-2.45	-1.34
			Max. Mx	5	-9.06	-493.39	0.98
			Max. My	8	-9.04	0.70	-494.66
			Max. Vy	5	13.10	-493.39	0.98
			Max. Vx	8	13.24	0.70	-494.66
			Max. Torque	9			0.66
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.47	-2.69	-1.49
L16	99.75 - 94.75	Pole	Max. Mx	5	-9.76	-560.31	1.58
			Max. My	8	-9.74	1.27	-562.27
			Max. Vy	5	13.66	-560.31	1.58
			Max. Vx	8	13.81	1.27	-562.27
			Max. Torque	9			0.67
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.49	-2.93	-1.63
			Max. Mx	5	-10.47	-630.04	2.17
			Max. My	8	-10.45	1.84	-632.70
			Max. Vy	5	14.22	-630.04	2.17
L17	94.75 - 89.75	Pole	Max. Vx	8	14.37	1.84	-632.70
			Max. Torque	9			0.68
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.52	-3.18	-1.78
			Max. Mx	5	-11.21	-702.56	2.76
			Max. My	8	-11.19	2.41	-705.91
			Max. Vy	5	14.78	-702.56	2.76
			Max. Vx	8	14.92	2.41	-705.91
			Max. Torque	9			0.69
			Max Tension	1	0.00	0.00	0.00
L18	89.75 - 84.75	Pole	Max. Compression	14	-20.20	-3.34	-1.88
			Max. Mx	5	-11.70	-751.18	3.14
			Max. My	8	-11.68	2.78	-754.98
			Max. Vy	5	15.14	-751.18	3.14
			Max. Vx	8	15.28	2.78	-754.98
			Max. Torque	9			0.70
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.25	-3.35	-1.88
			Max. Mx	5	-11.74	-754.97	3.17
			Max. My	8	-11.73	2.81	-758.81
L19	84.75 - 81.5	Pole	Max. Vy	5	15.16	-754.97	3.17
			Max. Vx	8	15.30	2.81	-758.81
			Max. Torque	9			0.70
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.94	-3.52	-1.98
			Max. Mx	5	-12.23	-804.83	3.55
			Max. My	8	-12.22	3.18	-809.13
			Max. Vy	5	15.52	-804.83	3.55
			Max. Vx	8	15.66	3.18	-809.13
			Max. Torque	9			0.71
L20	81.5 - 81.25	Pole	Max. My	8	-12.22	3.18	-809.13
			Max. Vy	5	15.52	-804.83	3.55
			Max. Vx	8	15.66	3.18	-809.13
			Max. Torque	9			0.71
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.94	-3.52	-1.98
			Max. Mx	5	-12.23	-804.83	3.55
			Max. My	8	-12.22	3.18	-809.13
			Max. Vy	5	15.52	-804.83	3.55
			Max. Vx	8	15.66	3.18	-809.13
L21	81.25 - 78	Pole	Max. Torque	9			0.71
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.94	-3.52	-1.98
			Max. Mx	5	-12.23	-804.83	3.55
			Max. My	8	-12.22	3.18	-809.13
			Max. Vy	5	15.52	-804.83	3.55
			Max. Vx	8	15.66	3.18	-809.13
			Max. Torque	9			0.71
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.94	-3.52	-1.98

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	Client	Crown Castle	Designed by	LeeMH

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	78 - 77.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.00	-3.53	-1.99
			Max. Mx	5	-12.30	-808.72	3.58
			Max. My	8	-12.28	3.21	-813.04
			Max. Vy	5	15.54	-808.72	3.58
			Max. Vx	8	15.69	3.21	-813.04
			Max. Torque	9			0.71
L23	77.75 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22.37	-3.79	-2.14
			Max. Mx	5	-13.34	-887.93	4.17
			Max. My	8	-13.33	3.77	-892.95
			Max. Vy	5	16.13	-887.93	4.17
			Max. Vx	8	16.27	3.77	-892.95
			Max. Torque	8			0.72
L24	72.75 - 66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.12	-3.93	-2.23
			Max. Mx	5	-13.92	-932.74	4.50
			Max. My	8	-13.91	4.09	-938.14
			Max. Vy	5	16.45	-932.74	4.50
			Max. Vx	8	16.59	4.09	-938.14
			Max. Torque	8			0.73
L25	66 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.46	-4.20	-2.39
			Max. Mx	5	-15.82	-1016.66	5.08
			Max. My	8	-15.81	4.65	-1022.75
			Max. Vy	5	17.10	-1016.66	5.08
			Max. Vx	8	17.24	4.65	-1022.75
			Max. Torque	8			0.75
L26	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.93	-4.46	-2.55
			Max. Mx	5	-16.99	-1103.55	5.67
			Max. My	8	-16.98	5.22	-1110.34
			Max. Vy	5	17.66	-1103.55	5.67
			Max. Vx	8	17.80	5.22	-1110.34
			Max. Torque	8			0.77
L27	60 - 55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.41	-4.73	-2.71
			Max. Mx	5	-18.19	-1193.21	6.26
			Max. My	8	-18.18	5.78	-1200.70
			Max. Vy	5	18.20	-1193.21	6.26
			Max. Vx	8	18.35	5.78	-1200.70
			Max. Torque	8			0.78
L28	55 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.53	-4.93	-2.83
			Max. Mx	5	-19.10	-1262.22	6.70
			Max. My	8	-19.08	6.20	-1270.23
			Max. Vy	5	18.60	-1262.22	6.70
			Max. Vx	8	18.75	6.20	-1270.23
			Max. Torque	8			0.80
L29	51.25 - 51	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.62	-4.94	-2.84
			Max. Mx	5	-19.17	-1266.88	6.73
			Max. My	8	-19.16	6.23	-1274.92
			Max. Vy	5	18.62	-1266.88	6.73
			Max. Vx	8	18.77	6.23	-1274.92
			Max. Torque	8			0.80
L30	51 - 50.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.68	-4.96	-2.85
			Max. Mx	5	-19.22	-1271.54	6.76
			Max. My	8	-19.21	6.26	-1279.62
			Max. Vy	5	18.65	-1271.54	6.76

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	24 of 33
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	Client	Crown Castle	Designed by	LeeMH

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L31	50.75 - 45.75	Pole	Max. Vx	8	18.79	6.26	-1279.62
			Max. Torque	8			0.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.99	-5.23	-3.01
			Max. Mx	5	-20.26	-1366.09	7.35
			Max. My	8	-20.25	6.82	-1374.86
			Max. Vy	5	19.16	-1366.09	7.35
			Max. Vx	8	19.31	6.82	-1374.86
L32	45.75 - 42	Pole	Max. Torque	8			0.81
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.97	-5.43	-3.13
			Max. Mx	5	-21.06	-1438.63	7.78
			Max. My	8	-21.05	7.24	-1447.92
			Max. Vy	5	19.53	-1438.63	7.78
			Max. Vx	8	19.67	7.24	-1447.92
			Max. Torque	8			0.83
L33	42 - 41.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.05	-5.45	-3.14
			Max. Mx	5	-21.14	-1443.52	7.81
			Max. My	8	-21.13	7.27	-1452.84
			Max. Vy	5	19.55	-1443.52	7.81
			Max. Vx	8	19.69	7.27	-1452.84
			Max. Torque	8			0.83
			Max Tension	1	0.00	0.00	0.00
L34	41.75 - 36.75	Pole	Max. Compression	14	-33.68	-5.72	-3.31
			Max. Mx	5	-22.49	-1542.57	8.39
			Max. My	8	-22.49	7.82	-1552.58
			Max. Vy	5	20.06	-1542.57	8.39
			Max. Vx	8	20.20	7.82	-1552.58
			Max. Torque	8			0.84
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.32	-5.99	-3.47
L35	36.75 - 31.75	Pole	Max. Mx	5	-23.87	-1644.11	8.97
			Max. My	8	-23.86	8.37	-1654.81
			Max. Vy	5	20.55	-1644.11	8.97
			Max. Vx	8	20.69	8.37	-1654.81
			Max. Torque	8			0.86
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.90	-6.09	-3.53
			Max. Mx	5	-24.35	-1680.23	9.17
L36	31.75 - 27	Pole	Max. My	8	-24.34	8.57	-1691.16
			Max. Vy	5	20.73	-1680.23	9.17
			Max. Vx	8	20.87	8.57	-1691.16
			Max. Torque	8			0.87
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.06	-6.28	-3.64
			Max. Mx	5	-26.20	-1758.72	9.60
			Max. My	8	-26.20	8.98	-1770.17
L37	27 - 26.25	Pole	Max. Vy	5	21.13	-1758.72	9.60
			Max. Vx	8	21.27	8.98	-1770.17
			Max. Torque	8			0.88
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.15	-6.30	-3.65
			Max. Mx	5	-26.28	-1764.01	9.63
			Max. My	8	-26.28	9.00	-1775.49
			Max. Vy	5	21.15	-1764.01	9.63
L38	26.25 - 26	Pole	Max. Vx	8	21.29	9.00	-1775.49
			Max. Torque	8			0.88
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.91	-6.56	-3.81
			Max. Mx	5	-27.79	-1870.97	10.21
			Max. My	8			
			Max. Vy	5			
			Max. Vx	8			
L39	26 - 21	Pole	Max. Torque	8			0.88
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.91	-6.56	-3.81

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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
L40	21 - 16	Pole	Max. My	8	-27.78	9.55	-1883.14
			Max. Vy	5	21.63	-1870.97	10.21
			Max. Vx	8	21.77	9.55	-1883.14
			Max. Torque	8			0.90
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.70	-6.83	-3.97
			Max. Mx	5	-29.32	-1980.30	10.78
			Max. My	8	-29.31	10.10	-1993.14
			Max. Vy	5	22.10	-1980.30	10.78
			Max. Vx	8	22.24	10.10	-1993.14
L41	16 - 11	Pole	Max. Torque	8			0.91
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.51	-7.11	-4.14
			Max. Mx	5	-30.87	-2091.98	11.34
			Max. My	8	-30.87	10.64	-2105.49
			Max. Vy	5	22.57	-2091.98	11.34
			Max. Vx	8	22.71	10.64	-2105.49
			Max. Torque	8			0.93
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.78	-7.15	-4.17
L42	11 - 10.25	Pole	Max. Mx	5	-31.11	-2108.93	11.43
			Max. My	8	-31.11	10.72	-2122.55
			Max. Vy	5	22.64	-2108.93	11.43
			Max. Vx	8	22.78	10.72	-2122.55
			Max. Torque	8			0.93
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.87	-7.16	-4.18
			Max. Mx	5	-31.19	-2114.59	11.46
			Max. My	8	-31.19	10.74	-2128.25
			Max. Vy	5	22.65	-2114.59	11.46
L43	10.25 - 10	Pole	Max. Vx	8	22.79	10.74	-2128.25
			Max. Torque	8			0.93
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.65	-7.45	-4.35
			Max. Mx	5	-32.71	-2229.07	12.02
			Max. My	8	-32.71	11.28	-2243.39
			Max. Vy	5	23.13	-2229.07	12.02
			Max. Vx	8	23.27	11.28	-2243.39
			Max. Torque	8			0.95
			Max Tension	1	0.00	0.00	0.00
L44	10 - 5	Pole	Max. Compression	14	-46.19	-7.53	-4.40
			Max. Mx	5	-33.17	-2263.86	12.19
			Max. My	8	-33.17	11.44	-2278.38
			Max. Vy	5	23.27	-2263.86	12.19
			Max. Vx	8	23.41	11.44	-2278.38
			Max. Torque	8			0.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.28	-7.55	-4.41
			Max. Mx	5	-33.25	-2269.68	12.21
			Max. My	8	-33.25	11.47	-2284.24
L45	5 - 3.5	Pole	Max. Vy	5	23.28	-2269.68	12.21
			Max. Vx	8	23.42	11.47	-2284.24
			Max. Torque	8			0.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.37	-7.74	-4.52
			Max. Mx	5	-34.17	-2345.85	12.58
			Max. My	8	-34.17	11.81	-2360.83
			Max. Vy	5	23.58	-2345.85	12.58
			Max. Vx	8	23.72	11.81	-2360.83
			Max. Torque	8			0.97
L46	3.5 - 3.25	Pole	Max. My	8	-34.17	11.81	-2360.83
			Max. Vy	5	23.58	-2345.85	12.58
			Max. Vx	8	23.72	11.81	-2360.83
			Max. Torque	8			0.97
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.37	-7.74	-4.52
			Max. Mx	5	-34.17	-2345.85	12.58
			Max. My	8	-34.17	11.81	-2360.83
			Max. Vy	5	23.58	-2345.85	12.58
			Max. Vx	8	23.72	11.81	-2360.83
L47	3.25 - 0	Pole	Max. Torque	8			0.97
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.37	-7.74	-4.52
			Max. Mx	5	-34.17	-2345.85	12.58
			Max. My	8	-34.17	11.81	-2360.83
			Max. Vy	5	23.58	-2345.85	12.58
			Max. Vx	8	23.72	11.81	-2360.83
			Max. Torque	8			0.97
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.37	-7.74	-4.52

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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	18	47.37	-6.34	0.02
	Max. H _x	11	34.19	23.57	-0.12
	Max. H _z	2	34.19	-0.12	23.70
	Max. M _x	2	2358.60	-0.12	23.70
	Max. M _z	5	2345.85	-23.57	0.12
	Max. Torsion	8	0.97	0.12	-23.70
	Min. Vert	1	34.19	0.00	0.00
	Min. H _x	5	34.19	-23.57	0.12
	Min. H _z	8	34.19	0.12	-23.70
	Min. M _x	8	-2360.83	0.12	-23.70
	Min. M _z	11	-2342.08	23.57	-0.12
	Min. Torsion	2	-0.96	-0.12	23.70

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	34.19	0.00	0.00	1.09	-1.84	-0.00
Dead+Wind 0 deg - No Ice	34.19	0.12	-23.70	-2358.60	-15.58	0.96
Dead+Wind 30 deg - No Ice	34.19	11.89	-20.59	-2049.28	-1185.68	0.89
Dead+Wind 60 deg - No Ice	34.19	20.47	-11.96	-1190.60	-2038.61	0.59
Dead+Wind 90 deg - No Ice	34.19	23.57	-0.12	-12.58	-2345.85	0.12
Dead+Wind 120 deg - No Ice	34.19	20.35	11.75	1169.16	-2024.99	-0.38
Dead+Wind 150 deg - No Ice	34.19	11.68	20.47	2037.89	-1162.00	-0.78
Dead+Wind 180 deg - No Ice	34.19	-0.12	23.70	2360.83	11.81	-0.97
Dead+Wind 210 deg - No Ice	34.19	-11.89	20.59	2051.51	1181.91	-0.89
Dead+Wind 240 deg - No Ice	34.19	-20.47	11.96	1192.84	2034.84	-0.57
Dead+Wind 270 deg - No Ice	34.19	-23.57	0.12	14.81	2342.08	-0.11
Dead+Wind 300 deg - No Ice	34.19	-20.35	-11.75	-1166.92	2021.23	0.38
Dead+Wind 330 deg - No Ice	34.19	-11.68	-20.47	-2035.66	1158.24	0.77
Dead+Ice+Temp	47.37	0.00	0.00	4.52	-7.74	-0.00
Dead+Wind 0 deg+Ice+Temp	47.37	0.02	-6.36	-661.24	-10.31	0.25
Dead+Wind 30 deg+Ice+Temp	47.37	3.19	-5.52	-573.29	-341.41	0.20
Dead+Wind 60 deg+Ice+Temp	47.37	5.50	-3.20	-330.52	-583.12	0.10
Dead+Wind 90 deg+Ice+Temp	47.37	6.34	-0.02	2.04	-670.68	-0.03
Dead+Wind 120 deg+Ice+Temp	47.37	5.48	3.16	335.27	-580.61	-0.15
Dead+Wind 150 deg+Ice+Temp	47.37	3.15	5.50	579.89	-337.06	-0.23
Dead+Wind 180 deg+Ice+Temp	47.37	-0.02	6.36	670.34	-5.28	-0.25
Dead+Wind 210 deg+Ice+Temp	47.37	-3.19	5.52	582.40	325.83	-0.20
Dead+Wind 240 deg+Ice+Temp	47.37	-5.50	3.20	339.63	567.54	-0.10
Dead+Wind 270 deg+Ice+Temp	47.37	-6.34	0.02	7.07	655.10	0.03
Dead+Wind 300 deg+Ice+Temp	47.37	-5.48	-3.16	-326.16	565.03	0.15
Dead+Wind 330 deg+Ice+Temp	47.37	-3.15	-5.50	-570.78	321.47	0.23
Dead+Wind 0 deg - Service	34.19	0.04	-8.20	-817.03	-6.64	0.34
Dead+Wind 30 deg - Service	34.19	4.11	-7.12	-709.79	-412.34	0.31
Dead+Wind 60 deg - Service	34.19	7.08	-4.14	-412.06	-708.07	0.20
Dead+Wind 90 deg - Service	34.19	8.15	-0.04	-3.62	-814.57	0.04
Dead+Wind 120 deg - Service	34.19	7.04	4.07	406.09	-703.32	-0.13
Dead+Wind 150 deg - Service	34.19	4.04	7.08	707.30	-404.12	-0.27
Dead+Wind 180 deg - Service	34.19	-0.04	8.20	819.28	2.85	-0.34

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service	34.19	-4.11	7.12	712.04	408.55	-0.31
Dead+Wind 240 deg - Service	34.19	-7.08	4.14	414.31	704.27	-0.20
Dead+Wind 270 deg - Service	34.19	-8.15	0.04	5.87	810.78	-0.04
Dead+Wind 300 deg - Service	34.19	-7.04	-4.07	-403.85	699.53	0.13
Dead+Wind 330 deg - Service	34.19	-4.04	-7.08	-705.05	400.33	0.27

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-34.19	0.00	0.00	34.19	0.00	0.000%
2	0.12	-34.19	-23.70	-0.12	34.19	23.70	0.000%
3	11.89	-34.19	-20.59	-11.89	34.19	20.59	0.000%
4	20.47	-34.19	-11.96	-20.47	34.19	11.96	0.000%
5	23.57	-34.19	-0.12	-23.57	34.19	0.12	0.000%
6	20.35	-34.19	11.75	-20.35	34.19	-11.75	0.000%
7	11.68	-34.19	20.47	-11.68	34.19	-20.47	0.000%
8	-0.12	-34.19	23.70	0.12	34.19	-23.70	0.000%
9	-11.89	-34.19	20.59	11.89	34.19	-20.59	0.000%
10	-20.47	-34.19	11.96	20.47	34.19	-11.96	0.000%
11	-23.57	-34.19	0.12	23.57	34.19	-0.12	0.000%
12	-20.35	-34.19	-11.75	20.35	34.19	11.75	0.000%
13	-11.68	-34.19	-20.47	11.68	34.19	20.47	0.000%
14	0.00	-47.37	0.00	-0.00	47.37	-0.00	0.000%
15	0.02	-47.37	-6.36	-0.02	47.37	6.36	0.000%
16	3.19	-47.37	-5.52	-3.19	47.37	5.52	0.000%
17	5.50	-47.37	-3.20	-5.50	47.37	3.20	0.000%
18	6.34	-47.37	-0.02	-6.34	47.37	0.02	0.000%
19	5.48	-47.37	3.16	-5.48	47.37	-3.16	0.000%
20	3.15	-47.37	5.50	-3.15	47.37	-5.50	0.000%
21	-0.02	-47.37	6.36	0.02	47.37	-6.36	0.000%
22	-3.19	-47.37	5.52	3.19	47.37	-5.52	0.000%
23	-5.50	-47.37	3.20	5.50	47.37	-3.20	0.000%
24	-6.34	-47.37	0.02	6.34	47.37	-0.02	0.000%
25	-5.48	-47.37	-3.16	5.48	47.37	3.16	0.000%
26	-3.15	-47.37	-5.50	3.15	47.37	5.50	0.000%
27	0.04	-34.19	-8.20	-0.04	34.19	8.20	0.000%
28	4.11	-34.19	-7.12	-4.11	34.19	7.12	0.000%
29	7.08	-34.19	-4.14	-7.08	34.19	4.14	0.000%
30	8.15	-34.19	-0.04	-8.15	34.19	0.04	0.000%
31	7.04	-34.19	4.07	-7.04	34.19	-4.07	0.000%
32	4.04	-34.19	7.08	-4.04	34.19	-7.08	0.000%
33	-0.04	-34.19	8.20	0.04	34.19	-8.20	0.000%
34	-4.11	-34.19	7.12	4.11	34.19	-7.12	0.000%
35	-7.08	-34.19	4.14	7.08	34.19	-4.14	0.000%
36	-8.15	-34.19	0.04	8.15	34.19	-0.04	0.000%
37	-7.04	-34.19	-4.07	7.04	34.19	4.07	0.000%
38	-4.04	-34.19	-7.08	4.04	34.19	7.08	0.000%

Non-Linear Convergence Results

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job 150-ft Monopole - NORWALK WEST- CT AVE	Page 28 of 33
	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by LeeMH

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	6	0.0000001	0.00007898
3	Yes	7	0.0000001	0.00009181
4	Yes	7	0.0000001	0.00008903
5	Yes	5	0.0000001	0.00027822
6	Yes	7	0.0000001	0.00008875
7	Yes	7	0.0000001	0.00009046
8	Yes	5	0.0000001	0.00048122
9	Yes	7	0.0000001	0.00008848
10	Yes	7	0.0000001	0.00009126
11	Yes	5	0.0000001	0.00079775
12	Yes	7	0.0000001	0.00008938
13	Yes	7	0.0000001	0.00008767
14	Yes	5	0.0000001	0.00010269
15	Yes	6	0.0000001	0.00063343
16	Yes	7	0.0000001	0.00009991
17	Yes	6	0.0000001	0.00099500
18	Yes	6	0.0000001	0.00064220
19	Yes	7	0.0000001	0.00009938
20	Yes	7	0.0000001	0.00010060
21	Yes	6	0.0000001	0.00064222
22	Yes	6	0.0000001	0.00097754
23	Yes	6	0.0000001	0.00099129
24	Yes	6	0.0000001	0.00062541
25	Yes	6	0.0000001	0.00095753
26	Yes	6	0.0000001	0.00094789
27	Yes	5	0.0000001	0.00024150
28	Yes	6	0.0000001	0.00017528
29	Yes	6	0.0000001	0.00016563
30	Yes	5	0.0000001	0.00007444
31	Yes	6	0.0000001	0.00016416
32	Yes	6	0.0000001	0.00017010
33	Yes	5	0.0000001	0.00017545
34	Yes	6	0.0000001	0.00016363
35	Yes	6	0.0000001	0.00017247
36	Yes	5	0.0000001	0.00011440
37	Yes	6	0.0000001	0.00016395
38	Yes	6	0.0000001	0.00015882

