



Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

September 7, 2021

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Exempt Modification Application
41 Manitock Hill Road, Waterford CT 06385
Latitude: 41.357875
Longitude: -72.151189
Site#: 876338_Crown_VZW

Dear Ms. Bachman:

Verizon Wireless is requesting to file an exempt modification for an existing tower located at 41 Manitock Hill Road, Waterford CT 06385. Verizon Wireless currently maintains twelve (12) antennas at the 107-foot level of the existing 136-foot tower. The property is owned by the City of New London and the tower is owned by Crown Castle. Verizon now intends to replace nine (9) of the existing antenna and add nine (9) new antenna. The new antennas would be installed at the 107-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable. Antenna mount modifications will be completed as per the attached Maser mount analysis dated June 11, 2021.

Verizon Planned Modifications:

Remove: NONE

Remove and Replace:

- (3) BSAMNT-SBS-1-2 Antenna (REMOVE) – (3) MX06FR0660 Antenna (REPLACE)
- (3) SBNHH-1D65B Antenna (REMOVE) – (3) MX06FR0660 Antenna (REPLACE)
- (3) BXA-70063 Antenna (REMOVE) – (3) MT6407-77A Antenna (REPLACE)
- (3) Nokia B13 RRH (REMOVE) - (3) Samsung B2/B66A -BRO49 – RFV01U-D1A RRH (REPLACE)
- (3) Nokia B25 RRH (REMOVE) - (3) Samsung B5/B13 -BRO4C – RFV01U-D2A RRH (REPLACE)

Install New: NONE

Existing to Remain:

- (2) BXA-80063/6CF Antenna
- (1) Raycap
- (12) Coax
- (2) Hybrid Line



The facility was approved by the Town of Waterford Planning & Zoning Commission on September 29, 1997. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Robert J Brule, First Selectman, and Abby Piersall, Planning Director, for the Town of Waterford. A copy is also being sent to the tower owner, and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications 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 Communications 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, Verizon Wireless respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments

cc: Robert J Brule, First Selectman
Town of Waterford
15 Rope Ferry Road, Waterford CT 06438

Abby Piersall, Planning Director
Town of Waterford
15 Rope Ferry Road, Waterford CT 06438

City of New London, Property Owner
181 State Street, New London CT 06320
Treasurer's Office

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

NOTICE OF GRANT OF A SPECIAL PERMIT

This is to certify that on September 29, 1997 the Waterford Planning & Zoning Commission granted Special Permit #97-112/304.

Owner of Record: City of New London

Address: 41 Manitock Hill Road

Description of Premises:

As recorded in Volume 173, Page 256 of the Waterford Land Records.

Nature of Special Permit: Special Permit granted for the construction of a 140 foot lattice design communications tower by Sprint. Co-location for additional carriers is provided for on this tower.

Applicable Zoning Regulations: Section 3.6, 5.2.1, 5.2.3 and 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of September 29, 1997.

PLANNING & ZONING COMMISSION

By: Pam Hagerman
Pamela Hagerman
Recording Secretary
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

RECEIVED FOR RECORD March 16 . 1999
4:02 P M. ATTEST [Signature]
TOWN CLERK

Exhibit B

Property Card

41 MANITOCK HILL ROAD



NEW LONDON CITY OF

15 MASONIC ST
NEW LONDON, CT 06320

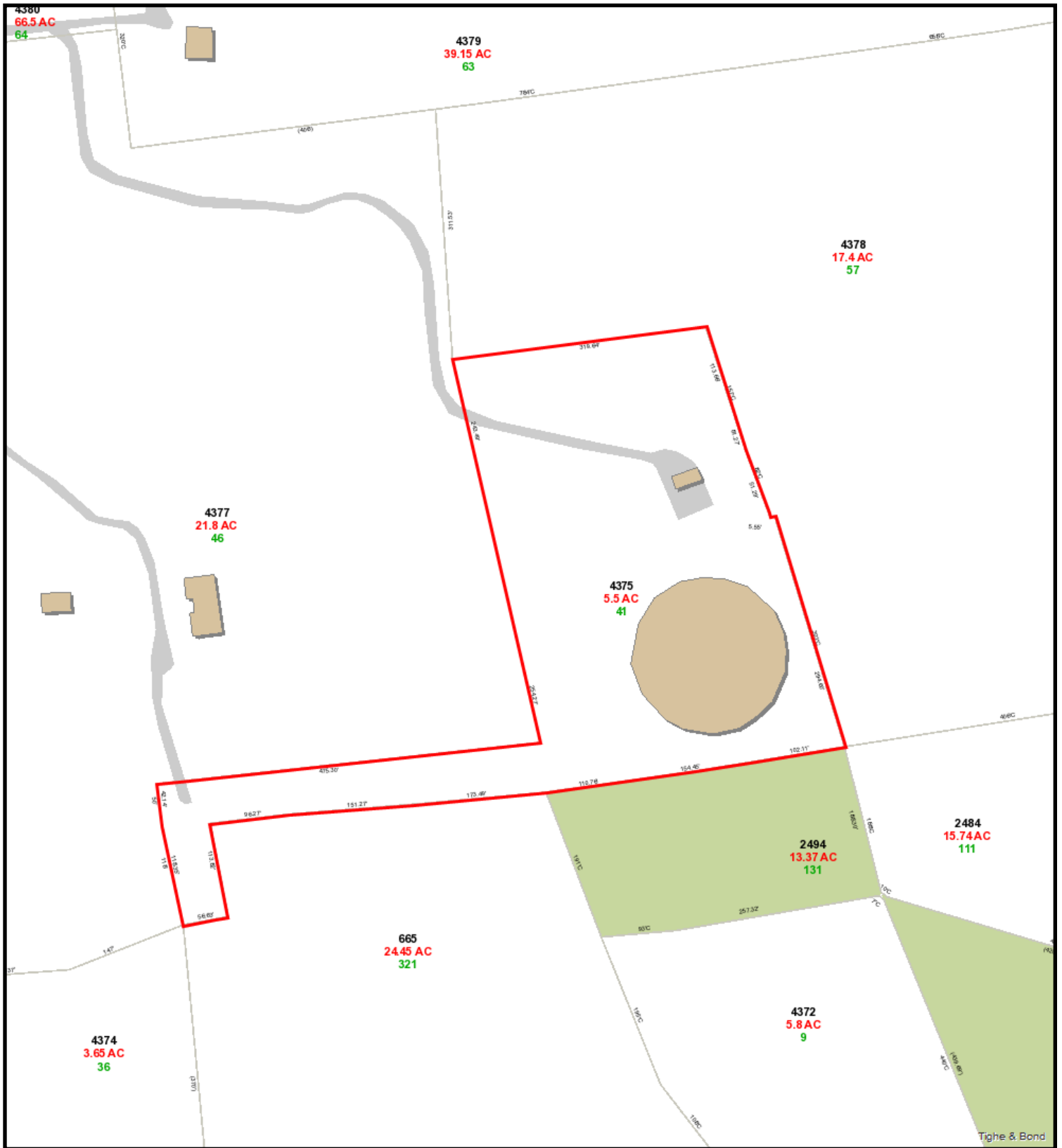
Parcel ID:
Lot Size (ac):
Total Value: \$9180

- Links
- Abutters

- [Parcel Details](#)
- [Photo](#)
- Google Map

- Bing Bird's Eye
- Property Map.

- **CAMA ID**4375
- **Parcel ID**038 0154A
- **LOCATION**41 MANITOCK HILL ROAD
- **BLDG VALUE**0
- **LAND VALUE**7600
- **OTHER VALUE**1580
- **TOTAL VALUE**9180
- **LAST SALE DATE**6/11/1968
- **LAST SALE PRICE**0
- **OWNER1**NEW LONDON CITY OF
- **OWNER2**WATER DEPT
- **OWNER ADDR1**15 MASONIC ST
- **OWNER ADDR2**Null
- **OWNER CITY**NEW LONDON
- **OWNER STATE**CT
- **OWNER ZIP**06320
- **LS BOOK**173
- **LS PAGE**256
- **ZONER**-40
- **YEAR BUILT**Null
- **MUNICIPALITY ID**117-4375



4/7/2021 3:20:13 PM

Scale: 1"=166'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.



Exhibit C

Construction Drawings



VERIZON SITE NUMBER: 325076
VERIZON SITE NAME: WATERFORD 2 CT
SITE TYPE: SELF-SUPPORT TOWER
TOWER HEIGHT: 136'-0"

BUSINESS UNIT #: 876338
SITE ADDRESS: 41 MANITOCK HILL ROAD
 WATERFORD, CT 06385-2000
COUNTY: NEW LONDON
JURISDICTION: TOWN OF WATERFORD

VERIZON 5G L-SUB6 - CARRIER ADD/ FUZE ID 16244091



180 WASHINGTON VALLEY ROAD
 BEDMINSTER, NJ 07921



1200 MACARTHUR BLVD, SUITE 200
 MAHWAH, NJ 07430



70 Pleasant Hill Road
 P.O. Box 37
 Mountainville, NY 10953
 Phone: (845) 534-5959
 (800) 829-8531
 www.tectonicengineering.com

TECTONIC WO: 10545.WATERFORD CT

VERIZON SITE NUMBER:
 325076

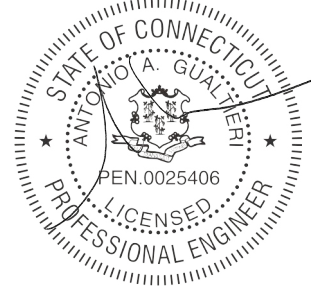
BU #: 876338
WATERFORD

41 MANITOCK HILL ROAD
 WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/21/21	VM	CONSTRUCTION	----



IT IS A VIOLATION OF LAW FOR ANY PERSON,
 UNLESS THEY ARE ACTING UNDER THE DIRECTION
 OF A LICENSED PROFESSIONAL ENGINEER,
 TO ALTER THIS DOCUMENT.

SHEET NUMBER:
T-1

REVISION:
A

SITE INFORMATION

CROWN CASTLE USA INC. WATERFORD
SITE NAME:
SITE ADDRESS: 41 MANITOCK HILL ROAD
 WATERFORD, CT 06385-2000

COUNTY: NEW LONDON
MAP/PARCEL #: 4375-038-0154A
AREA OF CONSTRUCTION: EXISTING
LATITUDE: 41° 21' 16.70" N
LONGITUDE: 72° 9' 1.60" W
LAT/LONG TYPE: NAD83
GROUND ELEVATION: ----
CURRENT ZONING: R-40
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL
JURISDICTION: TOWN OF WATERFORD
OCCUPANCY CLASSIFICATION: ----
TYPE OF CONSTRUCTION: ----
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR
 HUMAN HABITATION

PROPERTY OWNER: CITY OF NEW LONDON
 15 MASONIC ST
 NEW LONDON CT 0632

TOWER OWNER: CROWN CASTLE MU LLC
 2000 CORPORATE DRIVE
 CANONSBURG, PA 15317

CARRIER/APPLICANT: VERIZON WIRELESS
 180 WASHINGTON VALLEY ROAD
 BEDMINSTER, NJ 07921

ELECTRIC PROVIDER: NORTHEAST UTILITIES
 (860) 286-2000

TELCO PROVIDER: CROWN CASTLE FIBER
 (855) 913-4237

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT SCHEDULES
C-4	EQUIPMENT DETAILS
C-5	EQUIPMENT DETAILS
C-6	PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR
 ----. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING
 DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL
 IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY
 DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR
 BE RESPONSIBLE FOR SAME.

APPROVALS

SIGNATURE	DATE

CONTRACTOR PMI REQUIREMENTS

PMI ACCESSED AT <https://pmi.vxwsmart.com>
 SMART TOOL VENDOR
 PROJECT NUMBER 10069535
 V2W LOCATION CODE (PSLC) 467304

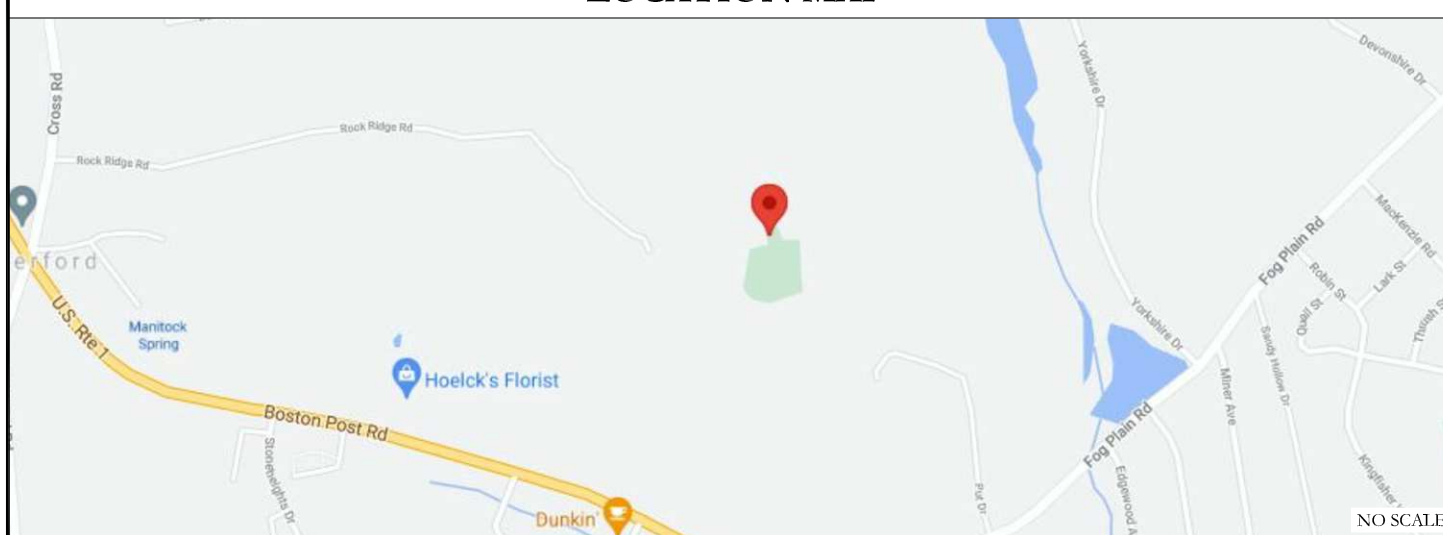
*** PMI AND REQUIREMENTS ALSO EMBEDDED IN MOUNT
 ANALYSIS REPORT

MOUNT MODIFICATION REQUIRED **Y**

V2W APPROVED SMART KIT VENDORS

REFER TO MOUNT MODIFICATION DRAWINGS PAGE FOR
 V2W SMART KIT APPROVED VENDORS

LOCATION MAP



DRIVING DIRECTIONS FROM VERIZON LOCAL OFFICE (180 WASHINGTON VALLEY RD, BEDMINSTER, NJ 07921)

HEAD NORTHWEST. SLIGHT LEFT. TURN RIGHT ONTO US-202 N/US-206 N. TURN RIGHT ONTO SCHLEY MOUNTAIN RD. MERGE WITH I-287 N. ENTERING NEW YORK. TAKE THE I-87 S/NEW YORK STATE THRUWAY/I-287 EXIT TOWARD GOV MARIO M. CUOMO BR/NEW YORK CITY. MERGE WITH I-287 E/I-87 S. KEEP LEFT AT THE Y JUNCTION TO CONTINUE ON I-287 E. FOLLOW SIGNS FOR WHITE PLAINS/RYE. KEEP LEFT TO STAY ON I-287 E. MERGE WITH I-95 N. ENTERING CONNECTICUT. CONTINUE STRAIGHT TO STAY ON I-95 N. KEEP LEFT TO STAY ON I-95 N. KEEP LEFT TO STAY ON I-95 N. TAKE EXIT 81 TOWARD CROSS RD. TURN LEFT ONTO WATERFORD PKWY S. TURN RIGHT ONTO CROSS RD. TURN LEFT ONTO ROCK RIDGE RD.

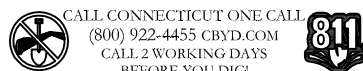
APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT SBC
MECHANICAL	2018 CT SBC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: ----
 DATED:
 MOUNT ANALYSIS: MASER CONSULTING (MOUNT MODIFICATION)
 DATED: 6/11/21
 RFDS REVISION: 0
 DATED: 02/11/21
 ORDER ID: 552701
 REVISION: 0



CALL CONNECTICUT ONE CALL
 (800) 922-4455 CBYD.COM
 CALL 2 WORKING DAYS
 BEFORE YOU DIG!



