



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

February 10, 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: 881364
AT&T Site ID: CT1108
123 Costello Road, Newington, CT 06111
Latitude: 41° 39' 18.72" / Longitude: -72° 43' 17.19"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 105-foot level of the existing 145-foot monopole at 123 Costello Road in Newington, CT. The tower is owned by Crown Castle. The property is owned by Costello Industries Inc. AT&T now intends to replace three (3) antennas with three (3) new CCI 800 MHz antennas. These antennas would be installed at the 105-foot level of the tower. AT&T also intends to install three (3) RRU32s, one (1) Raycap, two (2) DC trunks, and one (1) Fiber trunk.

This facility was approved by Newington Town Plan and Zoning Commisision in Petition 65-01 on November 28, 2001. This approval included the conditions that:

1. All ground equipment shall be located within a 8' fence enclosure, no equipment shall be placed within 10' side setback area.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Stephen Woods, Mayor, Town of Newington 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.

Melanie A. Bachman

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3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, 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 Stephen Woods, Mayor, Town of Newington
131 Cedar Street
Newington, CT 06111

Costello Industries Inc
123 Costello Road
Newington, CT 06111



TOWN OF NEWINGTON

Town Hall • 131 Cedar Street, Newington, Connecticut 06111
Central Telephone (860) 665-8500
Department Telephone (860) 665-8575
Department Fax No. (860) 665-8577

Certified Mail No. 7106 4575 1292 0696 5209
OFFICE OF THE TOWN PLANNER

CERTIFICATE OF ACTION

TO: Kenneth C. Baldwin
Robinson & Cole LLP
280 Trumbull Street
Hartford CT 06103-3597

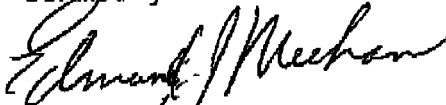
DATE: December 3, 2001

SUBJECT: PETITION 65-01 123 Costello Road, Costello Industries owner, Cellco Partnership d/b/a Verizon Wireless applicant, represented by Kenneth C. Baldwin, Robinson & Cole LLP, 280 Trumbull Street Hartford, CT 06103-3597 requests Special Exception Section 3.2.7 PCS antenna co location and ground base equipment, PD Zone District.

At a meeting held November 28, 2001, the Newington Town Plan and Zoning Commission voted to approve the above referenced PETITION subject to the following conditions:

1. Approval is granted for the placement of Verizon Wireless PCS platform and antenna as a co-locator on the existing monopole at the elevation of 125' as shown on plans prepared by URS Corporation AES, 795 Brook Street Rocky Hill, CT, dated 10-11-01, Sheets T-1, Z-1 and Z-2, entitled "123 Costello Road", Newington, Connecticut."
2. All ground equipment shall be located within an 8' fence enclosure, no equipment shall be placed within 10' side setback area.
3. The approval of this special exception shall be void and of no effect unless construction of the project commences within one year from the date of the Commission's approval. The term "construction" pertains to the installation of the antenna and support ground facilities by the Verizon Wireless.
4. Prior to the installation of the Verizon Wireless antenna building permits shall be obtained.

Certified by:



Edmund J. Meehan
Town Planner

This Special Exception will not become effective until this Certificate of Action is filed by the applicant on the Land Records of the Town of Newington.

This Site Plan Modification will not become effective until 1) a transparency of the Certificate of Action is affixed to the original site plan mylar, 2) the modification is incorporated into the site plan and noted as a revision and 3) a mylar copy of the modified signed site plan original mylar is filed in the Town Plan and Zoning Office.

An Autocad DXF File shall be provided to the Town Planner for incorporation into the Town's GIS database at the time of submission of the plan mylar.

PROJECT INFORMATION

SCOPE OF WORK:

- AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR, FOR A TOTAL (3) NEW ANTENNAS. (2) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (6) EXISTING ANTENNAS TO REMAIN. (1) EXISTING ANTENNA PER SECTOR FOR (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- AT&T RRUS: (1) NEW RRUS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUS; (2) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (6) EXISTING RRUS.
- AT&T SQUID: (1) NEW DC6 SURGE, FOR A TOTAL OF (1) NEW SQUID, (1) EXISTING DC-6 SURGE PROTECTOR, FOR A TOTAL OF (1) EXISTING SQUID TO REMAIN.
- AT&T CABLING: INSTALL (1) FIBER TRUNK AND (2) DC TRUNKS

SITE ADDRESS: 123 COSTELLO ROAD
NEWINGTON, CT 06111

LATITUDE: 41.6551889 41° 39' 18.68"N
LONGITUDE: -72.721442 -72° 43' 17.19"W

USID: 14525

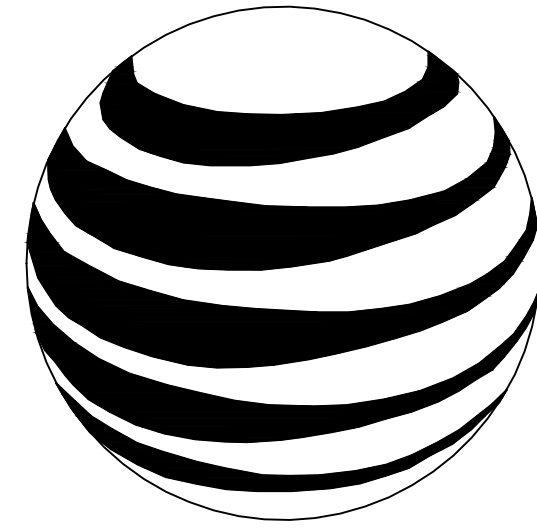
TOWER OWNER: TBD

TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT

MONOPOLE HEIGHT: 145'-0"±
RAD CENTER: 105'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



at&t
MOBILITY

FA CODE: 10042331
SITE NUMBER: CTU1108
SITE NAME: NEWINGTON SOUTH
BUN#: 881364

PROJECT TEAM

CLIENT REPRESENTATIVE

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

SITE ACQUISITION:

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

ZONING:

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

ENGINEERING:

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

RF ENGINEER:

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

CONSTRUCTION MANAGEMENT:

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

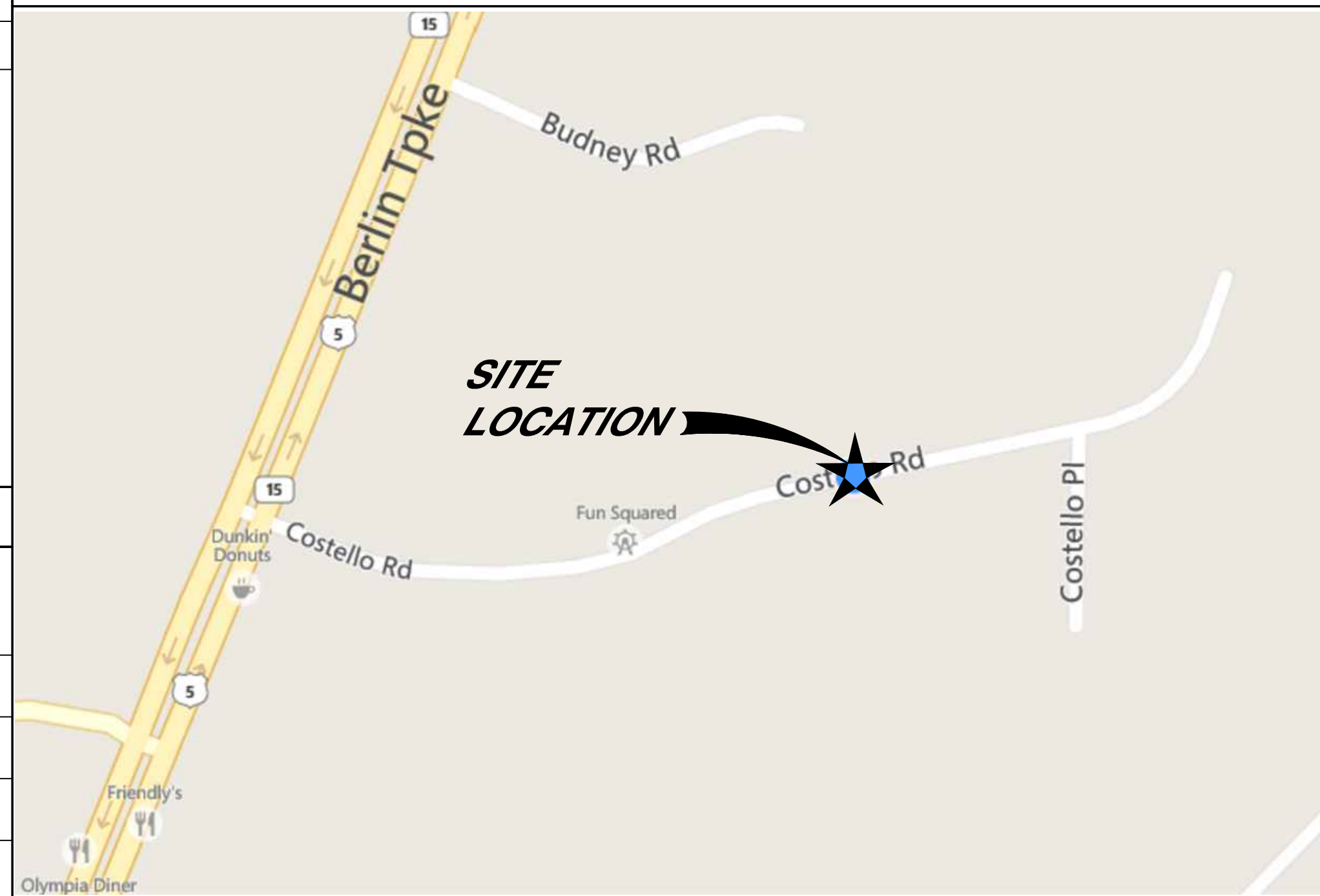
DRAWING INDEX

REV.

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VICINITY MAP

PROCEED EAST ON ENTERPRISE DR. TURN LEFT ON CAPITOL BLVD. TURN LEFT ON WEST ST. LEFT TURN HARTFORD/I-91 N. EXIT RIGHT FOLLOWING THE SIGN WINDSOR/BLOOMFIELD (EXIT 35A-35B). AT RAMP'S END, TAKE A LEFT TO PUTNAM HWY/CT-218. TURN RIGHT ON PINE LN. SITE WILL BE ON THE RIGHT.



GENERAL NOTES

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

APPROVALS

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

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



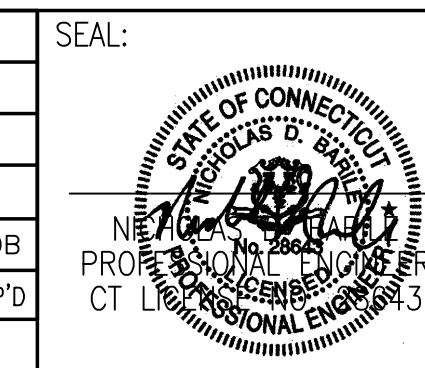
CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811



SITE NUMBER: CTU1108
SITE NAME: NEWINGTON SOUTH
123 COSTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY



| 0 | 02/08/16 | ISSUED AS FINAL | NJM | NDB | NDB |
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| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: NJM | DRAWN BY: NJM | | |



| | | |
|--------------------------------------|-----------------------|----------|
| AT&T | | |
| DRAWING TITLE: TITLE SHEET | | |
| JOB NUMBER 15053-EMP | DRAWING NUMBER T-1 | REV 0 |

GROUNDING NOTES:

- 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.
- 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.
- THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
- 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.
- 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.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
- ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – EMPIRE TELECOM
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – AT&T MOBILITY
 OEM – ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).
- 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.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
- 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.
- SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
- ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
- ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
- CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
- 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.
- THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

- SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
 - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
 - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
- SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
 - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
 - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
 - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
 - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
 - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
 - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
 - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
- 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.
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

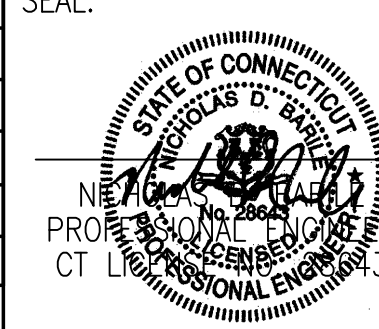


SITE NUMBER: CTU1108
SITE NAME: NEWINGTON SOUTH
123 COSTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY

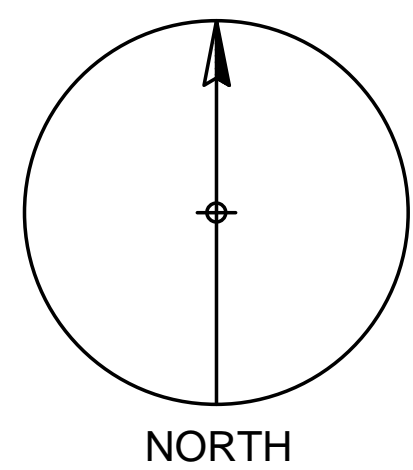
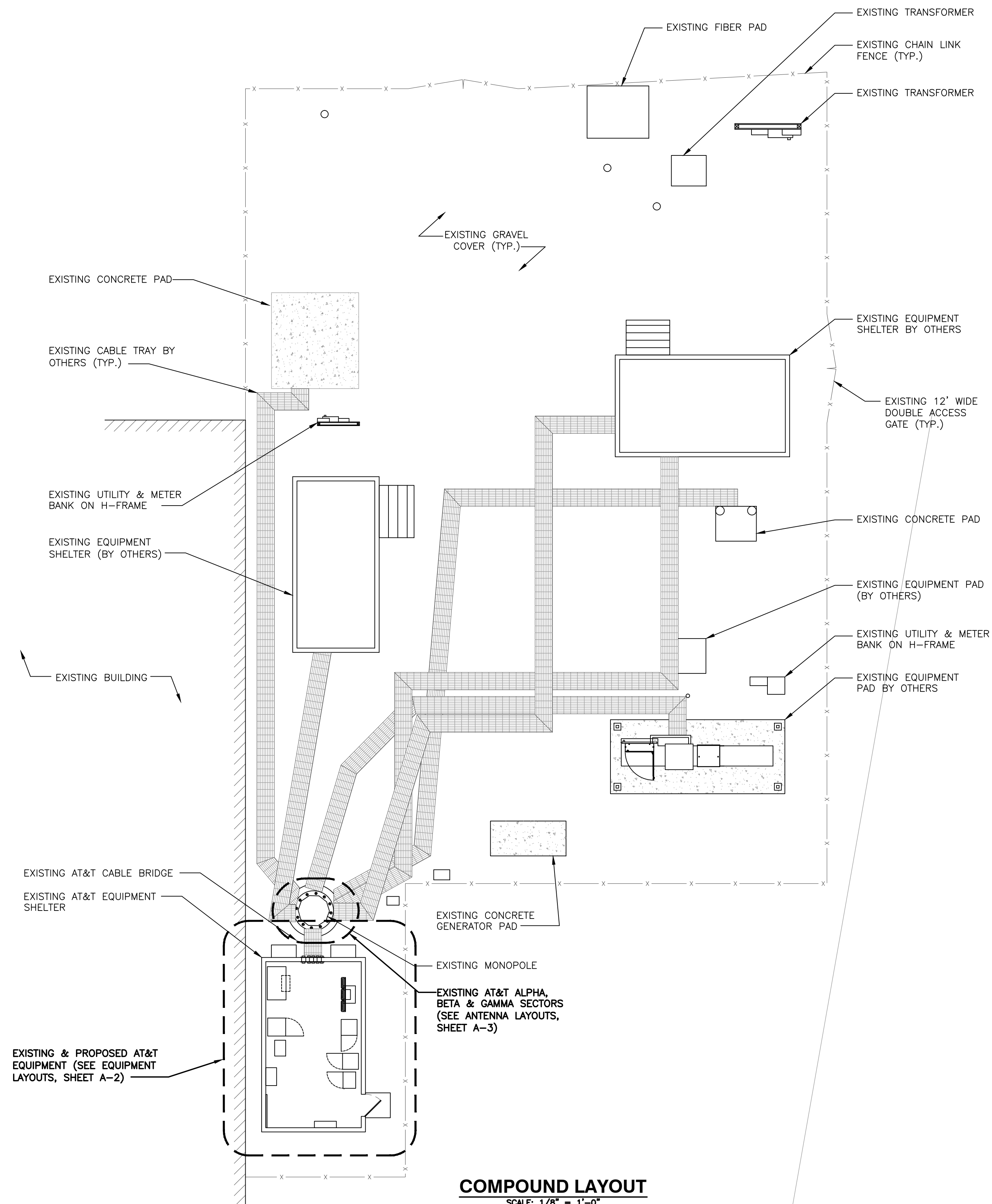


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| 0 | 02/08/16 | ISSUED AS FINAL | NJM | NDB | NDB |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: NJM | DRAWN BY: NJM | | |

SEAL:



| | | |
|--------------------------------------------------------|-------------------------------|-----------------|
| AT&T | | |
| DRAWING TITLE: GROUNDING & GENERAL NOTES | | |
| JOB NUMBER 15053-EMP | DRAWING NUMBER GN-1 | REV 0 |



COMPOUND LAYOUT
 SCALE: 1/8" = 1'-0"
 GRAPHIC SCALE: 1/8" = 1'-0"

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

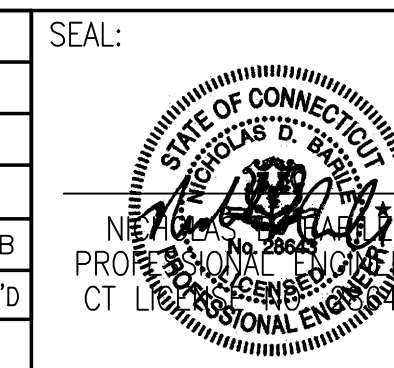
COM-EX
 Consultants
 115 ROUTE 46
 SUITE E39
 MOUNTAIN LAKES, NJ 07046
 PHONE: 862.209.4300
 FAX: 862.209.4301

EMPIRE
 telecom
 16 ESQUIRE ROAD
 BILLERICA, MA 01821

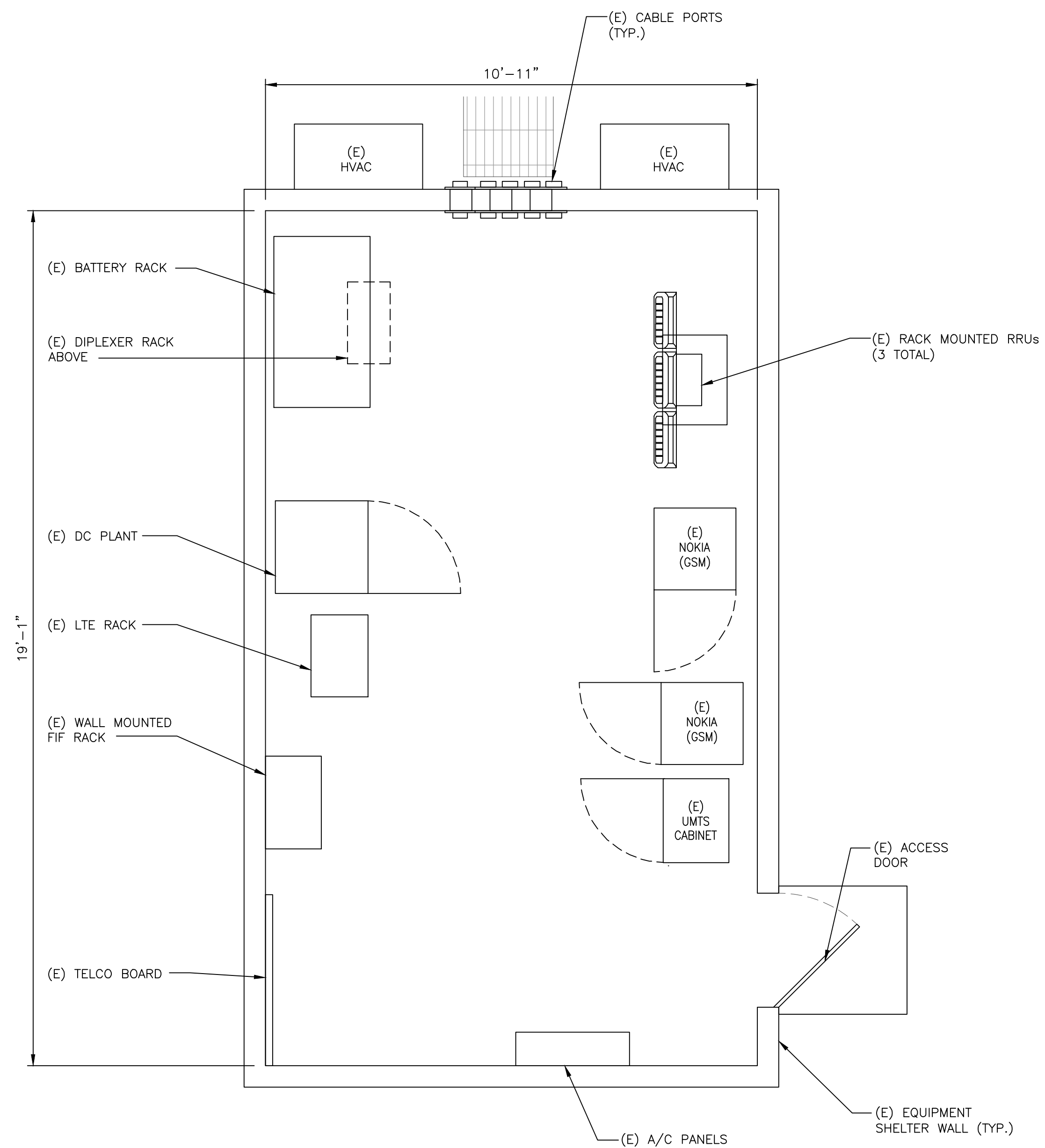
SITE NUMBER: CTU1108
SITE NAME: NEWINGTON SOUTH
 123 COSTELLO ROAD
 NEWINGTON, CT 06111
 HARTFORD COUNTY

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

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|-----------------|----------|------------------|---------------|-----|-------|
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
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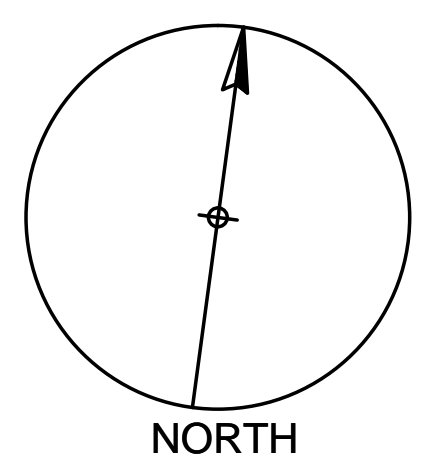
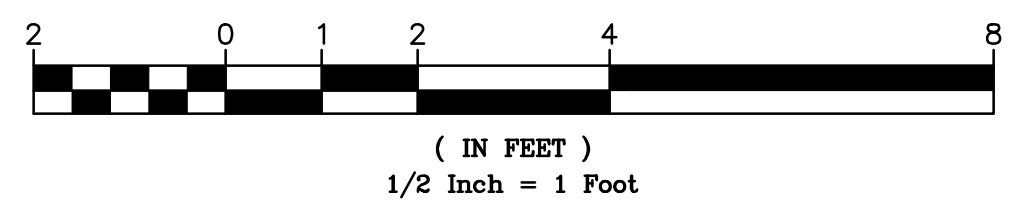


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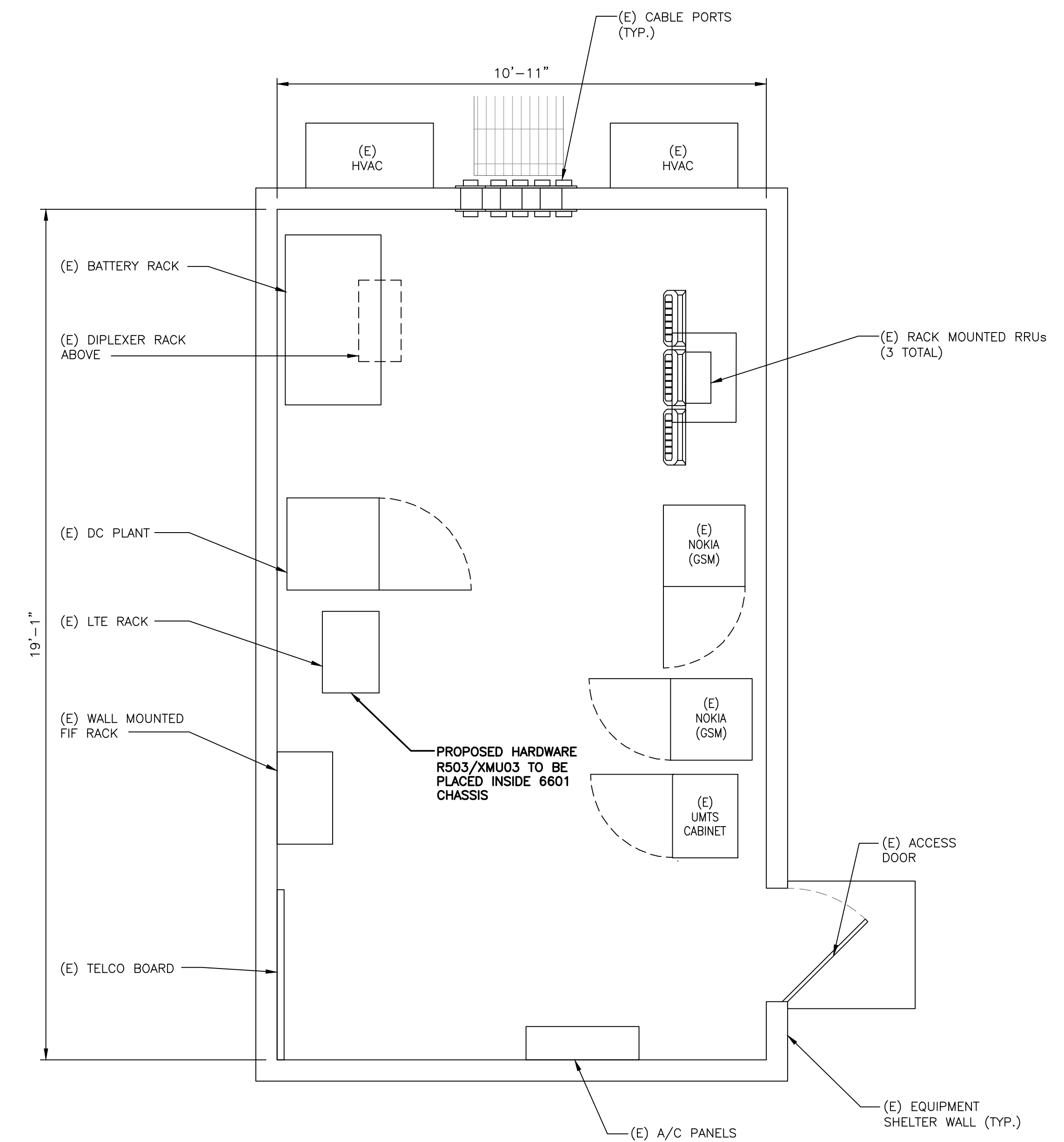


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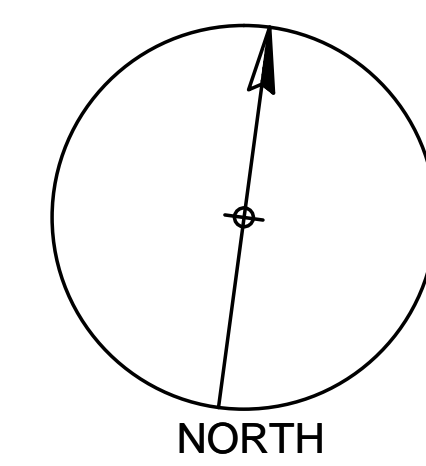
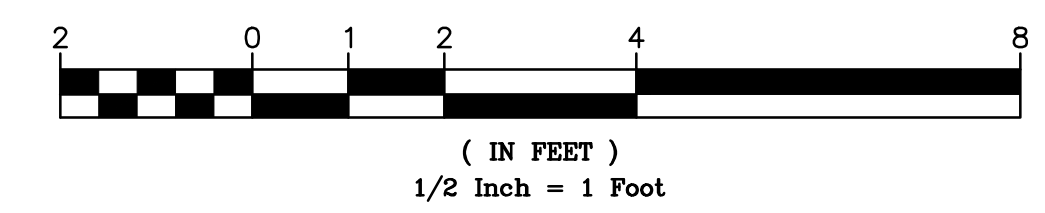


NORTH



PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"



NORTH

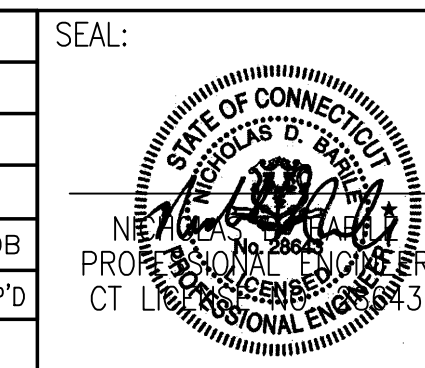
COM-EX
Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

