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

January 8, 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 2C/3C Crown Site BU: 806939**
AT&T Site ID: CT2159
800 Oggmeadow Road, Orange, CT 06477
Latitude: 41° 18' 28.36" / Longitude: -73° 1' 56.22"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 152-foot level of the existing 160-foot monopole at 800 Oggmeadow Road in Orange, CT. The tower is owned by Crown Castle. The property is owned by South Central CT. AT&T now intends to replace three (3) Powerwave with three (3) CCI new 1.9 GHz antennas, as well as, replace three (3) Kathreins with three (3) Quintel new 800 MHz antennas. These antennas would be installed at the 152-foot level of the tower. AT&T also intends to, install three (3) RRU32s, three (3) RRU12s, one (1) Raycap, two (2) A2s, two (2) DC, one (1) Fiber, and remove six (6) TMAs.

This facility was approved by the Connecticut Siting Council in Docket 177A on August 6, 1997. This approval included the conditions that:

1. The towers shall be constructed as proposed, no taller than necessary to provide the proposed communications service, sufficient to accommodate the antennas of BANM, Springwich Cellular Limited Partnership (Springwich), Smart SMR of New York, Inc. d/b/a Nextel Communications (Nextel), and Sprint Spectrum L.P. d/b/a Sprint PCS (Sprint). Neither tower, excluding antennas, shall exceed 160 feet above ground level.

2. The Certificate Holder shall prepare Development and Management (D&M) Plans for the prime A amd prime B sites in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plans shall be submitted to and approved by the Council prior to the commencement of facility construction. The prime A D&M plan shall include a tower and foundation plan, signed by a professionally licensed engineer, designed to be safe and adequate to protect the electric supply system, and provisions for landscaping, architectural treatment, and traffic management consistent with terms established with the Town. The prime B D&M plan shall include relocation of the prime B tower within the leased parcel to prevent the fall zone of the tower from crossing paved sections of the Route 15 right-of-way; a

tower and foundation plan, signed by a professionally licensed engineer; plans for dewatering the site if necessary; installation of a propane tank to fuel the emergency generator; placement of a counter-sunk and sealed concrete floor for the equipment building; traffic management with schedule to construct during daytime hours; and best management practices for on-site use of construction equipment. In addition, we will require landscaping and the establishment of vegetation to stabilize the site consistent with watershed management plans. Both site plans shall provide specifications for the placement of all antennas to be attached to the towers, and plans for the equipment buildings, foundation pads for Sprint's equipment, security fencing and gate, access roads, utility lines, site clearing, tree trimming, and erosion and sedimentation control consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. Consistent with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council notification of:
commencement of construction;
completion of construction;
completion of site rehabilitation;
commencement of operation;
transfer of ownership of the prime A tower to the Town of Orange; and
final construction cost.

4. Upon the establishment of any new State or federal radio frequency power density standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If the facility does not initially provide, or permanently ceases to provide telecommunications services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

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 Mr. James M. Zeoli, First Selectman for the Town of Orange, as well as the property owner, and Crown Castle is the tower owner.

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

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

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

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

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: Mr. James M. Zeoli, First Selectman
Town Hall
617 Orange Center Road
Orange, CT 06477

South Central CT
90 Sargent Dr
Regional Water Authority
C/O Dianne L. Tompkins
New Haven, CT 06511-5966

Terry, Dashanna

From: Holzschuh, Cymon <Cymon.Holzschuh@ct.gov>
Sent: Thursday, January 07, 2016 3:45 PM
To: Terry, Dashanna; CSC-DL Siting Council
Cc: Barbadora, Jeff
Subject: RE: 800 Oggmeadow Rd - Existing Telecommunication Tower located at 800 Oggmeadow Rd, Orange (Crown Castle 806939 / ATT CT2159 - CSC Requirement

Follow Up Flag: Follow up
Flag Status: Flagged

Hello,

Be advised that, per the Council Database of CSC-Approved Telecommunications Sites, the facility at 800 Oggmeadow Road was approved in Docket 177A (d0177a). Per the Council website, the Council approved the construction, maintenance and operation of a two-cell site configuration in Orange in Docket 177A - this appears to include the facility in question.

In the Decision and Order for Docket 177A, item 1 includes the condition that neither of the approved towers, excluding antennas, shall exceed 160 feet above ground level. Because an exempt modification filing, by definition, does not change the height of the tower, this approval therefore included no conditions that restrict exempt modifications (meaning, no conditions that restrict antenna mounting configuration or height).

Note that municipalities may be unlikely to carry records of approval for facilities that were certificated by the Council.

Also, be advised that exempt modification filings that propose a "one-for-one" swap of antennas (meaning the total number of antennas remains the same, or decreases), are not required to include information concerning the facility's conditions of approval.

Thanks,

Cymon Holzschuh
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051
P: 860.827.2941 | F: 860.827.2950

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

Conserving, improving and protecting our natural resources and environment;
Ensuring a clean, affordable, reliable, and sustainable energy supply.

From: Terry, Dashanna [mailto:Dashanna.Terry@crowncastle.com]
Sent: Thursday, January 07, 2016 11:55 AM
To: CSC-DL Siting Council
Cc: Barbadora, Jeff
Subject: 800 Oggmeadow Rd - Existing Telecommunication Tower located at 800 Oggmeadow Rd, Orange (Crown Castle 806939 / ATT CT2159 - CSC Requirement

To Whom It May Concern:

Please be advised both the township (see email below) and Crown Castle as the tower owner, do not have the original zoning resolution on file. Please use this email as notification to waive this requirement as we will include this and the email from the township within our submission.

Please let me know if you have any questions or need additional information. Thank you in advance.

Dashanna

DASHANNA TERRY
□□□□□ □□□□□ □r□□□□□ □□rd□□□□r
□□□□□1 □□□□□□□□□□M□□□□1 □□□1 □□□□□

From: Paul Dinice [mailto:pdinice@orange-ct.gov]
Sent: Thursday, January 07, 2016 10:11 AM
To: Terry, Dashanna
Subject: 800 Oggmeadow Road Cell Tower

Dashanna, Attached is a Certificate of Compliance which I signed April 26, 2016. Unfortunately I could not locate the original approval which dates back to approximately 2000. I was the Zoning Administrator & Enforcement Officer at the time of the original approval. If you have any further questions I can be contacted at the number below.

Paul Dinice
Zoning Administrator & Enforcement Officer
203 891-4743
Fax 203 891-2185

6937

CROWN CASTLE - ETA PROPERTY
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

32-61-1110

DATE 1/7/2016

PAY TO THE ORDER OF Connecticut Siting Council $ 625—

Six hundred twenty five xx/100 DOLLARS

Security Features Included. Details on back.

CHASE
JPMorgan Chase Bank, N.A.
www.Chase.com

VALID FOR 180 DAYS

FOR CT2159-806939-322396

⑈006937⑈ ⑆111000614⑆ 464638118⑈

PROJECT INFORMATION

SCOPE OF WORK:

- REMOVE (1) EXISTING LTE ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- NEW AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW ANTENNAS; (6) EXISTING GSM/UMTS ANTENNAS TO REMAIN (2 PER SECTOR)
- AT&T RRUs: (1) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (2) EXISTING RRU PER SECTOR TO REMAIN, FOR A TOTAL OF (6) EXISTING RRUs.
- AT&T A2 MODULES: (1) NEW A2 MODULE PER SECTOR FOR A TOTAL OF (3) A2 MODULES

SITE ADDRESS:	800 OGG MEADOW ROAD ORANGE, CT 06477	
LATITUDE:	41.3078811	41° 18' 28.37196"N
LONGITUDE:	−73.0322769	−73°−01'−56.19684"W
USID:	61183	
TOWER OWNER:		
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT	
MONOPOLE HEIGHT:	160'−0"±	
RAD CENTER:	152'−0"±	
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	

DRAWING INDEX

		REV.
T−1	TITLE SHEET	B
GN−1	GROUNDING & GENERAL NOTES	B
A−1	COMPOUND LAYOUT	B
A−2	EQUIPMENT LAYOUTS	B
A−3	ANTENNA LAYOUTS & ELEVATIONS	B
A−4	DETAILS	B
A−5	ANTENNA MOUNTING DETAILS	B
G−1	GROUNDING, ONE−LINE DIAGRAM & DETAILS	B

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 AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

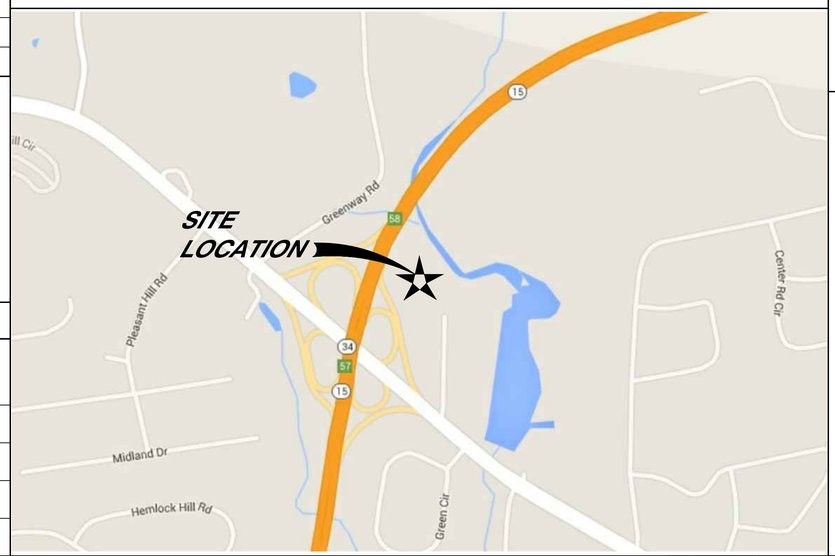
DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035121
SITE NUMBER: CT2159
SITE NAME: ORANGE NORTH
LTE 2C UPGRADE

VICINITY MAP

1. DEPART ENTERPRISE DR TOWARD CAPITOL BLVD, 0.3 MI. 2. TURN LEFT ONTO CAPITOL BLVD, 0.2 MI. 3. TURN LEFT ONTO WEST ST, 0.3 MI. 4. TAKE RAMP LEFT FOR I−91 SOUTH, 9.7 MI. 5. AT EXIT 17, TAKE RAMP RIGHT FOR SR−15 SOUTH/WILBUR CROSS PKWY TOWARD E. MAIN ST, 22.0 MI. 6. AT EXIT 57, TAKE RAMP RIGHT FOR SR−34 EAST/DERBY AVE TOWARD ORANGE 0.7 MI. 7. MAKE A U−TURN AT SR−152/ORANGE CENTER RD, 0.3 MI. 8. TURN RIGHT ONTO OGG MEADOW ROAD, 0.1 MI. 9. FOLLOW ACCESS ROAD TO COMPOUND, 0.1 MI.



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

GENERAL NOTES

1. 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.
2. 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.
3. 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.

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP - CALL BEFORE YOU DIG!

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

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: CT2159
SITE NAME: ORANGE NORTH
800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

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

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, 28643, REGISTERED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15130−EMP	T−1	B

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

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

23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY CENTEK ENGINEERING FOR A RECENT UPGRADE DATED 04/06/2011. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

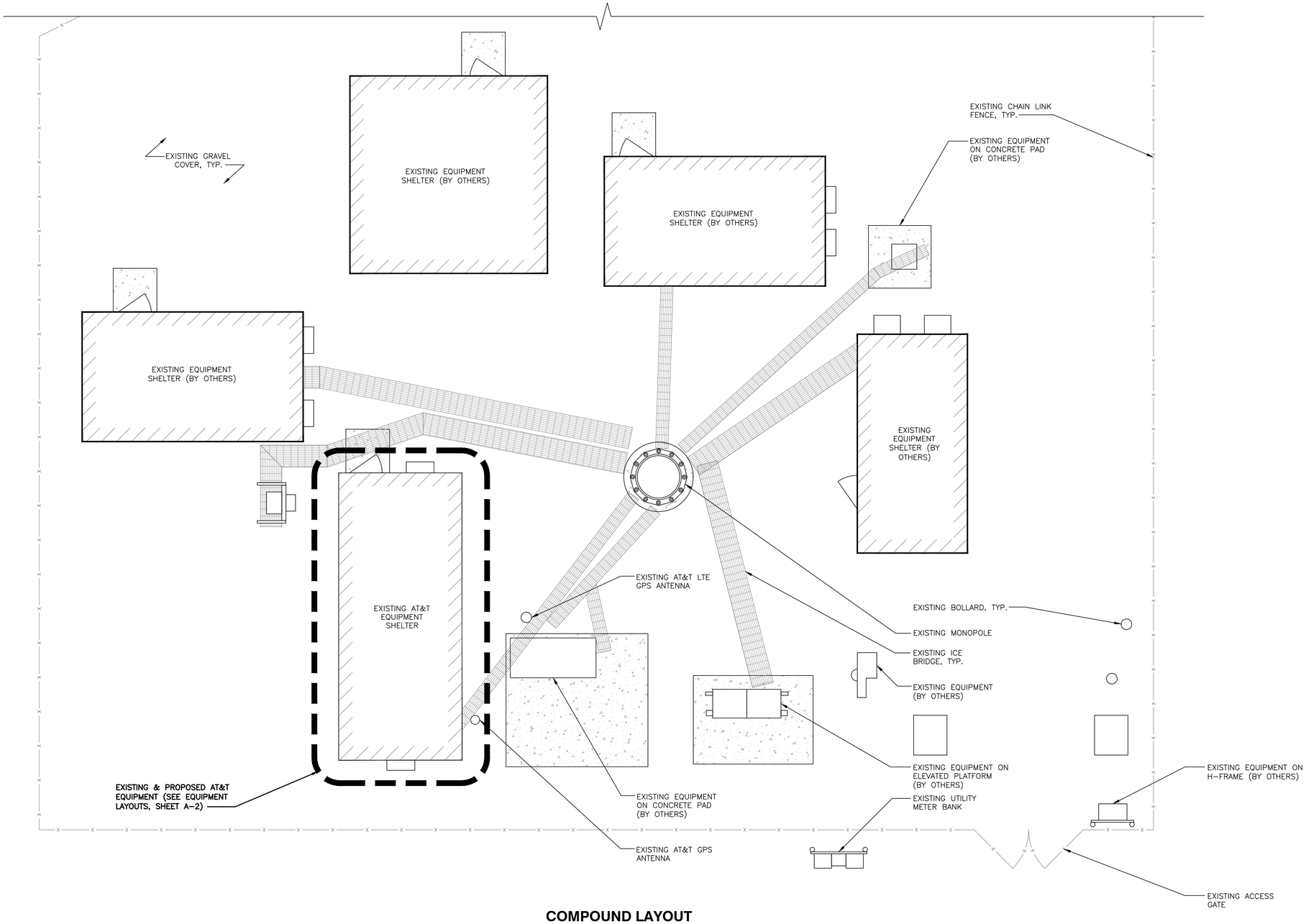
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · PROFESSIONAL ENGINEER · LICENSE NO. 28643

AT&T

DRAWING TITLE: GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	GN-1	B



NORTH

COMPOUND LAYOUT

SCALE: 1" = 4'-0"

4 0 2 4 8 16

(IN FEET)

1/4 inch = 1 Foot

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

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

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

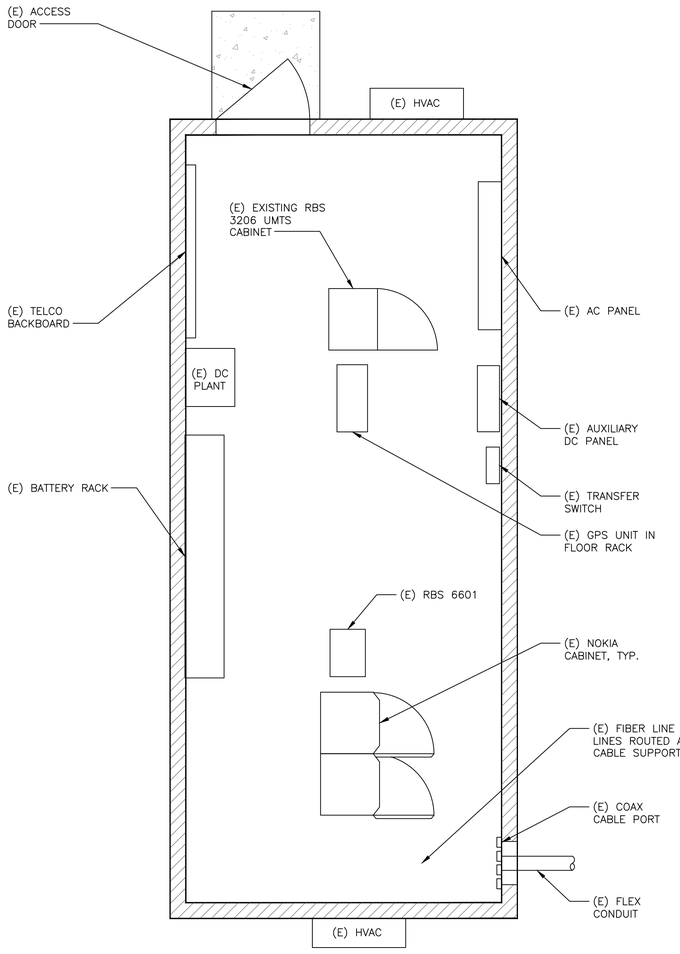
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · 28643 · PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	A-1	B

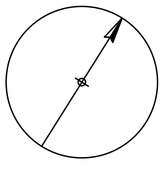


EXISTING EQUIPMENT LAYOUT

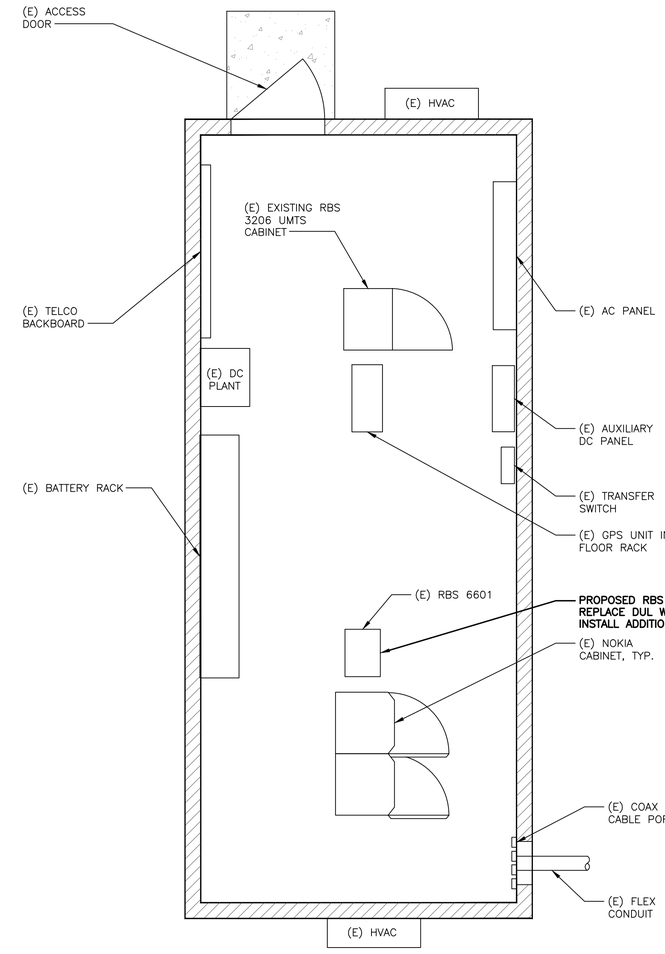
SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



NORTH

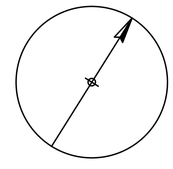


PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



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

SITE NUMBER: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

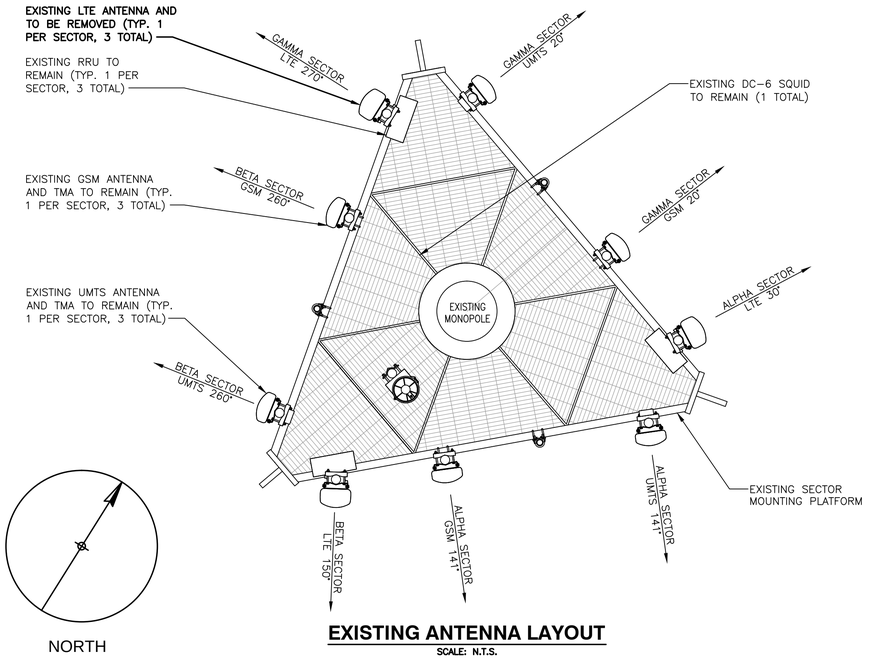
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · 28643 · PROFESSIONAL ENGINEER

AT&T

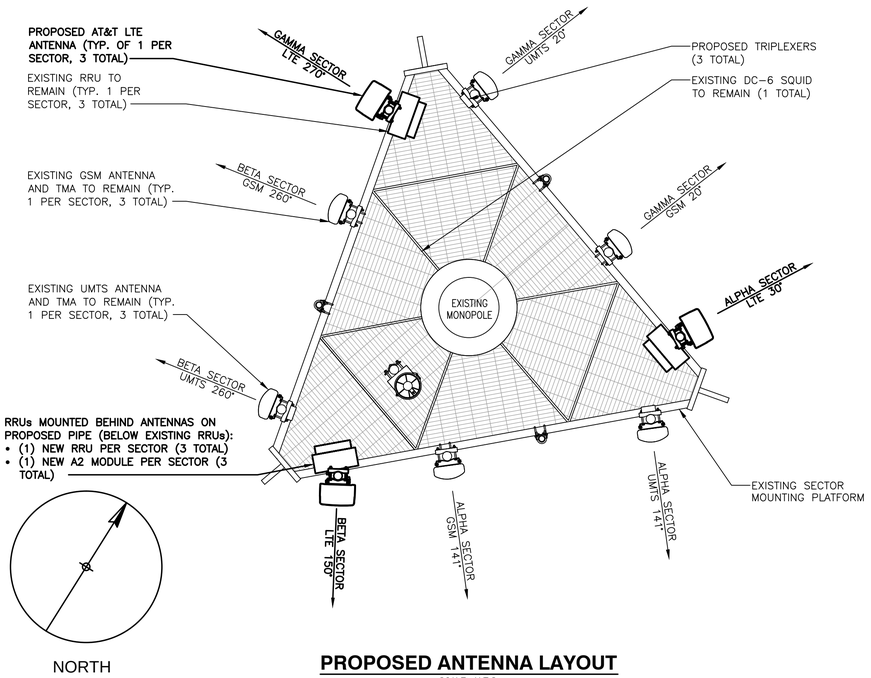
DRAWING TITLE:
EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	A-2	B