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
L1	150 - 145 (1)	TP15.2541x14.5x0.25	5.00	0.00	0.0	21.600	12.0783	-2.95	260.89	0.011
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	5.00	0.00	0.0	21.600	12.6854	-3.23	274.01	0.012
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	0.42	0.00	0.0	21.600	12.7360	-3.26	275.10	0.012
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	0.25	0.00	0.0	21.600	27.5548	-3.28	595.18	0.006
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	5.00	0.00	0.0	21.600	27.6194	-3.74	596.58	0.006
L6	134.333 -	TP17.6172x16.863x0.5125	5.00	0.00	0.0	21.600	28.2270	-4.23	609.70	0.007

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	29 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	LeeMH

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L7	129.333 (6)	TP18.3713x17.6172x0.5	5.00	0.00	0.0	21.600	28.7728	-4.74	621.49	0.008
L8	129.333 - 124.333 (7)	TP19.1254x18.3713x0.4875	5.00	0.00	0.0	21.600	29.2569	-5.26	631.95	0.008
L9	119.333 - 119.333 (8)	TP19.1757x19.1254x0.4875	0.33	0.00	0.0	21.600	29.3357	-5.30	633.65	0.008
L10	119 - 118.75 (9)	TP19.2134x19.1757x0.8875	0.25	0.00	0.0	21.600	52.3707	-5.34	1131.21	0.005
L11	118.75 - 113.75 (10)	TP19.9675x19.2134x0.85	5.00	0.00	0.0	21.600	52.3246	-6.16	1130.21	0.005
L12	113.75 - 110 (11)	TP20.5331x19.9675x0.825	3.75	0.00	0.0	21.600	52.3546	-6.79	1130.86	0.006
L13	110 - 109.75 (12)	TP20.5708x20.5331x0.5625	0.25	0.00	0.0	39.000	36.2400	-7.75	1413.36	0.005
L14	109.75 - 104.75 (13)	TP21.3249x20.5708x0.55	5.00	0.00	0.0	39.000	36.7924	-8.36	1434.90	0.006
L15	104.75 - 99.75 (14)	TP22.0791x21.3249x0.5375	5.00	0.00	0.0	39.000	37.2831	-9.03	1454.04	0.006
L16	99.75 - 94.75 (15)	TP22.8332x22.0791x0.525	5.00	0.00	0.0	39.000	37.7120	-9.73	1470.77	0.007
L17	94.75 - 89.75 (16)	TP23.5874x22.8332x0.5125	5.00	0.00	0.0	39.000	38.0793	-10.44	1485.09	0.007
L18	89.75 - 84.75 (17)	TP24.3415x23.5874x0.5	5.00	0.00	0.0	39.000	38.3848	-11.18	1497.01	0.007
L19	84.75 - 81.5 (18)	TP24.8317x24.3415x0.5	3.25	0.00	0.0	39.000	39.1740	-11.67	1527.79	0.008
L20	81.5 - 81.25 (19)	TP24.8694x24.8317x0.5	0.25	0.00	0.0	39.000	39.2347	-11.72	1530.15	0.008
L21	81.25 - 78 (20)	TP25.3596x24.8694x0.4875	3.25	0.00	0.0	39.000	39.0429	-12.21	1522.67	0.008
L22	78 - 77.75 (21)	TP25.3973x25.3596x0.7625	0.25	0.00	0.0	39.000	60.4845	-12.27	2358.90	0.005
L23	77.75 - 72.75 (22)	TP26.1514x25.3973x0.75	5.00	0.00	0.0	39.000	61.3444	-13.32	2392.43	0.006
L24	72.75 - 66 (23)	TP27.1695x26.1514x0.7375	6.75	0.00	0.0	39.000	61.3367	-13.90	2392.13	0.006
L25	66 - 65 (24)	TP26.8203x26.0662x0.7995	5.00	0.00	0.0	39.000	66.9878	-15.80	2612.52	0.006
L26	65 - 60 (25)	TP27.5745x26.8203x0.787	5.00	0.00	0.0	39.000	67.8832	-16.97	2647.45	0.006
L27	60 - 55 (26)	TP28.3286x27.5745x0.762	5.00	0.00	0.0	39.000	67.6385	-18.17	2637.90	0.007
L28	55 - 51.25 (27)	TP28.8942x28.3286x0.7495	3.75	0.00	0.0	39.000	67.9242	-19.08	2649.04	0.007
L29	51.25 - 51 (28)	TP28.9319x28.8942x0.837	0.25	0.00	0.0	39.000	75.7198	-19.15	2953.07	0.006
L30	51 - 50.75 (29)	TP28.9696x28.9319x0.5995	0.25	0.00	0.0	39.000	54.7654	-19.21	2135.85	0.009
L31	50.75 - 45.75 (30)	TP29.7238x28.9696x0.5995	5.00	0.00	0.0	39.000	56.2212	-20.25	2192.63	0.009
L32	45.75 - 42 (31)	TP30.2894x29.7238x0.587	3.75	0.00	0.0	39.000	56.1417	-21.05	2189.52	0.010
L33	42 - 41.75 (32)	TP30.3271x30.2894x0.812	0.25	0.00	0.0	39.000	77.1713	-21.13	3009.68	0.007
L34	41.75 - 36.75 (33)	TP31.0812x30.3271x0.7995	5.00	0.00	0.0	39.000	77.9570	-22.48	3040.32	0.007
L35	36.75 - 31.75 (34)	TP31.8354x31.0812x0.787	5.00	0.00	0.0	39.000	78.6809	-23.86	3068.56	0.008
L36	31.75 - 27 (35)	TP32.5518x31.8354x0.7745	4.75	0.00	0.0	39.000	78.1206	-24.34	3046.71	0.008
L37	27 - 26.25 (36)	TP32.0409x31.4753x0.85	3.75	0.00	0.0	39.000	85.3695	-26.19	3329.41	0.008
L38	26.25 - 26 (37)	TP32.0786x32.0409x0.85	0.25	0.00	0.0	39.000	85.4727	-26.27	3333.44	0.008
L39	26 - 21 (38)	TP32.8327x32.0786x0.825	5.00	0.00	0.0	39.000	85.0285	-27.78	3316.11	0.008
L40	21 - 16 (39)	TP33.5868x32.8327x0.825	5.00	0.00	0.0	39.000	87.0318	-29.31	3394.24	0.009
L41	16 - 11 (40)	TP34.3409x33.5868x0.8	5.00	0.00	0.0	39.000	86.4015	-30.87	3369.66	0.009
L42	11 - 10.25 (41)	TP34.4541x34.3409x0.8	0.75	0.00	0.0	39.000	86.6929	-31.10	3381.02	0.009
L43	10.25 - 10 (42)	TP34.4918x34.4541x0.7875	0.25	0.00	0.0	39.000	85.4656	-31.19	3333.16	0.009
L44	10 - 5 (43)	TP35.2459x34.4918x0.775	5.00	0.00	0.0	39.000	86.0221	-32.71	3354.86	0.010
L45	5 - 3.5 (44)	TP35.4721x35.2459x0.775	1.50	0.00	0.0	39.000	86.5867	-33.17	3376.88	0.010
L46	3.5 - 3.25 (45)	TP35.5098x35.4721x0.7	0.25	0.00	0.0	39.000	78.4613	-33.25	3059.99	0.011
L47	3.25 - 0 (46)	TP36x35.5098x0.7	3.25	0.00	0.0	39.000	79.5662	-34.17	3103.08	0.011

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	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by LeeMH

Pole Bending Design Data

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 $\frac{f_{by}}{F_{by}}$
L1	150 - 145 (1)	TP15.2541x14.5x0.25	47.53	12.985	21.600	0.601	0.00	0.000	21.600	0.000
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	84.77	20.979	21.600	0.971	0.00	0.000	21.600	0.000
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	87.98	21.599	21.600	1.000	0.00	0.000	21.600	0.000
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	89.91	10.574	21.600	0.490	0.00	0.000	21.600	0.000
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	129.99	14.479	21.600	0.670	0.00	0.000	21.600	0.000
L6	134.333 - 129.333 (6)	TP17.6172x16.863x0.5125	172.80	17.952	21.600	0.831	0.00	0.000	21.600	0.000
L7	129.333 - 124.333 (7)	TP18.3713x17.6172x0.5	218.37	21.260	21.600	0.984	0.00	0.000	21.600	0.000
L8	124.333 - 119.333 (8)	TP19.1254x18.3713x0.4875	266.71	24.443	21.600	1.132	0.00	0.000	21.600	0.000
L9	119.333 - 119 (9)	TP19.1757x19.1254x0.4875	270.03	24.612	21.600	1.139	0.00	0.000	21.600	0.000
L10	119 - 118.75 (10)	TP19.2134x19.1757x0.8875	272.53	14.498	21.600	0.671	0.00	0.000	21.600	0.000
L11	118.75 - 113.75 (11)	TP19.9675x19.2134x0.85	324.11	16.480	21.600	0.763	0.00	0.000	21.600	0.000
L12	113.75 - 110 (12)	TP20.5331x19.9675x0.825	364.76	17.937	21.600	0.830	0.00	0.000	21.600	0.000
L13	110 - 109.75 (13)	TP20.5708x20.5331x0.5625	368.06	25.415	39.000	0.652	0.00	0.000	39.000	0.000
L14	109.75 - 104.75 (14)	TP21.3249x20.5708x0.55	429.93	28.117	39.000	0.721	0.00	0.000	39.000	0.000
L15	104.75 - 99.75 (15)	TP22.0791x21.3249x0.5375	495.04	30.767	39.000	0.789	0.00	0.000	39.000	0.000
L16	99.75 - 94.75 (16)	TP22.8332x22.0791x0.525	562.98	33.356	39.000	0.855	0.00	0.000	39.000	0.000
L17	94.75 - 89.75 (17)	TP23.5874x22.8332x0.5125	633.74	35.904	39.000	0.921	0.00	0.000	39.000	0.000
L18	89.75 - 84.75 (18)	TP24.3415x23.5874x0.5	707.28	38.427	39.000	0.985	0.00	0.000	39.000	0.000
L19	84.75 - 81.5 (19)	TP24.8317x24.3415x0.5	756.57	39.449	39.000	1.012	0.00	0.000	39.000	0.000
L20	81.5 - 81.25 (20)	TP24.8694x24.8317x0.5	760.40	39.525	39.000	1.013	0.00	0.000	39.000	0.000
L21	81.25 - 78 (21)	TP25.3596x24.8694x0.4875	810.94	41.465	39.000	1.063	0.00	0.000	39.000	0.000
L22	78 - 77.75 (22)	TP25.3973x25.3596x0.7625	814.87	27.457	39.000	0.704	0.00	0.000	39.000	0.000
L23	77.75 - 72.75 (23)	TP26.1514x25.3973x0.75	895.10	28.801	39.000	0.738	0.00	0.000	39.000	0.000
L24	72.75 - 66 (24)	TP27.1695x26.1514x0.7375	940.47	29.735	39.000	0.762	0.00	0.000	39.000	0.000
L25	66 - 65 (25)	TP26.8203x26.0662x0.7995	1025.41	29.529	39.000	0.757	0.00	0.000	39.000	0.000
L26	65 - 60 (26)	TP27.5745x26.8203x0.787	1113.33	30.692	39.000	0.787	0.00	0.000	39.000	0.000
L27	60 - 55 (27)	TP28.3286x27.5745x0.762	1204.01	32.316	39.000	0.829	0.00	0.000	39.000	0.000
L28	55 - 51.25 (28)	TP28.8942x28.3286x0.7495	1273.79	33.313	39.000	0.854	0.00	0.000	39.000	0.000
L29	51.25 - 51 (29)	TP28.9319x28.8942x0.837	1278.49	30.140	39.000	0.773	0.00	0.000	39.000	0.000
L30	51 - 50.75 (30)	TP28.9696x28.9319x0.5995	1283.21	41.071	39.000	1.053	0.00	0.000	39.000	0.000
L31	50.75 - 45.75 (31)	TP29.7238x28.9696x0.5995	1378.77	41.852	39.000	1.073	0.00	0.000	39.000	0.000
L32	45.75 - 42 (32)	TP30.2894x29.7238x0.587	1452.08	43.245	39.000	1.109	0.00	0.000	39.000	0.000
L33	42 - 41.75 (33)	TP30.3271x30.2894x0.812	1457.01	32.009	39.000	0.821	0.00	0.000	39.000	0.000
L34	41.75 - 36.75 (34)	TP31.0812x30.3271x0.7995	1557.07	32.970	39.000	0.845	0.00	0.000	39.000	0.000
L35	36.75 - 31.75	TP31.8354x31.0812x0.787	1659.62	33.923	39.000	0.870	0.00	0.000	39.000	0.000

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	31 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	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 $\frac{f_{by}}{F_{by}}$
	(35)									
L36	31.75 - 27 (36)	TP32.5518x31.8354x0.7745	1696.08	34.588	39.000	0.887	0.00	0.000	39.000	0.000
L37	27 - 26.25 (37)	TP32.0409x31.4753x0.85	1775.33	33.354	39.000	0.855	0.00	0.000	39.000	0.000
L38	26.25 - 26 (38)	TP32.0786x32.0409x0.85	1780.67	33.373	39.000	0.856	0.00	0.000	39.000	0.000
L39	26 - 21 (39)	TP32.8327x32.0786x0.825	1888.63	34.666	39.000	0.889	0.00	0.000	39.000	0.000
L40	21 - 16 (40)	TP33.5868x32.8327x0.825	1998.94	35.001	39.000	0.897	0.00	0.000	39.000	0.000
L41	16 - 11 (41)	TP34.3409x33.5868x0.8	2111.61	36.331	39.000	0.932	0.00	0.000	39.000	0.000
L42	11 - 10.25 (42)	TP34.4541x34.3409x0.8	2128.71	36.377	39.000	0.933	0.00	0.000	39.000	0.000
L43	10.25 - 10 (43)	TP34.4918x34.4541x0.7875	2134.42	36.928	39.000	0.947	0.00	0.000	39.000	0.000
L44	10 - 5 (44)	TP35.2459x34.4918x0.775	2249.88	37.781	39.000	0.969	0.00	0.000	39.000	0.000
L45	5 - 3.5 (45)	TP35.4721x35.2459x0.775	2284.96	37.866	39.000	0.971	0.00	0.000	39.000	0.000
L46	3.5 - 3.25 (46)	TP35.5098x35.4721x0.7	2290.82	41.668	39.000	1.068	0.00	0.000	39.000	0.000
L47	3.25 - 0 (47)	TP36x35.5098x0.7	2367.62	41.866	39.000	1.073	0.00	0.000	39.000	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	150 - 145 (1)	TP15.2541x14.5x0.25	7.22	0.597	14.400	0.084	0.06	0.008	14.400	0.001
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	7.67	0.605	14.400	0.085	0.06	0.007	14.400	0.000
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	7.71	0.605	14.400	0.085	0.06	0.007	14.400	0.000
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	7.74	0.281	14.400	0.040	0.06	0.003	14.400	0.000
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	8.28	0.300	14.400	0.042	0.07	0.004	14.400	0.000
L6	134.333 - 129.333 (6)	TP17.6172x16.863x0.5125	8.83	0.313	14.400	0.044	0.08	0.004	14.400	0.000
L7	129.333 - 124.333 (7)	TP18.3713x17.6172x0.5	9.39	0.326	14.400	0.046	0.09	0.004	14.400	0.000
L8	124.333 - 119.333 (8)	TP19.1254x18.3713x0.4875	9.94	0.340	14.400	0.048	0.09	0.004	14.400	0.000
L9	119.333 - 119 (9)	TP19.1757x19.1254x0.4875	9.98	0.340	14.400	0.048	0.09	0.004	14.400	0.000
L10	119 - 118.75 (10)	TP19.2134x19.1757x0.8875	10.01	0.191	14.400	0.027	0.09	0.002	14.400	0.000
L11	118.75 - 113.75 (11)	TP19.9675x19.2134x0.85	10.61	0.203	14.400	0.029	0.16	0.004	14.400	0.000
L12	113.75 - 110 (12)	TP20.5331x19.9675x0.825	11.06	0.211	14.400	0.030	0.16	0.004	14.400	0.000
L13	110 - 109.75 (13)	TP20.5708x20.5331x0.5625	11.89	0.328	26.000	0.026	0.11	0.003	26.000	0.000
L14	109.75 - 104.75 (14)	TP21.3249x20.5708x0.55	12.74	0.346	26.000	0.027	0.64	0.020	26.000	0.001
L15	104.75 - 99.75 (15)	TP22.0791x21.3249x0.5375	13.31	0.357	26.000	0.028	0.66	0.019	26.000	0.001
L16	99.75 - 94.75 (16)	TP22.8332x22.0791x0.525	13.88	0.368	26.000	0.029	0.67	0.018	26.000	0.001
L17	94.75 - 89.75 (17)	TP23.5874x22.8332x0.5125	14.44	0.379	26.000	0.030	0.68	0.018	26.000	0.001
L18	89.75 - 84.75 (18)	TP24.3415x23.5874x0.5	14.99	0.391	26.000	0.031	0.69	0.018	26.000	0.001
L19	84.75 - 81.5 (19)	TP24.8317x24.3415x0.5	15.35	0.392	26.000	0.031	0.70	0.017	26.000	0.001
L20	81.5 - 81.25	TP24.8694x24.8317x0.5	15.37	0.392	26.000	0.031	0.70	0.017	26.000	0.001

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	150-ft Monopole - NORWALK WEST- CT AVE	Page	32 of 33
	Project	BU841287_WO1193060	Date	13:10:23 02/22/16
	Client	Crown Castle	Designed by	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 $\frac{f_{vt}}{F_{vt}}$
(20)										
L21	81.25 - 78 (21)	TP25.3596x24.8694x0.4875	15.73	0.403	26.000	0.031	0.71	0.017	26.000	0.001
L22	78 - 77.75 (22)	TP25.3973x25.3596x0.7625	15.76	0.260	26.000	0.020	0.71	0.011	26.000	0.000
L23	77.75 - 72.75 (23)	TP26.1514x25.3973x0.75	16.35	0.266	26.000	0.021	0.72	0.011	26.000	0.000
L24	72.75 - 66 (24)	TP27.1695x26.1514x0.7375	16.66	0.272	26.000	0.021	0.73	0.011	26.000	0.000
L25	66 - 65 (25)	TP26.8203x26.0662x0.7995	17.31	0.258	26.000	0.020	0.74	0.010	26.000	0.000
L26	65 - 60 (26)	TP27.5745x26.8203x0.787	17.87	0.263	26.000	0.021	0.75	0.010	26.000	0.000
L27	60 - 55 (27)	TP28.3286x27.5745x0.762	18.42	0.272	26.000	0.021	0.77	0.010	26.000	0.000
L28	55 - 51.25 (28)	TP28.8942x28.3286x0.7495	18.82	0.277	26.000	0.022	0.78	0.009	26.000	0.000
L29	51.25 - 51 (29)	TP28.9319x28.8942x0.837	18.84	0.249	26.000	0.019	0.78	0.008	26.000	0.000
L30	51 - 50.75 (30)	TP28.9696x28.9319x0.5995	18.86	0.344	26.000	0.027	0.78	0.012	26.000	0.000
L31	50.75 - 45.75 (31)	TP29.7238x28.9696x0.5995	19.38	0.345	26.000	0.027	0.79	0.011	26.000	0.000
L32	45.75 - 42 (32)	TP30.2894x29.7238x0.587	19.75	0.352	26.000	0.027	0.80	0.011	26.000	0.000
L33	42 - 41.75 (33)	TP30.3271x30.2894x0.812	19.76	0.256	26.000	0.020	0.80	0.008	26.000	0.000
L34	41.75 - 36.75 (34)	TP31.0812x30.3271x0.7995	20.28	0.260	26.000	0.020	0.81	0.008	26.000	0.000
L35	36.75 - 31.75 (35)	TP31.8354x31.0812x0.787	20.76	0.264	26.000	0.021	0.82	0.008	26.000	0.000
L36	31.75 - 27 (36)	TP32.5518x31.8354x0.7745	20.94	0.268	26.000	0.021	0.82	0.008	26.000	0.000
L37	27 - 26.25 (37)	TP32.0409x31.4753x0.85	21.34	0.250	26.000	0.020	0.83	0.007	26.000	0.000
L38	26.25 - 26 (38)	TP32.0786x32.0409x0.85	21.36	0.250	26.000	0.020	0.83	0.007	26.000	0.000
L39	26 - 21 (39)	TP32.8327x32.0786x0.825	21.84	0.257	26.000	0.020	0.84	0.007	26.000	0.000
L40	21 - 16 (40)	TP33.5868x32.8327x0.825	22.31	0.256	26.000	0.020	0.85	0.007	26.000	0.000
L41	16 - 11 (41)	TP34.3409x33.5868x0.8	22.78	0.264	26.000	0.021	0.86	0.007	26.000	0.000
L42	11 - 10.25 (42)	TP34.4541x34.3409x0.8	22.85	0.264	26.000	0.021	0.87	0.007	26.000	0.000
L43	10.25 - 10 (43)	TP34.4918x34.4541x0.7875	22.86	0.268	26.000	0.021	0.87	0.007	26.000	0.000
L44	10 - 5 (44)	TP35.2459x34.4918x0.775	23.34	0.271	26.000	0.021	0.88	0.007	26.000	0.000
L45	5 - 3.5 (45)	TP35.4721x35.2459x0.775	23.48	0.271	26.000	0.021	0.88	0.007	26.000	0.000
L46	3.5 - 3.25 (46)	TP35.5098x35.4721x0.7	23.49	0.299	26.000	0.023	0.88	0.007	26.000	0.000
L47	3.25 - 0 (47)	TP36x35.5098x0.7	23.79	0.299	26.000	0.023	0.89	0.007	26.000	0.000