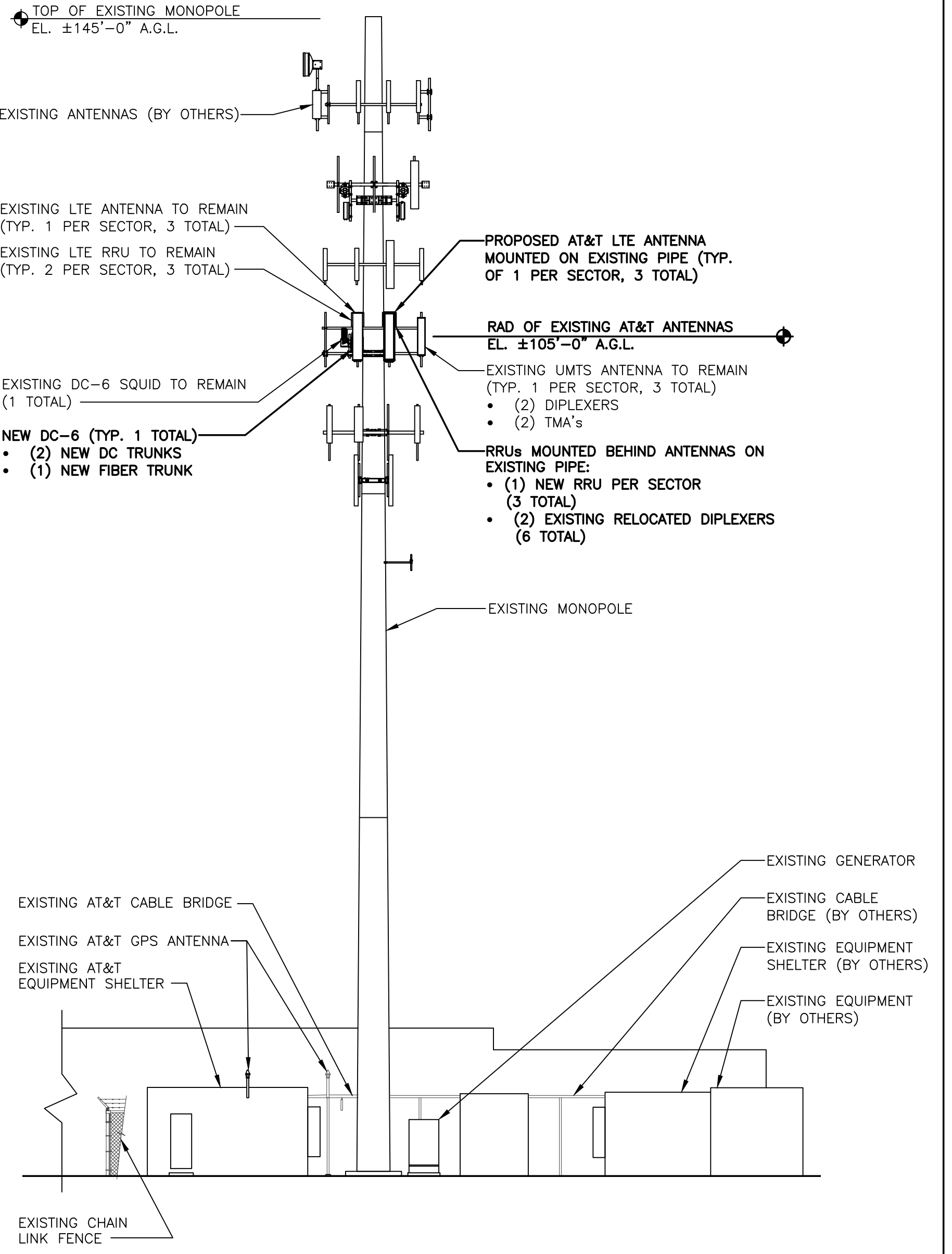
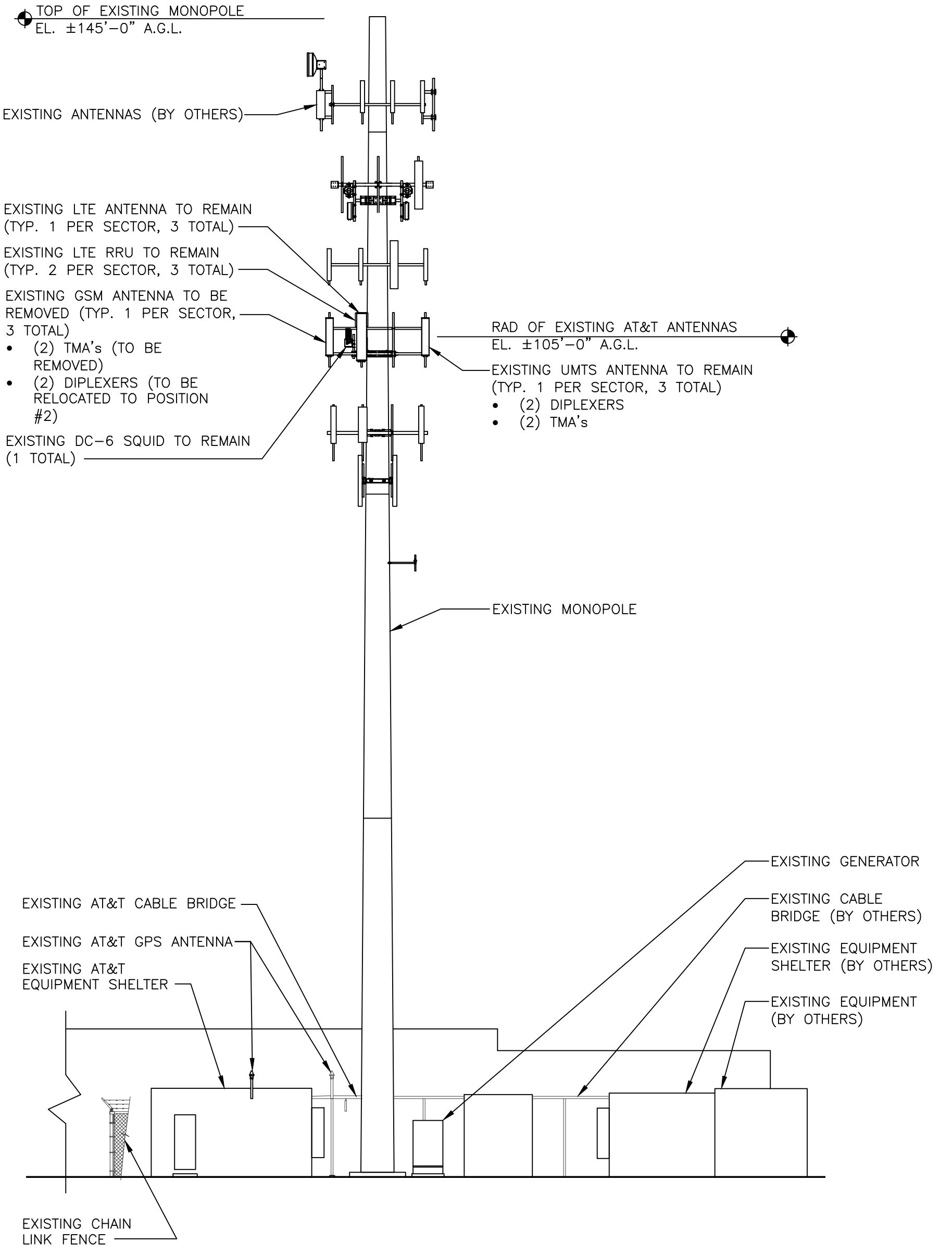
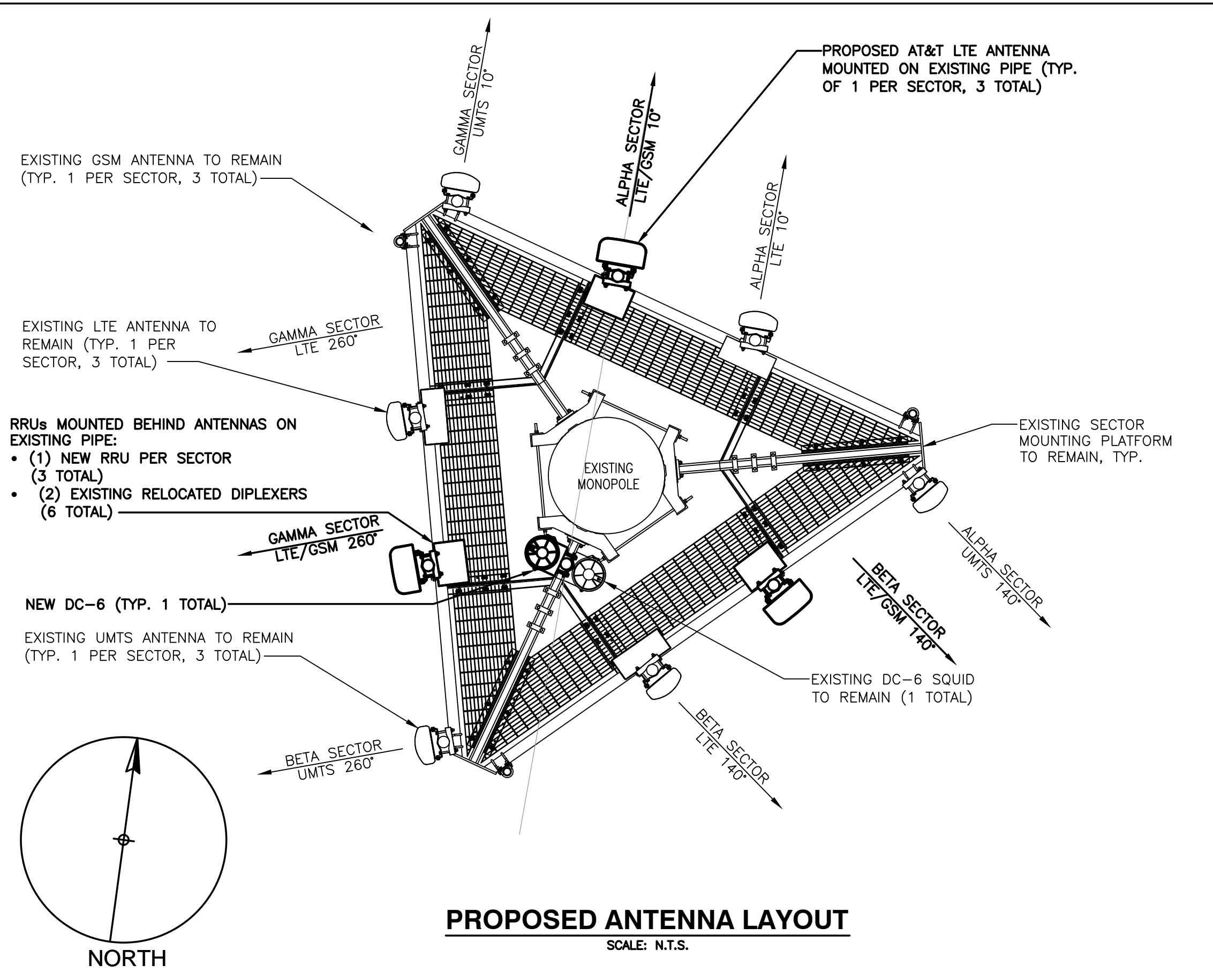
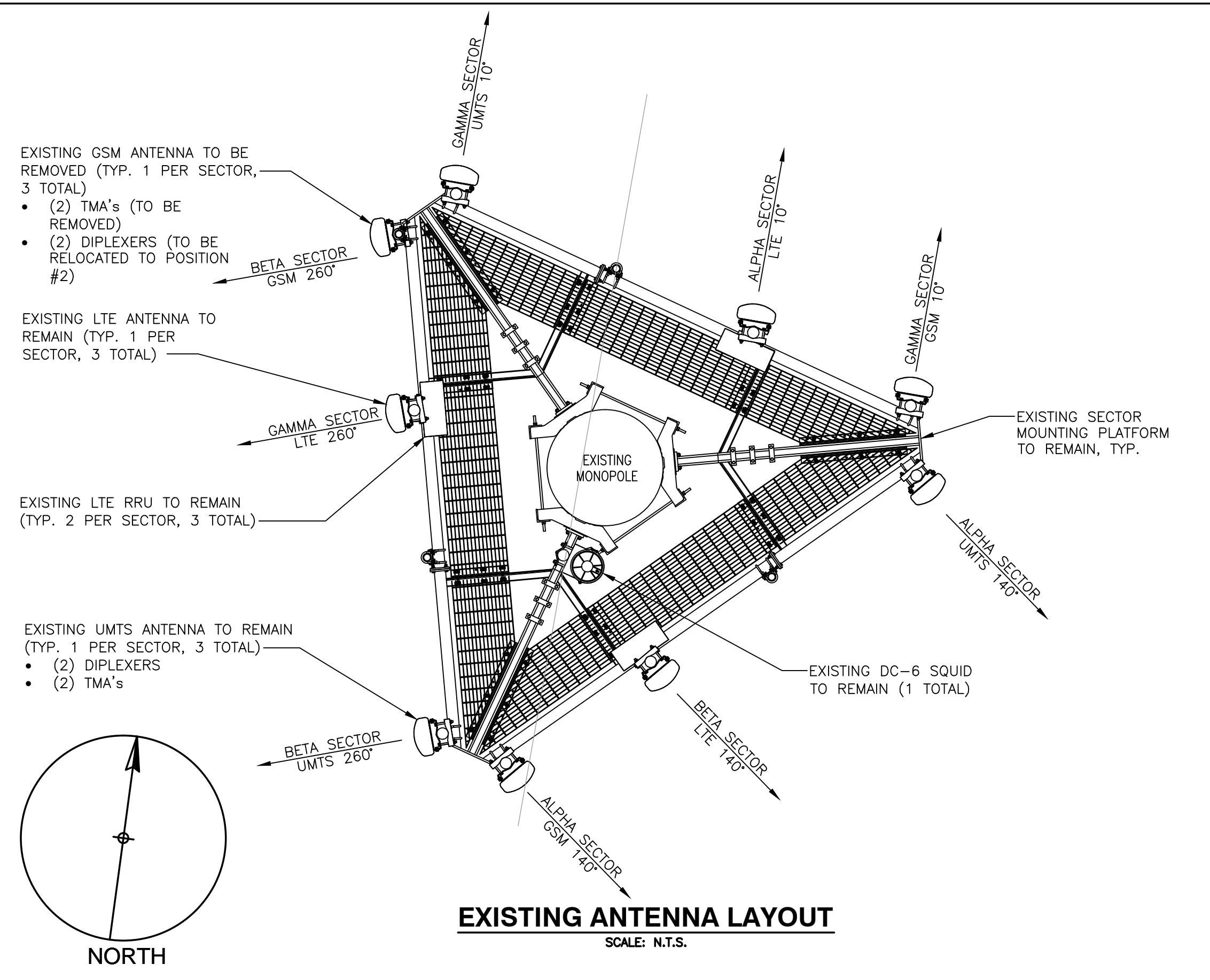
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SITE NAME: NEWINGTON SOUTH
123 COSTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY

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

| 0 | 02/08/16 | ISSUED AS FINAL | NJM | NDB | NDB |
|-----------------|----------|------------------|---------------|-----|-------|
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: NJM | DRAWN BY: NJM | | |



| | | |
|--------------------------------------------|-----------------------|----------|
| AT&T | | |
| DRAWING TITLE: EQUIPMENT LAYOUTS | | |
| JOB NUMBER 15053-EMP | DRAWING NUMBER A-2 | REV 0 |



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

COM-EX
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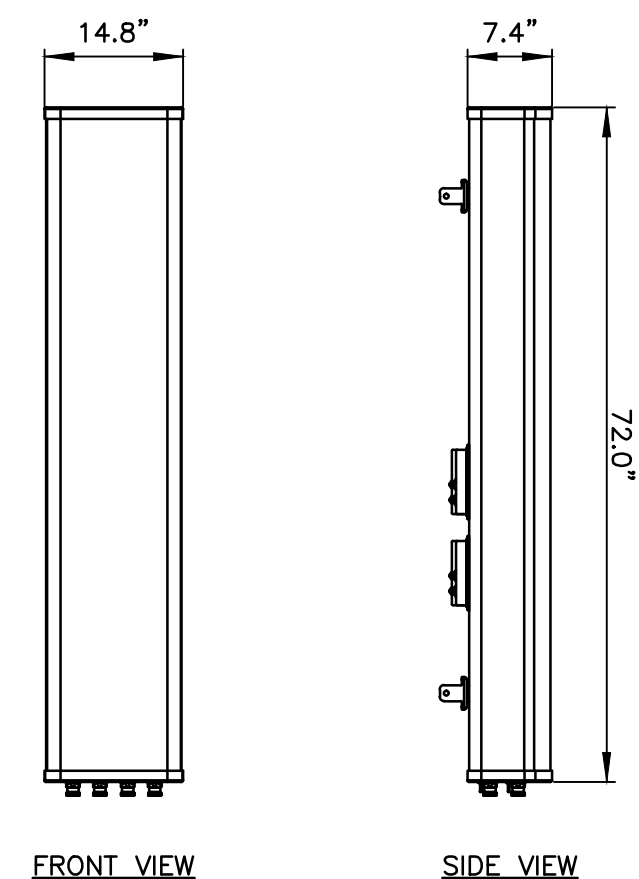
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SITE NAME: NEWINGTON SOUTH
123 COSTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY

at&t
MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

| | | | | | |
|-----------------|----------|------------------|---------------|-----|-------|
| 0 | 02/08/16 | ISSUED AS FINAL | NJM | NDB | NDB |
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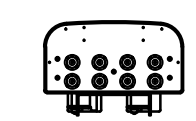
SEAL:
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
CT LICENSE # 10000

AT&T
DRAWING TITLE:
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JOB NUMBER: 15053-EMP
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REV: 0



FRONT VIEW

SIDE VIEW

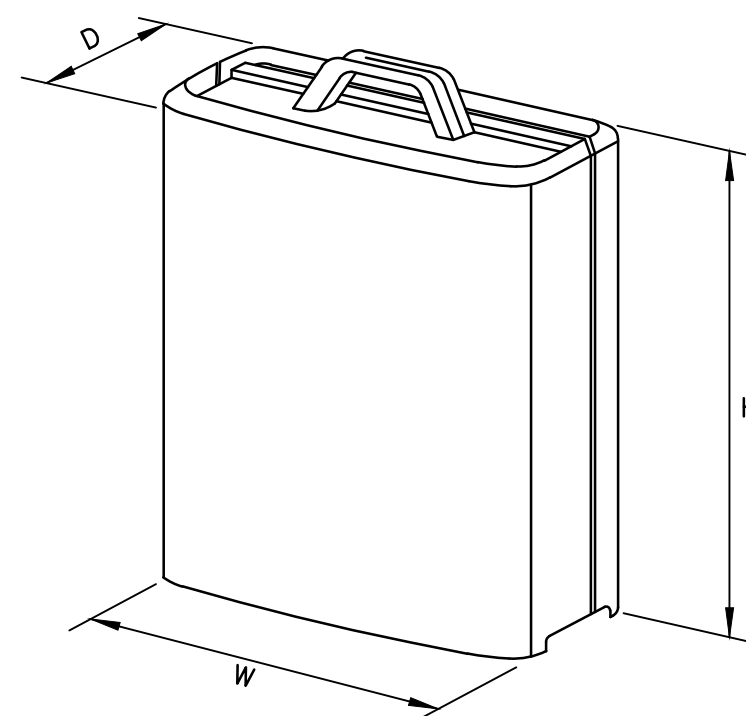


BOTTOM VIEW

| | |
|--------------|-----------------|
| MANUFACTURER | CCI |
| MODEL | OPA-65R-LCUU-H6 |
| WEIGHT | 73 LBS |

LTE ANTENNA DETAIL

SCALE: N.T.S.

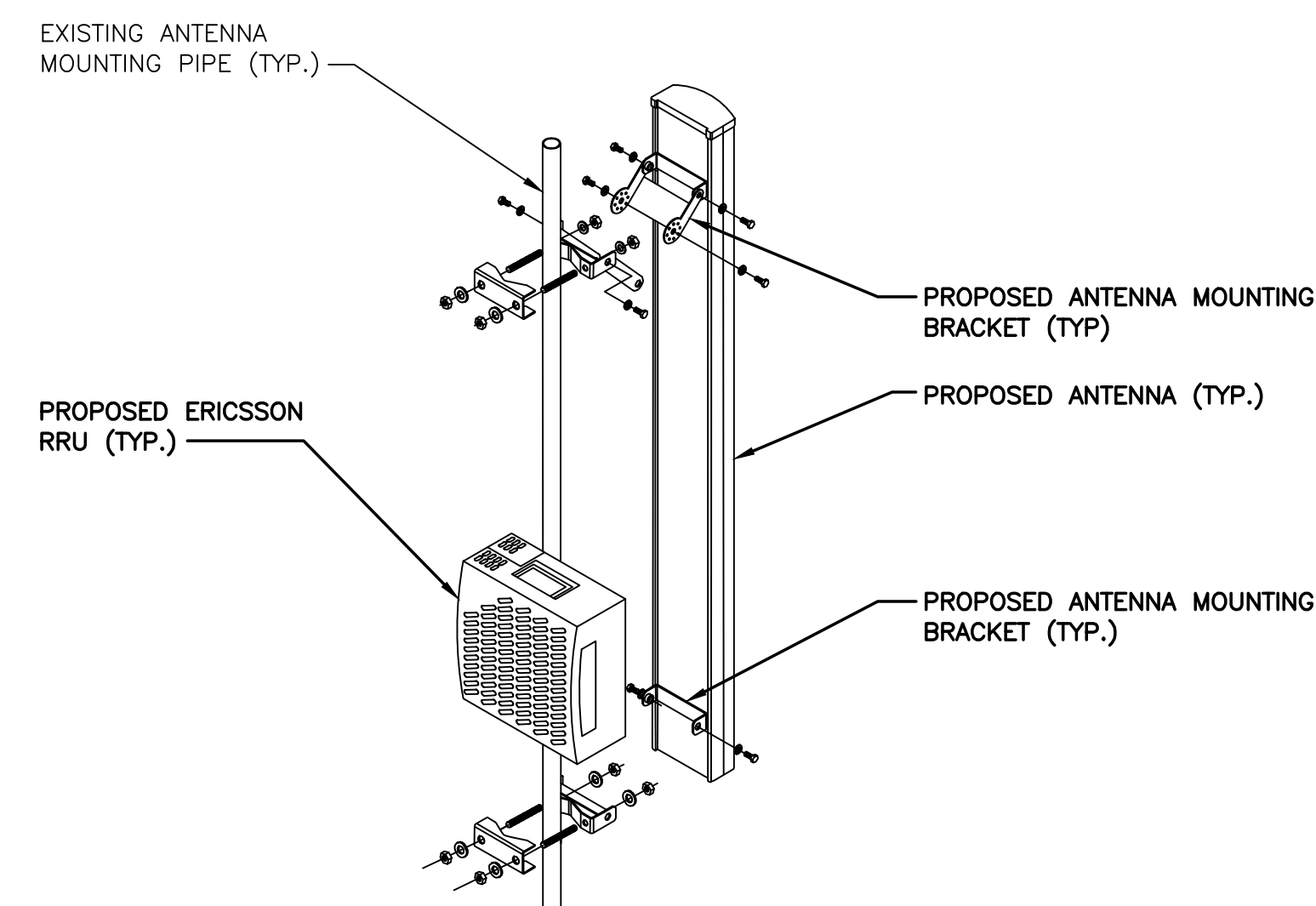


| MODEL | L x W x H | WEIGHT |
|----------|-------------------------|----------|
| *RRUS-11 | 19.69" x 16.97" x 7.17" | 50.7 LBS |
| RRUS-32 | 29.9" x 13.3" x 9.5" | 77 LBS |

*DENOTES EXISTING.

RRUS DETAIL

SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

| SECTOR | POSITION | MAKE | MODEL | SIZE (INCHES) |
|--------|----------|-----------|-----------------------|----------------|
| ALPHA | A1 | POWERWAVE | 7770 | 55"x11"x5" |
| | A2 | - | - | - |
| | A3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | A4 | POWERWAVE | 7770 | 55"x11"x5" |
| BETA | B1 | POWERWAVE | 7770 | 55"x11"x5" |
| | B2 | - | - | - |
| | B3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | B4 | POWERWAVE | 7770 | 55"x11"x5" |
| GAMMA | G1 | POWERWAVE | 7770 | 55"x11"x5" |
| | G2 | - | - | - |
| | G3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | G4 | POWERWAVE | 7770 | 55"x11"x5" |

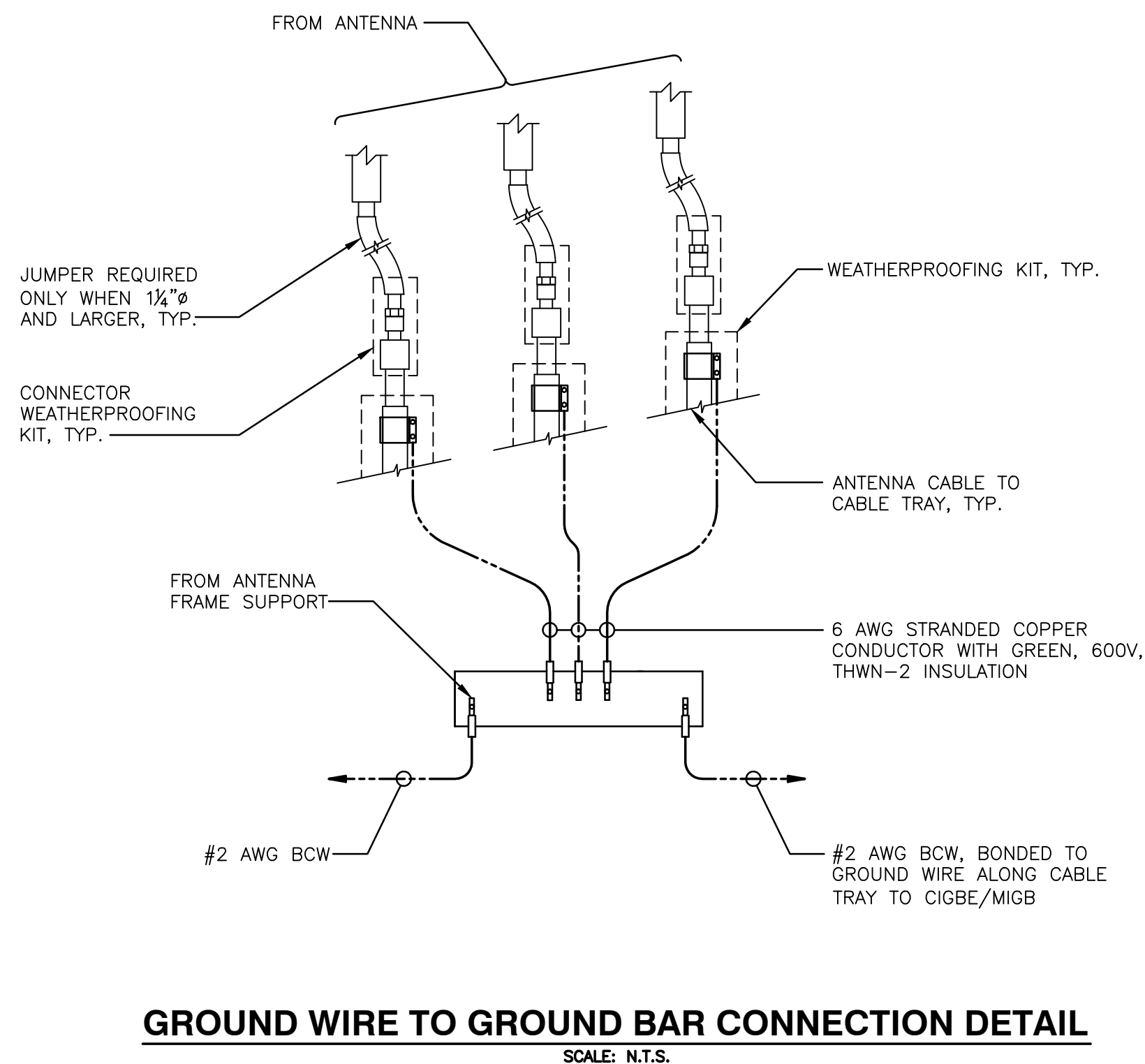
FINAL ANTENNA SCHEDULE

| SECTOR | POSITION | MAKE | MODEL | SIZE (INCHES) |
|--------|----------|-----------|-----------------------|----------------|
| ALPHA | A1 | POWERWAVE | 7770 | 55"x11"x5" |
| | A2 | CCI | OPA-65R-LCUU-H6 | 72"x14.8"x7.4" |
| | A3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | A4 | - | - | - |
| BETA | B1 | POWERWAVE | 7770 | 55"x11"x5" |
| | B2 | CCI | OPA-65R-LCUU-H6 | 72"x14.8"x7.4" |
| | B3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | B4 | - | - | - |
| GAMMA | G1 | POWERWAVE | 7770 | 55"x11"x5" |
| | G2 | CCI | OPA-65R-LCUU-H6 | 72"x14.8"x7.4" |
| | G3 | KMW | AM-X-CD-16-65-00T-RET | 72"x11.8"x5.9" |
| | G4 | - | - | - |

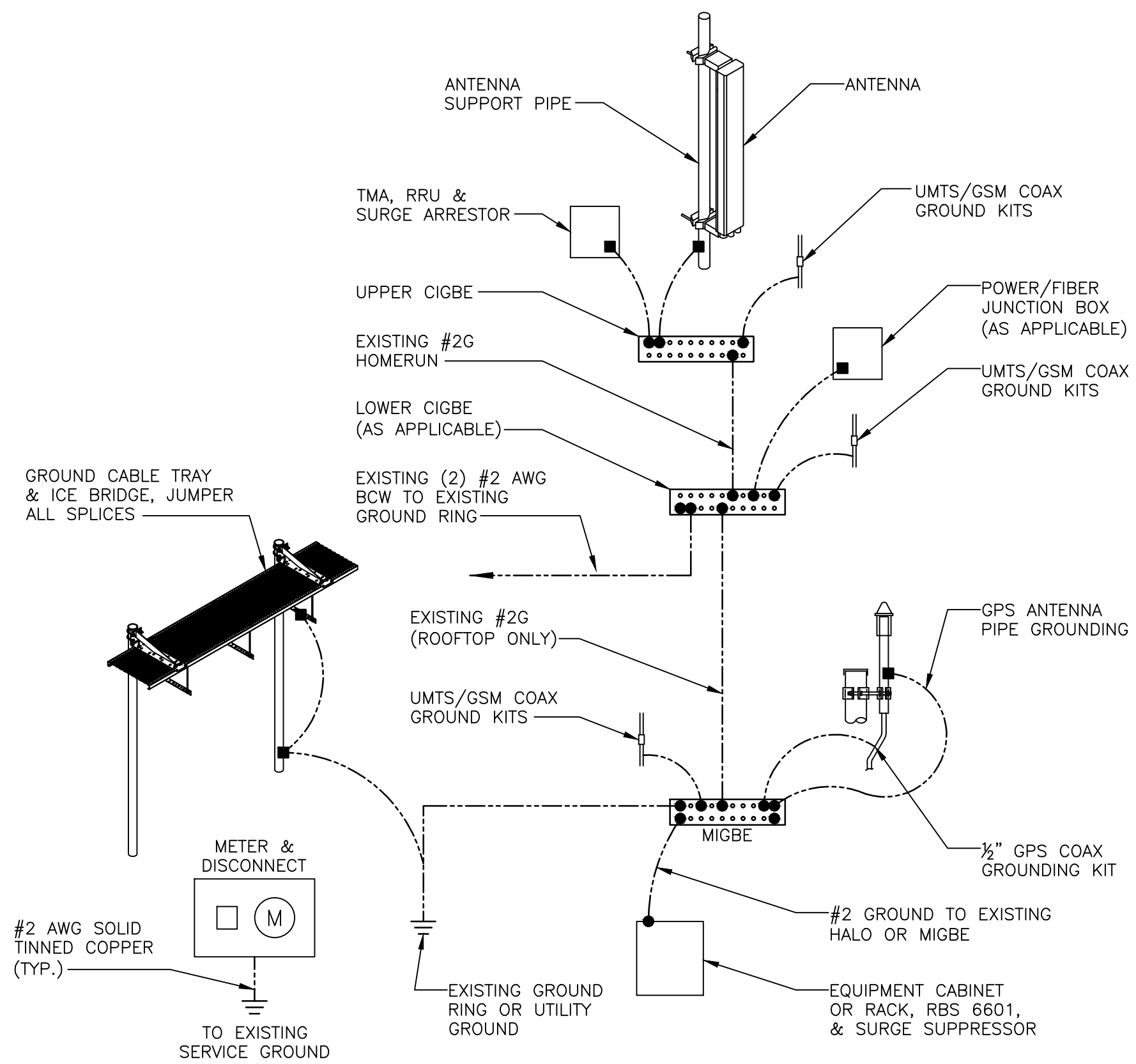
PROPOSED RRU SCHEDULE

| SECTOR | MAKE | MODEL | SIZE (INCHES) | ADDITIONAL COMPONENT | SIZE (INCHES) |
|--------|----------|--------------------|------------------|----------------------|---------------|
| ALPHA | ERICSSON | RRUS-32 | 29.9"x13.3"x9.5" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |
| BETA | ERICSSON | RRUS-32 | 29.9"x13.3"x9.5" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |
| GAMMA | ERICSSON | RRUS-32 | 29.9"x13.3"x9.5" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |
| | ERICSSON | RRUS-11 (EXISTING) | 19.7"x16.9"x7.2" | - | - |

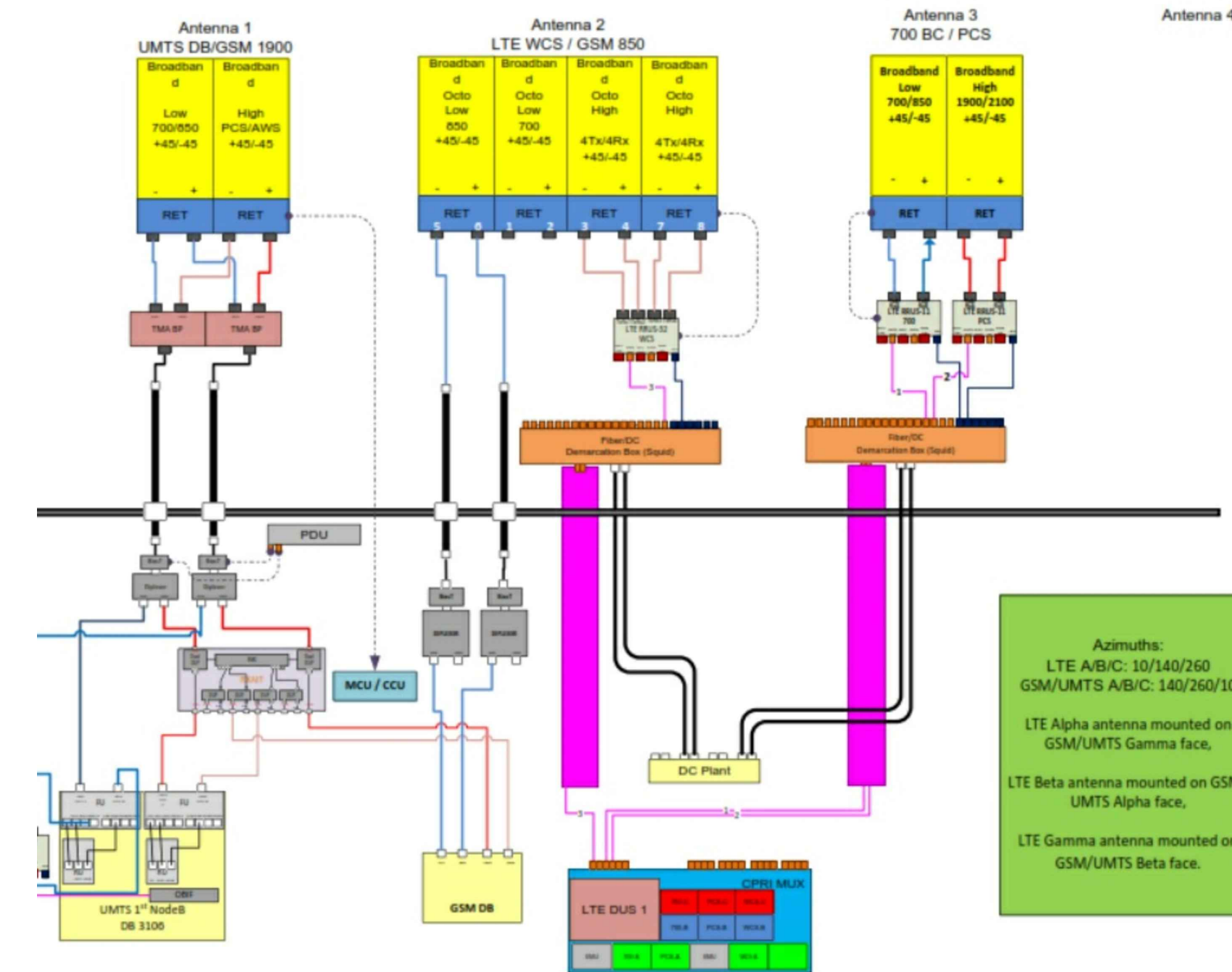
PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING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



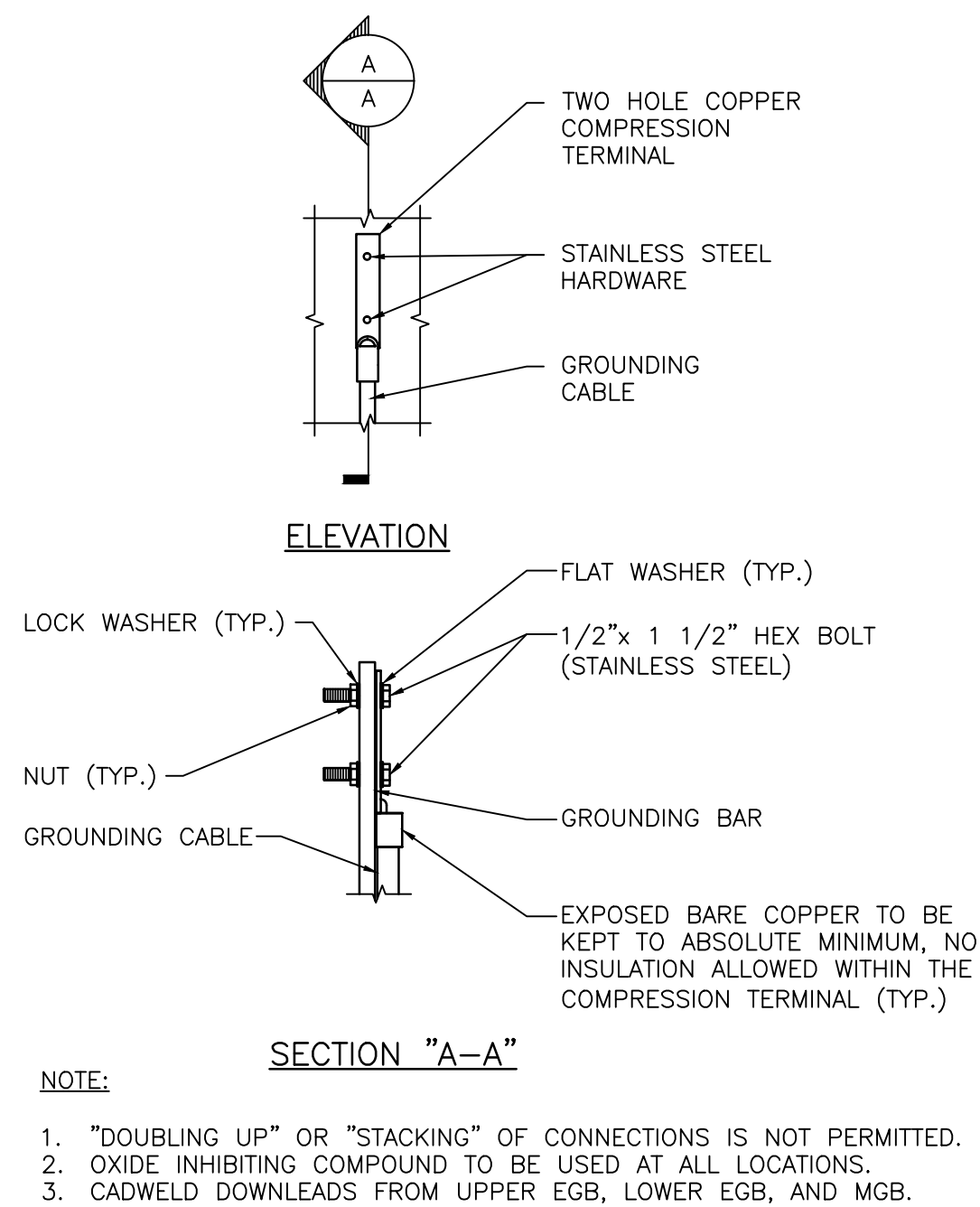
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



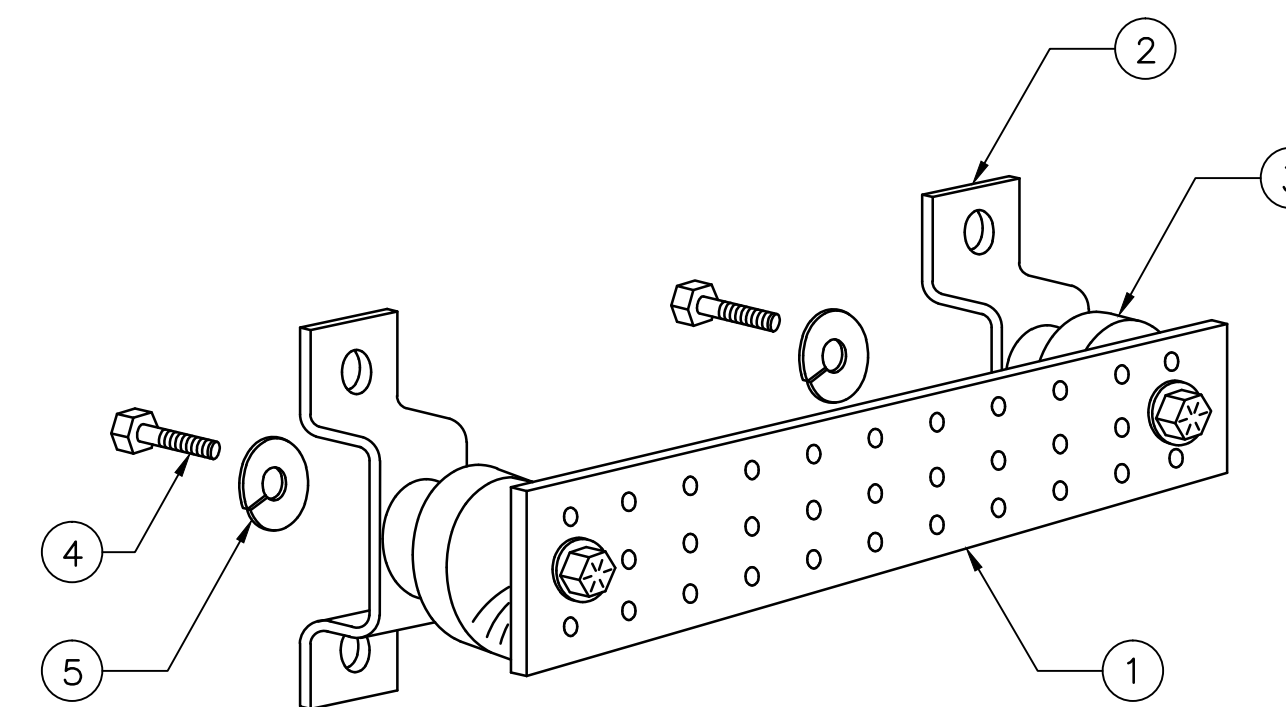
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



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



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



| ITEM NO. | QTY. | DESCRIPTION |
|----------|------|----------------------------------|
| 1 | 1 | SOLID GROUND BAR (20"x 4"x 1/4") |
| 2 | 2 | WALL MOUNTING BRACKET |
| 3 | 2 | INSULATORS |
| 4 | 4 | 5/16"-11x1" H.H.C.S. |
| 5 | 4 | 5/16" LOCK WASHER |

GROUND BAR DETAIL
SCALE: N.T.S.