PROJECT TEAM

A&E FIRM: TECTONIC ENGINEERING &
 SURVEYING CONSULTANTS P.C.
 1279 ROUTE 300
 NEWBURGH, NY 12550
 PHONE: (845) 567-6656

CROWN CASTLE USA INC. DISTRICT CONTACTS: 1200 MACARTHUR BLVD, SUITE 200
 MAHWAH, NJ 07430

---- - PROJECT MANAGER

 ---- - CONSTRUCTION MANAGER

VERIZON CONTACT: ----

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:

- REMOVE (9) ANTENNAS
- REMOVE (9) RRHS
- REMOVE (3) MOUNT
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHS
- INSTALL (3) MOUNT

GROUND SCOPE OF WORK:

- NONE

NOTE:
 PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
- "LOOK UP" - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORING POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
- ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED-STD-10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) TRAINING SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E)
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GREENFIELD GROUNDING NOTES:

- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTIVE GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING 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 CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (I.E., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER: VERIZON
TOWER OWNER: CROWN CASTLE USA INC
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
- NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
- SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 CROWN CASTLE.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WFF) SHALL CONFORM TO ASTM A188. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
#4 BARS AND SMALLER.....40 ksi
#5 BARS AND LARGER.....60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 BARS AND LARGER.....2"
#5 BARS AND SMALLER.....1-1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
SLAB AND WALLS.....3/4"
BEAMS AND COLUMNS.....1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREFOLD SPECIMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (I.E. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "VERIZON".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
120/208V, 3Ø	GROUND	GREEN
	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
277/480V, 3Ø	GROUND	GREEN
	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
DC VOLTAGE	GROUND	GREEN
	POS (+)	RED**
	NEG (-)	BLACK**

APWA UNIFORM COLOR CODE:

- PROPOSED EXCAVATION
- TEMPORARY SURVEY MARKINGS
- ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
- GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
- COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
- POTABLE WATER
- RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
- SEWERS AND DRAIN LINES

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

ABBREVIATIONS:

- ANT ANTENNA
- (E) EXISTING
- FIF FACILITY INTERFACE FRAME
- GEN GENERATOR
- GPS GLOBAL POSITIONING SYSTEM
- GSM GLOBAL SYSTEM FOR MOBILE
- LTE LONG TERM EVOLUTION
- MGB MASTER GROUND BAR
- MW MICROWAVE
- (N) NEW
- NEC NATIONAL ELECTRICAL CODE
- (P) PROPOSED
- PP POWER PLANT
- QTY QUANTITY
- RECT RECTIFIER
- RBS RADIO BASE STATION
- RET REMOTE ELECTRIC TILT
- RFDTS RADIO FREQUENCY DATA SHEET
- RRH REMOTE RADIO HEAD
- RRU REMOTE RADIO UNIT
- SIAD SMART INTEGRATED DEVICE
- TMA TOWER MOUNTED AMPLIFIER
- TYP TYPICAL
- UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
- W.P. WORK POINT



VERIZON SITE NUMBER:
325076

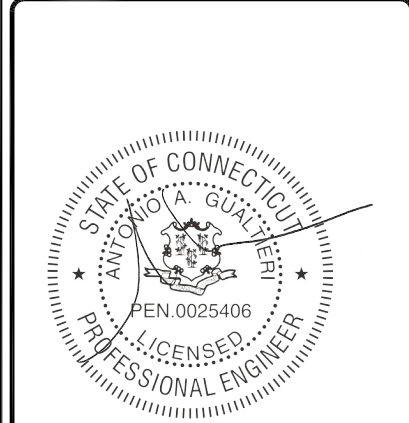
BU #: 876338
WATERFORD

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

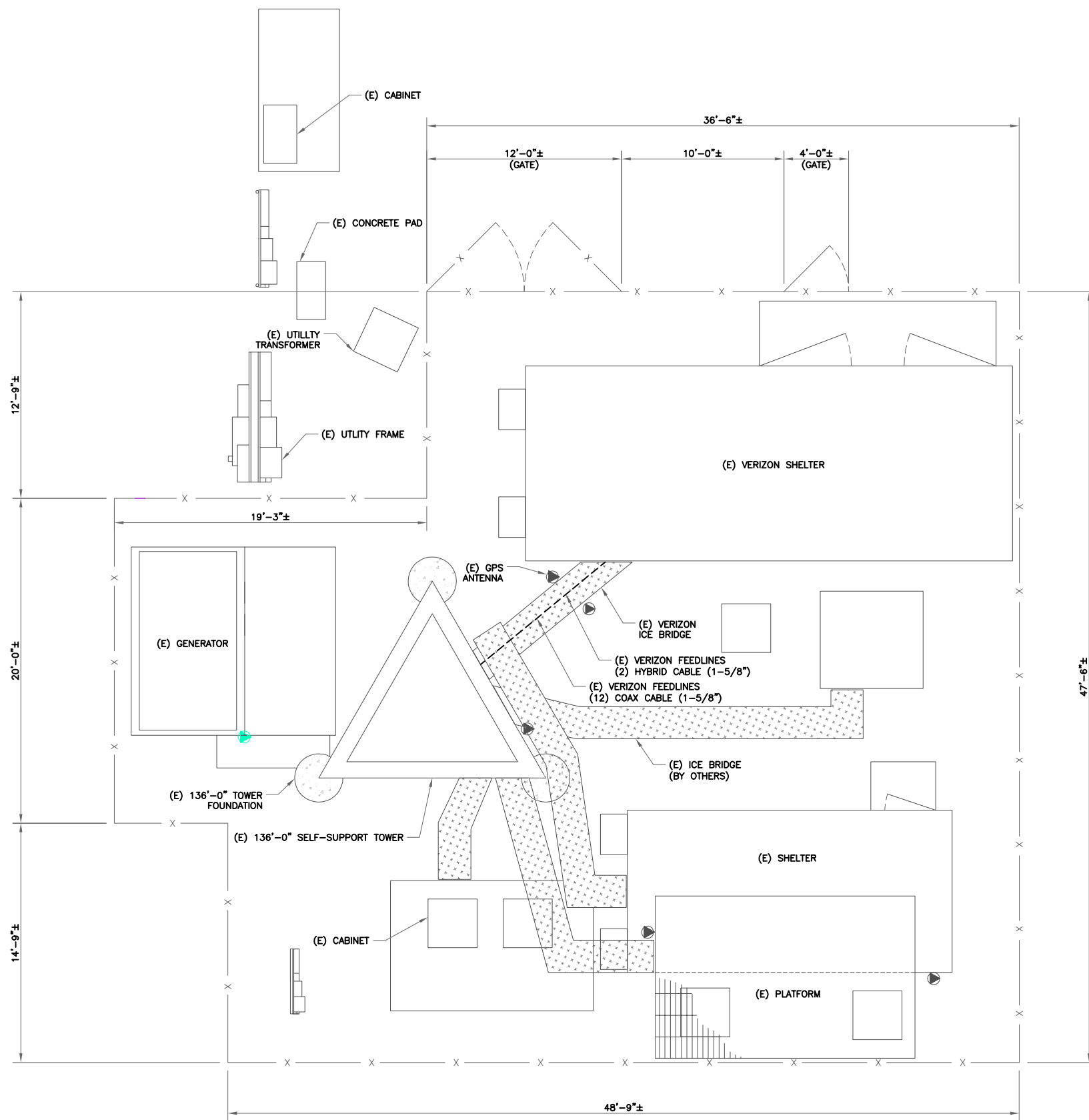
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/21/21	VM	CONSTRUCTION	----



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SHEET NUMBER: **T-2** REVISION: **A**



1 SITE PLAN
 SCALE: 1/4"=1'-0" (FULL SIZE)
 1/8"=1'-0" (11x17)



verizon
 180 WASHINGTON VALLEY ROAD
 BEDMINSTER, NJ 07921

CROWN CASTLE
 1200 MACARTHUR BLVD, SUITE 200
 MAHWAH, NJ 07430

Tectonic
 PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
 Tectonic Engineering & Surveying Consultants P.C.
 70 Pleasant Hill Road Phone: (845) 534-5959
 P.O. Box 37 (800) 829-8531
 Mountville, NY 10953 www.tectonicengineering.com
 Project Contact Info
 1279 Route 300
 Newburgh, NY 12550 Phone: (845) 547-6656
 TECTONIC WO: 10545, WATERFORD CT

VERIZON SITE NUMBER:
325076

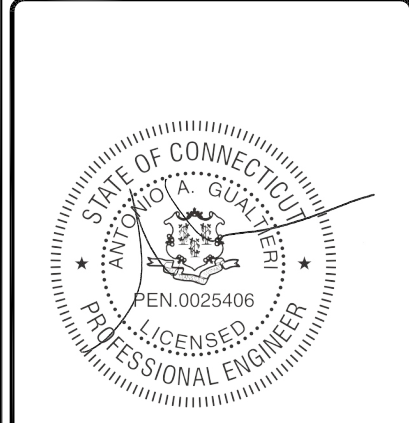
BU #: **876338**
WATERFORD

41 MANITOCK HILL ROAD
 WATERFORD, CT 06385-2000

EXISTING 136'-0"
 SELF-SUPPORT TOWER

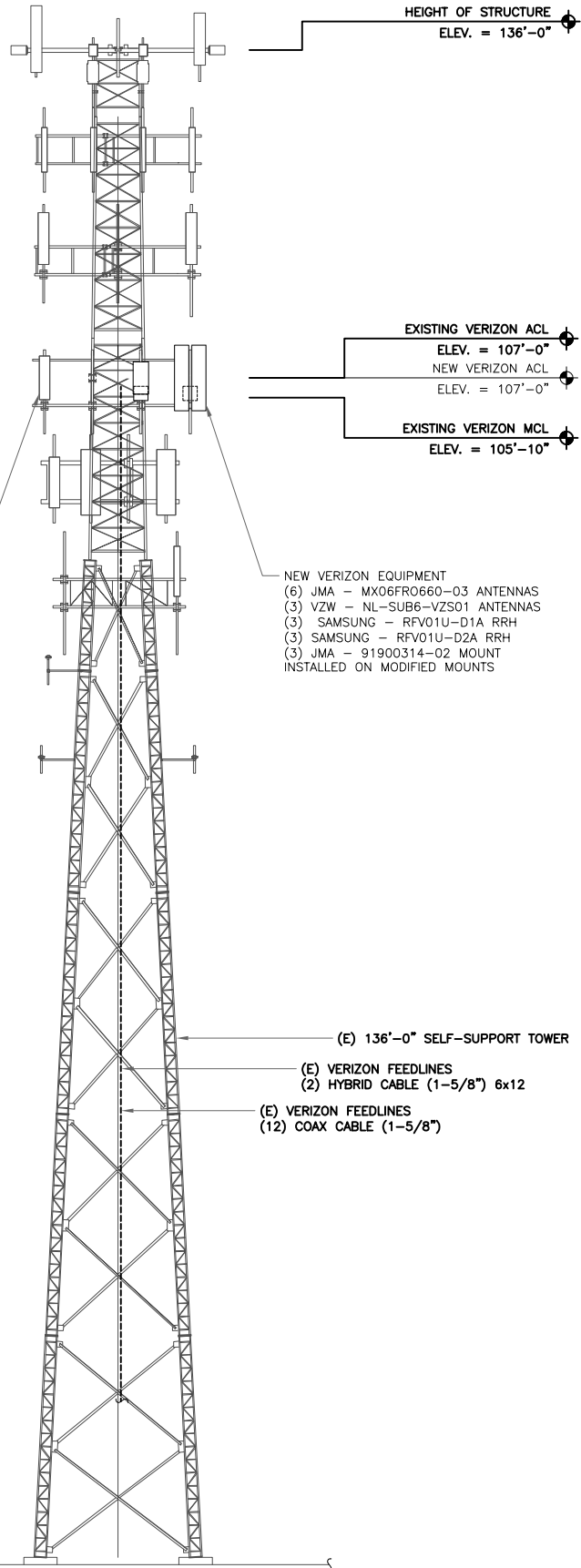
ISSUED FOR:

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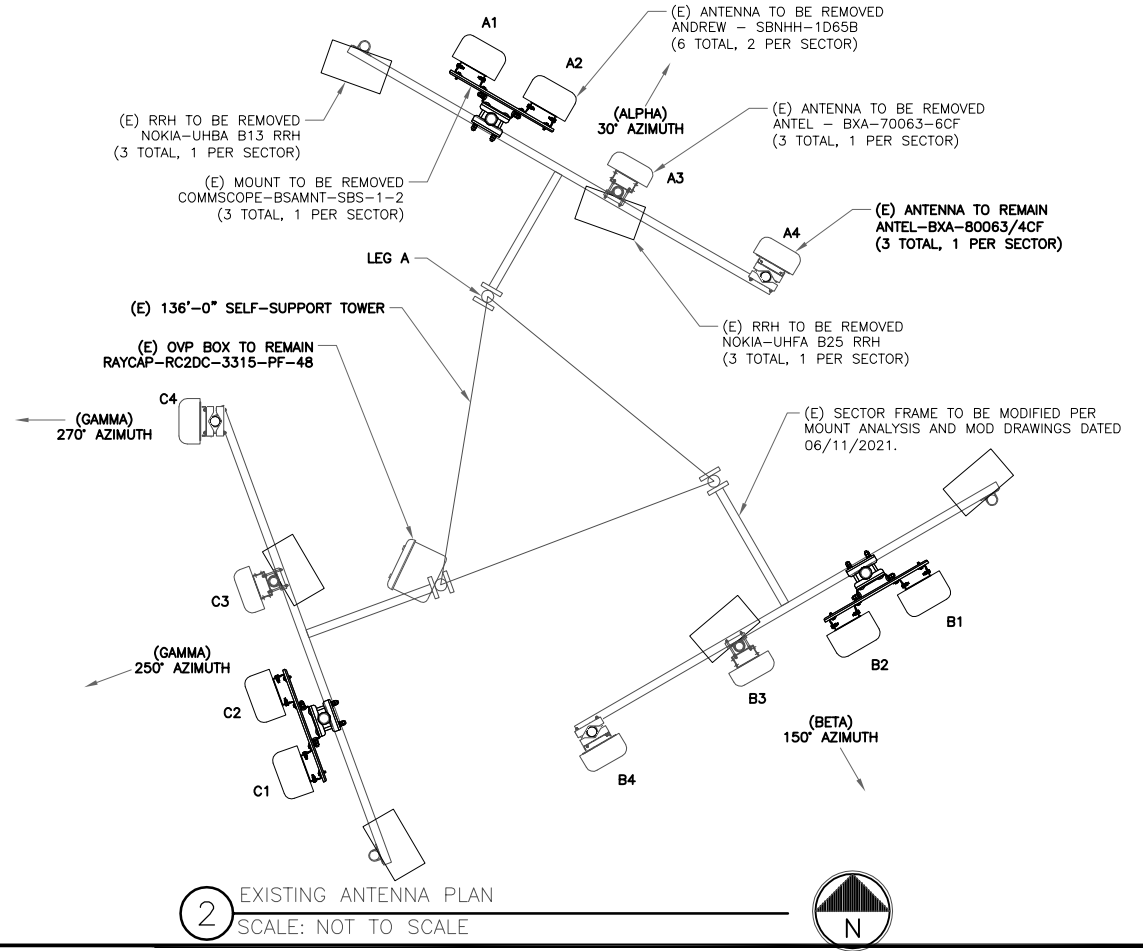
SHEET NUMBER: **C-1** REVISION: **A**



1 TOWER ELEVATION
SCALE: NOT TO SCALE

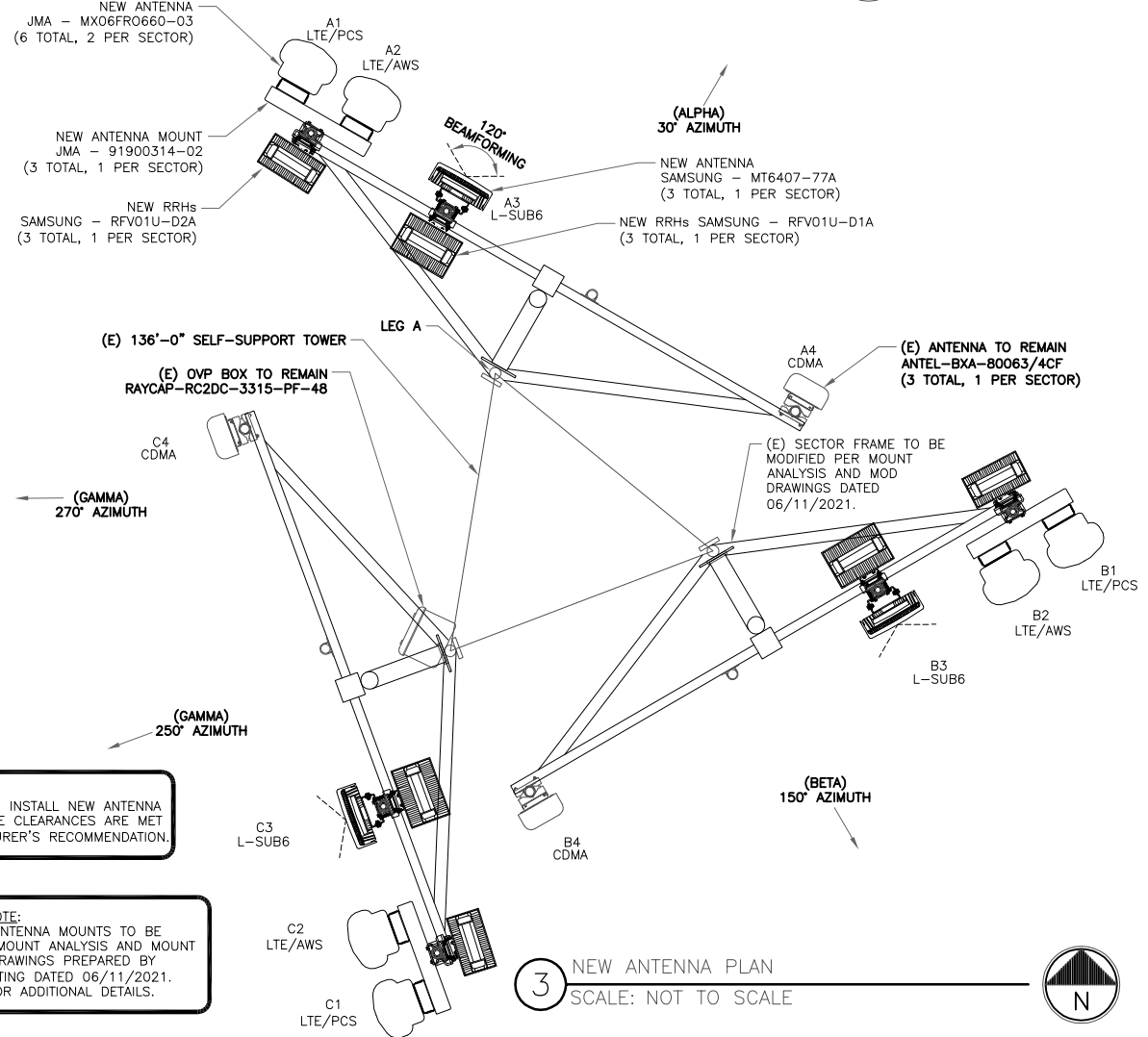
VERIZON EQUIPMENT
(E) ANTENNA CL: 107'-0"
(N) ANTENNA CL: 107'-0"
MOUNT CL: 105'-10"

TOWER NOTE:
EXISTING STRUCTURE SHALL BE ANALYZED
BY A PROFESSIONAL ENGINEER LICENSED IN
THE STATE OF NEW YORK.



NOTE:
CONTRACTOR TO INSTALL NEW ANTENNA
AND MAKE SURE CLEARANCES ARE MET
PER MANUFACTURER'S RECOMMENDATION.

STRUCTURAL NOTE:
THE EXISTING ANTENNA MOUNTS TO BE
MODIFIED PER MOUNT ANALYSIS AND MOUNT
MODIFICATION DRAWINGS PREPARED BY
MASER CONSULTING DATED 06/11/2021.
SEE REPORT FOR ADDITIONAL DETAILS.