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	TP15.254x14.5x0.25	Note 1	Note 1	Note 1	45.8	Pass
L2	145 - 140	Pole	TP16.008x15.254x0.25	Note 1	Note 1	Note 1	73.5	Pass
L3	140 - 139.58	Pole	TP16.071x16.008x0.25	Note 1	Note 1	Note 1	75.7	Pass
L4	139.58 - 139.33	Pole + Reinf.	TP16.109x16.071x0.55	Note 1	Note 1	Note 1	37.1	Pass
L5	139.33 - 134.33	Pole + Reinf.	TP16.863x16.109x0.525	Note 1	Note 1	Note 1	50.1	Pass
L6	134.33 - 129.33	Pole + Reinf.	TP17.617x16.863x0.5125	Note 1	Note 1	Note 1	62.4	Pass
L7	129.33 - 124.33	Pole + Reinf.	TP18.371x17.617x0.5	Note 1	Note 1	Note 1	74.1	Pass
L8	124.33 - 119.33	Pole + Reinf.	TP19.125x18.371x0.4875	Note 1	Note 1	Note 1	85.3	Pass
L9	119.33 - 119	Pole + Reinf.	TP19.176x19.125x0.4875	Note 1	Note 1	Note 1	86.0	Pass
L10	119 - 118.75	Pole + Reinf.	TP19.213x19.176x0.8875	Note 1	Note 1	Note 1	50.5	Pass
L11	118.75 - 113.75	Pole + Reinf.	TP19.967x19.213x0.85	Note 1	Note 1	Note 1	57.3	Pass
L12	113.75 - 110	Pole + Reinf.	TP20.533x19.967x0.825	Note 1	Note 1	Note 1	62.3	Pass
L13	110 - 109.75	Pole + Reinf.	TP20.571x20.533x0.5625	Note 1	Note 1	Note 1	58.8	Pass
L14	109.75 - 104.75	Pole + Reinf.	TP21.325x20.571x0.55	Note 1	Note 1	Note 1	65.1	Pass
L15	104.75 - 99.75	Pole + Reinf.	TP22.079x21.325x0.5375	Note 1	Note 1	Note 1	71.2	Pass
L16	99.75 - 94.75	Pole + Reinf.	TP22.833x22.079x0.525	Note 1	Note 1	Note 1	77.0	Pass
L17	94.75 - 89.75	Pole + Reinf.	TP23.587x22.833x0.5125	Note 1	Note 1	Note 1	82.5	Pass

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	Project BU841287_WO1193060	Date 13:10:23 02/22/16
	Client Crown Castle	Designed by LeeMH

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L18	89.75 - 84.75	Pole + Reinf.	TP24.341x23.587x0.5	Note 1	Note 1	Note 1	87.8	Pass	
L19	84.75 - 81.5	Pole + Reinf.	TP24.832x24.341x0.5	Note 1	Note 1	Note 1	91.1	Pass	
L20	81.5 - 81.25	Pole + Reinf.	TP24.869x24.832x0.5	Note 1	Note 1	Note 1	91.3	Pass	
L21	81.25 - 78	Pole + Reinf.	TP25.36x24.869x0.4875	Note 1	Note 1	Note 1	94.5	Pass	
L22	78 - 77.75	Pole + Reinf.	TP25.397x25.36x0.7625	Note 1	Note 1	Note 1	72.1	Pass	
L23	77.75 - 72.75	Pole + Reinf.	TP26.151x25.397x0.75	Note 1	Note 1	Note 1	76.1	Pass	
L24	72.75 - 70	Pole + Reinf.	TP27.17x26.151x0.7375	Note 1	Note 1	Note 1	78.3	Pass	
L25	70 - 65	Pole + Reinf.	TP26.82x26.066x0.7995	Note 1	Note 1	Note 1	77.6	Pass	
L26	65 - 60	Pole + Reinf.	TP27.574x26.82x0.787	Note 1	Note 1	Note 1	81.0	Pass	
L27	60 - 55	Pole + Reinf.	TP28.329x27.574x0.762	Note 1	Note 1	Note 1	84.3	Pass	
L28	55 - 51.25	Pole + Reinf.	TP28.894x28.329x0.7495	Note 1	Note 1	Note 1	86.7	Pass	
L29	51.25 - 51	Pole + Reinf.	TP28.932x28.894x0.837	Note 1	Note 1	Note 1	78.3	Pass	
L30	51 - 50.75	Pole + Reinf.	TP28.97x28.932x0.5995	Note 1	Note 1	Note 1	90.8	Pass	
L31	50.75 - 45.75	Pole + Reinf.	TP29.724x28.97x0.5995	Note 1	Note 1	Note 1	93.7	Pass	
L32	45.75 - 42	Pole + Reinf.	TP30.289x29.724x0.587	Note 1	Note 1	Note 1	95.9	Pass	
L33	42 - 41.75	Pole + Reinf.	TP30.327x30.289x0.812	Note 1	Note 1	Note 1	83.6	Pass	
L34	41.75 - 36.75	Pole + Reinf.	TP31.081x30.327x0.7995	Note 1	Note 1	Note 1	86.4	Pass	
L35	36.75 - 31.75	Pole + Reinf.	TP31.835x31.081x0.787	Note 1	Note 1	Note 1	89.0	Pass	
L36	31.75 - 30	Pole + Reinf.	TP32.552x31.835x0.7745	Note 1	Note 1	Note 1	90.0	Pass	
L37	30 - 26.25	Pole + Reinf.	TP32.041x31.475x0.85	Note 1	Note 1	Note 1	87.3	Pass	
L38	26.25 - 26	Pole + Reinf.	TP32.079x32.041x0.85	Note 1	Note 1	Note 1	87.4	Pass	
L39	26 - 21	Pole + Reinf.	TP32.833x32.079x0.825	Note 1	Note 1	Note 1	89.6	Pass	
L40	21 - 16	Pole + Reinf.	TP33.587x32.833x0.825	Note 1	Note 1	Note 1	91.7	Pass	
L41	16 - 11	Pole + Reinf.	TP34.341x33.587x0.8	Note 1	Note 1	Note 1	93.8	Pass	
L42	11 - 10.25	Pole + Reinf.	TP34.454x34.341x0.8	Note 1	Note 1	Note 1	94.1	Pass	
L43	10.25 - 10	Pole + Reinf.	TP34.492x34.454x0.7875	Note 1	Note 1	Note 1	81.3	Pass	
L44	10 - 5	Pole + Reinf.	TP35.246x34.492x0.775	Note 1	Note 1	Note 1	83.0	Pass	
L45	5 - 3.5	Pole + Reinf.	TP35.472x35.246x0.775	Note 1	Note 1	Note 1	83.5	Pass	
L46	3.5 - 3.25	Pole + Reinf.	TP35.51x35.472x0.7	Note 1	Note 1	Note 1	83.9	Pass	
L47	3.25 - 0	Pole + Reinf.	TP36x35.51x0.7	Note 1	Note 1	Note 1	84.8	Pass	
							Summary		
							Pole Reinforcement	86.0	Pass
							Overall	95.9	Pass

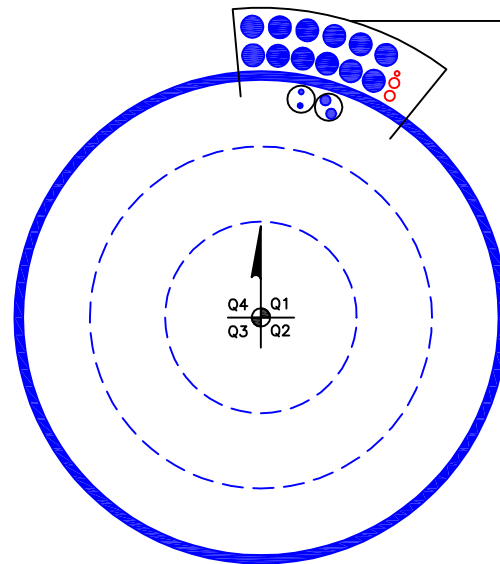
Notes:

- 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 152 FT LEVEL
- (2) 3/4" TO 152 FT LEVEL
- (INSTALLED-IN (2) 2" CONDUIT)
- (3) 3/8" TO 152 FT LEVEL
- (2) 3/4" TO 152 FT LEVEL
- (INSTALLED)
- (12) 1-5/8" TO 152 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Additional Calculations



Site BU: 841287
Work Order: 1193060



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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	150	40	0	12	14.5	20.5331	0.25	1	A36
2	110	44	4	12	20.53	27.1695	0.25	1	A572-65
3	70	43	3	12	26.07	32.5518	0.312	1.248	A572-65
4	30	30	0	12	31.48	36	0.375	1.5	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
1	3.5	26.25	channel	MP3-05 (1.1875")	4		x			x			x			x	
2	26.25	51.25	channel	MP3-05 (1.1875")	4		x			x			x			x	
3	51.25	81.5	channel	MP3-04 (1.1875")	4		x			x			x			x	
4	81.5	110	channel	MP3-04 (1.1875")	4		x			x			x			x	
5	110	139.583	channel	MP3-03 (1.1875")	4		x			x			x			x	
6	0	3.5	plate	(ts) 3x1.25	4			x			x			x			x
7	10.25	42	plate	CCI-SFP-045100	4			x			x			x			x
8	51	78	plate	CCI-SFP-045100	4			x			x			x			x
9	110	119	plate	CFP-045100	4			x			x			x			x
10	0	10.25	plate	(ts) 3x1.25	4	x			x			x			x		
11																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _u (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
2	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
3	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.593	1.1875	A572-65
4	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.593	1.1875	A572-65
5	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
6	1.25	3	3.75	1.5	n/a	n/a	0.000	3.750	0.0000	A572-65
7	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
8	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
9	4.5	1	4.5	0.5	n/a	24.000	20.000	3.250	1.1875	A572-65
10	1.25	3	3.75	1.5	n/a	n/a	0.000	3.750	0.0000	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	150 - 145	5		12	14.500	15.254	0.25	A36	1.000
2	145 - 140	5		12	15.254	16.008	0.25	A36	1.000
3	140 - 139.583	0.417		12	16.008	16.071	0.25	A36	1.000
4	139.583 - 139.333	0.25		12	16.071	16.109	0.55	A36	0.888
5	139.333 - 134.333	5		12	16.109	16.863	0.525	A36	0.908
6	134.333 - 129.333	5		12	16.863	17.617	0.5125	A36	0.910
7	129.333 - 124.333	5		12	17.617	18.371	0.5	A36	0.914
8	124.333 - 119.333	5		12	18.371	19.125	0.4875	A36	0.919
9	119.333 - 119	0.333		12	19.125	19.176	0.4875	A36	0.918
10	119 - 118.75	0.25		12	19.176	19.213	0.8875	A36	0.859
11	118.75 - 113.75	5		12	19.213	19.967	0.85	A36	0.871
12	113.75 - 110	3.75	0	12	19.967	20.533	0.825	A36	0.880
13	110 - 109.75	0.25		12	20.533	20.571	0.5625	A572-65	0.908
14	109.75 - 104.75	5		12	20.571	21.325	0.55	A572-65	0.911
15	104.75 - 99.75	5		12	21.325	22.079	0.5375	A572-65	0.915
16	99.75 - 94.75	5		12	22.079	22.833	0.525	A572-65	0.921
17	94.75 - 89.75	5		12	22.833	23.587	0.5125	A572-65	0.928
18	89.75 - 84.75	5		12	23.587	24.341	0.5	A572-65	0.936
19	84.75 - 81.5	3.25		12	24.341	24.832	0.5	A572-65	0.927
20	81.5 - 81.25	0.25		12	24.832	24.869	0.5	A572-65	0.927
21	81.25 - 78	3.25		12	24.869	25.360	0.4875	A572-65	0.941
22	78 - 77.75	0.25		12	25.360	25.397	0.7625	A572-65	0.906
23	77.75 - 72.75	5		12	25.397	26.151	0.75	A572-65	0.903
24	72.75 - 70	6.75	4	12	26.151	27.170	0.7375	A572-65	0.909
25	70 - 65	5		12	26.066	26.820	0.7995	A572-65	0.914
26	65 - 60	5		12	26.820	27.574	0.787	A572-65	0.913
27	60 - 55	5		12	27.574	28.329	0.762	A572-65	0.927
28	55 - 51.25	3.75		12	28.329	28.894	0.7495	A572-65	0.932
29	51.25 - 51	0.25		12	28.894	28.932	0.837	A572-65	0.917
30	51 - 50.75	0.25		12	28.932	28.970	0.5995	A572-65	0.939
31	50.75 - 45.75	5		12	28.970	29.724	0.5995	A572-65	0.928
32	45.75 - 42	3.75		12	29.724	30.289	0.587	A572-65	0.940
33	42 - 41.75	0.25		12	30.289	30.327	0.812	A572-65	0.918
34	41.75 - 36.75	5		12	30.327	31.081	0.7995	A572-65	0.918
35	36.75 - 31.75	5		12	31.081	31.835	0.787	A572-65	0.919
36	31.75 - 30	4.75	3	12	31.835	32.552	0.7745	A572-65	0.929
37	30 - 26.25	3.75		12	31.475	32.041	0.85	A572-65	0.924
38	26.25 - 26	0.25		12	32.041	32.079	0.85	A572-65	0.924
39	26 - 21	5		12	32.079	32.833	0.825	A572-65	0.939
40	21 - 16	5		12	32.833	33.587	0.825	A572-65	0.928
41	16 - 11	5		12	33.587	34.341	0.8	A572-65	0.945
42	11 - 10.25	0.75		12	34.341	34.454	0.8	A572-65	0.944
43	10.25 - 10	0.25		12	34.454	34.492	0.7875	A572-65	0.923
44	10 - 5	5		12	34.492	35.246	0.775	A572-65	0.927
45	5 - 3.5	1.5		12	35.246	35.472	0.775	A572-65	0.924
46	3.5 - 3.25	0.25		12	35.472	35.510	0.7	A572-65	0.924
47	3.25 - 0	3.25		12	35.510	36.000	0.7	A572-65	0.918

TNX Section Forces

Increment (ft):		TNX Output		
	5	P _u (K)	M _{ux} (kip-ft)	V _u (K)
	Section Height (ft)			
1	150 - 145	2.9529	47.531	7.2175
2	145 - 140	3.2277	84.77	7.6709
3	140 - 139.583	3.2536	87.98	7.7123
4	139.583 - 139.333	3.2779	89.913	7.7389
5	139.333 - 134.333	3.7426	129.99	8.2837
6	134.333 - 129.333	4.2279	172.8	8.8332
7	129.333 - 124.333	4.7324	218.37	9.3868
8	124.333 - 119.333	5.2565	266.71	9.9433
9	119.333 - 119	5.2957	270.03	9.9788
10	119 - 118.75	5.3378	272.53	10.009
11	118.75 - 113.75	6.1575	324.11	10.613
12	113.75 - 110	6.7866	364.76	11.059
13	110 - 109.75	7.7469	368.06	11.89
14	109.75 - 104.75	8.3564	429.93	12.745
15	104.75 - 99.75	9.0321	495.04	13.312
16	99.75 - 94.75	9.7282	562.98	13.877
17	94.75 - 89.75	10.445	633.74	14.438
18	89.75 - 84.75	11.182	707.28	14.993
19	84.75 - 81.5	11.672	756.57	15.352
20	81.5 - 81.25	11.718	760.41	15.373
21	81.25 - 78	12.21	810.94	15.734
22	78 - 77.75	12.272	814.87	15.756
23	77.75 - 72.75	13.318	895.1	16.345
24	72.75 - 70	13.903	940.47	16.663
25	70 - 65	15.798	1025.4	17.312
26	65 - 60	16.974	1113.3	17.871
27	60 - 55	18.17	1204	18.417
28	55 - 51.25	19.079	1273.8	18.819
29	51.25 - 51	19.154	1278.5	18.838
30	51 - 50.75	19.205	1283.2	18.864
31	50.75 - 45.75	20.248	1378.8	19.376
32	45.75 - 42	21.048	1452.1	19.745
33	42 - 41.75	21.127	1457	19.758
34	41.75 - 36.75	22.481	1557.1	20.276
35	36.75 - 31.75	23.86	1659.6	20.764
36	31.75 - 30	24.342	1696.1	20.94
37	30 - 26.25	26.193	1775.3	21.341
38	26.25 - 26	26.273	1780.7	21.359
39	26 - 21	27.8	1888.6	21.8
40	21 - 16	29.3	1998.9	22.3
41	16 - 11	30.9	2111.6	22.8
42	11 - 10.25	31.1	2128.7	22.8
43	10.25 - 10	31.2	2134.4	22.9
44	10 - 5	32.7	2249.9	23.3
45	5 - 3.5	33.2	2285.0	23.5
46	3.5 - 3.25	33.2	2290.8	23.5
47	3.25 - 0	34.2	2367.6	23.8

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP15.254x14.5x0.25	Pole	45.8%	Pass
145 - 140	Pole	TP16.008x15.254x0.25	Pole	73.5%	Pass
140 - 139.58	Pole	TP16.071x16.008x0.25	Pole	75.7%	Pass
139.58 - 139.33	Pole + Reinf.	TP16.109x16.071x0.55	Pole	37.1%	Pass
139.33 - 134.33	Pole + Reinf.	TP16.863x16.109x0.525	Pole	50.1%	Pass
134.33 - 129.33	Pole + Reinf.	TP17.617x16.863x0.5125	Pole	62.4%	Pass
129.33 - 124.33	Pole + Reinf.	TP18.371x17.617x0.5	Pole	74.1%	Pass
124.33 - 119.33	Pole + Reinf.	TP19.125x18.371x0.4875	Pole	85.3%	Pass
119.33 - 119	Pole + Reinf.	TP19.176x19.125x0.4875	Pole	86.0%	Pass
119 - 118.75	Pole + Reinf.	TP19.213x19.176x0.8875	Pole	50.5%	Pass
118.75 - 113.75	Pole + Reinf.	TP19.967x19.213x0.85	Pole	57.3%	Pass
113.75 - 110	Pole + Reinf.	TP20.533x19.967x0.825	Pole	62.3%	Pass
110 - 109.75	Pole + Reinf.	TP20.571x20.533x0.5625	Reinf. 4 Tension Rupture	58.8%	Pass
109.75 - 104.75	Pole + Reinf.	TP21.325x20.571x0.55	Reinf. 4 Tension Rupture	65.1%	Pass
104.75 - 99.75	Pole + Reinf.	TP22.079x21.325x0.5375	Reinf. 4 Tension Rupture	71.2%	Pass
99.75 - 94.75	Pole + Reinf.	TP22.833x22.079x0.525	Reinf. 4 Tension Rupture	77.0%	Pass
94.75 - 89.75	Pole + Reinf.	TP23.587x22.833x0.5125	Reinf. 4 Tension Rupture	82.5%	Pass
89.75 - 84.75	Pole + Reinf.	TP24.341x23.587x0.5	Reinf. 4 Tension Rupture	87.8%	Pass
84.75 - 81.5	Pole + Reinf.	TP24.832x24.341x0.5	Reinf. 4 Tension Rupture	91.1%	Pass
81.5 - 81.25	Pole + Reinf.	TP24.869x24.832x0.5	Reinf. 3 Tension Rupture	91.3%	Pass
81.25 - 78	Pole + Reinf.	TP25.36x24.869x0.4875	Reinf. 3 Tension Rupture	94.5%	Pass
78 - 77.75	Pole + Reinf.	TP25.397x25.36x0.7625	Reinf. 8 Compression	72.1%	Pass
77.75 - 72.75	Pole + Reinf.	TP26.151x25.397x0.75	Reinf. 8 Compression	76.1%	Pass
72.75 - 70	Pole + Reinf.	TP27.17x26.151x0.7375	Reinf. 8 Compression	78.3%	Pass
70 - 65	Pole + Reinf.	TP26.82x26.066x0.7995	Reinf. 8 Compression	77.6%	Pass
65 - 60	Pole + Reinf.	TP27.574x26.82x0.787	Reinf. 8 Compression	81.0%	Pass
60 - 55	Pole + Reinf.	TP28.329x27.574x0.762	Reinf. 8 Compression	84.3%	Pass
55 - 51.25	Pole + Reinf.	TP28.894x28.329x0.7495	Reinf. 8 Compression	86.7%	Pass
51.25 - 51	Pole + Reinf.	TP28.932x28.894x0.837	Reinf. 8 Compression	78.3%	Pass
51 - 50.75	Pole + Reinf.	TP28.97x28.932x0.5995	Reinf. 2 Tension Rupture	90.8%	Pass
50.75 - 45.75	Pole + Reinf.	TP29.724x28.97x0.5995	Reinf. 2 Tension Rupture	93.7%	Pass
45.75 - 42	Pole + Reinf.	TP30.289x29.724x0.587	Reinf. 2 Tension Rupture	95.9%	Pass
42 - 41.75	Pole + Reinf.	TP30.327x30.289x0.812	Reinf. 7 Compression	83.6%	Pass
41.75 - 36.75	Pole + Reinf.	TP31.081x30.327x0.7995	Reinf. 7 Compression	86.4%	Pass
36.75 - 31.75	Pole + Reinf.	TP31.835x31.081x0.787	Reinf. 7 Compression	89.0%	Pass
31.75 - 30	Pole + Reinf.	TP32.552x31.835x0.7745	Reinf. 7 Compression	90.0%	Pass
30 - 26.25	Pole + Reinf.	TP32.041x31.475x0.85	Reinf. 7 Compression	87.3%	Pass
26.25 - 26	Pole + Reinf.	TP32.079x32.041x0.85	Reinf. 7 Compression	87.4%	Pass
26 - 21	Pole + Reinf.	TP32.833x32.079x0.825	Reinf. 7 Compression	89.6%	Pass
21 - 16	Pole + Reinf.	TP33.587x32.833x0.825	Reinf. 7 Compression	91.7%	Pass
16 - 11	Pole + Reinf.	TP34.341x33.587x0.8	Reinf. 7 Compression	93.8%	Pass
11 - 10.25	Pole + Reinf.	TP34.454x34.341x0.8	Reinf. 7 Compression	94.1%	Pass
10.25 - 10	Pole + Reinf.	TP34.492x34.454x0.7875	Reinf. 1 Tension Rupture	81.3%	Pass
10 - 5	Pole + Reinf.	TP35.246x34.492x0.775	Reinf. 1 Tension Rupture	83.0%	Pass
5 - 3.5	Pole + Reinf.	TP35.472x35.246x0.775	Reinf. 1 Tension Rupture	83.5%	Pass
3.5 - 3.25	Pole + Reinf.	TP35.51x35.472x0.7	Reinf. 10 Compression	83.9%	Pass
3.25 - 0	Pole + Reinf.	TP36x35.51x0.7	Reinf. 10 Compression	84.8%	Pass
				Summary	
			Pole	86.0%	Pass
			Reinforcement	95.9%	Pass
			Overall	95.9%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity										
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
150 - 145	348	n/a	348	12.06	n/a	12.06	45.8%										
145 - 140	403	n/a	403	12.67	n/a	12.67	73.5%										
140 - 139.58	407	n/a	407	12.72	n/a	12.72	75.7%										
139.58 - 139.33	410	440	850	12.75	11.68	24.43	37.1%					25.2%					
139.33 - 134.33	472	479	951	13.35	11.68	25.03	50.1%					33.9%					
134.33 - 129.33	539	520	1059	13.96	11.68	25.64	62.4%					42.1%					
129.33 - 124.33	612	562	1174	14.57	11.68	26.25	74.1%					49.9%					
124.33 - 119.33	692	606	1298	15.17	11.68	26.85	85.3%					57.2%					
119.33 - 119	697	609	1306	15.21	11.68	26.89	86.0%					57.7%					
119 - 118.75	702	1546	2248	15.24	29.68	44.92	50.5%					33.9%				38.6%	
118.75 - 113.75	789	1662	2450	15.85	29.68	45.53	57.3%					38.3%				43.7%	
113.75 - 110	859	1751	2610	16.30	29.68	45.98	62.2%					41.6%				54.1%	
110 - 109.75	863	989	1853	16.33	16.52	32.85	47.6%					58.8%					
109.75 - 104.75	963	1058	2022	16.94	16.52	33.46	52.8%					65.1%					
104.75 - 99.75	1070	1130	2200	17.55	16.52	34.07	57.9%					71.2%					
99.75 - 94.75	1185	1204	2389	18.15	16.52	34.67	62.7%					77.0%					
94.75 - 89.75	1308	1280	2587	18.76	16.52	35.28	67.3%					82.5%					
89.75 - 84.75	1439	1358	2797	19.37	16.52	35.89	71.7%					87.8%					
84.75 - 81.5	1528	1410	2939	19.76	16.52	36.28	74.4%					91.1%					
81.5 - 81.25	1535	1414	2950	19.79	16.52	36.31	74.6%				91.3%						
81.25 - 78	1629	1468	3097	20.18	16.52	36.70	77.3%				94.5%						
78 - 77.75	1636	3056	4692	20.21	34.52	54.73	51.4%				62.8%					72.1%	
77.75 - 72.75	1788	3231	5019	20.82	34.52	55.34	54.3%				66.3%					76.2%	
72.75 - 70	1875	3329	5204	21.15	34.52	55.67	55.9%				68.2%					78.3%	
70 - 65	2392	3390	5782	26.59	34.52	61.11	55.4%				67.6%					77.6%	
65 - 60	2602	3574	6176	27.35	34.52	61.87	57.9%				70.6%					81.0%	
60 - 55	2824	3763	6587	28.11	34.52	62.63	60.4%				73.4%					84.3%	
55 - 51.25	2998	3908	6907	28.67	34.52	63.19	62.1%				75.5%					86.8%	
51.25 - 51	3010	4676	7686	28.71	40.60	69.31	56.1%			66.7%						78.3%	
51 - 50.75	3022	2651	5673	28.75	22.60	51.35	76.4%			90.8%							
50.75 - 45.75	3267	2783	6050	29.51	22.60	52.11	78.9%			93.7%							
45.75 - 42	3459	2884	6343	30.07	22.60	52.67	80.8%			95.9%							
42 - 41.75	3472	5114	8587	30.11	40.60	70.71	60.0%			71.2%						83.6%	
41.75 - 36.75	3741	5360	9100	30.87	40.60	71.47	62.0%			73.5%						86.4%	
36.75 - 31.75	4022	5611	9633	31.62	40.60	72.22	64.0%			75.7%						89.0%	
31.75 - 30	4124	5700	9824	31.89	40.60	72.49	64.7%			76.5%						90.0%	
30 - 26.25	4901	5680	10580	38.18	40.60	78.78	62.7%			74.2%						87.3%	
26.25 - 26	4918	5693	10611	38.23	40.60	78.83	62.8%			74.3%						87.4%	
26 - 21	5277	5951	11229	39.14	40.60	79.74	64.4%			76.2%						89.6%	
21 - 16	5654	6216	11869	40.05	40.60	80.65	66.0%			77.9%						91.7%	
16 - 11	6048	6486	12533	40.96	40.60	81.56	67.5%			79.7%						93.8%	
11 - 10.25	6108	6527	12635	41.09	40.60	81.69	67.8%			79.9%						94.1%	
10.25 - 10	6129	6332	12461	41.14	37.60	78.74	68.9%			81.3%							74.9%
10 - 5	6544	6595	13139	42.05	37.60	79.65	70.4%			83.0%							76.4%
5 - 3.5	6672	6675	13347	42.32	37.60	79.92	70.9%			83.5%							76.8%
3.5 - 3.25	6694	5574	12268	42.36	30.00	72.36	77.4%					83.9%					83.9%
3.25 - 0	6978	5717	12695	42.96	30.00	72.96	78.4%					84.8%					84.8%