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



Date: November 11, 2015

Timothy Howell
Crown Castle
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Charlotte, NC 28277
980.209.8242

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jmeinerding@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CT1108
Carrier Site Name: Newington South

Crown Castle Designation: Crown Castle BU Number: 881364
Crown Castle Site Name: Newington
Crown Castle JDE Job Number: 350073
Crown Castle Work Order Number: 1148446
Crown Castle Application Number: 310233 Rev. 1

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37515-0757.007.7700

Site Data: 123 Costelo Road, Newington, Hartford County, CT
Latitude 41° 39' 18.72", Longitude -72° 43' 17.19"
145 Foot - Monopole Tower

Dear Timothy Howell,

Paul J. Ford and Company is pleased to submit this "Structural Modification 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 842793, in accordance with application 310233, revision 1.

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

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

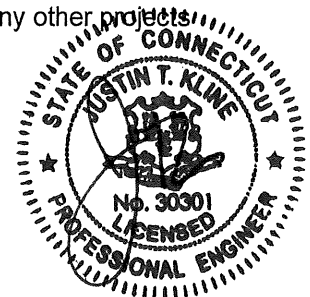
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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 Paul J. Ford and Company 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.

Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer



Date: **November 11, 2015**

Timothy Howell
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
980.209.8242

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jmeinerding@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT1108
Carrier Site Name: Newington South

Crown Castle Designation: **Crown Castle BU Number:** 881364
Crown Castle Site Name: Newington
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Engineering Firm Designation: **Paul J. Ford and Company Project Number:** 37515-0757.007.7700

Site Data: **123 Costelo Road, Newington, Hartford County, CT**
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Joey Meinerding, E.I.
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tnxTower Output

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1) INTRODUCTION

This tower is a 145 ft. monopole tower designed by Summit in August of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 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 |
|---------------------|----------------------------|--------------------|----------------------|-------------------------------|----------------------|---------------------|------|
| 105.0 | 105.0 | 3 | cci antennas | OPA-65R-LCUU-H6 w/ Mount Pipe | 1 | 3/8 | -- |
| | | 3 | ericsson | RRUS 32 B30 | 2 | 3/4 | |
| | | 1 | raycap | DC6-48-60-18-8F | | | |

Table 2 - Existing and Reserved Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------------|-------------------------------|----------------------|---------------------|------|
| 133.0 | 139.0 | 2 | andrew | VHLP2.5-11 | 6 | 5/16 1/2 | 1 |
| | | 2 | dragonwave | HORIZON COMPACT | | | |
| | 135.0 | 3 | argus technologies | LLPX310R-V1 w/ Mount Pipe | | | |
| | | 1 | motorola | TIMING 2000 | | | |
| | | 3 | samsung telecommunications | WIMAX DAP HEAD | | | |
| 133.0 | 1 | tower mounts | Platform Mount [LP 712-1] | | | | |
| 124.0 | 124.0 | 3 | alcatel lucent | TD-RRH8x20-25 | 4 | 1-1/4 | 1 |
| | | 3 | rfs celwave | APXVSPP18-C-A20 w/ Mount Pipe | | | |
| | | 3 | rfs celwave | APXVTM14-C-120 w/ Mount Pipe | | | |
| | | 3 | rfs celwave | IBC1900BB-1 | | | |
| | | 3 | rfs celwave | IBC1900HG-2A | | | |
| | | 1 | tower mounts | Platform Mount [LP 712-1] | | | |
| 122.0 | 122.0 | 3 | alcatel lucent | PCS 1900MHz 4x45W-65MHz | -- | -- | 1 |
| | | 1 | tower mounts | Pipe Mount [PM 601-3] | | | |
| | 118.0 | 3 | alcatel lucent | 800MHz 2X50W RRH W/FILTER | | | |

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|------------------------------|------------------------------------------|----------------------|---------------------|------|
| 114.0 | 116.0 | 1 | lucent | KS24019-L112A | 1 13 | 1/2 1-5/8 | 1 |
| | 114.0 | 3 | antel | BXA-80063/4CFx5 w/ Mount Pipe | | | |
| | | 1 | rfs celwave | DB-T1-6Z-8AB-0Z | | | |
| | | 6 | rfs celwave | FD9R6004/2C-3L | | | |
| | | 1 | tower mounts | Platform Mount [LP 712-1] | | | |
| | | 3 | alcatel lucent | RRH2X60-PCS | | | |
| | | 3 | alcatel lucent | RRH2x60-700 | | | |
| | | 3 | alcatel lucent | RRH4X45-AWS4 B66 | | | |
| | 9 | andrew | SBNHH-1D65B w/ Mount Pipe | 1 | 1-5/8 | 2 | |
| | 1 | rfs celwave | DB-T1-6Z-8AB-0Z | | | | |
| 105.0 | 105.0 | 3 | powerwave technologies | 7770.00 w/ Mount Pipe | -- | -- | 3 |
| | | 6 | powerwave technologies | LGP2140X | | | |
| | | 3 | ericsson | RRUS 11 B2 | | | |
| | | 6 | ericsson | RRUS-11 | 1 2 12 | 3/8 3/4 1-5/8 | 1 |
| | | 3 | kmw communications | AM-X-CD-16-65-00T-RET w/ Mount Pipe | | | |
| | | 3 | powerwave technologies | 7770.00 w/ Mount Pipe | | | |
| | | 6 | powerwave technologies | LGP2140X | | | |
| | | 1 | raycap | DC6-48-60-18-8F | | | |
| | | 1 | tower mounts | Platform Mount [LP 712-1] | | | |
| 94.0 | 95.0 | 3 | commscope | LNx-6515DS-A1M w/ Mount Pipe | -- | -- | 2 |
| | | 3 | ericsson | RRUS 11 B12 | | | |
| | | 3 | ericsson | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 13 | 1-5/8 | 1 |
| | | 3 | ericsson | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | | | |
| | | 3 | ericsson | KRY 112 144/1 | | | |
| | 94.0 | 1 | tower mounts | Platform Mount [LP 712-1] | | | |
| 87.0 | 87.0 | 3 | kathrein | 742 213 w/ Mount Pipe | 6 | 1-5/8 | 1 |
| | | 1 | tower mounts | Pipe Mount [PM 601-3] | | | |
| 77.0 | 77.0 | 1 | symmetricom | 58532A | 1 | 1/2 | 1 |
| | | 1 | tower mounts | Side Arm Mount [SO 701- 1] | | | |

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
|------------------------------------------|----------------------------------------|-----------|----------|
| 4-GEOTECHNICAL REPORTS | Dr. Clarence Welti, 08/10/1999 | 1425352 | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS | Summit/PJF, 5153/29299-105, 08/11/1999 | 1425473 | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS | Summit, 5153, 08/10/1999 | 1425417 | CCISITES |

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) For proposed modifications: monopole will be modified in conformance with the attached proposed modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (K) | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-----------------|----------------|--------------------------|------------------|--------|----------------|------------|-------------|
| L1 | 145 - 130 | Pole | TP26.77x24x0.1875 | 1 | -2.35 | 822.43 | 4.9 | Pass |
| L2 | 130 - 84.75 | Pole | TP35.27x26.77x0.25 | 2 | -16.08 | 1409.77 | 66.0 | Pass |
| L3 | 84.75 - 58.0833 | Pole | TP39.6977x33.9247x0.3125 | 3 | -22.78 | 2030.88 | 94.5 | Pass |
| L4 | 58.0833 - 44.25 | Pole | TP42.26x39.6977x0.4281 | 4 | -24.99 | 2444.52 | 88.8 | Pass |
| L5 | 44.25 - 31.25 | Pole | TP44.0424x40.4313x0.4837 | 5 | -31.25 | 2924.50 | 92.1 | Pass |
| L6 | 31.25 - 4.75 | Pole | TP48.9503x44.0424x0.5485 | 6 | -40.40 | 3910.72 | 85.2 | Pass |
| L7 | 4.75 - 0 | Pole | TP49.83x48.9503x0.517 | 7 | -42.06 | 3963.54 | 86.6 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L3) | 94.5 | Pass |
| | | | | | | RATING = | 94.5 | Pass |

Table 5 - Tower Component Stresses vs. Capacity

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|-------|----------------------------------|----------------|------------|-------------|
| 1 | Anchor Rods | 0 | 91.2 | Pass |
| 1 | Base Plate | 0 | 91.0 | Pass |
| 1 | Base Foundation Structural Steel | 0 | 69.6 | Pass |
| 1,2 | Base Foundation Soil Interaction | 0 | 79.7 | Pass |

| | |
|-----------------------------------------------------|--------------|
| Structure Rating (max from all components) = | 94.5% |
|-----------------------------------------------------|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

Install the proposed modifications per the attached drawings.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

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

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.2500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) 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 <i>ft</i> | Section Length <i>ft</i> | Splice Length <i>ft</i> | Number of Sides | Top Diameter <i>in</i> | Bottom Diameter <i>in</i> | Wall Thickness <i>in</i> | Bend Radius <i>in</i> | Pole Grade |
|---------|------------------------|--------------------------------|-------------------------------|-----------------------|------------------------------|---------------------------------|--------------------------------|-----------------------------|-----------------------------|
| L1 | 145.00-130.00 | 15.00 | 0.00 | 18 | 24.0000 | 26.7700 | 0.1875 | 0.7500 | A607-65 (65 ksi) |
| L2 | 130.00-84.75 | 45.25 | 4.50 | 18 | 26.7700 | 35.2700 | 0.2500 | 1.0000 | A607-65 (65 ksi) |
| L3 | 84.75-58.08 | 31.17 | 0.00 | 18 | 33.9247 | 39.6977 | 0.3125 | 1.2500 | A607-65 (65 ksi) |
| L4 | 58.08-44.25 | 13.83 | 5.25 | 18 | 39.6977 | 42.2600 | 0.4281 | 1.7124 | Reinf 55.05 ksi (55 ksi) |
| L5 | 44.25-31.25 | 18.25 | 0.00 | 18 | 40.4313 | 44.0424 | 0.4837 | 1.9347 | Reinf 54.68 ksi (55 ksi) |
| L6 | 31.25-4.75 | 26.50 | 0.00 | 18 | 44.0424 | 48.9503 | 0.5485 | 2.1939 | Reinf 58.03 ksi (58 ksi) |
| L7 | 4.75-0.00 | 4.75 | | 18 | 48.9503 | 49.8300 | 0.5170 | 2.0680 | Reinf 61.24 ksi (61 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/Q in ² | w in | w/t |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|------------------------|---------|--------|
| L1 | 24.3702 | 14.1714 | 1015.2211 | 8.4534 | 12.1920 | 83.2694 | 2031.7780 | 7.0871 | 3.8940 | 20.768 |
| | 27.1830 | 15.8199 | 1412.3200 | 9.4368 | 13.5992 | 103.8535 | 2826.4984 | 7.9115 | 4.3815 | 23.368 |
| L2 | 27.1830 | 21.0436 | 1869.8421 | 9.4146 | 13.5992 | 137.4969 | 3742.1446 | 10.5238 | 4.2715 | 17.086 |
| | 35.8141 | 27.7884 | 4305.5913 | 12.4321 | 17.9172 | 240.3055 | 8616.8481 | 13.8968 | 5.7675 | 23.07 |
| L3 | 35.2944 | 33.3391 | 4758.6659 | 11.9323 | 17.2337 | 276.1248 | 9523.5933 | 16.6727 | 5.4207 | 17.346 |
| | 40.3101 | 39.0652 | 7655.8350 | 13.9817 | 20.1664 | 379.6329 | 15321.7438 | 19.5363 | 6.4368 | 20.598 |
| L4 | 40.3101 | 53.3603 | 10396.0378 | 13.9407 | 20.1664 | 515.5124 | 20805.7550 | 26.6852 | 6.2333 | 14.56 |
| | 42.9119 | 56.8421 | 12566.7277 | 14.8503 | 21.4681 | 585.3680 | 25149.9911 | 28.4264 | 6.6843 | 15.613 |
| L5 | 42.1099 | 61.3276 | 12364.4808 | 14.1814 | 20.5391 | 601.9969 | 24745.2311 | 30.6696 | 6.2646 | 12.952 |
| | 44.7219 | 66.8714 | 16029.8341 | 15.4634 | 22.3736 | 716.4633 | 32080.7606 | 33.4421 | 6.9002 | 14.266 |
| L6 | 44.7219 | 75.7162 | 18096.0756 | 15.4404 | 22.3736 | 808.8152 | 36215.9625 | 37.8653 | 6.7862 | 12.373 |
| | 49.7054 | 84.2600 | 24939.1890 | 17.1826 | 24.8667 | 1002.9132 | 49911.1937 | 42.1380 | 7.6499 | 13.948 |
| L7 | 49.7054 | 79.4785 | 23554.5580 | 17.1938 | 24.8667 | 947.2312 | 47140.1098 | 39.7468 | 7.7053 | 14.904 |
| | 50.5987 | 80.9221 | 24861.4998 | 17.5061 | 25.3136 | 982.1385 | 49755.7129 | 40.4687 | 7.8601 | 15.203 |

| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A _r | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals | Double Angle Stitch Bolt Spacing Horizontals |
|------------------|------------------------|------------------|--------------|-------------------------------|-------------------------------|--------------|--------------------------------------------|----------------------------------------------|
| ft | ft ² | in | | | | | in | in |
| L1 145.00-130.00 | | | | 1 | 1 | 1 | | |
| L2 130.00-84.75 | | | | 1 | 1 | 1 | | |
| L3 84.75-58.08 | | | | 1 | 1 | 1 | | |
| L4 58.08-44.25 | | | | 1 | 1 | 1 | | |
| L5 44.25-31.25 | | | | 1 | 1 | 1 | | |
| L6 31.25-4.75 | | | | 1 | 1 | 1 | | |
| L7 4.75-0.00 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | C _A A _A | Weight |
|--------------------|-------------|--------------|----------------|---------------|--------------|-------------------------------|--------|
| | | | | ft | | ft ² /ft | plf |
| ATCB-B01-005(1/4") | C | No | Inside Pole | 133.00 - 0.00 | 6 | No Ice | 0.07 |
| | | | | | | 1/2" Ice | 0.07 |
| | | | | | | 1" Ice | 0.07 |
| | | | | | | 2" Ice | 0.07 |
| | | | | | | 4" Ice | 0.07 |
| FSJ4-50B(1/2) | C | No | Inside Pole | 133.00 - 0.00 | 2 | No Ice | 0.14 |
| | | | | | | 1/2" Ice | 0.14 |
| | | | | | | 1" Ice | 0.14 |
| | | | | | | 2" Ice | 0.14 |
| | | | | | | 4" Ice | 0.14 |
| 2" Conduit | C | No | Inside Pole | 133.00 - 0.00 | 2 | No Ice | 1.16 |
| | | | | | | 1/2" Ice | 1.16 |
| | | | | | | 1" Ice | 1.16 |
| | | | | | | 2" Ice | 1.16 |
| | | | | | | | 1.16 |

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | C _A A _A | | Weight | |
|---------------------------|-------------|--------------|--------------------|-----------------|--------------|-------------------------------|----------|--------|-------|
| | | | | | | ft ² /ft | plf | | |
| *** | | | | | | | 4" Ice | 0.00 | 1.16 |
| HB114-1-08U4-M5J(1-1/4") | C | No | Inside Pole | 124.00 - 0.00 | 3 | | No Ice | 0.00 | 1.08 |
| | | | | | | | 1/2" Ice | 0.00 | 1.08 |
| | | | | | | | 1" Ice | 0.00 | 1.08 |
| | | | | | | | 2" Ice | 0.00 | 1.08 |
| | | | | | | | 4" Ice | 0.00 | 1.08 |
| HB114-21U3M12-XXXF(1-1/4) | C | No | Inside Pole | 124.00 - 0.00 | 1 | | No Ice | 0.00 | 1.22 |
| | | | | | | | 1/2" Ice | 0.00 | 1.22 |
| | | | | | | | 1" Ice | 0.00 | 1.22 |
| | | | | | | | 2" Ice | 0.00 | 1.22 |
| | | | | | | | 4" Ice | 0.00 | 1.22 |
| *** | | | | | | | No Ice | 0.00 | 0.15 |
| LDF4-50A(1/2) | C | No | Inside Pole | 114.00 - 0.00 | 1 | | 1/2" Ice | 0.00 | 0.15 |
| | | | | | | | 1" Ice | 0.00 | 0.15 |
| | | | | | | | 2" Ice | 0.00 | 0.15 |
| | | | | | | | 4" Ice | 0.00 | 0.15 |
| HB158-1-08U8-S8J18(1-5/8) | C | No | CaAa (Out Of Face) | 114.00 - 0.00 | 1 | | No Ice | 0.00 | 1.30 |
| | | | | | | | 1/2" Ice | 0.00 | 2.81 |
| | | | | | | | 1" Ice | 0.00 | 4.94 |
| | | | | | | | 2" Ice | 0.00 | 11.02 |
| | | | | | | | 4" Ice | 0.00 | 30.52 |
| LDF7-50A(1-5/8) | C | No | CaAa (Out Of Face) | 114.00 - 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 | 10.55 |
| | | | | | | | 4" Ice | 0.00 | 30.04 |
| LDF7-50A(1-5/8) | C | No | CaAa (Out Of Face) | 114.00 - 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 | 10.55 |
| | | | | | | | 4" Ice | 1.00 | 30.04 |
| HB158-1-08U8-S8J18(1-5/8) | C | No | CaAa (Out Of Face) | 114.00 - 0.00 | 1 | | No Ice | 0.20 | 1.30 |
| | | | | | | | 1/2" Ice | 0.30 | 2.81 |
| | | | | | | | 1" Ice | 0.40 | 4.94 |
| | | | | | | | 2" Ice | 0.60 | 11.02 |
| | | | | | | | 4" Ice | 1.00 | 30.52 |
| *** | | | | | | | No Ice | 0.00 | 0.80 |
| LCF158-50A(1-5/8") | C | No | Inside Pole | 105.00 - 0.00 | 12 | | 1/2" Ice | 0.00 | 0.80 |
| | | | | | | | 1" Ice | 0.00 | 0.80 |
| | | | | | | | 2" Ice | 0.00 | 0.80 |
| | | | | | | | 4" Ice | 0.00 | 0.80 |
| FB-L98B-002-75000(3/8) | C | No | Inside Pole | 105.00 - 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) | C | No | Inside Pole | 105.00 - 0.00 | 2 | | No Ice | 0.00 | 0.59 |
| | | | | | | | 1/2" Ice | 0.00 | 0.59 |
| | | | | | | | 1" Ice | 0.00 | 0.59 |
| | | | | | | | 2" Ice | 0.00 | 0.59 |
| | | | | | | | 4" Ice | 0.00 | 0.59 |
| 2" Conduit | C | No | Inside Pole | 105.00 - 0.00 | 1 | | No Ice | 0.00 | 1.16 |
| | | | | | | | 1/2" Ice | 0.00 | 1.16 |
| | | | | | | | 1" Ice | 0.00 | 1.16 |
| | | | | | | | 2" Ice | 0.00 | 1.16 |
| | | | | | | | 4" Ice | 0.00 | 1.16 |
| FB-L98B-002-75000(3/8) | C | No | Inside Pole | 105.00 - 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) | C | No | Inside Pole | 105.00 - 0.00 | 2 | | No Ice | 0.00 | 0.59 |
| | | | | | | | 1/2" Ice | 0.00 | 0.59 |
| | | | | | | | 1" Ice | 0.00 | 0.59 |
| | | | | | | | 2" Ice | 0.00 | 0.59 |
| | | | | | | | 4" Ice | 0.00 | 0.59 |

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | C _A A _A | | Weight |
|----------------------------------------------|-------------|--------------|--------------------|-----------------|--------------|-------------------------------|---------------------|--------|
| | | | | | | | ft ² /ft | plf |
| 2" Conduit | C | No | CaAa (Out Of Face) | 105.00 - 0.00 | 1 | No Ice | 0.17 | 1.16 |
| | | | | | | 1/2" Ice | 0.27 | 2.53 |
| | | | | | | 1" Ice | 0.37 | 4.51 |
| | | | | | | 2" Ice | 0.57 | 10.30 |
| | | | | | | 4" Ice | 0.97 | 29.21 |
| *** | | | | | | | | |
| MLE Hybrid 9Power/18Fiber RL 2(1 5/8) | C | No | Inside Pole | 94.00 - 0.00 | 1 | No Ice | 0.00 | 1.07 |
| | | | | | | 1/2" Ice | 0.00 | 1.07 |
| | | | | | | 1" Ice | 0.00 | 1.07 |
| | | | | | | 2" Ice | 0.00 | 1.07 |
| | | | | | | 4" Ice | 0.00 | 1.07 |
| HJ7-50A(1-5/8) | C | No | Inside Pole | 94.00 - 0.00 | 5 | No Ice | 0.00 | 1.04 |
| | | | | | | 1/2" Ice | 0.00 | 1.04 |
| | | | | | | 1" Ice | 0.00 | 1.04 |
| | | | | | | 2" Ice | 0.00 | 1.04 |
| | | | | | | 4" Ice | 0.00 | 1.04 |
| HJ7-50A(1-5/8) | C | No | CaAa (Out Of Face) | 94.00 - 0.00 | 7 | No Ice | 0.00 | 1.04 |
| | | | | | | 1/2" Ice | 0.00 | 2.55 |
| | | | | | | 1" Ice | 0.00 | 4.68 |
| | | | | | | 2" Ice | 0.00 | 10.76 |
| | | | | | | 4" Ice | 0.00 | 30.26 |
| *** | | | | | | | | |
| AVA7-50(1-5/8) | C | No | Inside Pole | 87.00 - 0.00 | 6 | No Ice | 0.00 | 0.70 |
| | | | | | | 1/2" Ice | 0.00 | 0.70 |
| | | | | | | 1" Ice | 0.00 | 0.70 |
| | | | | | | 2" Ice | 0.00 | 0.70 |
| | | | | | | 4" Ice | 0.00 | 0.70 |
| *** | | | | | | | | |
| LDF4-50A(1/2) | C | No | CaAa (Out Of Face) | 77.00 - 0.00 | 1 | No Ice | 0.00 | 0.15 |
| | | | | | | 1/2" Ice | 0.00 | 0.84 |
| | | | | | | 1" Ice | 0.00 | 2.14 |
| | | | | | | 2" Ice | 0.00 | 6.56 |
| | | | | | | 4" Ice | 0.00 | 22.75 |
| *** | | | | | | | | |
| 1 1/4" Flat Reinforcement | C | No | CaAa (Out Of Face) | 35.50 - 0.00 | 1 | No Ice | 0.21 | 0.00 |
| | | | | | | 1/2" Ice | 0.32 | 0.00 |
| | | | | | | 1" Ice | 0.43 | 0.00 |
| | | | | | | 2" Ice | 0.65 | 0.00 |
| | | | | | | 4" Ice | 1.10 | 0.00 |
| 1" Flat Reinforcement | C | No | CaAa (Out Of Face) | 60.58 - 35.50 | 1 | No Ice | 0.17 | 0.00 |
| | | | | | | 1/2" Ice | 0.28 | 0.00 |
| | | | | | | 1" Ice | 0.39 | 0.00 |
| | | | | | | 2" Ice | 0.61 | 0.00 |
| | | | | | | 4" Ice | 1.06 | 0.00 |

Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | A _R | A _F | C _A A _A In Face | C _A A _A Out Face | Weight |
|---------------|-----------------------|------|-----------------|-----------------|------------------------------------------|-------------------------------------------|--------|
| | | | ft ² | ft ² | ft ² | ft ² | K |
| L1 | 145.00-130.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.01 |
| L2 | 130.00-84.75 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 20.898 | 1.11 |
| L3 | 84.75-58.08 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 20.896 | 1.40 |
| L4 | 58.08-44.25 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 12.930 | 0.73 |
| L5 | 44.25-31.25 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 12.328 | 0.68 |
| L6 | 31.25-4.75 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |

| Tower Section n | 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 |
|-----------------|--------------------|------|-----------------------------------|-----------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------|
| L7 | 4.75-0.00 | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 25.873 | 1.39 |
| | | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 4.638 | 0.25 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section n | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight K |
|-----------------|--------------------|-------------|------------------|-----------------------------------|-----------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------|
| L1 | 145.00-130.00 | A | 1.483 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.01 |
| L2 | 130.00-84.75 | A | 1.439 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 51.980 | 4.22 |
| L3 | 84.75-58.08 | A | 1.371 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 52.393 | 5.16 |
| L4 | 58.08-44.25 | A | 1.317 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 31.557 | 2.46 |
| L5 | 44.25-31.25 | A | 1.270 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 29.834 | 2.31 |
| L6 | 31.25-4.75 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 59.734 | 4.47 |
| L7 | 4.75-0.00 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 10.707 | 0.80 |