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BEDMINSTER, NJ 07921

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1200 MACARTHUR BLVD, SUITE 200
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TECTONIC WO: 10545.WATERFORD CT

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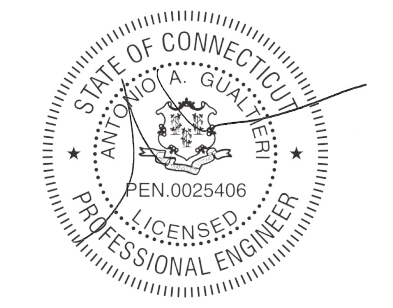
BU #: 876338
WATERFORD

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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SHEET NUMBER:
C-2

REVISION:
A

VERIZON SITE NUMBER:
325076

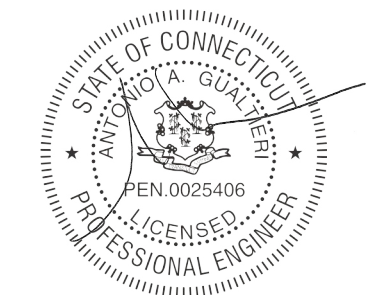
BU #: **876338**
WATERFORD

41 MANITOCK HILL ROAD
 WATERFORD, CT 06385-2000

EXISTING 136'-0"
 SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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SHEET NUMBER:
C-3

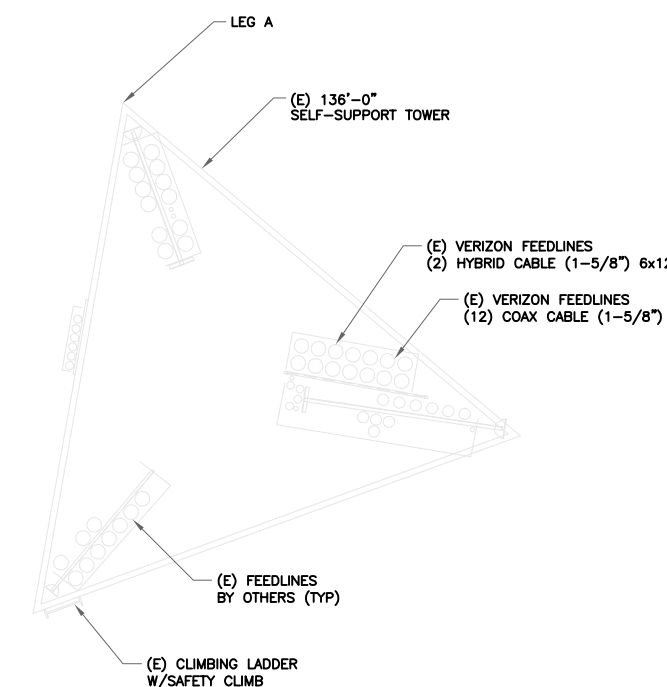
REVISION:
A

ANTENNA/RRH SCHEDULE

SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA CENTERLINE	AZIMUTH	MECHANICAL DOWNTILTS	ELECTRICAL DOWNTILTS	TOWER EQUIPMENT MANUFACTURER	TOWER EQUIPMENT QTY/MODEL
A1	NEW	JMA	MX06FRO660-03	107'-0"	30°	0°	6'/6"	RAYCAP SAMSUNG SAMSUNG JMA	RC2DC-3315-PF-48 (1) RFV01U-D1A (1) RFV01U-D2A (1) 91900314-02
A2	NEW	JMA	MX06FRO660-03	107'-0"	30°	0°	0'/0"		
A3	NEW	SAMSUNG	NL-SUB6 - MT6407-77A	107'-0"	30°	0°	3'		
A4	EXISTING	ANTEL	BXA-80063/4CF	107'-0"	30°	6°	0°		
B1	NEW	JMA	MX06FRO660-03	107'-0"	150°	0°	2'/10"	SAMSUNG SAMSUNG JMA	(1) RFV01U-D1A (1) RFV01U-D2A (1) 91900314-02
B2	NEW	JMA	MX06FRO660-03	107'-0"	150°	0°	0'/0"		
B3	NEW	SAMSUNG	NL-SUB6 - MT6407-77A	107'-0"	150°	0°	3'	SAMSUNG SAMSUNG JMA	(1) RFV01U-D1A (1) RFV01U-D2A (1) 91900314-02
B4	EXISTING	ANTEL	BXA-80063/4CF	107'-0"	150°	3°	0°		
C1	NEW	JMA	MX06FRO660-03	107'-0"	250°	0°	4'/4"	SAMSUNG SAMSUNG JMA	(1) RFV01U-D1A (1) RFV01U-D2A (1) 91900314-02
C2	NEW	JMA	MX06FRO660-03	107'-0"	250°	0°	0'/0"		
C3	NEW	SAMSUNG	NL-SUB6 - MT6407-77A	107'-0"	250°	0°	3'	SAMSUNG SAMSUNG JMA	(1) RFV01U-D1A (1) RFV01U-D2A (1) 91900314-02
C4	EXISTING	ANTEL	BXA-80063/4CF	107'-0"	270°	2°	0°		

CABLE SCHEDULE

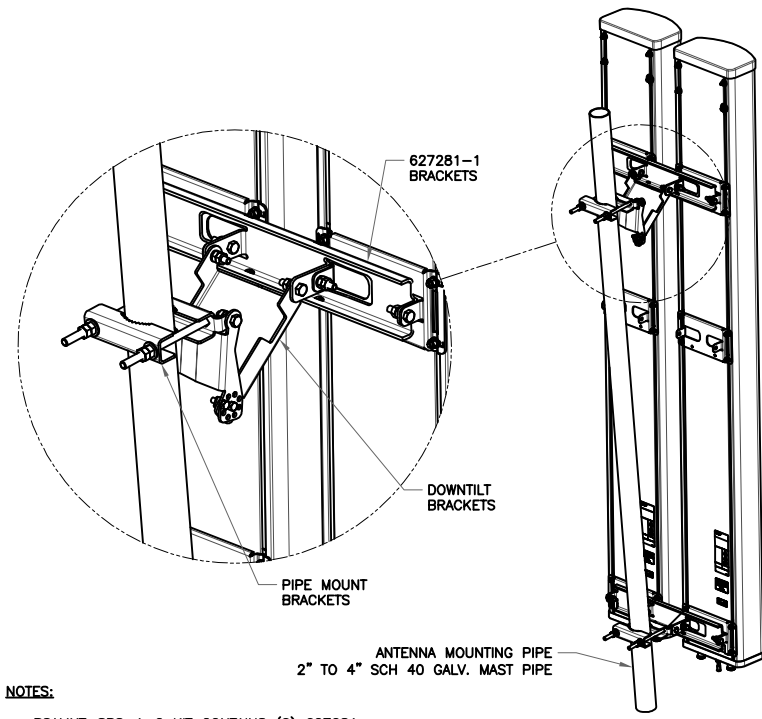
STATUS	CABLE TYPE	SIZE	LENGTH	QTY
EXISTING	COAX	1-5/8"	157'-0"±	12
EXISTING	HYBRID	1-5/8" (6x12)	157'-0"±	2
TOTAL CABLE QTY:				14



1 VERIZON TOWER EQUIPMENT SCHEDULE
 SCALE: NOT TO SCALE

2 BASE LEVEL DETAIL
 SCALE: NOT TO SCALE



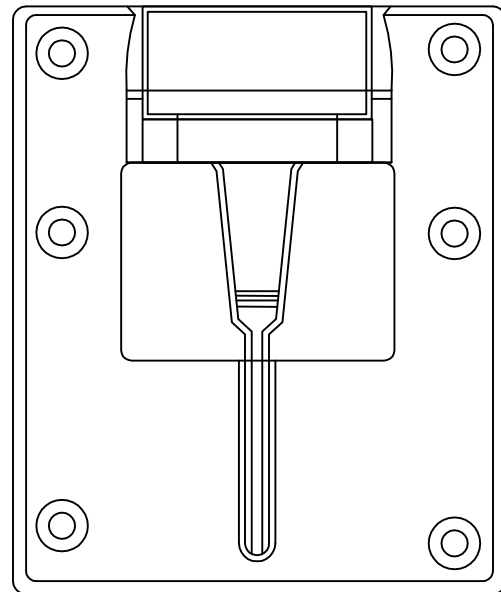


NOTES:

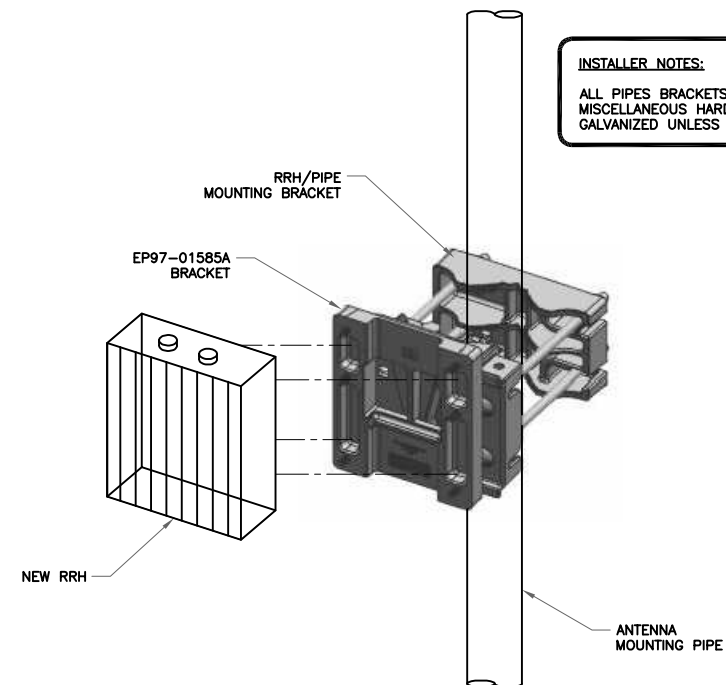
- BSAMNT-SBS-1-2 KIT CONTAINS (2) 627281 MOUNTING BRACKETS.
- TORQUE THE M10 BOLT ASSEMBLY TO 37 N.m. PER MANUFACTURE'S RECOMMENDATIONS.

1 JMA - 91900314-02
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE



3 SAMSUNG - EP97-01585A BRACKET DETAIL
SCALE: NOT TO SCALE



4 ANTENNA & RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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Newburgh, NY 12550 Phone: (845) 547-6656
TECTONIC WO: 10545, WATERFORD CT

VERIZON SITE NUMBER:
325076

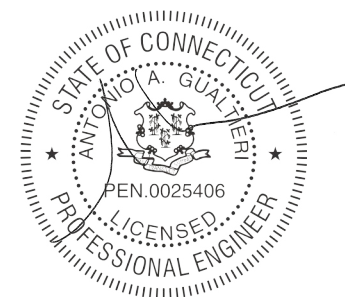
BU #: **876338**
WATERFORD

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

ISSUED FOR:

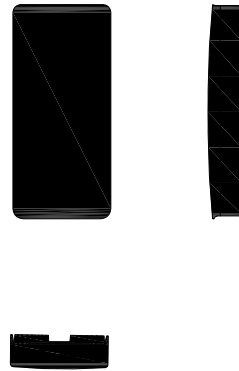
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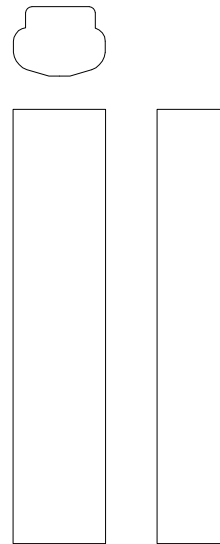
SHEET NUMBER:
C-4

REVISION:
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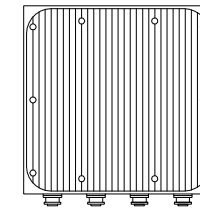
SAMSUNG – MT6407-77A (L-SUB6)
 WEIGHT : 87.1 LBS
 SIZE (HxWxD): 35.12 x 16.06 x 5.51 IN.

① SAMSUNG – MT6407-77A
 SCALE: NOT TO SCALE



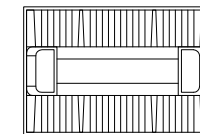
JMA – MX06FRO660-03
 WEIGHT : 60.00 LBS
 SIZE (HxWxD): 71.30 x 15.40 x 10.7 IN.

② JMA – MX06FRO660-03
 SCALE: NOT TO SCALE



SAMSUNG – B2/B66A RRH-BR049 (RFV01U-D1A)
 WEIGHT(W/O EQUIPMENT): 84.4 LBS
 SIZE (HxWxD): 15x15x10 IN.

③ SAMSUNG – B2/B66A RRH-BR049 (RFV01U-D1A)
 SCALE: NOT TO SCALE



SAMSUNG – B5/B13 RRH-BR04C (RFV01U-D2A)
 WEIGHT (W/O EQUIPMENT): 31.9 LBS
 SIZE (HxWxD): 15x15x8.1 IN.

④ SAMSUNG – B5/B13 RRH-BR04C (RFV01U-D2A)
 SCALE: NOT TO SCALE

⑤ NOT USED
 SCALE: NOT TO SCALE

⑥ NOT USED
 SCALE: NOT TO SCALE

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VERIZON SITE NUMBER:
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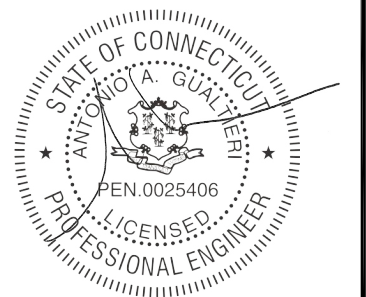
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EXISTING 136'-0"
 SELF-SUPPORT TOWER

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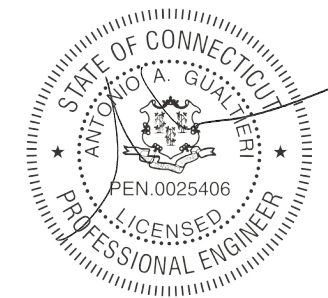
BU #: **876338**
WATERFORD

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

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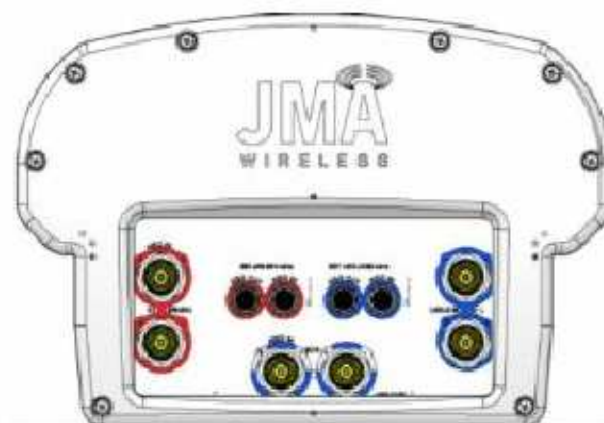
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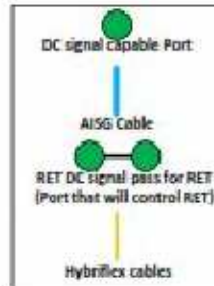
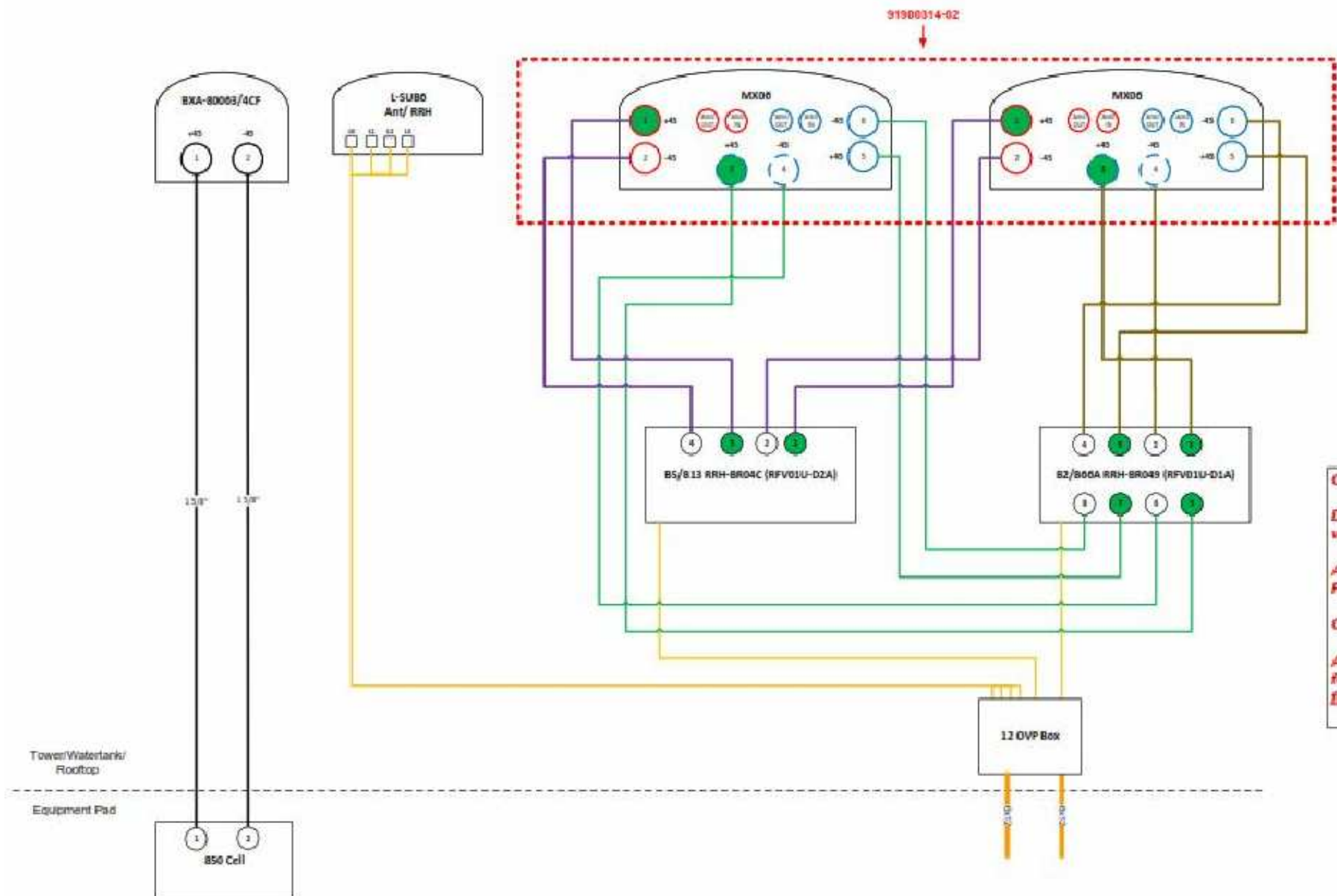
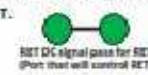
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REVISION:

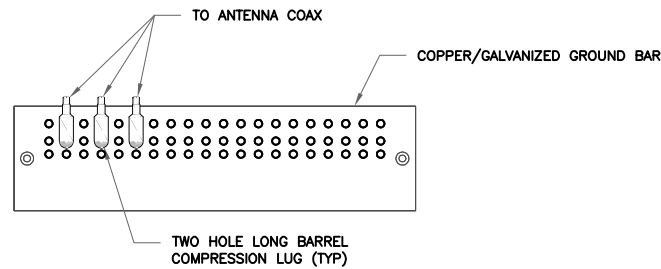
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- Port 1 & 2 are for low band (698-896 MHz).
- Port 3,4,5, & 8 are for high band (1895-2300 MHz).
- Smart Bias Tee (SBT) is through port 1 & 3 for low band and port 1 for high band.
- AISG cable is only needed when drawn in the diagrams below, if it is not drawn then SBT is enough to control all RET motors.
- Not all SBT ports are needed to control RET, only green port connection to green port will control RET.