Note: Section capacity checked in 5 degree increments.

Project Name:	NORWALK WEST- CT AVE
Project Number:	BU#841287
Job Number:	WO#1193060
Date:	3/3/2016



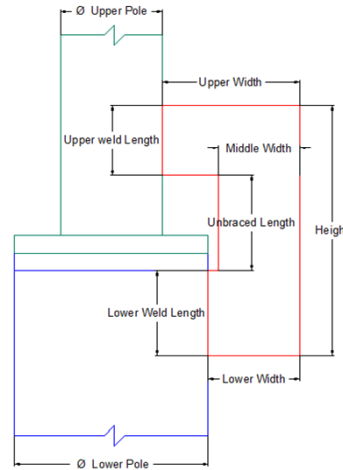
Created On:	6/17/2014
Checked By:	SMR
Revised On:	7/31/2014
Revision No.:	1

Flange Bypass - Step Monopole

Elevation:	110
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Code:	F	
Moment	364.76	k-ft
Axial	6.79	kips
Shear	11.06	kips

Ø Upper Pole	22.5331	in
Ø Lower Pole	20.5331	in
Flange Bolt Grade	A354 Gr. BC	
Flange Bolt Quantity	0	
Flange Bolt Diameter	0	in
Flange Bolt Circle	0	in
I flange bolts	0	in ⁴
No. Flange Bypass Plates	4	
Plate Yield Strength (Fy)	65	ksi
Plate Rupture Strength (Fu)	80	ksi
Height	95.5	in
Plate Thickness	1.25	in
Unbraced Length	14	in



Flange Bolts		
Allowable Axial	0.0	kips
Max Bolt Load	0.0	kips
Capacity	0.0%	Pass

	Width (in)	Area (in ²)	Moment Arm (in)	ybar (in)	Moment of Inertia (in ⁴)
Upper Width	9	11.25	31.5	15.8	5593.1
Middle Width	5	6.25	35.5	17.8	3945.6
Lower Width	10	12.50	30.5	15.3	5826.7

Tension		
Tu	123.18	kips
Allowable	324.27	kips
Capacity	38.0%	Pass

Buckling		
K	1	
Moment of Inertia	0.814	in ⁴
r	0.361	in
KL/r	38.798	
Fe	190.14	ksi
Fcr	56.33	ksi
Pu	123.18	kips
Allowable	281.04	kips
Capacity	43.8%	Pass

Stress		
Max Stress	22.48288607	ksi
Allowable	51.88	ksi
Capacity	43.3%	Pass

Upper Weld		
Weld Thickness (1/16ths)	3	
Weld Strength	80	
C1	1.03	
Lweld	39	in
ex	4.5	in
a	0.12	AISC 8-4
C	3.69	
Tu	123.18	kips
Allowable	296.07	kips
Capacity	41.6%	Pass

Lower Weld		
Weld Thickness (1/16ths)	3	
Weld Strength	80	
C1	1.03	
Lweld	42.5	in
ex	5	in
a	0.12	AISC 8-4
C	3.68	
Tu	123.18	kips
Allowable	322.21	kips
Capacity	38.2%	Pass

Project Name:	NORWALK WEST- CT AVE	JACOBS Jacobs Engineering Group, Inc.	Created On: 6/17/2014
Project Number:	BU#841287		Checked By: SMR
Job Number:	WO#1193060		Revised On: 7/21/2015
Date:	2/22/2016		Revision No.: 2.3

Additional Bolt Capacity Calculator

Anchor Bolts?	Yes	
Code:	F	
Moment (M)	2368	kip-ft
Axial (P)	34	kips
Shear (V)	24	kips

Existing Bolts		
Number of Bolts	8	
Bolt Circle	44	in
y	22	in
Moment of Inertia (I)	6292	in ⁴
Bolt Grade	A615-75	
Thread Type	Non-Upset	
Diameter (d)	2.25	in
Ag	3.98	in ²
Ae	3.25	in ²
Fy	75	ksi
Fu	100	ksi
Tension per Bolt	182.94	kips
Shear per Bolt	3.00	kips
Allowable	195.0	kips
% Capacity	93.8%	%
	Pass	

New Bolts		
Number of Bolts	8	
Bolt Circle	49	in
y	24.5	in
Moment of Inertia (I)	4,562	in ⁴
Bolt Grade	A193 B7	
Thread Type	Non-Upset	
Diameter (d)	1.75	in
Ag	2.41	in ²
Ae	1.90	in ²
Fy	105	ksi
Fu	125	ksi
Tension per Bolt	121.87	kips
Shear per Bolt	0.00	kips
Allowable	132.6	kips
% Capacity	91.9%	%
	Pass	

Total Moment of Inertia	10853.90	in ⁴
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New Anchor Bolts Reinforce Foundation?	No
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Bearing Capacity of Anchor Bolt Pipe Sleeve		
Pipe Fy	42	ksi
Pipe Area	7.64	in ²
Allowable	385.06	k
% Capacity	31.6%	%
	Pass	

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F / G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding $(1) \times (\text{Rod Diameter})$

Site Data

BU#: 841287
 Site Name: NORWALK WEST- CT AVE
 App #: 326317 Rev. 2

Anchor Rod Data

Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	44	in
Anchor Spacing:	6	in

Plate Data

W=Side:	44	in
Thick:	2.5	in
Grade:	60	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened	
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

Pole Data

Diam:	36	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor

ASD ASIF:	1.333	
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	1373	ft-kips
Unfactored Axial, P:	34	kips
Unfactored Shear, V:	24	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension: 182.9 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 93.8% **Pass**

Base Plate Results

Base Plate Stress: 52.7 ksi
 Allowable PL Bending Stress: 60.0 ksi
 Base Plate Stress Ratio: 87.8% **Pass**

Flexural Check

PL Ref. Data

Yield Line (in):	26.23
Max PL Length:	26.23

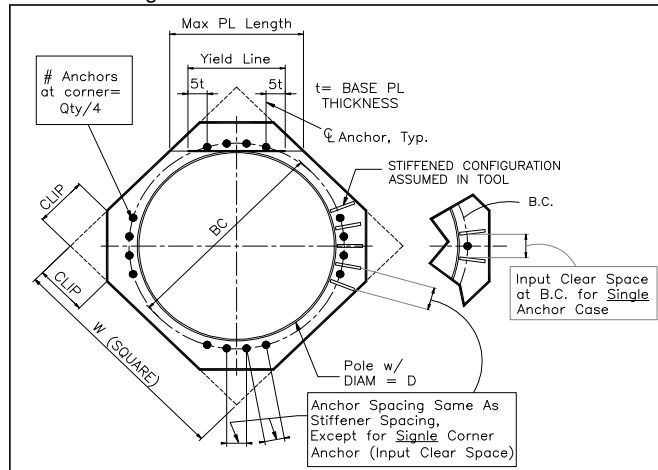
N/A - Unstiffened

Stiffener Results

Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A



(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: 841287
Site Name: NORWALK WEST- CT AVE
App #: 326317 Rev. 2

Monopole Base Reaction Forces			
TIA Revision:	F	<--Pull Down	
Unfactored DL Axial, PD:	34	kips	
Unfactored WL Axial, PW:	0	kips	
Unfactored WL Shear, V:	24	kips	
Unfactored WL Moment, M:	2368	ft-kips	

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	40.8	kips
0.90	0.9D+1.6W, Pu:	30.6	kips
1.35	Vu:	32.4	kips
	Mu:	3196.8	ft-kips

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	4	in
Pad Bearing Depth, D:	7.1	ft
Pad Thickness, T:	3.5	ft
Pad Width=Length, L:	21.25	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	25.00	ft^2
Pier Height:	3.93	ft
Soil (above pad) Height:	3.60	ft

1.2D+1.6W Load Combination, Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	587.54	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	3387.12	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 5.76 ft
 Orthogonal qu= 2.84 ksf
 qu/φ*qn Ratio= **18.96% Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 4.08 ft
 Diagonal qu= 3.42 ksf
 qu/φ*qn Ratio= **22.83% Pass**

<-- Press Upon Completing All Input

Soil Parameters		
Unit Weight, γ:	120.0	pcf
Ultimate Bearing Capacity, qn:	20.00	ksf
Strength Reduct. factor, φ:	0.75	
Angle of Friction, Φ:	33.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: φ*qn:	15.00	ksf
Passive Pres. Coeff., Kp	3.39	

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	32.4	kips
Pad Force Location Above D:	1.56	ft
φ(Passive Pressure Moment):	50.52	ft-kips
Factored O.T. M(WL), "1.6W":	3437.6	ft-kips
Factored OT (MW-Msoil), M1	3387.12	ft-kips

(w/ Soil Wedges) [Reaction+Conc+Soil]	464.32	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	3214.09	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.34	ft
Sum of Soil Wedges Wt:	26.29	kips
Soil Wedges ecc, K1:	7.31	ft
Ftg+Soil above Pad wt:	455.6	kips
Unfactored (Total ftg-soil Wt):	481.91	kips
1.2D. No Soil Wedges.	587.54	kips
0.9D. With Soil Wedges	464.32	kips

Orthogonal ecc3 = M2/P2 = 6.92 ft
 Ortho Non Bearing Length,NBL= **13.84 ft**
 Orthogonal qu= 2.95 ksf
 Diagonal qu= 3.54 ksf

Resistance due to Cohesion (Vertical)		
φ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2368.00		
M Orthogonal:	3402.90	69.59%	Pass
M Diagonal:	3402.90	69.59%	Pass

Project Name:	NORWALK WEST- CT AVE
Project Number:	BU#841287
Job Number:	WO#1193060
Date:	2/22/2016



Created On:	6/3/2014
Checked By:	DW
Revised On:	3/4/2015
Revision No.:	1.6

Monopole Pad & Pier Foundation

Foundation Parameters

Load	
Code	G
Axial	34 kips
Shear	24 kips
Moment	2368 k-ft
Soil Unit Weight	120 pcf
Friction Angle	33
Cohesion	0 psf

Material	
Concrete Strength (F'c)	3000 psi
Concrete Density	150 pcf
Rebar Tensile (Fy)	60 ksi
Clear Cover	3 in

Pier	
Pier type	Square
Width	5 ft
Height above Grade	0.33 ft
Rebar Size	9
Rebar Quantity	56
Tie Size	4
Tie C/C Spacing	12 in

Structural Checks

Pad-Pier Bearing Capacity	11934.0 kips
Pad-Pier Bearing	557.3 kips
Pad-Pier Bearing Check	4.7% Pass

Pier Beam Shear Capacity	331.7 kips
Pier Beam Shear	24.0 kips
Pier Beam Shear Check	7.2% Pass

Pier Bending Moment Capacity	5939.4 k-ft
Pier Bending Moment	2457.5 k-ft
Pier Bending Moment Check	41.4% Pass

APPENDIX D
STRUCTURAL MODIFICATION DRAWINGS

CROWN CASTLE

SITE NAME: NORWALK WEST- CT AVE
 BU NUMBER: 841287
 SITE ADDRESS: 613 CONNECTICUT AVENUE
 NORWALK, CT 06850
 TOWER TYPE: 150 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:



DRAWING NOTICE:
 THESE DOCUMENTS ARE CONFIDENTIAL AND ARE THE SOLE PROPERTY OF JACOBS ENGINEERING AND MAY NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT FROM JACOBS ENGINEERING.

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	03/03/16	GS	0

DRAWN BY: GS
 CHECKED BY: MHL
 APPROVED BY: MEW
 JACOBS PROJECT NO.: 1193060

SITE NAME:
NORWALK WEST- CT AVE

SITE BU NUMBER:
841287

SITE ADDRESS:
**613 CONNECTICUT AVENUE
 NORWALK, CT
 06850**

SHEET DESCRIPTION:
TITLE SHEET

SHEET NUMBER:
T-1

SITE INFORMATION	VICINITY MAP
LATITUDE (NAD83): 41° 5' 49.45" LONGITUDE (NAD83): -73° 26' 56.61" COUNTY: FAIRFIELD	

PROJECT DESCRIPTION
<ul style="list-style-type: none"> EXISTING MONOPOLE TO BE MODIFIED PER SHEET S-4.
ENGINEERS COMMENTS
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.
APPLICABLE CODES
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. - ANSI/TIA/EIA-222-F-1996 STANDARD, "STRUCTURAL STANDARD FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES" - 2005 CONNECTICUT BUILDING CODE

DRAWING INDEX		REV	DESIGNER
SHEET NO:	SHEET TITLE		
T-1	TITLE SHEET	0	GS
N-1	GENERAL NOTES	0	GS
N-2	MODIFICATION INSPECTION CHECKLIST	0	GS
S-1	NexGen2™ BOLT SPECS & TIGHTENING PROCEDURE	0	GS
S-2	FORGBolt™ BOLT SPECS & TIGHTENING PROCEDURE	0	GS
S-3	AJAX ONESIDE™ BOLT SPECS & TIGHTENING PROCEDURE	0	GS
S-4	POLE MODIFICATION SCHEDULE	0	GS
S-5	ANCHOR ROD BRACKET EXTENSION DETAILS	0	GS
S-6	TOWER SECTION VIEW I	0	GS
S-7	TOWER SECTION VIEW II	0	GS
S-8	TOWER SECTION VIEW III	0	GS
S-9	FLAT PLATE REINFORCEMENT DETAILS	0	GS
S-10	REPAIR WORK AND MISCELLANEOUS	0	GS
S-11	STEP BOLT CLIP	0	GS

TOWER INFORMATION
<p><u>FAILING STRUCTURAL ANALYSIS</u> STRUCTURAL ANALYSIS BY: JACOBS ENGINEERING GROUP, INC PROJECT NO.: 1188691 WORK ORDER NO.: 1188691 APPLICATION & REV. NO.: 326317, REV. 2 DATE: 02/04/2016</p> <p><u>PASSING STRUCTURAL ANALYSIS</u> STRUCTURAL ANALYSIS BY: JACOBS ENGINEERING GROUP, INC. PROJECT NO.: 1193060 WORK ORDER NO.: 1193060 CARRIER NAME: AT&T MOBILITY APPLICATION & REV. NO.: 326317, REV. 2 DATE: 03/03/2016</p>

PROJECT CONTACTS			
<u>DESIGN ENGINEER - MAIN RFI CONTACT</u> MATTHEW LEE 919-859-5758 111 CORNING RD. STE 200 CARY, NC 27518 Matthew.Lee@jacobs.com	<u>ENGINEER OF RECORD</u> MATT WATKINS, PE 5449 BELLS FERRY ROAD ACWORTH, GA 30102 Matt.Watkins@jacobs.com	<u>CROWN TOWER MOD PM</u> DAN VADNEY 518-373-3510 Dan.Vadney@crowncastle.com	<u>CROWN CM INFO</u> JASON D'AMICO 860-209-0104 Jason.D'Amico@crowncastle.com

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.