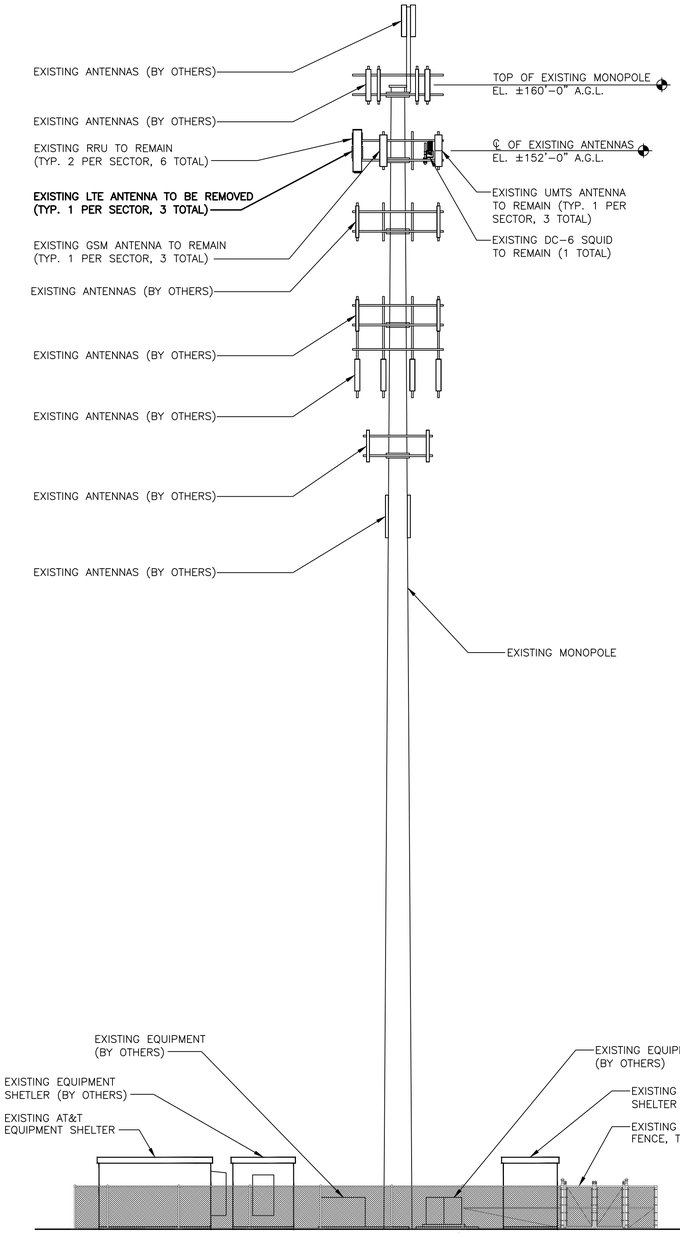
EXISTING ANTENNA LAYOUT

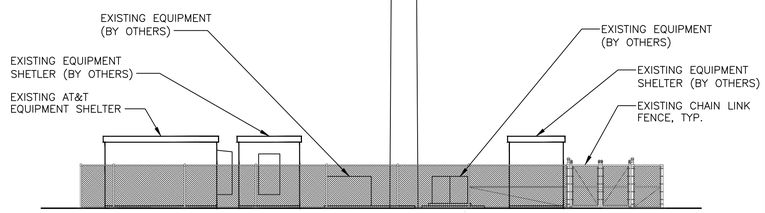
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT

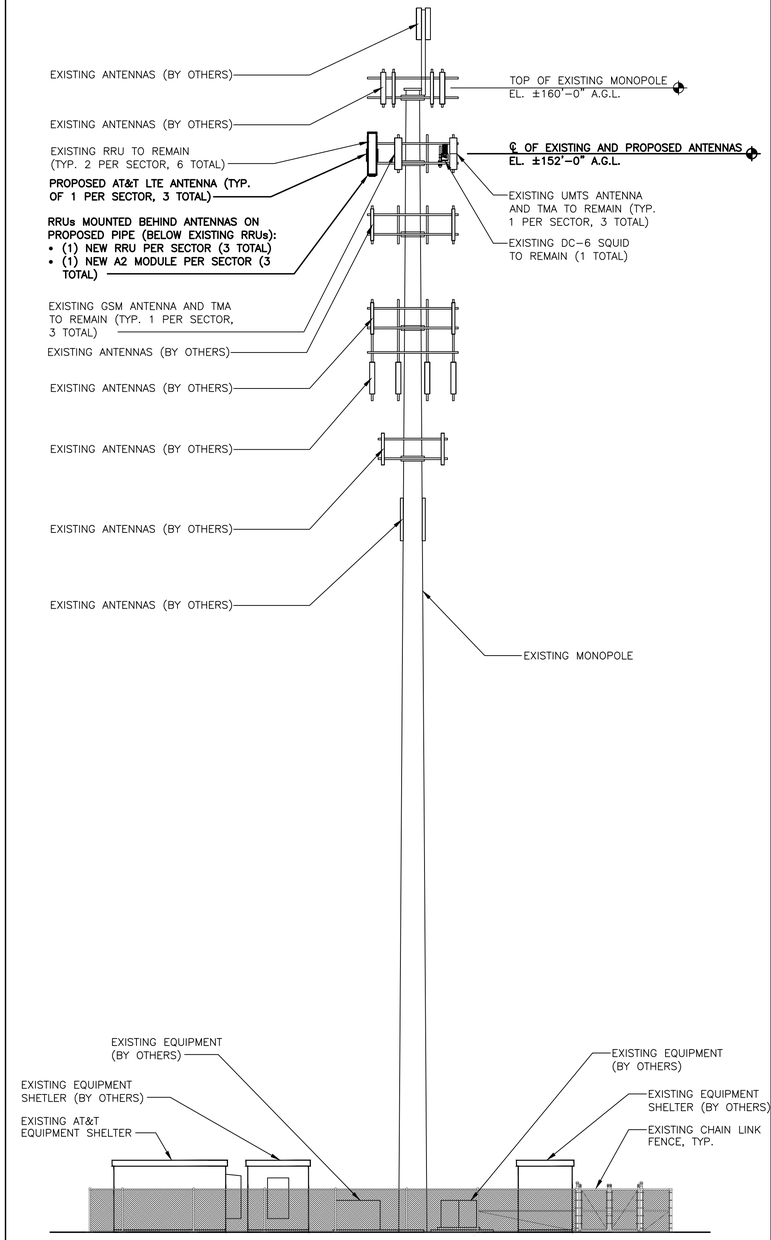
SCALE: N.T.S.





EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

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 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: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

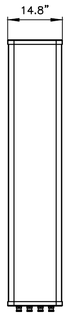
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT — NICHOLAS D. BARILE — LICENSED PROFESSIONAL ENGINEER — 28643

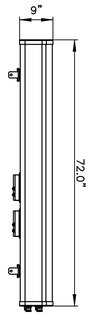
AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	A-3	B



FRONT VIEW



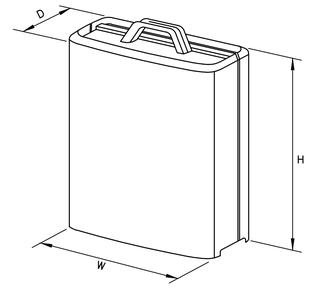
SIDE VIEW

BOTTOM VIEW

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

LTE ANTENNA DETAIL

SCALE: N.T.S.



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

*DENOTES EXISTING.

RRUS DETAIL

SCALE: N.T.S.

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: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

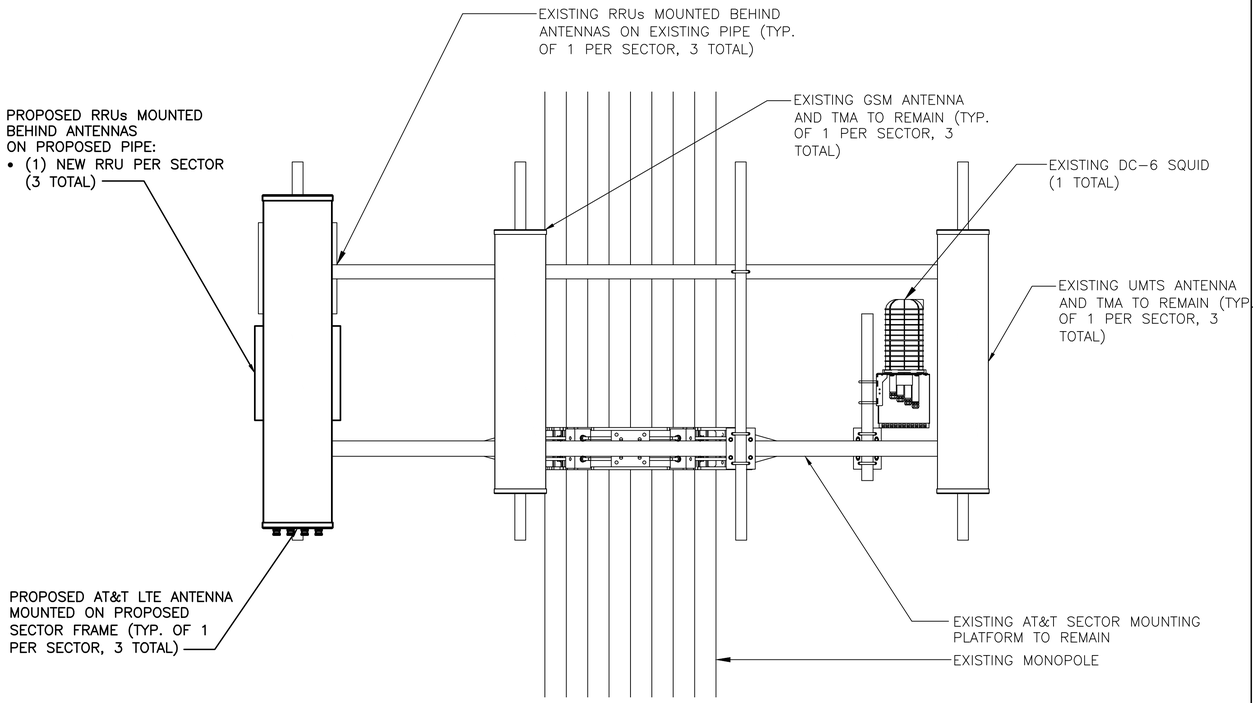
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · PROFESSIONAL ENGINEER · 28643

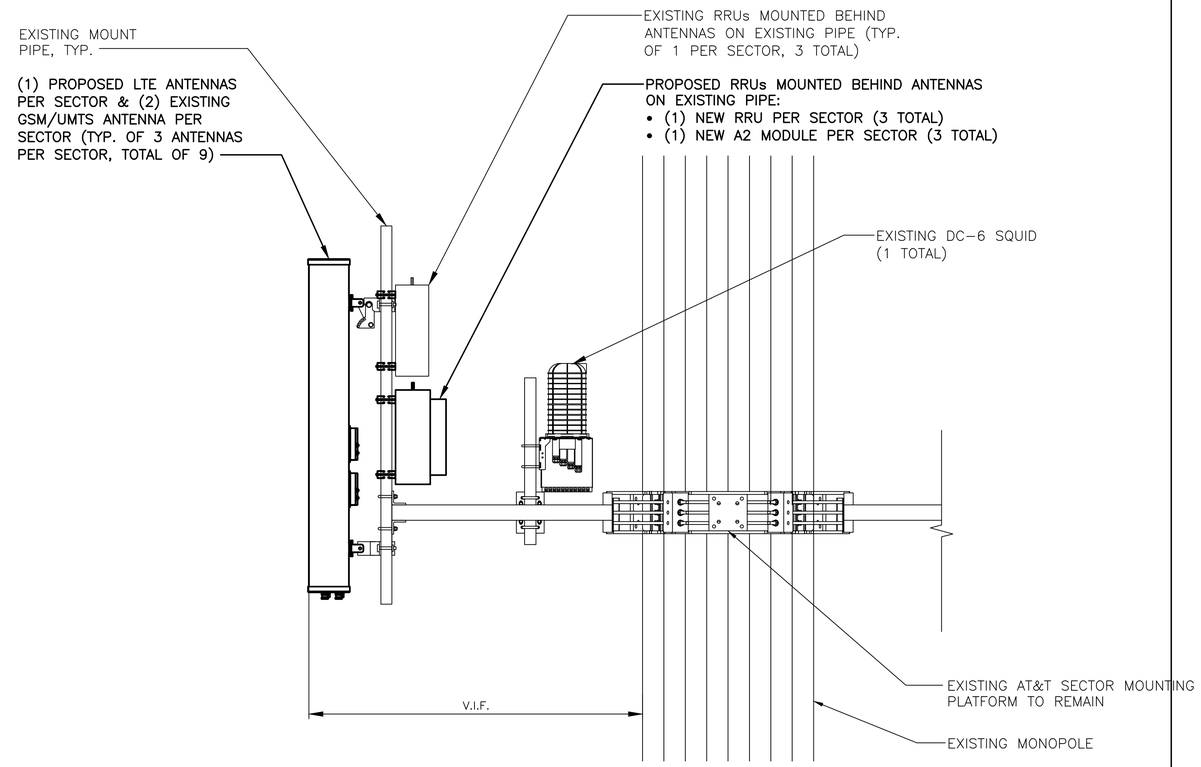
AT&T

DRAWING TITLE: DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	A-4	B



PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)
SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	A2	–	–	–
	A3	KATHREIN	800-10121	54.5"x10.3"x5.9"
	A4	POWERWAVE	P65-16-XLH-RR	72"x12"x9"
BETA	B1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	B2	–	–	–
	B3	KATHREIN	800-10121	54.5"x10.3"x5.9"
	B4	POWERWAVE	P65-16-XLH-RR	72"x12"x9"
GAMMA	G1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	G2	–	–	–
	G3	KATHREIN	800-10121	54.5"x10.3"x5.9"
	G4	POWERWAVE	P65-16-XLH-RR	72"x12"x9"

FINAL ANTENNA SCHEDULE

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

PROPOSED RRU SCHEDULE

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

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

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: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

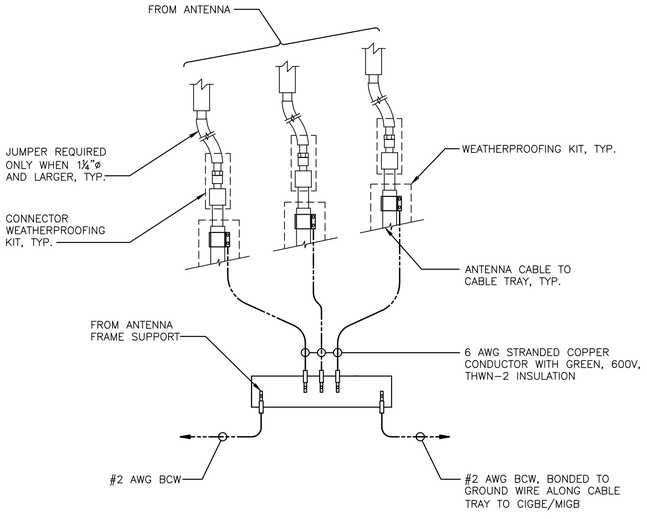
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · PROFESSIONAL ENGINEER · 28643

AT&T

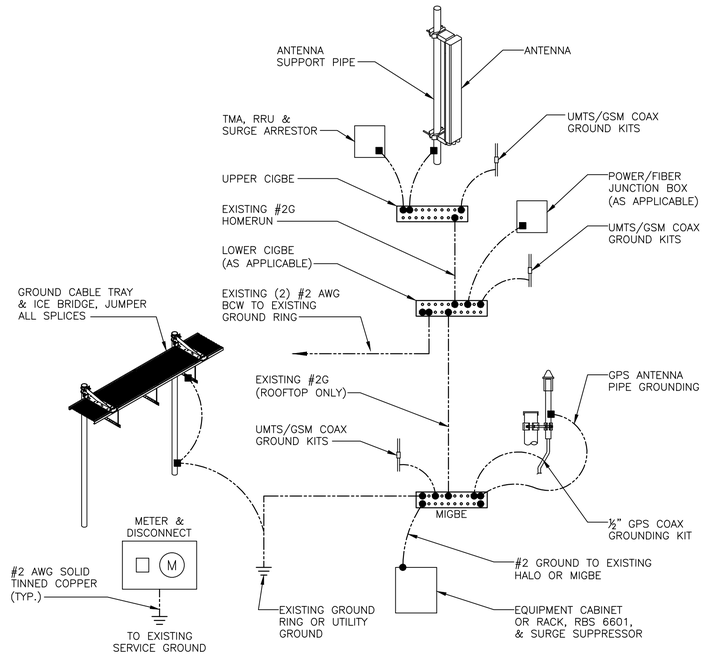
DRAWING TITLE:
ANTENNA MOUNTING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	A-5	B



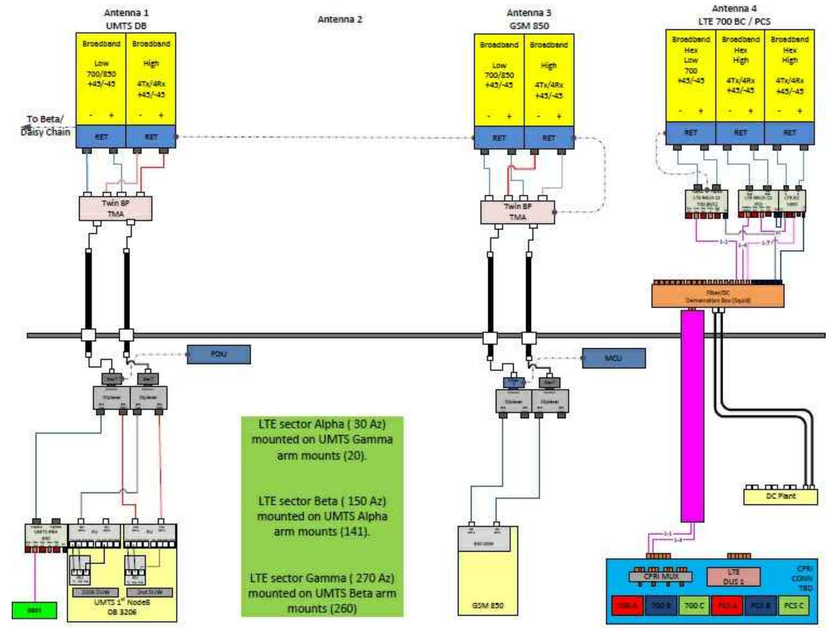
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



GROUNDING RISER DIAGRAM

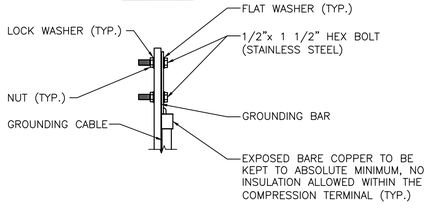
SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.

ELEVATION



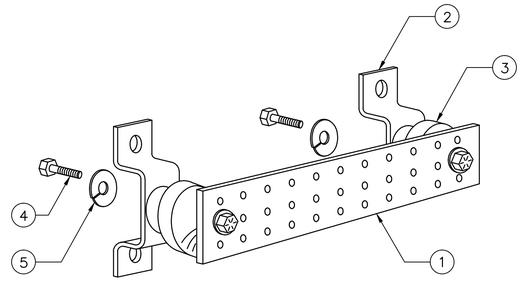
SECTION "A–A"

NOTE:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

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

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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: CT2159
SITE NAME: ORANGE NORTH

800 OGG MEADOW ROAD
ORANGE, CT 06477
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	1/8/16	REVISED PER CLIENT COMMENTS	KCD	NDB	NDB
A	11/09/15	ISSUED AS PRELIM	AM	NDB	NDB

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

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · 28643 · PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15130-EMP	G-1	B

Date: **December 09, 2015**

TECTONIC
Practical Solutions, Exceptional Service

Holly Haas
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

TECTONIC
1279 Route 300
Newburgh, NY 12550
(845) 567-6656

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2159
	Carrier Site Name:	Orange North
Crown Castle Designation:	**Crown Castle BU Number:**	806939
	Crown Castle Site Name:	NHV 2071 143137
	Crown Castle JDE Job Number:	358040
	Crown Castle Work Order Number:	1160798
	Crown Castle Application Number:	322396 Rev. 1
Engineering Firm Designation:	**TECTONIC Project Number:**	6500.806939
Site Data:	**800 OGG MEADOW ROAD, ORANGE, New Haven County, CT** **Latitude *41° 18' 28.36"*, Longitude *-73° 1' 56.22"*** **160 Foot - Monopole Tower**	

Dear Holly Haas,

Tectonic Engineering & Surveying Consultants P.C. (TECTONIC) is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 851103, in accordance with application 322396, 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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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

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

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

Structural analysis prepared by: Garrett Miller / IM

Respectfully submitted by:

Antonio A. Gualtieri, P.E.
Sr. Vice President

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Antenna and Cable Information
Table 2 - Existing and Reserved Antenna and Cable Information
Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE
Table 4 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 5 - Section Capacity (Summary)
Table 6 – Tower Components vs. Capacity
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by Valmont in June of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

The tower has been modified per reinforcement drawings prepared by Paul J. Ford and Company, in October of 2013. Reinforcement consists of plate reinforcement to the pole shaft from 0'-0" 70'-8" and from 84'-9"to 104'-9".