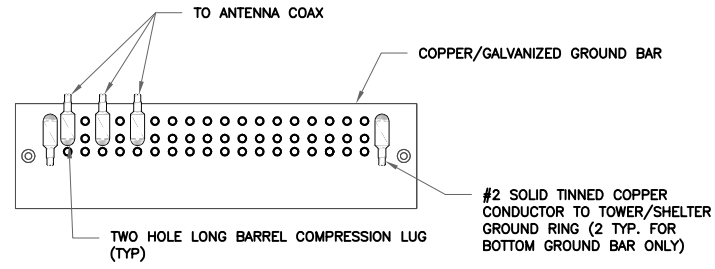
Comments:
Diagram shows antenna port configuration as viewed from below antennas.
Antenna positions are indicated as viewed from IN FRONT of antennas.
Cap and weatherproof unused antenna ports.
All plumbing diagram colors are irrelevant except for AISG & Hybridflex cable. (For the coax colors follow Coax Colors guide above)



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

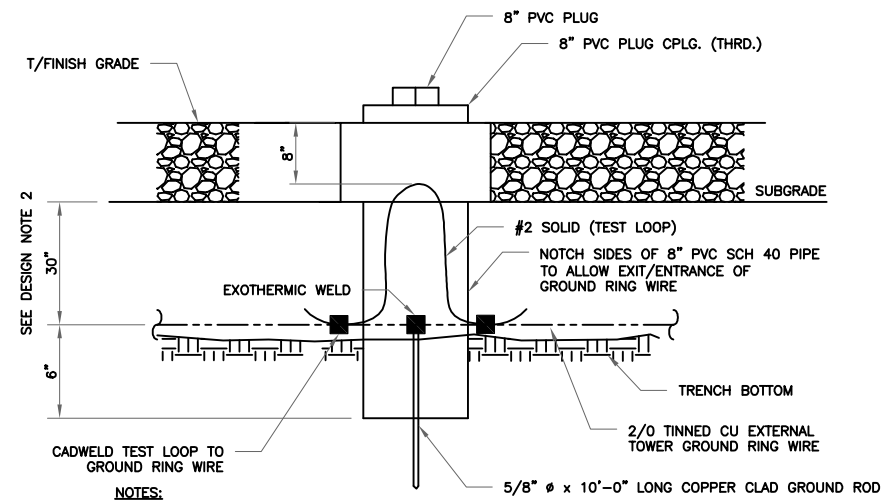
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

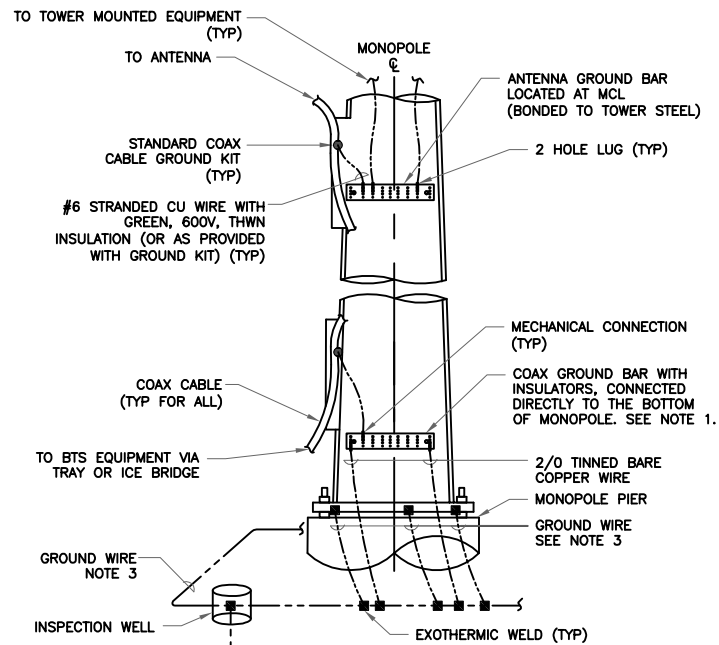
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

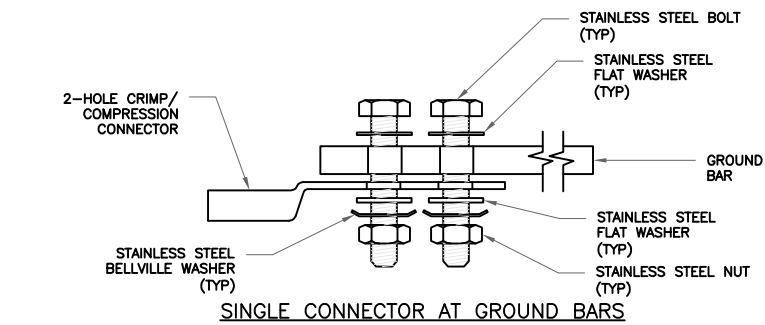
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



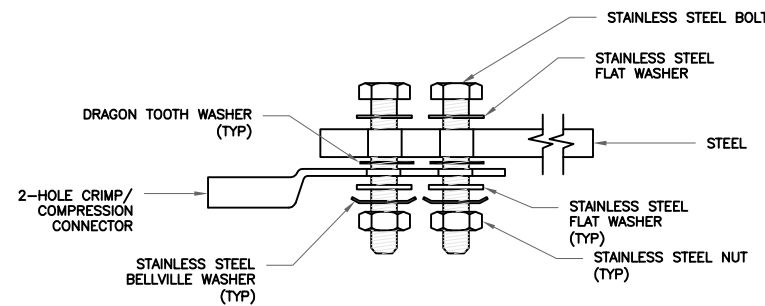
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

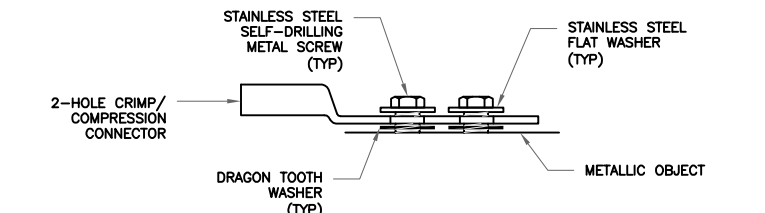
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

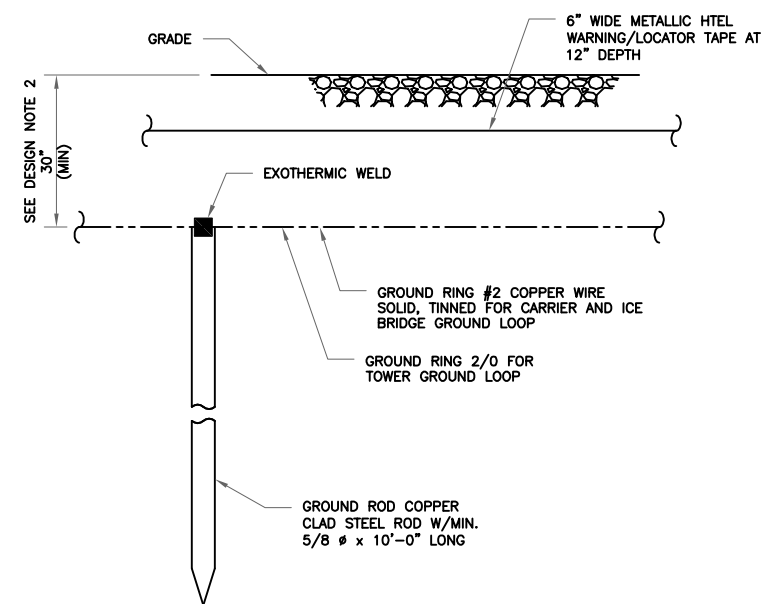


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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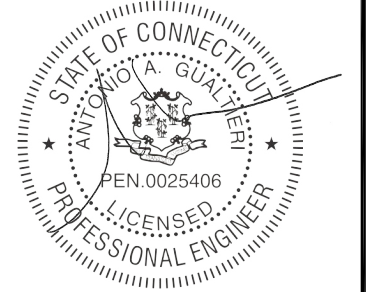
BU #: 876338
WATERFORD

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WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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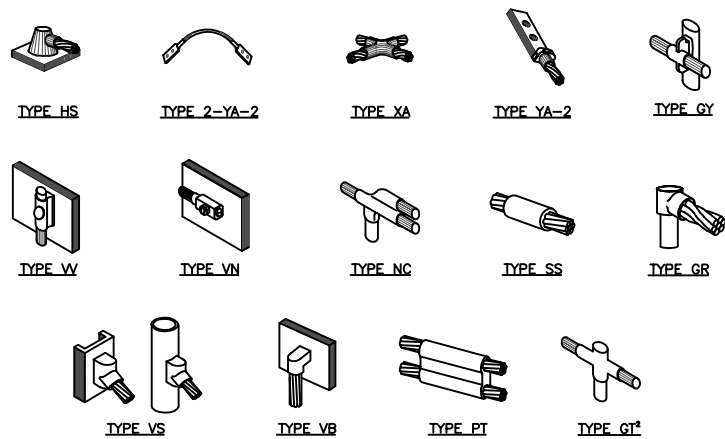
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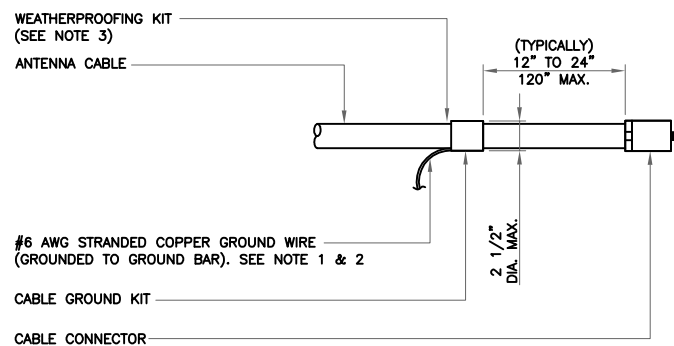
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NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

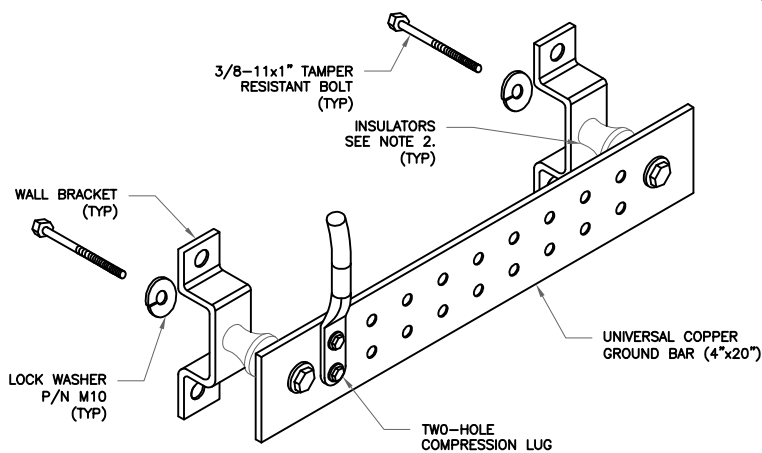
1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

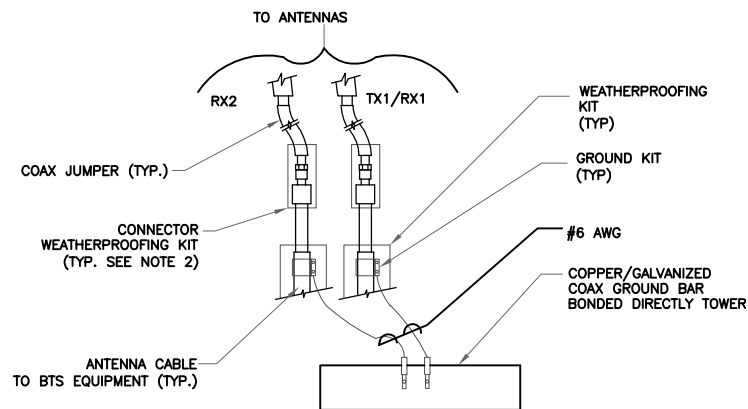
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

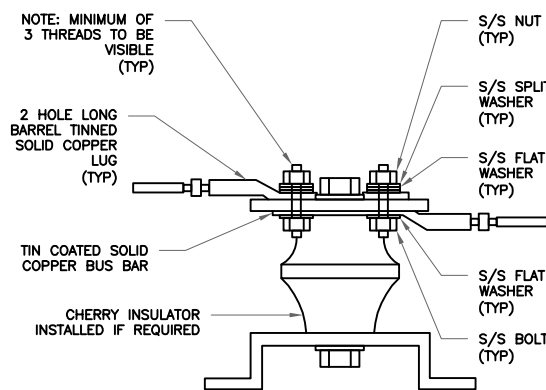
6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

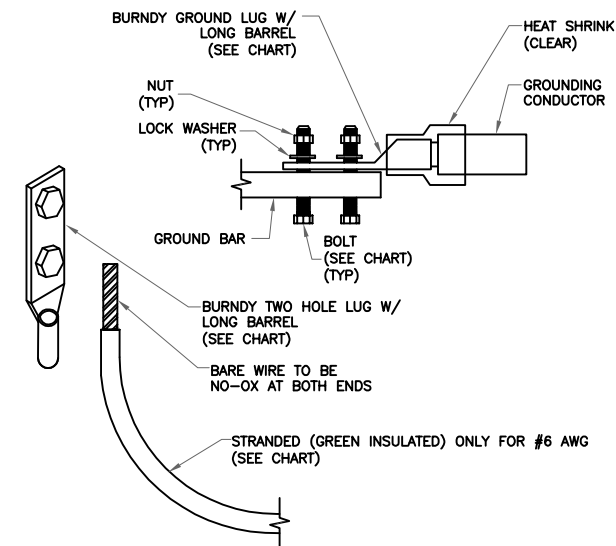
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

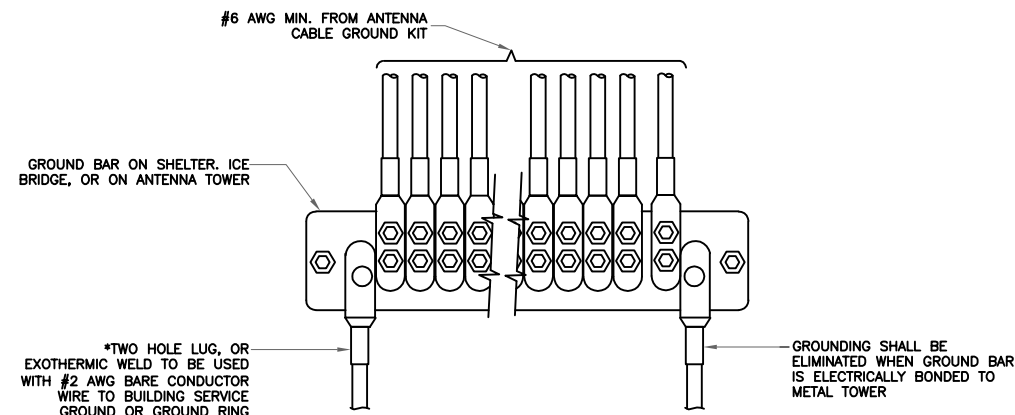
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



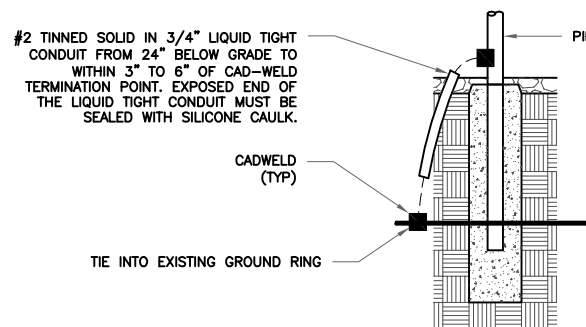
NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

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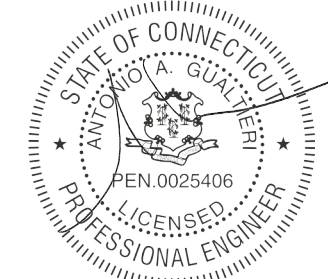
BU #: **876338**
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41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

EXISTING 136'-0"
SELF-SUPPORT TOWER

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Exhibit D

Structural Analysis Report



MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 379-8500

Date: **May 08, 2021**

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 467304
Site Name: Waterford 2 CT

Crown Castle Designation: **BU Number:** 876338
Site Name: Waterford
JDE Job Number: 644636
Work Order Number: 1953815
Order Number: 552701 Rev. 0

Engineering Firm Designation: **Morrison Hershfield Project Number:** CN8-185 / 2101398

Site Data: **41 Manitock Hill Road, Waterford, New London County, CT 06385-2000**
Latitude 41° 21' 16.7", Longitude -72° 9' 1.6"
136 Foot - Self Support Tower

Morrison Hershfield is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity (73.6%)**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer



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1) INTRODUCTION

This tower is a 136 ft Self Support tower designed by PiROD Manufactures, Inc.