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
 HAVE AND MAINTAIN A VALID CONTRACTORS 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 ANS/ITIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANS/ITIA-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:
- 2.1 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
- 2.2 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.
 E. SHIM PLATE STEEL ASTM A36 (FY = 36 KSI)
- UNO. = 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
 3/4" 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
 3/8" 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
 3/4" 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
 3/8" 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:

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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REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	03/03/16	GS	0

DRAWN BY:	GS
CHECKED BY:	MHL
APPROVED BY:	MEW
JACOBS PROJECT NO:	1193060

SITE NAME:

NORWALK WEST- CT AVE

SITE BU NUMBER:

841287

SITE ADDRESS:

613 CONNECTICUT AVENUE
 NORWALK, CT
 06850

SHEET DESCRIPTION:

GENERAL NOTES

SHEET NUMBER:

N-1

PLANS PREPARED FOR:

**CROWN
CASTLE**

PLANS PREPARED BY:

JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
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613 CONNECTICUT AVENUE
NORWALK, CT
06850

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
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	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:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

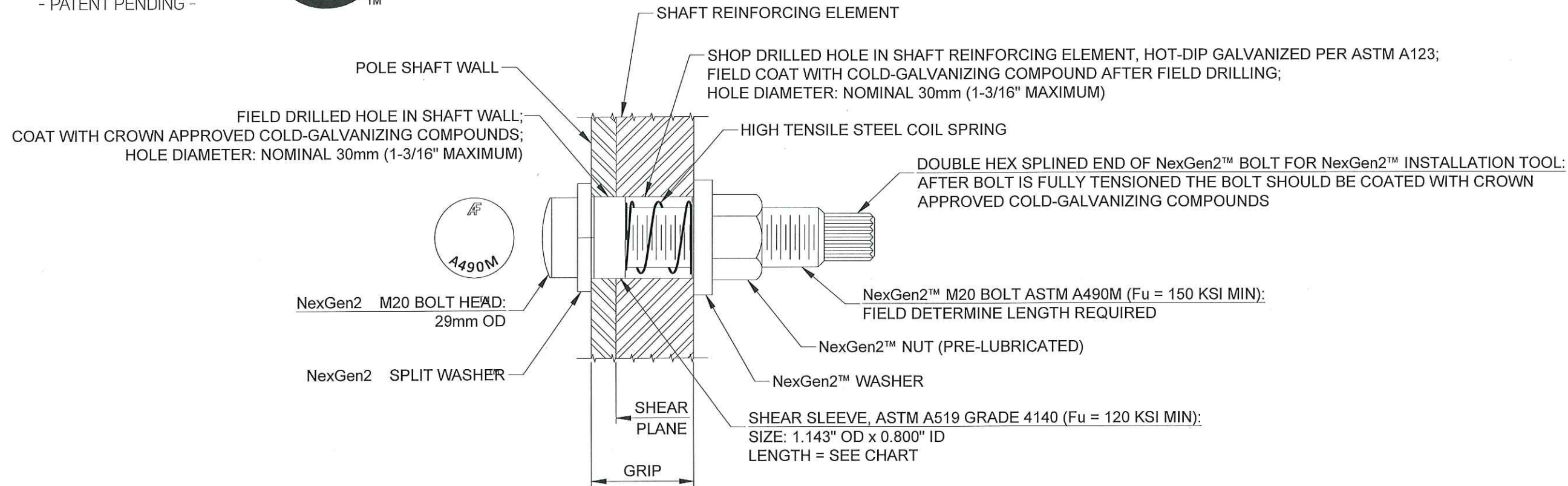
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

NEXGEN2

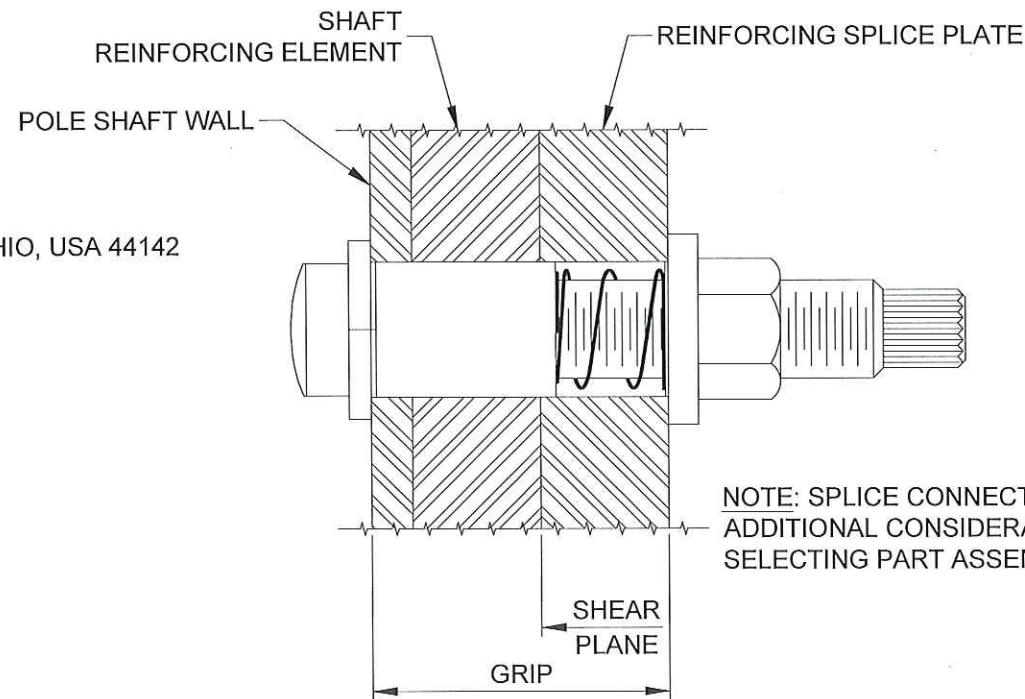
BLIND BOLT ASSEMBLY
- PATENT PENDING -



INTERIOR OF POLE SHAFT EXTERIOR OF POLE SHAFT



TYPICAL **NG2** BOLT DETAIL



PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
M20x36	M20x95	11/16"	15/16"	1-7/16"
M20x48	M20x95	1-3/16"	1-7/16"	1-7/8"
M20x57	M20x95	1-5/8"	1-7/8"	2-1/4"
M20x68	M20x135	2"	2-1/4"	2-11/16"
M20x96	M20x135	2-7/16"	2-11/16"	3-3/4"
M20x127	M20x165	3"	3-3/4"	5"
M20x212	M20x250	4"	5"	8-5/16"

MANUFACTURER:
ALLFASTENERS
15401 COMMERCE PARK DRIVE, BROOKPARK, OHIO, USA 44142
PHONE: 440-232-6060
WEBSITE: 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.

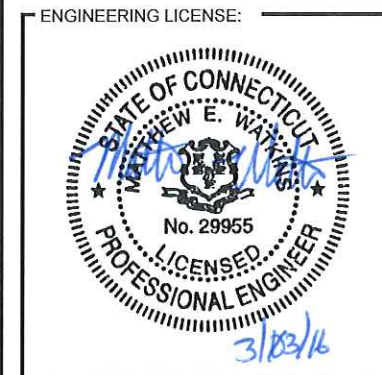
NOTE: INSTALL PER MANUFACTURER'S INSTRUCTIONS.

NOTE: SPLICE CONNECTIONS REQUIRE ADDITIONAL CONSIDERATION WHEN SELECTING PART ASSEMBLIES

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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FIRST ISSUE		03/03/16	GS	0

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JACOBS PROJECT NO: 1193060

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NORWALK WEST- CT AVE

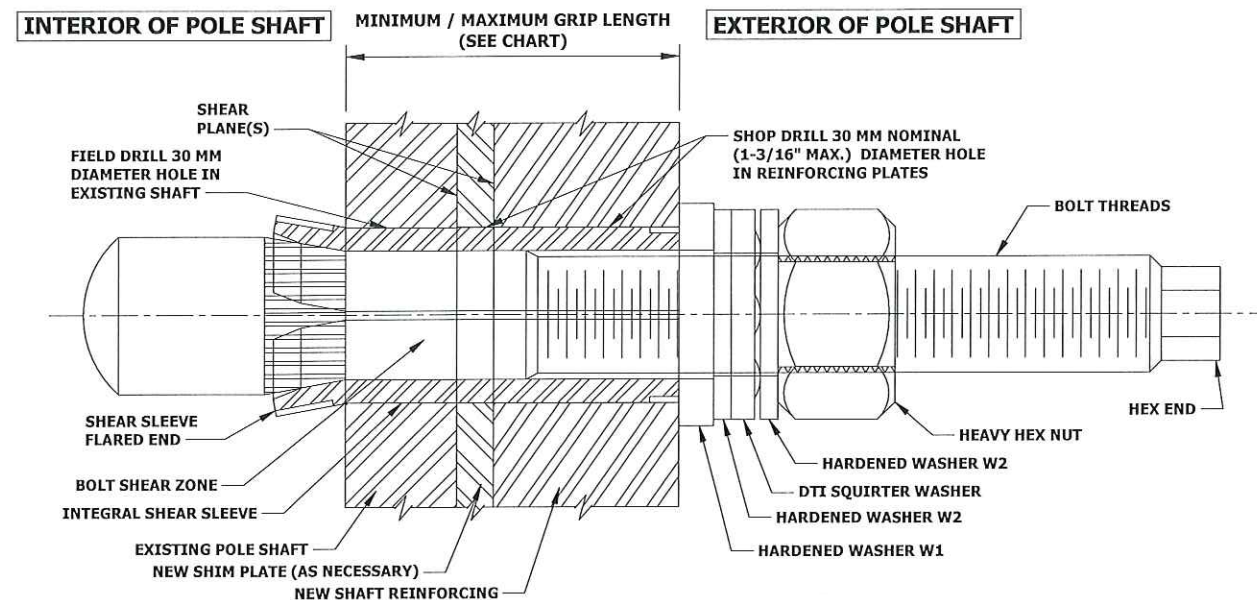
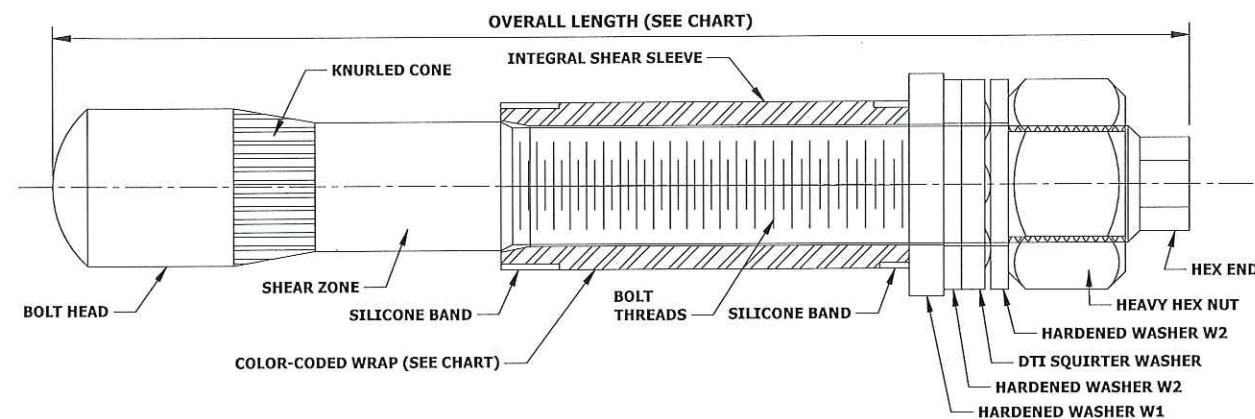
SITE BU NUMBER:
841287

SITE ADDRESS:
613 CONNECTICUT AVENUE
NORWALK, CT
06850

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:

1. ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".
2. 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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FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1 135	5.31	1.3	3/8" to 1"	--	RED
	2 160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3 195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4 260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5 365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6 440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squitter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

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

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. 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:

 3/18/16

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 06850

SHEET DESCRIPTION:
 FORGBolt™ BOLT SPECS & TIGHTENING PROCEDURE

SHEET NUMBER:
S-2

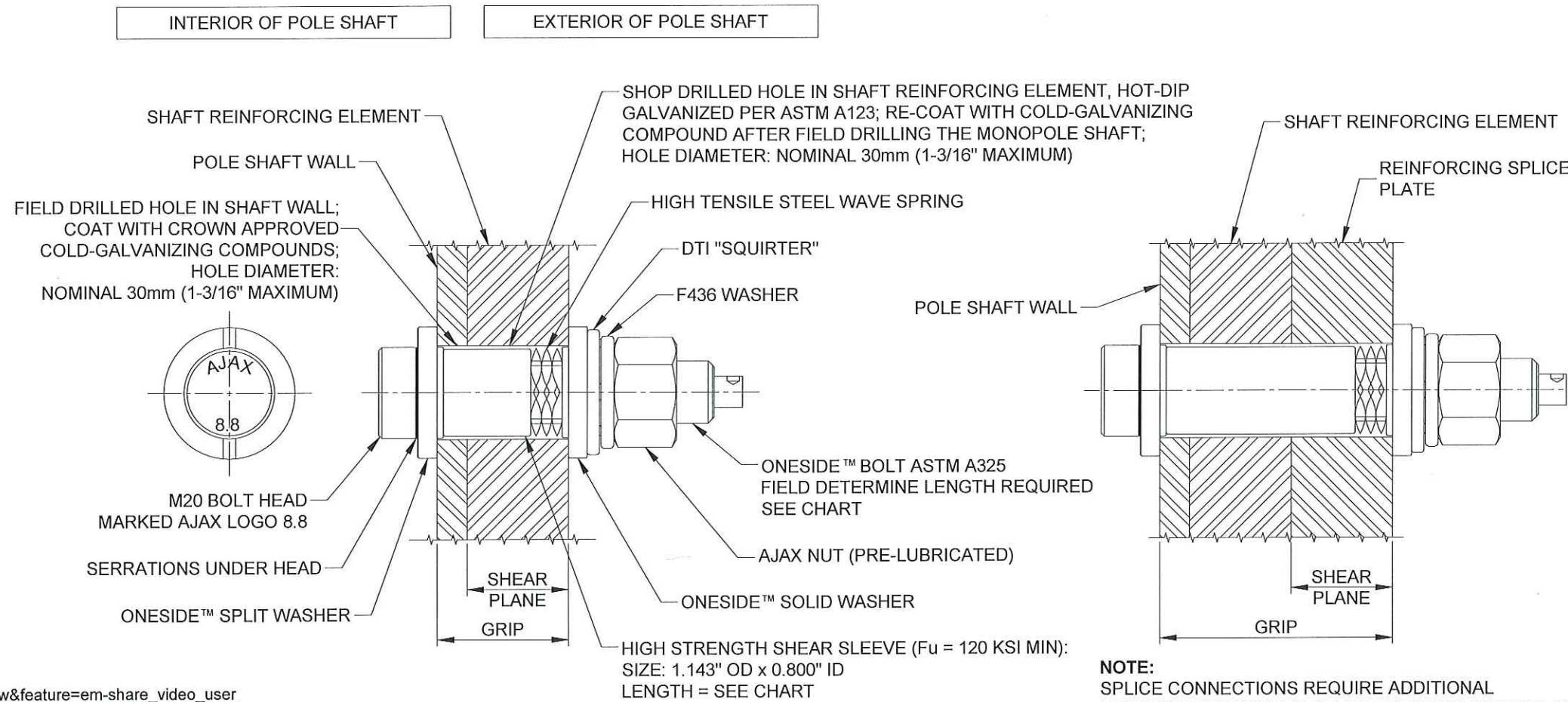
AJAX FASTENERS ONESIDE™

PATENT US 7,373,709B2

MANUFACTURER INSTALLATION VIDEO



https://www.youtube.com/watch?v=ZGBS0eLrZsw&feature=em-share_video_user



AJAX ONESIDE™ BOLT DETAIL

CODE	SIZE	COLOR	SLEEVE LENGTH	GRIP	GRIP IMP
OSBA20.65-6	M20 x 65	ORANGE	6.0 (0.236")	12.5 / 20.0	0.500" / 0.787"
OSBA20.95-14	M20 x 95	BLACK	14.0 (0.551")	20.0 / 32.0	0.787" / 1.259"
OSBA20.95-22	M20 x 95	GREEN	22.0 (0.866")	30.0 / 50.0	1.181" / 1.968"
OSBA20.95-30	M20 x 95	YELLOW	30.0 (1.181")	40.5 / 50.0	1.595" / 1.968"
OSBA20.135-39	M20 x 135	BLUE	39.0 (1.535")	49.0 / 77.0	1.929" / 3.031"
OSBA20.135-48	M20 x 135	BROWN	48.0 (1.889")	60.5 / 77.0	2.375" / 3.031"
OSBA20.135-57	M20 x 135	PURPLE	57.0 (2.244")	67.0 / 90.0	2.637" / 3.543"
OSBA20.165-76	M20 x 165	RED	76.0 (3.000")	87.0 / 120.0	3.425" / 4.724"
OSBA20.250	M20 x 250	SILVER	MTO	121.0 / 211.0	4.724" / 8.310"

MANUFACTURER
AJAX FASTENERS
SALES + TECH: ONESIDE@AJAXFAST.COM.AU

DISTRIBUTOR
IRA SVENSGAARD AND ASSOCIATES
PETER SVENDSGAARD - PETERS@IRASVENS.COM
JOHN KILLAM - JOHN@IRASVENS.COM
PHONE (530) 647-8225
FAX (530) 647-8229

BOLT ASSEMBLY AND INSTALLATION:

1. BOLT MUST BE PURCHASED PRE-ASSEMBLED.
2. FOLLOW BOLT AND DTI MANUFACTURERS INSTRUCTIONS FOR INSTALLATION.

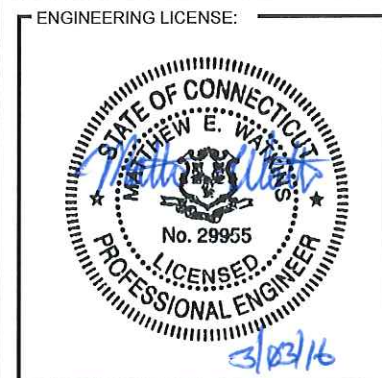
INSPECTION:

1. A MINIMUM OF 4 OUT OF 5 SQUIRTER® DTI PROTRUSIONS SHALL BE ENGAGED IN ANY AJAX/DTI BOLT ASSEMBLY IN THE REINFORCING MEMBERS. A FEELER GAGE MAY BE USED TO VERIFY PROTRUSION COMPRESSION.
2. INSPECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS AND CROWN DOCUMENT ENG-SOW-10007: MODIFICATION INSPECTION SOW.

PLANS PREPARED FOR:
CROWN CASTLE

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SITE BU NUMBER:
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SITE ADDRESS:
**613 CONNECTICUT AVENUE
NORWALK, CT
06850**

SHEET DESCRIPTION:
**AJAX ONESIDE™ BOLT
SPECIFICATIONS AND
TIGHTENING PROCEDURE**

SHEET NUMBER:
S-3

EL: 150.0'
[TOP OF STRUCTURE]

SECTION 1

EL: 110.0'

SECTION 2

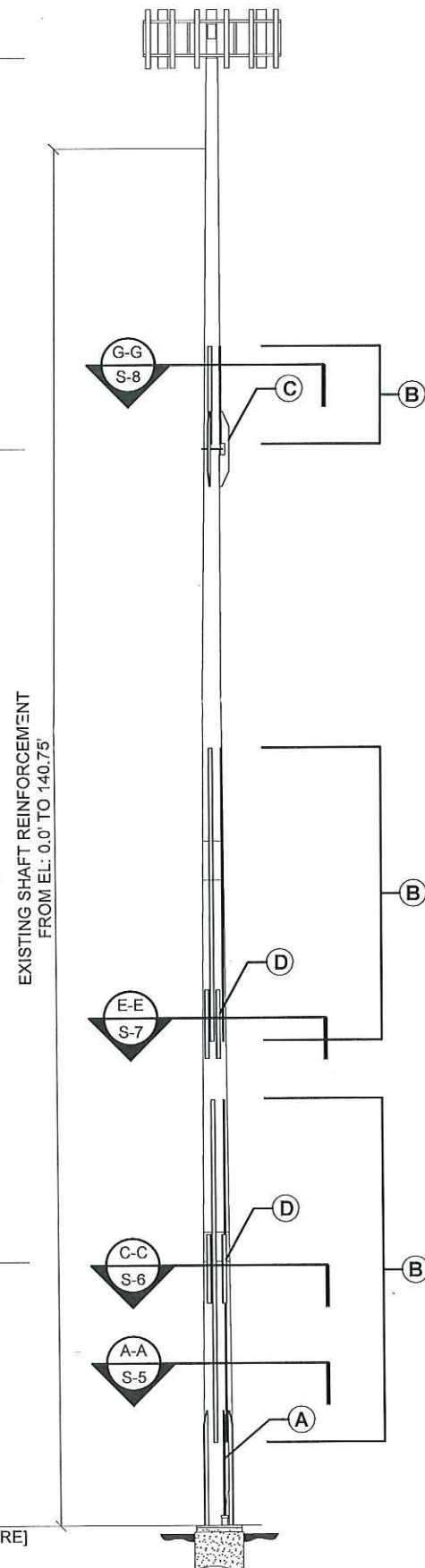
EL: 66.0'

SECTION 3

EL: 27.0'

SECTION 4

EL: 0.0'
[BOTTOM OF STRUCTURE]



TOWER ELEVATION VIEW

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)
110.5'	120.5'	CFP-04510010	3, 6, 9, 12	N/A	8	1'-8"	10	153	40	612.0
49.5'	79.5'	CCI-SFP-04510030	3, 6, 9, 12	6	6	1'-8"	28	459.0	112	1836.0
8.5'	43.5'	CCI-SFP-04510035	3, 6, 9, 12	6	6	1'-8"	31	535.5	124	2142.0
TOTAL									276	4590.0

NOTES FOR CROWN REINFORCING (65 KSI) MATERIAL:

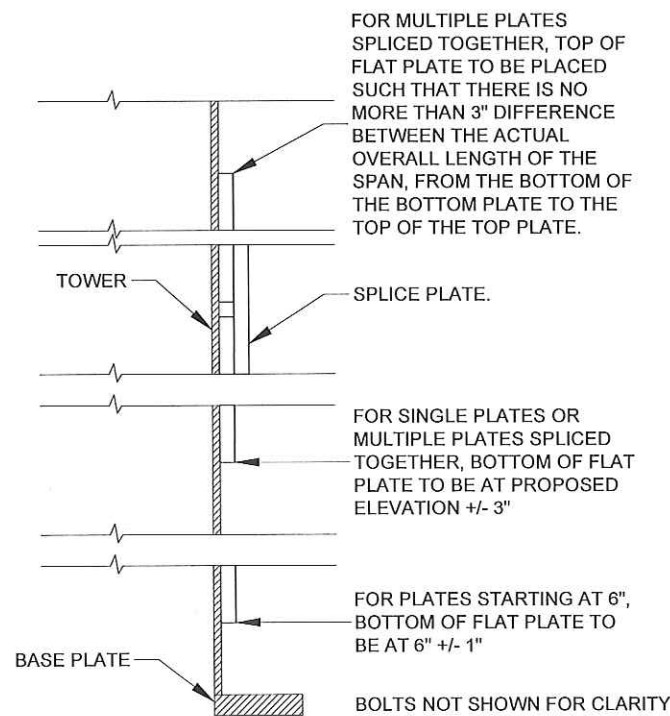
- DO NOT WELD WITHOUT APPROVAL FROM THE EOR.
- SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. 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.