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	152.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2	3/8 3/4	-
		3	ericsson	RRUS 12			
		3	ericsson	RRUS 32 B30			
		3	ericsson	RRUS A2			
		3	quintel technology	QS66512-3 w/ Mount Pipe			
		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
158.0	165.0	1	gps	GPS_A	1 12	1/2 1-5/8	1
	162.0	6	rfs celwave	FD9R6004/2C-3L			
		3	alcatel lucent	RRH2X60-AWS	1	1-5/8	2
		3	alcatel lucent	RRH2X60-PCS			
		2	amphenol	BXA-80063-6BF-EDIN-X w/ Mount Pipe			
		3	antel	BXA-70040/6CF w/ Mount Pipe			
		1	antel	BXA-80063/4CF w/ Mount Pipe			
		2	commscope	HBXX-6516DS-A2M w/ Mount Pipe			
		4	commscope	HBXX-6517DS-A2M w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
	158.0	1	crown mounts	LP 602-1	-	-	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
156.0	170.0	3	ems wireless	RR90-17-00DP w/ Mount Pipe	-	-	3
		4	nokia	CS72993.07			
	156.0	1	crown mounts	PM 601-3			
147.0	152.0	6	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe	-	-	3
		3	powerwave technologies	TTAW-07BP111-001			
		3	kathrein	800 10121 w/ Mount Pipe	2 2 12	3/8 5/8 1-1/4	1
	147.0	1	crown mounts	LP 602-1			
		6	ericsson	RRUS-11			
		3	powerwave technologies	TTAW-07BP111-001			
		1	raycap	DC6-48-60-18-8F			
137.0	140.0	3	alcatel lucent	1900MHz RRH (65MHz)	1 3	5/8 1-1/4	1
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		1	andrew	VHLP2-11			
		1	dragonwave	Horizon Duo			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	137.0	1	crown mounts	LP 602-1			
127.0	129.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	-	-	2
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	KRY 112 144/1			
	127.0	1	crown mounts	LP 713-1			
		1	crown mounts	NA 507-1			
107.0	110.0	1	andrew	PX2F-52	3 3	1/2 5/8	1
		1	andrew	VHLP2-11			
		3	argus technologies	LLPX310R w/ Mount Pipe			
		2	dragonwave	HORIZON COMPACT			
		3	samsung telecommunications	WIMAX DAP HEAD			
	107.0	1	crown mounts	SO 101-3			
100.0	100.0	1	crown mounts	PM 601-3	6	7/8	1
		3	rfs celwave	APXV18-206517S-C			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
80.0	81.0	1	kathrein	OG-860/1920/GPS-A	1	7/8	1
	80.0	2	crown mounts	SO 701-1			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
157.0	157.0	12	swedcom	ALP 9011	-	-
147.0	147.0	12	swedcom	ALP 110 11-N	-	-
137.0	137.0	12	decibel	DB980H	-	-
127.0	127.0	12	swedcom	ALP 9011	-	-
117.0	117.0	12	swedcom	ALP 9011	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH	1257473	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	4025748	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	822032	CCISITES
4-POST-MODIFICATION INSPECTION	SGS	4489413	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH (Mapping) / Valmont	1060127	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) When applicable, transmission cables are considered as structural components for calculating wind loads allowed by TIA/EIA-222-F.
5) TECTONIC did not analyze the antenna supporting mounts as a part of this analysis report and assumed they are structurally sufficient. It is the carrier's responsibility to ensure structural compliance of their existing and/or proposed antenna supporting mounts.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP22.701x21.65x0.25	Pole	11.5%	Pass
155 - 150	Pole	TP23.751x22.701x0.25	Pole	19.5%	Pass
150 - 145	Pole	TP24.802x23.751x0.25	Pole	33.8%	Pass
145 - 140	Pole	TP25.852x24.802x0.25	Pole	46.0%	Pass
140 - 135	Pole	TP26.903x25.852x0.25	Pole	59.4%	Pass
135 - 130	Pole	TP27.953x26.903x0.25	Pole	71.9%	Pass
130 - 126	Pole	TP29.774x27.953x0.25	Pole	82.9%	Pass
126 - 121	Pole	TP29.343x28.293x0.375	Pole	67.5%	Pass
121 - 116	Pole	TP30.393x29.343x0.375	Pole	75.8%	Pass
116 - 111	Pole	TP31.442x30.393x0.375	Pole	83.2%	Pass
111 - 106	Pole	TP32.492x31.442x0.375	Pole	90.1%	Pass
106 - 102.5	Pole	TP33.227x32.492x0.375	Pole	94.7%	Pass
102.5 - 102.25	Pole + Reinf.	TP33.279x33.227x0.5625	Reinf. 6 Tension Rupture	79.3%	Pass
102.25 - 97.25	Pole + Reinf.	TP34.329x33.279x0.5625	Reinf. 6 Tension Rupture	85.3%	Pass
97.25 - 92.25	Pole + Reinf.	TP35.378x34.329x0.55	Reinf. 6 Tension Rupture	90.8%	Pass
92.25 - 87.25	Pole + Reinf.	TP36.428x35.378x0.55	Reinf. 6 Tension Rupture	95.9%	Pass
87.25 - 87	Pole + Reinf.	TP37.67x36.428x0.55	Reinf. 6 Tension Rupture	96.2%	Pass
87 - 80.33	Pole	TP37.13x35.73x0.5	Pole	92.8%	Pass
80.33 - 75.33	Pole	TP38.179x37.13x0.5	Pole	95.8%	Pass
75.33 - 70.33	Pole	TP39.228x38.179x0.5	Pole	98.4%	Pass
70.33 - 67.67	Pole	TP39.787x39.228x0.5	Pole	99.7%	Pass
67.67 - 67.42	Pole + Reinf.	TP39.84x39.787x0.725	Reinf. 5 Tension Rupture	85.9%	Pass
67.42 - 62.42	Pole + Reinf.	TP40.889x39.84x0.7125	Reinf. 5 Tension Rupture	88.5%	Pass
62.42 - 57.42	Pole + Reinf.	TP41.938x40.889x0.7	Reinf. 5 Tension Rupture	91.0%	Pass
57.42 - 52.42	Pole + Reinf.	TP42.988x41.938x0.7	Reinf. 5 Tension Rupture	93.2%	Pass
52.42 - 50.5	Pole + Reinf.	TP43.391x42.988x0.7	Reinf. 5 Tension Rupture	94.0%	Pass
50.5 - 50.25	Pole + Reinf.	TP43.443x43.391x0.7	Reinf. 4 Tension Rupture	94.1%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
50.25 - 48	Pole + Reinf.	TP45.297x43.443x0.7	Reinf. 4 Tension Rupture	95.0%	Pass
48 - 40.42	Pole + Reinf.	TP44.509x42.915x0.7625	Reinf. 4 Tension Rupture	93.7%	Pass
40.42 - 35.42	Pole + Reinf.	TP45.559x44.509x0.75	Reinf. 4 Tension Rupture	95.2%	Pass
35.42 - 30.5	Pole + Reinf.	TP46.592x45.559x0.75	Reinf. 4 Tension Rupture	96.6%	Pass
30.5 - 30.25	Pole + Reinf.	TP46.645x46.592x0.7625	Reinf. 3 Tension Rupture	96.4%	Pass
30.25 - 26.5	Pole + Reinf.	TP47.432x46.645x0.7625	Reinf. 3 Tension Rupture	97.4%	Pass
26.5 - 26.25	Pole + Reinf.	TP47.485x47.432x0.7375	Reinf. 1 Compression	89.7%	Pass
26.25 - 21.25	Pole + Reinf.	TP48.535x47.485x0.7375	Reinf. 1 Compression	90.9%	Pass
21.25 - 16.25	Pole + Reinf.	TP49.586x48.535x0.725	Reinf. 1 Compression	92.0%	Pass
16.25 - 11.25	Pole + Reinf.	TP50.636x49.586x0.725	Reinf. 1 Compression	93.0%	Pass
11.25 - 6.25	Pole + Reinf.	TP51.687x50.636x0.7125	Reinf. 1 Compression	93.9%	Pass
6.25 - 1.25	Pole + Reinf.	TP52.737x51.687x0.7125	Reinf. 1 Compression	94.8%	Pass
1.25 - 0	Pole + Reinf.	TP53x52.737x0.7125	Reinf. 1 Compression	95.0%	Pass
				Summary	
			Pole	99.7%	Pass
			Reinforcement	97.4%	Pass
			Overall	99.7%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	93.4	Pass
1	Base Plate	0	75.3	Pass
1	Base Foundation	0	91.9	Pass
1	Base Foundation Soil Interaction	0	51.9	Pass

Structure Rating (max from all components) =	99.7%

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

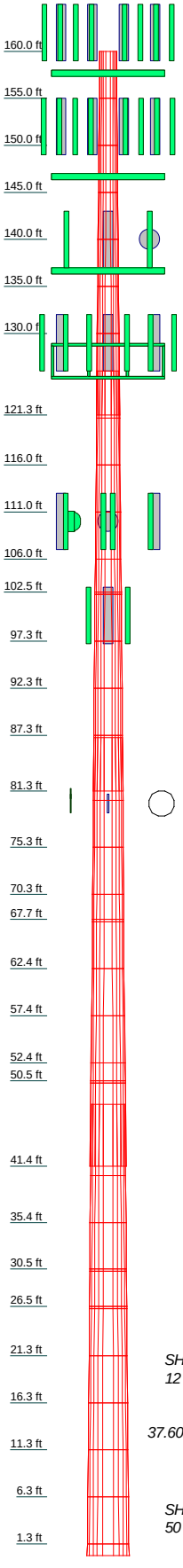
4.1) Recommendations

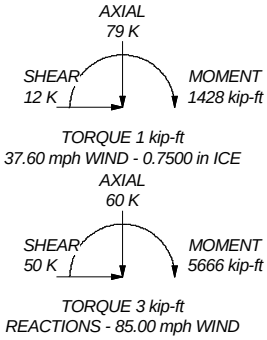
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.0000	12	0.2500		21.6500	22.7005		0.3
2	5.0000	12	0.2500		22.7005	23.7510		0.3
3	5.0000	12	0.2500		23.7510	24.8015		0.3
4	5.0000	12	0.2500		24.8015	25.8520		0.3
5	5.0000	12	0.2500		25.8520	26.9025		0.4
6	5.0000	12	0.2500		26.9025	27.9530		0.4
7	5.0000	12	0.2500	4.6670	27.9530	29.0035		0.7
8	5.0000	12	0.3750		29.0035	30.0540		0.6
9	5.0000	12	0.3750		30.0540	31.1045		0.6
10	5.0000	12	0.3750		31.1045	32.1550		0.6
11	5.0000	12	0.3750		32.1550	33.2055		0.6
12	5.0000	12	0.5625		33.2055	34.2560		0.5
13	5.0000	12	0.5625		34.2560	35.3065		0.5
14	5.0000	12	0.5625		35.3065	36.3570		1.0
15	5.0000	12	0.5500		36.3570	37.4075		1.0
16	5.0000	12	0.5500		37.4075	38.4580		1.0
17	5.0000	12	0.5500	5.6670	38.4580	39.5085		1.3
18	5.0000	12	0.5000		39.5085	40.5590		1.3
19	5.0000	12	0.5000		40.5590	41.6095		1.0
20	5.0000	12	0.5000		41.6095	42.6600		1.0
21	5.0000	12	0.7500		42.6600	43.7105		0.6
22	5.0000	12	0.7500		43.7105	44.7610		0.6
23	5.0000	12	0.7125		44.7610	45.8115		1.5
24	5.0000	12	0.7000		45.8115	46.8620		1.5
25	5.0000	12	0.7000		46.8620	47.9125		1.6
26	5.0000	12	0.7000		47.9125	48.9630		0.6
27	5.0000	12	0.7000		48.9630	50.0135		0.0
28	7.5833	12	0.7000	6.5833	50.0135	52.1145		2.9
29	5.0000	12	0.7625		52.1145	53.1650		2.6
30	5.0000	12	0.7500		53.1650	54.2155		1.8
31	5.0000	12	0.7500		54.2155	55.2660		1.8
32	5.0000	12	0.7500		55.2660	56.3165		1.4
33	5.0000	12	0.7500		56.3165	57.3670		1.4
34	5.0000	12	0.7500		57.3670	58.4175		0.0
35	5.0000	12	0.7375		58.4175	59.4680		2.0
36	5.0000	12	0.7250		59.4680	60.5185		2.0
37	5.0000	12	0.7250		60.5185	61.5690		2.1
38	5.0000	12	0.7125		61.5690	62.6195		2.1
39	5.0000	12	0.7125		62.6195	63.6700		2.1
40	1.2500	12	0.7125		63.6700	64.0000		0.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
GPS_A	158	800MHZ RRH	137
(2) FD9R6004/2C-3L	158	800MHZ RRH	137
(2) FD9R6004/2C-3L	158	Horizon Duo	137
(2) FD9R6004/2C-3L	158	(2) 6' x 2" STD Pipe	137
BXA-80063/4CF w/ Mount Pipe	158	(2) 6' x 2" STD Pipe	137
BXA-80063-6BF-EDIN-X w/ Mount Pipe	158	(2) 6' x 2" STD Pipe	137
BXA-80063-6BF-EDIN-X w/ Mount Pipe	158	LP 602-1	137
BXA-70040/6CF w/ Mount Pipe	158	VHLP2-11	137
BXA-70040/6CF w/ Mount Pipe	158	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	127
BXA-70040/6CF w/ Mount Pipe	158		
(2) HBXX-6516DS-A2M w/ Mount Pipe	158	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	127
(2) HBXX-6517DS-A2M w/ Mount Pipe	158		
(2) HBXX-6517DS-A2M w/ Mount Pipe	158	KRY 112 144/1	127
RRH2X60-AWS	158	KRY 112 144/1	127
RRH2X60-AWS	158	KRY 112 144/1	127
RRH2X60-AWS	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	127
RRH2X60-PCS	158		
RRH2X60-PCS	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	127
RRH2X60-PCS	158		
DB-T1-6Z-8AB-0Z	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	127
LP 602-1	158		
HPA-65R-BUU-H6 w/ Mount Pipe	147	LNX-6515DS-VTM w/ Mount Pipe	127
HPA-65R-BUU-H6 w/ Mount Pipe	147	LNX-6515DS-VTM w/ Mount Pipe	127
HPA-65R-BUU-H6 w/ Mount Pipe	147	LNX-6515DS-VTM w/ Mount Pipe	127
QS66512-3 w/ Mount Pipe	147	RRUS 11 B12	127
QS66512-3 w/ Mount Pipe	147	RRUS 11 B12	127
QS66512-3 w/ Mount Pipe	147	RRUS 11 B12	127
RRUS 12	147	6' x 2" STD Pipe	127
RRUS 12	147	6' x 2" STD Pipe	127
RRUS 12	147	6' x 2" STD Pipe	127
RRUS 12	147	LP 713-1	127
RRUS 32 B30	147	NA 507-1	127
RRUS 32 B30	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	127
RRUS 32 B30	147		
RRUS A2	147	LLPX310R w/ Mount Pipe	107
RRUS A2	147	LLPX310R w/ Mount Pipe	107
RRUS A2	147	WIMAX DAP HEAD	107
DC6-48-60-18-8F	147	WIMAX DAP HEAD	107
800 10121 w/ Mount Pipe	147	WIMAX DAP HEAD	107
800 10121 w/ Mount Pipe	147	HORIZON COMPACT	107
800 10121 w/ Mount Pipe	147	HORIZON COMPACT	107
TTAW-07BP111-001	147	6' x 2" STD Pipe	107
TTAW-07BP111-001	147	6' x 2" STD Pipe	107
TTAW-07BP111-001	147	6' x 2" STD Pipe	107
(2) RRUS-11	147	8' x 2" STD Pipe	107
(2) RRUS-11	147	8' x 2" STD Pipe	107
(2) RRUS-11	147	8' x 2" STD Pipe	107
DC6-48-60-18-8F	147	SO 101-3	107
LP 602-1	147	LLPX310R w/ Mount Pipe	107
APXVSPP18-C-A20 w/ Mount Pipe	137	VHLP2-11	107
APXVSPP18-C-A20 w/ Mount Pipe	137	PX2F-52	107
APXVSPP18-C-A20 w/ Mount Pipe	137	PM 601-3	100
800 EXTERNAL NOTCH FILTER	137	APXV18-206517S-C	100
800 EXTERNAL NOTCH FILTER	137	APXV18-206517S-C	100
800 EXTERNAL NOTCH FILTER	137	APXV18-206517S-C	100
(3) ACU-A20-N	137	SO 701-1	80
(3) ACU-A20-N	137	SO 701-1	80
(3) ACU-A20-N	137	OG-860/1920/GPS-A	80
1900MHz RRH (65MHz)	137	2' x 2" STD Pipe	80
1900MHz RRH (65MHz)	137	2' x 2" STD Pipe	80
1900MHz RRH (65MHz)	137		
800MHZ RRH	137		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 99.7%

TECTONIC
Practical Solutions, Exceptional Service
TECTONIC
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: 6500.806939			
Project: BU 806939 - NHV 2071 143137			
Client: Crown Castle	Drawn by: Ian Marinaccio	App'd:	
Code: TIA/EIA-222-F	Date: 12/0□/15	Scale: NTS	
Path: G:\Newburgh\Projects\6500 Crown SA\806939\Structural\reinf trial 2\6500.806939_reinf.eri		Dwg No. E-1	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

4) Tower is located in New Haven County, Connecticut.
5) Basic wind speed of 85.00 mph.
6) Nominal ice thickness of 0.7500 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56.00 pcf.
9) A wind speed of 37.60 mph is used in combination with ice.
10) Deflections calculated using a wind speed of 50.00 mph.
11) TOWER RATING: 99.7%.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	160.0000-155.0000	5.0000	0.00	12	21.6500	22.7005	0.2500	1.0000	A572-65 (65 ksi)
L2	155.0000-150.0000	5.0000	0.00	12	22.7005	23.7510	0.2500	1.0000	A572-65 (65 ksi)
L3	150.0000-145.0000	5.0000	0.00	12	23.7510	24.8015	0.2500	1.0000	A572-65 (65 ksi)
L4	145.0000-140.0000	5.0000	0.00	12	24.8015	25.8520	0.2500	1.0000	A572-65 (65 ksi)
L5	140.0000-135.0000	5.0000	0.00	12	25.8520	26.9025	0.2500	1.0000	A572-65 (65 ksi)
L6	135.0000-130.0000	5.0000	0.00	12	26.9025	27.9530	0.2500	1.0000	A572-65 (65 ksi)
L7	130.0000-121.3330	8.6670	4.67	12	27.9530	29.7740	0.2500	1.0000	A572-65 (65 ksi)
L8	121.3330-121.0000	5.0000	0.00	12	28.2935	29.3431	0.3750	1.5000	A572-65 (65 ksi)
L9	121.0000-116.0000	5.0000	0.00	12	29.3431	30.3927	0.3750	1.5000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L10	116.0000-111.0000	5.0000	0.00	12	30.3927	31.4423	0.3750	1.5000	A572-65 (65 ksi)
L11	111.0000-106.0000	5.0000	0.00	12	31.4423	32.4919	0.3750	1.5000	A572-65 (65 ksi)
L12	106.0000-102.5000	3.5000	0.00	12	32.4919	33.2266	0.3750	1.5000	A572-65 (65 ksi)
L13	102.5000-102.2500	0.2500	0.00	12	33.2266	33.2791	0.5625	2.2500	A572-65 (65 ksi)
L14	102.2500-97.2500	5.0000	0.00	12	33.2791	34.3287	0.5625	2.2500	A572-65 (65 ksi)
L15	97.2500-92.2500	5.0000	0.00	12	34.3287	35.3783	0.5500	2.2000	A572-65 (65 ksi)
L16	92.2500-87.2500	5.0000	0.00	12	35.3783	36.4279	0.5500	2.2000	A572-65 (65 ksi)
L17	87.2500-81.3330	5.9170	5.67	12	36.4279	37.6700	0.5500	2.2000	A572-65 (65 ksi)
L18	81.3330-80.3330	6.6670	0.00	12	35.7304	37.1296	0.5000	2.0000	A572-65 (65 ksi)
L19	80.3330-75.3330	5.0000	0.00	12	37.1296	38.1789	0.5000	2.0000	A572-65 (65 ksi)
L20	75.3330-70.3330	5.0000	0.00	12	38.1789	39.2283	0.5000	2.0000	A572-65 (65 ksi)
L21	70.3330-67.6700	2.6630	0.00	12	39.2283	39.7872	0.5000	2.0000	A572-65 (65 ksi)
L22	67.6700-67.4200	0.2500	0.00	12	39.7872	39.8397	0.7250	2.9000	A572-65 (65 ksi)
L23	67.4200-62.4200	5.0000	0.00	12	39.8397	40.8890	0.7125	2.8500	A572-65 (65 ksi)
L24	62.4200-57.4200	5.0000	0.00	12	40.8890	41.9384	0.7000	2.8000	A572-65 (65 ksi)
L25	57.4200-52.4200	5.0000	0.00	12	41.9384	42.9877	0.7000	2.8000	A572-65 (65 ksi)
L26	52.4200-50.5000	1.9200	0.00	12	42.9877	43.3907	0.7000	2.8000	A572-65 (65 ksi)
L27	50.5000-50.2500	0.2500	0.00	12	43.3907	43.4431	0.7000	2.8000	A572-65 (65 ksi)
L28	50.2500-41.4167	8.8333	6.58	12	43.4431	45.2970	0.7000	2.8000	A572-65 (65 ksi)
L29	41.4167-40.4167	7.5833	0.00	12	42.9154	44.5086	0.7625	3.0500	A572-65 (65 ksi)
L30	40.4167-35.4167	5.0000	0.00	12	44.5086	45.5591	0.7500	3.0000	A572-65 (65 ksi)
L31	35.4167-30.5000	4.9167	0.00	12	45.5591	46.5920	0.7500	3.0000	A572-65 (65 ksi)
L32	30.5000-30.2500	0.2500	0.00	12	46.5920	46.6446	0.7625	3.0500	A572-65 (65 ksi)
L33	30.2500-26.5000	3.7500	0.00	12	46.6446	47.4324	0.7625	3.0500	A572-65 (65 ksi)
L34	26.5000-26.2500	0.2500	0.00	12	47.4324	47.4850	0.7375	2.9500	A572-65 (65 ksi)
L35	26.2500-21.2500	5.0000	0.00	12	47.4850	48.5354	0.7375	2.9500	A572-65 (65 ksi)
L36	21.2500-16.2500	5.0000	0.00	12	48.5354	49.5859	0.7250	2.9000	A572-65 (65 ksi)
L37	16.2500-11.2500	5.0000	0.00	12	49.5859	50.6364	0.7250	2.9000	A572-65 (65 ksi)
L38	11.2500-6.2500	5.0000	0.00	12	50.6364	51.6869	0.7125	2.8500	A572-65 (65 ksi)
L39	6.2500-1.2500	5.0000	0.00	12	51.6869	52.7374	0.7125	2.8500	A572-65 (65 ksi)
L40	1.2500-0.0000	1.2500		12	52.7374	53.0000	0.7125	2.8500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.4137	17.2270	1006.9853	7.6612	11.2147	89.7916	2040.4253	8.4786	5.1322	20.529
	23.5013	18.0727	1162.6804	8.0373	11.7589	98.8769	2355.9057	8.8948	5.4137	21.655
L2	23.5013	18.0727	1162.6804	8.0373	11.7589	98.8769	2355.9057	8.8948	5.4137	21.655
	24.5889	18.9183	1333.6497	8.4134	12.3030	108.4001	2702.3358	9.3110	5.6953	22.781
L3	24.5889	18.9183	1333.6497	8.4134	12.3030	108.4001	2702.3358	9.3110	5.6953	22.781
	25.6764	19.7640	1520.6078	8.7894	12.8472	118.3611	3081.1637	9.7272	5.9768	23.907
L4	25.6764	19.7640	1520.6078	8.7894	12.8472	118.3611	3081.1637	9.7272	5.9768	23.907
	26.7640	20.6096	1724.2696	9.1655	13.3914	128.7599	3493.8377	10.1434	6.2583	25.033
L5	26.7640	20.6096	1724.2696	9.1655	13.3914	128.7599	3493.8377	10.1434	6.2583	25.033
	27.8516	21.4553	1945.3497	9.5416	13.9355	139.5965	3941.8059	10.5596	6.5399	26.16
L6	27.8516	21.4553	1945.3497	9.5416	13.9355	139.5965	3941.8059	10.5596	6.5399	26.16
	28.9391	22.3010	2184.5629	9.9177	14.4797	150.8709	4426.5166	10.9759	6.8214	27.286
L7	28.9391	22.3010	2184.5629	9.9177	14.4797	150.8709	4426.5166	10.9759	6.8214	27.286
	30.8243	23.7668	2644.2799	10.5696	15.4229	171.4512	5358.0279	11.6973	7.3094	29.238
L8	30.3058	33.7115	3353.8780	9.9948	14.6560	228.8398	6795.8661	16.5918	6.5776	17.54
	30.3782	34.9789	3746.5486	10.3706	15.1997	246.4882	7591.5232	17.2156	6.8589	18.291
L9	30.3782	34.9789	3746.5486	10.3706	15.1997	246.4882	7591.5232	17.2156	6.8589	18.291
	31.4648	36.2463	4168.7310	10.7463	15.7434	264.7923	8446.9791	17.8393	7.1402	19.041
L10	31.4648	36.2463	4168.7310	10.7463	15.7434	264.7923	8446.9791	17.8393	7.1402	19.041
	32.5514	37.5137	4621.4944	11.1221	16.2871	283.7519	9364.4007	18.4631	7.4215	19.791
L11	32.5514	37.5137	4621.4944	11.1221	16.2871	283.7519	9364.4007	18.4631	7.4215	19.791
	33.6381	38.7811	5105.9084	11.4978	16.8308	303.3671	10345.9546	19.0869	7.7028	20.541
L12	33.6381	38.7811	5105.9084	11.4978	16.8308	303.3671	10345.9546	19.0869	7.7028	20.541
	34.3987	39.6683	5464.4027	11.7609	17.2114	317.4878	11072.3614	19.5235	7.8997	21.066
L13	34.3987	59.1629	8057.0576	11.6937	17.2114	468.1239	16325.7831	29.1182	7.3972	13.151
	34.4530	59.2579	8095.9550	11.7125	17.2386	469.6421	16404.5998	29.1649	7.4113	13.176
L14	34.4530	59.2579	8095.9550	11.7125	17.2386	469.6421	16404.5998	29.1649	7.4113	13.176
	35.5397	61.1590	8900.4177	12.0883	17.7823	500.5223	18034.6593	30.1006	7.6926	13.676
L15	35.5397	59.8221	8712.2992	12.0928	17.7823	489.9433	17653.4801	29.4426	7.7261	14.047
	36.6263	61.6809	9549.9485	12.4685	18.3260	521.1160	19350.7848	30.3575	8.0074	14.559
L16	36.6263	61.6809	9549.9485	12.4685	18.3260	521.1160	19350.7848	30.3575	8.0074	14.559
	37.7129	63.5398	10439.6382	12.8443	18.8697	553.2502	21153.5374	31.2723	8.2887	15.07
L17	37.7129	63.5398	10439.6382	12.8443	18.8697	553.2502	21153.5374	31.2723	8.2887	15.07
	38.9989	65.7395	11561.8788	13.2890	19.5131	592.5200	23427.5011	32.3550	8.6216	15.676
L18	38.2221	56.7209	8985.9440	12.6125	18.5083	485.5080	18207.9588	27.9163	8.2357	16.471
	38.4394	58.9736	10099.6879	13.1134	19.2331	525.1194	20464.7058	29.0250	8.6107	17.221
L19	38.4394	58.9736	10099.6879	13.1134	19.2331	525.1194	20464.7058	29.0250	8.6107	17.221
	39.5258	60.6631	10992.7923	13.4891	19.7767	555.8458	22274.3775	29.8565	8.8920	17.784
L20	39.5258	60.6631	10992.7923	13.4891	19.7767	555.8458	22274.3775	29.8565	8.8920	17.784
	40.6121	62.3526	11937.0540	13.8647	20.3203	587.4459	24187.7077	30.6880	9.1732	18.346
L21	40.6121	62.3526	11937.0540	13.8647	20.3203	587.4459	24187.7077	30.6880	9.1732	18.346
	41.1907	63.2524	12461.3375	14.0648	20.6098	604.6327	25250.0483	31.1309	9.3230	18.646
L22	41.1907	91.1907	17760.2684	13.9843	20.6098	861.7405	35987.1188	44.8813	8.7200	12.028
	41.2450	91.3132	17831.9306	14.0030	20.6369	864.0782	36132.3259	44.9416	8.7340	12.047
L23	41.2450	89.7675	17541.2900	14.0075	20.6369	849.9946	35543.4092	44.1808	8.7675	12.305
	42.3314	92.1750	18990.805	14.3832	21.1805	896.6171	38480.519	45.3657	9.0488	12.7