The tower has been modified per reinforcement drawings prepared by Vertical Structures, Inc. in January 2009. Reinforcement consists of secondary horizontal members between the elevations 90' and 95' and 1-1/4" tie-rod assemblies for tower legs from 80' to 90'.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
107.0	107.0	3	antel	BXA-80063/4CF	14	1-5/8
		6	jma wireless	MX06FRO660-03 w/ Mount Pipe		
		3	vzw	Sub6 Antenna - VZS01 w/ Mount Pipe		
		3	samsung	RFV01U-D1A		
		3	samsung	RFV01U-D2A		
		1	commscope	RC2DC-3315-PF-48		
		1	-	Sector Mount [SM 402-3]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136.0	137.0	3	alcatel lucent	TD-RRH8X20-25	4	1-1/4
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
	136.0	1	-	Platform Mount [LP 405-1]		
134.0	136.0	3	rfs celwave	IBC1900BB-1	-	-
		3	rfs celwave	IBC1900HG-2A		
	134.0	1	-	Side Arm Mount [SO 104-3]		
		3	alcatel lucent	1900MHZ RRH (65MHZ)		
		3	alcatel lucent	800MHZ 2X50W RRH W/FILTER		
127.0	127.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4
		1	-	Sector Mount [SM 411-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
117.0	119.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	9	1-5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
	117.0	3	site pro 1	12' HD V-Frame [#VFA12-HD]		
97.0	97.0	1	-	Sector Mount [SM 504-3]	2 2 2 6	3/8 5/8 7/8 1-1/4
		1	cci antennas	DMP65R-BU4D w/ Mount Pipe		
		1	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU8D w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		6	powerwave technologies	LGP21401		
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
87.0	89.0	3	kathrein	800 10504 w/ Mount Pipe	6	7/8
	87.0	1	-	Sector Mount [SM 104-3]		
80.0	81.0	1	gps	GPS_A	1	1/2
	80.0	1	-	Side Arm Mount [SO 701-1]		
72.0	72.0	2	gps	GPS_A	2	1/2
		2	-	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2035622	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2068030	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1441523	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2125417	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	136 - 133.625	Leg	1 1/2	2	-3.068	54.734	5.6	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.584	49.844	9.2	Pass
T3	130 - 110	Leg	2	29	-38.714	117.047	33.1	Pass
T4	110 - 94.9427	Leg	2 1/4	108	-82.276	156.330	52.6	Pass
T5	94.9427 - 92.5938	Leg	2 1/4	150	-90.868	179.339	50.7	Pass
T6	92.5938 - 90	Leg	2 1/4	162	-103.594	185.754	55.8	Pass
T7	90 - 80	Leg	PIRod 105244 w/ (2) 1-1/4" Tie Rod	175	-111.957	249.511	44.9	Pass
T8	80 - 60	Leg	PiRod 105217	184	-156.832	225.602	69.5	Pass
T9	60 - 40	Leg	PiRod 105218	199	-194.856	315.715	61.7	Pass
T10	40 - 20	Leg	PiRod 105218	214	-228.454	315.715	72.4	Pass
T11	20 - 0	Leg	PiRod 105219	229	-259.543	419.861	61.8	Pass
T1	136 - 133.625	Diagonal	3/4	7	-1.006	5.771	17.4	Pass
T2	133.625 - 130	Diagonal	3/4	25	-1.559	5.881	26.5	Pass
T3	130 - 110	Diagonal	7/8	40	-4.177	9.765	42.8	Pass
T4	110 - 94.9427	Diagonal	1	116	-5.699	14.703	38.8	Pass
T5	94.9427 - 92.5938	Diagonal	1	156	-6.059	14.412	42.0	Pass
T6	92.5938 - 90	Diagonal	1	171	-7.094	14.874	47.7	Pass
T7	90 - 80	Diagonal	L3x3x3/16	183	-8.127	25.342	32.1 73.6 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	191	-6.699	14.567	46.0 65.8 (b)	Pass
T9	60 - 40	Diagonal	L3x3x3/16	202	-6.378	20.182	31.6 54.3 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	217	-6.707	16.112	41.6 54.1 (b)	Pass
T11	20 - 0	Diagonal	L3x3x5/16	232	-9.031	20.965	43.1	Pass
T2	133.625 - 130	Horizontal	3/4	16	-0.233	3.477	6.7	Pass
T3	130 - 110	Horizontal	3/4	43	-0.732	2.875	25.4	Pass
T5	94.9427 -	Secondary	1 1/2	158	-1.574	50.442	3.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
	92.5938	Horizontal						
T6	92.5938 - 90	Secondary Horizontal	1 1/2	173	-1.794	49.847	3.6	Pass
T1	136 - 133.625	Top Girt	6x3/8	4	-0.720	5.142	14.0	Pass
T3	130 - 110	Top Girt	7/8	31	-0.732	6.540	11.2	Pass
T4	110 - 94.9427	Top Girt	1	109	-1.773	8.776	20.2	Pass
T2	133.625 - 130	Bottom Girt	7/8	19	-0.659	6.442	10.2	Pass
T3	130 - 110	Bottom Girt	7/8	34	-1.768	5.181	34.1	Pass
T6	92.5938 - 90	Bottom Girt	1	164	-1.794	7.169	25.0	Pass
							Summary	
							Leg (T10)	72.4 Pass
							Diagonal (T7)	73.6 Pass
							Horizontal (T3)	25.4 Pass
							Secondary Horizontal (T6)	3.6 Pass
							Top Girt (T4)	20.2 Pass
							Bottom Girt (T3)	34.1 Pass
							Bolt Checks	70.1 Pass
							Rating =	73.6 Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.6	Pass
1	Base Foundation (Structure)	0	21.4	Pass
1	Base Foundation (Soil Interaction)		72.4	Pass

Structure Rating (max from all components) =	73.6%*
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) *Rating per TIA-222-H, Section 15.5.

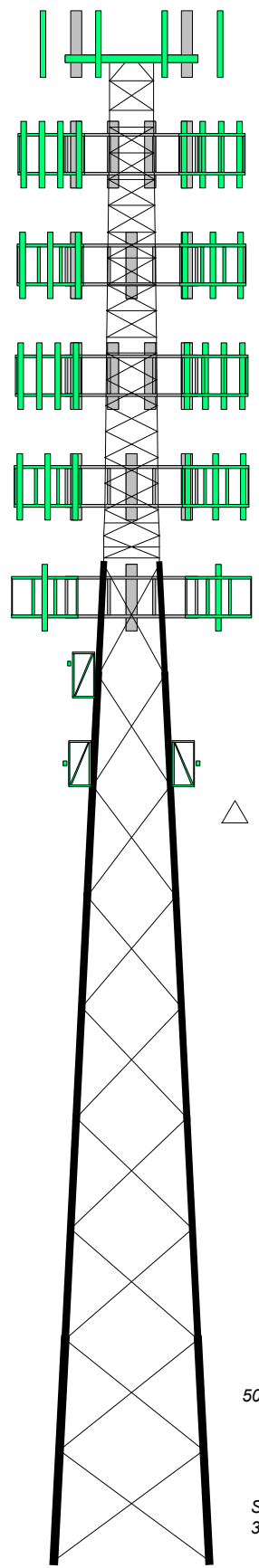
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P1rod 105218	P1rod 105217	A572-50	A	SR 2 1/4	SR 2	SR 1 1/2	SR 2	SR 1 1/2	SR 1 1/2
Leg Grade	L3x3x3/16	L3x3x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16	SR 1	SR 7/8	SR 3/4	SR 7/8	SR 3/4	SR 3/4
Diagonal Grade	A36	A36	A572-50	A572-50	SR 1	SR 7/8	SR 3/4	SR 7/8	SR 3/4	SR 3/4
Top Girts	N.A.	N.A.	N.A.	N.A.	SR 1	SR 7/8	N.A.	SR 7/8	N.A.	B
Bottom Girts	N.A.	N.A.	N.A.	N.A.	C	SR 7/8	SR 3/4	SR 7/8	N.A.	N.A.
Horizontal	N.A.	N.A.	N.A.	N.A.	SR 1 1/2	SR 1 1/2	N.A.	SR 1 1/2	N.A.	N.A.
Sec. Horizontals	N.A.	N.A.	N.A.	N.A.	SR 1 1/2	SR 1 1/2	N.A.	SR 1 1/2	N.A.	N.A.
Face Width (ft)	12	10	8	6	4.5	4.5	4.5	4.5	4.5	4
# Panels @ (ft)	14	10	8	6	6 @ 2.34983	6 @ 2.34983	6 @ 2.34983	6 @ 2.34983	6 @ 2.34983	6 @ 2.34983
Weight (K)	17.3	4.5	2.9	2.2	1.4	1.4	1.4	1.4	1.4	0.2

136.0 ft
133.6 ft
130.0 ft
110.0 ft
94.9 ft
92.6 ft
90.0 ft
80.0 ft
60.0 ft
40.0 ft
20.0 ft
0.0 ft



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	PIRod 105244 w/ (2) 1-1/4" Tie Rod	E	1 @ 2.625
B	6x3/8	F	1 @ 2.34896
C	SR 1	G	1 @ 2.01042
D	1 @ 2.375		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

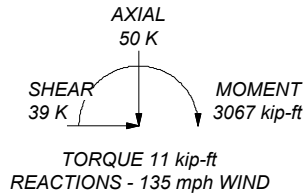
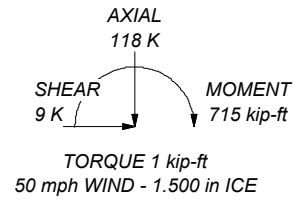
1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0'
8. TOWER RATING: 73.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 270 K
SHEAR: 27 K

UPLIFT: -238 K
SHEAR: 24 K



Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501

Job: CN8-185 / 2101398		
Project: 876338 / Waterford		
Client: Crown Castle USA	Drawn by: CKK	App'd:
Code: TIA-222-H	Date: 05/08/21	Scale: NTS
Path:	Dwg No. E-1	

C:\Users\CKK\OneDrive\CN8-185 - 876338 - WATERFORD\CN8-185 BU - 876338 W0 - 192381.dwg

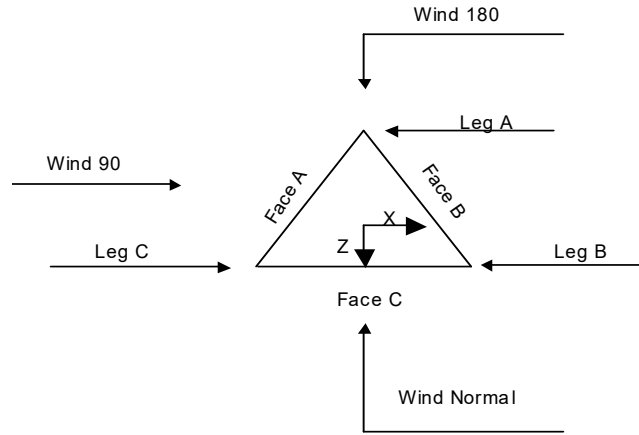
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136' above the ground line.
 The base of the tower is set at an elevation of 0' above the ground line.
 The face width of the tower is 4' at the top and 14' at the base.
 This tower is designed using the TIA-222-H standard.
 The following design criteria apply:

- Tower is located in New London County, Connecticut.
- Tower base elevation above sea level: 242'.
- Basic wind speed of 135 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0'.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile ✓ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section ✓ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area ✓ Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules ✓ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA ✓ SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque ✓ Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	136'-133'7-1/2"			4'	1	2'4-1/2"
T2	133'7-1/2"-130'			4'	1	3'7-1/2"
T3	130'-110'			4'	1	20'
T4	110'-94'11-5/16"			4'6"	1	15'11/16"
T5	94'11-5/16"-92'7-1/8"			4'10-1/2"	1	2'4-3/16"
T6	92'7-1/8"-90'			4'11-7/32"	1	2'7-1/8"
T7	90'-80'			5'	1	10'
T8	80'-60'			6'	1	20'
T9	60'-40'			8'	1	20'
T10	40'-20'			10'	1	20'
T11	20'-0'			12'	1	20'

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	136'-133'7-1/2"	2'4-1/2"	K Brace Down	No	Yes	0.000	0.000
T2	133'7-1/2"-130'	2'7-1/2"	X Brace	No	Yes	0.000	12.000
T3	130'-110'	2'4-1/2"	X Brace	No	Yes	6.000	6.000
T4	110'-94'11-5/16"	2'4-3/16"	X Brace	No	No	11.500	0.000
T5	94'11-5/16"-92'7-1/8"	2'4-3/16"	X Brace	No	Yes	0.000	0.000
T6	92'7-1/8"-90'	2'1/8"	X Brace	No	Yes	0.000	7.000
T7	90'-80'	10'	X Brace	No	No	0.000	0.000
T8	80'-60'	10'	X Brace	No	No	0.000	0.000

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T9	60'-40'	10'	X Brace	No	No	0.000	0.000
T10	40'-20'	10'	X Brace	No	No	0.000	0.000
T11	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136'-133'7-1/2"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 133'7-1/2"-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-94'11-5/16"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 94'11-5/16"-92'7-1/8"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 90'-80'	Truss Leg	PIRod 105244 w/ (2) 1-1/4" Tie Rod	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 80'-60'	Truss Leg	PiRod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 60'-40'	Truss Leg	PiRod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 40'-20'	Truss Leg	PiRod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 20'-0'	Truss Leg	PiRod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136'-133'7-1/2"	Flat Bar	6x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 133'7-1/2"-130'	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-94'11-5/16"	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136'-133'7-1/2"	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 133'7-1/2"-130'	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T5 94'11-5/16"-92'7-1/8"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 136'-133'7-1/2"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 133'7-1/2"-130'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 130'-110'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 110'-94'11-5/16"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 94'11-5/16"-92'7-1/8"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 92'7-1/8"-90'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 90'-80'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 80'-60'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 60'-40'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 40'-20'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T11 20'-0'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry (cont'd)

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
				X	X	X	X	X	X	X
				Y	Y	Y	Y	Y	Y	Y

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹								
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
				X Y	X Y						X Y
T1 136'-133'7-1/2"	No	Yes	1	1	1	1	1	1	1	1	1
T2 133'7-1/2"-130'	No	Yes	1	1	1	1	1	1	1	1	1
T3 130'-110'	No	Yes	1	1	1	1	1	1	1	1	1
T4 110'-94'11-5/16"	No	Yes	1	1	1	1	1	1	1	1	1
T5 94'11-5/16"-92'7-1/8"	No	Yes	1	1	1	1	1	1	1	0.5	1
T6 92'7-1/8"-90'	No	Yes	1	1	1	1	1	1	1	0.5	1
T7 90'-80'	Yes	No	1	1	1	1	1	1	1	1	1
T8 80'-60'	Yes	No	1	1	1	1	1	1	1	1	1
T9 60'-40'	Yes	No	1	1	1	1	1	1	1	1	1
T10 40'-20'	Yes	No	1	1	1	1	1	1	1	1	1
T11 20'-0'	Yes	No	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry (cont'd)

Tower Elevation ft	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T7 90'-80'	1.29	0.5	0.85	1	1	1
T8 80'-60'	1	0.5	0.85	1	1	1
T9 60'-40'	1	0.5	0.85	1	1	1
T10 40'-20'	1	0.5	0.85	1	1	1
T11 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136'-133'7-1/2"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	1
T2 133'7-1/2"-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	1
T3 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T4 110'-94'11-5/16"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T5 94'11-5/16"-92'7-1/8"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T6 92'7-1/8"-90'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T7 90'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T8 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T9 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T10 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T11 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136'-133'7-1/2"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 133'7-1/2"-130'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 130'-110'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 110'-94'11-5/16"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 94'11-5/16"-92'7-1/8"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 92'7-1/8"-90'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 90'-80'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 80'-60'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 60'-40'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 40'-20'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 20'-0'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136'-133'7-1/2"	Flange	0.625	0	0.000	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2 133'7-1/2"-130'	Sleeve DS	0.625	5	0.000	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3 130'-110'	Sleeve DS	0.750	5	0.000	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4 110'-94'11-5/16"	Flange	0.000	0	0.000	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5 94'11-5/16"-92'7-1/8"	Flange	0.000	0	0.000	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6 92'7-1/8"-90'	Flange	1.000	6	0.000	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 90'-80'	Flange	1.000	6	1.000	1	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8 80'-60'	Flange	1.000	6	1.000	1	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9 60'-40'	Flange	1.000	6	1.000	1	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T10 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0
T11 20'-0'	Flange	1.250 A-687	0	1.250 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	97' - 0'	-9.000	0.4	6	6	0.850 0.750	1.550		0.001
WR-VG86ST-BRDA(7/8)	C	No	No	Ar (CaAa)	97' - 0'	-5.000	-0.35	6	3	0.850 0.750	0.880		0.001
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Ar (CaAa)	136' - 0'	-5.000	-0.4	4	3	0.850 0.750	1.540		0.001
FLC 12-50J(1/2")	C	No	No	Ar (CaAa)	80' - 0'	-5.000	-0.47	1	1	0.850 0.750	0.640		0.000
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	107' - 0'	-4.000	0.37	14	7	0.850 0.750	1.980		0.001
T-Brackets*	B	No	No	Af (CaAa)	136' - 0'	-7.000	0.4	1	1	1.000	1.000		0.008
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	127' - 0'	-5.000	-0.4	6	6	0.850 0.750	1.550		0.001
LDF6-50A(1-1/4)	A	No	No	Ar (CaAa)	127' - 0'	-5.000	0.4	6	6	0.850 0.750	1.550		0.001
LDF4-50A(1/2")	A	No	No	Ar (CaAa)	72' - 0'	-9.000	0.4	2	2	0.850 0.750	0.630		0.000
T-Brackets*	A	No	No	Af (CaAa)	127' - 0'	-7.000	0.4	1	1	1.000	1.000		0.008
LDF7-50A(1-5/8")	C	No	No	Ar (CaAa)	117' - 0'	-5.000	0.4	7	7	0.850 0.750	1.980		0.001
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	117' - 0'	-5.000	-0.4	2	2	0.850 0.750	1.980		0.001
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	117' - 0'	-3.000	-0.45	1	1	0.850 0.750	1.980		0.001
T-Brackets*	C	No	No	Af (CaAa)	117' - 0'	-5.000	0.4	1	1	1.000	1.000		0.008
FXL 780 PE(7/8)	A	No	No	Ar (CaAa)	87' - 0'	0.000	0	6	6	1.000	1.090		0.000
LDF1-50A(1/4)	A	No	No	Ar (CaAa)	87' - 0'	0.000	0.1	1	1	0.345	0.345		0.000
Feedline Ladder (Af)*	A	No	No	Af (CaAa)	87' - 0'	0.000	0	1	1	3.000	3.000		0.008
Safety Line 3/8	C	No	No	Ar (CaAa)	90' - 0'	0.000	0.48	1	1	0.375	0.375		0.000
Safety Line 3/8	C	No	No	Ar (CaAa)	136' - 90'	0.000	0	1	1	0.375	0.375		0.000
Ladder Rung SR 3/4 (48"w 26"s)***	C	No	No	Af (CaAa)	136' - 90'	0.000	0	1	1	1.350	1.350		0.003