POLE MODIFICATION SCHEDULE			
LETTER	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
(A)	BASE PLATE	INSTALL NEW ANCHOR ROD BRACKET EXTENSIONS	S-5
(B)	120.5 - 110.5 79.5 - 49.5 43.5 - 8.5	INSTALL NEW FLAT PLATE REINFORCEMENT	S-4 THROUGH S-11
(C)	110	INSTALL FLANGE PLATE BYPASS STIFFENERS	S-8
(D)	51.25 26.25	REMOVE EXISTING WING SPLICE PLATE & INSTALL NEW SPLICE PLATE	S-6, S-7
(E)	VARIES	REPAIR WORK FOR EXISTING MODIFICATIONS, STEP PEG RELOCATION, WELDED ANGLE BRACKET REMOVAL, AND PAINT WORK	S-10, S-11

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.151 IN/FT
SHAFT STEEL:	A36 (SECTION 1) ; ASTM A572 - 65 KSI (SECTION 2-4)
BASE PL STEEL:	ASTM A588 (60 KSI)
ANCHOR RODS:	2 1/4"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	40.00	0.2500	N/A	14.500	20.5331
2	44.00	0.2500	48.00	20.530	27.1695
3	43.00	0.3125	36.00	26.070	32.5518
4	30.00	0.3750		31.480	36.0000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES



FLAT PLATE ELEVATION TOLERANCE
DETAIL

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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NORWALK WEST- CT AVE

SITE BU NUMBER:
841287

SITE ADDRESS:
**613 CONNECTICUT AVENUE
NORWALK, CT
06850**

SHEET DESCRIPTION:
**POLE MODIFICATION
SCHEDULE**

SHEET NUMBER:
S-4

PLANS PREPARED FOR:
CROWN CASTLE

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

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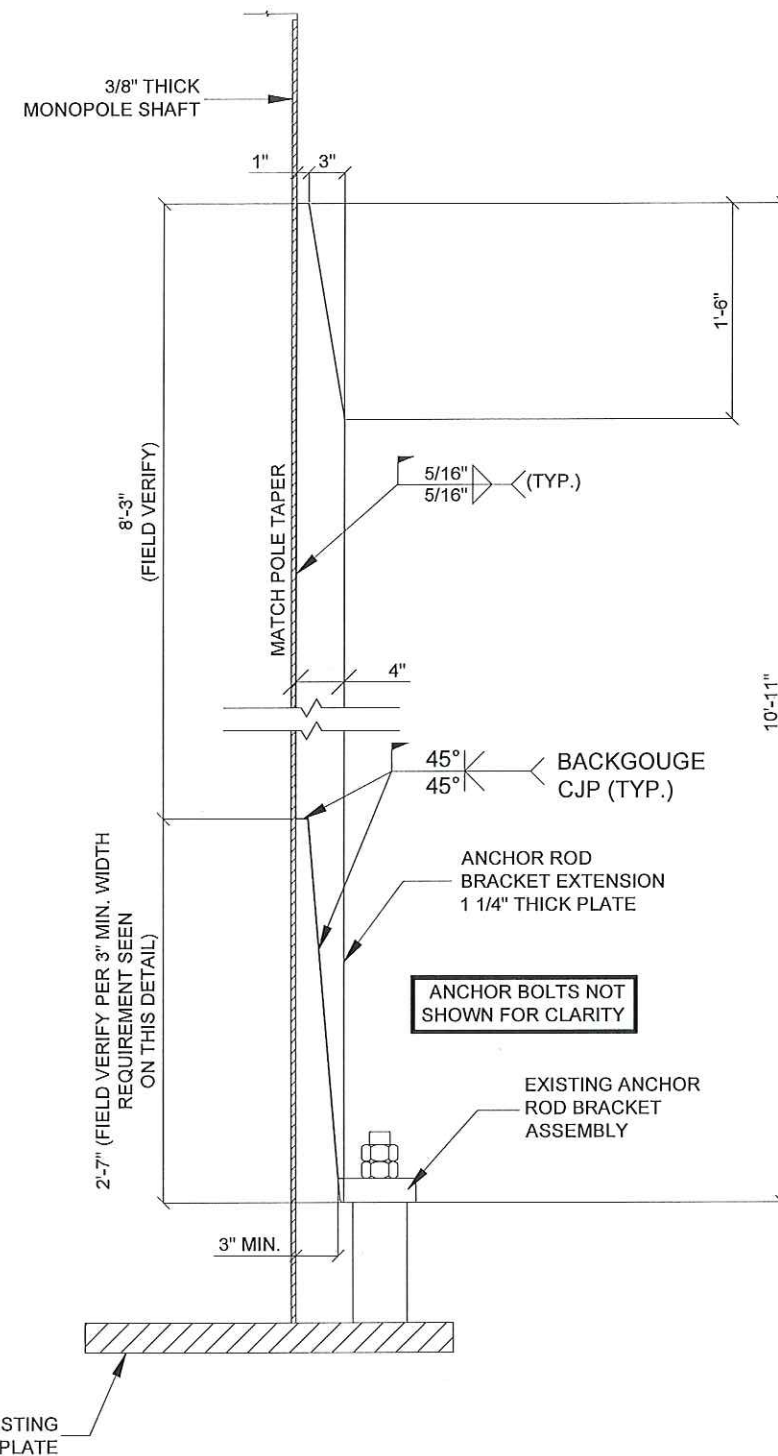
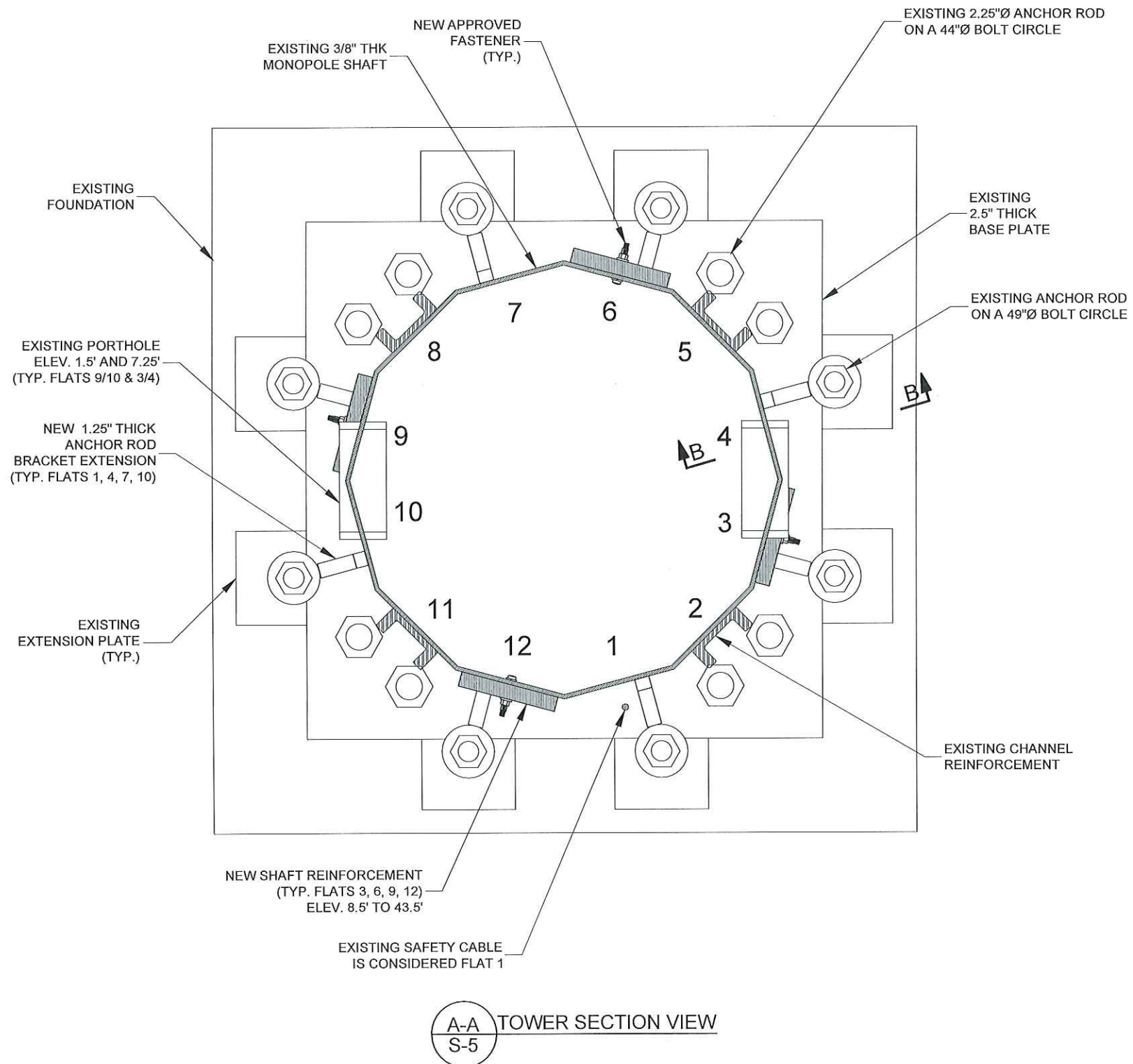
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SITE BU NUMBER:
841287

SITE ADDRESS:
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NORWALK, CT
06850

SHEET DESCRIPTION:
ANCHOR ROD BRACKET
EXTENSION DETAILS

SHEET NUMBER:
S-5

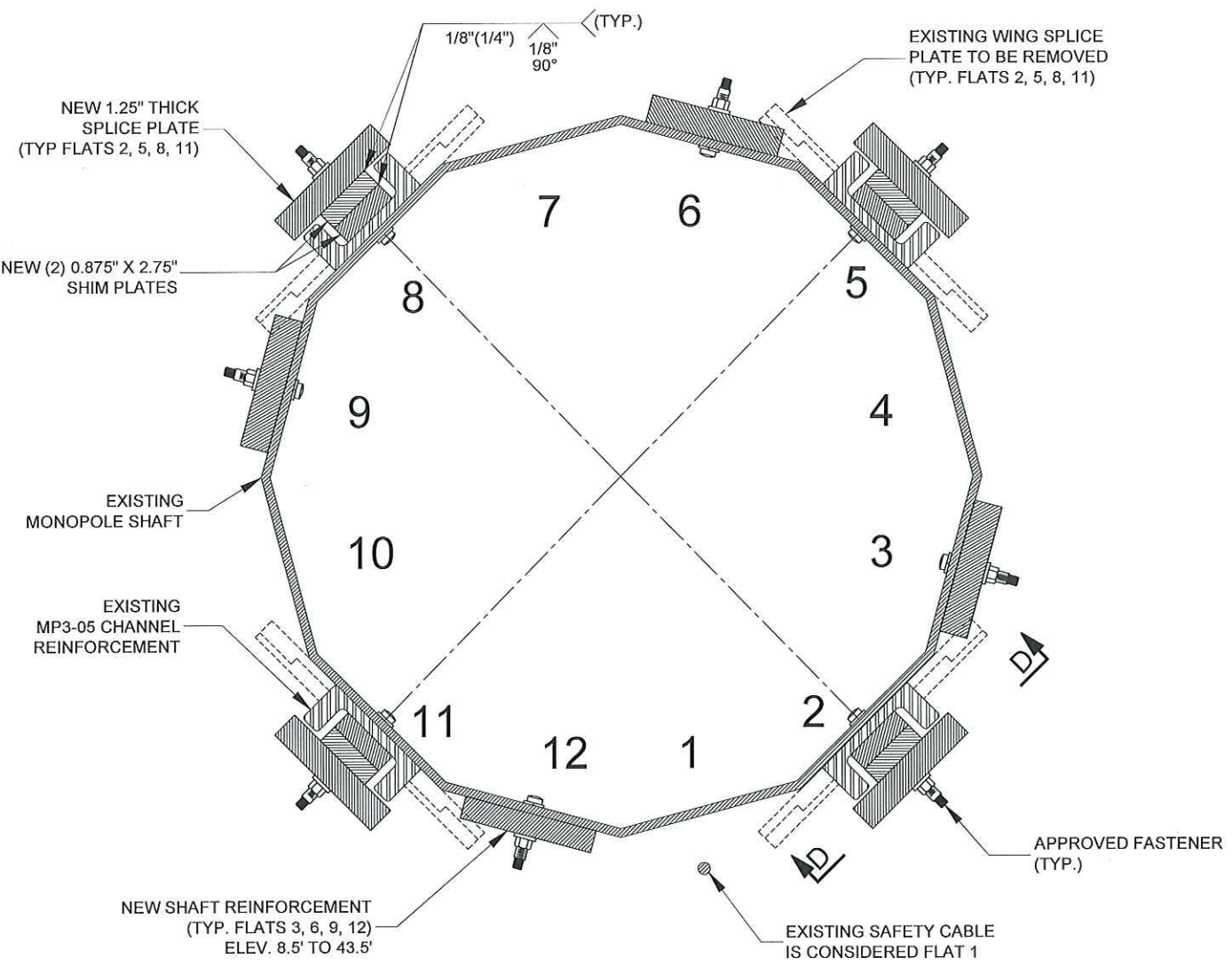


SECTION "B-B"
ANCHOR ROD BRACKET EXTENSION ELEVATION VIEW
(TYPICAL DETAIL)

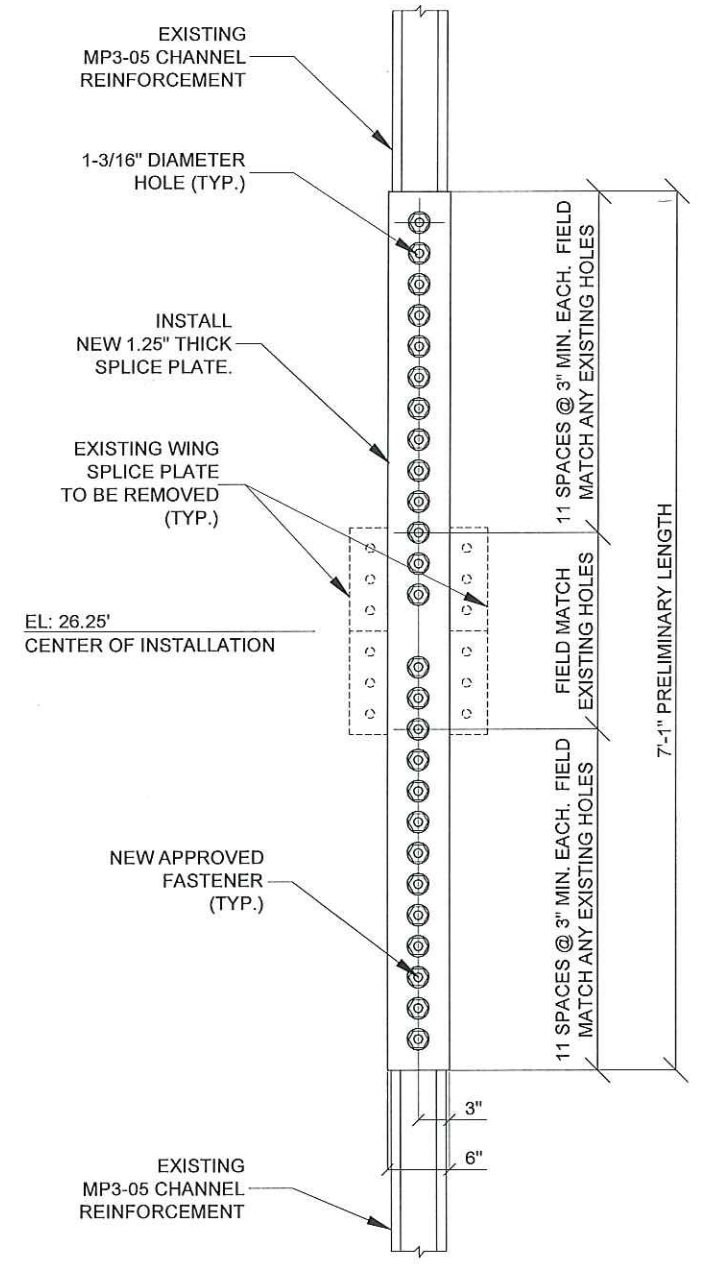
BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	4	ANCHOR ROD BRACKET EXTENSION (BP-1) A572-65

NOTE: ALL MATERIAL TO BE GALVANIZED



C-C TOWER SECTION VIEW
S-6 ELEVATION 26.25'



ELEVATION VIEW "D-D"
SPLICE PLATE INSTALLATION
(TYPICAL DETAIL)

- NOTES:**
1. ALL HOLES TO BE DRILLED. DO NOT BURN OR PUNCH.
 2. TOLERANCES: FRACTIONS +/- 1/16"
ANGLES +/- 1/2 DEGREE
DECIMALS +/- .010"
 3. THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
B. THE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123.
 4. SHIM PLATES TO BE A36 OR GREATER.
 5. EQUIVALENT SIZE SHIM PLATES CAN BE USED TO ACHIEVE CLEARANCE.
 6. REFER TO SITE SPECIFIC DESIGN FOR SIZING AND QUANTITY REQUIRED.

BILL OF MATERIAL		
ITEM	QUANTITY	DESCRIPTION
1	4	SPLICE PLATE (SP-1) PL 1 1/4" X 6" X 7'-1" (A572-65)
2	8	SHIM PLATE (SH-1) PL 7/8" X 2 3/4" X 7'-1" (A36)
3	104	APPROVED FASTENERS

NOTE: ALL MATERIAL TO BE GALVANIZED

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

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SITE BU NUMBER:
841287

SITE ADDRESS:
613 CONNECTICUT AVENUE
NORWALK, CT
06850

SHEET DESCRIPTION:
TOWER SECTION VIEW I

SHEET NUMBER:
S-6

PLANS PREPARED FOR:

CROWN CASTLE

PLANS PREPARED BY:



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

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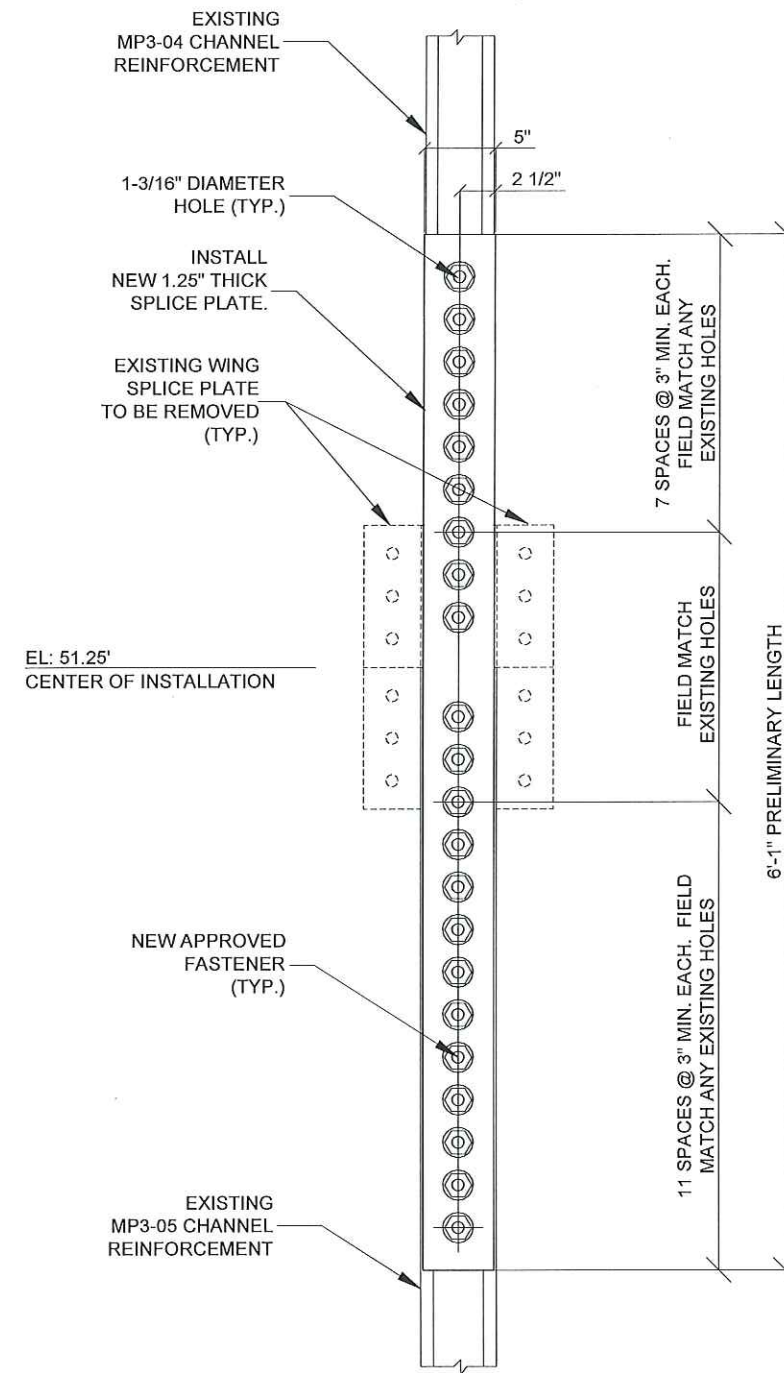
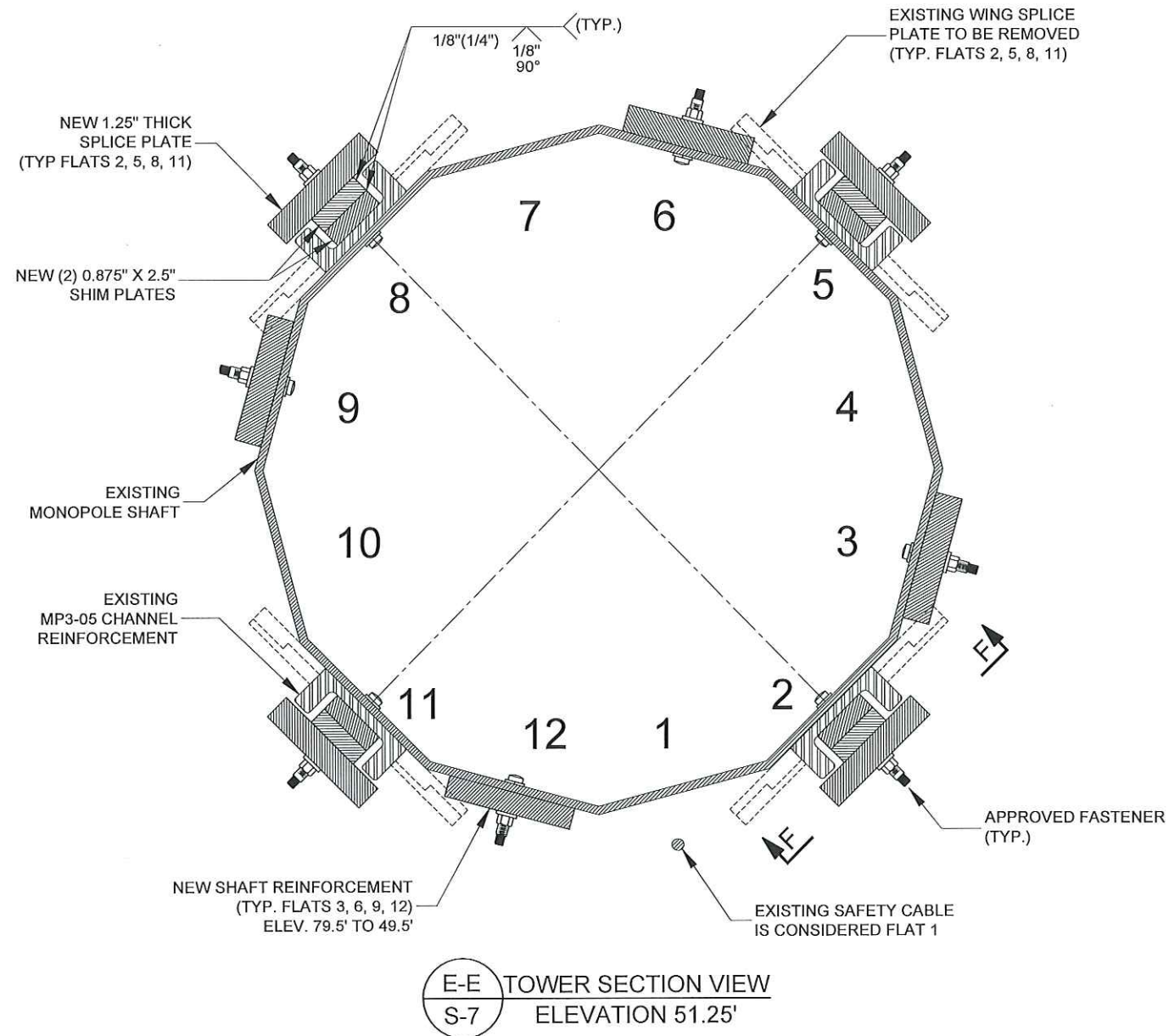
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SITE ADDRESS:
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NORWALK, CT
06850**

SHEET DESCRIPTION:
TOWER SECTION VIEW II

SHEET NUMBER:
S-7



**ELEVATION VIEW "F-F"
SPLICE PLATE INSTALLATION
(TYPICAL DETAIL)**

BILL OF MATERIAL		
ITEM	QUANTITY	DESCRIPTION
4	4	SPLICE PLATE (SP-2) PL 1 1/4" X 5" X 6'-1" (A572-65)
5	8	SHIM PLATE (SH-2) PL 7/8" X 2 1/2" X 6'-1" (A36)
6	88	APPROVED FASTENERS

NOTE: ALL MATERIAL TO BE GALVANIZED

- NOTES:**
- ALL HOLES TO BE DRILLED. DO NOT BURN OR PUNCH.
 - TOLERANCES: FRACTIONS +/- 1/16"
ANGLES +/- 1/2 DEGREE
DECIMALS +/- .010"
 - THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
B. THE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123.
 - SHIM PLATES TO BE A36 OR GREATER.
 - EQUIVALENT SIZE SHIM PLATES CAN BE USED TO ACHIEVE CLEARANCE.
 - REFER TO SITE SPECIFIC DESIGN FOR SIZING AND QUANTITY REQUIRED.