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
			0				7			
L24	42.3314	90.5860	18675.053	14.3877	21.1805	881.7094	37840.720	44.5837	9.0823	12.975
			1				7			
	43.4178	92.9513	20176.427	14.7633	21.7241	928.7589	40882.912	45.7478	9.3635	13.376
			4				0			
L25	43.4178	92.9513	20176.427	14.7633	21.7241	928.7589	40882.912	45.7478	9.3635	13.376
			4				0			
	44.5042	95.3165	21756.187	15.1390	22.2676	977.0315	44083.934	46.9119	9.6447	13.778
			7				6			
L26	44.5042	95.3165	21756.187	15.1390	22.2676	977.0315	44083.934	46.9119	9.6447	13.778
			7				6			
	44.9213	96.2248	22384.066	15.2833	22.4764	995.8933	45356.186	47.3589	9.7527	13.932
			2				7			
L27	44.9213	96.2248	22384.066	15.2833	22.4764	995.8933	45356.186	47.3589	9.7527	13.932
			2				7			
	44.9757	96.3430	22466.699	15.3020	22.5035	998.3625	45523.623	47.4171	9.7668	13.953
			2				6			
L28	44.9757	96.3430	22466.699	15.3020	22.5035	998.3625	45523.623	47.4171	9.7668	13.953
			2				6			
	46.8949	100.5216	25518.597	15.9657	23.4638	1087.5709	51707.596	49.4737	10.2636	14.662
			2				4			
L29	45.8612	103.4958	23472.678	15.0907	22.2302	1055.8937	47562.010	50.9375	9.4578	12.404
			4				1			
	46.0787	107.4076	26236.092	15.6611	23.0554	1137.9564	53161.435	52.8627	9.8848	12.964
			2				8			
L30	46.0787	105.6770	25828.120	15.6656	23.0554	1120.2612	52334.773	52.0110	9.9183	13.224
			1				6			
	47.1662	108.2139	27733.248	16.0416	23.5996	1175.1578	56195.080	53.2596	10.1998	13.6
			8				8			
L31	47.1662	108.2139	27733.248	16.0416	23.5996	1175.1578	56195.080	53.2596	10.1998	13.6
			8				8			
	48.2356	110.7085	29695.806	16.4115	24.1347	1230.4205	60171.755	54.4874	10.4767	13.969
			9				7			
L32	48.2356	112.5230	30166.046	16.4070	24.1347	1249.9045	61124.589	55.3804	10.4432	13.696
			9				5			
	48.2900	112.6520	30269.883	16.4258	24.1619	1252.7946	61334.990	55.4439	10.4572	13.714
			7				9			
L33	48.2900	112.6520	30269.883	16.4258	24.1619	1252.7946	61334.990	55.4439	10.4572	13.714
			7				9			
	49.1057	114.5864	31856.148	16.7078	24.5700	1296.5465	64549.194	56.3959	10.6684	13.991
			8				1			
L34	49.1057	110.8888	30861.226	16.7168	24.5700	1256.0531	62533.212	54.5761	10.7354	14.556
			7				2			
	49.1600	111.0135	30965.485	16.7356	24.5972	1258.9024	62744.468	54.6375	10.7495	14.576
			5				7			
L35	49.1600	111.0135	30965.485	16.7356	24.5972	1258.9024	62744.468	54.6375	10.7495	14.576
			5				7			
	50.2476	113.5082	33100.265	17.1117	25.1414	1316.5663	67070.112	55.8653	11.0310	14.957
			9				6			
L36	50.2476	111.6135	32564.779	17.1161	25.1414	1295.2672	65985.072	54.9328	11.0645	15.261
			8				7			
	51.3351	114.0658	34758.813	17.4922	25.6855	1353.2460	70430.780	56.1397	11.3460	15.65
			7				2			
L37	51.3351	114.0658	34758.813	17.4922	25.6855	1353.2460	70430.780	56.1397	11.3460	15.65
			7				2			
	52.4227	116.5182	37049.246	17.8683	26.2297	1412.4943	75071.817	57.3467	11.6276	16.038
			4				8			
L38	52.4227	114.5379	36437.829	17.8728	26.2297	1389.1842	73832.921	56.3721	11.6611	16.366
			5				3			
	53.5102	116.9480	38786.709	18.2488	26.7738	1448.6809	78592.388	57.5583	11.9426	16.762
			2				5			
L39	53.5102	116.9480	38786.709	18.2488	26.7738	1448.6809	78592.388	57.5583	11.9426	16.762
			2				5			
	54.5978	119.3581	41234.423	18.6249	27.3180	1509.4253	83552.121	58.7444	12.2241	17.157
			6				4			
L40	54.5978	119.3581	41234.423	18.6249	27.3180	1509.4253	83552.121	58.7444	12.2241	17.157
			6				4			
	54.8696	119.9606	41862.033	18.7189	27.4540	1524.8064	84823.829	59.0410	12.2945	17.255
			7				7			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 160.0000-155.0000				1	1	1		
L2 155.0000-150.0000				1	1	1		
L3 150.0000-145.0000				1	1	1		
L4 145.0000-140.0000				1	1	1		
L5 140.0000-135.0000				1	1	1		
L6 135.0000-130.0000				1	1	1		
L7 130.0000-121.3330				1	1	1		
L8 121.3330-121.0000				1	1	1		
L9 121.0000-116.0000				1	1	1		
L10 116.0000-111.0000				1	1	1		
L11 111.0000-106.0000				1	1	1		
L12 106.0000-102.5000				1	1	1		
L13 102.5000-102.2500				1	1	0.97468		
L14 102.2500-97.2500				1	1	0.965105		
L15 97.2500-92.2500				1	1	0.977487		
L16 92.2500-87.2500				1	1	0.968837		
L17 87.2500-81.3330				1	1	0.968418		
L18 81.3330-80.3330				1	1	1		
L19 80.3330-75.3330				1	1	1		
L20 75.3330-70.3330				1	1	1		
L21 70.3330-67.6700				1	1	1		
L22 67.6700-67.4200				1	1	0.960943		
L23 67.4200-62.4200				1	1	0.970288		
L24 62.4200-57.4200				1	1	0.98036		
L25 57.4200-52.4200				1	1	0.973757		
L26 52.4200-50.5000				1	1	0.971308		
L27 50.5000-50.2500				1	1	0.970993		
L28 50.2500-41.4167				1	1	0.968188		
L29 41.4167-40.4167				1	1	0.968342		
L30 40.4167-35.4167				1	1	0.97871		
L31 35.4167-				1	1	0.973556		

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
30.5000								
L32 30.5000-30.2500				1	1	1.00205		
L33 30.2500-26.5000				1	1	0.997591		
L34 26.5000-26.2500				1	1	1.05311		
L35 26.2500-21.2500				1	1	1.04672		
L36 21.2500-16.2500				1	1	1.05829		
L37 16.2500-11.2500				1	1	1.05234		
L38 11.2500-6.2500				1	1	1.06474		
L39 6.2500-1.2500				1	1	1.05919		
L40 1.2500-0.0000				1	1	1.05783		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*****								
Safety Line 3/8	B	No	CaAa (Out Of Face)	160.0000 - 0.0000	1	No Ice	0.0375	0.22
						1/2" Ice	0.1375	0.75
						1" Ice	0.2375	1.28
						2" Ice	0.4375	2.34
						4" Ice	0.8375	4.46
Step Bolts	B	No	CaAa (Out Of Face)	160.0000 - 0.0000	1	No Ice	0.0375	2.00
						1/2" Ice	0.1375	2.53
						1" Ice	0.2375	3.68
						2" Ice	0.4375	7.80
						4" Ice	0.8375	23.38
158								
HJ7-50A(1-5/8")	A	No	Inside Pole	158.0000 - 0.0000	12	No Ice	0.0000	1.04
						1/2" Ice	0.0000	1.04
						1" Ice	0.0000	1.04
						2" Ice	0.0000	1.04
						4" Ice	0.0000	1.04
LDF4-50A(1/2")	A	No	Inside Pole	158.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	158.0000 - 0.0000	1	No Ice	0.1980	1.30
						1/2" Ice	0.2980	2.81
						1" Ice	0.3980	4.94
						2" Ice	0.5980	11.03
						4" Ice	0.9980	30.52
147								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
2" Rigid Conduit	C	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000	2.80
						1/2" Ice	0.0000	2.80
						1" Ice	0.0000	2.80
						2" Ice	0.0000	2.80
						4" Ice	0.0000	2.80
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	147.0000 - 0.0000	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
						2" Ice	0.0000	0.58
						4" Ice	0.0000	0.58
LDF6-50A(1-1/4")	C	No	Inside Pole	147.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
FB-L98B-002-75000(3/8")	C	No	Inside Pole	147.0000 - 0.0000	2	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	147.0000 - 0.0000	2	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
						2" Ice	0.0000	0.31
						4" Ice	0.0000	0.31
137								
HB114-1-0813U4-M5J(1 1/4")	B	No	Inside Pole	137.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
						2" Ice	0.0000	1.20
						4" Ice	0.0000	1.20
LDF4-75A(5/8")	B	No	Inside Pole	137.0000 - 0.0000	1	No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
						2" Ice	0.0000	0.14
						4" Ice	0.0000	0.14
127								
FLC 158-50J(1-5/8")	C	No	Inside Pole	127.0000 - 0.0000	13	No Ice	0.0000	0.92
						1/2" Ice	0.0000	0.92
						1" Ice	0.0000	0.92
						2" Ice	0.0000	0.92
						4" Ice	0.0000	0.92
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	1	No Ice	0.1625	1.07
						1/2" Ice	0.2625	2.37
						1" Ice	0.3625	4.28
						2" Ice	0.5625	9.93
						4" Ice	0.9625	28.56
107								
HJ4.5-50(5/8")	B	No	Inside Pole	107.0000 - 0.0000	3	No Ice	0.0000	0.40
						1/2" Ice	0.0000	0.40
						1" Ice	0.0000	0.40
						2" Ice	0.0000	0.40
						4" Ice	0.0000	0.40
EC4-50(1/2")	B	No	Inside Pole	107.0000 - 0.0000	3	No Ice	0.0000	0.16
						1/2" Ice	0.0000	0.16
						1" Ice	0.0000	0.16
						2" Ice	0.0000	0.16
						4" Ice	0.0000	0.16
2" Rigid Conduit	B	No	Inside Pole	107.0000 - 0.0000	1	No Ice	0.0000	2.80
						1/2" Ice	0.0000	2.80
						1" Ice	0.0000	2.80
						2" Ice	0.0000	2.80
						4" Ice	0.0000	2.80
2" Rigid Conduit	B	No	CaAa (Out Of	107.0000 - 0.0000	1	No Ice	0.2000	2.80

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.3000	4.33
						1" Ice	0.4000	6.47
						2" Ice	0.6000	12.57
						4" Ice	1.0000	32.12
100								
CR 50 1070PE(7/8")	C	No	Inside Pole	100.0000 - 0.0000	6	No Ice	0.0000	0.28
						1/2" Ice	0.0000	0.28
						1" Ice	0.0000	0.28
						2" Ice	0.0000	0.28
						4" Ice	0.0000	0.28
80								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	80.0000 - 0.0000	1	No Ice	0.0630	0.15
						1/2" Ice	0.1630	0.84
						1" Ice	0.2630	2.14
						2" Ice	0.4630	6.58
						4" Ice	0.8630	22.78
***								
CCI-65FP-085125	C	No	CaAa (Out Of Face)	30.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3333	0.00
						1" Ice	0.4583	0.00
						2" Ice	0.7082	0.00
						4" Ice	1.2081	0.00
CCI-65FP-085125	A	No	CaAa (Out Of Face)	30.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
CCI-65FP-085125	B	No	CaAa (Out Of Face)	30.5000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
***								
CCI-65FP-065125	C	No	CaAa (Out Of Face)	50.5000 - 30.5000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3333	0.00
						1" Ice	0.4583	0.00
						2" Ice	0.7082	0.00
						4" Ice	1.2081	0.00
CCI-65FP-065125	A	No	CaAa (Out Of Face)	50.5000 - 30.5000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
CCI-65FP-065125	B	No	CaAa (Out Of Face)	50.5000 - 23.5000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
***								
CCI-65FP-065125	C	No	CaAa (Out Of Face)	70.5000 - 50.5000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3333	0.00
						1" Ice	0.4583	0.00
						2" Ice	0.7082	0.00
						4" Ice	1.2081	0.00
CCI-65FP-065125	A	No	CaAa (Out Of Face)	70.5000 - 50.5000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
CCI-65FP-065125	B	No	CaAa (Out Of Face)	70.5000 - 50.5000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
***								
CCI-65FP-060100	C	No	CaAa (Out Of Face)	104.7500 - 84.7500	1	No Ice	0.2083	0.00
						1/2" Ice	0.3333	0.00
						1" Ice	0.4583	0.00
						2" Ice	0.7082	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	1.2081	0.00
CCI-65FP-060100	A	No	CaAa (Out Of Face)	104.7500 - 84.7500	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
CCI-65FP-060100	B	No	CaAa (Out Of Face)	104.7500 - 84.7500	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
****								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.0000-155.0000	A	0.000	0.000	0.000	0.594	0.04
		B	0.000	0.000	0.000	0.375	0.01
		C	0.000	0.000	0.000	0.000	0.00
L2	155.0000-150.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.01
		C	0.000	0.000	0.000	0.000	0.00
L3	150.0000-145.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.01
		C	0.000	0.000	0.000	0.000	0.03
L4	145.0000-140.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.01
		C	0.000	0.000	0.000	0.000	0.06
L5	140.0000-135.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.02
		C	0.000	0.000	0.000	0.000	0.06
L6	135.0000-130.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.03
		C	0.000	0.000	0.000	0.000	0.06
L7	130.0000-121.3330	A	0.000	0.000	0.000	1.716	0.12
		B	0.000	0.000	0.000	0.650	0.05
		C	0.000	0.000	0.000	0.921	0.18
L8	121.3330-121.0000	A	0.000	0.000	0.000	0.066	0.00
		B	0.000	0.000	0.000	0.025	0.00
		C	0.000	0.000	0.000	0.054	0.01
L9	121.0000-116.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.03
		C	0.000	0.000	0.000	0.813	0.13
L10	116.0000-111.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.375	0.03
		C	0.000	0.000	0.000	0.813	0.13
L11	111.0000-106.0000	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	0.575	0.04
		C	0.000	0.000	0.000	0.813	0.13
L12	106.0000-102.5000	A	0.000	0.000	0.000	0.693	0.05
		B	0.000	0.000	0.000	0.963	0.05
		C	0.000	0.000	0.000	1.038	0.09
L13	102.5000-102.2500	A	0.000	0.000	0.000	0.050	0.00
		B	0.000	0.000	0.000	0.069	0.00
		C	0.000	0.000	0.000	0.093	0.01
L14	102.2500-97.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	1.854	0.13
L15	97.2500-92.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	1.854	0.14
L16	92.2500-87.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	1.854	0.14

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L17	87.2500-81.3330	A	0.000	0.000	0.000	1.172	0.08
		B	0.000	0.000	0.000	1.627	0.08
		C	0.000	0.000	0.000	1.482	0.16
L18	81.3330-80.3330	A	0.000	0.000	0.000	0.198	0.01
		B	0.000	0.000	0.000	0.275	0.01
		C	0.000	0.000	0.000	0.163	0.03
L19	80.3330-75.3330	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	1.107	0.14
L20	75.3330-70.3330	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	1.162	0.14
L21	70.3330-67.6700	A	0.000	0.000	0.000	0.527	0.04
		B	0.000	0.000	0.000	0.732	0.04
		C	0.000	0.000	0.000	1.155	0.07
L22	67.6700-67.4200	A	0.000	0.000	0.000	0.050	0.00
		B	0.000	0.000	0.000	0.069	0.00
		C	0.000	0.000	0.000	0.108	0.01
L23	67.4200-62.4200	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L24	62.4200-57.4200	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L25	57.4200-52.4200	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L26	52.4200-50.5000	A	0.000	0.000	0.000	0.380	0.03
		B	0.000	0.000	0.000	0.528	0.03
		C	0.000	0.000	0.000	0.833	0.05
L27	50.5000-50.2500	A	0.000	0.000	0.000	0.050	0.00
		B	0.000	0.000	0.000	0.069	0.00
		C	0.000	0.000	0.000	0.108	0.01
L28	50.2500-41.4167	A	0.000	0.000	0.000	1.749	0.12
		B	0.000	0.000	0.000	2.429	0.12
		C	0.000	0.000	0.000	3.832	0.24
L29	41.4167-40.4167	A	0.000	0.000	0.000	0.198	0.01
		B	0.000	0.000	0.000	0.275	0.01
		C	0.000	0.000	0.000	0.434	0.03
L30	40.4167-35.4167	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L31	35.4167-30.5000	A	0.000	0.000	0.000	0.974	0.07
		B	0.000	0.000	0.000	1.352	0.07
		C	0.000	0.000	0.000	2.133	0.14
L32	30.5000-30.2500	A	0.000	0.000	0.000	0.050	0.00
		B	0.000	0.000	0.000	0.069	0.00
		C	0.000	0.000	0.000	0.108	0.01
L33	30.2500-26.5000	A	0.000	0.000	0.000	0.743	0.05
		B	0.000	0.000	0.000	1.031	0.05
		C	0.000	0.000	0.000	1.627	0.10
L34	26.5000-26.2500	A	0.000	0.000	0.000	0.050	0.00
		B	0.000	0.000	0.000	0.069	0.00
		C	0.000	0.000	0.000	0.108	0.01
L35	26.2500-21.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L36	21.2500-16.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L37	16.2500-11.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L38	11.2500-6.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14
L39	6.2500-1.2500	A	0.000	0.000	0.000	0.990	0.07
		B	0.000	0.000	0.000	1.375	0.07
		C	0.000	0.000	0.000	2.169	0.14

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L40	1.2500-0.0000	A	0.000	0.000	0.000	0.248	0.02
		B	0.000	0.000	0.000	0.344	0.02
		C	0.000	0.000	0.000	0.542	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.0000-155.0000	A	0.905	0.000	0.000	0.000	1.137	0.05
		B		0.000	0.000	0.000	2.184	0.02
		C		0.000	0.000	0.000	0.000	0.00
L2	155.0000-150.0000	A	0.901	0.000	0.000	0.000	1.891	0.09
		B		0.000	0.000	0.000	2.177	0.02
		C		0.000	0.000	0.000	0.000	0.00
L3	150.0000-145.0000	A	0.898	0.000	0.000	0.000	1.888	0.09
		B		0.000	0.000	0.000	2.170	0.02
		C		0.000	0.000	0.000	0.000	0.03
L4	145.0000-140.0000	A	0.894	0.000	0.000	0.000	1.884	0.09
		B		0.000	0.000	0.000	2.163	0.02
		C		0.000	0.000	0.000	0.000	0.06
L5	140.0000-135.0000	A	0.890	0.000	0.000	0.000	1.880	0.09
		B		0.000	0.000	0.000	2.155	0.03
		C		0.000	0.000	0.000	0.000	0.06
L6	135.0000-130.0000	A	0.886	0.000	0.000	0.000	1.876	0.09
		B		0.000	0.000	0.000	2.147	0.04
		C		0.000	0.000	0.000	0.000	0.06
L7	130.0000-121.3330	A	0.880	0.000	0.000	0.000	3.242	0.15
		B		0.000	0.000	0.000	3.703	0.07
		C		0.000	0.000	0.000	1.919	0.20
L8	121.3330-121.0000	A	0.877	0.000	0.000	0.000	0.125	0.01
		B		0.000	0.000	0.000	0.142	0.00
		C		0.000	0.000	0.000	0.113	0.01
L9	121.0000-116.0000	A	0.874	0.000	0.000	0.000	1.864	0.09
		B		0.000	0.000	0.000	2.124	0.04
		C		0.000	0.000	0.000	1.687	0.14
L10	116.0000-111.0000	A	0.870	0.000	0.000	0.000	1.860	0.09
		B		0.000	0.000	0.000	2.115	0.04
		C		0.000	0.000	0.000	1.682	0.14
L11	111.0000-106.0000	A	0.865	0.000	0.000	0.000	1.855	0.08
		B		0.000	0.000	0.000	2.478	0.05
		C		0.000	0.000	0.000	1.678	0.14
L12	106.0000-102.5000	A	0.861	0.000	0.000	0.000	1.296	0.06
		B		0.000	0.000	0.000	2.771	0.07
		C		0.000	0.000	0.000	2.124	0.10
L13	102.5000-102.2500	A	0.859	0.000	0.000	0.000	0.092	0.00
		B		0.000	0.000	0.000	0.198	0.00
		C		0.000	0.000	0.000	0.189	0.01
L14	102.2500-97.2500	A	0.856	0.000	0.000	0.000	1.846	0.08
		B		0.000	0.000	0.000	3.944	0.09
		C		0.000	0.000	0.000	3.781	0.15
L15	97.2500-92.2500	A	0.851	0.000	0.000	0.000	1.841	0.08
		B		0.000	0.000	0.000	3.929	0.09
		C		0.000	0.000	0.000	3.769	0.15
L16	92.2500-87.2500	A	0.846	0.000	0.000	0.000	1.836	0.08
		B		0.000	0.000	0.000	3.912	0.09
		C		0.000	0.000	0.000	3.757	0.15
L17	87.2500-81.3330	A	0.839	0.000	0.000	0.000	2.165	0.10
		B		0.000	0.000	0.000	4.607	0.11
		C		0.000	0.000	0.000	3.000	0.18
L18	81.3330-80.3330	A	0.835	0.000	0.000	0.000	0.366	0.02
		B		0.000	0.000	0.000	0.779	0.02
		C		0.000	0.000	0.000	0.330	0.03
L19	80.3330-75.3330	A	0.831	0.000	0.000	0.000	1.821	0.08
		B		0.000	0.000	0.000	3.869	0.09
		C		0.000	0.000	0.000	2.714	0.16

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L20	75.3330-70.3330	A	0.825	0.000	0.000	0.000	1.815	0.08
		B		0.000	0.000	0.000	3.849	0.09
		C		0.000	0.000	0.000	2.846	0.16
L21	70.3330-67.6700	A	0.819	0.000	0.000	0.000	0.964	0.04
		B		0.000	0.000	0.000	2.042	0.05
		C		0.000	0.000	0.000	2.574	0.08
L22	67.6700-67.4200	A	0.817	0.000	0.000	0.000	0.090	0.00
		B		0.000	0.000	0.000	0.191	0.00
		C		0.000	0.000	0.000	0.241	0.01
L23	67.4200-62.4200	A	0.813	0.000	0.000	0.000	1.803	0.08
		B		0.000	0.000	0.000	3.815	0.09
		C		0.000	0.000	0.000	4.813	0.16
L24	62.4200-57.4200	A	0.806	0.000	0.000	0.000	1.796	0.08
		B		0.000	0.000	0.000	3.792	0.09
		C		0.000	0.000	0.000	4.787	0.16
L25	57.4200-52.4200	A	0.797	0.000	0.000	0.000	1.787	0.08
		B		0.000	0.000	0.000	3.767	0.09
		C		0.000	0.000	0.000	4.760	0.16
L26	52.4200-50.5000	A	0.791	0.000	0.000	0.000	0.684	0.03
		B		0.000	0.000	0.000	1.439	0.03
		C		0.000	0.000	0.000	1.820	0.06
L27	50.5000-50.2500	A	0.789	0.000	0.000	0.000	0.089	0.00
		B		0.000	0.000	0.000	0.187	0.00
		C		0.000	0.000	0.000	0.237	0.01
L28	50.2500-41.4167	A	0.780	0.000	0.000	0.000	3.127	0.15
		B		0.000	0.000	0.000	6.564	0.16
		C		0.000	0.000	0.000	8.311	0.28
L29	41.4167-40.4167	A	0.770	0.000	0.000	0.000	0.354	0.02
		B		0.000	0.000	0.000	0.743	0.02
		C		0.000	0.000	0.000	0.941	0.03
L30	40.4167-35.4167	A	0.763	0.000	0.000	0.000	1.753	0.08
		B		0.000	0.000	0.000	3.663	0.09
		C		0.000	0.000	0.000	4.647	0.16
L31	35.4167-30.5000	A	0.750	0.000	0.000	0.000	1.711	0.08
		B		0.000	0.000	0.000	3.565	0.09
		C		0.000	0.000	0.000	4.530	0.15
L32	30.5000-30.2500	A	0.750	0.000	0.000	0.000	0.087	0.00
		B		0.000	0.000	0.000	0.181	0.00
		C		0.000	0.000	0.000	0.230	0.01
L33	30.2500-26.5000	A	0.750	0.000	0.000	0.000	1.305	0.06
		B		0.000	0.000	0.000	2.719	0.07
		C		0.000	0.000	0.000	3.455	0.12
L34	26.5000-26.2500	A	0.750	0.000	0.000	0.000	0.087	0.00
		B		0.000	0.000	0.000	0.181	0.00
		C		0.000	0.000	0.000	0.230	0.01
L35	26.2500-21.2500	A	0.750	0.000	0.000	0.000	1.740	0.08
		B		0.000	0.000	0.000	3.625	0.09
		C		0.000	0.000	0.000	4.606	0.16
L36	21.2500-16.2500	A	0.750	0.000	0.000	0.000	1.740	0.08
		B		0.000	0.000	0.000	3.625	0.09
		C		0.000	0.000	0.000	4.606	0.16
L37	16.2500-11.2500	A	0.750	0.000	0.000	0.000	1.740	0.08
		B		0.000	0.000	0.000	3.625	0.09
		C		0.000	0.000	0.000	4.606	0.16
L38	11.2500-6.2500	A	0.750	0.000	0.000	0.000	1.740	0.08
		B		0.000	0.000	0.000	3.625	0.09
		C		0.000	0.000	0.000	4.606	0.16
L39	6.2500-1.2500	A	0.750	0.000	0.000	0.000	1.740	0.08
		B		0.000	0.000	0.000	3.625	0.09
		C		0.000	0.000	0.000	4.606	0.16
L40	1.2500-0.0000	A	0.750	0.000	0.000	0.000	0.435	0.02
		B		0.000	0.000	0.000	0.906	0.02
		C		0.000	0.000	0.000	1.152	0.04