Feed Line Center of Pressure

| Section | Elevation ft | CP _X in | CP _Z in | CP _X Ice in | CP _Z Ice in |
|---------|---------------|-----------------------|-----------------------|------------------------------|------------------------------|
| L1 | 145.00-130.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L2 | 130.00-84.75 | -0.5360 | 0.3095 | -1.0226 | 0.5904 |
| L3 | 84.75-58.08 | -0.8136 | 0.4698 | -1.4941 | 0.8626 |
| L4 | 58.08-44.25 | -0.9533 | 0.5504 | -1.7107 | 0.9877 |
| L5 | 44.25-31.25 | -0.9732 | 0.5619 | -1.7480 | 1.0092 |
| L6 | 31.25-4.75 | -1.0130 | 0.5849 | -1.7904 | 1.0337 |
| L7 | 4.75-0.00 | -1.0251 | 0.5919 | -1.8321 | 1.0578 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment t ° | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K | |
|---------------------------|-------------|-------------|----------------------------------------------------|------------------------------|-----------------|-----------------------------------------------------------|----------------------------------------------------------|-------------|------|
| LLPX310R-V1 w/ Mount Pipe | A | From Leg | 4.00 | 0.000 | 133.00 | No Ice | 5.07 | 2.98 | 0.05 |
| | | | 0.00 | | | 1/2" | 5.48 | 3.53 | 0.08 |
| | | | 2.00 | | | Ice | 5.91 | 4.09 | 0.13 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | | C_{AA} | C_{AA} | Weight |
|-------------------------------|-------------|-------------|----------|---------|--------------------|-----------|-----------------|-----------------|----------|--------|
| | | | Horz | Lateral | | | | Front | Side | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| LLPX310R-V1 w/ Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 6.79 | 5.31 | 0.23 |
| | | | | | | | 2" Ice | 8.70 | 8.13 | 0.54 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 5.07 | 2.98 | 0.05 |
| | | | | | | | 1/2" Ice | 5.48 | 3.53 | 0.08 |
| | | | | | | | Ice | 5.91 | 4.09 | 0.13 |
| LLPX310R-V1 w/ Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 6.79 | 5.31 | 0.23 |
| | | | | | | | 2" Ice | 8.70 | 8.13 | 0.54 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 5.07 | 2.98 | 0.05 |
| | | | | | | | 1/2" Ice | 5.48 | 3.53 | 0.08 |
| | | | | | | | Ice | 5.91 | 4.09 | 0.13 |
| TIMING 2000 | A | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 0.38 | 0.38 | 0.01 |
| | | | | | | | 2" Ice | 0.78 | 0.78 | 0.05 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 0.13 | 0.13 | 0.00 |
| | | | | | | | 1/2" Ice | 0.18 | 0.18 | 0.00 |
| | | | | | | | Ice | 0.24 | 0.24 | 0.01 |
| WIMAX DAP HEAD | A | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 2.59 | 1.39 | 0.09 |
| | | | | | | | 2" Ice | 3.51 | 2.14 | 0.20 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 1.80 | 0.78 | 0.03 |
| | | | | | | | 1/2" Ice | 1.99 | 0.92 | 0.04 |
| | | | | | | | Ice | 2.18 | 1.07 | 0.06 |
| WIMAX DAP HEAD | B | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 2.59 | 1.39 | 0.09 |
| | | | | | | | 2" Ice | 3.51 | 2.14 | 0.20 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 1.80 | 0.78 | 0.03 |
| | | | | | | | 1/2" Ice | 1.99 | 0.92 | 0.04 |
| | | | | | | | Ice | 2.18 | 1.07 | 0.06 |
| WIMAX DAP HEAD | C | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 2.59 | 1.39 | 0.09 |
| | | | | | | | 2" Ice | 3.51 | 2.14 | 0.20 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 1.80 | 0.78 | 0.03 |
| | | | | | | | 1/2" Ice | 1.99 | 0.92 | 0.04 |
| | | | | | | | Ice | 2.18 | 1.07 | 0.06 |
| HORIZON COMPACT | A | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 1.39 | 0.86 | 0.05 |
| | | | | | | | 2" Ice | 2.08 | 1.43 | 0.12 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 0.84 | 0.43 | 0.01 |
| | | | | | | | 1/2" Ice | 0.97 | 0.52 | 0.02 |
| | | | | | | | Ice | 1.10 | 0.63 | 0.03 |
| HORIZON COMPACT | B | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 1.39 | 0.86 | 0.05 |
| | | | | | | | 2" Ice | 2.08 | 1.43 | 0.12 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 0.84 | 0.43 | 0.01 |
| | | | | | | | 1/2" Ice | 0.97 | 0.52 | 0.02 |
| | | | | | | | Ice | 1.10 | 0.63 | 0.03 |
| (3) 2.375" OD x 5' Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 1.19 | 1.19 | 0.02 |
| | | | | | | | 1/2" Ice | 1.50 | 1.50 | 0.03 |
| | | | | | | | Ice | 1.81 | 1.81 | 0.04 |
| (3) 2.375" OD x 5' Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 1.19 | 1.19 | 0.02 |
| | | | | | | | 1/2" Ice | 1.50 | 1.50 | 0.03 |
| | | | | | | | Ice | 1.81 | 1.81 | 0.04 |
| (3) 2.375" OD x 5' Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 133.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | | | | | 1/2" Ice | 1.50 | 1.50 | 0.03 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C_{AA} Front | C_{AA} Side | Weight | |
|----------------------------------|-------------|-------------|----------|---------|--------------------|-----------|----------------|---------------|--------|------|
| | | | Horz | Lateral | | | | | | ft |
| | | | 0.00 | | | | | | | |
| Platform Mount [LP 712-1] | C | None | | | 0.000 | 133.00 | Ice | 1.81 | 1.81 | 0.04 |
| | | | 1" Ice | 2.46 | | | 2.46 | 0.08 | | |
| | | | 2" Ice | 3.92 | | | 3.92 | 0.20 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 24.53 | | | 24.53 | 1.34 | | |
| | | | 1/2" | 29.94 | | | 29.94 | 1.65 | | |
| | | | Ice | 35.35 | | | 35.35 | 1.96 | | |
| | | | 1" Ice | 46.17 | | | 46.17 | 2.58 | | |
| 2" Ice | 67.81 | 67.81 | 3.82 | | | | | | | |
| 4" Ice | | | | | | | | | | |
| *** | | | | | | | | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | A | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 8.50 | 6.95 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.15 | 8.13 | 0.15 |
| | | | 0.00 | | | | Ice | 9.77 | 9.02 | 0.23 |
| | | | | | | | 1" Ice | 11.03 | 10.84 | 0.41 |
| | | | | | | | 2" Ice | 13.68 | 14.85 | 0.91 |
| 4" Ice | | | | | | | | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | B | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 8.50 | 6.95 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.15 | 8.13 | 0.15 |
| | | | 0.00 | | | | Ice | 9.77 | 9.02 | 0.23 |
| | | | | | | | 1" Ice | 11.03 | 10.84 | 0.41 |
| | | | | | | | 2" Ice | 13.68 | 14.85 | 0.91 |
| 4" Ice | | | | | | | | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | C | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 8.50 | 6.95 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.15 | 8.13 | 0.15 |
| | | | 0.00 | | | | Ice | 9.77 | 9.02 | 0.23 |
| | | | | | | | 1" Ice | 11.03 | 10.84 | 0.41 |
| | | | | | | | 2" Ice | 13.68 | 14.85 | 0.91 |
| 4" Ice | | | | | | | | | | |
| APXVTM14-C-120 w/ Mount Pipe | A | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 7.13 | 4.96 | 0.08 |
| | | | 0.00 | | | | 1/2" | 7.66 | 5.75 | 0.13 |
| | | | 0.00 | | | | Ice | 8.18 | 6.47 | 0.19 |
| | | | | | | | 1" Ice | 9.26 | 8.01 | 0.34 |
| | | | | | | | 2" Ice | 11.53 | 11.41 | 0.75 |
| 4" Ice | | | | | | | | | | |
| APXVTM14-C-120 w/ Mount Pipe | B | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 7.13 | 4.96 | 0.08 |
| | | | 0.00 | | | | 1/2" | 7.66 | 5.75 | 0.13 |
| | | | 0.00 | | | | Ice | 8.18 | 6.47 | 0.19 |
| | | | | | | | 1" Ice | 9.26 | 8.01 | 0.34 |
| | | | | | | | 2" Ice | 11.53 | 11.41 | 0.75 |
| 4" Ice | | | | | | | | | | |
| APXVTM14-C-120 w/ Mount Pipe | C | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 7.13 | 4.96 | 0.08 |
| | | | 0.00 | | | | 1/2" | 7.66 | 5.75 | 0.13 |
| | | | 0.00 | | | | Ice | 8.18 | 6.47 | 0.19 |
| | | | | | | | 1" Ice | 9.26 | 8.01 | 0.34 |
| | | | | | | | 2" Ice | 11.53 | 11.41 | 0.75 |
| 4" Ice | | | | | | | | | | |
| TD-RRH8x20-25 | A | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 4.72 | 1.70 | 0.07 |
| | | | 0.00 | | | | 1/2" | 5.01 | 1.92 | 0.10 |
| | | | 0.00 | | | | Ice | 5.32 | 2.15 | 0.13 |
| | | | | | | | 1" Ice | 5.95 | 2.62 | 0.20 |
| | | | | | | | 2" Ice | 7.31 | 3.68 | 0.40 |
| 4" Ice | | | | | | | | | | |
| TD-RRH8x20-25 | B | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 4.72 | 1.70 | 0.07 |
| | | | 0.00 | | | | 1/2" | 5.01 | 1.92 | 0.10 |
| | | | 0.00 | | | | Ice | 5.32 | 2.15 | 0.13 |
| | | | | | | | 1" Ice | 5.95 | 2.62 | 0.20 |
| | | | | | | | 2" Ice | 7.31 | 3.68 | 0.40 |
| 4" Ice | | | | | | | | | | |
| TD-RRH8x20-25 | C | From Leg | 4.00 | | 0.000 | 124.00 | No Ice | 4.72 | 1.70 | 0.07 |
| | | | 0.00 | | | | 1/2" | 5.01 | 1.92 | 0.10 |
| | | | 0.00 | | | | Ice | 5.32 | 2.15 | 0.13 |
| | | | | | | | 1" Ice | 5.95 | 2.62 | 0.20 |
| | | | | | | | 2" Ice | 7.31 | 3.68 | 0.40 |
| 4" Ice | | | | | | | | | | |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|-------------------------------------|-------------|-------------|--------------|------|--------------------|-----------|-------------------------------------|------------------------------------|--------|------|
| | | | Horz Lateral | Vert | | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| IBC1900HG-2A | A | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| IBC1900HG-2A | B | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| IBC1900HG-2A | C | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| IBC1900BB-1 | A | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| IBC1900BB-1 | B | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| IBC1900BB-1 | C | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.13 | 0.53 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.27 | 0.65 | 0.03 |
| | | | 0.00 | | | | Ice | 1.43 | 0.77 | 0.04 |
| | | | | | | | 1" Ice | 1.76 | 1.04 | 0.06 |
| | | | | | | | 2" Ice | 2.53 | 1.69 | 0.15 |
| 2.375" OD x 5' Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| 2.375" OD x 5' Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| 2.375" OD x 5' Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 124.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| Platform Mount [LP 712-1] | C | None | | | 0.000 | 124.00 | No Ice | 24.53 | 24.53 | 1.34 |
| | | | | | | | 1/2" | 29.94 | 29.94 | 1.65 |
| | | | | | | | Ice | 35.35 | 35.35 | 1.96 |
| | | | | | | | 1" Ice | 46.17 | 46.17 | 2.58 |
| | | | | | | | 2" Ice | 67.81 | 67.81 | 3.82 |
| *** 800MHz 2X50W RRH W/FILTER | A | From Leg | 1.00 | 0.00 | 0.000 | 122.00 | No Ice | 2.40 | 2.25 | 0.06 |
| | | | 0.00 | | | | 1/2" | 2.61 | 2.46 | 0.09 |
| | | | -4.00 | | | | Ice | 2.83 | 2.68 | 0.11 |
| | | | | | | | 1" Ice | 3.30 | 3.13 | 0.17 |

| Description | Face or Leg | Offset Type | Offsets: | | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|--------------------------------------|-------------|-------------|----------|---------|-------|--------------------|-----------|-------------------------------------|------------------------------------|--------|------|
| | | | Horz | Lateral | Vert | | | | | | ft |
| | | | ft | ft | ft | ° | ft | ft ² | ft ² | K | |
| 800MHz 2X50W RRH W/FILTER | B | From Leg | 1.00 | 0.00 | -4.00 | 0.000 | 122.00 | 2" Ice | 4.34 | 4.15 | 0.34 |
| | | | | | | | | 4" Ice | | | |
| | | | | | | | | No Ice | 2.40 | 2.25 | 0.06 |
| | | | | | | | | 1/2" Ice | 2.61 | 2.46 | 0.09 |
| | | | | | | | | 1" Ice | 2.83 | 2.68 | 0.11 |
| | | | | | | | | 2" Ice | 3.30 | 3.13 | 0.17 |
| 800MHz 2X50W RRH W/FILTER | C | From Leg | 1.00 | 0.00 | -4.00 | 0.000 | 122.00 | 4" Ice | 4.34 | 4.15 | 0.34 |
| | | | | | | | | No Ice | 2.40 | 2.25 | 0.06 |
| | | | | | | | | 1/2" Ice | 2.61 | 2.46 | 0.09 |
| | | | | | | | | 1" Ice | 2.83 | 2.68 | 0.11 |
| | | | | | | | | 2" Ice | 3.30 | 3.13 | 0.17 |
| | | | | | | | | 4" Ice | 4.34 | 4.15 | 0.34 |
| PCS 1900MHz 4x45W-65MHz | A | From Leg | 1.00 | 0.00 | 0.00 | 0.000 | 122.00 | No Ice | 2.71 | 2.61 | 0.06 |
| | | | | | | | | 1/2" Ice | 2.95 | 2.85 | 0.08 |
| | | | | | | | | 1" Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | | | 2" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | | | 4" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | No Ice | 2.71 | 2.61 | 0.06 |
| PCS 1900MHz 4x45W-65MHz | B | From Leg | 1.00 | 0.00 | 0.00 | 0.000 | 122.00 | 1/2" Ice | 2.95 | 2.85 | 0.08 |
| | | | | | | | | 1" Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | | | 2" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | | | 4" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | No Ice | 2.71 | 2.61 | 0.06 |
| | | | | | | | | 1/2" Ice | 2.95 | 2.85 | 0.08 |
| PCS 1900MHz 4x45W-65MHz | C | From Leg | 1.00 | 0.00 | 0.00 | 0.000 | 122.00 | Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | | | 1" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | | | 2" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | 4" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | No Ice | 2.71 | 2.61 | 0.06 |
| | | | | | | | | 1/2" Ice | 2.95 | 2.85 | 0.08 |
| Pipe Mount [PM 601-3] | C | None | | | | 0.000 | 122.00 | Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | | | 1" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | | | 2" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | 4" Ice | 4.86 | 4.74 | 0.35 |
| | | | | | | | | No Ice | 4.39 | 4.39 | 0.20 |
| | | | | | | | | 1/2" Ice | 5.48 | 5.48 | 0.24 |
| *** BXA-80063/4CFx5 w/ Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.00 | 0.000 | 114.00 | Ice | 6.57 | 6.57 | 0.28 |
| | | | | | | | | 1" Ice | 8.75 | 8.75 | 0.36 |
| | | | | | | | | 2" Ice | 13.11 | 13.11 | 0.53 |
| | | | | | | | | 4" Ice | 13.11 | 13.11 | 0.53 |
| | | | | | | | | No Ice | 5.40 | 3.62 | 0.03 |
| | | | | | | | | 1/2" Ice | 5.84 | 4.22 | 0.07 |
| BXA-80063/4CFx5 w/ Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.00 | 0.000 | 114.00 | Ice | 6.30 | 4.83 | 0.12 |
| | | | | | | | | 1" Ice | 7.24 | 6.16 | 0.23 |
| | | | | | | | | 2" Ice | 9.26 | 9.18 | 0.57 |
| | | | | | | | | 4" Ice | 9.26 | 9.18 | 0.57 |
| | | | | | | | | No Ice | 5.40 | 3.62 | 0.03 |
| | | | | | | | | 1/2" Ice | 5.84 | 4.22 | 0.07 |
| BXA-80063/4CFx5 w/ Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.00 | 0.000 | 114.00 | Ice | 6.30 | 4.83 | 0.12 |
| | | | | | | | | 1" Ice | 7.24 | 6.16 | 0.23 |
| | | | | | | | | 2" Ice | 9.26 | 9.18 | 0.57 |
| | | | | | | | | 4" Ice | 9.26 | 9.18 | 0.57 |
| | | | | | | | | No Ice | 5.40 | 3.62 | 0.03 |
| | | | | | | | | 1/2" Ice | 5.84 | 4.22 | 0.07 |
| KS24019-L112A | B | From Leg | 4.00 | 0.00 | 2.00 | 0.000 | 114.00 | Ice | 0.30 | 0.30 | 0.01 |
| | | | | | | | | 1" Ice | 0.48 | 0.48 | 0.02 |
| | | | | | | | | 2" Ice | 0.95 | 0.95 | 0.06 |
| | | | | | | | | 4" Ice | 0.95 | 0.95 | 0.06 |
| | | | | | | | | No Ice | 0.16 | 0.16 | 0.01 |
| | | | | | | | | 1/2" Ice | 0.22 | 0.22 | 0.01 |
| (2) FD9R6004/2C-3L | A | From Leg | 4.00 | 0.00 | | 0.000 | 114.00 | No Ice | 0.37 | 0.08 | 0.00 |
| | | | | | | | | 1/2" Ice | 0.45 | 0.14 | 0.01 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|-------------------------------|-------------|-------------|--------------|------|--------------------|-----------|-------------------------------------|------------------------------------|--------|------|
| | | | Horz Lateral | Vert | | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| | | | | 0.00 | | | | | | |
| | | | | | | Ice | 0.54 | 0.20 | 0.01 | |
| | | | | | | 1" Ice | 0.75 | 0.34 | 0.02 | |
| | | | | | | 2" Ice | 1.28 | 0.74 | 0.06 | |
| | | | | | | 4" Ice | | | | |
| (2) FD9R6004/2C-3L | B | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 0.37 | 0.08 | 0.00 |
| | | | 0.00 | | | | 1/2" | 0.45 | 0.14 | 0.01 |
| | | | 0.00 | | | | Ice | 0.54 | 0.20 | 0.01 |
| | | | | | | | 1" Ice | 0.75 | 0.34 | 0.02 |
| | | | | | | | 2" Ice | 1.28 | 0.74 | 0.06 |
| | | | | | | | 4" Ice | | | |
| (2) FD9R6004/2C-3L | C | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 0.37 | 0.08 | 0.00 |
| | | | 0.00 | | | | 1/2" | 0.45 | 0.14 | 0.01 |
| | | | 0.00 | | | | Ice | 0.54 | 0.20 | 0.01 |
| | | | | | | | 1" Ice | 0.75 | 0.34 | 0.02 |
| | | | | | | | 2" Ice | 1.28 | 0.74 | 0.06 |
| | | | | | | | 4" Ice | | | |
| DB-T1-6Z-8AB-0Z | B | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 5.60 | 2.33 | 0.04 |
| | | | 0.00 | | | | 1/2" | 5.92 | 2.56 | 0.08 |
| | | | 0.00 | | | | Ice | 6.24 | 2.79 | 0.12 |
| | | | | | | | 1" Ice | 6.91 | 3.28 | 0.21 |
| | | | | | | | 2" Ice | 8.37 | 4.37 | 0.45 |
| | | | | | | | 4" Ice | | | |
| (3) SBNHH-1D65B w/ Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 8.65 | 7.42 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.28 | 8.45 | 0.15 |
| | | | 0.00 | | | | Ice | 9.90 | 9.35 | 0.23 |
| | | | | | | | 1" Ice | 11.16 | 11.18 | 0.42 |
| | | | | | | | 2" Ice | 13.82 | 15.22 | 0.94 |
| | | | | | | | 4" Ice | | | |
| (3) SBNHH-1D65B w/ Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 8.65 | 7.42 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.28 | 8.45 | 0.15 |
| | | | 0.00 | | | | Ice | 9.90 | 9.35 | 0.23 |
| | | | | | | | 1" Ice | 11.16 | 11.18 | 0.42 |
| | | | | | | | 2" Ice | 13.82 | 15.22 | 0.94 |
| | | | | | | | 4" Ice | | | |
| (3) SBNHH-1D65B w/ Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 8.65 | 7.42 | 0.08 |
| | | | 0.00 | | | | 1/2" | 9.28 | 8.45 | 0.15 |
| | | | 0.00 | | | | Ice | 9.90 | 9.35 | 0.23 |
| | | | | | | | 1" Ice | 11.16 | 11.18 | 0.42 |
| | | | | | | | 2" Ice | 13.82 | 15.22 | 0.94 |
| | | | | | | | 4" Ice | | | |
| RRH4X45-AWS4 B66 | A | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 3.10 | 1.76 | 0.06 |
| | | | 0.00 | | | | 1/2" | 3.36 | 1.98 | 0.08 |
| | | | 0.00 | | | | Ice | 3.62 | 2.21 | 0.11 |
| | | | | | | | 1" Ice | 4.17 | 2.69 | 0.17 |
| | | | | | | | 2" Ice | 5.38 | 3.77 | 0.33 |
| | | | | | | | 4" Ice | | | |
| RRH4X45-AWS4 B66 | B | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 3.10 | 1.76 | 0.06 |
| | | | 0.00 | | | | 1/2" | 3.36 | 1.98 | 0.08 |
| | | | 0.00 | | | | Ice | 3.62 | 2.21 | 0.11 |
| | | | | | | | 1" Ice | 4.17 | 2.69 | 0.17 |
| | | | | | | | 2" Ice | 5.38 | 3.77 | 0.33 |
| | | | | | | | 4" Ice | | | |
| RRH4X45-AWS4 B66 | C | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 3.10 | 1.76 | 0.06 |
| | | | 0.00 | | | | 1/2" | 3.36 | 1.98 | 0.08 |
| | | | 0.00 | | | | Ice | 3.62 | 2.21 | 0.11 |
| | | | | | | | 1" Ice | 4.17 | 2.69 | 0.17 |
| | | | | | | | 2" Ice | 5.38 | 3.77 | 0.33 |
| | | | | | | | 4" Ice | | | |
| RRH2X60-PCS | A | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 2.57 | 2.01 | 0.06 |
| | | | 0.00 | | | | 1/2" | 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | | Ice | 3.02 | 2.43 | 0.10 |
| | | | | | | | 1" Ice | 3.52 | 2.89 | 0.16 |
| | | | | | | | 2" Ice | 4.61 | 3.92 | 0.31 |
| | | | | | | | 4" Ice | | | |
| RRH2X60-PCS | B | From Leg | 4.00 | 0.00 | 0.000 | 114.00 | No Ice | 2.57 | 2.01 | 0.06 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment ° | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K | |
|-------------------------------------|-------------|-------------|----------------------------------------------|-------------------------|-----------------|--------------------------------------------------------|-------------------------------------------------------|-------------|------|
| | | | 0.00 | | | 1/2" | 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | Ice | 3.02 | 2.43 | 0.10 |
| | | | | | | 1" Ice | 3.52 | 2.89 | 0.16 |
| | | | | | | 2" Ice | 4.61 | 3.92 | 0.31 |
| | | | | | | 4" Ice | | | |
| RRH2X60-PCS | C | From Leg | 4.00 | 0.000 | 114.00 | No Ice | 2.57 | 2.01 | 0.06 |
| | | | 0.00 | | | 1/2" | 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | Ice | 3.02 | 2.43 | 0.10 |
| | | | | | | 1" Ice | 3.52 | 2.89 | 0.16 |
| | | | | | | 2" Ice | 4.61 | 3.92 | 0.31 |
| | | | | | | 4" Ice | | | |
| RRH2x60-700 | A | From Leg | 4.00 | 0.000 | 114.00 | No Ice | 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" | 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice | 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice | 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | 6.72 | 4.25 | 0.35 |
| | | | | | | 4" Ice | | | |
| RRH2x60-700 | B | From Leg | 4.00 | 0.000 | 114.00 | No Ice | 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" | 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice | 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice | 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | 6.72 | 4.25 | 0.35 |
| | | | | | | 4" Ice | | | |
| RRH2x60-700 | C | From Leg | 4.00 | 0.000 | 114.00 | No Ice | 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" | 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice | 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice | 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | 6.72 | 4.25 | 0.35 |
| | | | | | | 4" Ice | | | |
| DB-T1-6Z-8AB-0Z | A | From Leg | 4.00 | 0.000 | 114.00 | No Ice | 5.60 | 2.33 | 0.04 |
| | | | 0.00 | | | 1/2" | 5.92 | 2.56 | 0.08 |
| | | | 0.00 | | | Ice | 6.24 | 2.79 | 0.12 |
| | | | | | | 1" Ice | 6.91 | 3.28 | 0.21 |
| | | | | | | 2" Ice | 8.37 | 4.37 | 0.45 |
| | | | | | | 4" Ice | | | |
| Platform Mount [LP 712-1] | C | None | | 0.000 | 114.00 | No Ice | 24.53 | 24.53 | 1.34 |
| | | | | | | 1/2" | 29.94 | 29.94 | 1.65 |
| | | | | | | Ice | 35.35 | 35.35 | 1.96 |
| | | | | | | 1" Ice | 46.17 | 46.17 | 2.58 |
| | | | | | | 2" Ice | 67.81 | 67.81 | 3.82 |
| | | | | | | 4" Ice | | | |
| *** | | | | | | | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | A | From Leg | 4.00 | 0.000 | 105.00 | No Ice | 8.50 | 6.30 | 0.07 |
| | | | 0.00 | | | 1/2" | 9.15 | 7.48 | 0.14 |
| | | | 0.00 | | | Ice | 9.77 | 8.37 | 0.21 |
| | | | | | | 1" Ice | 11.03 | 10.18 | 0.38 |
| | | | | | | 2" Ice | 13.68 | 14.02 | 0.87 |
| | | | | | | 4" Ice | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | B | From Leg | 4.00 | 0.000 | 105.00 | No Ice | 8.50 | 6.30 | 0.07 |
| | | | 0.00 | | | 1/2" | 9.15 | 7.48 | 0.14 |
| | | | 0.00 | | | Ice | 9.77 | 8.37 | 0.21 |
| | | | | | | 1" Ice | 11.03 | 10.18 | 0.38 |
| | | | | | | 2" Ice | 13.68 | 14.02 | 0.87 |
| | | | | | | 4" Ice | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | C | From Leg | 4.00 | 0.000 | 105.00 | No Ice | 8.50 | 6.30 | 0.07 |
| | | | 0.00 | | | 1/2" | 9.15 | 7.48 | 0.14 |
| | | | 0.00 | | | Ice | 9.77 | 8.37 | 0.21 |
| | | | | | | 1" Ice | 11.03 | 10.18 | 0.38 |
| | | | | | | 2" Ice | 13.68 | 14.02 | 0.87 |
| | | | | | | 4" Ice | | | |
| 7770.00 w/ Mount Pipe | A | From Leg | 4.00 | 0.000 | 105.00 | No Ice | 6.22 | 4.82 | 0.09 |
| | | | 0.00 | | | 1/2" | 6.71 | 5.51 | 0.14 |
| | | | 0.00 | | | Ice | 7.22 | 6.21 | 0.21 |
| | | | | | | 1" Ice | 8.26 | 7.67 | 0.36 |
| | | | | | | 2" Ice | 10.48 | 11.06 | 0.76 |

| Description | Face or Leg | Offset Type | Offsets: | | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight |
|-------------------------------|-------------|-------------|----------|---------|--------|--------------------|-----------|-------------------------------------|------------------------------------|--------|
| | | | Horz | Lateral | Vert | | | | | |
| 7770.00 w/ Mount Pipe | B | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 6.22 | 4.82 | 0.09 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| 7770.00 w/ Mount Pipe | C | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 6.22 | 4.82 | 0.09 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) LGP2140X | A | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 1.26 | 0.38 | 0.01 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) LGP2140X | B | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 1.26 | 0.38 | 0.01 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) LGP2140X | C | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 1.26 | 0.38 | 0.01 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) RRUS-11 | A | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 3.25 | 1.37 | 0.05 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) RRUS-11 | B | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 3.25 | 1.37 | 0.05 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| (2) RRUS-11 | C | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 3.25 | 1.37 | 0.05 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| DC6-48-60-18-8F | A | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 1.47 | 1.47 | 0.02 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| OPA-65R-LCUU-H6 w/ Mount Pipe | A | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 10.60 | 7.18 | 0.10 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 2" Ice | | | | |
| OPA-65R-LCUU-H6 w/ Mount Pipe | B | From Leg | 4.00 | 0.000 | 105.00 | 4" Ice | 10.60 | 7.18 | 0.10 | |
| | | | 0.00 | | | No Ice | | | | |
| | | | 0.00 | | | 1/2" Ice | | | | |
| | | | | | | 1" Ice | | | | |
| | | | | | | 1" Ice | | | | |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|---------------------------------------|-------------|-------------|----------|---------|--------------------|-----------|-------------------------------------|------------------------------------|--------|------|
| | | | Horz | Lateral | | | | | | ft |
| | | | | | | | ft ² | ft ² | K | |
| OPA-65R-LCUU-H6 w/ Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 105.00 | 2" Ice | 15.93 | 15.15 | 1.00 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 10.60 | 7.18 | 0.10 |
| | | | | | | | 1/2" Ice | 11.27 | 8.36 | 0.18 |
| | | | | | | | 1" Ice | 11.91 | 9.26 | 0.26 |
| RRUS 32 B30 | A | From Leg | 4.00 | 0.00 | 0.000 | 105.00 | 1" Ice | 13.21 | 11.09 | 0.46 |
| | | | | | | | 2" Ice | 15.93 | 15.15 | 1.00 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 3.87 | 2.76 | 0.08 |
| | | | | | | | 1/2" Ice | 4.15 | 3.02 | 0.10 |
| RRUS 32 B30 | B | From Leg | 4.00 | 0.00 | 0.000 | 105.00 | Ice | 4.44 | 3.29 | 0.14 |
| | | | | | | | 1" Ice | 5.06 | 3.85 | 0.21 |
| | | | | | | | 2" Ice | 6.38 | 5.08 | 0.41 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 3.87 | 2.76 | 0.08 |
| RRUS 32 B30 | C | From Leg | 4.00 | 0.00 | 0.000 | 105.00 | 1/2" Ice | 4.15 | 3.02 | 0.10 |
| | | | | | | | Ice | 4.44 | 3.29 | 0.14 |
| | | | | | | | 1" Ice | 5.06 | 3.85 | 0.21 |
| | | | | | | | 2" Ice | 6.38 | 5.08 | 0.41 |
| | | | | | | | 4" Ice | | | |
| DC6-48-60-18-8F | A | From Leg | 4.00 | 0.00 | 0.000 | 105.00 | No Ice | 1.47 | 1.47 | 0.02 |
| | | | | | | | 1/2" Ice | 1.67 | 1.67 | 0.04 |
| | | | | | | | Ice | 1.88 | 1.88 | 0.06 |
| | | | | | | | 1" Ice | 2.33 | 2.33 | 0.11 |
| | | | | | | | 2" Ice | 3.38 | 3.38 | 0.24 |
| Platform Mount [LP 712-1] | C | None | | | 0.000 | 105.00 | 4" Ice | | | |
| | | | | | | | No Ice | 24.53 | 24.53 | 1.34 |
| | | | | | | | 1/2" Ice | 29.94 | 29.94 | 1.65 |
| | | | | | | | Ice | 35.35 | 35.35 | 1.96 |
| | | | | | | | 1" Ice | 46.17 | 46.17 | 2.58 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.000 | 94.00 | 2" Ice | 67.81 | 67.81 | 3.82 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 6.82 | 5.63 | 0.11 |
| | | | | | | | 1/2" Ice | 7.34 | 6.47 | 0.17 |
| | | | | | | | Ice | 7.85 | 7.25 | 0.23 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 94.00 | 1" Ice | 8.92 | 8.85 | 0.38 |
| | | | | | | | 2" Ice | 11.17 | 12.28 | 0.81 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 6.82 | 5.63 | 0.11 |
| | | | | | | | 1/2" Ice | 7.34 | 6.47 | 0.17 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | C | From Leg | 4.00 | 0.00 | 0.000 | 94.00 | Ice | 7.85 | 7.25 | 0.23 |
| | | | | | | | 1" Ice | 8.92 | 8.85 | 0.38 |
| | | | | | | | 2" Ice | 11.17 | 12.28 | 0.81 |
| | | | | | | | 4" Ice | | | |
| | | | | | | | No Ice | 6.82 | 5.63 | 0.11 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | A | From Leg | 4.00 | 0.00 | 0.000 | 94.00 | 1/2" Ice | 7.34 | 6.47 | 0.17 |
| | | | | | | | Ice | 7.85 | 7.25 | 0.23 |
| | | | | | | | 1" Ice | 8.92 | 8.85 | 0.38 |
| | | | | | | | 2" Ice | 11.17 | 12.28 | 0.81 |
| | | | | | | | 4" Ice | | | |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | B | From Leg | 4.00 | 0.00 | 0.000 | 94.00 | No Ice | 6.83 | 5.64 | 0.11 |
| | | | | | | | 1/2" Ice | 7.35 | 6.48 | 0.17 |
| | | | | | | | Ice | 7.86 | 7.26 | 0.23 |
| | | | | | | | 1" Ice | 8.93 | 8.86 | 0.38 |
| | | | | | | | 2" Ice | 11.18 | 12.29 | 0.81 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|---------------------------------------|-------------|-------------|--------------|-------|--------------------|-----------|-------------------------------------|------------------------------------|--------|------|
| | | | Horz Lateral | Vert | | | | | | ft |
| | | | | 1.00 | | | | | | |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | C | From Leg | | | 0.000 | 94.00 | Ice | 7.86 | 7.26 | 0.23 |
| | | | 1" Ice | 8.93 | | | 8.86 | 0.38 | | |
| | | | 2" Ice | 11.18 | | | 12.29 | 0.81 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 6.83 | | | 5.64 | 0.11 | | |
| | | | 1/2" | 7.35 | | | 6.48 | 0.17 | | |
| | | | Ice | 7.86 | | | 7.26 | 0.23 | | |
| KRY 112 144/1 | A | From Leg | | | 0.000 | 94.00 | 1" Ice | 8.93 | 8.86 | 0.38 |
| | | | 2" Ice | 11.18 | | | 12.29 | 0.81 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 0.41 | | | 0.20 | 0.01 | | |
| | | | 1/2" | 0.50 | | | 0.27 | 0.01 | | |
| | | | Ice | 0.59 | | | 0.35 | 0.02 | | |
| | | | 1" Ice | 0.81 | | | 0.53 | 0.03 | | |
| KRY 112 144/1 | B | From Leg | | | 0.000 | 94.00 | 2" Ice | 1.36 | 1.00 | 0.08 |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 0.41 | | | 0.20 | 0.01 | | |
| | | | 1/2" | 0.50 | | | 0.27 | 0.01 | | |
| | | | Ice | 0.59 | | | 0.35 | 0.02 | | |
| | | | 1" Ice | 0.81 | | | 0.53 | 0.03 | | |
| | | | 2" Ice | 1.36 | | | 1.00 | 0.08 | | |
| KRY 112 144/1 | C | From Leg | | | 0.000 | 94.00 | 4" Ice | | | |
| | | | No Ice | 0.41 | | | 0.20 | 0.01 | | |
| | | | 1/2" | 0.50 | | | 0.27 | 0.01 | | |
| | | | Ice | 0.59 | | | 0.35 | 0.02 | | |
| | | | 1" Ice | 0.81 | | | 0.53 | 0.03 | | |
| | | | 2" Ice | 1.36 | | | 1.00 | 0.08 | | |
| | | | 4" Ice | | | | | | | |
| LNX-6515DS-A1M w/ Mount Pipe | A | From Leg | | | 0.000 | 94.00 | No Ice | 11.68 | 9.84 | 0.08 |
| | | | 1/2" | 12.40 | | | 11.37 | 0.17 | | |
| | | | Ice | 13.14 | | | 12.91 | 0.27 | | |
| | | | 1" Ice | 14.60 | | | 15.27 | 0.51 | | |
| | | | 2" Ice | 17.87 | | | 20.14 | 1.15 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 11.68 | | | 9.84 | 0.08 | | |
| LNX-6515DS-A1M w/ Mount Pipe | B | From Leg | | | 0.000 | 94.00 | 1/2" | 12.40 | 11.37 | 0.17 |
| | | | Ice | 13.14 | | | 12.91 | 0.27 | | |
| | | | 1" Ice | 14.60 | | | 15.27 | 0.51 | | |
| | | | 2" Ice | 17.87 | | | 20.14 | 1.15 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 11.68 | | | 9.84 | 0.08 | | |
| | | | 1/2" | 12.40 | | | 11.37 | 0.17 | | |
| LNX-6515DS-A1M w/ Mount Pipe | C | From Leg | | | 0.000 | 94.00 | Ice | 13.14 | 12.91 | 0.27 |
| | | | 1" Ice | 14.60 | | | 15.27 | 0.51 | | |
| | | | 2" Ice | 17.87 | | | 20.14 | 1.15 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 11.68 | | | 9.84 | 0.08 | | |
| | | | 1/2" | 12.40 | | | 11.37 | 0.17 | | |
| | | | Ice | 13.14 | | | 12.91 | 0.27 | | |
| RRUS 11 B12 | A | From Leg | | | 0.000 | 94.00 | Ice | 3.80 | 1.73 | 0.10 |
| | | | 1" Ice | 4.33 | | | 2.13 | 0.15 | | |
| | | | 2" Ice | 5.50 | | | 3.04 | 0.31 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 3.31 | | | 1.36 | 0.05 | | |
| | | | 1/2" | 3.55 | | | 1.54 | 0.07 | | |
| | | | Ice | 3.80 | | | 1.73 | 0.10 | | |
| RRUS 11 B12 | B | From Leg | | | 0.000 | 94.00 | 1" Ice | 4.33 | 2.13 | 0.15 |
| | | | 2" Ice | 5.50 | | | 3.04 | 0.31 | | |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 3.31 | | | 1.36 | 0.05 | | |
| | | | 1/2" | 3.55 | | | 1.54 | 0.07 | | |
| | | | Ice | 3.80 | | | 1.73 | 0.10 | | |
| | | | 1" Ice | 4.33 | | | 2.13 | 0.15 | | |
| RRUS 11 B12 | C | From Leg | | | 0.000 | 94.00 | 2" Ice | 5.50 | 3.04 | 0.31 |
| | | | 4" Ice | | | | | | | |
| | | | No Ice | 3.31 | | | 1.36 | 0.05 | | |
| | | | 1/2" | 3.55 | | | 1.54 | 0.07 | | |
| | | | Ice | 3.80 | | | 1.73 | 0.10 | | |
| | | | 1" Ice | 4.33 | | | 2.13 | 0.15 | | |
| | | | 2" Ice | 5.50 | | | 3.04 | 0.31 | | |
| 2.375" OD x 5' Mount Pipe | A | From Leg | 4.00 | | 0.000 | 94.00 | No Ice | 1.19 | 1.19 | 0.02 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight |
|---------------------------|-------------|-------------|----------|---------|--------------------|-----------|-------------------------------------|------------------------------------|--------|
| | | | Horz | Lateral | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K |
| | | | 0.00 | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| | | | | | | 4" Ice | | | |
| 2.375" OD x 5' Mount Pipe | B | From Leg | 4.00 | 0.000 | 94.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| | | | | | | 4" Ice | | | |
| 2.375" OD x 5' Mount Pipe | C | From Leg | 4.00 | 0.000 | 94.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | 1/2" | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | Ice | 1.81 | 1.81 | 0.04 |
| | | | | | | 1" Ice | 2.46 | 2.46 | 0.08 |
| | | | | | | 2" Ice | 3.92 | 3.92 | 0.20 |
| | | | | | | 4" Ice | | | |
| Platform Mount [LP 712-1] | C | None | | 0.000 | 94.00 | No Ice | 24.53 | 24.53 | 1.34 |
| | | | | | | 1/2" | 29.94 | 29.94 | 1.65 |
| | | | | | | Ice | 35.35 | 35.35 | 1.96 |
| | | | | | | 1" Ice | 46.17 | 46.17 | 2.58 |
| | | | | | | 2" Ice | 67.81 | 67.81 | 3.82 |
| | | | | | | 4" Ice | | | |
| *** | | | | | | | | | |
| 742 213 w/ Mount Pipe | A | From Leg | 1.00 | 0.000 | 87.00 | No Ice | 5.37 | 4.62 | 0.05 |
| | | | 0.00 | | | 1/2" | 5.95 | 6.00 | 0.09 |
| | | | 0.00 | | | Ice | 6.50 | 6.98 | 0.15 |
| | | | | | | 1" Ice | 7.61 | 8.85 | 0.28 |
| | | | | | | 2" Ice | 9.93 | 12.79 | 0.68 |
| | | | | | | 4" Ice | | | |
| 742 213 w/ Mount Pipe | B | From Leg | 1.00 | 0.000 | 87.00 | No Ice | 5.37 | 4.62 | 0.05 |
| | | | 0.00 | | | 1/2" | 5.95 | 6.00 | 0.09 |
| | | | 0.00 | | | Ice | 6.50 | 6.98 | 0.15 |
| | | | | | | 1" Ice | 7.61 | 8.85 | 0.28 |
| | | | | | | 2" Ice | 9.93 | 12.79 | 0.68 |
| | | | | | | 4" Ice | | | |
| 742 213 w/ Mount Pipe | C | From Leg | 1.00 | 0.000 | 87.00 | No Ice | 5.37 | 4.62 | 0.05 |
| | | | 0.00 | | | 1/2" | 5.95 | 6.00 | 0.09 |
| | | | 0.00 | | | Ice | 6.50 | 6.98 | 0.15 |
| | | | | | | 1" Ice | 7.61 | 8.85 | 0.28 |
| | | | | | | 2" Ice | 9.93 | 12.79 | 0.68 |
| | | | | | | 4" Ice | | | |
| Pipe Mount [PM 601-3] | C | None | | 0.000 | 87.00 | No Ice | 4.39 | 4.39 | 0.20 |
| | | | | | | 1/2" | 5.48 | 5.48 | 0.24 |
| | | | | | | Ice | 6.57 | 6.57 | 0.28 |
| | | | | | | 1" Ice | 8.75 | 8.75 | 0.36 |
| | | | | | | 2" Ice | 13.11 | 13.11 | 0.53 |
| | | | | | | 4" Ice | | | |
| *** | | | | | | | | | |
| 58532A | A | From Leg | 3.00 | 0.000 | 77.00 | No Ice | 0.22 | 0.22 | 0.00 |
| | | | 0.00 | | | 1/2" | 0.29 | 0.29 | 0.00 |
| | | | 0.00 | | | Ice | 0.37 | 0.37 | 0.01 |
| | | | | | | 1" Ice | 0.55 | 0.55 | 0.02 |
| | | | | | | 2" Ice | 1.01 | 1.01 | 0.06 |
| | | | | | | 4" Ice | | | |
| Side Arm Mount [SO 701-1] | A | None | | 0.000 | 77.00 | No Ice | 0.85 | 1.67 | 0.07 |
| | | | | | | 1/2" | 1.14 | 2.34 | 0.08 |
| | | | | | | Ice | 1.43 | 3.01 | 0.09 |
| | | | | | | 1" Ice | 2.01 | 4.35 | 0.12 |
| | | | | | | 2" Ice | 3.17 | 7.03 | 0.18 |
| | | | | | | 4" Ice | | | |