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
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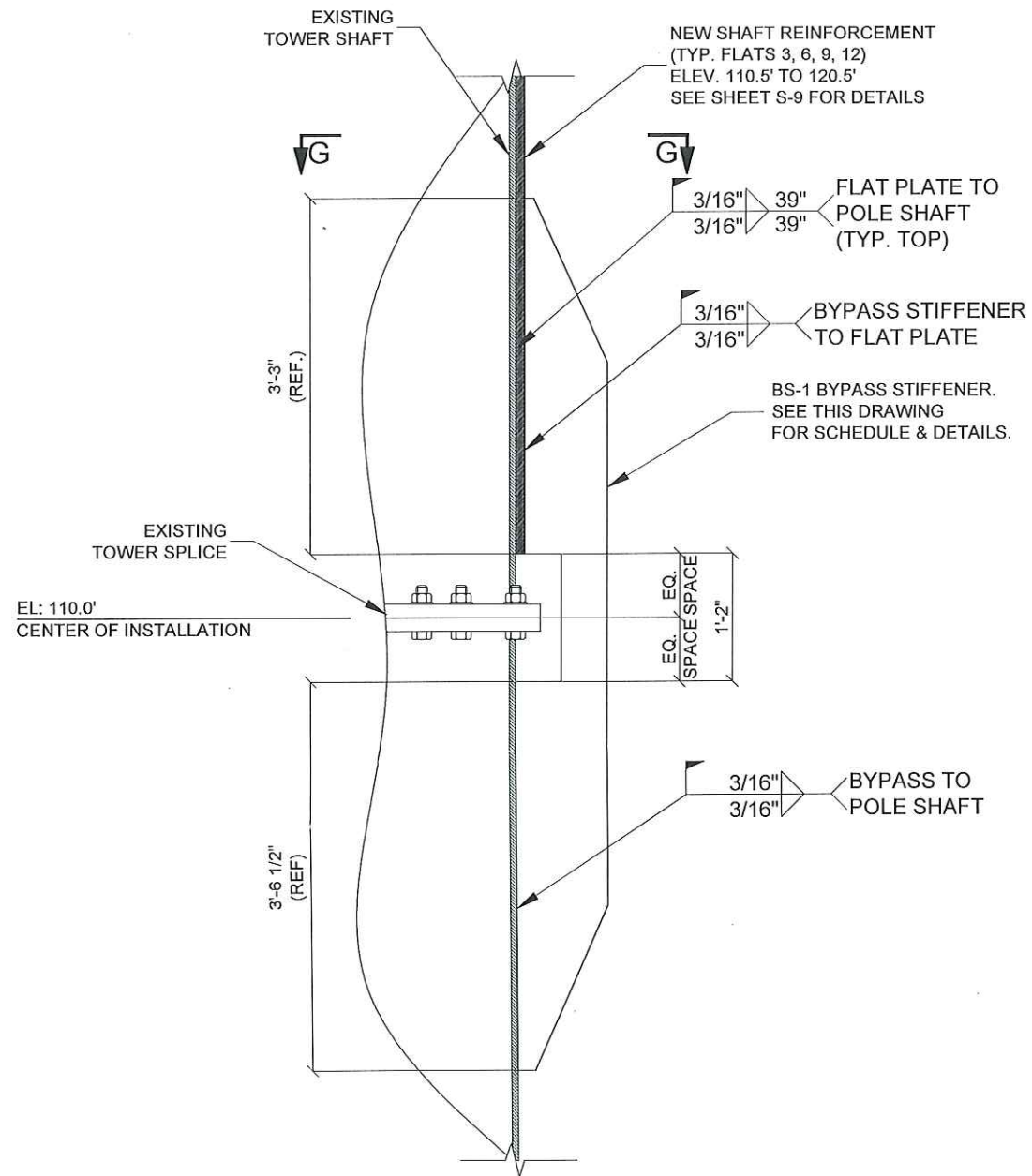
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SITE BU NUMBER:
841287

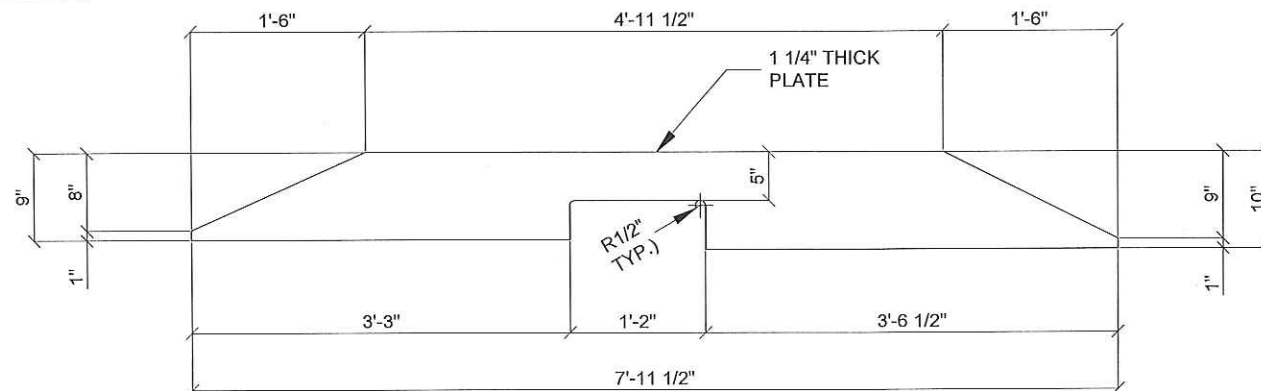
SITE ADDRESS:
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NORWALK, CT
06850

SHEET DESCRIPTION:
TOWER SECTION VIEW III

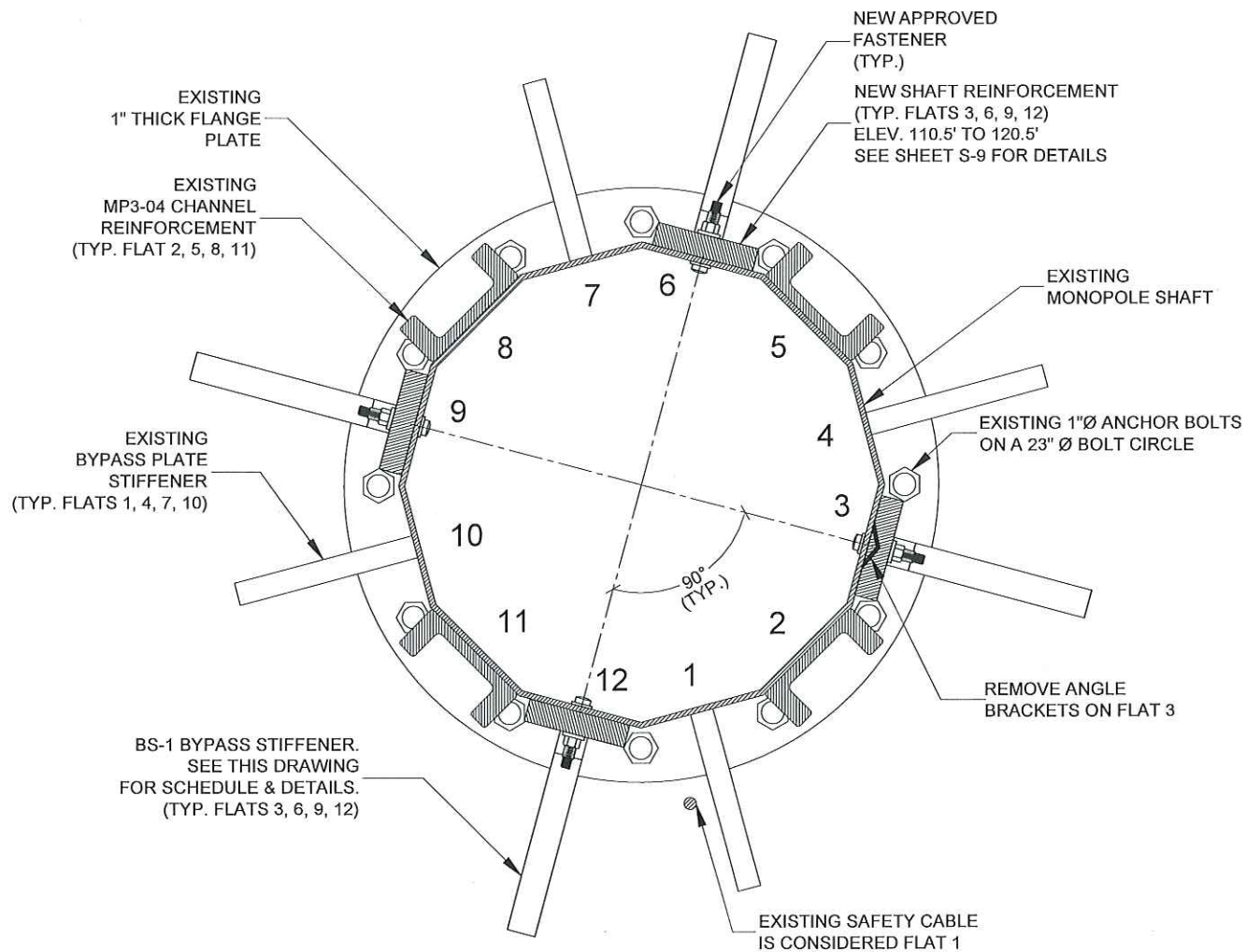
SHEET NUMBER:
S-8



**BYPASS STIFFENER INSTALLATION
ELEVATION VIEW
(TYPICAL DETAIL)**



BYPASS STIFFENER - BS1 DETAIL
PL 1 1/4" X 10" X 7'- 11 1/2" (ASTM A572-65)
(4 REQ'D)




**G-G TOWER SECTION VIEW
S-8 ELEVATION 120.0'**

- NOTES:
- ALL MATERIAL TO BE GALVANIZED.
 - (4) BYPASS STIFFENERS REQUIRED AT SPLICE ELEVATION.

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
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 Jacobs Engineering Group, Inc.
 5449 BELLS FERRY ROAD
 ACWORTH, GEORGIA 30102
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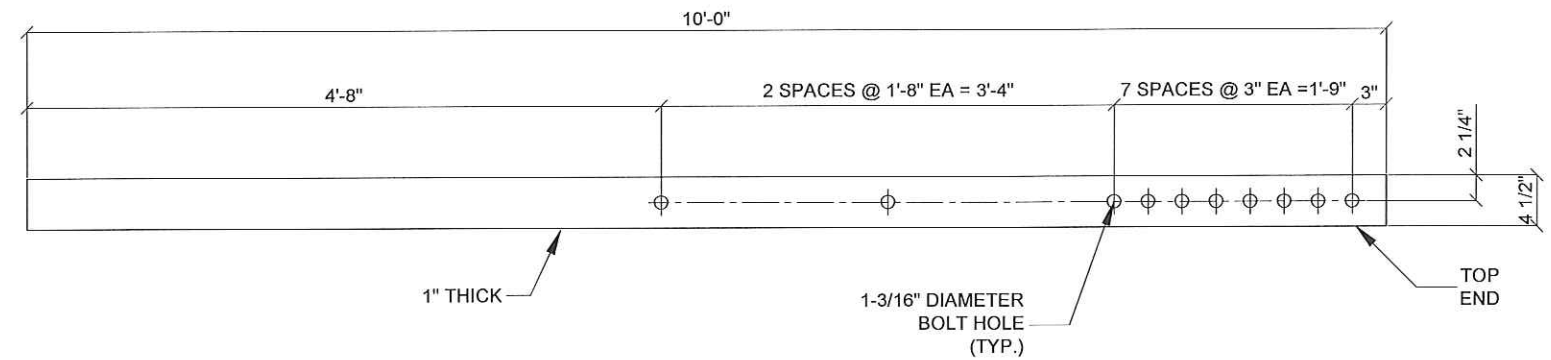
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SITE BU NUMBER:
841287

SITE ADDRESS:
**613 CONNECTICUT AVENUE
 NORWALK, CT
 06850**

SHEET DESCRIPTION:
**FLAT PLATE
 REINFORCEMENT DETAILS**

SHEET NUMBER:
S-9



CFP-04510010
 CUSTOM FLAT PLATE DETAIL
 (4) PL 1" X 4 1/2" X 10'-0" (A572-65)
 N.T.S.

- NOTES:
- ALL HOLES TO BE DRILLED. DO NOT BURN OR PUNCH.
 - TOLERANCES: FRACTIONS +/- 1/16"
 ANGLES +/- 1/2 DEGREE
 DECIMALS +/- .010"
 - THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
 A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
 B. THE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123.
 - SHIM PLATES TO BE A36 OR GREATER.
 - EQUIVALENT SIZE SHIM PLATES CAN BE USED TO ACHIEVE CLEARANCE.
 - REFER TO SITE SPECIFIC DESIGN FOR SIZING AND QUANTITY REQUIRED.

ADDITIONAL WORK REQUIRED:

1. REPAIR WORK FOR EXISTING MODIFICATIONS:

NOTE: REPAIR WORK IS INTENDED TO ADDRESS THE DEFICIENCIES NOTED IN THE LEGACY MODIFICATION INSPECTION REPORT PREPARED BY GPD GROUP ON DECEMBER 30, 2015

- (A) THERE IS AN EXISTING ANCHOR ROD BRACKET WITH AN UNDERSIZED 5/16" VERTICAL FILLET WELD. REPAIR THIS WELD PER AWS D1.1 SPECIFICATIONS.
- (B) CORROSION WAS FOUND IN VARIOUS AREAS THROUGHOUT THE EXISTING MODIFICATION INCLUDING BURN THROUGH ON THE INSIDE OF THE MONOPOLE. CLEAN AREAS OF CORROSION AND APPLY 2 COATS OF CROWN APPROVED COLD GALVANIZATION COMPOUND.
- (C) THERE IS A MISSING BOLT ON THE EXISTING AERO CHANNEL REINFORCEMENT AT THE 80.0' ELEVATION. INSTALL AN APPROVED FASTENER AT THIS LOCATION.

2. CLIMBING SYSTEM WORK:

THE TOWER HAS STEP BOLTS WELDED TO FLAT BAR MOUNTS ON VARIOUS FLATS THROUGHOUT THE LENGTH OF THE TOWER. THESE FLAT BAR MOUNTS ARE BOLTED TO THE TOWER SHAFT. WHERE INTERFERENCE EXISTS WITH THE NEW REINFORCEMENTS, THESE FLAT BAR MOUNTS ARE TO BE REMOVED FROM THE TOWER. EMPTY HOLES LEFT FROM THE REMOVAL OF THE FASTENERS SHOULD BE CLEANED AND 2 COATS OF CROWN APPROVED COLD GALVANIZATION COMPOUND SHOULD BE APPLIED. THIS WORK NEEDS TO BE COMPLETED, BEFORE NEW FLAT PLATE REINFORCEMENT IS INSTALLED ON THE TOWER AND PHOTOS OF THIS WORK SHOULD BE SUBMITTED FOR THE MI INSPECTION. REINSTALL STEP BOLTS PER DETAILS SEEN ON SHEET S-11 OF THESE DRAWINGS.

3. REMOVE EXISTING ANGLE BRACKETS WHERE REQUIRED DUE TO INTERFERENCE. TAKE CARE TO INSURE THAT THE MONOPOLE SHAFT IS NOT UNDERCUT DURING THE REMOVAL OF THESE BRACKETS. REFERENCE SHEET S-8 FOR FURTHER DETAILS.

4. AFTER ALL WORK IS COMPLETE, PAINT ALL NEW REINFORCEMENTS TO MATCH THE EXISTING TOWER. PAINT ANY AREAS WHERE NEW COLD GALVANIZATION WAS APPLIED.

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

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SITE BU NUMBER:

841287

SITE ADDRESS:

613 CONNECTICUT AVENUE
NORWALK, CT
06850

SHEET DESCRIPTION:

REPAIR WORK
AND MISCELLANEOUS

SHEET NUMBER:

S-10

PLANS PREPARED FOR:

CROWN CASTLE

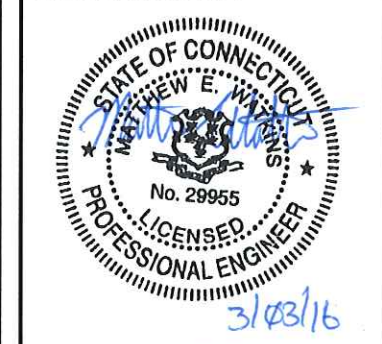
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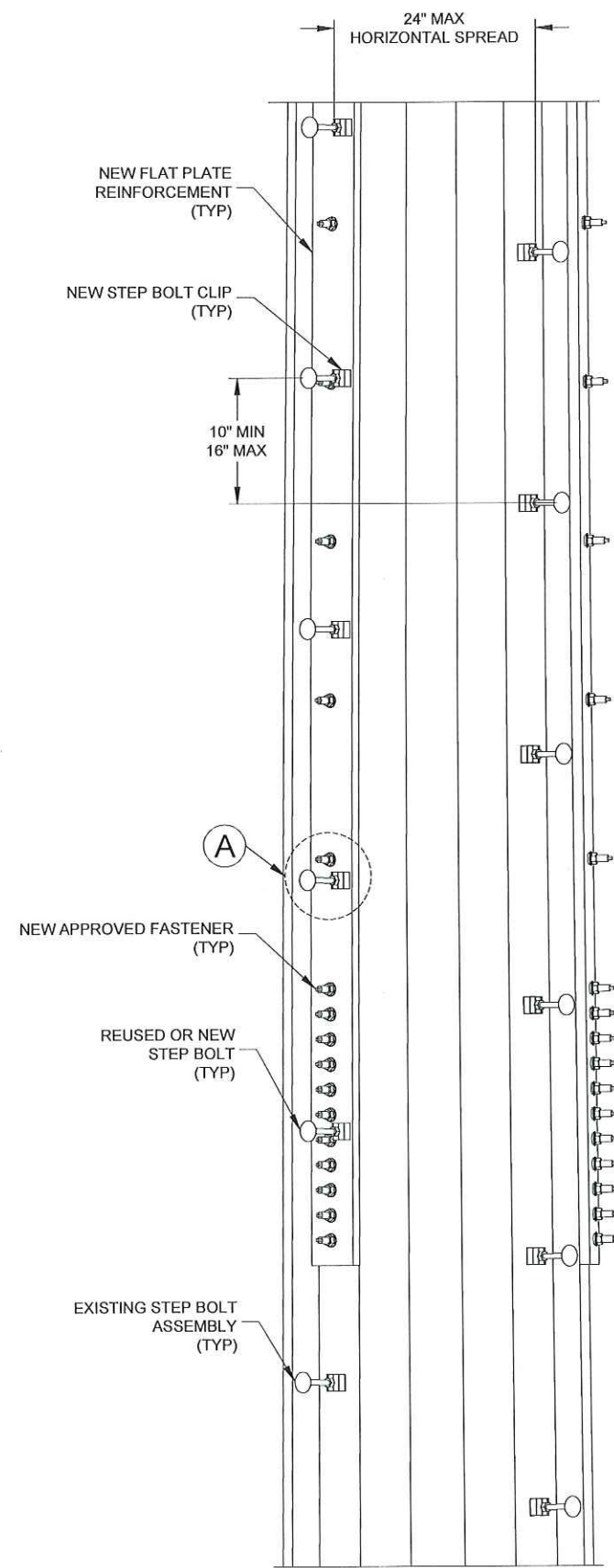
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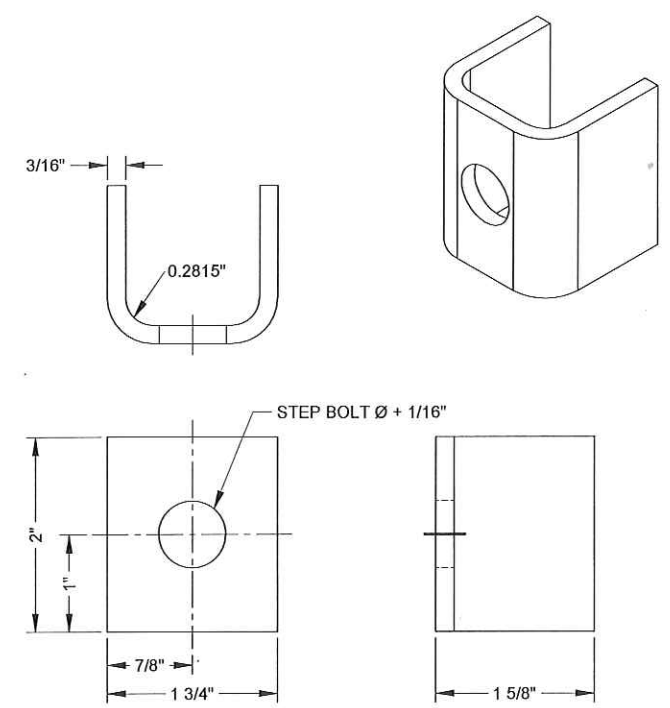
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NORWALK, CT
06850**