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	160.0000-155.0000	0.0882	-0.1119	0.3938	-0.0115
L2	155.0000-150.0000	0.0854	-0.2110	0.3776	-0.1607
L3	150.0000-145.0000	0.0858	-0.2121	0.3822	-0.1632
L4	145.0000-140.0000	0.0863	-0.2132	0.3864	-0.1656
L5	140.0000-135.0000	0.0867	-0.2142	0.3903	-0.1678
L6	135.0000-130.0000	0.0870	-0.2151	0.3938	-0.1699
L7	130.0000-121.3330	-0.0364	-0.1384	0.1778	-0.0490
L8	121.3330-121.0000	-0.0965	-0.1009	0.0754	0.0086
L9	121.0000-116.0000	-0.0967	-0.1012	0.0749	0.0081
L10	116.0000-111.0000	-0.0972	-0.1017	0.0751	0.0078
L11	111.0000-106.0000	-0.0518	-0.0751	0.1390	0.0449
L12	106.0000-102.5000	-0.0223	0.1030	0.1404	0.2911
L13	102.5000-102.2500	-0.0954	0.1436	0.0247	0.3476
L14	102.2500-97.2500	-0.0958	0.1442	0.0245	0.3496
L15	97.2500-92.2500	-0.0965	0.1452	0.0243	0.3531
L16	92.2500-87.2500	-0.0971	0.1462	0.0240	0.3564
L17	87.2500-81.3330	0.0267	0.0782	0.2247	0.2621
L18	81.3330-80.3330	0.1212	0.0258	0.3822	0.1857
L19	80.3330-75.3330	0.0571	0.0616	0.1898	0.2793
L20	75.3330-70.3330	0.0452	0.0686	0.1658	0.2929
L21	70.3330-67.6700	-0.1618	0.1840	-0.1547	0.4512
L22	67.6700-67.4200	-0.1620	0.1843	-0.1552	0.4520
L23	67.4200-62.4200	-0.1625	0.1848	-0.1560	0.4536
L24	62.4200-57.4200	-0.1634	0.1858	-0.1577	0.4562
L25	57.4200-52.4200	-0.1642	0.1868	-0.1592	0.4584
L26	52.4200-50.5000	-0.1648	0.1874	-0.1603	0.4597
L27	50.5000-50.2500	-0.1650	0.1876	-0.1606	0.4601
L28	50.2500-41.4167	-0.1657	0.1884	-0.1620	0.4614
L29	41.4167-40.4167	-0.1657	0.1884	-0.1620	0.4615
L30	40.4167-35.4167	-0.1662	0.1890	-0.1629	0.4590
L31	35.4167-30.5000	-0.1669	0.1898	-0.1643	0.4592
L32	30.5000-30.2500	-0.1673	0.1902	-0.1650	0.4611
L33	30.2500-26.5000	-0.1676	0.1905	-0.1655	0.4626
L34	26.5000-26.2500	-0.1678	0.1909	-0.1660	0.4640
L35	26.2500-21.2500	-0.1682	0.1913	-0.1667	0.4659
L36	21.2500-16.2500	-0.1689	0.1920	-0.1679	0.4694
L37	16.2500-11.2500	-0.1695	0.1928	-0.1691	0.4728
L38	11.2500-6.2500	-0.1701	0.1935	-0.1703	0.4761
L39	6.2500-1.2500	-0.1707	0.1942	-0.1715	0.4793
L40	1.2500-0.0000	-0.1711	0.1946	-0.1722	0.4812

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	K
****158****								

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
GPS_A	B	From Leg	4.0000 0.00 7.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2975 0.3739 0.4589 0.6549 1.1506	0.2975 0.3739 0.4589 0.6549 1.1506	0.00 0.00 0.01 0.02 0.08
(2) FD9R6004/2C-3L	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
BXA-80063/4CF w/ Mount Pipe	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.4238 4.0221 4.6369 5.9176 8.9263	0.03 0.07 0.12 0.23 0.56
BXA-80063-6BF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.7073 8.3278 8.9190 10.1316 12.6769	5.6302 6.7191 7.5606 9.2937 12.9684	0.04 0.10 0.17 0.33 0.79
BXA-80063-6BF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.7073 8.3278 8.9190 10.1316 12.6769	5.6302 6.7191 7.5606 9.2937 12.9684	0.04 0.10 0.17 0.33 0.79
BXA-70040/6CF w/ Mount Pipe	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.5510 17.2727 17.9604 19.3657 22.2962	7.3656 8.5350 9.4168 11.2339 15.3444	0.06 0.16 0.27 0.52 1.17
BXA-70040/6CF w/ Mount Pipe	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.5510 17.2727 17.9604 19.3657 22.2962	7.3656 8.5350 9.4168 11.2339 15.3444	0.06 0.16 0.27 0.52 1.17
BXA-70040/6CF w/ Mount Pipe	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.5510 17.2727 17.9604 19.3657 22.2962	7.3656 8.5350 9.4168 11.2339 15.3444	0.06 0.16 0.27 0.52 1.17
(2) HBXX-6516DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.1758 6.6547 7.1374 8.1341 10.2560	4.5251 5.2049 5.8987 7.3732 10.5560	0.05 0.10 0.15 0.29 0.67

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.9184 9.5649 10.1882 11.4619 14.1251	6.9055 8.1001 9.0086 10.8591 14.8084	0.08 0.15 0.22 0.41 0.92
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.9184 9.5649 10.1882 11.4619 14.1251	6.9055 8.1001 9.0086 10.8591 14.8084	0.08 0.15 0.22 0.41 0.92
RRH2X60-AWS	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.9569 4.2724 4.5965 5.2705 6.7224	2.0504 2.3315 2.6212 3.2266 4.5410	0.06 0.08 0.11 0.18 0.36
RRH2X60-AWS	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.9569 4.2724 4.5965 5.2705 6.7224	2.0504 2.3315 2.6212 3.2266 4.5410	0.06 0.08 0.11 0.18 0.36
RRH2X60-AWS	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.9569 4.2724 4.5965 5.2705 6.7224	2.0504 2.3315 2.6212 3.2266 4.5410	0.06 0.08 0.11 0.18 0.36
RRH2X60-PCS	A	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5667 2.7914 3.0247 3.5173 4.6062	2.0106 2.2184 2.4349 2.8938 3.9152	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5667 2.7914 3.0247 3.5173 4.6062	2.0106 2.2184 2.4349 2.8938 3.9152	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	C	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5667 2.7914 3.0247 3.5173 4.6062	2.0106 2.2184 2.4349 2.8938 3.9152	0.06 0.08 0.10 0.16 0.31
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000 0.00 4.00	0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.6000 5.9154 6.2395 6.9136 8.3654	2.3333 2.5580 2.7914 3.2840 4.3728	0.04 0.08 0.12 0.21 0.45
LP 602-1	C	None		0.0000	158.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.0300 38.7100 45.3900 58.7500 85.4700	32.0300 38.7100 45.3900 58.7500 85.4700	1.34 1.80 2.26 3.17 5.00
156 ***147***									
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000 0.00	0.0000	147.0000	No Ice 1/2"	10.5975 11.2684	8.1125 9.3041	0.08 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			5.00			Ice	11.9061	10.2095	0.25
						1" Ice	13.2089	12.1748	0.46
						2" Ice	15.9341	16.3544	1.02
						4" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	10.5975 11.2684 11.9061 13.2089 15.9341	8.1125 9.3041 10.2095 12.1748 16.3544	0.08 0.16 0.25 0.46 1.02
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	10.5975 11.2684 11.9061 13.2089 15.9341	8.1125 9.3041 10.2095 12.1748 16.3544	0.08 0.16 0.25 0.46 1.02
QS66512-3 w/ Mount Pipe	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	8.4625 9.6573 10.6203 12.6104 16.8055	0.13 0.21 0.29 0.49 1.02
QS66512-3 w/ Mount Pipe	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	8.4625 9.6573 10.6203 12.6104 16.8055	0.13 0.21 0.29 0.49 1.02
QS66512-3 w/ Mount Pipe	C	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	8.4625 9.6573 10.6203 12.6104 16.8055	0.13 0.21 0.29 0.49 1.02
RRUS 12	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.6692 3.9256 4.1907 4.7468 5.9627	1.4875 1.6727 1.8665 2.2800 3.2107	0.06 0.08 0.11 0.17 0.34
RRUS 12	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.6692 3.9256 4.1907 4.7468 5.9627	1.4875 1.6727 1.8665 2.2800 3.2107	0.06 0.08 0.11 0.17 0.34
RRUS 12	C	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.6692 3.9256 4.1907 4.7468 5.9627	1.4875 1.6727 1.8665 2.2800 3.2107	0.06 0.08 0.11 0.17 0.34
RRUS 32 B30	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.1410 3.3968 3.6612 4.2160 5.4294	1.7392 1.9600 2.1895 2.6743 3.7476	0.06 0.08 0.10 0.16 0.32
RRUS 32 B30	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.1410 3.3968 3.6612 4.2160 5.4294	1.7392 1.9600 2.1895 2.6743 3.7476	0.06 0.08 0.10 0.16 0.32
RRUS 32 B30	C	From Leg	4.0000	0.0000	147.0000	No Ice	3.1410	1.7392	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 5.00			1/2" Ice 1" Ice 2" Ice 4" Ice	3.3968 3.6612 4.2160 5.4294	1.9600 2.1895 2.6743 3.7476	0.08 0.10 0.16 0.32
RRUS A2	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5329 0.6652 0.8062 1.1140 1.8335	0.02 0.03 0.05 0.09 0.20
RRUS A2	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5329 0.6652 0.8062 1.1140 1.8335	0.02 0.03 0.05 0.09 0.20
RRUS A2	C	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5329 0.6652 0.8062 1.1140 1.8335	0.02 0.03 0.05 0.09 0.20
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4667 1.6667 1.8778 2.3333 3.3778	1.4667 1.6667 1.8778 2.3333 3.3778	0.02 0.04 0.06 0.11 0.24
800 10121 w/ Mount Pipe	A	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4576 5.8819 6.3149 7.2067 9.0941	3.3521 3.7426 4.1516 5.0623 7.2551	0.05 0.08 0.12 0.22 0.49
800 10121 w/ Mount Pipe	B	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4576 5.8819 6.3149 7.2067 9.0941	3.3521 3.7426 4.1516 5.0623 7.2551	0.05 0.08 0.12 0.22 0.49
800 10121 w/ Mount Pipe	C	From Leg	4.0000 0.00 5.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4576 5.8819 6.3149 7.2067 9.0941	3.3521 3.7426 4.1516 5.0623 7.2551	0.05 0.08 0.12 0.22 0.49
TTAW-07BP111-001	A	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6449 0.7568 0.8773 1.1444 1.7822	0.5198 0.6232 0.7354 0.9856 1.5896	0.02 0.02 0.03 0.05 0.12
TTAW-07BP111-001	B	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6449 0.7568 0.8773 1.1444 1.7822	0.5198 0.6232 0.7354 0.9856 1.5896	0.02 0.02 0.03 0.05 0.12
TTAW-07BP111-001	C	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6449 0.7568 0.8773 1.1444 1.7822	0.5198 0.6232 0.7354 0.9856 1.5896	0.02 0.02 0.03 0.05 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) RRUS-11	A	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	B	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	C	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
DC6-48-60-18-8F	C	From Leg	4.0000 0.00 0.00	0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4667 1.6667 1.8778 2.3333 3.3778	1.4667 1.6667 1.8778 2.3333 3.3778	0.02 0.04 0.06 0.11 0.24
LP 602-1	C	None		0.0000	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.0300 38.7100 45.3900 58.7500 85.4700	32.0300 38.7100 45.3900 58.7500 85.4700	1.34 1.80 2.26 3.17 5.00
137									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
800 EXTERNAL NOTCH FILTER	A	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice	0.7701 0.8898 1.0181 1.3007	0.3747 0.4647 0.5634 0.7868	0.01 0.02 0.02 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	1.9696	1.3372	0.11
(3) ACU-A20-N	A	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
1900MHz RRH (65MHz)	A	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	C	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
800MHZ RRH	A	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	C	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
Horizon Duo	B	From Leg	4.0000 0.00 3.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.5469 0.6484 0.7586 1.0049 1.6012	0.3427 0.4261 0.5181 0.7281 1.2518	0.01 0.01 0.02 0.04 0.10
(2) 6' x 2" STD Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	137.0000	No Ice 1/2" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.02 0.03 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	3.0596	3.0596	0.09
						2" Ice	4.7022	4.7022	0.23
						4" Ice			
(2) 6' x 2" STD Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" STD Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
LP 602-1	C	From Leg	0.0000 0.00 0.00	0.0000	137.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.0300 38.7100 45.3900 58.7500 85.4700	32.0300 38.7100 45.3900 58.7500 85.4700	1.34 1.80 2.26 3.17 5.00
127									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	B	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.4092 0.4978 0.5950 0.8154 1.3598	0.1661 0.2281 0.2987 0.4659 0.9041	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.4092 0.4978 0.5950 0.8154 1.3598	0.1661 0.2281 0.2987 0.4659 0.9041	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.4092 0.4978 0.5950 0.8154 1.3598	0.1661 0.2281 0.2987 0.4659 0.9041	0.01 0.01 0.02 0.03 0.08
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A	B	From Leg	4.0000	0.0000	127.0000	No Ice	6.8253	5.6424	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B2P w/ Mount Pipe			0.00 2.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.3471 7.8631 8.9261 11.1755	6.4800 7.2567 8.8640 12.2932	0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
RRUS 11 B12	A	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.0000 0.00 2.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
6' x 2" STD Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
6' x 2" STD Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
6' x 2" STD Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LP 713-1	B	None		0.0000	127.0000	No Ice	31.2700	31.2700	1.51
						1/2" Ice	39.6800	39.6800	1.93
						1" Ice	48.0900	48.0900	2.35
						2" Ice	64.9100	64.9100	3.19
						4" Ice	98.5500	98.5500	4.86
NA 507-1	C	None		0.0000	127.0000	No Ice	4.8000	4.8000	0.25
						1/2" Ice	6.7000	6.7000	0.29
						1" Ice	8.6000	8.6000	0.34
						2" Ice	12.4000	12.4000	0.44
						4" Ice	20.0000	20.0000	0.64
107									
LLPX310R w/ Mount Pipe	A	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	5.0651	2.9846	0.05
						1/2" Ice	5.4799	3.5275	0.08
						1" Ice	5.9053	4.0872	0.13
						2" Ice	6.7882	5.3142	0.23
						4" Ice	8.7047	8.1325	0.54
LLPX310R w/ Mount Pipe	B	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	5.0651	2.9846	0.05
						1/2" Ice	5.4799	3.5275	0.08
						1" Ice	5.9053	4.0872	0.13
						2" Ice	6.7882	5.3142	0.23
						4" Ice	8.7047	8.1325	0.54
LLPX310R w/ Mount Pipe	C	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	5.0651	2.9846	0.05
						1/2" Ice	5.4799	3.5275	0.08
						1" Ice	5.9053	4.0872	0.13
						2" Ice	6.7882	5.3142	0.23
						4" Ice	8.7047	8.1325	0.54
WIMAX DAP HEAD	A	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	1.8044	0.7778	0.03
						1/2" Ice	1.9877	0.9182	0.04
						1" Ice	2.1795	1.0673	0.06
						2" Ice	2.5891	1.3914	0.09
						4" Ice	3.5121	2.1432	0.20
WIMAX DAP HEAD	B	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	1.8044	0.7778	0.03
						1/2" Ice	1.9877	0.9182	0.04
						1" Ice	2.1795	1.0673	0.06
						2" Ice	2.5891	1.3914	0.09
						4" Ice	3.5121	2.1432	0.20
WIMAX DAP HEAD	C	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	1.8044	0.7778	0.03
						1/2" Ice	1.9877	0.9182	0.04
						1" Ice	2.1795	1.0673	0.06
						2" Ice	2.5891	1.3914	0.09
						4" Ice	3.5121	2.1432	0.20
HORIZON COMPACT	A	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	0.8409	0.4295	0.01
						1/2" Ice	0.9658	0.5249	0.02
						1" Ice	1.0993	0.6289	0.03
						2" Ice	1.3922	0.8629	0.05
						4" Ice	2.0819	1.4345	0.12
HORIZON COMPACT	C	From Leg	1.0000 0.00 3.00	0.0000	107.0000	No Ice	0.8409	0.4295	0.01
						1/2" Ice	0.9658	0.5249	0.02
						1" Ice	1.0993	0.6289	0.03
						2" Ice	1.3922	0.8629	0.05
						4" Ice	2.0819	1.4345	0.12
6' x 2" STD Pipe	A	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	4.7022	4.7022	0.23
6' x 2" STD Pipe	B	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
6' x 2" STD Pipe	C	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
8' x 2" STD Pipe	A	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.9000 2.7281 3.4009 4.3962 6.4980	1.9000 2.7281 3.4009 4.3962 6.4980	0.03 0.04 0.06 0.12 0.30
8' x 2" STD Pipe	B	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.9000 2.7281 3.4009 4.3962 6.4980	1.9000 2.7281 3.4009 4.3962 6.4980	0.03 0.04 0.06 0.12 0.30
8' x 2" STD Pipe	C	From Leg	1.0000 0.00 0.00	0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.9000 2.7281 3.4009 4.3962 6.4980	1.9000 2.7281 3.4009 4.3962 6.4980	0.03 0.04 0.06 0.12 0.30
SO 101-3	C	None		0.0000	107.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.5000 8.9000 10.3000 13.1000 18.7000	7.5000 8.9000 10.3000 13.1000 18.7000	0.25 0.33 0.41 0.58 0.90
100									
APXV18-206517S-C	A	From Leg	1.0000 0.00 0.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.1667 5.6182 6.0772 7.0173 9.1225	3.0375 3.4693 3.9086 4.8093 6.6995	0.03 0.05 0.09 0.17 0.40
APXV18-206517S-C	B	From Leg	1.0000 0.00 0.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.1667 5.6182 6.0772 7.0173 9.1225	3.0375 3.4693 3.9086 4.8093 6.6995	0.03 0.05 0.09 0.17 0.40
APXV18-206517S-C	C	From Leg	1.0000 0.00 0.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.1667 5.6182 6.0772 7.0173 9.1225	3.0375 3.4693 3.9086 4.8093 6.6995	0.03 0.05 0.09 0.17 0.40
PM 601-3	C	None		0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.3900 5.4800 6.5700 8.7500 13.1100	4.3900 5.4800 6.5700 8.7500 13.1100	0.20 0.24 0.28 0.36 0.53
80									
OG-860/1920/GPS-A	C	From Leg	3.0000	0.0000	80.0000	No Ice	0.3286	0.4044	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 1.00			1/2" Ice 1" Ice 2" Ice 4" Ice	0.4340 0.5481 0.8022 1.4140	0.5138 0.6317 0.8936 1.5210	0.01 0.01 0.02 0.08
2' x 2" STD Pipe	A	From Leg	3.0000 0.00 0.00	0.0000	80.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3440 0.4741 0.6319 0.9917 1.8444	0.3440 0.4741 0.6319 0.9917 1.8444	0.01 0.01 0.02 0.03 0.09
2' x 2" STD Pipe	C	From Leg	3.0000 0.00 0.00	0.0000	80.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3440 0.4741 0.6319 0.9917 1.8444	0.3440 0.4741 0.6319 0.9917 1.8444	0.01 0.01 0.02 0.03 0.09
SO 701-1	C	From Leg	1.5000 0.00 0.00	0.0000	80.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8500 1.1400 1.4300 2.0100 3.1700	1.6700 2.3400 3.0100 4.3500 7.0300	0.07 0.08 0.09 0.12 0.18
SO 701-1	A	From Leg	1.5000 0.00 0.00	0.0000	80.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8500 1.1400 1.4300 2.0100 3.1700	1.6700 2.3400 3.0100 4.3500 7.0300	0.07 0.08 0.09 0.12 0.18
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
137											
VHLP2-11	B	Paraboloid w/Shroud (HP)	From Centroid-Face	4.0000 2.00 3.00	43.0000		137.0000	2.1750	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.7200 4.0100 4.3000 4.8800 6.0400	0.03 0.05 0.07 0.11 0.20
107											
VHLP2-11	A	Paraboloid w/Shroud (HP)	From Leg	2.0000 0.00 3.00	-17.0000		107.0000	2.1750	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.7200 4.0100 4.3000 4.8800 6.0400	0.03 0.05 0.07 0.11 0.20
PX2F-52	C	Paraboloid w/Shroud (HP)	From Leg	2.0000 0.00 3.00	0.0000		107.0000	2.0917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.4400 3.7200 3.9900 4.5500 5.6700	0.02 0.04 0.06 0.09 0.17
**											