Dishes

| Description | Face or Leg | Dish Type | Offset Type | Offsets: | | Azimuth Adjustment | 3 dB Beam Width | Elevation | Outside Diameter | Aperture Area | Weight |
|-------------|-------------|--------------------------|-------------|----------|--------------|--------------------|-----------------|-----------|------------------|---------------|--------|
| | | | | Horz | Lateral Vert | | | | | | |
| | | | | ft | ° | ° | ft | ft | ft ² | K | |
| VHLP2.5-11 | A | Paraboloid w/Shroud (HP) | From Leg | 4.00 | 0.000 | | 133.00 | 2.92 | No Ice | 6.68 | 0.05 |
| | | | | 0.00 | | | | | 1/2" Ice | 7.07 | 0.08 |
| | | | | 6.00 | | | | | 1" Ice | 7.46 | 0.12 |
| | | | | | | | | | 2" Ice | 8.23 | 0.19 |
| | | | | | | | | | 4" Ice | 9.78 | 0.34 |
| VHLP2.5-11 | B | Paraboloid w/Shroud (HP) | From Leg | 4.00 | 0.000 | | 133.00 | 2.92 | No Ice | 6.68 | 0.05 |
| | | | | 0.00 | | | | | 1/2" Ice | 7.07 | 0.08 |
| | | | | 6.00 | | | | | 1" Ice | 7.46 | 0.12 |
| | | | | | | | | | 2" Ice | 8.23 | 0.19 |
| | | | | | | | | | 4" Ice | 9.78 | 0.34 |

Tower Pressures - No Ice

$G_H = 1.690$

| Section Elevation | z | K _Z | q _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _A A _A In Face | C _A A _A Out Face |
|-------------------|--------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|---------------------------------------|----------------------------------------|
| ft | ft | | psf | ft ² | e | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 145.00-130.00 | 137.36 | 1.503 | 24.63 | 31.731 | A | 0.000 | 31.731 | 31.731 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 31.731 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 31.731 | 100.00 | 0.000 | 0.000 | |
| L2 130.00-84.75 | 106.68 | 1.398 | 22.86 | 116.971 | A | 0.000 | 116.971 | 116.971 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 116.971 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 116.971 | 100.00 | 0.000 | 20.898 | |
| L3 84.75-58.08 | 71.12 | 1.245 | 20.40 | 82.729 | A | 0.000 | 82.729 | 82.729 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 82.729 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 82.729 | 100.00 | 0.000 | 20.896 | |
| L4 58.08-44.25 | 51.09 | 1.133 | 18.56 | 47.239 | A | 0.000 | 47.239 | 47.239 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 47.239 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 47.239 | 100.00 | 0.000 | 12.930 | |
| L5 44.25-31.25 | 37.68 | 1.039 | 17.02 | 46.319 | A | 0.000 | 46.319 | 46.319 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 46.319 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 46.319 | 100.00 | 0.000 | 12.328 | |
| L6 31.25-4.75 | 17.77 | 1 | 16.38 | 102.679 | A | 0.000 | 102.679 | 102.679 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 102.679 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 102.679 | 100.00 | 0.000 | 25.873 | |
| L7 4.75-0.00 | 2.37 | 1 | 16.38 | 19.550 | A | 0.000 | 19.550 | 19.550 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 19.550 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 19.550 | 100.00 | 0.000 | 4.638 | |

Tower Pressure - With Ice

$G_H = 1.690$

| Section Elevation | z | K _Z | q _z | t _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _A A _A In Face | C _A A _A Out Face |
|-------------------|--------|----------------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|---------------------------------------|----------------------------------------|
| ft | ft | | psf | in | ft ² | e | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 145.00-130.00 | 137.36 | 1.503 | 5.44 | 1.4833 | 35.440 | A | 0.000 | 35.440 | 35.440 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 35.440 | 100.00 | 0.000 | 0.000 | |
| | | | | | | C | 0.000 | 35.440 | 100.00 | 0.000 | 0.000 | |
| L2 130.00-84.75 | 106.68 | 1.398 | 5.05 | 1.4390 | 127.824 | A | 0.000 | 127.824 | 127.824 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 127.824 | 100.00 | 0.000 | 0.000 | |
| | | | | | | C | 0.000 | 127.824 | 100.00 | 0.000 | 51.980 | |
| L3 84.75-58.08 | 71.12 | 1.245 | 4.51 | 1.3707 | 89.124 | A | 0.000 | 89.124 | 89.124 | 100.00 | 0.000 | 0.000 |

| Section Elevation ft | z ft | K _Z | q _z psf | l _z in | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|-------------------------------------------------------------|--------------------------------------------------------------|
| L4 58.08-44.25 | 51.09 | 1.133 | 4.10 | 1.3173 | 50.277 | B | 0.000 | 89.124 | 50.277 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 89.124 | | 100.00 | 0.000 | 52.393 |
| | | | | | | A | 0.000 | 50.277 | | 100.00 | 0.000 | 0.000 |
| L5 44.25-31.25 | 37.68 | 1.039 | 3.76 | 1.2701 | 49.174 | B | 0.000 | 50.277 | 49.174 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 50.277 | | 100.00 | 0.000 | 31.557 |
| | | | | | | A | 0.000 | 49.174 | | 100.00 | 0.000 | 0.000 |
| L6 31.25-4.75 | 17.77 | 1 | 3.62 | 1.2500 | 108.200 | B | 0.000 | 49.174 | 108.200 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 49.174 | | 100.00 | 0.000 | 29.834 |
| | | | | | | A | 0.000 | 108.200 | | 100.00 | 0.000 | 0.000 |
| L7 4.75-0.00 | 2.37 | 1 | 3.62 | 1.2500 | 20.540 | B | 0.000 | 108.200 | 20.540 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 108.200 | | 100.00 | 0.000 | 59.734 |
| | | | | | | A | 0.000 | 20.540 | | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 20.540 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 20.540 | | 100.00 | 0.000 | 10.707 |

Tower Pressure - Service

G_H = 1.690

| Section Elevation ft | z ft | K _Z | q _z psf | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|-------------------------------------------------------------|--------------------------------------------------------------|
| L1 145.00-130.00 | 137.36 | 1.503 | 9.62 | 31.731 | A | 0.000 | 31.731 | 31.731 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 31.731 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 31.731 | | 100.00 | 0.000 | 0.000 |
| L2 130.00-84.75 | 106.68 | 1.398 | 8.93 | 116.971 | A | 0.000 | 116.971 | 116.971 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 116.971 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 116.971 | | 100.00 | 0.000 | 20.898 |
| L3 84.75-58.08 | 71.12 | 1.245 | 7.97 | 82.729 | A | 0.000 | 82.729 | 82.729 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 82.729 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 82.729 | | 100.00 | 0.000 | 20.896 |
| L4 58.08-44.25 | 51.09 | 1.133 | 7.25 | 47.239 | A | 0.000 | 47.239 | 47.239 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 47.239 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 47.239 | | 100.00 | 0.000 | 12.930 |
| L5 44.25-31.25 | 37.68 | 1.039 | 6.65 | 46.319 | A | 0.000 | 46.319 | 46.319 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 46.319 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 46.319 | | 100.00 | 0.000 | 12.328 |
| L6 31.25-4.75 | 17.77 | 1 | 6.40 | 102.679 | A | 0.000 | 102.679 | 102.679 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 102.679 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 102.679 | | 100.00 | 0.000 | 25.873 |
| L7 4.75-0.00 | 2.37 | 1 | 6.40 | 19.550 | A | 0.000 | 19.550 | 19.550 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 19.550 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 19.550 | | 100.00 | 0.000 | 4.638 |

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 |

| Comb. No. | Description |
|-----------|-----------------------------|
| 13 | Dead+Wind 330 deg - No Ice |
| 14 | Dead+Ice+Temp |
| 15 | Dead+Wind 0 deg+Ice+Temp |
| 16 | Dead+Wind 30 deg+Ice+Temp |
| 17 | Dead+Wind 60 deg+Ice+Temp |
| 18 | Dead+Wind 90 deg+Ice+Temp |
| 19 | Dead+Wind 120 deg+Ice+Temp |
| 20 | Dead+Wind 150 deg+Ice+Temp |
| 21 | Dead+Wind 180 deg+Ice+Temp |
| 22 | Dead+Wind 210 deg+Ice+Temp |
| 23 | Dead+Wind 240 deg+Ice+Temp |
| 24 | Dead+Wind 270 deg+Ice+Temp |
| 25 | Dead+Wind 300 deg+Ice+Temp |
| 26 | Dead+Wind 330 deg+Ice+Temp |
| 27 | Dead+Wind 0 deg - Service |
| 28 | Dead+Wind 30 deg - Service |
| 29 | Dead+Wind 60 deg - Service |
| 30 | Dead+Wind 90 deg - Service |
| 31 | Dead+Wind 120 deg - Service |
| 32 | Dead+Wind 150 deg - Service |
| 33 | Dead+Wind 180 deg - Service |
| 34 | Dead+Wind 210 deg - Service |
| 35 | Dead+Wind 240 deg - Service |
| 36 | Dead+Wind 270 deg - Service |
| 37 | Dead+Wind 300 deg - Service |
| 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 | 145 - 130 | Pole | Max Tension | 2 | 0.00 | 0.00 | -0.00 |
| | | | Max. Compression | 14 | -5.42 | -0.83 | 0.53 |
| | | | Max. Mx | 11 | -2.37 | 19.55 | 1.47 |
| | | | Max. My | 8 | -2.36 | -1.28 | -20.26 |
| | | | Max. Vy | 11 | -3.72 | 19.55 | 1.47 |
| | | | Max. Vx | 8 | 3.79 | -1.28 | -20.26 |
| | | | Max. Torque | 12 | | | -0.82 |
| L2 | 130 - 84.75 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -40.45 | 2.54 | -0.61 |
| | | | Max. Mx | 11 | -16.11 | 633.93 | 9.30 |
| | | | Max. My | 8 | -16.09 | -7.45 | -638.75 |
| | | | Max. Vy | 11 | -26.36 | 633.93 | 9.30 |
| | | | Max. Vx | 8 | 26.50 | -7.45 | -638.75 |
| | | | Max. Torque | 12 | | | -1.65 |
| L3 | 84.75 - 58.0833 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -53.61 | 9.23 | -4.39 |
| | | | Max. Mx | 11 | -22.80 | 1522.11 | 15.60 |
| | | | Max. My | 8 | -22.78 | -12.33 | -1530.81 |
| | | | Max. Vy | 11 | -29.94 | 1522.11 | 15.60 |
| | | | Max. Vx | 8 | 30.07 | -12.33 | -1530.81 |
| | | | Max. Torque | 12 | | | -1.58 |
| L4 | 58.0833 - 44.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -57.32 | 11.19 | -5.52 |
| | | | Max. Mx | 11 | -25.01 | 1782.42 | 17.28 |
| | | | Max. My | 8 | -25.00 | -13.61 | -1792.17 |
| | | | Max. Vy | 11 | -30.69 | 1782.42 | 17.28 |
| | | | Max. Vx | 8 | 30.82 | -13.61 | -1792.17 |
| | | | Max. Torque | 12 | | | -1.43 |
| L5 | 44.25 - 31.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -67.18 | 15.45 | -7.97 |
| | | | Max. Mx | 11 | -31.26 | 2358.18 | 20.83 |
| | | | Max. My | 8 | -31.25 | -16.30 | -2370.12 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L6 | 31.25 - 4.75 | Pole | Max. Vy | 11 | -32.27 | 2358.18 | 20.83 |
| | | | Max. Vx | 8 | 32.41 | -16.30 | -2370.12 |
| | | | Max. Torque | 11 | | | -1.34 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -80.81 | 21.62 | -11.53 |
| | | | Max. Mx | 11 | -40.40 | 3241.22 | 25.84 |
| | | | Max. My | 8 | -40.40 | -20.05 | -3256.27 |
| | | | Max. Vy | 11 | -34.33 | 3241.22 | 25.84 |
| L7 | 4.75 - 0 | Pole | Max. Vx | 8 | 34.46 | -20.05 | -3256.27 |
| | | | Max. Torque | 11 | | | -1.28 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -83.28 | 22.77 | -12.20 |
| | | | Max. Mx | 11 | -42.06 | 3405.20 | 26.71 |
| | | | Max. My | 8 | -42.06 | -20.70 | -3420.79 |
| | | | Max. Vy | 11 | -34.68 | 3405.20 | 26.71 |
| | | | Max. Vx | 8 | 34.81 | -20.70 | -3420.79 |
| | | | Max. Torque | 11 | | | -1.16 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole | Max. Vert | 14 | 83.28 | -0.00 | 0.00 |
| | Max. H _x | 11 | 42.07 | 34.66 | 0.21 |
| | Max. H _z | 2 | 42.07 | 0.24 | 34.73 |
| | Max. M _x | 2 | 3409.94 | 0.24 | 34.73 |
| | Max. M _z | 5 | 3389.53 | -34.59 | -0.12 |
| | Max. Torsion | 5 | 1.12 | -34.59 | -0.12 |
| | Min. Vert | 2 | 42.07 | 0.24 | 34.73 |
| | Min. H _x | 5 | 42.07 | -34.59 | -0.12 |
| | Min. H _z | 8 | 42.07 | -0.17 | -34.79 |
| | Min. M _x | 8 | -3420.79 | -0.17 | -34.79 |
| | Min. M _z | 11 | -3405.20 | 34.66 | 0.21 |
| | Min. Torsion | 11 | -1.13 | 34.66 | 0.21 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overturing Moment, M _x kip-ft | Overturing Moment, M _z kip-ft | Torque kip-ft |
|----------------------------|------------|----------------------|----------------------|------------------------------------------|------------------------------------------|---------------|
| Dead Only | 42.07 | -0.00 | 0.00 | 1.42 | 2.79 | 0.00 |
| Dead+Wind 0 deg - No Ice | 42.07 | -0.24 | -34.73 | -3409.94 | 35.96 | 0.24 |
| Dead+Wind 30 deg - No Ice | 42.07 | 17.19 | -30.02 | -2944.82 | -1679.32 | 0.19 |
| Dead+Wind 60 deg - No Ice | 42.07 | 29.91 | -17.27 | -1691.21 | -2928.91 | -0.54 |
| Dead+Wind 90 deg - No Ice | 42.07 | 34.59 | 0.12 | 17.78 | -3389.53 | -1.12 |
| Dead+Wind 120 deg - No Ice | 42.07 | 29.96 | 17.58 | 1736.13 | -2935.47 | -0.77 |
| Dead+Wind 150 deg - No Ice | 42.07 | 17.41 | 30.19 | 2971.24 | -1708.22 | -0.58 |
| Dead+Wind 180 deg - No Ice | 42.07 | 0.17 | 34.79 | 3420.79 | -20.70 | -0.43 |
| Dead+Wind 210 deg - No Ice | 42.07 | -17.15 | 30.12 | 2962.26 | 1679.75 | -0.20 |
| Dead+Wind 240 deg - No Ice | 42.07 | -29.94 | 17.28 | 1696.35 | 2938.51 | 0.54 |
| Dead+Wind 270 deg - No Ice | 42.07 | -34.66 | -0.21 | -26.71 | 3405.20 | 1.13 |
| Dead+Wind 300 deg - No Ice | 42.07 | -30.04 | -17.55 | -1728.74 | 2952.53 | 0.96 |
| Dead+Wind 330 deg - No Ice | 42.07 | -17.44 | -30.17 | -2965.28 | 1719.23 | 0.58 |
| Dead+Ice+Temp | 83.28 | 0.00 | -0.00 | 12.20 | 22.77 | -0.00 |
| Dead+Wind 0 deg+Ice+Temp | 83.28 | -0.06 | -10.78 | -1083.50 | 31.81 | -0.16 |
| Dead+Wind 30 deg+Ice+Temp | 83.28 | 5.35 | -9.32 | -934.41 | -518.66 | -0.09 |
| Dead+Wind 60 deg+Ice+Temp | 83.28 | 9.30 | -5.37 | -532.10 | -919.95 | -0.17 |

| Load Combination | Vertical | Shear _x | Shear _y | Overturning Moment, M _x | Overturning Moment, M _y | Torque |
|-----------------------------|----------|--------------------|--------------------|------------------------------------|------------------------------------|--------|
| | K | K | K | kip-ft | kip-ft | kip-ft |
| Dead+Wind 90 deg+Ice+Temp | 83.28 | 10.75 | 0.03 | 16.58 | -1067.72 | -0.20 |
| Dead+Wind 120 deg+Ice+Temp | 83.28 | 9.31 | 5.45 | 567.85 | -921.60 | -0.01 |
| Dead+Wind 150 deg+Ice+Temp | 83.28 | 5.40 | 9.37 | 965.25 | -526.28 | 0.08 |
| Dead+Wind 180 deg+Ice+Temp | 83.28 | 0.04 | 10.80 | 1110.14 | 16.70 | 0.11 |
| Dead+Wind 210 deg+Ice+Temp | 83.28 | -5.34 | 9.35 | 962.94 | 563.15 | 0.09 |
| Dead+Wind 240 deg+Ice+Temp | 83.28 | -9.30 | 5.37 | 557.28 | 966.91 | 0.17 |
| Dead+Wind 270 deg+Ice+Temp | 83.28 | -10.77 | -0.05 | 4.78 | 1116.34 | 0.20 |
| Dead+Wind 300 deg+Ice+Temp | 83.28 | -9.33 | -5.44 | -542.05 | 970.59 | 0.06 |
| Dead+Wind 330 deg+Ice+Temp | 83.28 | -5.41 | -9.36 | -939.84 | 573.63 | -0.08 |
| Dead+Wind 0 deg - Service | 42.07 | -0.09 | -13.57 | -1332.24 | 15.80 | 0.09 |
| Dead+Wind 30 deg - Service | 42.07 | 6.71 | -11.73 | -1150.31 | -654.74 | 0.08 |
| Dead+Wind 60 deg - Service | 42.07 | 11.68 | -6.74 | -660.24 | -1143.22 | -0.21 |
| Dead+Wind 90 deg - Service | 42.07 | 13.51 | 0.05 | 7.83 | -1323.24 | -0.44 |
| Dead+Wind 120 deg - Service | 42.07 | 11.70 | 6.87 | 679.58 | -1145.81 | -0.31 |
| Dead+Wind 150 deg - Service | 42.07 | 6.80 | 11.79 | 1162.42 | -666.06 | -0.23 |
| Dead+Wind 180 deg - Service | 42.07 | 0.07 | 13.59 | 1338.11 | -6.36 | -0.17 |
| Dead+Wind 210 deg - Service | 42.07 | -6.70 | 11.77 | 1158.89 | 658.39 | -0.08 |
| Dead+Wind 240 deg - Service | 42.07 | -11.69 | 6.75 | 664.02 | 1150.46 | 0.21 |
| Dead+Wind 270 deg - Service | 42.07 | -13.54 | -0.08 | -9.57 | 1332.85 | 0.45 |
| Dead+Wind 300 deg - Service | 42.07 | -11.73 | -6.85 | -674.94 | 1155.96 | 0.38 |
| Dead+Wind 330 deg - Service | 42.07 | -6.81 | -11.79 | -1158.33 | 673.83 | 0.23 |

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 | -42.07 | 0.00 | 0.00 | 42.07 | -0.00 | 0.000% |
| 2 | -0.24 | -42.07 | -34.74 | 0.24 | 42.07 | 34.73 | 0.009% |
| 3 | 17.19 | -42.07 | -30.02 | -17.19 | 42.07 | 30.02 | 0.000% |
| 4 | 29.91 | -42.07 | -17.27 | -29.91 | 42.07 | 17.27 | 0.000% |
| 5 | 34.59 | -42.07 | 0.12 | -34.59 | 42.07 | -0.12 | 0.004% |
| 6 | 29.96 | -42.07 | 17.58 | -29.96 | 42.07 | -17.58 | 0.000% |
| 7 | 17.41 | -42.07 | 30.19 | -17.41 | 42.07 | -30.19 | 0.000% |
| 8 | 0.17 | -42.07 | 34.79 | -0.17 | 42.07 | -34.79 | 0.004% |
| 9 | -17.15 | -42.07 | 30.12 | 17.15 | 42.07 | -30.12 | 0.000% |
| 10 | -29.94 | -42.07 | 17.28 | 29.94 | 42.07 | -17.28 | 0.000% |
| 11 | -34.66 | -42.07 | -0.21 | 34.66 | 42.07 | 0.21 | 0.004% |
| 12 | -30.04 | -42.07 | -17.55 | 30.04 | 42.07 | 17.55 | 0.000% |
| 13 | -17.44 | -42.07 | -30.17 | 17.44 | 42.07 | 30.17 | 0.000% |
| 14 | 0.00 | -83.28 | 0.00 | -0.00 | 83.28 | 0.00 | 0.001% |
| 15 | -0.06 | -83.28 | -10.78 | 0.06 | 83.28 | 10.78 | 0.000% |
| 16 | 5.35 | -83.28 | -9.32 | -5.35 | 83.28 | 9.32 | 0.000% |
| 17 | 9.30 | -83.28 | -5.37 | -9.30 | 83.28 | 5.37 | 0.000% |
| 18 | 10.75 | -83.28 | 0.03 | -10.75 | 83.28 | -0.03 | 0.000% |
| 19 | 9.31 | -83.28 | 5.45 | -9.31 | 83.28 | -5.45 | 0.000% |
| 20 | 5.40 | -83.28 | 9.37 | -5.40 | 83.28 | -9.37 | 0.000% |
| 21 | 0.04 | -83.28 | 10.80 | -0.04 | 83.28 | -10.80 | 0.000% |
| 22 | -5.34 | -83.28 | 9.35 | 5.34 | 83.28 | -9.35 | 0.000% |

| Load Comb. | Sum of Applied Forces | | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|---------|------------------|---------|--------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | | |
| 23 | -9.30 | -83.28 | 5.37 | 9.30 | 83.28 | -5.37 | 0.000% | |
| 24 | -10.77 | -83.28 | -0.05 | 10.77 | 83.28 | 0.05 | 0.000% | |
| 25 | -9.33 | -83.28 | -5.44 | 9.33 | 83.28 | 5.44 | 0.000% | |
| 26 | -5.41 | -83.28 | -9.36 | 5.41 | 83.28 | 9.36 | 0.000% | |
| 27 | -0.09 | -42.07 | -13.57 | 0.09 | 42.07 | 13.57 | 0.005% | |
| 28 | 6.71 | -42.07 | -11.73 | -6.71 | 42.07 | 11.73 | 0.002% | |
| 29 | 11.68 | -42.07 | -6.75 | -11.68 | 42.07 | 6.74 | 0.002% | |
| 30 | 13.51 | -42.07 | 0.05 | -13.51 | 42.07 | -0.05 | 0.005% | |
| 31 | 11.70 | -42.07 | 6.87 | -11.70 | 42.07 | -6.87 | 0.002% | |
| 32 | 6.80 | -42.07 | 11.79 | -6.80 | 42.07 | -11.79 | 0.002% | |
| 33 | 0.07 | -42.07 | 13.59 | -0.07 | 42.07 | -13.59 | 0.005% | |
| 34 | -6.70 | -42.07 | 11.77 | 6.70 | 42.07 | -11.77 | 0.002% | |
| 35 | -11.69 | -42.07 | 6.75 | 11.69 | 42.07 | -6.75 | 0.002% | |
| 36 | -13.54 | -42.07 | -0.08 | 13.54 | 42.07 | 0.08 | 0.005% | |
| 37 | -11.74 | -42.07 | -6.85 | 11.73 | 42.07 | 6.85 | 0.002% | |
| 38 | -6.81 | -42.07 | -11.79 | 6.81 | 42.07 | 11.79 | 0.002% | |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 6 | 0.00000001 | 0.00000001 |
| 2 | Yes | 13 | 0.00012282 | 0.00012838 |
| 3 | Yes | 17 | 0.00000001 | 0.00013095 |
| 4 | Yes | 17 | 0.00000001 | 0.00012998 |
| 5 | Yes | 14 | 0.00005182 | 0.00009277 |
| 6 | Yes | 17 | 0.00000001 | 0.00013051 |
| 7 | Yes | 17 | 0.00000001 | 0.00013755 |
| 8 | Yes | 14 | 0.00005176 | 0.00011853 |
| 9 | Yes | 17 | 0.00000001 | 0.00012799 |
| 10 | Yes | 17 | 0.00000001 | 0.00012859 |
| 11 | Yes | 14 | 0.00005179 | 0.00014573 |
| 12 | Yes | 17 | 0.00000001 | 0.00013882 |
| 13 | Yes | 17 | 0.00000001 | 0.00013123 |
| 14 | Yes | 10 | 0.00000001 | 0.00005831 |
| 15 | Yes | 16 | 0.00000001 | 0.00008324 |
| 16 | Yes | 16 | 0.00000001 | 0.00009632 |
| 17 | Yes | 16 | 0.00000001 | 0.00009613 |
| 18 | Yes | 16 | 0.00000001 | 0.00008194 |
| 19 | Yes | 16 | 0.00000001 | 0.00009880 |
| 20 | Yes | 16 | 0.00000001 | 0.00009971 |
| 21 | Yes | 16 | 0.00000001 | 0.00008487 |
| 22 | Yes | 16 | 0.00000001 | 0.00010162 |
| 23 | Yes | 16 | 0.00000001 | 0.00010142 |
| 24 | Yes | 16 | 0.00000001 | 0.00008531 |
| 25 | Yes | 16 | 0.00000001 | 0.00010168 |
| 26 | Yes | 16 | 0.00000001 | 0.00010102 |
| 27 | Yes | 13 | 0.00012692 | 0.00006596 |
| 28 | Yes | 14 | 0.00000001 | 0.00013008 |
| 29 | Yes | 14 | 0.00000001 | 0.00012722 |
| 30 | Yes | 13 | 0.00012693 | 0.00007423 |
| 31 | Yes | 14 | 0.00000001 | 0.00012130 |
| 32 | Yes | 14 | 0.00000001 | 0.00014048 |
| 33 | Yes | 13 | 0.00012691 | 0.00007445 |
| 34 | Yes | 14 | 0.00000001 | 0.00012077 |
| 35 | Yes | 14 | 0.00000001 | 0.00012237 |
| 36 | Yes | 13 | 0.00012692 | 0.00008065 |
| 37 | Yes | 14 | 0.00000001 | 0.00014338 |
| 38 | Yes | 14 | 0.00000001 | 0.00012261 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 145 - 130 | 32.771 | 38 | 1.785 | 0.005 |
| L2 | 130 - 84.75 | 27.168 | 38 | 1.779 | 0.004 |
| L3 | 89.25 - 58.0833 | 12.956 | 38 | 1.433 | 0.002 |
| L4 | 58.0833 - 44.25 | 5.252 | 38 | 0.863 | 0.001 |
| L5 | 49.5 - 31.25 | 3.830 | 38 | 0.719 | 0.000 |
| L6 | 31.25 - 4.75 | 1.517 | 38 | 0.461 | 0.000 |
| L7 | 4.75 - 0 | 0.036 | 38 | 0.073 | 0.000 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|---------------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 139.00 | VHLP2.5-11 | 38 | 30.528 | 1.787 | 0.004 | 176927 |
| 133.00 | LLPX310R-V1 w/ Mount Pipe | 38 | 28.287 | 1.784 | 0.004 | 86341 |
| 124.00 | APXVSPP18-C-A20 w/ Mount Pipe | 38 | 24.938 | 1.762 | 0.004 | 19593 |
| 122.00 | 800MHz 2X50W RRH W/FILTER | 38 | 24.198 | 1.754 | 0.003 | 15783 |
| 114.00 | BXA-80063/4CFx5 w/ Mount Pipe | 38 | 21.277 | 1.709 | 0.003 | 8876 |
| 105.00 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 38 | 18.096 | 1.633 | 0.002 | 5948 |
| 94.00 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 38 | 14.436 | 1.503 | 0.002 | 4238 |
| 87.00 | 742 213 w/ Mount Pipe | 38 | 12.279 | 1.397 | 0.002 | 3654 |
| 77.00 | 58532A | 38 | 9.481 | 1.220 | 0.001 | 3198 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 145 - 130 | 83.671 | 13 | 4.562 | 0.011 |
| L2 | 130 - 84.75 | 69.375 | 13 | 4.547 | 0.010 |
| L3 | 89.25 - 58.0833 | 33.106 | 13 | 3.662 | 0.004 |
| L4 | 58.0833 - 44.25 | 13.428 | 13 | 2.205 | 0.002 |
| L5 | 49.5 - 31.25 | 9.793 | 13 | 1.837 | 0.001 |
| L6 | 31.25 - 4.75 | 3.880 | 13 | 1.179 | 0.001 |
| L7 | 4.75 - 0 | 0.093 | 13 | 0.187 | 0.000 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|---------------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 139.00 | VHLP2.5-11 | 13 | 77.947 | 4.566 | 0.011 | 70633 |
| 133.00 | LLPX310R-V1 w/ Mount Pipe | 13 | 72.229 | 4.558 | 0.010 | 34460 |
| 124.00 | APXVSPP18-C-A20 w/ Mount Pipe | 13 | 63.684 | 4.503 | 0.009 | 7771 |
| 122.00 | 800MHz 2X50W RRH W/FILTER | 13 | 61.797 | 4.483 | 0.009 | 6257 |
| 114.00 | BXA-80063/4CFx5 w/ Mount Pipe | 13 | 54.344 | 4.368 | 0.008 | 3516 |
| 105.00 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 13 | 46.226 | 4.174 | 0.006 | 2354 |
| 94.00 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 13 | 36.884 | 3.841 | 0.005 | 1675 |