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} A _A ft ² /ft	Weight klf

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} A _A In Face ft ²	C _{AA} A _A Out Face ft ²	Weight K
T1	136'-133'7-1/2"	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.237	0.000	0.020
		C	0.000	0.000	2.086	0.000	0.019
T2	133'7-1/2"-130'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.362	0.000	0.030
		C	0.000	0.000	3.185	0.000	0.028
T3	130'-110'	A	0.000	0.000	21.668	0.000	0.221
		B	0.000	0.000	17.810	0.000	0.229
		C	0.000	0.000	27.972	0.000	0.255
T4	110'-94'11-5/16"	A	0.000	0.000	24.453	0.000	0.218
		B	0.000	0.000	50.845	0.000	0.327
		C	0.000	0.000	36.689	0.000	0.339
T5	94'11-5/16"-92'7-1/8"	A	0.000	0.000	3.815	0.000	0.034
		B	0.000	0.000	11.115	0.000	0.064
		C	0.000	0.000	6.794	0.000	0.061
T6	92'7-1/8"-90'	A	0.000	0.000	4.212	0.000	0.038
		B	0.000	0.000	12.274	0.000	0.070
		C	0.000	0.000	7.502	0.000	0.068
T7	90'-80'	A	0.000	0.000	24.560	0.000	0.214
		B	0.000	0.000	47.320	0.000	0.271
		C	0.000	0.000	26.675	0.000	0.233
T8	80'-60'	A	0.000	0.000	57.762	0.000	0.492
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T9	60'-40'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T10	40'-20'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T11	20'-0'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} A _A In Face ft ²	C _{AA} A _A Out Face ft ²	Weight K
T1	136'-133'7-1/2"	A	1.468	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.935	0.000	0.030
		C		0.000	0.000	5.421	0.000	0.076
T2	133'7-1/2"-130'	A	1.464	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.424	0.000	0.046
		C		0.000	0.000	8.266	0.000	0.115
T3	130'-110'	A	1.451	0.000	0.000	54.251	0.000	0.789
		B		0.000	0.000	44.019	0.000	0.695
		C		0.000	0.000	67.729	0.000	0.976
T4	110'-94'11-5/16"	A	1.428	0.000	0.000	62.120	0.000	0.853
		B		0.000	0.000	76.949	0.000	1.315
		C		0.000	0.000	84.094	0.000	1.238
T5	94'11-5/16"-92'7-1/8"	A	1.415	0.000	0.000	9.660	0.000	0.132
		B		0.000	0.000	17.628	0.000	0.282

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T6	92'7-1/8"-90'	C		0.000	0.000	15.347	0.000	0.225
		A	1.412	0.000	0.000	10.656	0.000	0.146
		B		0.000	0.000	19.454	0.000	0.311
T7	90'-80'	C		0.000	0.000	16.931	0.000	0.248
		A	1.402	0.000	0.000	61.648	0.000	0.842
		B		0.000	0.000	74.889	0.000	1.194
T8	80'-60'	C		0.000	0.000	60.061	0.000	0.872
		A	1.375	0.000	0.000	148.944	0.000	1.963
		B		0.000	0.000	149.168	0.000	2.358
T9	60'-40'	C		0.000	0.000	126.149	0.000	1.789
		A	1.329	0.000	0.000	152.949	0.000	1.949
		B		0.000	0.000	148.143	0.000	2.308
T10	40'-20'	C		0.000	0.000	124.697	0.000	1.743
		A	1.263	0.000	0.000	150.168	0.000	1.867
		B		0.000	0.000	146.653	0.000	2.236
T11	20'-0'	C		0.000	0.000	122.585	0.000	1.678
		A	1.132	0.000	0.000	144.660	0.000	1.709
		B		0.000	0.000	143.705	0.000	2.096
		C		0.000	0.000	118.399	0.000	1.552

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
T1	136'-133'7-1/2"	2.671	1.764	2.035	1.873
T2	133'7-1/2"-130'	5.484	3.425	3.341	2.987
T3	130'-110'	-0.035	-5.377	-0.011	-2.511
T4	110'-94'11-5/16"	-1.125	-0.799	-2.039	-0.428
T5	94'11-5/16"-92'7-1/8"	1.605	1.595	0.119	1.292
T6	92'7-1/8"-90'	1.599	1.568	0.106	1.116
T7	90'-80'	0.401	0.485	-1.066	0.086
T8	80'-60'	0.415	-0.061	-1.150	-0.635
T9	60'-40'	0.625	-0.434	-1.430	-1.382
T10	40'-20'	0.819	-0.667	-1.724	-1.879
T11	20'-0'	0.986	-0.873	-1.940	-2.366

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	3	HB114-21U3M12-XXXF(1-1/4)	133.63 - 136.00	0.6000	0.3616
T1	6	T-Brackets	133.63 - 136.00	0.6000	0.3616
T1	23	Safety Line 3/8	133.63 - 136.00	0.6000	0.3616
T1	24	Ladder Rung SR 3/4 (48"w 26"s)	133.63 - 136.00	0.6000	0.3616
T2	3	HB114-21U3M12-XXXF(1-1/4)	130.00 - 133.63	0.6000	0.4840
T2	6	T-Brackets	130.00 - 133.63	0.6000	0.4840
T2	23	Safety Line 3/8	130.00 - 133.63	0.6000	0.4840
T2	24	Ladder Rung SR 3/4 (48"w 26"s)	130.00 - 133.63	0.6000	0.4840

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T3	3	HB114-21U3M12-XXXF(1-1/4)	110.00 - 130.00	0.6000	0.4344
T3	6	T-Brackets	110.00 - 130.00	0.6000	0.4344
T3	8	LDF6-50A(1-1/4)	110.00 - 127.00	0.6000	0.4344
T3	9	LDF6-50A(1-1/4)	110.00 - 127.00	0.6000	0.4344
T3	11	T-Brackets	110.00 - 127.00	0.6000	0.4344
T3	13	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	14	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	15	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	16	T-Brackets	110.00 - 117.00	0.6000	0.4344
T3	23	Safety Line 3/8	110.00 - 130.00	0.6000	0.4344
T3	24	Ladder Rung SR 3/4 (48"w 26"s)	110.00 - 130.00	0.6000	0.4344
T4	1	LDF6-50A(1-1/4)	94.94 - 97.00	0.6000	0.5497
T4	2	WR-VG86ST-BRDA(7/8)	94.94 - 97.00	0.6000	0.5497
T4	3	HB114-21U3M12-XXXF(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	5	LDF7-50A(1-5/8")	94.94 - 107.00	0.6000	0.5497
T4	6	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	8	LDF6-50A(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	9	LDF6-50A(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	11	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	13	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	14	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	15	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	16	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	23	Safety Line 3/8	94.94 - 110.00	0.6000	0.5497
T4	24	Ladder Rung SR 3/4 (48"w 26"s)	94.94 - 110.00	0.6000	0.5497
T5	1	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	2	WR-VG86ST-BRDA(7/8)	92.59 - 94.94	0.6000	0.4214
T5	3	HB114-21U3M12-XXXF(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	5	LDF7-50A(1-5/8")	92.59 - 94.94	0.6000	0.4214
T5	6	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	8	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	9	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	11	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	13	LDF7-50A(1-5/8")	92.59 - 94.94	0.6000	0.4214
T5	14	LDF7-50A(1-5/8")	92.59 -	0.6000	0.4214

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T5	15	LDF7-50A(1-5/8")	94.94 92.59 - 94.94	0.6000	0.4214
T5	16	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	23	Safety Line 3/8	92.59 - 94.94	0.6000	0.4214
T5	24	Ladder Rung SR 3/4 (48"w 26"s)	92.59 - 94.94	0.6000	0.4214
T6	1	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	2	WR-VG86ST-BRDA(7/8)	90.00 - 92.59	0.6000	0.3574
T6	3	HB114-21U3M12-XXXF(1- 1/4)	90.00 - 92.59	0.6000	0.3574
T6	5	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	6	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	8	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	9	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	11	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	13	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	14	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	15	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	16	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	23	Safety Line 3/8	90.00 - 92.59	0.6000	0.3574
T6	24	Ladder Rung SR 3/4 (48"w 26"s)	90.00 - 92.59	0.6000	0.3574
T7	1	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	2	WR-VG86ST-BRDA(7/8)	80.00 - 90.00	0.6000	0.3989
T7	3	HB114-21U3M12-XXXF(1- 1/4)	80.00 - 90.00	0.6000	0.3989
T7	5	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	6	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	8	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	9	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	11	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	13	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	14	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	15	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	16	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	18	FXL 780 PE(7/8)	80.00 - 87.00	0.6000	0.3989
T7	19	LDF1-50A(1/4)	80.00 - 87.00	0.6000	0.3989
T7	20	Feedline Ladder (Af)	80.00 - 87.00	0.6000	0.3989
T7	22	Safety Line 3/8	80.00 - 90.00	0.6000	0.3989

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	1	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	2	WR-VG86ST-BRDA(7/8)	60.00 - 80.00	0.6000	0.4754
T8	3	HB114-21U3M12-XXXF(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	4	FLC 12-50J(1/2")	60.00 - 80.00	0.6000	0.4754
T8	5	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	6	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	8	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	9	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	10	LDF4-50A(1/2")	60.00 - 72.00	0.6000	0.4754
T8	11	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	13	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	14	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	15	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	16	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	18	FXL 780 PE(7/8)	60.00 - 80.00	0.6000	0.4754
T8	19	LDF1-50A(1/4)	60.00 - 80.00	0.6000	0.4754
T8	20	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.4754
T8	22	Safety Line 3/8	60.00 - 80.00	0.6000	0.4754
T9	1	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	2	WR-VG86ST-BRDA(7/8)	40.00 - 60.00	0.6000	0.5541
T9	3	HB114-21U3M12-XXXF(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	4	FLC 12-50J(1/2")	40.00 - 60.00	0.6000	0.5541
T9	5	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	6	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	8	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	9	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	10	LDF4-50A(1/2")	40.00 - 60.00	0.6000	0.5541
T9	11	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	13	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	14	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	15	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	16	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	18	FXL 780 PE(7/8)	40.00 - 60.00	0.6000	0.5541
T9	19	LDF1-50A(1/4)	40.00 - 60.00	0.6000	0.5541
T9	20	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5541

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	22	Safety Line 3/8	60.00 40.00 - 60.00	0.6000	0.5541
T10	1	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	2	WR-VG86ST-BRDA(7/8)	20.00 - 40.00	0.6000	0.6000
T10	3	HB114-21U3M12-XXXF(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	4	FLC 12-50J(1/2")	20.00 - 40.00	0.6000	0.6000
T10	5	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	6	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	8	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	9	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	10	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T10	11	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	13	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	14	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	15	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	16	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	18	FXL 780 PE(7/8)	20.00 - 40.00	0.6000	0.6000
T10	19	LDF1-50A(1/4)	20.00 - 40.00	0.6000	0.6000
T10	20	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	22	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T11	1	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	2	WR-VG86ST-BRDA(7/8)	0.00 - 20.00	0.6000	0.6000
T11	3	HB114-21U3M12-XXXF(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	4	FLC 12-50J(1/2")	0.00 - 20.00	0.6000	0.6000
T11	5	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	6	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	8	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	9	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	10	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T11	11	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	13	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	14	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	15	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	16	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	18	FXL 780 PE(7/8)	0.00 - 20.00	0.6000	0.6000
T11	19	LDF1-50A(1/4)	0.00 - 20.00	0.6000	0.6000
T11	20	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	22	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
TD-RRH8X20-25	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
TD-RRH8X20-25	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
TD-RRH8X20-25	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
6' x 2" Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
Platform Mount [LP 405-1]	C	None			0.000	136'	No Ice	20.880	20.880	1.800
							1/2" Ice	28.890	28.890	2.277
							1" Ice	37.040	37.040	2.868
							2" Ice	53.730	53.730	4.394

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
*										
1900MHZ RRH (65MHZ)	A	From Leg	4.000	0'	0.000	134'	No Ice	2.322	2.236	0.060
							1/2" Ice	2.527	2.439	0.083
							Ice	2.739	2.648	0.109
							1" Ice	3.185	3.091	0.172
							2" Ice			
1900MHZ RRH (65MHZ)	B	From Leg	4.000	0'	0.000	134'	No Ice	2.322	2.236	0.060
							1/2" Ice	2.527	2.439	0.083
							Ice	2.739	2.648	0.109
							1" Ice	3.185	3.091	0.172
							2" Ice			
1900MHZ RRH (65MHZ)	C	From Leg	4.000	0'	0.000	134'	No Ice	2.322	2.236	0.060
							1/2" Ice	2.527	2.439	0.083
							Ice	2.739	2.648	0.109
							1" Ice	3.185	3.091	0.172
							2" Ice			
800MHZ 2X50W RRH W/FILTER	A	From Leg	4.000	0'	0.000	134'	No Ice	2.058	1.932	0.064
							1/2" Ice	2.240	2.109	0.086
							Ice	2.429	2.293	0.111
							1" Ice	2.829	2.684	0.172
							2" Ice			
800MHZ 2X50W RRH W/FILTER	B	From Leg	4.000	0'	0.000	134'	No Ice	2.058	1.932	0.064
							1/2" Ice	2.240	2.109	0.086
							Ice	2.429	2.293	0.111
							1" Ice	2.829	2.684	0.172
							2" Ice			
800MHZ 2X50W RRH W/FILTER	C	From Leg	4.000	0'	0.000	134'	No Ice	2.058	1.932	0.064
							1/2" Ice	2.240	2.109	0.086
							Ice	2.429	2.293	0.111
							1" Ice	2.829	2.684	0.172
							2" Ice			
IBC1900BB-1	A	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
IBC1900BB-1	B	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
IBC1900BB-1	C	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
IBC1900HG-2A	A	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
IBC1900HG-2A	B	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
IBC1900HG-2A	C	From Leg	4.000	0'	0.000	134'	No Ice	0.966	0.463	0.022
							1/2" Ice	1.091	0.558	0.030
							Ice	1.223	0.660	0.039
							1" Ice	1.510	0.893	0.065
							2" Ice			
(2) 4' x 2" Pipe Mount	A	From Leg	4.000	0'	0.000	134'	No Ice	0.785	0.785	0.029
							1/2" Ice	1.028	1.028	0.035
							Ice	1.281	1.281	0.044
							1" Ice	1.814	1.814	0.072
							2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(2) 4' x 2" Pipe Mount	B	From Leg	4.000 0' 0'	0.000	134'	2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
(2) 4' x 2" Pipe Mount	C	From Leg	4.000 0' 0'	0.000	134'	2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
Side Arm Mount [SO 104-3]	C	None		0.000	134'	2" Ice			
						No Ice	2.620	2.620	0.288
						1/2"	3.300	3.300	0.408
						Ice	3.980	3.980	0.528
						1" Ice	5.350	5.350	0.768
* (4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
HSS 4"x4"x4'	A	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	A	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	B	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	B	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	C	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	C	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
Sector Mount [SM 411-3]	C	None		0.000	127'	2" Ice			
						No Ice	20.530	20.530	1.069
						1/2"	28.620	28.620	1.457
						Ice	36.630	36.630	1.972

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						1" Ice	52.730	52.730	3.369
						2" Ice			
* ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
KRY 112 144/1	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
RADIO 4449 B12/B71	A	From Leg	4.000 0'	0.000	117'	No Ice 1/2"	1.650 1.810	1.163 1.301	0.074 0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
RADIO 4449 B12/B71	B	From Leg	4.000	0.000	117'	No Ice 1.650	1.163	0.074
			0'			1/2" 1.810	1.301	0.090
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
RADIO 4449 B12/B71	C	From Leg	4.000	0.000	117'	No Ice 1.650	1.163	0.074
			0'			1/2" 1.810	1.301	0.090
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
(3) 12' HD V-Frame [#VFA12-HD]	C	None		0.000	117'	No Ice 29.820	29.820	1.673
						1/2" 42.210	42.210	2.266
						Ice 54.430	54.430	3.052
						1" Ice 78.490	78.490	5.180
						2" Ice		
*								
BXA-80063/4CF	A	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
BXA-80063/4CF	B	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
BXA-80063/4CF	C	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
RC2DC-3315-PF-48	A	From Leg	4.000	0.000	107'	No Ice 3.792	2.512	0.032
			0'			1/2" 4.044	2.725	0.063
			0'			Ice 4.303	2.945	0.099
						1" Ice 4.844	3.414	0.181
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	A	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	B	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	C	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101
			0'			1/2" 5.264	3.151	0.141
			0'			Ice 5.623	3.631	0.186
						1" Ice 6.371	4.639	0.294
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101
			0'			1/2" 5.264	3.151	0.141
			0'			Ice 5.623	3.631	0.186
						1" Ice 6.371	4.639	0.294
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Mount Pipe			0' 0'			1/2" Ice 1" Ice 2" Ice	5.264 5.623 6.371	3.151 3.631 4.639	0.141 0.186 0.294
RFV01U-D1A	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D2A	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
Sector Mount [SM 402-3]	C	None		0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	18.870 26.470 33.990 48.840	18.870 26.470 33.990 48.840	0.851 1.210 1.696 3.044
*									
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	15.890 16.810 17.760 19.700	7.890 8.740 9.600 11.370	0.139 0.252 0.380 0.679
DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	7.530 8.040 8.570 9.680	3.790 4.230 4.680 5.630	0.095 0.156 0.225 0.391
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	11.960 12.700 13.460 15.020	5.970 6.630 7.300 8.690	0.115 0.201 0.298 0.529
OPA65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	17.460 18.460 19.480 21.580	8.580 9.490 10.420 12.330	0.109 0.224 0.353 0.656
OPA65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	8.100 8.650 9.210 10.390	4.030 4.500 4.980 5.980	0.081 0.142 0.212 0.380