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
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	160 - 155	Pole	Max Tension	33	0.00	-0.00	0.00
			Max. Compression	14	-5.74	-0.53	-1.18
			Max. Mx	5	-1.87	-47.93	-0.72
			Max. My	8	-1.89	-0.60	-47.35
			Max. Vy	11	-8.20	47.57	0.26
			Max. Vx	8	8.08	-0.60	-47.35
			Max. Torque	4			-2.08
L2	155 - 150	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-6.30	-0.55	-1.18
			Max. Mx	5	-2.21	-90.41	-1.09
			Max. My	8	-2.23	-0.96	-89.21
			Max. Vy	11	-8.79	90.03	0.60
			Max. Vx	8	8.67	-0.96	-89.21
			Max. Torque	4			-2.08
L3	150 - 145	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.38	-0.34	-1.05
			Max. Mx	5	-4.76	-170.84	-1.44
			Max. My	8	-4.79	-1.27	-169.05
			Max. Vy	11	-16.29	170.61	0.96
			Max. Vx	8	16.17	-1.27	-169.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	4			-2.07
L4	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.04	-0.35	-1.05
			Max. Mx	5	-5.23	-253.84	-1.82
			Max. My	8	-5.26	-1.64	-251.42
			Max. Vy	11	-16.91	253.60	1.30
			Max. Vx	8	16.79	-1.64	-251.42
			Max. Torque	5			-1.85
L5	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.56	1.33	-2.26
			Max. Mx	11	-7.39	355.91	1.13
			Max. My	8	-7.44	-1.22	-352.20
			Max. Vy	11	-21.82	355.91	1.13
			Max. Vx	8	21.59	-1.22	-352.20
			Max. Torque	6			-2.66
L6	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.28	1.31	-2.27
			Max. Mx	11	-7.97	466.55	1.64
			Max. My	8	-8.01	-1.84	-461.67
			Max. Vy	11	-22.45	466.55	1.64
			Max. Vx	8	22.21	-1.84	-461.67
			Max. Torque	6			-2.66
L7	130 - 121.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.00	1.39	-2.41
			Max. Mx	11	-10.83	570.24	1.96
			Max. My	8	-10.87	-2.28	-564.41
			Max. Vy	11	-28.67	570.24	1.96
			Max. Vx	8	28.42	-2.28	-564.41
			Max. Torque	6			-2.71
L8	121.333 - 121	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.52	1.39	-2.42
			Max. Mx	11	-12.02	715.42	2.45
			Max. My	8	-12.06	-2.87	-708.32
			Max. Vy	11	-29.41	715.42	2.45
			Max. Vx	8	29.15	-2.87	-708.32
			Max. Torque	6			-2.70
L9	121 - 116	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.56	1.39	-2.43
			Max. Mx	11	-12.92	864.16	2.94
			Max. My	8	-12.96	-3.47	-855.80
			Max. Vy	11	-30.10	864.16	2.94
			Max. Vx	8	29.85	-3.47	-855.80
			Max. Torque	6			-2.70
L10	116 - 111	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.63	1.40	-2.44
			Max. Mx	11	-13.87	1016.35	3.44
			Max. My	8	-13.91	-4.07	-1006.71
			Max. Vy	11	-30.79	1016.35	3.44
			Max. Vx	8	30.54	-4.07	-1006.71
			Max. Torque	6			-2.70
L11	111 - 106	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.11	1.59	-2.29
			Max. Mx	11	-15.44	1176.91	3.95
			Max. My	8	-15.47	-4.47	-1166.16
			Max. Vy	11	-33.31	1176.91	3.95
			Max. Vx	8	33.13	-4.47	-1166.16
			Max. Torque	6			-2.69
L12	106 - 102.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.93	1.56	-2.30
			Max. Mx	11	-16.18	1294.37	4.26
			Max. My	8	-16.21	-4.79	-1283.01
			Max. Vy	11	-33.84	1294.37	4.26
			Max. Vx	8	33.66	-4.79	-1283.01
			Max. Torque	12			2.59
L13	102.5 - 102.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.00	1.56	-2.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-16.26	1302.83	4.28
			Max. My	8	-16.29	-4.81	-1291.43
			Max. Vy	11	-33.87	1302.83	4.28
			Max. Vx	8	33.69	-4.81	-1291.43
			Max. Torque	12			2.59
L14	102.25 - 97.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.99	1.52	-2.32
			Max. Mx	11	-17.82	1476.24	4.73
			Max. My	8	-17.85	-5.27	-1463.98
			Max. Vy	11	-35.44	1476.24	4.73
			Max. Vx	8	35.26	-5.27	-1463.98
			Max. Torque	12			2.60
L15	97.25 - 92.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.52	1.48	-2.34
			Max. Mx	11	-19.19	1655.40	5.17
			Max. My	8	-19.22	-5.73	-1642.28
			Max. Vy	11	-36.26	1655.40	5.17
			Max. Vx	8	36.08	-5.73	-1642.28
			Max. Torque	12			2.61
L16	92.25 - 87.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.08	1.44	-2.36
			Max. Mx	11	-20.60	1838.65	5.62
			Max. My	8	-20.63	-6.18	-1824.66
			Max. Vy	11	-37.07	1838.65	5.62
			Max. Vx	8	36.89	-6.18	-1824.66
			Max. Torque	12			2.62
L17	87.25 - 81.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.16	1.43	-2.36
			Max. Mx	11	-20.69	1847.91	5.64
			Max. My	8	-20.71	-6.21	-1833.89
			Max. Vy	11	-37.10	1847.91	5.64
			Max. Vx	8	36.92	-6.21	-1833.89
			Max. Torque	12			2.62
L18	81.333 - 80.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.60	1.38	-2.39
			Max. Mx	11	-23.62	2099.15	6.24
			Max. My	8	-23.65	-6.82	-2083.97
			Max. Vy	11	-38.26	2099.15	6.24
			Max. Vx	8	38.08	-6.82	-2083.97
			Max. Torque	12			2.62
L19	80.333 - 75.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.37	1.67	-2.27
			Max. Mx	11	-25.21	2293.15	6.87
			Max. My	8	-25.23	-7.16	-2276.72
			Max. Vy	11	-39.15	2293.15	6.87
			Max. Vx	8	38.96	-7.16	-2276.72
			Max. Torque	12			2.69
L20	75.333 - 70.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.95	1.63	-2.30
			Max. Mx	11	-26.69	2490.61	7.39
			Max. My	8	-26.71	-7.70	-2473.25
			Max. Vy	11	-39.87	2490.61	7.39
			Max. Vx	8	39.68	-7.70	-2473.25
			Max. Torque	12			2.69
L21	70.333 - 67.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.81	1.62	-2.31
			Max. Mx	11	-27.49	2597.27	7.67
			Max. My	8	-27.51	-7.99	-2579.42
			Max. Vy	11	-40.28	2597.27	7.67
			Max. Vx	8	40.08	-7.99	-2579.42
			Max. Torque	12			2.70

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	67.67 - 67.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.91	1.61	-2.31
			Max. Mx	11	-27.60	2607.34	7.70
			Max. My	8	-27.62	-8.01	-2589.44
			Max. Vy	11	-40.30	2607.34	7.70
			Max. Vx	8	40.11	-8.01	-2589.44
			Max. Torque	12			2.70
L23	67.42 - 62.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.95	1.58	-2.34
			Max. Mx	11	-29.48	2810.81	8.22
			Max. My	8	-29.50	-8.55	-2791.98
			Max. Vy	11	-41.11	2810.81	8.22
			Max. Vx	8	40.92	-8.55	-2791.98
			Max. Torque	12			2.71
L24	62.42 - 57.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.03	1.54	-2.37
			Max. Mx	11	-31.40	3018.24	8.75
			Max. My	8	-31.42	-9.09	-2998.48
			Max. Vy	11	-41.90	3018.24	8.75
			Max. Vx	8	41.70	-9.09	-2998.48
			Max. Torque	12			2.73
L25	57.42 - 52.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.14	1.51	-2.40
			Max. Mx	11	-33.36	3229.55	9.27
			Max. My	8	-33.38	-9.63	-3208.87
			Max. Vy	11	-42.67	3229.55	9.27
			Max. Vx	8	42.47	-9.63	-3208.87
			Max. Torque	12			2.74
L26	52.42 - 50.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.95	1.49	-2.42
			Max. Mx	11	-34.11	3311.71	9.47
			Max. My	8	-34.12	-9.83	-3290.68
			Max. Vy	11	-42.97	3311.71	9.47
			Max. Vx	8	42.77	-9.83	-3290.68
			Max. Torque	12			2.75
L27	50.5 - 50.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.06	1.49	-2.42
			Max. Mx	11	-34.23	3322.45	9.50
			Max. My	8	-34.25	-9.86	-3301.37
			Max. Vy	11	-42.99	3322.45	9.50
			Max. Vx	8	42.79	-9.86	-3301.37
			Max. Torque	12			2.75
L28	50.25 - 41.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.03	1.47	-2.43
			Max. Mx	11	-35.12	3419.52	9.73
			Max. My	8	-35.13	-10.10	-3398.02
			Max. Vy	11	-43.32	3419.52	9.73
			Max. Vx	8	43.13	-10.10	-3398.02
			Max. Torque	12			2.76
L29	41.4167 - 40.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-57.93	1.42	-2.48
			Max. Mx	11	-40.42	3752.81	10.53
			Max. My	8	-40.43	-10.92	-3729.92
			Max. Vy	11	-44.59	3752.81	10.53
			Max. Vx	8	44.40	-10.92	-3729.92
			Max. Torque	12			2.78
L30	40.4167 - 35.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60.26	1.38	-2.51
			Max. Mx	11	-42.61	3977.36	11.05
			Max. My	8	-42.62	-11.46	-3953.55
			Max. Vy	11	-45.27	3977.36	11.05
			Max. Vx	8	45.08	-11.46	-3953.55

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	12			2.80
L31	35.4167 - 30.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-62.58	1.34	-2.54
			Max. Mx	11	-44.80	4201.41	11.56
			Max. My	8	-44.81	-11.99	-4176.71
			Max. Vy	11	-45.92	4201.41	11.56
			Max. Vx	8	45.73	-11.99	-4176.71
			Max. Torque	12			2.81
L32	30.5 - 30.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-62.70	1.34	-2.54
			Max. Mx	11	-44.93	4212.89	11.59
			Max. My	8	-44.94	-12.02	-4188.14
			Max. Vy	11	-45.94	4212.89	11.59
			Max. Vx	8	45.74	-12.02	-4188.14
			Max. Torque	12			2.81
L33	30.25 - 26.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-64.56	1.31	-2.57
			Max. Mx	11	-46.67	4386.03	11.98
			Max. My	8	-46.68	-12.42	-4360.60
			Max. Vy	11	-46.44	4386.03	11.98
			Max. Vx	8	46.25	-12.42	-4360.60
			Max. Torque	12			2.83
L34	26.5 - 26.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-64.69	1.31	-2.57
			Max. Mx	11	-46.81	4397.64	12.00
			Max. My	8	-46.82	-12.45	-4372.16
			Max. Vy	11	-46.46	4397.64	12.00
			Max. Vx	8	46.27	-12.45	-4372.16
			Max. Torque	12			2.83
L35	26.25 - 21.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-67.24	1.26	-2.60
			Max. Mx	11	-49.22	4631.53	12.52
			Max. My	8	-49.23	-12.99	-4605.15
			Max. Vy	11	-47.13	4631.53	12.52
			Max. Vx	8	46.94	-12.99	-4605.15
			Max. Torque	12			2.84
L36	21.25 - 16.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-69.83	1.22	-2.63
			Max. Mx	11	-51.68	4868.69	13.04
			Max. My	8	-51.69	-13.52	-4841.41
			Max. Vy	11	-47.78	4868.69	13.04
			Max. Vx	8	47.59	-13.52	-4841.41
			Max. Torque	12			2.86
L37	16.25 - 11.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-72.46	1.18	-2.67
			Max. Mx	11	-54.18	5109.12	13.55
			Max. My	8	-54.18	-14.06	-5080.94
			Max. Vy	11	-48.44	5109.12	13.55
			Max. Vx	8	48.25	-14.06	-5080.94
			Max. Torque	12			2.88
L38	11.25 - 6.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-75.13	1.14	-2.70
			Max. Mx	11	-56.71	5352.80	14.06
			Max. My	8	-56.71	-14.59	-5323.73
			Max. Vy	11	-49.09	5352.80	14.06
			Max. Vx	8	48.90	-14.59	-5323.73
			Max. Torque	12			2.89
L39	6.25 - 1.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-77.84	1.09	-2.74
			Max. Mx	11	-59.28	5599.73	14.57
			Max. My	8	-59.28	-15.12	-5569.78
			Max. Vy	11	-49.74	5599.73	14.57
			Max. Vx	8	49.55	-15.12	-5569.78
			Max. Torque	12			2.91
L40	1.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-78.52	1.08	-2.75
			Max. Mx	11	-59.92	5661.98	14.70
			Max. My	8	-59.92	-15.26	-5631.80
			Max. Vy	11	-49.91	5661.98	14.70
			Max. Vx	8	49.72	-15.26	-5631.80
			Max. Torque	12			2.92

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	78.52	12.36	0.02
	Max. H_x	11	59.95	49.88	0.11
	Max. H_z	2	59.95	0.05	49.66
	Max. M_x	2	5624.15	0.05	49.66
	Max. M_z	5	5657.79	-49.87	-0.10
	Max. Torsion	12	2.92	43.25	24.91
	Min. Vert	1	59.95	0.00	0.00
	Min. H_x	5	59.95	-49.87	-0.10
	Min. H_z	8	59.95	-0.10	-49.70
	Min. M_x	8	-5631.80	-0.10	-49.70
	Min. M_z	11	-5661.98	49.88	0.11
	Min. Torsion	6	-2.89	-43.25	-24.90

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	59.95	0.00	0.00	1.40	0.65	0.00
Dead+Wind 0 deg - No Ice	59.95	-0.05	-49.66	-5624.15	11.36	-1.34
Dead+Wind 30 deg - No Ice	59.95	24.89	-42.98	-4865.28	-2820.98	0.13
Dead+Wind 60 deg - No Ice	59.95	43.16	-24.76	-2799.36	-4895.14	1.36
Dead+Wind 90 deg - No Ice	59.95	49.87	0.10	16.45	-5657.79	2.49
Dead+Wind 120 deg - No Ice	59.95	43.25	24.90	2825.62	-4908.16	2.89
Dead+Wind 150 deg - No Ice	59.95	25.03	43.07	4882.15	-2843.30	2.58
Dead+Wind 180 deg - No Ice	59.95	0.10	49.70	5631.80	-15.26	1.29
Dead+Wind 210 deg - No Ice	59.95	-24.86	42.98	4867.67	2819.59	-0.13
Dead+Wind 240 deg - No Ice	59.95	-43.16	24.74	2799.35	4898.11	-1.31
Dead+Wind 270 deg - No Ice	59.95	-49.88	-0.11	-14.70	5661.98	-2.36
Dead+Wind 300 deg - No Ice	59.95	-43.25	-24.91	-2824.04	4911.50	-2.92
Dead+Wind 330 deg - No Ice	59.95	-25.08	-43.02	-4874.21	2851.82	-2.60
Dead+Ice	78.52	-0.00	0.00	2.75	1.08	0.00
Dead+Wind 0 deg+Ice	78.52	-0.01	-12.32	-1417.71	3.54	-0.36
Dead+Wind 30 deg+Ice	78.52	6.17	-10.66	-1226.23	-710.11	0.09
Dead+Wind 60 deg+Ice	78.52	10.69	-6.14	-704.73	-1232.69	0.47
Dead+Wind 90 deg+Ice	78.52	12.36	0.02	6.23	-1424.75	0.78
Dead+Wind 120 deg+Ice	78.52	10.71	6.18	715.73	-1235.61	0.87
Dead+Wind 150 deg+Ice	78.52	6.20	10.69	1235.13	-715.10	0.75
Dead+Wind 180 deg+Ice	78.52	0.02	12.33	1424.55	-2.42	0.35
Dead+Wind 210 deg+Ice	78.52	-6.16	10.66	1231.87	711.80	-0.09
Dead+Wind 240 deg+Ice	78.52	-10.70	6.14	709.84	1235.37	-0.46
Dead+Wind 270 deg+Ice	78.52	-12.36	-0.02	-0.73	1427.71	-0.76
Dead+Wind 300 deg+Ice	78.52	-10.72	-6.18	-710.27	1238.38	-0.88
Dead+Wind 330 deg+Ice	78.52	-6.21	-10.67	-1228.23	719.04	-0.75
Dead+Wind 0 deg - Service	59.95	-0.02	-17.18	-1947.97	4.40	-0.47
Dead+Wind 30 deg - Service	59.95	8.61	-14.87	-1685.00	-977.09	0.05
Dead+Wind 60 deg - Service	59.95	14.93	-8.57	-969.11	-1695.87	0.48
Dead+Wind 90 deg - Service	59.95	17.26	0.03	6.66	-1960.17	0.87
Dead+Wind 120 deg -	59.95	14.96	8.62	980.14	-1700.40	1.01

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 150 deg - Service	59.95	8.66	14.90	1692.79	-984.85	0.90
Dead+Wind 180 deg - Service	59.95	0.03	17.20	1952.54	-4.83	0.45
Dead+Wind 210 deg - Service	59.95	-8.60	14.87	1687.74	977.53	-0.04
Dead+Wind 240 deg - Service	59.95	-14.94	8.56	971.02	1697.81	-0.46
Dead+Wind 270 deg - Service	59.95	-17.26	-0.04	-4.14	1962.55	-0.83
Dead+Wind 300 deg - Service	59.95	-14.97	-8.62	-977.68	1702.49	-1.02
Dead+Wind 330 deg - Service	59.95	-8.68	-14.89	-1688.12	988.72	-0.91

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-59.95	0.00	0.00	59.95	0.00	0.000%
2	-0.05	-59.95	-49.66	0.05	59.95	49.66	0.000%
3	24.89	-59.95	-42.98	-24.89	59.95	42.98	0.000%
4	43.16	-59.95	-24.76	-43.16	59.95	24.76	0.000%
5	49.87	-59.95	0.10	-49.87	59.95	-0.10	0.000%
6	43.25	-59.95	24.90	-43.25	59.95	-24.90	0.000%
7	25.03	-59.95	43.07	-25.03	59.95	-43.07	0.000%
8	0.10	-59.95	49.70	-0.10	59.95	-49.70	0.000%
9	-24.86	-59.95	42.98	24.86	59.95	-42.98	0.000%
10	-43.16	-59.95	24.74	43.16	59.95	-24.74	0.000%
11	-49.88	-59.95	-0.11	49.88	59.95	0.11	0.000%
12	-43.25	-59.95	-24.91	43.25	59.95	24.91	0.000%
13	-25.08	-59.95	-43.02	25.08	59.95	43.02	0.000%
14	0.00	-78.52	0.00	0.00	78.52	-0.00	0.000%
15	-0.01	-78.52	-12.32	0.01	78.52	12.32	0.000%
16	6.17	-78.52	-10.66	-6.17	78.52	10.66	0.000%
17	10.69	-78.52	-6.14	-10.69	78.52	6.14	0.000%
18	12.36	-78.52	0.02	-12.36	78.52	-0.02	0.000%
19	10.71	-78.52	6.18	-10.71	78.52	-6.18	0.000%
20	6.20	-78.52	10.69	-6.20	78.52	-10.69	0.000%
21	0.02	-78.52	12.33	-0.02	78.52	-12.33	0.000%
22	-6.16	-78.52	10.66	6.16	78.52	-10.66	0.000%
23	-10.70	-78.52	6.14	10.70	78.52	-6.14	0.000%
24	-12.36	-78.52	-0.02	12.36	78.52	0.02	0.000%
25	-10.72	-78.52	-6.18	10.72	78.52	6.18	0.000%
26	-6.21	-78.52	-10.67	6.21	78.52	10.67	0.000%
27	-0.02	-59.95	-17.18	0.02	59.95	17.18	0.000%
28	8.61	-59.95	-14.87	-8.61	59.95	14.87	0.000%
29	14.93	-59.95	-8.57	-14.93	59.95	8.57	0.000%
30	17.26	-59.95	0.03	-17.26	59.95	-0.03	0.000%
31	14.96	-59.95	8.62	-14.96	59.95	-8.62	0.000%
32	8.66	-59.95	14.90	-8.66	59.95	-14.90	0.000%
33	0.03	-59.95	17.20	-0.03	59.95	-17.20	0.000%
34	-8.60	-59.95	14.87	8.60	59.95	-14.87	0.000%
35	-14.94	-59.95	8.56	14.94	59.95	-8.56	0.000%
36	-17.26	-59.95	-0.04	17.26	59.95	0.04	0.000%
37	-14.97	-59.95	-8.62	14.97	59.95	8.62	0.000%
38	-8.68	-59.95	-14.89	8.68	59.95	14.89	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00013507
3	Yes	6	0.00000001	0.00014752
4	Yes	6	0.00000001	0.00014457
5	Yes	5	0.00000001	0.00024815
6	Yes	6	0.00000001	0.00015283
7	Yes	6	0.00000001	0.00014418
8	Yes	5	0.00000001	0.00007097
9	Yes	6	0.00000001	0.00014678
10	Yes	6	0.00000001	0.00014973
11	Yes	5	0.00000001	0.00016286
12	Yes	6	0.00000001	0.00014350
13	Yes	6	0.00000001	0.00015221
14	Yes	4	0.00000001	0.00000459
15	Yes	5	0.00000001	0.00011762
16	Yes	5	0.00000001	0.00063819
17	Yes	5	0.00000001	0.00060835
18	Yes	5	0.00000001	0.00014983
19	Yes	5	0.00000001	0.00070354
20	Yes	5	0.00000001	0.00061718
21	Yes	5	0.00000001	0.00011607
22	Yes	5	0.00000001	0.00064166
23	Yes	5	0.00000001	0.00067549
24	Yes	5	0.00000001	0.00014376
25	Yes	5	0.00000001	0.00060800
26	Yes	5	0.00000001	0.00069055
27	Yes	5	0.00000001	0.00003906
28	Yes	5	0.00000001	0.00044397
29	Yes	5	0.00000001	0.00042941
30	Yes	5	0.00000001	0.00005890
31	Yes	5	0.00000001	0.00047929
32	Yes	5	0.00000001	0.00043168
33	Yes	4	0.00000001	0.00095180
34	Yes	5	0.00000001	0.00044309
35	Yes	5	0.00000001	0.00045995
36	Yes	5	0.00000001	0.00005219
37	Yes	5	0.00000001	0.00042901
38	Yes	5	0.00000001	0.00047452

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	160 - 155 (1)	TP22.7005x21.65x0.25	5.0000	0.0000	0.0	39.000	18.0727	-1.86	704.83	0.003
L2	155 - 150 (2)	TP23.751x22.7005x0.25	5.0000	0.0000	0.0	39.000	18.9183	-2.20	737.81	0.003
L3	150 - 145 (3)	TP24.8015x23.751x0.25	5.0000	0.0000	0.0	39.000	19.7640	-4.75	770.79	0.006
L4	145 - 140 (4)	TP25.852x24.8015x0.25	5.0000	0.0000	0.0	39.000	20.6096	-5.23	803.78	0.007
L5	140 - 135 (5)	TP26.9025x25.852x0.25	5.0000	0.0000	0.0	39.000	21.4553	-7.39	836.76	0.009
L6	135 - 130 (6)	TP27.953x26.9025x0.25	5.0000	0.0000	0.0	39.000	22.3010	-7.96	869.74	0.009
L7	130 - 121.333 (7)	TP29.774x27.953x0.25	8.6670	0.0000	0.0	39.000	22.9775	-10.82	896.12	0.012
L8	121.333 - 121 (8)	TP29.3431x28.2935x0.375	5.0000	0.0000	0.0	39.000	34.9789	-12.01	1364.18	0.009
L9	121 - 116 (9)	TP30.3927x29.3431x0.375	5.0000	0.0000	0.0	39.000	36.2463	-12.92	1413.61	0.009
L10	116 - 111 (10)	TP31.4423x30.3927x0.375	5.0000	0.0000	0.0	39.000	37.5137	-13.87	1463.04	0.009
L11	111 - 106 (11)	TP32.4919x31.4423x0.375	5.0000	0.0000	0.0	39.000	38.7811	-15.43	1512.46	0.010
L12	106 - 102.5 (12)	TP33.2266x32.4919x0.375	3.5000	0.0000	0.0	39.000	39.6683	-16.17	1547.06	0.010
L13	102.5 - 102.25 (13)	TP33.2791x33.2266x0.5625	0.2500	0.0000	0.0	39.000	59.2579	-16.26	2311.06	0.007