SHEET DESCRIPTION:
STEP BOLT CLIP

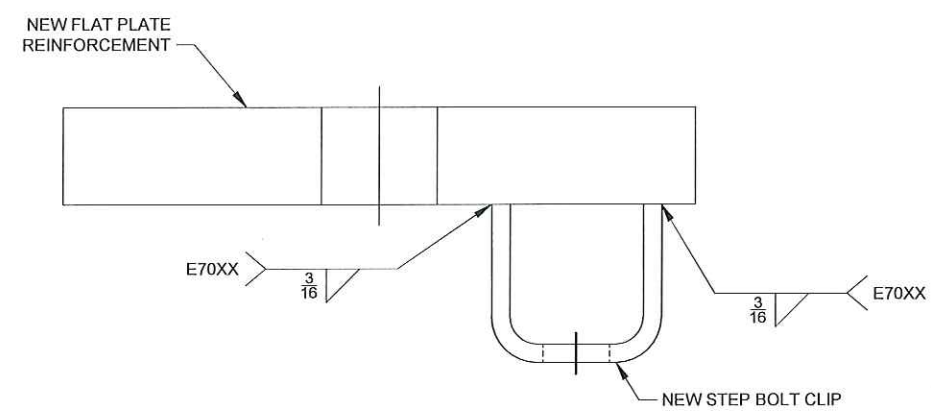
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S-11



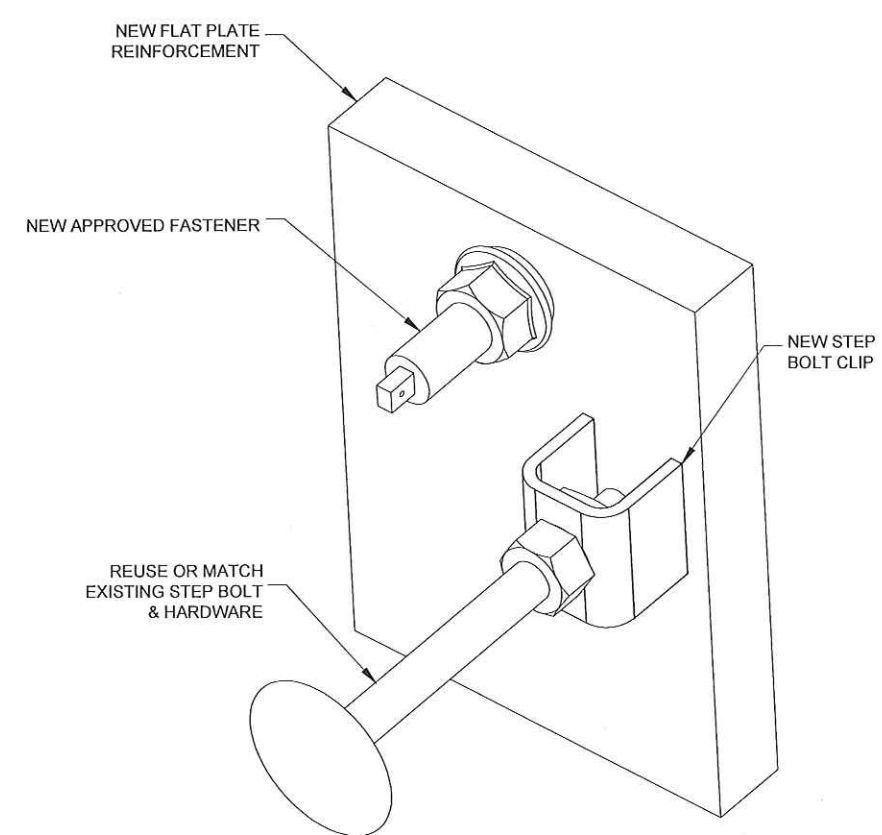
TOWER ELEVATION VIEW
ACTUAL REINFORCEMENT CONFIGURATION NOT SHOWN.
FOR ILLUSTRATION PURPOSES ONLY.



STEP BOLT CLIP (A36)



STEP BOLT CLIP WELD DETAIL



A STEP BOLT CLIP INSTALLATION DETAIL

- NOTES:**
- STEP BOLT CLIP WELDS ARE SUBJECT TO AWS D1.1 AND MUST BE CWI INSPECTED. REFER TO DOCUMENT "ENG-STD-10069 GC CWI REQUIREMENT STANDARD" FOR CWI REQUIREMENTS.
 - STEP BOLT CLIPS CAN BE FIELD WELDED, BUT IT IS ALSO ACCEPTABLE TO SHOP WELD THE STEP BOLT CLIPS TO THE FLAT BAR, PROVIDED THAT THEY MEET THE CRITERIA NOTED HEREIN. IF STEP BOLT CLIPS ARE NOT NEEDED IN THE FIELD THEY CAN BE LEFT UNUSED.
 - SHOP WELDED STEP PEG CLIPS SHALL BE INSTALLED PRIOR TO HOT DIP GALVANIZING.
 - CONTRACTOR MAY REUSE EXISTING STEP BOLTS AND HARDWARE ONLY IF THEY ARE NOT DAMAGED OR SHOW SIGNIFICANT WEAR AND/OR CORROSION.
 - IF NEW STEP BOLTS ARE REQUIRED, MATCH EXISTING STEP BOLT SIZES. MINIMUM DIAMETER IS 5/8", MAXIMUM DIAMETER IS 3/4" AND MAXIMUM BOLT LENGTH IS 10".
 - CENTER TO CENTER STAGGERED SPACING SHOULD BE MATCHED TO EXISTING FIELD CONDITIONS. STAGGERED SPACING SHALL BE A MINIMUM OF 10" AND MAXIMUM OF 16".
 - MINIMUM CLEAR WIDTH OF STEP BOLTS IS 4 1/2" AND A BUTTON HEAD IS REQUIRED.
 - HORIZONTAL SPREAD IS TO NOT EXCEED 24".



SITE SAFE
RF COMPLIANCE EXPERTS

A BUSINESS OF FDH VELOCITEL

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info@sitesafe.com • www.sitesafe.com



SmartLink, LLC on behalf of AT&T Mobility, LLC

Site FA – 10034974

Site ID – CT2108 (3C)

USID – 60395

**Site Name – Norwalk West-CT
Ave**

Site Compliance Report

**613 Connecticut Avenue
Norwalk, CT 06850**

Latitude: N41-5-49.47

Longitude: W73-26-56.60

Structure Type: Monopole

Report generated date: February 9, 2016

Report by: Leo Romero

Customer Contact: Kristen Smith

**AT&T Mobility, LLC will be compliant when the
remediation recommended in section 5.2 or
other appropriate remediation is implemented.**

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	No
RF Sign(s) @ antennas	No
Barrier(s) @ sectors	No
Max cumulative simulated Radio Frequency Exposure (RFE) level on the Ground	<5% of General Public limit
FCC & AT&T Compliant?	Will Be Compliant.

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CT2108_2016-LTE-Next-Carrier_LTE-3C_ra9161_2051585311_10034974_60395_09-28-2015_Preliminary-Approved_v1.00

RF Configuration Datasheet: CT_33 sites with power density form

2 Map of Site

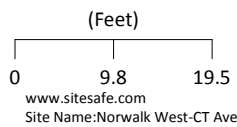
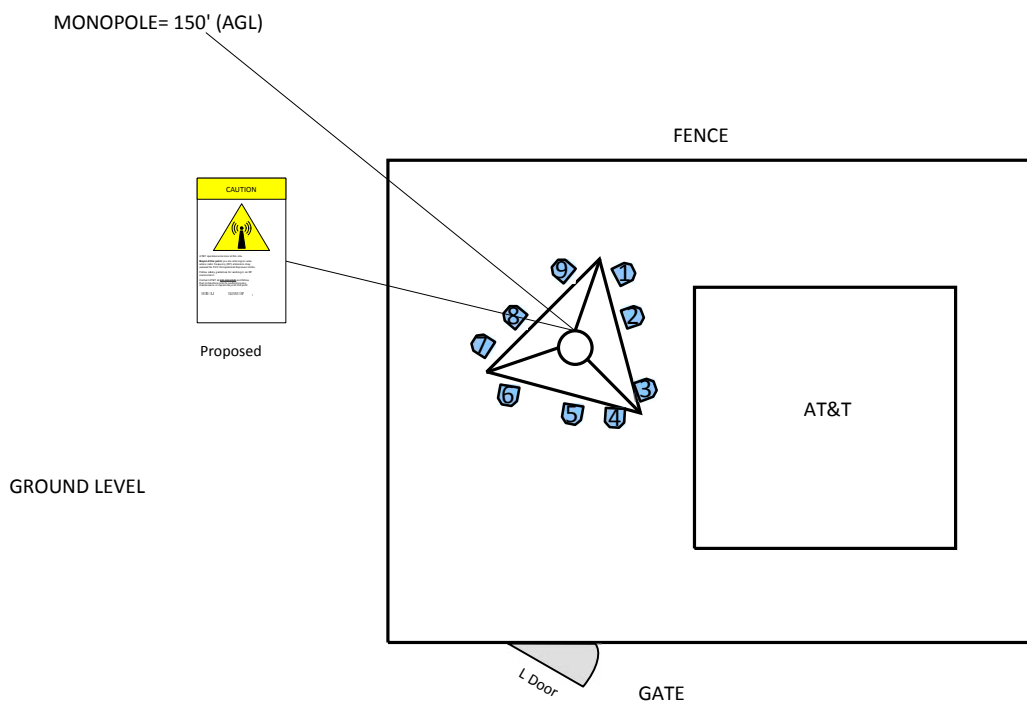
In the RF Emissions Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

The following diagrams are included:

- Site Map
- RF Emissions Diagram
- Elevation View

Site Map For: Norwalk West-CT Ave



AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

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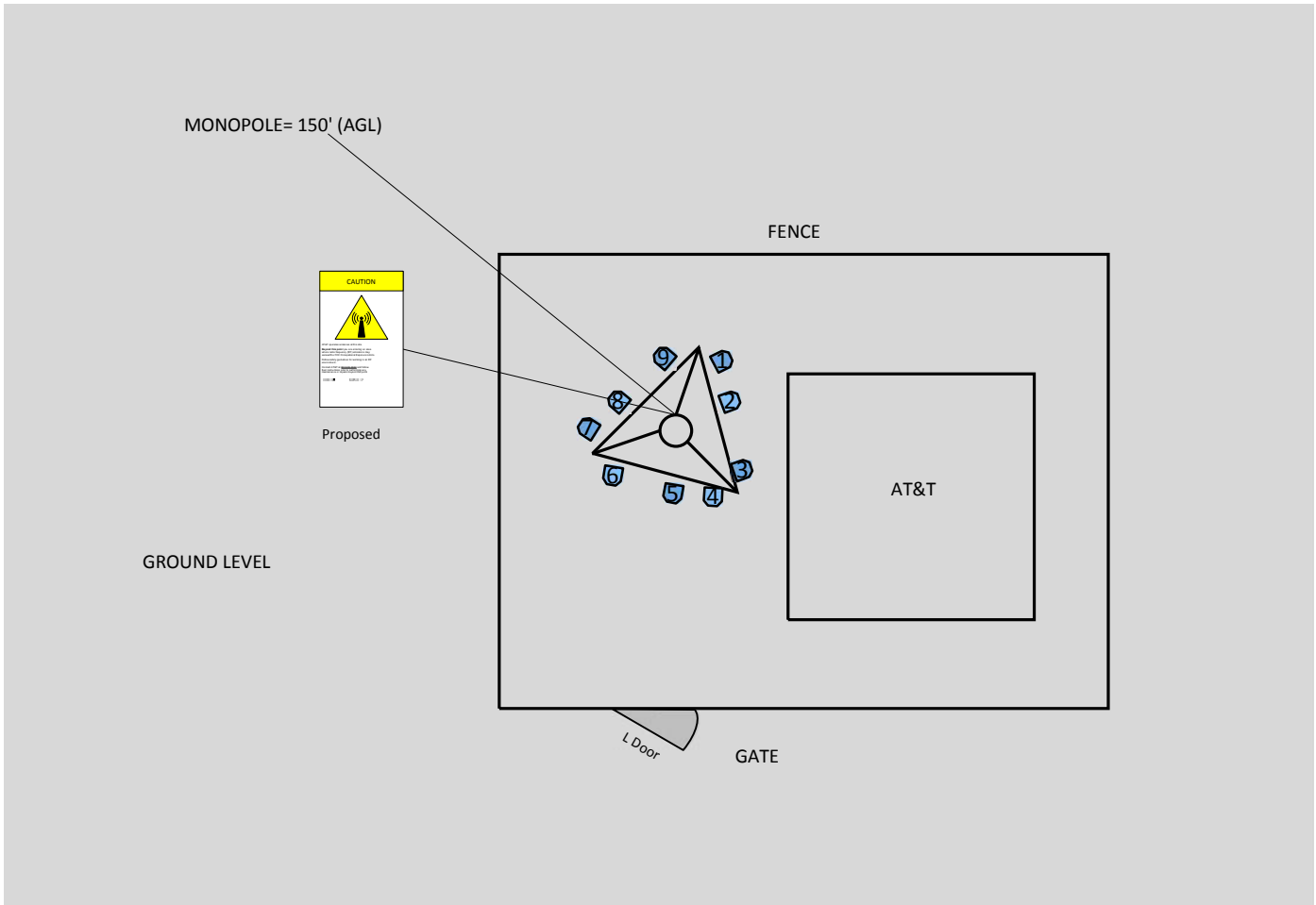
3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

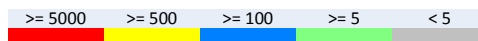
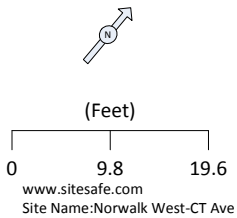
Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	23	82	4.6	11.51	0	2	0	386.6	126.6'	163.5'	150.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	23	86	4.6	13.41	0	1	0	375	126.6'	163.5'	150.7'
2	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	737	30	67	4	11.66	0	0	1	483.2	127.4'	159.1'	151'
2	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	1900	30	65	4	13.86	0	0	1	1600.1	127.4'	159.1'	151'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	30	61	4.6	11.47	1	0	0	88.7	128.7'	151.8'	150.7'
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	30	61	4.6	14.3	0	0	1	594.5	128.7'	151.8'	150.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	143	82	4.6	11.51	0	2	0	386.6	125.6'	148.8'	150.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	1	0	375	125.6'	148.8'	150.7'
5	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	737	150	67	4	11.66	0	0	1	483.2	121.2'	149.2'	151'
5	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	1900	150	65	4	13.86	0	0	1	1600.1	121.2'	149.2'	151'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	150	61	4.6	11.47	1	0	0	88.7	114.7'	151.1'	150.7'
6	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	150	61	4.6	14.3	0	0	1	594.5	114.7'	151.1'	150.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	2	0	386.6	112.1'	156.3'	150.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	375	112.1'	156.3'	150.7'
8	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	737	270	67	4	11.66	0	0	1	483.2	115.3'	159.2'	151'
8	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	1900	270	65	4	13.86	0	0	1	1600.1	115.3'	159.2'	151'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	270	61	4.6	11.47	1	0	0	39.6	120.2'	163.9'	150.7'
9	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	270	61	4.6	14.3	0	0	1	594.5	120.2'	163.9'	150.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level (AGL)**. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

RF Emissions Simulation For: Norwalk West-CT Ave Composite View



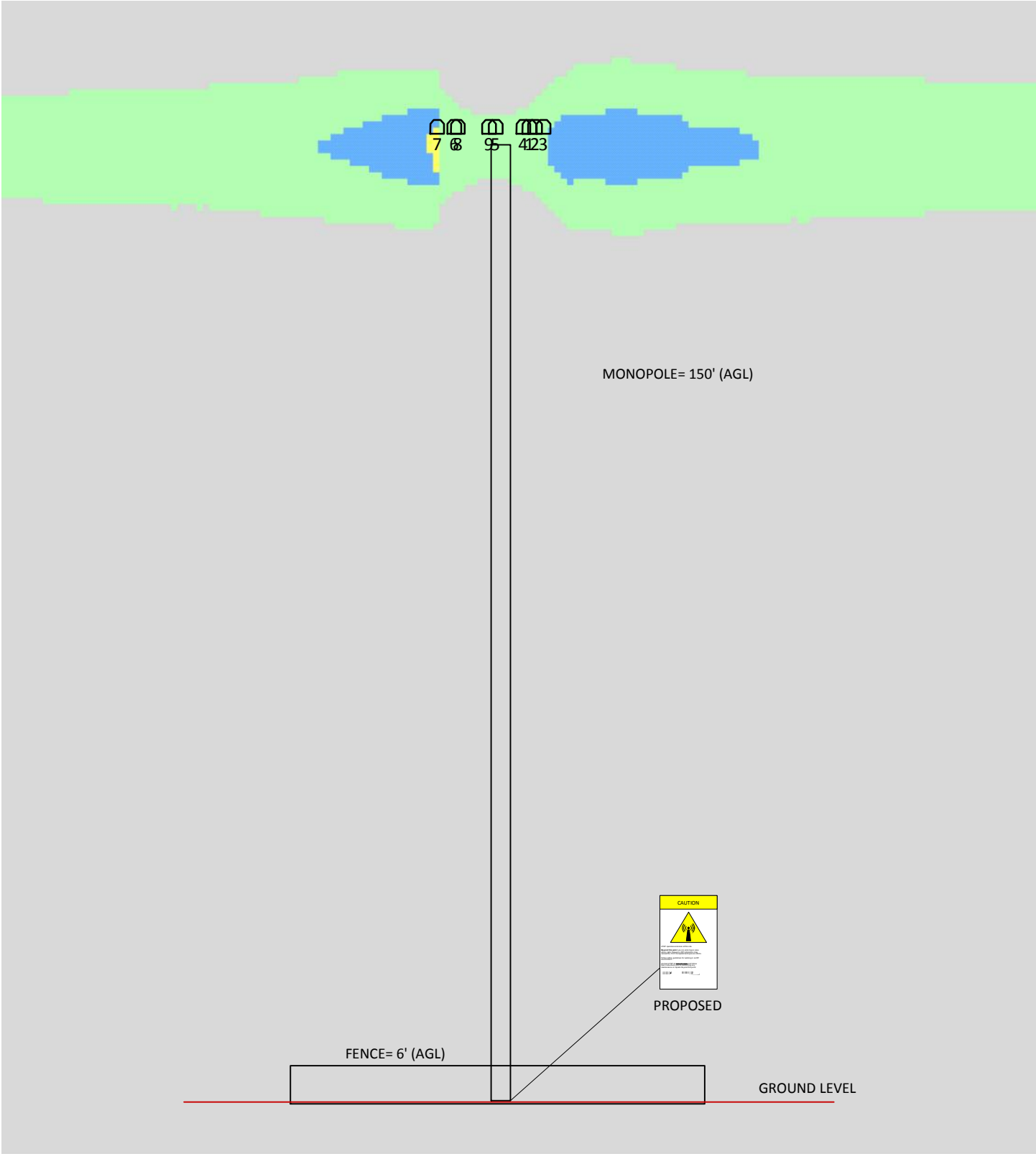
% of FCC Public Exposure Limit
Spatial average 0' - 6'



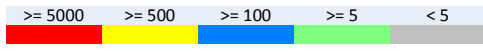
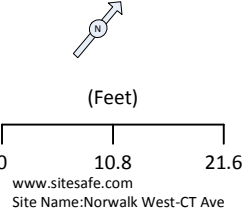
AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT
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RF Emissions Simulation For: Norwalk West-CT Ave Elevation View



% of FCC Public Exposure Limit
Spatial average 0' - 6'



AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

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5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

The site will be made compliant if the following changes are implemented:

Monopole Access Location

Yellow caution 2 sign required.

AT&T Mobility, LLC Proposed Alpha Sector Location

No action required.

AT&T Mobility, LLC Proposed Beta Sector Location

No action required.

AT&T Mobility, LLC Proposed Gamma Sector Location

No action required.

6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Leo Romero.

February 9, 2016

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 (“OET Bulletin 65”), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or “Controlled environment” and General Public or “Uncontrolled environment”. The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

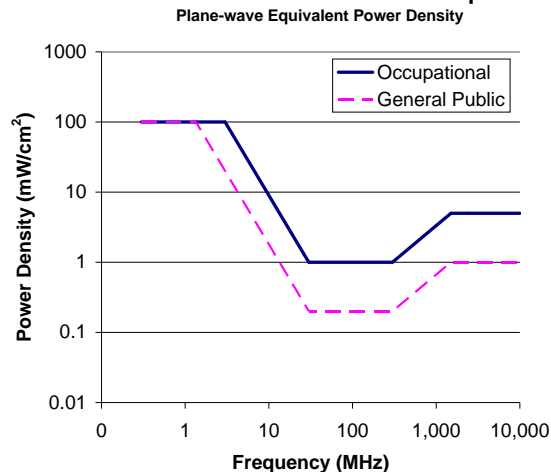
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

FCC Limits for Maximum Permissible Exposure (MPE)



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

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

f = frequency in MHz

*Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit.**
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers.**
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.**
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of “Generic” as an antenna model, or “Unknown” for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC’s Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA’s role is to promote the safety and health of America’s working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter’s final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf

Fairfax County, Virginia Public School Survey

<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-ionising Radiation

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>