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|-----------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 87.00 | 742 213 w/ Mount Pipe | 13 | 31.378 | 3.570 | 0.004 | 1443 |
| 77.00 | 58532A | 13 | 24.232 | 3.117 | 0.003 | 1260 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _u ft | Kl/r | F _a ksi | A in ² | Actual P K | Allow. P _a K | Ratio P P _a |
|----------------|---------------------|--------------------------|---------|----------------------|------|-----------------------|----------------------|------------------|-------------------------------|------------------------------|
| L1 | 145 - 130 (1) | TP26.77x24x0.1875 | 15.00 | 0.00 | 0.0 | 39.00 | 15.8199 | -2.35 | 616.98 | 0.004 |
| L2 | 130 - 84.75 (2) | TP35.27x26.77x0.25 | 45.25 | 0.00 | 0.0 | 39.00 | 27.1176 | -16.08 | 1057.59 | 0.015 |
| L3 | 84.75 - 58.0833 (3) | TP39.6977x33.9247x0.3125 | 31.17 | 0.00 | 0.0 | 39.00 | 39.0652 | -22.78 | 1523.54 | 0.015 |
| L4 | 58.0833 - 44.25 (4) | TP42.26x39.6977x0.4281 | 13.83 | 0.00 | 0.0 | 33.03 | 55.5207 | -24.99 | 1833.85 | 0.014 |
| L5 | 44.25 - 31.25 (5) | TP44.0424x40.4313x0.4837 | 18.25 | 0.00 | 0.0 | 32.81 | 66.8714 | -31.25 | 2193.92 | 0.014 |
| L6 | 31.25 - 4.75 (6) | TP48.9503x44.0424x0.5485 | 26.50 | 0.00 | 0.0 | 34.82 | 84.2600 | -40.40 | 2933.77 | 0.014 |
| L7 | 4.75 - 0 (7) | TP49.83x48.9503x0.5175 | 4.75 | 0.00 | 0.0 | 36.74 | 80.9221 | -42.06 | 2973.40 | 0.014 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | Actual M _x kip-ft | Actual f _{bx} ksi | Allow. F _{bx} ksi | Ratio f _{bx} F _{bx} | Actual M _y kip-ft | Actual f _{by} ksi | Allow. F _{by} ksi | Ratio f _{by} F _{by} |
|----------------|---------------------|--------------------------|------------------------------------|----------------------------------|----------------------------------|---------------------------------------------|------------------------------------|----------------------------------|----------------------------------|---------------------------------------------|
| L1 | 145 - 130 (1) | TP26.77x24x0.1875 | 20.68 | 2.39 | 39.00 | 0.061 | 0.00 | 0.00 | 39.00 | 0.000 |
| L2 | 130 - 84.75 (2) | TP35.27x26.77x0.25 | 641.45 | 33.64 | 39.00 | 0.863 | 0.00 | 0.00 | 39.00 | 0.000 |
| L3 | 84.75 - 58.0833 (3) | TP39.6977x33.9247x0.3125 | 1535.0 | 48.52 | 39.00 | 1.244 | 0.00 | 0.00 | 39.00 | 0.000 |
| L4 | 58.0833 - 44.25 (4) | TP42.26x39.6977x0.4281 | 1796.8 | 38.62 | 33.03 | 1.169 | 0.00 | 0.00 | 33.03 | 0.000 |
| L5 | 44.25 - 31.25 (5) | TP44.0424x40.4313x0.4837 | 2375.6 | 39.79 | 32.81 | 1.213 | 0.00 | 0.00 | 32.81 | 0.000 |
| L6 | 31.25 - 4.75 (6) | TP48.9503x44.0424x0.5485 | 3262.9 | 39.04 | 34.82 | 1.121 | 0.00 | 0.00 | 34.82 | 0.000 |
| L7 | 4.75 - 0 (7) | TP49.83x48.9503x0.5175 | 3427.6 | 41.88 | 36.74 | 1.140 | 0.00 | 0.00 | 36.74 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V K | Actual f _v ksi | Allow. F _v ksi | Ratio f _v F _v | Actual T kip-ft | Actual f _{vt} ksi | Allow. F _{vt} ksi | Ratio f _{vt} F _{vt} |
|----------------|---------------------|--------------------------|------------------|---------------------------------|---------------------------------|-------------------------------------------|-----------------------|----------------------------------|----------------------------------|---------------------------------------------|
| L1 | 145 - 130 (1) | TP26.77x24x0.1875 | 3.82 | 0.24 | 26.00 | 0.019 | 0.71 | 0.04 | 26.00 | 0.002 |
| L2 | 130 - 84.75 (2) | TP35.27x26.77x0.25 | 26.56 | 0.98 | 26.00 | 0.075 | 1.33 | 0.03 | 26.00 | 0.001 |
| L3 | 84.75 - 58.0833 (3) | TP39.6977x33.9247x0.3125 | 30.14 | 0.77 | 26.00 | 0.059 | 1.13 | 0.02 | 26.00 | 0.001 |
| L4 | 58.0833 - 44.25 (4) | TP42.26x39.6977x0.4281 | 30.89 | 0.56 | 22.02 | 0.051 | 1.05 | 0.01 | 22.02 | 0.000 |
| L5 | 44.25 - 31.25 | TP44.0424x40.4313x0.4837 | 32.47 | 0.49 | 21.87 | 0.044 | 0.89 | 0.01 | 21.87 | 0.000 |

| 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 $\frac{f_{vt}}{F_{vt}}$ |
|-------------|---------------------|------------------------------|---------------|---------------------|---------------------|-------------------------|--------------------|------------------------|------------------------|-------------------------------|
| L6 | 31.25 - 4.75 (5) | TP48.9503x44.0424x0.54 37 | 34.52 | 0.41 | 23.21 | 0.035 | 0.64 | 0.00 | 23.21 | 0.000 |
| L7 | 4.75 - 0 (7) | TP49.83x48.9503x0.517 85 | 34.87 | 0.43 | 24.50 | 0.035 | 0.59 | 0.00 | 24.50 | 0.000 |

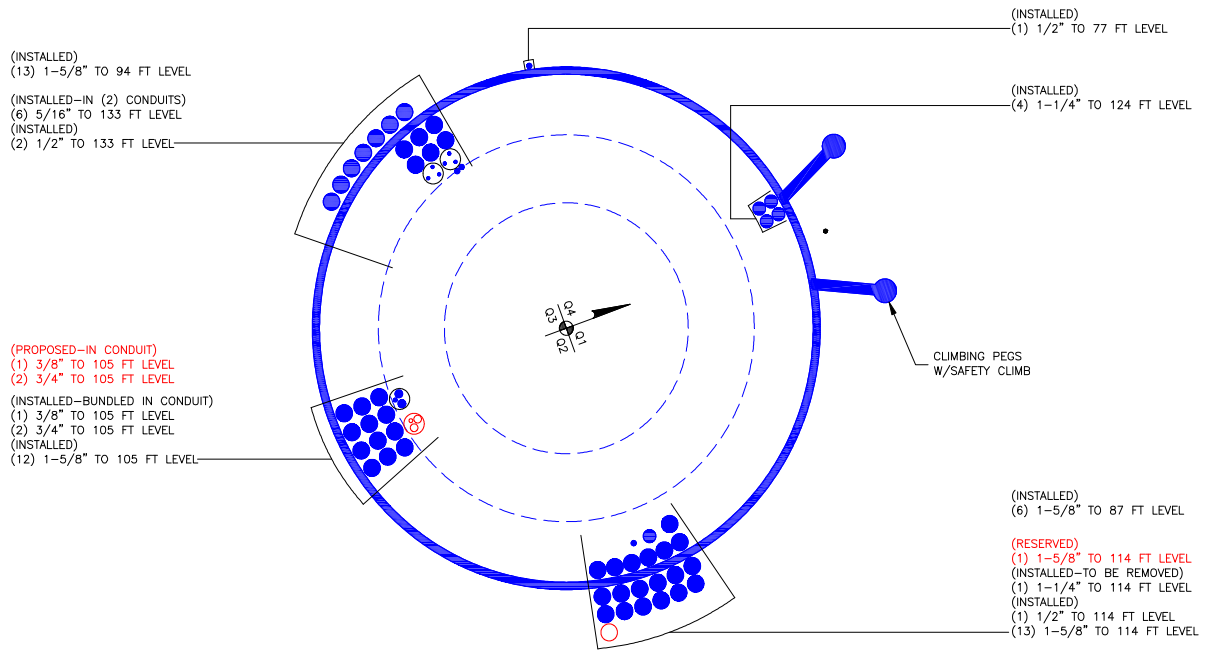
Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P $\frac{P}{P_a}$ | Ratio f_{bx} $\frac{f_{bx}}{F_{bx}}$ | Ratio f_{by} $\frac{f_{by}}{F_{by}}$ | Ratio f_v $\frac{f_v}{F_v}$ | Ratio f_{vt} $\frac{f_{vt}}{F_{vt}}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|------------------------|----------------------------|-------------------------------------------|-------------------------------------------|----------------------------------|-------------------------------------------|--------------------|---------------------|-----------|
| L1 | 145 - 130 (1) | 0.004 | 0.061 | 0.000 | 0.019 | 0.002 | 0.065 | 1.333 | H1-3+VT ✓ |
| L2 | 130 - 84.75 (2) | 0.015 | 0.863 | 0.000 | 0.075 | 0.001 | 0.879 | 1.333 | H1-3+VT ✓ |
| L3 | 84.75 - 58.0833 (3) | 0.015 | 1.244 | 0.000 | 0.059 | 0.001 | 1.260 | 1.333 | H1-3+VT ✓ |
| L4 | 58.0833 - 44.25 (4) | 0.014 | 1.169 | 0.000 | 0.051 | 0.000 | 1.183 | 1.333 | H1-3+VT ✓ |
| L5 | 44.25 - 31.25 (5) | 0.014 | 1.213 | 0.000 | 0.044 | 0.000 | 1.228 | 1.333 | H1-3+VT ✓ |
| L6 | 31.25 - 4.75 (6) | 0.014 | 1.121 | 0.000 | 0.035 | 0.000 | 1.135 | 1.333 | H1-3+VT ✓ |
| L7 | 4.75 - 0 (7) | 0.014 | 1.140 | 0.000 | 0.035 | 0.000 | 1.154 | 1.333 | H1-3+VT ✓ |

Section Capacity Table

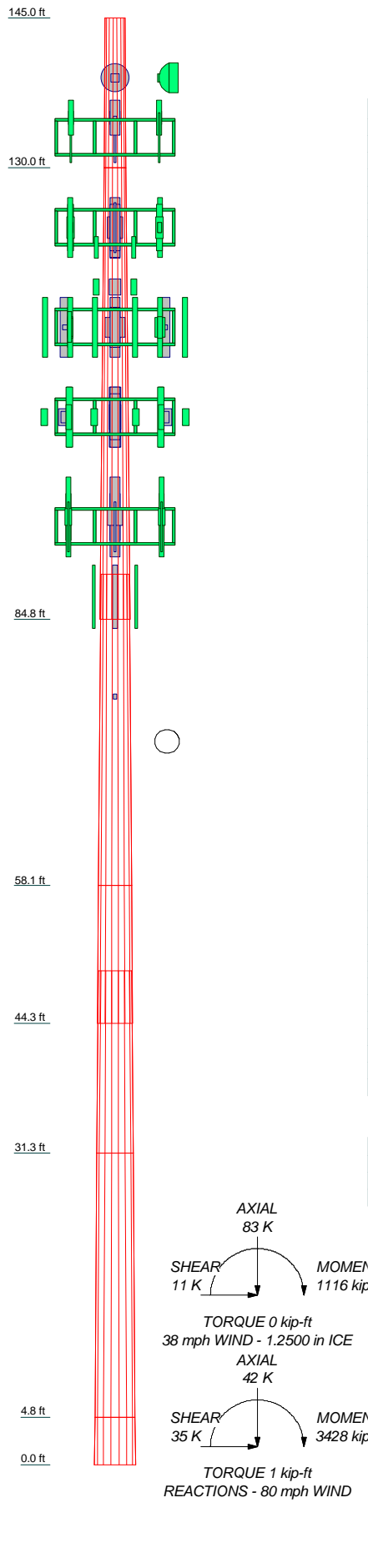
| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | SF* P_{allow} K | % Capacity | Pass Fail |
|-----------------|-----------------|----------------|--------------------------|------------------|--------|----------------------|-------------|-------------|
| L1 | 145 - 130 | Pole | TP26.77x24x0.1875 | 1 | -2.35 | 822.43 | 4.9 | Pass |
| L2 | 130 - 84.75 | Pole | TP35.27x26.77x0.25 | 2 | -16.08 | 1409.77 | 66.0 | Pass |
| L3 | 84.75 - 58.0833 | Pole | TP39.6977x33.9247x0.3125 | 3 | -22.78 | 2030.88 | 94.5 | Pass |
| L4 | 58.0833 - 44.25 | Pole | TP42.26x39.6977x0.4281 | 4 | -24.99 | 2444.52 | 88.8 | Pass |
| L5 | 44.25 - 31.25 | Pole | TP44.0424x40.4313x0.4837 | 5 | -31.25 | 2924.50 | 92.1 | Pass |
| L6 | 31.25 - 4.75 | Pole | TP48.9503x44.0424x0.5485 | 6 | -40.40 | 3910.72 | 85.2 | Pass |
| L7 | 4.75 - 0 | Pole | TP49.83x48.9503x0.517 | 7 | -42.06 | 3963.54 | 86.6 | Pass |
| Summary | | | | | | | | |
| Pole (L3) | | | | | | | 94.5 | Pass |
| RATING = | | | | | | | 94.5 | Pass |

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

| | | | | | | | |
|--------------------|---------|---------|---------|---------|-----------------|-----------------|-----------------|
| Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Length (ft) | 15.00 | 45.25 | 31.17 | 13.83 | 18.25 | 26.50 | 4.75 |
| Number of Sides | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| Thickness (in) | 0.1875 | 0.2500 | 0.3125 | 0.4281 | 0.4837 | 0.5485 | 0.5170 |
| Socket Length (ft) | | 4.50 | | 5.25 | | | |
| Top Dia (in) | 24.0000 | 26.7700 | 33.9247 | 39.6977 | 40.4313 | 44.0424 | 48.9503 |
| Bot Dia (in) | 26.7700 | 35.2700 | 39.6977 | 42.2600 | 44.0424 | 48.9503 | 49.8300 |
| Grade | | | A607-65 | | Reinf 55.05 ksi | Reinf 54.68 ksi | Reinf 61.24 ksi |
| Weight (K) | 0.8 | 3.8 | 3.8 | 2.6 | 4.0 | 7.2 | 1.3 |



DESIGNED APPURTENANCE LOADING

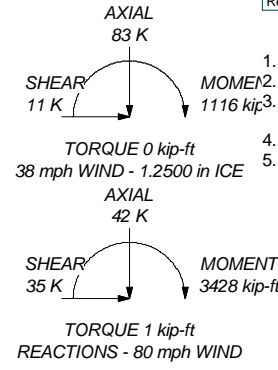
| TYPE | ELEVATION | TYPE | ELEVATION |
|-------------------------------|-----------|---------------------------------------|-----------|
| LLPX310R-V1 w/ Mount Pipe | 133 | RRH2x60-700 | 114 |
| LLPX310R-V1 w/ Mount Pipe | 133 | DB-T1-6Z-8AB-0Z | 114 |
| LLPX310R-V1 w/ Mount Pipe | 133 | Platform Mount [LP 712-1] | 114 |
| TIMING 2000 | 133 | BXA-80063/4CFx5 w/ Mount Pipe | 114 |
| WIMAX DAP HEAD | 133 | BXA-80063/4CFx5 w/ Mount Pipe | 114 |
| WIMAX DAP HEAD | 133 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 105 |
| WIMAX DAP HEAD | 133 | 7770.00 w/ Mount Pipe | 105 |
| HORIZON COMPACT | 133 | 7770.00 w/ Mount Pipe | 105 |
| HORIZON COMPACT | 133 | 7770.00 w/ Mount Pipe | 105 |
| (3) 2.375" OD x 5' Mount Pipe | 133 | (2) LGP2140X | 105 |
| (3) 2.375" OD x 5' Mount Pipe | 133 | (2) LGP2140X | 105 |
| (3) 2.375" OD x 5' Mount Pipe | 133 | (2) LGP2140X | 105 |
| Platform Mount [LP 712-1] | 133 | (2) RRUS-11 | 105 |
| VHLP2.5-11 | 133 | (2) RRUS-11 | 105 |
| VHLP2.5-11 | 133 | (2) RRUS-11 | 105 |
| APXVSP18-C-A20 w/ Mount Pipe | 124 | DC6-48-60-18-8F | 105 |
| APXVTM14-C-120 w/ Mount Pipe | 124 | OPA-65R-LCUU-H6 w/ Mount Pipe | 105 |
| APXVTM14-C-120 w/ Mount Pipe | 124 | OPA-65R-LCUU-H6 w/ Mount Pipe | 105 |
| APXVTM14-C-120 w/ Mount Pipe | 124 | OPA-65R-LCUU-H6 w/ Mount Pipe | 105 |
| TD-RRH8x20-25 | 124 | RRUS 32 B30 | 105 |
| TD-RRH8x20-25 | 124 | RRUS 32 B30 | 105 |
| TD-RRH8x20-25 | 124 | RRUS 32 B30 | 105 |
| IBC1900HG-2A | 124 | DC6-48-60-18-8F | 105 |
| IBC1900HG-2A | 124 | Platform Mount [LP 712-1] | 105 |
| IBC1900HG-2A | 124 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 105 |
| IBC1900BB-1 | 124 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 105 |
| IBC1900BB-1 | 124 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 94 |
| IBC1900BB-1 | 124 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 94 |
| 2.375" OD x 5' Mount Pipe | 124 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 94 |
| 2.375" OD x 5' Mount Pipe | 124 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 94 |
| 2.375" OD x 5' Mount Pipe | 124 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 94 |
| Platform Mount [LP 712-1] | 124 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 94 |
| APXVSP18-C-A20 w/ Mount Pipe | 124 | KRY 112 144/1 | 94 |
| APXVSP18-C-A20 w/ Mount Pipe | 124 | KRY 112 144/1 | 94 |
| 800MHz 2X50W RRH W/FILTER | 122 | KRY 112 144/1 | 94 |
| PCS 1900MHz 4x45W-65MHz | 122 | KRY 112 144/1 | 94 |
| PCS 1900MHz 4x45W-65MHz | 122 | LNx-6515DS-A1M w/ Mount Pipe | 94 |
| PCS 1900MHz 4x45W-65MHz | 122 | LNx-6515DS-A1M w/ Mount Pipe | 94 |
| Pipe Mount [PM 601-3] | 122 | LNx-6515DS-A1M w/ Mount Pipe | 94 |
| 800MHz 2X50W RRH W/FILTER | 122 | RRUS 11 B12 | 94 |
| 800MHz 2X50W RRH W/FILTER | 122 | RRUS 11 B12 | 94 |
| BXA-80063/4CFx5 w/ Mount Pipe | 114 | RRUS 11 B12 | 94 |
| KS24019-L112A | 114 | 2.375" OD x 5' Mount Pipe | 94 |
| (2) FD9R6004/2C-3L | 114 | 2.375" OD x 5' Mount Pipe | 94 |
| (2) FD9R6004/2C-3L | 114 | 2.375" OD x 5' Mount Pipe | 94 |
| (2) FD9R6004/2C-3L | 114 | Platform Mount [LP 712-1] | 94 |
| DB-T1-6Z-8AB-0Z | 114 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 94 |
| (3) SBNHH-1D65B w/ Mount Pipe | 114 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 94 |
| (3) SBNHH-1D65B w/ Mount Pipe | 114 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 94 |
| (3) SBNHH-1D65B w/ Mount Pipe | 114 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 94 |
| RRH4X45-AWS4 B66 | 114 | 742 213 w/ Mount Pipe | 87 |
| RRH4X45-AWS4 B66 | 114 | Pipe Mount [PM 601-3] | 87 |
| RRH4X45-AWS4 B66 | 114 | 742 213 w/ Mount Pipe | 87 |
| RRH2X60-PCS | 114 | 742 213 w/ Mount Pipe | 87 |
| RRH2X60-PCS | 114 | 58532A | 77 |
| RRH2X60-PCS | 114 | Side Arm Mount [SO 701-1] | 77 |
| RRH2x60-700 | 114 | | |
| RRH2x60-700 | 114 | | |

MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|-----------------|--------|--------|-----------------|--------|--------|
| A607-65 | 65 ksi | 80 ksi | Reinf 58.03 ksi | 58 ksi | 73 ksi |
| Reinf 55.05 ksi | 55 ksi | 69 ksi | Reinf 61.24 ksi | 61 ksi | 77 ksi |
| Reinf 54.68 ksi | 55 ksi | 69 ksi | | | |

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 94.5%



Paul J. Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: **145 ft Monopole / Newington**
 Project: **PJF 37515-0757 / BU 881364**

| | | |
|----------------------|---------------------------|-------------|
| Client: Crown Castle | Drawn by: Joey Meinerding | App'd: |
| Code: TIA/EIA-222-F | Date: 11/16/15 | Scale: NTS |
| Path: | | Dwg No. E-1 |

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)*(Rod Diameter)

| Site Data | | |
|-----------------|-----------|-----|
| BU#: | 881364 | |
| Site Name: | Newington | |
| App #: | | |
| Anchor Rod Data | | |
| Qty: | 16 | |
| Diam: | 2.25 | in |
| Rod Material: | A615-J | |
| Yield, Fy: | 75 | ksi |
| Strength, Fu: | 100 | ksi |
| Bolt Circle: | 57 | in |
| Anchor Spacing: | 6 | in |

| Plate Data | | |
|----------------|----|-----|
| W=Side: | 56 | in |
| Thick: | 3 | in |
| Grade: | 50 | ksi |
| Clip Distance: | 12 | 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: | 49.83 | in |
| Thick: | 0.375 | in |
| Grade: | 65 | ksi |
| # of Sides: | 18 | "0" IF Round |

| Stress Increase Factor | | |
|------------------------|-------|--|
| ASD ASIF: | 1.333 | |

** 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: | 3428 | ft-kips |
| Unfactored Axial, P: | 42 | kips |
| Unfactored Shear, V: | 35 | kips |

Anchor Rod Results

| | |
|-------------------------------|-------------------|
| TIA F --> Maximum Rod Tension | 177.8 Kips |
| Allowable Tension: | 195.0 Kips |
| Anchor Rod Stress Ratio: | 91.2% Pass |

Base Plate Results

| | | |
|------------------------------|-------------------|----------------|
| Base Plate Stress: | 45.5 ksi | Flexural Check |
| Allowable PL Bending Stress: | 50.0 ksi | |
| Base Plate Stress Ratio: | 91.0% Pass | |

| PL Ref. Data | |
|------------------|-------|
| Yield Line (in): | 29.37 |
| Max PL Length: | 29.37 |

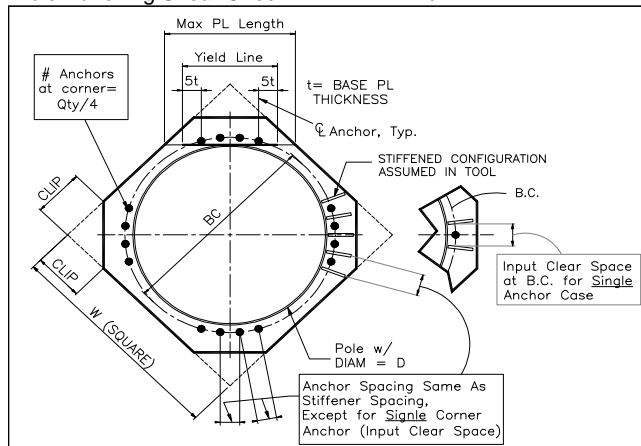
N/A - Unstiffened

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 |
|----------------------------|-----|



DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

| | | | |
|-----------------|-----------|-------------|---------------|
| | Comp. (+) | Tension (-) | |
| Moment, M = | 3428.0 | | k-ft |
| Shear, V = | 35.0 | | kips |
| Axial Load, P = | 42.0 | | kips |
| OTM = | 3445.5 | 0.0 | k-ft @ Ground |

Safety Factors / Load Factors / Φ Factors

| | |
|---------------------------|---------------|
| Tower Type = | Monopole DP |
| ACI Code = | ACI 318-02 |
| Seismic Design Category = | D |
| Reference Standard = | TIA/EIA-222-F |
| Use 1.3 Load Factor? | Yes |
| Load Factor = | 1.30 |

Drilled Pier Parameters

| | | |
|------------------------|-------|-------|
| Diameter = | 7 | ft |
| Height Above Grade = | 0.5 | ft |
| Depth Below Grade = | 25 | ft |
| fc' = | 3 | ksi |
| εc = | 0.003 | in/in |
| Mat Ftdn. Cap Width = | | ft |
| Mat Ftdn. Cap Length = | | ft |
| Depth Below Grade = | | ft |

| | | |
|------------------------------|---------------|---------------|
| | Safety Factor | Φ Factor |
| Soil Lateral Resistance = | 2.00 | 0.75 |
| Skin Friction = | 2.00 | 0.75 |
| End Bearing = | 2.00 | 0.75 |
| Concrete Wt. Resist Uplift = | 1.25 | |

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. ≥ Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

| | | |
|----------------------------|-------|-----|
| Number of Bars = | 28 | |
| Rebar Size = | #11 | |
| Rebar Fy = | 60 | ksi |
| Rebar MOE = | 29000 | ksi |
| Tie Size = | #5 | |
| Side Clear Cover to Ties = | 4 | in |

Soil Parameters

| | | |
|--------------------------------------------------------------|--------|----|
| Water Table Depth = | 10.00 | ft |
| Depth to Ignore Soil = | 4.00 | ft |
| Depth to Full Cohesion = | 0 | ft |
| Full Cohesion Starts at?* | Ground | |
| Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H) | | |
| Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H) | | |

Direct Embed Pole Shaft Parameters

| | | |
|---------------------------|--|-----|
| Dia @ Grade = | | in |
| Dia @ Depth Below Grade = | | in |
| Number of Sides = | | |
| Thickness = | | in |
| Fy = | | ksi |
| Backfill Condition = | | |

Maximum Capacity Ratios

| | |
|-----------------------|--------|
| Maximum Soil Ratio = | 110.0% |
| Maximum Steel Ratio = | 105.0% |

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

| Layer | Thickness ft | Unit Weight pcf | Cohesion psf | Friction Angle degrees | Soil Type | Ultimate End Bearing psf | Comp. Ult. Skin Friction psf | Tension Ult. Skin Friction psf | Depth ft |
|-------|--------------|-----------------|--------------|------------------------|-----------|--------------------------|------------------------------|--------------------------------|----------|
| 1 | 12 | 125 | 0 | 34 | Sand | | | | 12 |
| 2 | 16 | 125 | 0 | 30 | Sand | 6000 | | | 28 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |

Soil Results: Overturning

| | | |
|------------------------|---------|----------------|
| Depth to COR = | 16.99 | ft, from Grade |
| Bending Moment, M = | 4040.08 | k-ft, from COR |
| Resisting Moment, Ma = | 5070.00 | k-ft, from COR |

MOMENT RATIO = 79.7% OK

| | | |
|-----------------------|-------|------|
| Shear, V = | 35.00 | kips |
| Resisting Shear, Va = | 43.92 | kips |

SHEAR RATIO = 79.7% OK

Soil Results: Uplift

| | | |
|-----------------------------|-------|------|
| Uplift, T = | 0.00 | kips |
| Allowable Uplift Cap., Ta = | 88.95 | kips |

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

| | | |
|----------------------------|-------|------|
| Compression, C = | 42.00 | kips |
| Allowable Comp. Cap., Ca = | 88.51 | kips |

COMPRESSION RATIO = 47.4% OK

Steel Results (ACI 318-02):

| | | |
|---------------------------|----------|-------------------------|
| Minimum Steel Area = | 18.47 | sq in |
| Actual Steel Area = | 43.68 | sq in |
| Allowable Min Axial, Pa = | -1814.40 | kips, Where Ma = 0 k-ft |
| Allowable Max Axial, Pa = | 6656.37 | kips, Where Ma = 0 k-ft |

| | | |
|------------------------|---------|----------------------------|
| Axial Load, P = | 76.64 | kips @ 5.50 ft Below Grade |
| Moment, M = | 3619.27 | k-ft @ 5.50 ft Below Grade |
| Allowable Moment, Ma = | 5203.40 | k-ft |

MOMENT RATIO = 69.6% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

| |
|----------------------|
| BU#: 881364 |
| Site Name: Newington |
| App #: |

| | | |
|---------------------------|-----|--------------------|
| Enter Load Factors Below: | | |
| For M (WL) | 1.3 | <---- Enter Factor |
| For P (DL) | 1.3 | <---- Enter Factor |

| | |
|------------------------|------------------------|
| Pier Properties | |
| Concrete: | |
| Pier Diameter = | 7.0 ft |
| Concrete Area = | 5541.8 in ² |
| Reinforcement: | |
| Clear Cover to Tie= | 4.00 in |
| Horiz. Tie Bar Size= | 5 |
| Vert. Cage Diameter = | 6.11 ft |
| Vert. Cage Diameter = | 73.34 in |
| Vertical Bar Size = | 11 |
| Bar Diameter = | 1.41 in |
| Bar Area = | 1.56 in ² |
| Number of Bars = | 28 |
| As Total= | 43.68 in ² |
| A s/ Aconc, Rho: | 0.0079 0.79% |

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

| | | |
|------------------------|-------|-----------|
| Actual Req'd Min. Rho: | 0.33% | Flexural |
| Provided Rho: | 0.79% | OK |

| | | |
|--------------------------------------------------------------------------|---------|---------|
| Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn): | | |
| Max Pu = ($\phi=0.65$) Pn. | | |
| Pn per ACI 318 (10-2) | 8653.28 | kips |
| at Mu=($\phi=0.65$)Mn= | 5213.79 | ft-kips |
| Max Tu, ($\phi=0.9$) Tn = | 2358.72 | kips |
| at Mu= $\phi=(0.90)$ Mn= | 0.00 | ft-kips |

| | | |
|------------------------------------------|---------|------------------|
| Maximum Shaft Superimposed Forces | | |
| TIA Revision: | F | |
| Max. Service Shaft M: | 3619.27 | ft-kips (* Note) |
| Max. Service Shaft P: | 76.64 | kips |
| Max Axial Force Type: | Comp. | |

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

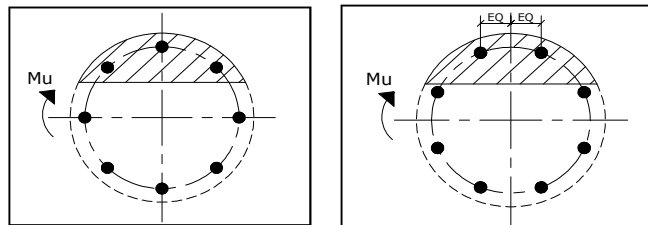
| | | |
|-------------|-----------------------------|------------------|
| Load Factor | Shaft Factored Loads | |
| 1.30 | Mu: | 4705.051 ft-kips |
| 1.30 | Pu: | 99.632 kips |

| | | |
|----------------------------------------|---------|-----|
| Material Properties | | |
| Concrete Comp. strength, f'c = | 3000 | psi |
| Reinforcement yield strength, Fy = | 60 | ksi |
| Reinforcing Modulus of Elasticity, E = | 29000 | ksi |
| Reinforcement yield strain = | 0.00207 | |
| Limiting compressive strain = | 0.003 | |
| ACI 318 Code | | |
| Select Analysis ACI Code= | 2002 | |
| Seismic Properties | | |
| Seismic Design Category = | D | |
| Seismic Risk = | High | |

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 16.19 in

Extreme Steel Strain, ϵ_t : 0.0115

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension

For Axial Compression, ϕ Pn = Pu: 99.63 kips

Drilled Shaft Moment Capacity, ϕ Mn: 6764.43 ft-kips

Drilled Shaft Superimposed Mu: 4705.05 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 69.6%

MODIFICATION OF AN EXISTING 145' MONOPOLE

BU #881364; NEWINGTON
 123 COSTELO ROAD
 NEWINGTON, CONNECTICUT 06111
 HARTFORD COUNTY
 LAT: 41° 39' 18.72"; LONG: -72° 43' 17.19"
 APP: 310233 REV. 1; WO:1148446

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THIS PROJECT INCLUDES THE FOLLOWING ITEMS

SHAFT REINFORCING
 FIELD WELDED STIFFENERS
 HIGH STRENGTH GROUT
 REMOVE AND REPLACE EXISTING STEP BOLTS AS REQUIRED

SHEET INDEX

| SHEET NUMBER | DESCRIPTION |
|--------------|----------------------|
| T-1 | TITLE SHEET |
| S-1 | GENERAL NOTES |
| S-2A | FORGBOLT™ DETAILS |
| S-2B | NEXGEN2™ BOLT DETAIL |
| S-3 | MONOPOLE PROFILE |
| S-4 | BASE PLATE DETAILS |
| S-5 | MI CHECKLIST |

WIND DESIGN DATA

| | |
|---------------------------------|-----------------------------|
| REFERENCE STANDARD | TIA/EIA-222-F |
| LOCAL CODE | 2005 CT STATE BUILDING CODE |
| BASIC WIND SPEED (FASTEST-MILE) | 80 MPH |
| ICE THICKNESS | 0.75 IN |
| ICE WIND SPEED | 37.6 MPH |
| SERVICE WIND SPEED | 50 MPH |

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1133172

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.