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	12.250	6.050	0.089
						1/2" Ice	13.000	6.710	0.176
						Ice	13.760	7.390	0.275
						1" Ice	15.340	8.790	0.508
						2" Ice			
7770.00 w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4478 B14_CCIV2	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 4478 B14_CCIV2	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 4478 B14_CCIV2	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(2) LGP21401	A	From Leg	4.000	0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
(2) LGP21401	B	From Leg	4.000	0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
(2) LGP21401	C	From Leg	4.000	0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
DC9-48-60-24-8C-EV	A	From Leg	4.000	0'	0.000	97'	No Ice	2.737	4.785	0.026
							1/2" Ice	2.963	5.065	0.063
							1" Ice	3.196	5.352	0.104
							2" Ice	3.684	5.948	0.200
DC6-48-60-18-8F	B	From Leg	4.000	0'	0.000	97'	No Ice	0.917	0.917	0.019
							1/2" Ice	1.458	1.458	0.037
							1" Ice	1.643	1.643	0.057
							2" Ice	2.042	2.042	0.105
8' x 2" Mount Pipe	A	From Leg	4.000	0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
Sector Mount [SM 504-3]	C	None			0.000	97'	No Ice	31.050	31.050	1.708
							1/2" Ice	43.830	43.830	2.326
							1" Ice	56.440	56.440	3.143
							2" Ice	81.280	81.280	5.358
* 800 10504 w/ Mount Pipe	A	From Leg	4.000	0'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	B	From Leg	4.000	0'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	C	From Leg	4.000	0'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
6' x 2" Mount Pipe	A	From Leg	4.000	0'	0.000	87'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
6' x 2" Mount Pipe	B	From Leg	4.000 0' 0'	0.000	87'	2" Ice			
						No Ice	1.425	1.425	0.022
						1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0' 0'	0.000	87'	2" Ice			
						No Ice	1.425	1.425	0.022
						1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
Sector Mount [SM 104-3]	C	None		0.000	87'	2" Ice			
						No Ice	30.210	30.210	0.953
						1/2"	38.120	38.120	1.432
						Ice	46.010	46.010	2.031
						1" Ice	62.030	62.030	3.577
* GPS_A	C	From Leg	3.000 0' 1'	0.000	80'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0' 0'	0.000	80'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
* GPS_A	B	From Leg	3.000 0' 0'	0.000	72'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
GPS_A	C	From Leg	3.000 0' 0'	0.000	72'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
Side Arm Mount [SO 701-1]	B	From Leg	1.500 0' 0'	0.000	72'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0' 0'	0.000	72'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
*									

Truss-Leg Properties

Section Designation	Area in ²	Area Ice in ²	Self Weight K	Ice Weight K	Equiv. Diameter r in	Equiv. Diameter r Ice in	Leg Area in ²
PiRod 105244 w/ (2) 1-1/4" Tie Rod	1076.466	2615.068	0.726	0.497	7.475	18.160	6.138

Section Designation	Area <i>in</i> ²	Area Ice <i>in</i> ²	Self Weight K	Ice Weight K	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in</i> ²
Pirod 105217	2296.236	5959.026	0.587	0.669	7.973	20.691	5.301
Pirod 105218	2425.314	5998.674	0.722	0.653	8.421	20.829	7.216
Pirod 105218	2425.314	5951.592	0.722	0.603	8.421	20.665	7.216
Pirod 105219	2597.910	5930.127	1.086	0.557	9.021	20.591	9.425

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	136 - 133.625	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	31	-3.068	-0.034	-0.019
			Max. Mx	8	-1.776	-0.166	-0.003
		Diagonal	Max. My	2	-1.793	0.005	0.169
			Max. Vy	8	0.277	-0.166	-0.003
			Max. Vx	3	-0.280	0.003	0.164
			Max Tension	9	0.938	0.000	0.000
			Max. Compression	8	-1.006	0.000	0.000
			Max. Mx	26	-0.081	0.005	0.000
		Top Girt	Max. Vy	26	0.006	0.000	0.000
			Max Tension	7	0.720	0.000	0.000
			Max. Compression	18	-0.720	-0.053	0.000
			Max. Mx	33	-0.081	-0.078	0.000
			Max. My	3	0.363	0.014	-0.000
			Max. Vy	33	0.062	-0.078	0.000
T2	133.625 - 130	Leg	Max Tension	15	3.302	0.008	0.501
			Max. Compression	10	-6.135	-0.479	-0.276
			Max. Mx	8	-5.508	-0.538	-0.016
		Diagonal	Max. My	2	-6.060	0.010	0.555
			Max. Vy	8	1.037	-0.538	-0.016
			Max. Vx	2	-1.065	0.010	0.555
			Max Tension	25	1.437	0.000	0.000
			Max. Compression	24	-1.559	0.000	0.000
			Max. Mx	33	0.167	-0.004	-0.000
		Horizontal	Max. My	20	1.405	-0.001	-0.000
			Max. Vy	33	0.007	-0.004	-0.000
			Max. Vx	20	0.000	-0.001	-0.000
			Max Tension	2	0.377	0.000	0.000
			Max. Compression	15	-0.233	0.000	0.000
			Max. Mx	26	0.164	0.012	0.000
Bottom Girt	Max. Vy	26	0.012	0.000	0.000		
	Max Tension	14	0.753	0.000	0.000		
	Max. Compression	3	-0.659	0.000	0.000		
	Max. Mx	26	0.125	0.014	0.000		
	Max. Vy	26	0.014	0.000	0.000		
	Max. Vx	20	2.644	0.001	0.243		
T3	130 - 110	Leg	Max Tension	15	34.312	1.706	-0.010
			Max. Compression	10	-42.237	-0.243	-0.005
			Max. Mx	2	-42.187	-1.714	0.010
		Diagonal	Max. My	20	-4.394	-0.001	1.564
			Max. Vy	2	-2.943	-0.243	0.002
			Max. Vx	20	2.644	0.001	0.243
			Max Tension	25	4.025	0.000	0.000
			Max. Compression	24	-4.177	0.000	0.000
			Max. Mx	38	0.818	-0.005	-0.000
		Horizontal	Max. My	24	-4.160	-0.001	0.000
			Max. Vy	38	0.010	-0.005	-0.000
			Max. Vx	24	-0.000	-0.001	0.000
			Max Tension	14	0.606	0.000	0.000
			Max. Compression	3	-0.423	0.000	0.000
			Max. Mx	26	0.290	0.014	0.000
Top Girt	Max. Vy	26	-0.013	0.000	0.000		
	Max Tension	2	0.676	0.000	0.000		
	Max. Compression	15	-0.638	0.000	0.000		
	Max. Mx	26	0.033	0.013	0.000		
	Max. Vy	26	-0.013	0.000	0.000		
	Max. Vx	20	2.651	0.007	-2.294		
T4	110 - 94.9427	Leg	Max Tension	7	70.004	-0.203	0.014
			Max. Compression	2	-82.276	0.015	0.006
			Max. Mx	2	-45.730	2.583	-0.014
		Bottom Girt	Max. My	20	-4.448	0.007	-2.294
			Max. Vy	2	-2.951	2.583	-0.014
			Max. Vx	20	2.651	0.007	-2.294

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T5	94.9427 - 92.5938	Diagonal	Max Tension	17	5.669	0.000	0.000	
			Max. Compression	4	-5.699	0.000	0.000	
			Max. Mx	27	1.050	-0.008	-0.000	
			Max. My	12	-4.636	-0.001	-0.001	
			Max. Vy	27	0.012	-0.008	-0.000	
		Top Girt	Max. Vx	12	0.001	0.000	0.000	
			Max Tension	2	1.817	0.000	0.000	
			Max. Compression	15	-1.773	0.000	0.000	
			Max. Mx	26	0.051	0.019	0.000	
			Max. Vy	26	-0.017	0.000	0.000	
		Leg	Max Tension	7	77.477	-0.034	0.015	
			Max. Compression	2	-90.868	-0.242	-0.000	
			Max. Mx	2	-90.856	0.308	-0.001	
			Max. My	8	-7.711	-0.011	0.238	
			Max. Vy	18	0.469	0.308	0.002	
			Max. Vx	8	0.248	-0.011	0.238	
			Diagonal	Max Tension	17	5.962	-0.004	0.000
				Max. Compression	16	-6.059	0.000	0.000
				Max. Mx	27	1.126	-0.008	0.000
				Max. My	18	4.590	-0.008	0.001
Max. Vy	27			0.012	-0.008	0.000		
Secondary Horizontal	Max. Vx		18	-0.001	0.000	0.000		
	Max Tension		6	0.597	0.000	0.000		
	Max. Compression		19	-0.498	-0.001	-0.001		
	Max. Mx		36	0.230	-0.010	-0.000		
	Max. My	4	-0.475	-0.004	-0.001			
	Max. Vy	36	-0.019	-0.010	-0.000			
	Max. Vx	16	0.001	0.000	0.000			
	Leg	Max Tension	7	89.801	1.226	-0.040		
		Max. Compression	2	-103.594	3.193	0.024		
		Max. Mx	18	-103.570	3.236	-0.066		
Max. My		8	-8.057	0.048	1.453			
Max. Vy		18	-7.640	3.236	-0.066			
Max. Vx		8	-3.380	0.048	1.453			
Diagonal		Max Tension	17	6.944	-0.004	0.000		
		Max. Compression	16	-7.094	0.000	0.000		
		Max. Mx	27	0.961	-0.008	0.000		
		Max. My	8	-3.562	-0.003	-0.001		
	Max. Vy	27	0.012	-0.008	0.000			
Secondary Horizontal	Max. Vx	8	-0.001	0.000	0.000			
	Max Tension	16	1.465	0.000	0.000			
	Max. Compression	17	-1.383	0.000	0.000			
	Max. Mx	31	-0.134	-0.012	-0.001			
	Max. My	4	-1.370	-0.008	-0.001			
	Max. Vy	31	0.021	-0.012	-0.001			
	Max. Vx	4	0.000	0.000	0.000			
	Bottom Girt	Max Tension	14	0.829	0.000	0.000		
		Max. Compression	3	-0.770	0.000	0.000		
		Max. Mx	26	0.071	0.023	0.000		
Max. Vy		26	-0.019	0.000	0.000			
Max Tension		7	97.809	-3.160	0.066			
Leg	Max. Compression	18	-111.957	3.423	0.011			
	Max. Mx	6	95.222	-4.078	-0.017			
	Max. My	4	-8.427	-0.339	-6.916			
	Max. Vy	22	0.335	-4.048	-0.014			
	Max. Vx	4	0.823	-0.339	-6.916			
	Diagonal	Max Tension	7	7.476	0.108	0.026		
		Max. Compression	18	-8.127	0.000	0.000		
		Max. Mx	6	6.867	0.109	-0.020		
		Max. My	10	-7.944	-0.065	0.033		
		Max. Vy	28	-0.027	0.048	0.001		
Leg	Max. Vx	10	-0.007	0.000	0.000			
	Max Tension	7	138.350	-6.021	0.010			
	Max. Compression	18	-156.832	5.997	0.011			
	Max. Mx	18	-156.488	6.173	-0.023			
	Max. My	4	-9.511	-0.339	-6.916			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
T9	60 - 40	Diagonal	Max. Vy	2	-0.397	6.132	0.019			
			Max. Vx	24	0.279	-0.347	6.801			
			Max Tension	16	7.018	0.066	0.005			
			Max. Compression	5	-6.845	0.000	0.000			
			Max. Mx	18	6.356	0.088	-0.004			
			Max. My	30	1.268	0.058	0.008			
		Leg	Max. Vy	27	-0.032	0.061	0.008			
			Max. Vx	30	-0.002	0.000	0.000			
			Max Tension	7	172.842	-5.739	-0.004			
			Max. Compression	18	-194.856	5.711	-0.004			
			Max. Mx	6	153.813	-6.025	-0.027			
			Max. My	16	-11.503	-0.018	5.815			
			Max. Vy	22	-0.144	-5.850	-0.041			
			Max. Vx	16	0.202	-0.018	5.815			
Diagonal	Max Tension	4	6.343	0.000	0.000					
	Max. Compression	18	-6.378	0.000	0.000					
	Max. Mx	18	5.647	0.106	0.007					
	Max. My	32	-0.971	0.037	-0.010					
	Max. Vy	29	0.044	0.069	-0.009					
	Max. Vx	32	0.003	0.000	0.000					
T10	40 - 20	Leg	Max Tension	7	202.894	-5.083	0.010			
			Max. Compression	18	-228.454	7.196	0.104			
			Max. Mx	18	-228.454	7.196	0.104			
			Max. My	16	-14.156	-0.190	6.148			
			Max. Vy	37	0.410	-3.893	-0.012			
			Max. Vx	16	0.293	-0.190	6.148			
		Diagonal	Max Tension	7	6.326	0.000	0.000			
			Max. Compression	18	-6.707	0.000	0.000			
			Max. Mx	18	5.010	0.099	0.008			
			Max. My	38	1.701	0.078	0.012			
			Max. Vy	29	0.050	0.080	0.011			
			Max. Vx	38	-0.003	0.000	0.000			
			T11	20 - 0	Leg	Max Tension	7	229.581	-5.352	0.008
						Max. Compression	18	-259.543	0.000	0.000
Max. Mx	18	-245.195				7.196	0.104			
Max. My	16	-16.148				-0.461	9.383			
Max. Vy	37	-0.716				-3.893	-0.012			
Max. Vx	16	1.076				-0.461	9.383			
Diagonal	Max Tension	7			8.330	0.000	0.000			
	Max. Compression	18			-9.031	0.000	0.000			
		Max. Mx	18	5.615	0.139	-0.017				
		Max. My	16	6.798	0.118	0.023				
		Max. Vy	29	0.064	0.126	-0.014				
		Max. Vx	28	0.004	0.000	0.000				

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	269.553	23.496	-13.134
	Max. H _x	18	269.553	23.496	-13.134
	Max. H _z	7	-237.922	-20.982	11.701
	Min. Vert	7	-237.922	-20.982	11.701
	Min. H _x	7	-237.922	-20.982	11.701
	Min. H _z	18	269.553	23.496	-13.134
Leg B	Max. Vert	10	258.152	-21.955	-12.795
	Max. H _x	23	-225.517	19.426	11.337
	Max. H _z	23	-225.517	19.426	11.337
	Min. Vert	23	-225.517	19.426	11.337
	Min. H _x	10	258.152	-21.955	-12.795
	Min. H _z	10	258.152	-21.955	-12.795
Leg A	Max. Vert	2	261.326	0.023	25.795
	Max. H _x	20	16.082	0.591	1.375
	Max. H _z	2	261.326	0.023	25.795

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	15	-229.811	-0.009	-22.903
	Min. H _x	9	12.602	-0.577	1.077
	Min. H _z	15	-229.811	-0.009	-22.903

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	41.566	0.000	0.000	2.379	-3.345	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	49.879	0.037	-37.217	-2966.827	-7.755	0.320
0.9 Dead+1.0 Wind 0 deg - No Ice	37.410	0.037	-37.217	-2967.541	-6.752	0.320
1.2 Dead+1.0 Wind 30 deg - No Ice	49.879	18.908	-32.875	-2613.510	-1507.824	11.205
0.9 Dead+1.0 Wind 30 deg - No Ice	37.410	18.908	-32.875	-2614.224	-1506.820	11.205
1.2 Dead+1.0 Wind 60 deg - No Ice	49.879	33.147	-19.253	-1522.600	-2627.007	8.779
0.9 Dead+1.0 Wind 60 deg - No Ice	37.410	33.147	-19.253	-1523.314	-2626.004	8.779
1.2 Dead+1.0 Wind 90 deg - No Ice	49.879	37.533	-0.037	-0.886	-2983.984	-3.163
0.9 Dead+1.0 Wind 90 deg - No Ice	37.410	37.533	-0.037	-1.600	-2982.980	-3.163
1.2 Dead+1.0 Wind 120 deg - No Ice	49.879	31.664	18.354	1469.634	-2532.860	-2.568
0.9 Dead+1.0 Wind 120 deg - No Ice	37.410	31.664	18.354	1468.920	-2531.856	-2.568
1.2 Dead+1.0 Wind 150 deg - No Ice	49.879	17.674	30.813	2498.053	-1433.549	5.001
0.9 Dead+1.0 Wind 150 deg - No Ice	37.410	17.674	30.813	2497.340	-1432.545	5.001
1.2 Dead+1.0 Wind 180 deg - No Ice	49.879	-0.037	36.465	2938.217	-0.273	-0.320
0.9 Dead+1.0 Wind 180 deg - No Ice	37.410	-0.037	36.465	2937.504	0.730	-0.320
1.2 Dead+1.0 Wind 210 deg - No Ice	49.879	-18.908	32.875	2619.220	1499.796	-11.205
0.9 Dead+1.0 Wind 210 deg - No Ice	37.410	-18.908	32.875	2618.506	1500.799	-11.205
1.2 Dead+1.0 Wind 240 deg - No Ice	49.879	-33.798	19.629	1545.469	2648.700	-8.779
0.9 Dead+1.0 Wind 240 deg - No Ice	37.410	-33.798	19.629	1544.756	2649.704	-8.779
1.2 Dead+1.0 Wind 270 deg - No Ice	49.879	-37.533	0.037	6.596	2975.955	3.163
0.9 Dead+1.0 Wind 270 deg - No Ice	37.410	-37.533	0.037	5.882	2976.959	3.163
1.2 Dead+1.0 Wind 300 deg - No Ice	49.879	-31.013	-17.979	-1446.765	2495.110	2.568
0.9 Dead+1.0 Wind 300 deg - No Ice	37.410	-31.013	-17.979	-1447.478	2496.114	2.568
1.2 Dead+1.0 Wind 330 deg - No Ice	49.879	-17.674	-30.813	-2492.344	1425.520	-5.001
0.9 Dead+1.0 Wind 330 deg - No Ice	37.410	-17.674	-30.813	-2493.058	1426.524	-5.001
1.2 Dead+1.0 Ice+1.0 Temp	118.296	0.000	0.000	5.519	-12.641	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	118.296	0.003	-8.759	-691.802	-13.011	-0.739
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	118.296	4.425	-7.690	-604.468	-363.576	1.331
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	118.296	7.745	-4.490	-349.050	-623.883	1.073

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
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	118.296	8.902	-0.003	5.149	-715.042	-0.846
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	118.296	7.607	4.406	354.530	-614.997	-0.566
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	118.296	4.302	7.482	603.509	-356.223	1.238
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	118.296	-0.003	8.680	699.248	-12.271	0.739
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	118.296	-4.425	7.690	615.506	338.295	-1.331
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	118.296	-7.814	4.530	361.883	601.712	-1.073
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	118.296	-8.902	0.003	5.889	689.761	0.846
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	118.296	-7.538	-4.366	-341.696	586.605	0.566
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	118.296	-4.302	-7.482	-592.471	330.942	-1.238
Dead+Wind 0 deg - Service	41.566	0.008	-7.739	-615.188	-4.123	0.072
Dead+Wind 30 deg - Service	41.566	3.932	-6.836	-541.712	-316.073	2.336
Dead+Wind 60 deg - Service	41.566	6.893	-4.004	-314.849	-548.814	1.831
Dead+Wind 90 deg - Service	41.566	7.805	-0.008	1.601	-623.051	-0.655
Dead+Wind 120 deg - Service	41.566	6.585	3.817	307.407	-529.238	-0.534
Dead+Wind 150 deg - Service	41.566	3.675	6.408	521.276	-300.629	1.037
Dead+Wind 180 deg - Service	41.566	-0.008	7.583	612.810	-2.567	-0.072
Dead+Wind 210 deg - Service	41.566	-3.932	6.836	546.470	309.382	-2.336
Dead+Wind 240 deg - Service	41.566	-7.028	4.082	323.175	548.304	-1.831
Dead+Wind 270 deg - Service	41.566	-7.805	0.008	3.157	616.361	0.655
Dead+Wind 300 deg - Service	41.566	-6.449	-3.739	-299.081	516.368	0.534
Dead+Wind 330 deg - Service	41.566	-3.675	-6.408	-516.518	293.939	-1.037