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 $\frac{P}{P_a}$
L14	102.25 - 97.25 (14)	TP34.3287x33.2791x0.5625	5.0000	0.0000	0.0	39.000	61.1590	-17.82	2385.20	0.007
L15	97.25 - 92.25 (15)	TP35.3783x34.3287x0.55	5.0000	0.0000	0.0	39.000	61.6809	-19.19	2405.56	0.008
L16	92.25 - 87.25 (16)	TP36.4279x35.3783x0.55	5.0000	0.0000	0.0	39.000	63.5398	-20.60	2478.05	0.008
L17	87.25 - 81.333 (17)	TP37.67x36.4279x0.55	5.9170	0.0000	0.0	39.000	63.6327	-20.68	2481.68	0.008
L18	81.333 - 80.333 (18)	TP37.1296x35.7304x0.5	6.6670	0.0000	0.0	39.000	58.9736	-23.62	2299.97	0.010
L19	80.333 - 75.333 (19)	TP38.1789x37.1296x0.5	5.0000	0.0000	0.0	39.000	60.6631	-25.20	2365.86	0.011
L20	75.333 - 70.333 (20)	TP39.2283x38.1789x0.5	5.0000	0.0000	0.0	39.000	62.3526	-26.69	2431.75	0.011
L21	70.333 - 67.67 (21)	TP39.7872x39.2283x0.5 H1-3+VT (1.33 CR) - 21	2.6630	0.0000	0.0	39.000	63.2524	-27.48	2466.84	0.011
L22	67.67 - 67.42 (22)	TP39.8397x39.7872x0.725	0.2500	0.0000	0.0	39.000	91.3132	-27.60	3561.21	0.008
L23	67.42 - 62.42 (23)	TP40.889x39.8397x0.7125	5.0000	0.0000	0.0	39.000	92.1750	-29.48	3594.82	0.008
L24	62.42 - 57.42 (24)	TP41.9384x40.889x0.7	5.0000	0.0000	0.0	39.000	92.9513	-31.40	3625.10	0.009
L25	57.42 - 52.42 (25)	TP42.9877x41.9384x0.7	5.0000	0.0000	0.0	39.000	95.3165	-33.36	3717.34	0.009
L26	52.42 - 50.5 (26)	TP43.3907x42.9877x0.7	1.9200	0.0000	0.0	39.000	96.2248	-34.11	3752.77	0.009
L27	50.5 - 50.25 (27)	TP43.4431x43.3907x0.7	0.2500	0.0000	0.0	39.000	96.3430	-34.23	3757.38	0.009
L28	50.25 - 41.4167 (28)	TP45.297x43.4431x0.7	8.8333	0.0000	0.0	39.000	97.4074	-35.12	3798.89	0.009
L29	41.4167 - 40.4167 (29)	TP44.5086x42.9154x0.7625	7.5833	0.0000	0.0	39.000	107.4080	-40.41	4188.90	0.010
L30	40.4167 - 35.4167 (30)	TP45.5591x44.5086x0.75	5.0000	0.0000	0.0	39.000	108.2140	-42.61	4220.34	0.010
L31	35.4167 - 30.5 (31)	TP46.592x45.5591x0.75	4.9167	0.0000	0.0	39.000	110.7090	-44.80	4317.63	0.010
L32	30.5 - 30.25 (32)	TP46.6446x46.592x0.7625	0.2500	0.0000	0.0	39.000	112.6520	-44.93	4393.43	0.010
L33	30.25 - 26.5 (33)	TP47.4324x46.6446x0.7625	3.7500	0.0000	0.0	39.000	114.5860	-46.67	4468.87	0.010
L34	26.5 - 26.25 (34)	TP47.485x47.4324x0.7375	0.2500	0.0000	0.0	39.000	111.0140	-46.81	4329.53	0.011
L35	26.25 - 21.25 (35)	TP48.5354x47.485x0.7375	5.0000	0.0000	0.0	39.000	113.5080	-49.22	4426.82	0.011
L36	21.25 - 16.25 (36)	TP49.5859x48.5354x0.725	5.0000	0.0000	0.0	39.000	114.0660	-51.68	4448.57	0.012
L37	16.25 - 11.25 (37)	TP50.6364x49.5859x0.725	5.0000	0.0000	0.0	39.000	116.5180	-54.18	4544.21	0.012
L38	11.25 - 6.25 (38)	TP51.6869x50.6364x0.7125	5.0000	0.0000	0.0	39.000	116.9480	-56.71	4560.97	0.012
L39	6.25 - 1.25 (39)	TP52.7374x51.6869x0.7125	5.0000	0.0000	0.0	39.000	119.3580	-59.28	4654.97	0.013
L40	1.25 - 0 (40)	TP53x52.7374x0.7125	1.2500	0.0000	0.0	39.000	119.9610	-59.92	4678.46	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	160 - 155 (1)	TP22.7005x21.65x0.25	48.34	5.867	39.000	0.150	0.00	0.000	39.000	0.000
L2	155 - 150 (2)	TP23.751x22.7005x0.25	90.97	10.071	39.000	0.258	0.00	0.000	39.000	0.000
L3	150 - 145 (3)	TP24.8015x23.751x0.25	171.53	17.391	39.000	0.446	0.00	0.000	39.000	0.000
L4	145 - 140 (4)	TP25.852x24.8015x0.25	254.69	23.736	39.000	0.609	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L5	140 - 135 (5)	TP26.9025x25.852x0.25	356.04	30.605	39.000	0.785	0.00	0.000	39.000	0.000
L6	135 - 130 (6)	TP27.953x26.9025x0.25	466.83	37.131	39.000	0.952	0.00	0.000	39.000	0.000
L7	130 - 121.333 (7)	TP29.774x27.953x0.25	570.58	42.738	39.000	1.096	0.00	0.000	39.000	0.000
L8	121.333 - 121 (8)	TP29.3431x28.2935x0.375	715.87	34.851	39.000	0.894	0.00	0.000	39.000	0.000
L9	121 - 116 (9)	TP30.3927x29.3431x0.375	864.73	39.188	39.000	1.005	0.00	0.000	39.000	0.000
L10	116 - 111 (10)	TP31.4423x30.3927x0.375	1017.03	43.011	39.000	1.103	0.00	0.000	39.000	0.000
L11	111 - 106 (11)	TP32.4919x31.4423x0.375	1177.72	46.586	39.000	1.195	0.00	0.000	39.000	0.000
L12	106 - 102.5 (12)	TP33.2266x32.4919x0.375	1295.24	48.956	39.000	1.255	0.00	0.000	39.000	0.000
L13	102.5 - 102.25 (13)	TP33.2791x33.2266x0.5625	1303.71	33.311	39.000	0.854	0.00	0.000	39.000	0.000
L14	102.25 - 97.25 (14)	TP34.3287x33.2791x0.5625	1477.20	35.416	39.000	0.908	0.00	0.000	39.000	0.000
L15	97.25 - 92.25 (15)	TP35.3783x34.3287x0.5625	1656.46	38.144	39.000	0.978	0.00	0.000	39.000	0.000
L16	92.25 - 87.25 (16)	TP36.4279x35.3783x0.5625	1839.79	39.905	39.000	1.023	0.00	0.000	39.000	0.000
L17	87.25 - 81.333 (17)	TP37.67x36.4279x0.5625	1849.07	39.988	39.000	1.025	0.00	0.000	39.000	0.000
L18	81.333 - 80.333 (18)	TP37.1296x35.7304x0.5	2100.43	47.999	39.000	1.231	0.00	0.000	39.000	0.000
L19	80.333 - 75.333 (19)	TP38.1789x37.1296x0.5	2294.59	49.537	39.000	1.270	0.00	0.000	39.000	0.000
L20	75.333 - 70.333 (20)	TP39.2283x38.1789x0.5	2492.20	50.909	39.000	1.305	0.00	0.000	39.000	0.000
L21	70.333 - 67.67 (21)	TP39.7872x39.2283x0.5	2598.93	51.580	39.000	1.323	0.00	0.000	39.000	0.000
L22	67.67 - 67.42 (22)	TP39.8397x39.7872x0.725	2609.01	36.233	39.000	0.929	0.00	0.000	39.000	0.000
L23	67.42 - 62.42 (23)	TP40.889x39.8397x0.7125	2812.62	37.643	39.000	0.965	0.00	0.000	39.000	0.000
L24	62.42 - 57.42 (24)	TP41.9384x40.889x0.7	3020.18	39.022	39.000	1.001	0.00	0.000	39.000	0.000
L25	57.42 - 52.42 (25)	TP42.9877x41.9384x0.7	3231.63	39.691	39.000	1.018	0.00	0.000	39.000	0.000
L26	52.42 - 50.5 (26)	TP43.3907x42.9877x0.7	3313.85	39.930	39.000	1.024	0.00	0.000	39.000	0.000
L27	50.5 - 50.25 (27)	TP43.4431x43.3907x0.7	3324.60	39.961	39.000	1.025	0.00	0.000	39.000	0.000
L28	50.25 - 41.4167 (28)	TP45.297x43.4431x0.7	3421.72	40.227	39.000	1.031	0.00	0.000	39.000	0.000
L29	41.4167 - 40.4167 (29)	TP44.5086x42.9154x0.7625	3755.23	39.600	39.000	1.015	0.00	0.000	39.000	0.000
L30	40.4167 - 35.4167 (30)	TP45.5591x44.5086x0.75	3979.92	40.641	39.000	1.042	0.00	0.000	39.000	0.000
L31	35.4167 - 30.5 (31)	TP46.592x45.5591x0.75	4204.12	41.002	39.000	1.051	0.00	0.000	39.000	0.000
L32	30.5 - 30.25 (32)	TP46.6446x46.592x0.7625	4215.60	40.380	39.000	1.035	0.00	0.000	39.000	0.000
L33	30.25 - 26.5 (33)	TP47.4324x46.6446x0.7625	4388.84	40.620	39.000	1.042	0.00	0.000	39.000	0.000
L34	26.5 - 26.25 (34)	TP47.485x47.4324x0.7375	4400.46	41.946	39.000	1.076	0.00	0.000	39.000	0.000
L35	26.25 - 21.25 (35)	TP48.5354x47.485x0.7375	4634.49	42.242	39.000	1.083	0.00	0.000	39.000	0.000
L36	21.25 - 16.25 (36)	TP49.5859x48.5354x0.725	4871.78	43.201	39.000	1.108	0.00	0.000	39.000	0.000
L37	16.25 - 11.25 (37)	TP50.6364x49.5859x0.725	5112.34	43.432	39.000	1.114	0.00	0.000	39.000	0.000
L38	11.25 - 6.25 (38)	TP51.6869x50.6364x0.7125	5356.17	44.367	39.000	1.138	0.00	0.000	39.000	0.000
L39	6.25 - 1.25 (39)	TP52.7374x51.6869x0.7125	5603.23	44.546	39.000	1.142	0.00	0.000	39.000	0.000
L40	1.25 - 0 (40)	TP53x52.7374x0.7125	5665.5	44.587	39.000	1.143	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
			2							

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	160 - 155 (1)	TP22.7005x21.65x0.25	8.23	0.456	26.000	0.036	1.48	0.084	26.000	0.003
L2	155 - 150 (2)	TP23.751x22.7005x0.25	8.82	0.466	26.000	0.036	1.47	0.077	26.000	0.003
L3	150 - 145 (3)	TP24.8015x23.751x0.25	16.32	0.826	26.000	0.065	1.46	0.070	26.000	0.003
L4	145 - 140 (4)	TP25.852x24.8015x0.25	16.94	0.822	26.000	0.064	1.44	0.064	26.000	0.002
L5	140 - 135 (5)	TP26.9025x25.852x0.25	21.85	1.019	26.000	0.080	2.61	0.106	26.000	0.004
L6	135 - 130 (6)	TP27.953x26.9025x0.25	22.48	1.008	26.000	0.079	2.60	0.098	26.000	0.004
L7	130 - 121.333 (7)	TP29.774x27.953x0.25	28.70	1.249	26.000	0.098	2.66	0.094	26.000	0.004
L8	121.333 - 121 (8)	TP29.3431x28.2935x0.375	29.43	0.841	26.000	0.066	2.65	0.061	26.000	0.002
L9	121 - 116 (9)	TP30.3927x29.3431x0.375	30.12	0.831	26.000	0.065	2.65	0.056	26.000	0.002
L10	116 - 111 (10)	TP31.4423x30.3927x0.375	30.81	0.821	26.000	0.064	2.65	0.053	26.000	0.002
L11	111 - 106 (11)	TP32.4919x31.4423x0.375	33.33	0.859	26.000	0.067	2.58	0.048	26.000	0.002
L12	106 - 102.5 (12)	TP33.2266x32.4919x0.375	33.86	0.854	26.000	0.067	2.59	0.046	26.000	0.002
L13	102.5 - 102.25 (13)	TP33.2791x33.2266x0.5625	33.89	0.572	26.000	0.045	2.59	0.031	26.000	0.001
L14	102.25 - 97.25 (14)	TP34.3287x33.2791x0.5625	35.46	0.580	26.000	0.045	2.60	0.029	26.000	0.001
L15	97.25 - 92.25 (15)	TP35.3783x34.3287x0.55	36.28	0.588	26.000	0.046	2.61	0.028	26.000	0.001
L16	92.25 - 87.25 (16)	TP36.4279x35.3783x0.55	37.09	0.584	26.000	0.046	2.62	0.027	26.000	0.001
L17	87.25 - 81.333 (17)	TP37.67x36.4279x0.55	37.12	0.583	26.000	0.046	2.62	0.027	26.000	0.001
L18	81.333 - 80.333 (18)	TP37.1296x35.7304x0.5	38.28	0.649	26.000	0.051	2.62	0.028	26.000	0.001
L19	80.333 - 75.333 (19)	TP38.1789x37.1296x0.5	39.18	0.646	26.000	0.050	2.69	0.027	26.000	0.001
L20	75.333 - 70.333 (20)	TP39.2283x38.1789x0.5	39.90	0.640	26.000	0.050	2.69	0.026	26.000	0.001
L21	70.333 - 67.67 (21)	TP39.7872x39.2283x0.5	40.31	0.637	26.000	0.050	2.70	0.025	26.000	0.001
L22	67.67 - 67.42 (22)	TP39.8397x39.7872x0.725	40.33	0.442	26.000	0.035	2.70	0.018	26.000	0.001
L23	67.42 - 62.42 (23)	TP40.889x39.8397x0.7125	41.14	0.446	26.000	0.035	2.71	0.017	26.000	0.001
L24	62.42 - 57.42 (24)	TP41.9384x40.889x0.7	41.93	0.451	26.000	0.035	2.73	0.017	26.000	0.001
L25	57.42 - 52.42 (25)	TP42.9877x41.9384x0.7	42.69	0.448	26.000	0.035	2.74	0.016	26.000	0.001
L26	52.42 - 50.5 (26)	TP43.3907x42.9877x0.7	43.00	0.447	26.000	0.035	2.75	0.016	26.000	0.001
L27	50.5 - 50.25 (27)	TP43.4431x43.3907x0.7	43.01	0.446	26.000	0.035	2.75	0.015	26.000	0.001
L28	50.25 - 41.4167 (28)	TP45.297x43.4431x0.7	43.35	0.445	26.000	0.035	2.76	0.015	26.000	0.001
L29	41.4167 - 40.4167 (29)	TP44.5086x42.9154x0.7625	44.62	0.415	26.000	0.032	2.78	0.014	26.000	0.001
L30	40.4167 - 35.4167 (30)	TP45.5591x44.5086x0.75	45.30	0.419	26.000	0.033	2.80	0.013	26.000	0.001
L31	35.4167 - 30.5 (31)	TP46.592x45.5591x0.75	45.95	0.415	26.000	0.032	2.81	0.013	26.000	0.000
L32	30.5 - 30.25 (32)	TP46.6446x46.592x0.7625	45.96	0.408	26.000	0.032	2.81	0.013	26.000	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 $\frac{f_{vt}}{F_{vt}}$
L33	30.25 - 26.5 (33)	TP47.4324x46.6446x0.7625	46.47	0.406	26.000	0.032	2.83	0.012	26.000	0.000
L34	26.5 - 26.25 (34)	TP47.485x47.4324x0.7375	46.49	0.419	26.000	0.033	2.83	0.013	26.000	0.000
L35	26.25 - 21.25 (35)	TP48.5354x47.485x0.7375	47.16	0.415	26.000	0.032	2.84	0.012	26.000	0.000
L36	21.25 - 16.25 (36)	TP49.5859x48.5354x0.725	47.81	0.419	26.000	0.033	2.86	0.012	26.000	0.000
L37	16.25 - 11.25 (37)	TP50.6364x49.5859x0.725	48.47	0.416	26.000	0.033	2.88	0.011	26.000	0.000
L38	11.25 - 6.25 (38)	TP51.6869x50.6364x0.7125	49.12	0.420	26.000	0.033	2.89	0.011	26.000	0.000
L39	6.25 - 1.25 (39)	TP52.7374x51.6869x0.7125	49.77	0.417	26.000	0.033	2.91	0.011	26.000	0.000
L40	1.25 - 0 (40)	TP53x52.7374x0.7125	49.94	0.416	26.000	0.033	2.92	0.011	26.000	0.000

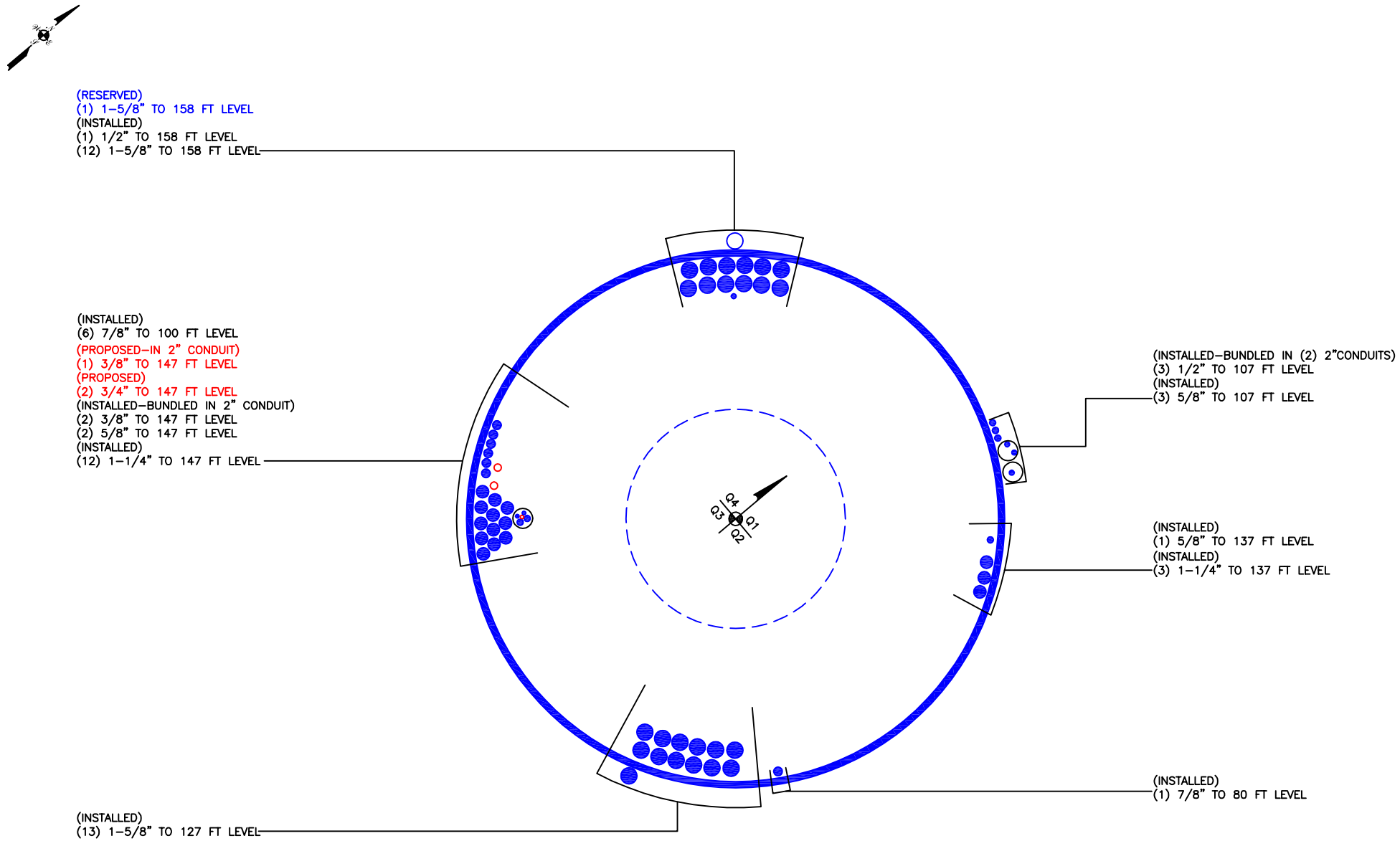
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 155 (1)	0.003	0.150	0.000	0.036	0.003	0.154 ✔	1.333	H1-3+VT ✔
L2	155 - 150 (2)	0.003	0.258	0.000	0.036	0.003	0.262 ✔	1.333	H1-3+VT ✔
L3	150 - 145 (3)	0.006	0.446	0.000	0.065	0.003	0.453 ✔	1.333	H1-3+VT ✔
L4	145 - 140 (4)	0.007	0.609	0.000	0.064	0.002	0.616 ✔	1.333	H1-3+VT ✔
L5	140 - 135 (5)	0.009	0.785	0.000	0.080	0.004	0.795 ✔	1.333	H1-3+VT ✔
L6	135 - 130 (6)	0.009	0.952	0.000	0.079	0.004	0.963 ✔	1.333	H1-3+VT ✔
L7	130 - 121.333 (7)	0.012	1.096	0.000	0.098	0.004	1.111 ✔	1.333	H1-3+VT ✔
L8	121.333 - 121 (8)	0.009	0.894	0.000	0.066	0.002	0.904 ✔	1.333	H1-3+VT ✔
L9	121 - 116 (9)	0.009	1.005	0.000	0.065	0.002	1.015 ✔	1.333	H1-3+VT ✔
L10	116 - 111 (10)	0.009	1.103	0.000	0.064	0.002	1.113 ✔	1.333	H1-3+VT ✔
L11	111 - 106 (11)	0.010	1.195	0.000	0.067	0.002	1.206 ✔	1.333	H1-3+VT ✔
L12	106 - 102.5 (12)	0.010	1.255	0.000	0.067	0.002	1.267 ✔	1.333	H1-3+VT ✔
L13	102.5 - 102.25 (13)	0.007	0.854	0.000	0.045	0.001	0.862 ✔	1.333	H1-3+VT ✔
L14	102.25 - 97.25 (14)	0.007	0.908	0.000	0.045	0.001	0.916 ✔	1.333	H1-3+VT ✔
L15	97.25 - 92.25 (15)	0.008	0.978	0.000	0.046	0.001	0.987 ✔	1.333	H1-3+VT ✔
L16	92.25 - 87.25 (16)	0.008	1.023	0.000	0.046	0.001	1.032 ✔	1.333	H1-3+VT ✔
L17	87.25 - 81.333 (17)	0.008	1.025	0.000	0.046	0.001	1.034 ✔	1.333	H1-3+VT ✔
L18	81.333 - 80.333 (18)	0.010	1.231	0.000	0.051	0.001	1.242 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L19	80.333 - 75.333 (19)	0.011	1.270	0.000	0.050	0.001	1.282 ✔	1.333	H1-3+VT ✔
L20	75.333 - 70.333 (20)	0.011	1.305	0.000	0.050	0.001	1.317 ✔	1.333	H1-3+VT ✔
L21	70.333 - 67.67 (21)	0.011	1.323	0.000	0.050	0.001	1.333 ✔	1.333	H1-3+VT ✔
L22	67.67 - 67.42 (22)	0.008	0.929	0.000	0.035	0.001	0.937 ✔	1.333	H1-3+VT ✔
L23	67.42 - 62.42 (23)	0.008	0.965	0.000	0.035	0.001	0.974 ✔	1.333	H1-3+VT ✔
L24	62.42 - 57.42 (24)	0.009	1.001	0.000	0.035	0.001	1.010 ✔	1.333	H1-3+VT ✔
L25	57.42 - 52.42 (25)	0.009	1.018	0.000	0.035	0.001	1.027 ✔	1.333	H1-3+VT ✔
L26	52.42 - 50.5 (26)	0.009	1.024	0.000	0.035	0.001	1.033 ✔	1.333	H1-3+VT ✔
L27	50.5 - 50.25 (27)	0.009	1.025	0.000	0.035	0.001	1.034 ✔	1.333	H1-3+VT ✔
L28	50.25 - 41.4167 (28)	0.009	1.031	0.000	0.035	0.001	1.041 ✔	1.333	H1-3+VT ✔
L29	41.4167 - 40.4167 (29)	0.010	1.015	0.000	0.032	0.001	1.025 ✔	1.333	H1-3+VT ✔
L30	40.4167 - 35.4167 (30)	0.010	1.042	0.000	0.033	0.001	1.052 ✔	1.333	H1-3+VT ✔
L31	35.4167 - 30.5 (31)	0.010	1.051	0.000	0.032	0.000	1.062 ✔	1.333	H1-3+VT ✔
L32	30.5 - 30.25 (32)	0.010	1.035	0.000	0.032	0.000	1.046 ✔	1.333	H1-3+VT ✔
L33	30.25 - 26.5 (33)	0.010	1.042	0.000	0.032	0.000	1.052 ✔	1.333	H1-3+VT ✔
L34	26.5 - 26.25 (34)	0.011	1.076	0.000	0.033	0.000	1.087 ✔	1.333	H1-3+VT ✔
L35	26.25 - 21.25 (35)	0.011	1.083	0.000	0.032	0.000	1.095 ✔	1.333	H1-3+VT ✔
L36	21.25 - 16.25 (36)	0.012	1.108	0.000	0.033	0.000	1.120 ✔	1.333	H1-3+VT ✔
L37	16.25 - 11.25 (37)	0.012	1.114	0.000	0.033	0.000	1.126 ✔	1.333	H1-3+VT ✔
L38	11.25 - 6.25 (38)	0.012	1.138	0.000	0.033	0.000	1.150 ✔	1.333	H1-3+VT ✔
L39	6.25 - 1.25 (39)	0.013	1.142	0.000	0.033	0.000	1.155 ✔	1.333	H1-3+VT ✔
L40	1.25 - 0 (40)	0.013	1.143	0.000	0.033	0.000	1.156 ✔	1.333	H1-3+VT ✔