PJF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145'
 MONOPOLE
 BU #881364; NEWINGTON
 NEWINGTON, CONNECTICUT

PROJECT No: 37515-0757.007.7700
 DRAWN BY: I.M.
 DESIGNED BY: J.W.M.
 CHECKED BY:
 DATE: 11-11-2015

TITLE SHEET

T-1

1. GENERAL NOTES

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
- 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.
- 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
- 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAIN, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

- 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
 - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
 - 2.1.1.2. "SPECIFICATION FOR STRUCTURAL STEEL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
 - 2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
 - 2.1.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
 - 2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
- 2.2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS', DEC. 31, 2009.
- 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2.4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65(FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
- 2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 2.9. FIELD CUTTING OF STEEL:
 - 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - 2.9.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT

- 3.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
- 3.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.
- 3.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

4. FOUNDATION WORK - (NOT REQUIRED)

5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

6. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)

7. TOUCH UP OF GALVANIZING

- 7.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 7.2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 7.3. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. HOT-DIP GALVANIZING

- 8.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
- 8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
- 8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

- 9.1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY CROWN CASTLE, CROWN CASTLE WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
- 9.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.
- 9.3. CROWN CASTLE SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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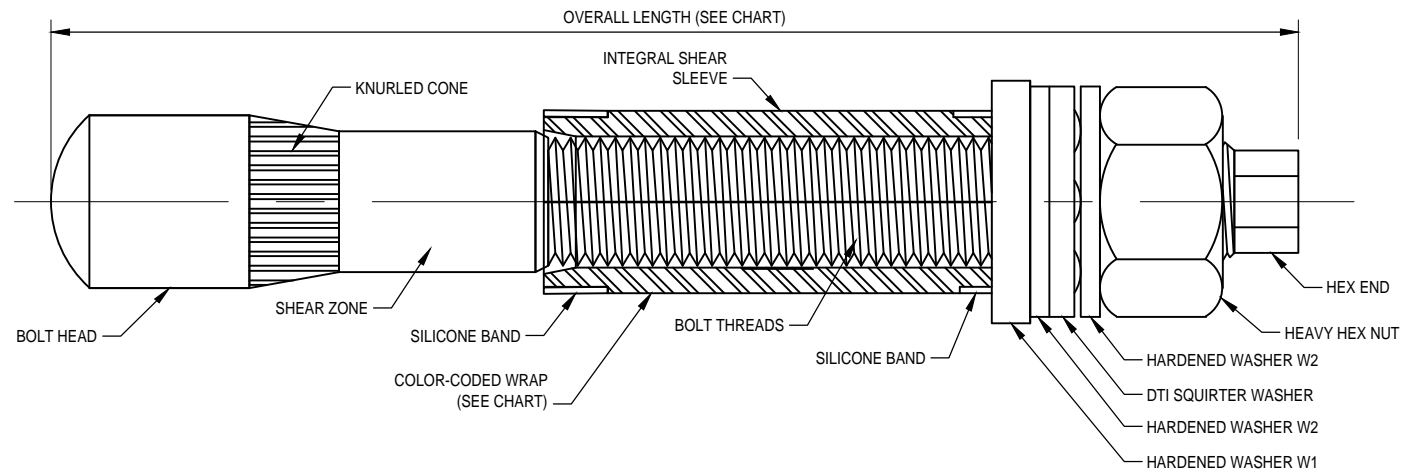
CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145' MONOPOLE
BU #881364; NEWINGTON NEWINGTON, CONNECTICUT

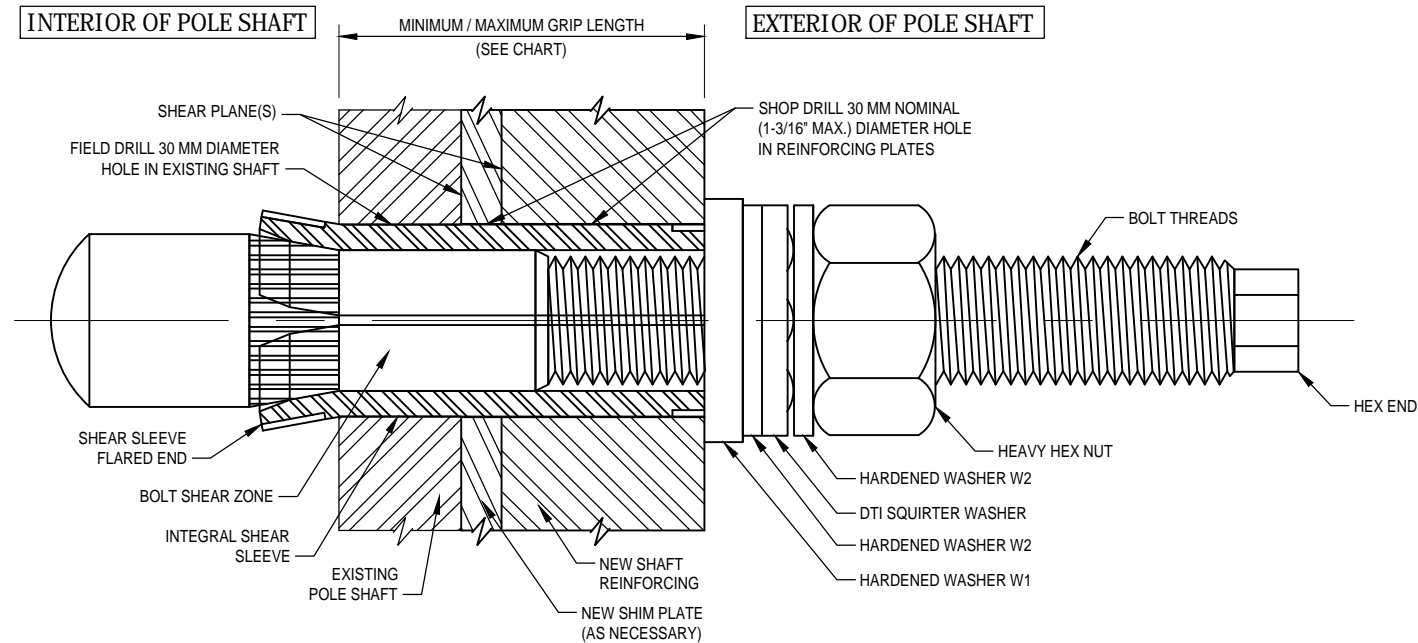
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| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | |
| DATE: | 11-11-2015 |

GENERAL NOTES

S-1



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1
S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2
S-2A

| FORGBolt™ | | AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum) | | | | | |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|-------------------|------------------|------------------|---------------|
| GROUP A | 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 'Squirter' DTI that is compatible with a M20-PC8.8 bolt. | | | | | | |

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

- INSTALLATION NOTES:**
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.

- 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.

- BOLT TIGHTENING AND INSPECTION 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.

**AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)**

CONTAINS PROPRIETARY INFORMATION PATENT PENDING
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DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
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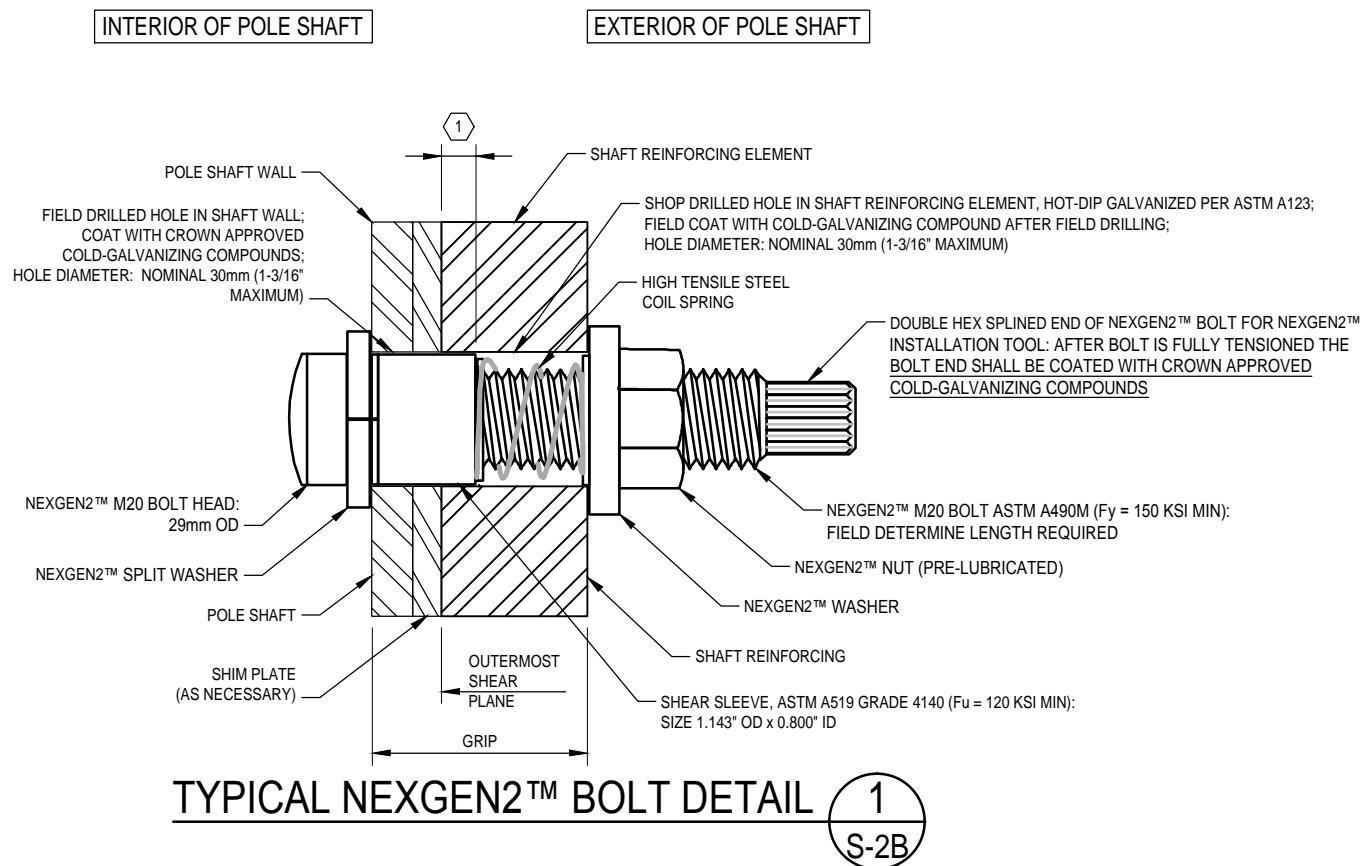
MODIFICATION OF AN EXISTING 145' MONOPOLE
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| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | |
| DATE: | 11-11-2015 |

FORGBolt™ DETAILS

S-2A

1 NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

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.

BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM

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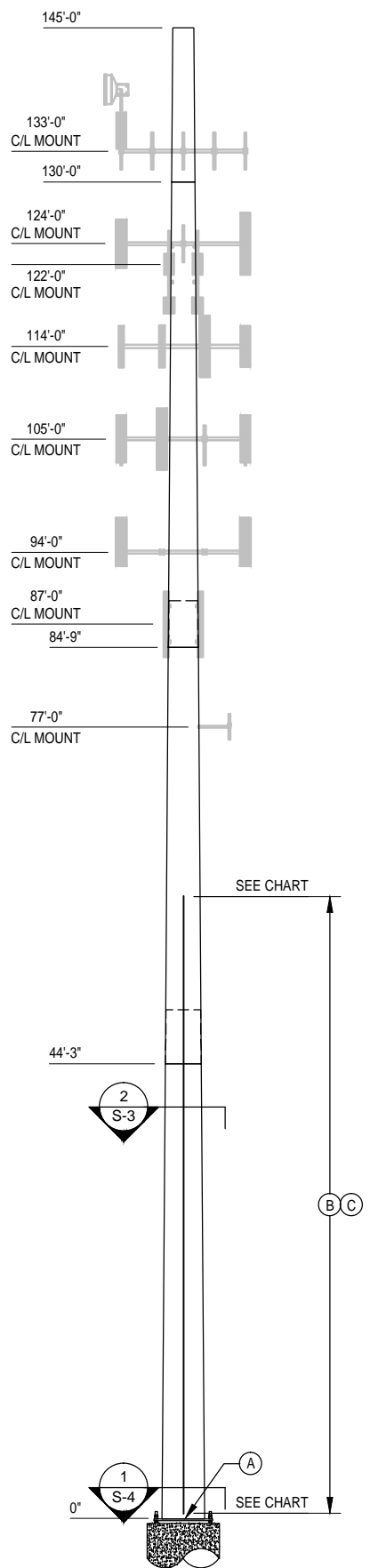
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| CHECKED BY: | |
| DATE: | 11-11-2015 |

NEXGEN2™ BOLT DETAIL

S-2B



POLE ELEVATION 1
S-3

NOTE: SHAFT REINFORCING MAY NEED TO BE INSTALLED OFF-CENTER OF FLAT FOR FIT UP

| NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE | | | | | | | | | | | |
|--------------------------------------------------|---------------|---------------------------|------------------|----------------|------------------|-------------------------------|---------------------------------|----------------------------|-------------------------|-----------------------------------|------------------------------|
| BOTTOM ELEVATION | TOP ELEVATION | FLAT #/ DEGREE SEPARATION | ELEMENT | ELEMENT LENGTH | ELEMENT QUANTITY | APPROXIMATE BOLTS PER ELEMENT | APPROXIMATE TOTAL BOLT QUANTITY | TERMINATION BOLTS (BOTTOM) | TERMINATION BOLTS (TOP) | MAXIMUM INTERMEDIATE BOLT SPACING | ESTIMATED TOTAL STEEL WEIGHT |
| 0' - 6" | 35' - 6" | F3, F9 & F14 | CCI-AFP-08512535 | 35' - 0" | 3 | 52 | 156 | 17 | 17 | 17" | 3796 LBS. |
| 35' - 7" | 60' - 7" | F3, F9 & F14 | CCI-AFP-06010025 | 25' - 0" | 3 | 34 | 102 | 10 | 10 | 16" | 1531 LBS. |
| 258 | | | | | | | | | | 5327 LBS. | |

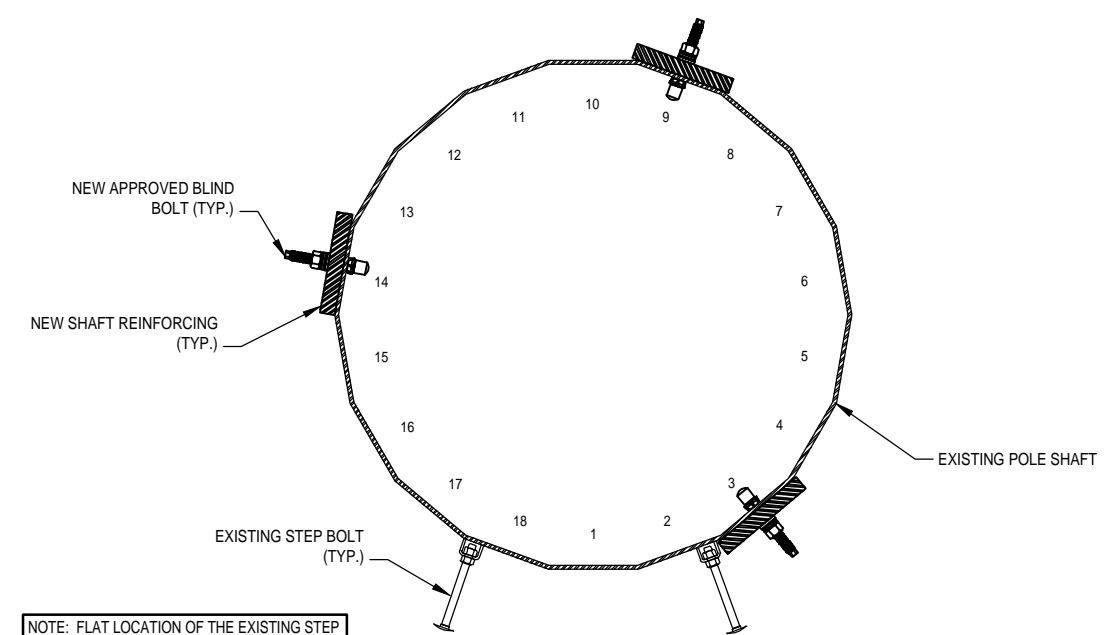
- NOTES:**
- 1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
 - 2.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
 - 3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
 - 4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
 - 5.) ALL SHIMS SHALL BE ASTM A-36.

| SPLICE PLATE INSTALLATION CHART | | | | | | | | | |
|---------------------------------|----------------------|------------------|-------------------|---------------------|----------------------|-------------------|-------------------|--------------------|--|
| ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | WELD LENGTH PER SIDE | TOTAL WELD LENGTH | BOLTS PER SPLICE* | TOTAL STEEL WEIGHT | |
| 35' - 7" | 1" | 6" | 7' - 4" | 3 | 0" | 0" | 27 | 449 LBS. | |
| | | | | | | | 0" | 449 LBS. | |

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

| NEW SHIM CHART | | | | |
|---------------------|--------------------|------------|-------------|---------------|
| 1/16" SHIM QUANTITY | 1/4" SHIM QUANTITY | SHIM WIDTH | SHIM LENGTH | HOLE DIAMETER |
| 15 | 3 | 6" | 6" | 1-1/4" |

SHIMS ARE FOR BIDDING PURPOSES ONLY, FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



SECTION 2
S-3

| SHAFT SECTION DATA | | | | | | | |
|--------------------|---------------------|----------------------|-----------------|----------------------------|----------|------------------|------------|
| SHAFT SECTION | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | LAP SPLICE (IN) | DIAMETER ACROSS FLATS (IN) | | POLE GRADE (ksi) | POLE SHAPE |
| | | | | @ TOP | @ BOTTOM | | |
| 1 | 15.00 | 0.1875 | | 24.000 | 26.770 | 65 | 18-SIDED |
| 2 | 45.25 | 0.2500 | 54.00 | 26.770 | 35.270 | 65 | 18-SIDED |
| 3 | 45.00 | 0.3125 | 63.00 | 33.925 | 42.260 | 65 | 18-SIDED |
| 4 | 49.50 | 0.3750 | | 40.663 | 49.830 | 65 | 18-SIDED |

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- MODIFICATIONS:**
- (A) INSTALL NEW TRANSITION STIFFENERS AND BEARING PLATES WITH GROUT AT BASE PLATE. SEE SHEET S-4.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
 - (C) REMOVE AND REPLACE EXISTING STEP BOLTS AS REQUIRED.

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CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145' MONOPOLE
 BU #881364; NEWINGTON
 NEWINGTON, CONNECTICUT

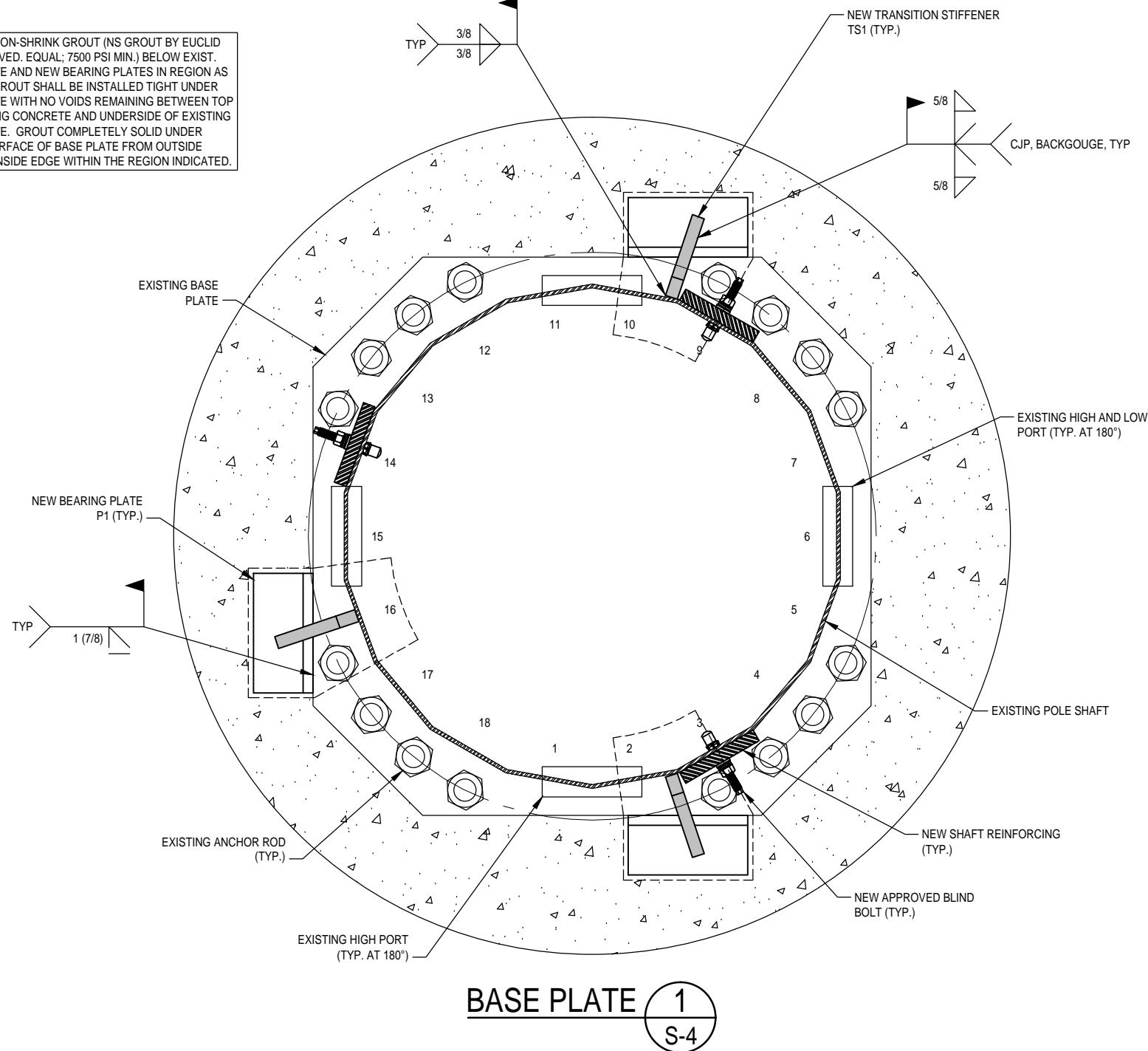
| | |
|--------------|---------------------|
| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | |
| DATE: | 11-11-2015 |

MONOPOLE PROFILE

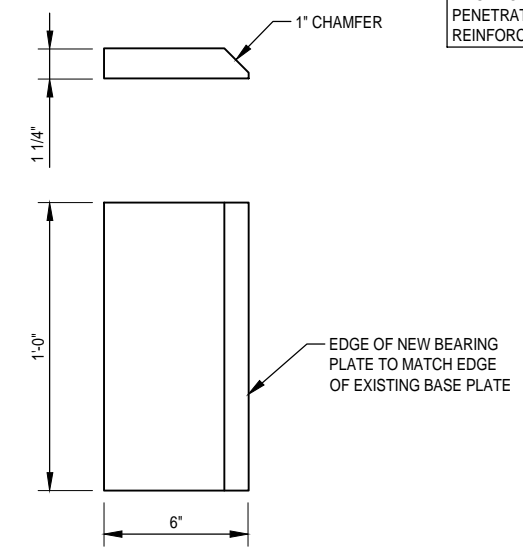
S-3

| BASE SPECIFICATIONS | |
|---------------------|--------------------------------------|
| BASE PLATE: | 56" SQUARE; 3" THK.; Fy=50 KSI |
| ANCHOR RODS: | (16) 2 1/4"; A615 GRADE 75; 57" B.C. |

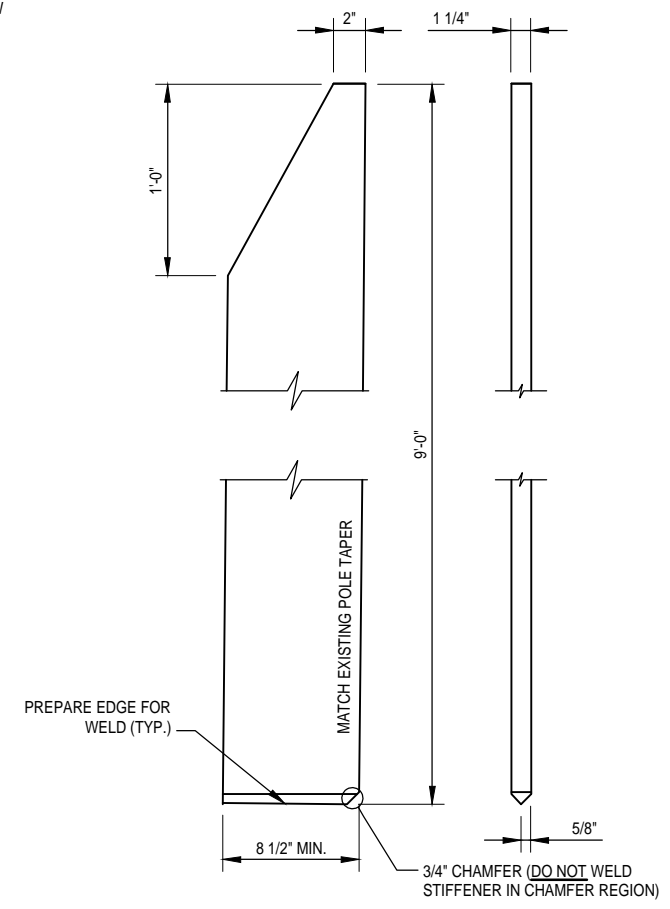
PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED, EQUAL; 7500 PSI MIN.) BELOW EXIST. BASE PLATE AND NEW BEARING PLATES IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.



NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



BEARING PLATE MK~P1
(3 REQUIRED) (Fy = 50 KSI)



TRANSITION STIFFENER MK~TS1
(3 REQUIRED) (Fy = 65 KSI)

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| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | |
| DATE: | 11-11-2015 |

BASE PLATE DETAILS

S-4

37515-0757.007.DWG

MODIFICATION INSPECTION NOTES:

- 1. GENERAL**
- 1.1. 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 EOR.
- 1.2. 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.
- 1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
- 1.4. 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 CASTLE POINT OF CONTACT (POC).
- 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.
- 2. MI INSPECTOR**
- 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
- 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.
- 3. GENERAL CONTRACTOR**
- 3.1. 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:
- 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
- 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.
- 4. RECOMMENDATIONS**
- 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
- 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- 4.1.4. 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.
- 4.1.5. 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.
- 5. CANCELLATION OR DELAYS IN SCHEDULED MI**
- 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.
- 6. CORRECTION OF FAILING MI'S**
- 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
- 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.
- 7. MI VERIFICATION INSPECTIONS**
- 7.1. CROWN CASTLE 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.
- 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
- 7.3. 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.
- 8. PHOTOGRAPHS**
- 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
- 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
- 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
- 8.1.3. RAW MATERIALS
- 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
- 8.1.5. FOUNDATION MODIFICATIONS
- 8.1.6. WELD PREPARATION
- 8.1.7. BOLT INSTALLATION AND TORQUE
- 8.1.8. FINAL INSTALLED CONDITION
- 8.1.9. SURFACE COATING REPAIR
- 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
- 8.1.11. FINAL INFIELD CONDITION
- 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
- 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

- 9. INSPECTION AND TESTING**
- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
- 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
- 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. GENERAL**
- 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)
- 9.8. CONCRETE TESTING PER ACI - (NOT REQUIRED)
- 9.9. STRUCTURAL STEEL**
- 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
- 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
- 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
- 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
- 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
- 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
- 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
- 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
- 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOFF LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. WELDING:**
- 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
- 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
- 9.10.3. APPROVE FIELD WELDING SEQUENCE.
- 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
- 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
- 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
- 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
- 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
- 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
- 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
- 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
- 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
- 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
- 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
- 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
- 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
- 9.10.5.12. 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.
- 9.10.5.13. 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.
- 9.11. REPORTS:**
- 9.11.1. COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
- 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
- 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
- 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

| MI CHECKLIST | |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR) | REPORT ITEM |
| PRE-CONSTRUCTION | |
| X | MI CHECKLIST DRAWINGS |
| X | EOR REVIEW |
| X | FABRICATION INSPECTION |
| N/A | FABRICATOR CERTIFIED WELD INSPECTION |
| X | MATERIAL TEST REPORT (MTR) |
| N/A | FABRICATOR NDE INSPECTION |
| X | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED) |
| X | PACKING SLIPS |
| ADDITIONAL TESTING AND INSPECTIONS: _____ | |
| CONSTRUCTION | |
| X | CONSTRUCTION INSPECTIONS |
| N/A | FOUNDATION INSPECTIONS |
| N/A | CONCRETE COMP. STRENGTH AND SLUMP TESTS |
| N/A | POST INSTALLED ANCHOR ROD VERIFICATION |
| N/A | DRILLED-IN REBAR AND HOLE VERIFICATION |
| X | BASE PLATE GROUT VERIFICATION |
| X | CONTRACTOR'S CERTIFIED WELD INSPECTION |
| N/A | EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION |
| X | ON SITE COLD GALVANIZING VERIFICATION |
| N/A | GUY WIRE TENSION REPORT |
| X | GC AS-BUILT DOCUMENTS |
| N/A | MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS |
| ADDITIONAL TESTING AND INSPECTIONS: _____ | |
| POST-CONSTRUCTION | |
| X | MI INSPECTOR REDLINE OR RECORD DRAWING(S) |
| N/A | POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING |
| N/A | REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS. |
| 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

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 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145' MONOPOLE
 BU #881364; NEWINGTON NEWINGTON, CONNECTICUT

| | |
|--------------|---------------------|
| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | |
| DATE: | 11-11-2015 |

MI CHECKLIST

MODIFICATION OF AN EXISTING 145' MONOPOLE

BU #881364; NEWINGTON
 123 COSTELO ROAD
 NEWINGTON, CONNECTICUT 06111
 HARTFORD COUNTY
 LAT: 41° 39' 18.72"; LONG: -72° 43' 17.19"
 APP: 310233 REV. 1; WO:1148446

PROJECT CONTACTS

STRUCTURE OWNER:

CROWN CASTLE
 MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM
 PH: (518) 373-3510
 MOD CM: JASON D'AMICO AT
 JASON.D'AMICO.VENDOR@CROWNCastle.COM
 PH: (860) 209-0104

ENGINEER OF RECORD:
 PJFMOD@PJFWEB.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS

SHAFT REINFORCING
 FIELD WELDED STIFFENERS
 HIGH STRENGTH GROUT
 REMOVE AND REPLACE EXISTING STEP BOLTS AS REQUIRED

SHEET INDEX

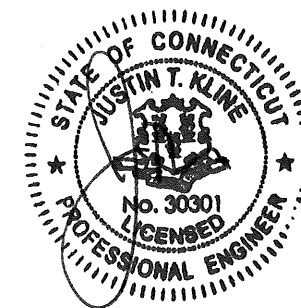
| SHEET NUMBER | DESCRIPTION |
|--------------|----------------------|
| T-1 | TITLE SHEET |
| S-1 | GENERAL NOTES |
| S-2A | FORGBOLT™ DETAILS |
| S-2B | NEXGEN2™ BOLT DETAIL |
| S-3 | MONOPOLE PROFILE |
| S-4 | BASE PLATE DETAILS |
| S-5 | MI CHECKLIST |

WIND DESIGN DATA

| | |
|---------------------------------|-----------------------------|
| REFERENCE STANDARD | TIA/EIA-222-F |
| LOCAL CODE | 2005 CT STATE BUILDING CODE |
| BASIC WIND SPEED (FASTEST-MILE) | 80 MPH |
| ICE THICKNESS | 0.75 IN |
| ICE WIND SPEED | 37.6 MPH |
| SERVICE WIND SPEED | 50 MPH |

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1133172

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.



NOV 16 2015

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PJF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

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TITLE SHEET

T-1

1. **GENERAL NOTES**

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. 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/I/TA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANS/I/TA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
- 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.
- 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
- 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAIN, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. **STRUCTURAL STEEL**

- 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
 - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
 - 2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
 - 2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
 - 2.1.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
 - 2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
- 2.2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS', DEC. 31, 2009.
- 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2.4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
- 2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 2.9. FIELD CUTTING OF STEEL:
 - 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - 2.9.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. **BASE PLATE GROUT**

- 3.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
- 3.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.
- 3.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

4. **FOUNDATION WORK - (NOT REQUIRED)**

5. **CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

6. **EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

7. **TOUCH UP OF GALVANIZING**

- 7.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 7.2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 7.3. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. **HOT-DIP GALVANIZING**

- 8.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
- 8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
- 8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. **PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**


- 9.1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY CROWN CASTLE, CROWN CASTLE WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
- 9.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.
- 9.3. CROWN CASTLE SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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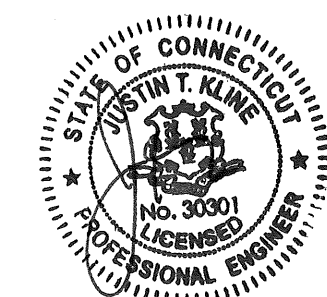
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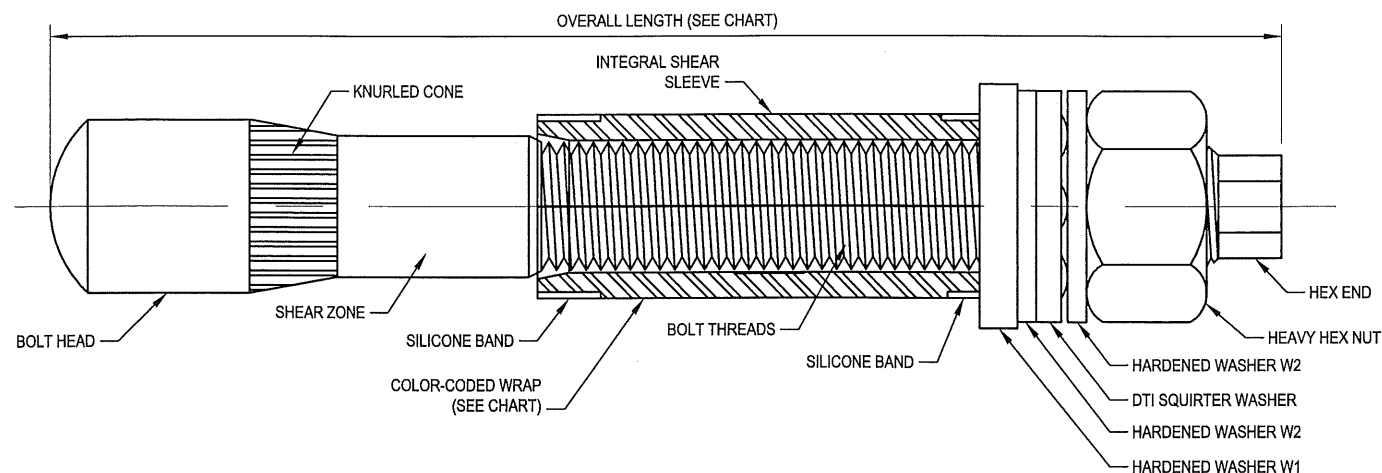
GENERAL NOTES

S-1

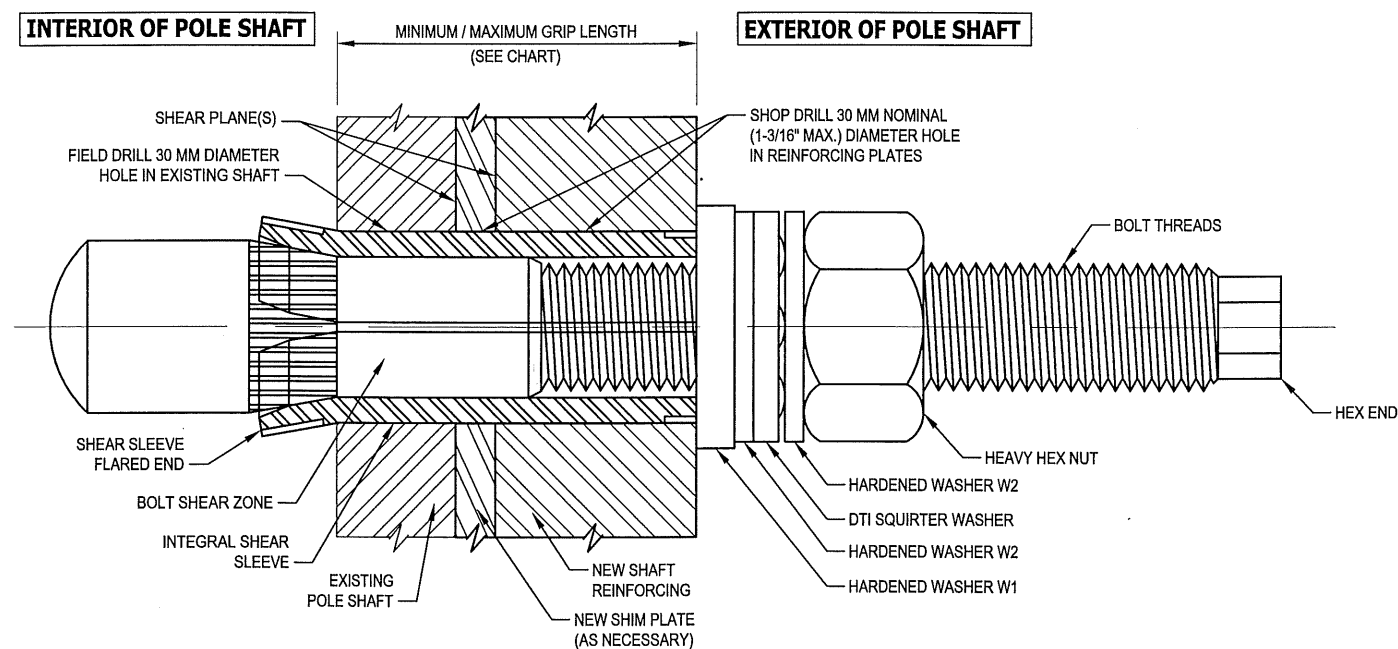


NOV 16 2015

37515-0757.007.DWG



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1
S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2
S-2A

| FORGBolt™ | | AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum) | | | | | |
|---------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|-------------------|------------------|------------------|--------|
| GROUP A | 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 'Squirter' DTI that is compatible with a M20-PC8.8 bolt. | | | | | | |

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:

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.

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.

BOLT TIGHTENING AND INSPECTION NOTES:

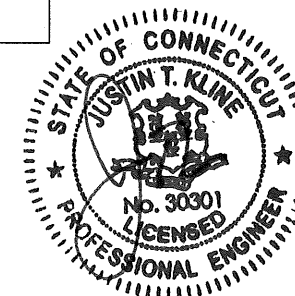
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION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

**AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)**

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

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DISTRIBUTOR CONTACT:
 PRECISION TOWER PRODUCTS
 PHONE: 888-926-4857
 EMAIL: info@precisiontowerproducts.com
 WEB: www.precisiontowerproducts.com



NOV 16 2015

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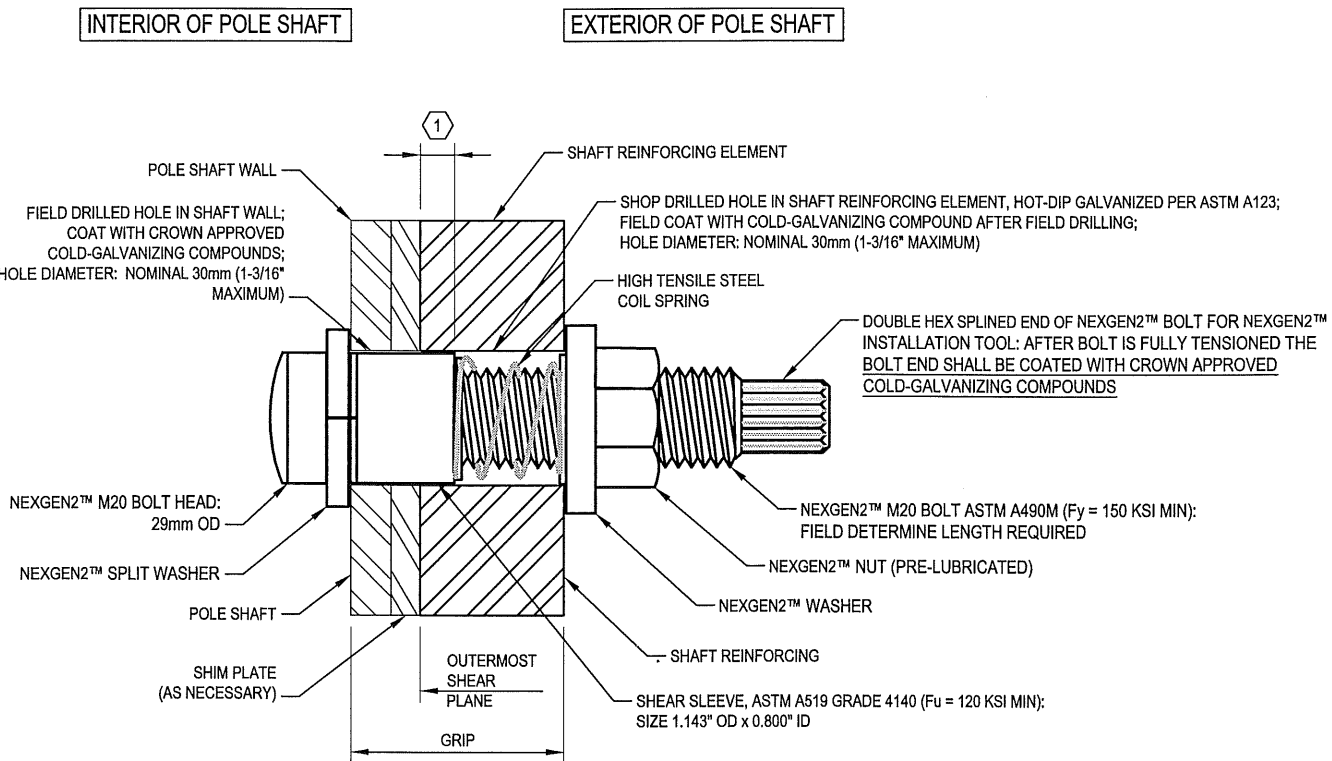
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FORGBolt™
 DETAILS

S-2A

1 NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL 1 S-2B

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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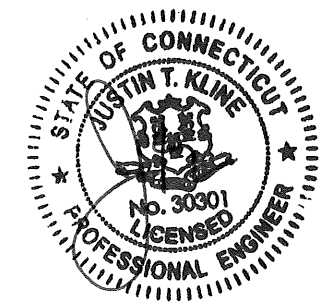
BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

DISTRIBUTOR CONTACT DETAILS:
 ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM



NOV 16 2015

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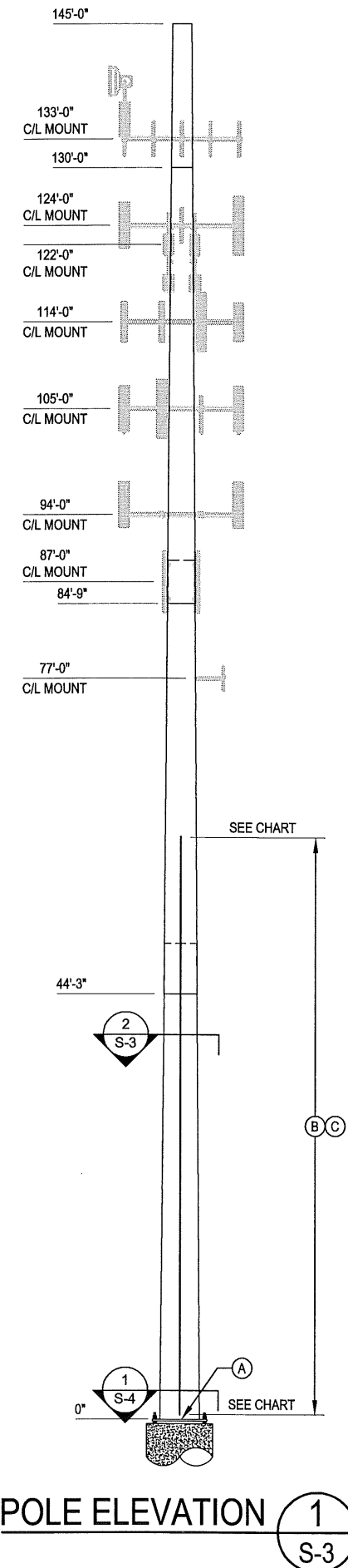
CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145' MONOPOLE
 BU #881364; NEWINGTON
 NEWINGTON, CONNECTICUT

| | |
|--------------|---------------------|
| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | JK |
| DATE: | 11-11-2015 |

NEXGEN2™ BOLT DETAIL

S-2B



NOTE: SHAFT REINFORCING MAY NEED TO BE INSTALLED OFF-CENTER OF FLAT FOR FIT UP

| NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE | | | | | | | | | | | |
|--------------------------------------------------|---------------|----------------------------|------------------|----------------|------------------|-------------------------------|---------------------------------|----------------------------|-------------------------|-----------------------------------|------------------------------|
| BOTTOM ELEVATION | TOP ELEVATION | FLAT # / DEGREE SEPARATION | ELEMENT | ELEMENT LENGTH | ELEMENT QUANTITY | APPROXIMATE BOLTS PER ELEMENT | APPROXIMATE TOTAL BOLT QUANTITY | TERMINATION BOLTS (BOTTOM) | TERMINATION BOLTS (TOP) | MAXIMUM INTERMEDIATE BOLT SPACING | ESTIMATED TOTAL STEEL WEIGHT |
| 0' - 6" | 35' - 6" | F3, F9 & F14 | CCI-AFP-08512535 | 35' - 0" | 3 | 52 | 156 | 17 | 17 | 17" | 3796 LBS. |
| 35' - 7" | 60' - 7" | F3, F9 & F14 | CCI-AFP-06010025 | 25' - 0" | 3 | 34 | 102 | 10 | 10 | 16" | 1531 LBS. |
| 258 | | | | | | | | | | 5327 LBS. | |

NOTES:

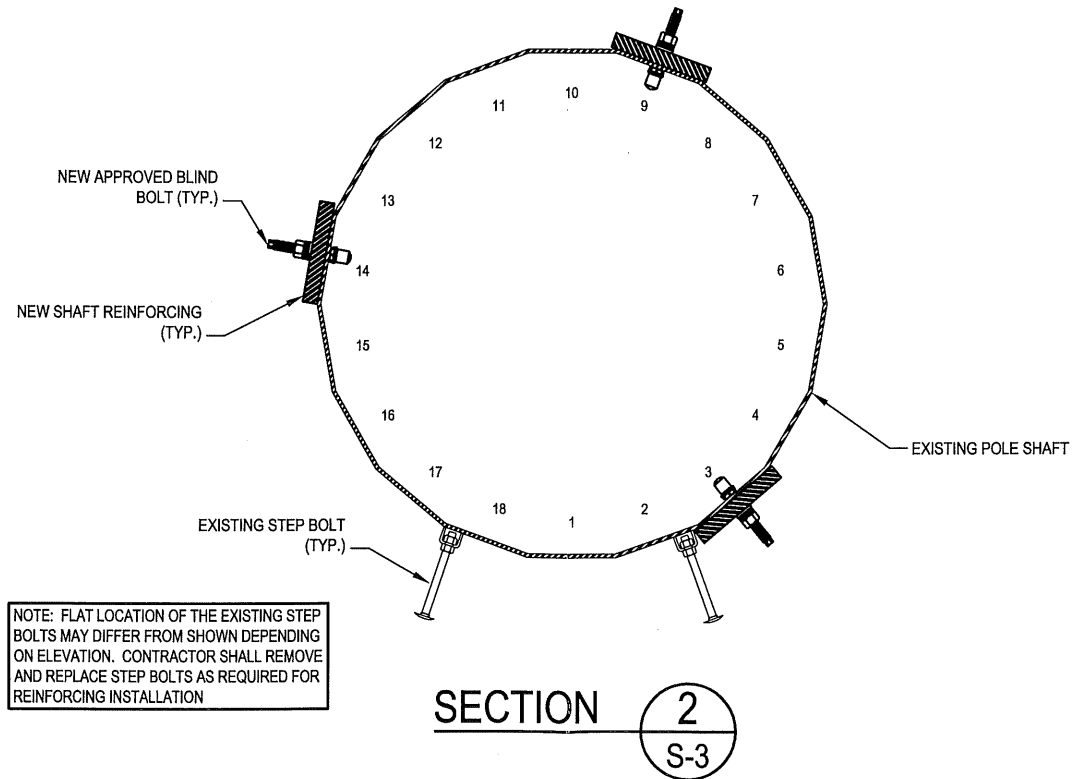
- 1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 2.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
- 3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
- 4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
- 5.) ALL SHIMS SHALL BE ASTM A-36.

| SPLICE PLATE INSTALLATION CHART | | | | | | | | |
|---------------------------------|----------------------|------------------|-------------------|---------------------|----------------------|-------------------|-------------------|--------------------|
| ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | WELD LENGTH PER SIDE | TOTAL WELD LENGTH | BOLTS PER SPLICE* | TOTAL STEEL WEIGHT |
| 35' - 7" | 1" | 6" | 7' - 4" | 3 | 0" | 0" | 27 | 449 LBS. |
| | | | | | | | 0" | 449 LBS. |

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

| NEW SHIM CHART | | | | |
|---------------------|--------------------|------------|-------------|---------------|
| 1/16" SHIM QUANTITY | 1/4" SHIM QUANTITY | SHIM WIDTH | SHIM LENGTH | HOLE DIAMETER |
| 15 | 3 | 6" | 6" | 1-1/4" |

SHIMS ARE FOR BIDDING PURPOSES ONLY, FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



NOTE: FLAT LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION

| SHAFT SECTION DATA | | | | | | | |
|--------------------|---------------------|----------------------|-----------------|----------------------------|----------|------------------|------------|
| SHAFT SECTION | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | LAP SPLICE (IN) | DIAMETER ACROSS FLATS (IN) | | POLE GRADE (ksi) | POLE SHAPE |
| | | | | @ TOP | @ BOTTOM | | |
| 1 | 15.00 | 0.1875 | | 24.000 | 26.770 | 65 | 18-SIDED |
| 2 | 45.25 | 0.2500 | 54.00 | 26.770 | 35.270 | 65 | 18-SIDED |
| 3 | 45.00 | 0.3125 | 63.00 | 33.925 | 42.260 | 65 | 18-SIDED |
| 4 | 49.50 | 0.3750 | | 40.663 | 49.830 | 65 | 18-SIDED |

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

MODIFICATIONS:

- (A) INSTALL NEW TRANSITION STIFFENERS AND BEARING PLATES WITH GROUT AT BASE PLATE. SEE SHEET S-4.
- (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
- (C) REMOVE AND REPLACE EXISTING STEP BOLTS AS REQUIRED.

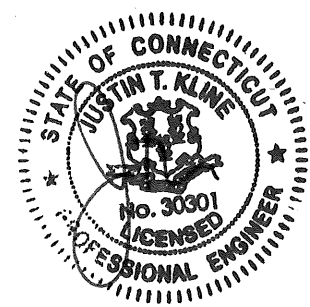
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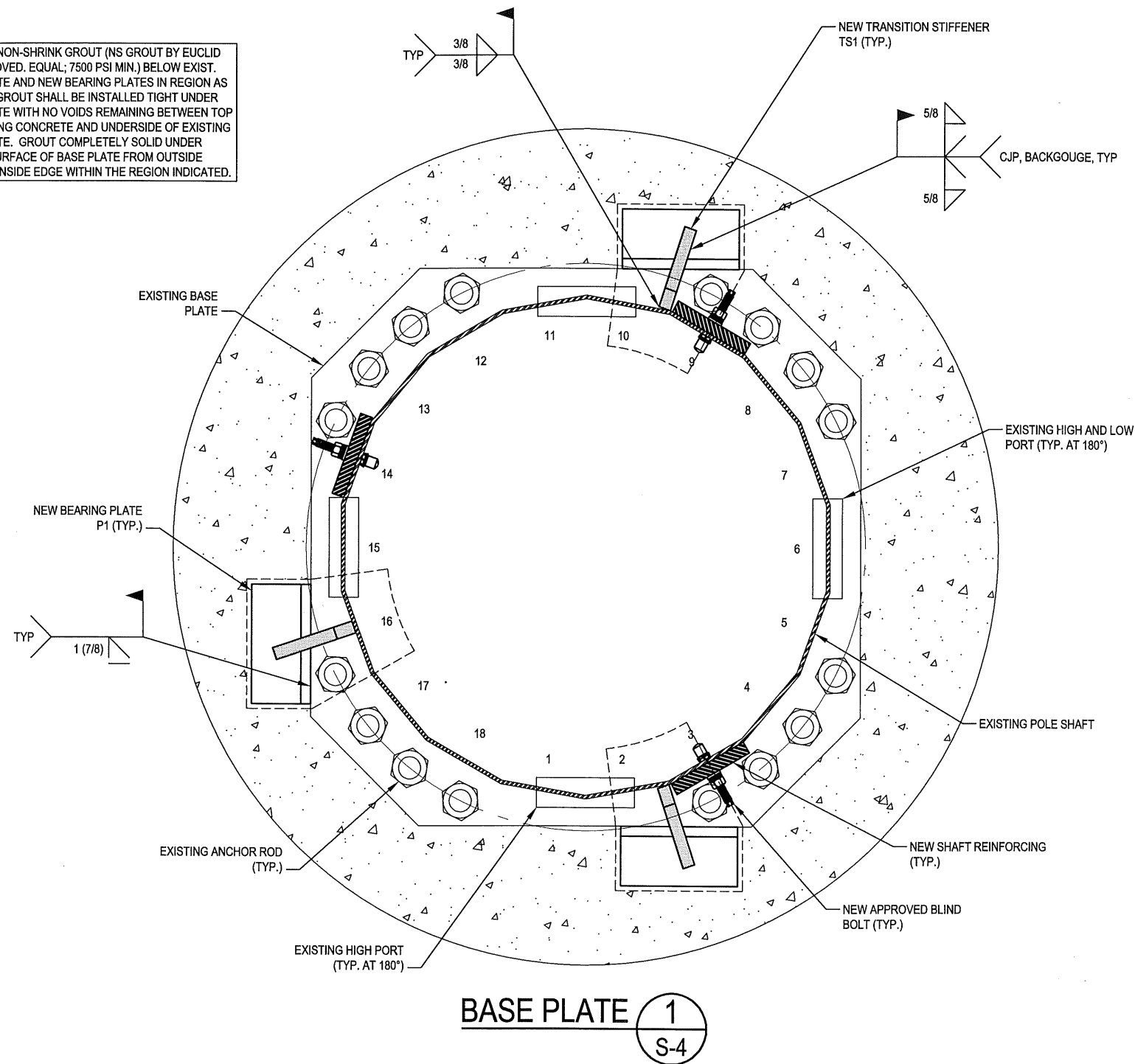
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MONOPOLE PROFILE
S-3

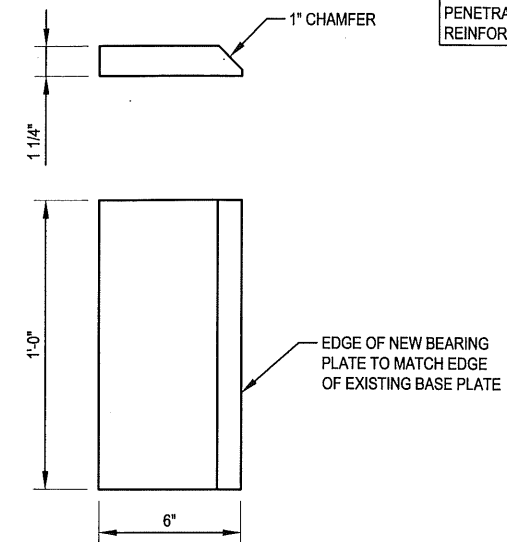
| BASE SPECIFICATIONS | |
|---------------------|---------------------------------------|
| BASE PLATE: | 56" SQUARE; 3" THK.; Fy=50 KSI |
| ANCHOR RODS: | (16) 2 1/4"Ø; A615 GRADE 75; 57" B.C. |

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED, EQUAL; 7500 PSI MIN.) BELOW EXIST. BASE PLATE AND NEW BEARING PLATES IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.

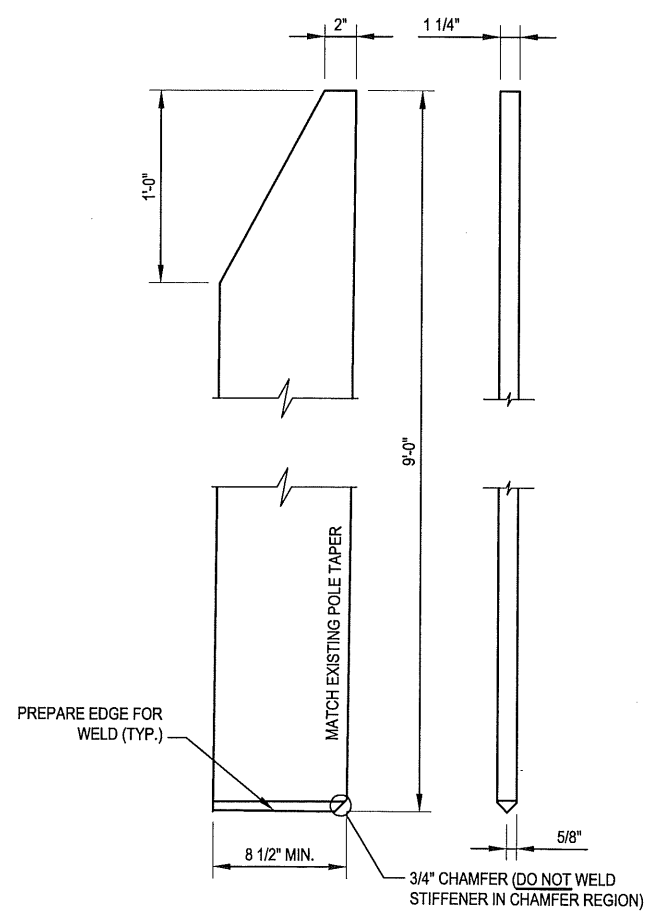
NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



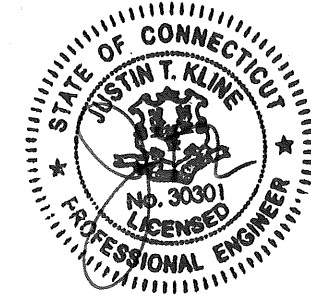
BASE PLATE 1
S-4



BEARING PLATE MK~P1
(3 REQUIRED) (Fy = 50 KSI)



TRANSITION STIFFENER MK~TS1
(3 REQUIRED) (Fy = 65 KSI)



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| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | JTK |
| DATE: | 11-11-2015 |

BASE PLATE DETAILS

S-4

NOV 16 2015

MODIFICATION INSPECTION NOTES:

1. **GENERAL**
 - 1.1. 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 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.
 - 1.2. ALL MIs SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
 - 1.3. 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 CASTLE POINT OF CONTACT (POC).
 - 1.4. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.
2. **MI INSPECTOR**
 - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
 - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.
3. **GENERAL CONTRACTOR**
 - 3.1. 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:
 - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
 - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.
4. **RECOMMENDATIONS**
 - 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
 - 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
 - 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
 - 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
 - 4.1.4. 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.
 - 4.1.5. 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.
5. **CANCELLATION OR DELAYS IN SCHEDULED MI**
 - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.
6. **CORRECTION OF FAILING MIs**
 - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
 - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
 - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.
7. **MI VERIFICATION INSPECTIONS**
 - 7.1. CROWN CASTLE 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.
 - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
 - 7.3. 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.
8. **PHOTOGRAPHS**
 - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
 - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
 - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - 8.1.3. RAW MATERIALS
 - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
 - 8.1.5. FOUNDATION MODIFICATIONS
 - 8.1.6. WELD PREPARATION
 - 8.1.7. BOLT INSTALLATION AND TORQUE
 - 8.1.8. FINAL INSTALLED CONDITION
 - 8.1.9. SURFACE COATING REPAIR
 - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
 - 8.1.11. FINAL INFIELD CONDITION
 - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
 - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

9. INSPECTION AND TESTING

- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. **GENERAL**
 - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. **FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)**
- 9.8. **CONCRETE TESTING PER ACI - (NOT REQUIRED)**
- 9.9. **STRUCTURAL STEEL**
 - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
 - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
 - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
 - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. **WELDING:**
 - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
 - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
 - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
 - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
 - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
 - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
 - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
 - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
 - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - 9.10.5.12. 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.
 - 9.10.5.13. 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.
- 9.11. **REPORTS:**
 - 9.11.1. COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
 - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
 - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
 - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

| MI CHECKLIST | |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR) | REPORT ITEM |
| PRE-CONSTRUCTION | |
| X | MI CHECKLIST DRAWINGS |
| X | EOR REVIEW |
| X | FABRICATION INSPECTION |
| N/A | FABRICATOR CERTIFIED WELD INSPECTION |
| X | MATERIAL TEST REPORT (MTR) |
| N/A | FABRICATOR NDE INSPECTION |
| X | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED) |
| X | PACKING SLIPS |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| CONSTRUCTION | |
| X | CONSTRUCTION INSPECTIONS |
| N/A | FOUNDATION INSPECTIONS |
| N/A | CONCRETE COMP. STRENGTH AND SLUMP TESTS |
| N/A | POST INSTALLED ANCHOR ROD VERIFICATION |
| N/A | DRILLED-IN REBAR AND HOLE VERIFICATION |
| X | BASE PLATE GROUT VERIFICATION |
| X | CONTRACTOR'S CERTIFIED WELD INSPECTION |
| N/A | EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION |
| X | ON SITE COLD GALVANIZING VERIFICATION |
| N/A | GUY WIRE TENSION REPORT |
| X | GC AS-BUILT DOCUMENTS |
| N/A | MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| POST-CONSTRUCTION | |
| X | MI INSPECTOR REDLINE OR RECORD DRAWING(S) |
| N/A | POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING |
| N/A | REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS. |
| 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

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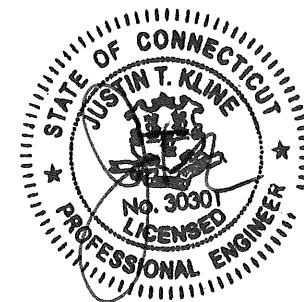
CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 145' MONOPOLE
 BU #881364; NEWINGTON
 NEWINGTON, CONNECTICUT

| | |
|--------------|---------------------|
| PROJECT No: | 37515-0757.007.7700 |
| DRAWN BY: | I.M. |
| DESIGNED BY: | J.W.M. |
| CHECKED BY: | JFK |
| DATE: | 11-11-2015 |

MI CHECKLIST

S-5



NOV 16 2015

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

AT&T Existing Facility

Site ID: CTU1108

Newington South
123 Costello Road
Newington, CT 06111

February 8, 2016

EBI Project Number: 66216000617

| Site Compliance Summary | |
|--------------------------------------------------------------|------------------|
| Compliance Status: | COMPLIANT |
| Site total MPE% of FCC general public allowable limit: | 18.65 % |

February 8, 2016

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

Emissions Analysis for Site: **CTU1108 – Newington South**

EBI Consulting was directed to analyze the proposed AT&T facility located at **123 Costello Road, Newington, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **123 Costello Road, Newington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 GSM channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 7) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 9) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antennas used in this modeling are the **KMW AM-X-CD-16-65-00T-RET, CCI HPA-65R-BUU-H6 and the Powerwave 7770.00** for transmission in the 700 MHz, 850 MHz, **1900 MHz (PCS)** and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antenna mounting height centerline of the proposed antennas is **105 feet** above ground level (AGL).
- 12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|--------------------|----------------------------------|--------------------|----------------------------------|--------------------|----------------------------------|
| Antenna #: | 1 | Antenna #: | 1 | Antenna #: | 1 |
| Make / Model: | Powerwave 7770.00 | Make / Model: | Powerwave 7770.00 | Make / Model: | Powerwave 7770.00 |
| Gain: | 11.4 / 13.4 dBd | Gain: | 11.4 / 13.4 dBd | Gain: | 11.4 / 13.4 dBd |
| Height (AGL): | 105 feet | Height (AGL): | 105 feet | Height (AGL): | 105 feet |
| Frequency Bands | 850 MHz / 1900 MHz (PCS) | Frequency Bands | 850 MHz / 1900 MHz (PCS) | Frequency Bands | 850 MHz / 1900 MHz (PCS) |
| Channel Count | 6 | Channel Count | 6 | Channel Count | 6 |
| Total TX Power(W): | 180 | Total TX Power(W): | 180 | Total TX Power(W): | 180 |
| ERP (W): | 3,453.54 | ERP (W): | 3,453.54 | ERP (W): | 3,453.54 |
| Antenna A1 MPE% | 1.50 | Antenna B1 MPE% | 1.50 | Antenna C1 MPE% | 1.50 |
| Antenna #: | 2 | Antenna #: | 2 | Antenna #: | 2 |
| Make / Model: | CCI HPA-65R-BUU-H6 | Make / Model: | CCI HPA-65R-BUU-H6 | Make / Model: | CCI HPA-65R-BUU-H6 |
| Gain: | 13.85 / 14.75 dBd | Gain: | 13.85 / 14.75 dBd | Gain: | 13.85 / 14.75 dBd |
| Height (AGL): | 105 feet | Height (AGL): | 105 feet | Height (AGL): | 105 feet |
| Frequency Bands | 850 MHz / 2300 MHz (WCS) | Frequency Bands | 850 MHz / 2300 MHz (WCS) | Frequency Bands | 850 MHz / 2300 MHz (WCS) |
| Channel Count | 4 | Channel Count | 4 | Channel Count | 4 |
| Total TX Power(W): | 180 | Total TX Power(W): | 180 | Total TX Power(W): | 180 |
| ERP (W): | 5,475.55 | ERP (W): | 5,475.55 | ERP (W): | 5,475.55 |
| Antenna A2 MPE% | 2.42 | Antenna B2 MPE% | 2.42 | Antenna C2 MPE% | 2.42 |
| Antenna #: | 3 | Antenna #: | 3 | Antenna #: | 3 |
| Make / Model: | KMW AM-X-CD-16-65- 00T-RET | Make / Model: | KMW AM-X-CD-16-65- 00T-RET | Make / Model: | KMW AM-X-CD-16-65- 00T-RET |
| Gain: | 11.95 / 13.4 dBd | Gain: | 11.95 / 13.4 dBd | Gain: | 11.95 / 13.4 dBd |
| Height (AGL): | 105 feet | Height (AGL): | 105 feet | Height (AGL): | 105 feet |
| Frequency Bands | 700 MHz / 1900 MHz (PCS) | Frequency Bands | 700 MHz / 1900 MHz (PCS) | Frequency Bands | 700 MHz / 1900 MHz (PCS) |
| Channel Count | 4 | Channel Count | 4 | Channel Count | 4 |
| Total TX Power(W): | 240 | Total TX Power(W): | 240 | Total TX Power(W): | 240 |
| ERP (W): | 5,462.56 | ERP (W): | 5,462.56 | ERP (W): | 5,462.56 |
| Antenna A3 MPE% | 2.79 | Antenna B3 MPE% | 2.79 | Antenna C3 MPE% | 2.79 |

| Site Composite MPE% | |
|--------------------------|----------------|
| Carrier | MPE% |
| AT&T – Max per sector | 6.71 % |
| Verizon Wireless | 4.41 % |
| MetroPCS | 1.85 % |
| Clearwire | 0.12 % |
| Sprint | 0.14 % |
| Nextel | 0.34 % |
| T-Mobile | 5.08 % |
| Site Total MPE %: | 18.65 % |

| | |
|----------------------|----------------|
| AT&T Sector 1 Total: | 6.71 % |
| AT&T Sector 2 Total: | 6.71 % |
| AT&T Sector 3 Total: | 6.71 % |
| Site Total: | 18.65 % |

| AT&T _ Per Sector | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ($\mu\text{W}/\text{cm}^2$) | Frequency (MHz) | Allowable MPE ($\mu\text{W}/\text{cm}^2$) | Calculated % MPE |
|--------------------------|------------|----------------------------|------------------|---------------------------------------------------------|--------------------|---------------------------------------------------|---------------------|
| AT&T 850 MHz UMTS | 2 | 414.12 | 105 | 3.04 | 850 | 567 | 0.54 % |
| AT&T 1900 MHz (PCS) UMTS | 2 | 656.33 | 105 | 4.81 | 1900 | 1000 | 0.48 % |
| AT&T 1900 MHz (PCS) GSM | 2 | 656.33 | 105 | 4.81 | 1900 | 1000 | 0.48 % |
| AT&T 850 MHz GSM | 2 | 727.98 | 105 | 5.34 | 850 | 567 | 0.94 % |
| AT&T 2300 MHz (WCS) LTE | 2 | 2009.79 | 105 | 14.74 | 2300 | 1000 | 1.47 % |
| AT&T 700 MHz LTE | 2 | 940.05 | 105 | 6.90 | 700 | 467 | 1.48 % |
| AT&T 1900 MHz (PCS) LTE | 2 | 1791.23 | 105 | 13.14 | 1900 | 1000 | 1.31 % |
| | | | | | | Total: | 6.71 % |

Summary

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

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

| AT&T Sector | Power Density Value (%) |
|-------------------------------------|-------------------------|
| Sector 1: | 6.71% |
| Sector 2: | 6.71% |
| Sector 3 : | 6.71% |
| AT&T Maximum Total (per sector): | 6.71% |
| | |
| Site Total: | 18.65 % |
| | |
| Site Compliance Status: | COMPLIANT |

The anticipated composite MPE value for this site assuming all carriers present is **18.65%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



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