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806939 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

CCIpole

per TIA-222- F

Site BU: 806939

Work Order: 1160798

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	160	38.667	4.667	12	21.65	29.774	0.25	1	A572-65
2	126	44.667	5.667	12	28.29	37.67	0.375	1.5	A572-65
3	87	45.5833	6.5833	12	35.73	45.297	0.5	2	A572-65
4	48	48	0	12	42.92	53	0.5625	2.25	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	30.5	plate	4" x 8-1/2" (0'-0" to 30	2						x				x		
2	0	26.5	plate	4" x 8-1/2" (0'-0" to 30	1			x									
3	26.5	50.5	plate	4" x 6-1/2" (23'-6" to 5	1		x										
4	30.5	50.5	plate	4" x 6-1/2" (30'-6" to 5	2						x				x		
5	50.5	67.67	plate	4" x 6-1/2" (50'-6" to 7	3		x				x				x		
6	87	102.5	plate	" x 6" (84'-9" to 104'-9	3	x				x				x			
7																	
8																	
9																	
10																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	8.5	1.25	10.625	0.625	48.000	48.000	17.000	8.984	1.2500	A572-65
2	8.5	1.25	10.625	0.625	48.000	48.000	17.000	8.984	1.2500	A572-65
3	6.5	1.25	8.125	0.625	36.000	39.000	17.000	6.484	1.2500	A572-65
4	6.5	1.25	8.125	0.625	39.000	39.000	19.000	6.484	1.2500	A572-65
5	6.5	1.25	8.125	0.625	39.000	36.000	19.000	6.484	1.2500	A572-65
6	6	1	6	0.5	27.000	27.000	16.000	4.688	1.2500	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	160 - 155	5		12	21.650	22.701	0.25	A572-65	1.000
2	155 - 150	5		12	22.701	23.751	0.25	A572-65	1.000
3	150 - 145	5		12	23.751	24.802	0.25	A572-65	1.000
4	145 - 140	5		12	24.802	25.852	0.25	A572-65	1.000
5	140 - 135	5		12	25.852	26.903	0.25	A572-65	1.000
6	135 - 130	5		12	26.903	27.953	0.25	A572-65	1.000
7	130 - 126	8.667	4.667	12	27.953	29.774	0.25	A572-65	1.000
8	126 - 121	5		12	28.293	29.343	0.375	A572-65	1.000
9	121 - 116	5		12	29.343	30.393	0.375	A572-65	1.000
10	116 - 111	5		12	30.393	31.442	0.375	A572-65	1.000
11	111 - 106	5		12	31.442	32.492	0.375	A572-65	1.000
12	106 - 102.5	3.5		12	32.492	33.227	0.375	A572-65	1.000
13	102.5 - 102.25	0.25		12	33.227	33.279	0.5625	A572-65	0.975
14	102.25 - 97.25	5		12	33.279	34.329	0.5625	A572-65	0.965
15	97.25 - 92.25	5		12	34.329	35.378	0.55	A572-65	0.977
16	92.25 - 87.25	5		12	35.378	36.428	0.55	A572-65	0.969
17	87.25 - 87	5.917	5.667	12	36.428	37.670	0.55	A572-65	0.968
18	87 - 80.333	6.667		12	35.730	37.130	0.5	A572-65	1.000
19	80.333 - 75.333	5		12	37.130	38.179	0.5	A572-65	1.000
20	75.333 - 70.333	5		12	38.179	39.228	0.5	A572-65	1.000
21	70.333 - 67.67	2.663		12	39.228	39.787	0.5	A572-65	1.000
22	67.67 - 67.42	0.25		12	39.787	39.840	0.725	A572-65	0.961
23	67.42 - 62.42	5		12	39.840	40.889	0.7125	A572-65	0.970
24	62.42 - 57.42	5		12	40.889	41.938	0.7	A572-65	0.980
25	57.42 - 52.42	5		12	41.938	42.988	0.7	A572-65	0.974
26	52.42 - 50.5	1.92		12	42.988	43.391	0.7	A572-65	0.971
27	50.5 - 50.25	0.25		12	43.391	43.443	0.7	A572-65	0.971
28	50.25 - 48	8.8333	6.5833	12	43.443	45.297	0.7	A572-65	0.968
29	48 - 40.4167	7.5833		12	42.915	44.509	0.7625	A572-65	0.968
30	40.4167 - 35.4167	5		12	44.509	45.559	0.75	A572-65	0.979
31	35.4167 - 30.5	4.9167		12	45.559	46.592	0.75	A572-65	0.974
32	30.5 - 30.25	0.25		12	46.592	46.645	0.7625	A572-65	1.002
33	30.25 - 26.5	3.75		12	46.645	47.432	0.7625	A572-65	0.998
34	26.5 - 26.25	0.25		12	47.432	47.485	0.7375	A572-65	1.053
35	26.25 - 21.25	5		12	47.485	48.535	0.7375	A572-65	1.047
36	21.25 - 16.25	5		12	48.535	49.586	0.725	A572-65	1.058
37	16.25 - 11.25	5		12	49.586	50.636	0.725	A572-65	1.052
38	11.25 - 6.25	5		12	50.636	51.687	0.7125	A572-65	1.065
39	6.25 - 1.25	5		12	51.687	52.737	0.7125	A572-65	1.059
40	1.25 - 0	1.25		12	52.737	53.000	0.7125	A572-65	1.058

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	160 - 155	1.8649	48.342	8.2328
2	155 - 150	2.2041	90.973	8.8214
3	150 - 145	4.7542	171.53	16.324
4	145 - 140	5.2253	254.69	16.941
5	140 - 135	7.3893	356.03	21.853
6	135 - 130	7.9647	466.83	22.48
7	130 - 126	10.822	570.58	28.696
8	126 - 121	12.012	715.87	29.432
9	121 - 116	12.916	864.73	30.125
10	116 - 111	13.869	1017	30.814
11	111 - 106	15.433	1177.7	33.327
12	106 - 102.5	16.173	1295.2	33.86
13	102.5 - 102.25	16.259	1303.7	33.893
14	102.25 - 97.25	17.816	1477.2	35.456
15	97.25 - 92.25	19.191	1656.5	36.276
16	92.25 - 87.25	20.599	1839.8	37.089
17	87.25 - 87	20.683	1849.1	37.122
18	87 - 80.333	23.622	2100.4	38.281
19	80.333 - 75.333	25.204	2294.6	39.18
20	75.333 - 70.333	26.686	2492.2	39.901
21	70.333 - 67.67	27.483	2598.9	40.307
22	67.67 - 67.42	27.6	2609	40.331
23	67.42 - 62.42	29.476	2812.6	41.14
24	62.42 - 57.42	31.401	3020.2	41.925
25	57.42 - 52.42	33.359	3231.6	42.695
26	52.42 - 50.5	34.106	3313.9	42.997
27	50.5 - 50.25	34.232	3324.6	43.015
28	50.25 - 48	35.119	3421.7	43.354
29	48 - 40.4167	40.414	3755.2	44.619
30	40.4167 - 35.4167	42.608	3979.9	45.301
31	35.4167 - 30.5	44.797	4204.1	45.946
32	30.5 - 30.25	44.93	4215.6	45.964
33	30.25 - 26.5	46.673	4388.8	46.474
34	26.5 - 26.25	46.809	4400.5	46.49
35	26.25 - 21.25	49.221	4634.5	47.158
36	21.25 - 16.25	51.682	4871.8	47.812
37	16.25 - 11.25	54.178	5112.3	48.465
38	11.25 - 6.25	56.711	5356.2	49.117
39	6.25 - 1.25	59.3	5603.2	49.8
40	1.25 - 0	59.9	5665.5	49.9

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP22.701x21.65x0.25	Pole	11.5%	Pass
155 - 150	Pole	TP23.751x22.701x0.25	Pole	19.5%	Pass
150 - 145	Pole	TP24.802x23.751x0.25	Pole	33.8%	Pass
145 - 140	Pole	TP25.852x24.802x0.25	Pole	46.0%	Pass
140 - 135	Pole	TP26.903x25.852x0.25	Pole	59.4%	Pass
135 - 130	Pole	TP27.953x26.903x0.25	Pole	71.9%	Pass
130 - 126	Pole	TP29.774x27.953x0.25	Pole	82.9%	Pass
126 - 121	Pole	TP29.343x28.293x0.375	Pole	67.5%	Pass
121 - 116	Pole	TP30.393x29.343x0.375	Pole	75.8%	Pass
116 - 111	Pole	TP31.442x30.393x0.375	Pole	83.2%	Pass
111 - 106	Pole	TP32.492x31.442x0.375	Pole	90.1%	Pass
106 - 102.5	Pole	TP33.227x32.492x0.375	Pole	94.7%	Pass
102.5 - 102.25	Pole + Reinf.	TP33.279x33.227x0.5625	Reinf. 6 Tension Rupture	79.3%	Pass
102.25 - 97.25	Pole + Reinf.	TP34.329x33.279x0.5625	Reinf. 6 Tension Rupture	85.3%	Pass
97.25 - 92.25	Pole + Reinf.	TP35.378x34.329x0.55	Reinf. 6 Tension Rupture	90.8%	Pass
92.25 - 87.25	Pole + Reinf.	TP36.428x35.378x0.55	Reinf. 6 Tension Rupture	95.9%	Pass
87.25 - 87	Pole + Reinf.	TP37.67x36.428x0.55	Reinf. 6 Tension Rupture	96.2%	Pass
87 - 80.33	Pole	TP37.13x35.73x0.5	Pole	92.8%	Pass
80.33 - 75.33	Pole	TP38.179x37.13x0.5	Pole	95.8%	Pass
75.33 - 70.33	Pole	TP39.228x38.179x0.5	Pole	98.4%	Pass
70.33 - 67.67	Pole	TP39.787x39.228x0.5	Pole	99.7%	Pass
67.67 - 67.42	Pole + Reinf.	TP39.84x39.787x0.725	Reinf. 5 Tension Rupture	85.9%	Pass
67.42 - 62.42	Pole + Reinf.	TP40.889x39.84x0.7125	Reinf. 5 Tension Rupture	88.5%	Pass
62.42 - 57.42	Pole + Reinf.	TP41.938x40.889x0.7	Reinf. 5 Tension Rupture	91.0%	Pass
57.42 - 52.42	Pole + Reinf.	TP42.988x41.938x0.7	Reinf. 5 Tension Rupture	93.2%	Pass
52.42 - 50.5	Pole + Reinf.	TP43.391x42.988x0.7	Reinf. 5 Tension Rupture	94.0%	Pass
50.5 - 50.25	Pole + Reinf.	TP43.443x43.391x0.7	Reinf. 4 Tension Rupture	94.1%	Pass
50.25 - 48	Pole + Reinf.	TP45.297x43.443x0.7	Reinf. 4 Tension Rupture	95.0%	Pass
48 - 40.42	Pole + Reinf.	TP44.509x42.915x0.7625	Reinf. 4 Tension Rupture	93.7%	Pass
40.42 - 35.42	Pole + Reinf.	TP45.559x44.509x0.75	Reinf. 4 Tension Rupture	95.2%	Pass
35.42 - 30.5	Pole + Reinf.	TP46.592x45.559x0.75	Reinf. 4 Tension Rupture	96.6%	Pass
30.5 - 30.25	Pole + Reinf.	TP46.645x46.592x0.7625	Reinf. 3 Tension Rupture	96.4%	Pass
30.25 - 26.5	Pole + Reinf.	TP47.432x46.645x0.7625	Reinf. 3 Tension Rupture	97.4%	Pass
26.5 - 26.25	Pole + Reinf.	TP47.485x47.432x0.7375	Reinf. 1 Compression	89.7%	Pass
26.25 - 21.25	Pole + Reinf.	TP48.535x47.485x0.7375	Reinf. 1 Compression	90.9%	Pass
21.25 - 16.25	Pole + Reinf.	TP49.586x48.535x0.725	Reinf. 1 Compression	92.0%	Pass
16.25 - 11.25	Pole + Reinf.	TP50.636x49.586x0.725	Reinf. 1 Compression	93.0%	Pass
11.25 - 6.25	Pole + Reinf.	TP51.687x50.636x0.7125	Reinf. 1 Compression	93.9%	Pass
6.25 - 1.25	Pole + Reinf.	TP52.737x51.687x0.7125	Reinf. 1 Compression	94.8%	Pass
1.25 - 0	Pole + Reinf.	TP53x52.737x0.7125	Reinf. 1 Compression	95.0%	Pass
				Summary	
			Pole	99.7%	Pass
			Reinforcement	97.4%	Pass
			Overall	99.7%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity						
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6
160 - 155	1164	n/a	1164	18.05	n/a	18.05	11.4%						
155 - 150	1335	n/a	1335	18.89	n/a	18.89	19.5%						
150 - 145	1523	n/a	1523	19.74	n/a	19.74	33.8%						
145 - 140	1727	n/a	1727	20.58	n/a	20.58	46.0%						
140 - 135	1948	n/a	1948	21.42	n/a	21.42	59.4%						
135 - 130	2188	n/a	2188	22.27	n/a	22.27	71.9%						
130 - 126	2393	n/a	2393	22.94	n/a	22.94	82.9%						
126 - 121	3752	n/a	3752	34.93	n/a	34.93	67.5%						
121 - 116	4174	n/a	4174	36.19	n/a	36.19	75.8%						
116 - 111	4628	n/a	4628	37.46	n/a	37.46	83.2%						
111 - 106	5113	n/a	5113	38.73	n/a	38.73	90.1%						
106 - 102.5	5472	n/a	5472	39.61	n/a	39.61	94.7%						
102.5 - 102.25	5498	2672	8170	39.67	18.00	57.67	61.9%						79.3%
102.25 - 97.25	6041	2836	8877	40.94	18.00	58.94	66.5%						85.3%
97.25 - 92.25	6619	3005	9624	42.21	18.00	60.21	70.9%						90.8%
92.25 - 87.25	7232	3180	10412	43.47	18.00	61.47	75.0%						95.9%
87.25 - 87	7264	3189	10453	43.53	18.00	61.53	75.1%						96.2%
87 - 80.33	10114	n/a	10114	58.89	n/a	58.89	92.8%						
80.33 - 75.33	11008	n/a	11008	60.58	n/a	60.58	95.8%						
75.33 - 70.33	11953	n/a	11953	62.26	n/a	62.26	98.4%						
70.33 - 67.67	12478	n/a	12478	63.16	n/a	63.16	99.7%						
67.67 - 67.42	12529	5189	17717	63.25	24.38	87.62	68.3%					85.9%	
67.42 - 62.42	13558	5455	19013	64.93	24.38	89.31	70.5%					88.5%	
62.42 - 57.42	14642	5728	20370	66.62	24.38	91.00	72.4%					91.0%	
57.42 - 52.42	15783	6007	21790	68.31	24.38	92.68	74.3%					93.2%	
52.42 - 50.5	16237	6116	22353	68.96	24.38	93.33	75.0%					94.0%	
50.5 - 50.25	16296	6131	22427	69.04	24.38	93.41	75.0%			94.1%	94.1%		
50.25 - 48	16840	6260	23100	69.80	24.38	94.17	75.8%			95.1%	95.1%		
48 - 40.42	19648	6424	26072	79.48	24.38	103.86	74.7%			93.7%	93.7%		
40.42 - 35.42	21091	6720	27811	81.38	24.38	105.76	76.0%			95.2%	95.2%		
35.42 - 30.5	22577	7018	29596	83.25	24.38	107.63	77.2%			96.6%	96.6%		
30.5 - 30.25	22678	7748	30426	83.35	29.38	112.72	77.1%	87.2%		96.4%			
30.25 - 26.5	23861	8003	31863	84.77	29.38	114.15	77.9%	88.1%		97.4%			
26.5 - 26.25	24009	6951	30959	84.87	31.88	116.74	84.5%	89.7%	85.1%				
26.25 - 21.25	25654	7251	32905	86.77	31.88	118.64	85.5%	90.9%	86.3%				
21.25 - 16.25	27373	7558	34932	88.67	31.88	120.54	86.5%	92.0%	87.4%				
16.25 - 11.25	29167	7872	37039	90.57	31.88	122.44	87.4%	93.0%	88.4%				
11.25 - 6.25	31038	8192	39231	92.47	31.88	124.34	88.2%	93.9%	89.4%				
6.25 - 1.25	32988	8519	41507	94.37	31.88	126.24	88.9%	94.8%	90.3%				
1.25 - 0	33487	8602	42089	94.84	31.88	126.72	89.1%	95.0%	90.5%				

Note: Section capacity checked in 5 degree increments.

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *806939*
Site Name: *NHV 2071 143137*
App #: *322396 Rev. 1*
Pole Manufacturer: *Other*

Reactions		
Moment:	5666	ft-kips
Axial:	60	kips
Shear:	50	kips

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

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	61.37	in

Anchor Rod Results

Maximum Rod Tension:	182.1 Kips	
Allowable Tension:	195.0 Kips	
Anchor Rod Stress Ratio:	93.4% **Pass**	

Rigid
Service, ASD
Fty*ASIF

Plate Data		
Diam:	67.37	in
Thick:	3	in
Grade:	60	ksi
Single-Rod B-eff:	7.10	in

Base Plate Results Flexural Check

Base Plate Stress:	45.2 ksi	
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	75.3% **Pass**	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 30.94

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

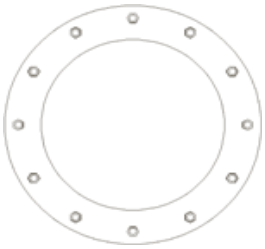
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	53	in
Thick:	0.5625	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	



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

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

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

Site Data

BU#: *806939*
Site Name: *NHV 2071 143137*
App #: *322396 Rev.1*

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

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	9.5	ft
Pad Thickness, T:	3.5	ft
Pad Width=Length, L:	30	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	38.48	ft^2
Pier Height:	6.50	ft
Soil (above pad) Height:	6.00	ft

Soil Parameters		
Unit Weight, γ:	120.0	pcf
Ultimate Bearing Capacity, qn:	25.00	ksf
Strength Reduct. factor, ϕ:	0.5	
Angle of Friction, Φ:	0.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	12.50	ksf
Passive Pres. Coeff., Kp	1.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	48.8	kips
Pad Force Location Above D:	1.62	ft
ϕ(Passive Pressure Moment):	79.01	ft-kips
Factored O.T. M(WL), "1.6W":	8341.0	ft-kips
Factored OT (MW-Msoil), M1	8261.96	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	1205.4	kips
Unfactored (Total ftg-soil Wt):	1205.36	kips
1.2D. **No Soil Wedges**.	1518.43	kips
0.9D. **With Soil Wedges**	1138.82	kips

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

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	60	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	50	kips
Unfactored WL Moment, M:	5666	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	72	kips
0.90	0.9D+1.6W, Pu:	54	kips
1.35	Vu:	67.5	kips
	Mu:	7649.1	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	1518.43	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	8261.96	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	5.44	ft
Orthogonal qu=	2.91	ksf
qu/ϕ*qn Ratio=	**23.29%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	3.85	ft
Diagonal qu=	3.05	ksf
qu/ϕ*qn Ratio=	**24.41%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	1138.82	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	8261.96	ft-kips

Orthogonal ecc3 = M2/P2 =	7.25	ft
Ortho Non Bearing Length,NBL=	14.51	ft
Orthogonal qu=	2.49	ksf
Diagonal qu=	2.92	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	5666.00		
M Orthogonal:	10918.71	**51.89%**	**Pass**
M Diagonal:	10918.71	**51.89%**	**Pass**

Analysis Date: 12/□/2015

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#: *806939*
Site Name: *NHV 2071 143137*
App #: *322396 Rev.1*

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**=	3.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.28	ft
Vert. Cage Diameter =	75.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	36	
As Total=	56.16	in^2
A s/ Aconc, Rho:	0.0101	1.01%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	1.01%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	9026.11	kips
at Mu=(ϕ=0.65)Mn=	5465.65	ft-kips
Max Tu, (φ=0.9) Tn =	3032.64	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	5991	ft-kips **(* Note)**
Max. Service Shaft P:	60	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:	7788.3	ft-kips
1.30	Pu:	78	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=	2005	

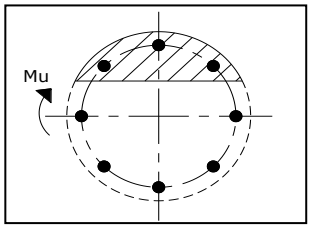
Seismic Properties

Seismic Design Category =	B	
Seismic Risk =	**Low**	

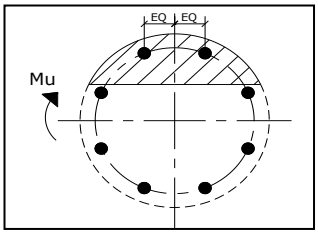
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**17.56**	in
Extreme Steel Strain, ϵt:	**0.0106**	
ϵt > 0.0050, Tension Controlled		
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	78.00	kips
Drilled Shaft Moment Capacity, φMn:	**8473.73**	ft-kips
Drilled Shaft Superimposed Mu:	**7788.30**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**91.9%**

EBI Consulting
environmental | engineering | due diligence

[redacted]

[redacted]

[redacted]

[redacted]

January 6, 2016

EBI Project Number: 6616000021

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**7.23 %**

EBI Consulting
environmental | engineering | due diligence

January 6, 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: **CT2159 – Orange North**

EBI Consulting was directed to analyze the proposed AT&T facility located at **800 Ogg Meadow Road, Orange, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

General population/uncontrolled exposure limits apply to situations in which the general 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 ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **800 Ogg Meadow Road, Orange, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

8) For the following calculations the sample point was the top of a 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.

9) The antennas used in this modeling are the **Kathrein 800-10121, Quintel QS66512-3 and the Powerwave P65-16-XLH-RR** 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.

10) The antenna mounting height centerline of the proposed antennas is **152 feet** above ground level (AGL).

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

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

EBI Consulting
environmental | engineering | due diligence

AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,471.44	ERP (W):	2,471.44	ERP (W):	2,471.44
Antenna A1 MPE%	**0.52**	Antenna B1 MPE%	**0.52**	Antenna C1 MPE%	**0.52**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Quintel QS66512-3	Make / Model:	Quintel QS66512-3	Make / Model:	Quintel QS66512-3
Gain:	12.15 / 14.75 / 15.65 dBd	Gain:	12.15 / 14.75 / 15.65 dBd	Gain:	12.15 / 14.75 / 15.65 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	Frequency Bands	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	300	Total TX Power(W):	300	Total TX Power(W):	300
ERP (W):	8,974.20	ERP (W):	8,974.20	ERP (W):	8,974.20
Antenna A2 MPE%	**1.64**	Antenna B2 MPE%	**1.64**	Antenna C2 MPE%	**1.64**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR
Gain:	14.8 dBd	Gain:	14.8 dBd	Gain:	14.8 dBd
Height (AGL):	152 feet	Height (AGL):	152 feet	Height (AGL):	152 feet
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,208.93	ERP (W):	2,208.93	ERP (W):	2,208.93
Antenna A3 MPE%	**0.80**	Antenna B3 MPE%	**0.80**	Antenna C3 MPE%	**0.80**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.96 %**
MetroPCS	0.68 %
Verizon Wireless	1.81 %
Clearwire	0.15 %
Nextel	0.42 %
Sprint	0.93 %
T-Mobile	0.02 %
Metricom	0.06 %
XM Sat Radio	0.20 %
Site Total MPE %:	**7.23 %**

AT&T Sector 1 Total:	2.96 %
AT&T Sector 2 Total:	2.96 %
AT&T Sector 3 Total:	2.96 %
Site Total:	7.23 %

AT&T _ Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	418.91	152	1.41	850	567	0.25 %
AT&T 1900 MHz (PCS) UMTS	2	816.81	152	2.76	1900	1000	0.28 %
AT&T 850 MHz GSM	2	492.18	152	1.66	850	567	0.29 %
AT&T 2300 MHz (WCS) LTE	2	1791.23	152	6.04	2300	1000	0.60 %
AT&T 1900 MHz (PCS) LTE	2	2203.69	152	7.43	1900	1000	0.74 %
AT&T 700 MHz LTE	2	1104.46	152	3.73	700	467	0.80 %
						Total:	2.96 %

EBI Consulting
environmental | engineering | due diligence

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:	2.96 %
Sector 2:	2.96 %
Sector 3 :	2.96 %
AT&T Maximum Total (per sector):	2.96 %
Site Total:	7.23 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.23%** 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.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803