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-41.566	0.000	0.000	41.566	0.000	0.000%
2	0.037	-49.879	-37.217	-0.037	49.879	37.217	0.000%
3	0.037	-37.410	-37.217	-0.037	37.410	37.217	0.000%
4	18.908	-49.879	-32.875	-18.908	49.879	32.875	0.000%
5	18.908	-37.410	-32.875	-18.908	37.410	32.875	0.000%
6	33.147	-49.879	-19.253	-33.147	49.879	19.253	0.000%
7	33.147	-37.410	-19.253	-33.147	37.410	19.253	0.000%
8	37.533	-49.879	-0.037	-37.533	49.879	0.037	0.000%
9	37.533	-37.410	-0.037	-37.533	37.410	0.037	0.000%
10	31.664	-49.879	18.354	-31.664	49.879	-18.354	0.000%
11	31.664	-37.410	18.354	-31.664	37.410	-18.354	0.000%
12	17.674	-49.879	30.813	-17.674	49.879	-30.813	0.000%
13	17.674	-37.410	30.813	-17.674	37.410	-30.813	0.000%
14	-0.037	-49.879	36.465	0.037	49.879	-36.465	0.000%
15	-0.037	-37.410	36.465	0.037	37.410	-36.465	0.000%
16	-18.908	-49.879	32.875	18.908	49.879	-32.875	0.000%
17	-18.908	-37.410	32.875	18.908	37.410	-32.875	0.000%
18	-33.798	-49.879	19.629	33.798	49.879	-19.629	0.000%
19	-33.798	-37.410	19.629	33.798	37.410	-19.629	0.000%
20	-37.533	-49.879	0.037	37.533	49.879	-0.037	0.000%
21	-37.533	-37.410	0.037	37.533	37.410	-0.037	0.000%
22	-31.013	-49.879	-17.979	31.013	49.879	17.979	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
23	-31.013	-37.410	-17.979	31.013	37.410	17.979	0.000%
24	-17.674	-49.879	-30.813	17.674	49.879	30.813	0.000%
25	-17.674	-37.410	-30.813	17.674	37.410	30.813	0.000%
26	0.000	-118.296	0.000	0.000	118.296	0.000	0.000%
27	0.003	-118.296	-8.759	-0.003	118.296	8.759	0.000%
28	4.425	-118.296	-7.690	-4.425	118.296	7.690	0.000%
29	7.745	-118.296	-4.490	-7.745	118.296	4.490	0.000%
30	8.902	-118.296	-0.003	-8.902	118.296	0.003	0.000%
31	7.607	-118.296	4.406	-7.607	118.296	-4.406	0.000%
32	4.302	-118.296	7.482	-4.302	118.296	-7.482	0.000%
33	-0.003	-118.296	8.680	0.003	118.296	-8.680	0.000%
34	-4.425	-118.296	7.690	4.425	118.296	-7.690	0.000%
35	-7.814	-118.296	4.530	7.814	118.296	-4.530	0.000%
36	-8.902	-118.296	0.003	8.902	118.296	-0.003	0.000%
37	-7.538	-118.296	-4.366	7.538	118.296	4.366	0.000%
38	-4.302	-118.296	-7.482	4.302	118.296	7.482	0.000%
39	0.008	-41.566	-7.739	-0.008	41.566	7.739	0.000%
40	3.932	-41.566	-6.836	-3.932	41.566	6.836	0.000%
41	6.893	-41.566	-4.004	-6.893	41.566	4.004	0.000%
42	7.805	-41.566	-0.008	-7.805	41.566	0.008	0.000%
43	6.585	-41.566	3.817	-6.585	41.566	-3.817	0.000%
44	3.675	-41.566	6.408	-3.675	41.566	-6.408	0.000%
45	-0.008	-41.566	7.583	0.008	41.566	-7.583	0.000%
46	-3.932	-41.566	6.836	3.932	41.566	-6.836	0.000%
47	-7.028	-41.566	4.082	7.028	41.566	-4.082	0.000%
48	-7.805	-41.566	0.008	7.805	41.566	-0.008	0.000%
49	-6.449	-41.566	-3.739	6.449	41.566	3.739	0.000%
50	-3.675	-41.566	-6.408	3.675	41.566	6.408	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 133.625	3.756	41	0.240	0.018
T2	133.625 - 130	3.636	41	0.239	0.018
T3	130 - 110	3.431	41	0.238	0.019
T4	110 - 94.9427	2.429	47	0.219	0.017
T5	94.9427 - 92.5938	1.741	47	0.188	0.013
T6	92.5938 - 90	1.647	47	0.181	0.012
T7	90 - 80	1.544	47	0.172	0.010
T8	80 - 60	1.190	47	0.151	0.007
T9	60 - 40	0.638	47	0.100	0.006
T10	40 - 20	0.276	47	0.063	0.004
T11	20 - 0	0.067	47	0.027	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSP18-C-A20 w/ Mount Pipe	41	3.756	0.240	0.018	26788
134'	1900MHZ RRH (65MHZ)	41	3.656	0.239	0.018	26788
127'	(4) DB844H90E-XY w/ Mount Pipe	41	3.264	0.237	0.019	13377
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	47	2.760	0.228	0.019	40290
107'	BXA-80063/4CF	47	2.286	0.215	0.016	152967
97'	DMP65R-BU8D w/ Mount Pipe	47	1.827	0.194	0.013	15225

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87'	800 10504 w/ Mount Pipe	47	1.431	0.165	0.009	18100
80'	GPS_A	47	1.190	0.151	0.007	22871
72'	GPS_A	47	0.945	0.132	0.007	23919

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 133.625	18.105	19	1.151	0.088
T2	133.625 - 130	17.529	19	1.151	0.088
T3	130 - 110	16.539	19	1.145	0.091
T4	110 - 94.9427	11.707	19	1.055	0.082
T5	94.9427 - 92.5938	8.389	19	0.905	0.061
T6	92.5938 - 90	7.934	19	0.871	0.057
T7	90 - 80	7.441	19	0.831	0.050
T8	80 - 60	5.730	19	0.727	0.034
T9	60 - 40	3.073	19	0.483	0.027
T10	40 - 20	1.327	19	0.305	0.017
T11	20 - 0	0.324	19	0.130	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSP18-C-A20 w/ Mount Pipe	19	18.105	1.151	0.088	5589
134'	1900MHZ RRH (65MHZ)	19	17.624	1.151	0.088	5589
127'	(4) DB844H90E-XY w/ Mount Pipe	19	15.735	1.137	0.093	2780
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	19	13.305	1.098	0.089	8462
107'	BXA-80063/4CF	19	11.019	1.033	0.078	33196
97'	DMP65R-BU8D w/ Mount Pipe	19	8.805	0.932	0.065	3174
87'	800 10504 w/ Mount Pipe	19	6.895	0.793	0.044	3778
80'	GPS_A	19	5.730	0.727	0.034	4765
72'	GPS_A	19	4.552	0.635	0.032	4981

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T2	133.625	Leg	A325N	0.625	5	1.227	27.612	0.044	1.05	Bolt DS
T3	130	Leg	A325N	0.750	5	8.447	39.761	0.212	1.05	Bolt DS
T6	92.5938	Leg	A325N	1.000	6	14.967	54.517	0.275	1.05	Bolt Tension
T7	90	Leg	A325N	1.000	6	16.302	54.517	0.299	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	7.476	10.164	0.736	1.05	Member Block Shear
T8	80	Leg	A325N	1.000	6	23.058	54.517	0.423	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	7.018	10.663	0.658	1.05	Member Block Shear
T9	60	Leg	A325N	1.000	6	28.807	54.517	0.528	1.05	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T10	40	Diagonal	A325N	1.000	1	6.343	11.682	0.543	1.05	Member Block Shear
		Leg	A325N	1.000	6	33.816	54.517	0.620	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	6.326	11.682	0.541	1.05	Member Block Shear
T11	20	Diagonal	A325N	1.250	1	8.330	23.701	0.351	1.05	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 133.625	1 1/2	2'4-1/2"	2'4-1/2"	76.0 K=1.00	1.767	-3.068	52.128	0.059 ¹
T2	133.625 - 130	1 1/2	3'7-1/2"	2'7-1/2"	84.0 K=1.00	1.767	-4.584	47.471	0.097 ¹
T3	130 - 110	2	20'1/32'	2'4-1/2"	57.0 K=1.00	3.142	-38.714	111.473	0.347 ¹
T4	110 - 94.9427	2 1/4	15'23/32"	2'4-3/16"	50.1 K=1.00	3.976	-82.276	148.886	0.553 ¹
T5	94.9427 - 92.5938	2 1/4	2'4-3/16"	1'2-3/16"	25.2 K=1.00	3.976	-90.868	170.799	0.532 ¹
T6	92.5938 - 90	2 1/4	2'7-1/8"	7"	12.4 K=1.00	3.976	-103.594	176.909	0.586 ¹
T7	90 - 80	PiRod 105244 w/ (2) 1-1/4" Tie Rod	10'7/32'	10'7/32'	45.4 K=1.00	6.138	-111.957	237.630	0.471 ¹
T8	80 - 60	PiRod 105217	20'13/32"	10'7/32'	37.8 K=1.00	5.301	-156.832	214.859	0.730 ¹
T9	60 - 40	PiRod 105218	20'13/32"	10'7/32'	32.4 K=1.00	7.216	-194.856	300.681	0.648 ¹
T10	40 - 20	PiRod 105218	20'13/32"	10'7/32'	32.4 K=1.00	7.216	-228.454	300.681	0.760 ¹
T11	20 - 0	PiRod 105219	20'13/32"	10'7/32'	28.4 K=1.00	9.425	-259.543	399.868	0.649 ¹

¹ $P_u / \phi P_n$ controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in ²	V_u K	ϕV_n K	Stress Ratio
T7	90 - 80	0.5	1'4-1/8"	109.8	276.204	0.196	0.825	3.482	0.238
T8	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.397	3.335	0.119
T9	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.203	3.378	0.061
T10	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.410	3.378	0.121
T11	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.078	6.958	0.156

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 133.625	3/4	3'1-1/4"	3'3/32"	134.8 K=0.70	0.442	-1.006	5.496	0.183 ¹
T2	133.625 - 130	3/4	4'9- 13/32"	2'3- 13/16"	133.5 K=0.90	0.442	-1.559	5.601	0.278 ¹
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	120.9 K=0.90	0.601	-4.177	9.300	0.449 ¹
T4	110 - 94.9427	1	5'4-5/8"	2'7-1/4"	112.5 K=0.90	0.785	-5.699	14.003	0.407 ¹
T5	94.9427 - 92.5938	1	5'5-1/4"	2'7- 19/32"	113.7 K=0.90	0.785	-6.059	13.726	0.441 ¹
T6	92.5938 - 90	1	5'4- 7/32"	2'7- 1/16"	111.8 K=0.90	0.785	-7.094	14.166	0.501 ¹
T7	90 - 80	L3x3x3/16	11'5"	5'3- 1/16"	109.4 K=1.03	1.090	-8.127	24.135	0.337 ¹
T8	80 - 60	L2 1/2x2 1/2x3/16	12'6- 1/32"	5'7- 17/32"	136.4 K=1.00	0.902	-6.699	13.873	0.483 ¹
T9	60 - 40	L3x3x3/16	13'9- 9/16"	6'3- 15/16"	127.4 K=1.00	1.090	-6.378	19.221	0.332 ¹
T10	40 - 20	L3x3x3/16	15'2- 29/32"	7'31/32' '	142.6 K=1.00	1.090	-6.707	15.345	0.437 ¹
T11	20 - 0	L3x3x5/16	16'9- 5/8"	7'10- 3/32"	159.7 K=1.00	1.780	-9.031	19.967	0.452 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	3/4	4'	3'10- 1/2"	173.6 K=0.70	0.442	-0.233	3.312	0.070 ¹
T3	130 - 110	3/4	4'5-1/8"	4'3-1/8"	190.9 K=0.70	0.442	-0.732	2.738	0.267 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	94.9427 - 92.5938	1 1/2	4'10- 7/8"	2'4- 5/16"	83.0 K=1.10	1.767	-1.574	48.040	0.033 ¹
T6	92.5938 - 90	1 1/2	4'11- 17/32"	2'4-5/8"	84.0 K=1.10	1.767	-1.794	47.473	0.038 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T1	136 - 133.625	6x3/8	4'	2'10-7/8"	322.2 K=1.00	2.250	-0.720	4.898	0.147 ¹
T3	130 - 110	KL/R > 200 (C) - 4 7/8	4'5/32"	3'10-5/32"	147.7 K=0.70	0.601	-0.732	6.229	0.117 ¹
T4	110 - 94.9427	1	4'6-9/32"	4'4-1/32"	145.7 K=0.70	0.785	-1.773	8.358	0.212 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T2	133.625 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	0.601	-0.659	6.135	0.107 ¹
T3	130 - 110	7/8	4'5-27/32"	4'3-27/32"	165.9 K=0.70	0.601	-1.768	4.935	0.358 ¹
T6	92.5938 - 90	1	4'11-13/16"	4'9-9/16"	161.2 K=0.70	0.785	-1.794	6.827	0.263 ¹

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T2	133.625 - 130	1 1/2	3'7-1/2"	1'	32.0	1.767	3.302	79.522	0.042 ¹
T3	130 - 110	2	20'1/32"	6"	12.0	2.188	34.312	106.689	0.322 ¹ #
T4	110 - 94.9427	2 1/4	15'23/32"	2'4-3/16"	50.1	3.976	70.004	178.924	0.391 ¹
T5	94.9427 - 92.5938	2 1/4	2'4-3/16"	1'2"	24.9	3.976	77.477	178.924	0.433 ¹
T6	92.5938 - 90	2 1/4	2'7-1/8"	7"	12.4	3.976	89.801	178.924	0.502 ¹
T7	90 - 80	PiRod 105244 w/ (2) 1-1/4" Tie Rod	10'7/32"	10'7/32"	45.4	6.138	97.809	276.204	0.354 ¹
T8	80 - 60	PiRod 105217	20'13/32"	10'7/32"	37.8	5.301	138.350	238.565	0.580 ¹
T9	60 - 40	PiRod 105218	20'13/32"	10'7/32"	32.4	7.216	172.842	324.713	0.532 ¹
T10	40 - 20	PiRod 105218	20'13/32"	10'7/32"	32.4	7.216	202.894	324.713	0.625 ¹
T11	20 - 0	PiRod 105219	20'13/32"	10'7/32"	28.4	9.425	229.581	424.115	0.541 ¹

¹ P_u / φP_n controls

Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	KI/r	$\phi P_n / K$	A / in^2	V_u / K	$\phi V_n / K$	Stress Ratio
T7	90 - 80	0.5	1'4-1/8"	109.8	276.204	0.196	0.825	3.482	0.238
T8	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.397	3.335	0.119
T9	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.203	3.378	0.061
T10	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.410	3.378	0.121
T11	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.078	6.958	0.156

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A / in^2	P_u / K	$\phi P_n / K$	Ratio $P_u / \phi P_n$
T1	136 - 133.625	3/4	3'1-1/4"	3'3/32"	192.5	0.442	0.938	19.880	0.047 ¹
T2	133.625 - 130	3/4	4'9-13/32"	2'3-13/16"	148.3	0.442	1.437	19.880	0.072 ¹
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	134.3	0.601	4.025	27.059	0.149 ¹
T4	110 - 94.9427	1	5'4-5/8"	2'7-1/4"	125.0	0.785	5.669	35.343	0.160 ¹
T5	94.9427 - 92.5938	1	5'5-1/4"	2'7-19/32"	126.3	0.785	5.962	35.343	0.169 ¹
T6	92.5938 - 90	1	5'4-7/32"	2'7-1/16"	124.2	0.785	6.944	35.343	0.196 ¹
T7	90 - 80	L3x3x3/16	11'5"	5'3-1/16"	69.3	0.659	7.476	28.679	0.261 ¹
T8	80 - 60	L2 1/2x2 1/2x3/16	11'11-5/32"	5'4-19/32"	86.2	0.518	7.018	22.546	0.311 ¹
T9	60 - 40	L3x3x3/16	13'1-17/32"	6'3/16"	79.5	0.659	6.343	28.679	0.221 ¹
T10	40 - 20	L3x3x3/16	15'2-29/32"	7'31/32"	93.2	0.659	6.326	28.679	0.221 ¹
T11	20 - 0	L3x3x5/16	16'9-5/8"	7'10-3/32"	105.3	1.013	8.330	44.054	0.189 ¹

¹ $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A / in^2	P_u / K	$\phi P_n / K$	Ratio $P_u / \phi P_n$
T2	133.625 - 130	3/4	4'	3'10-1/2"	248.0	0.442	0.377	19.880	0.019 ¹
T3	130 - 110	3/4	4'4-7/16"	4'2-7/16"	268.9	0.442	0.732	19.880	0.037 ¹

¹ $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A / in^2	P_u / K	$\phi P_n / K$	Ratio $P_u / \phi P_n$
T5	94.9427 - 92.5938	1 1/2	4'10-7/8"	2'4-5/16"	151.0	1.767	1.574	79.522	0.020 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	92.5938 - 90	1 1/2	4'11- 17/32"	2'4-5/8"	152.7	1.767	1.794	79.522	0.023 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 133.625	6x3/8	4'	2'10- 7/8"	322.2	2.250	0.720	72.900	0.010 ¹
T3	130 - 110	7/8	4'5/32"	3'10- 5/32"	211.0	0.601	0.732	27.059	0.027 ¹
T4	110 - 94.9427	1	4'6- 9/32"	4'4- 1/32"	208.1	0.785	1.817	35.343	0.051 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	7/8	4'	3'10- 1/2"	212.6	0.601	0.753	27.059	0.028 ¹
T3	130 - 110	7/8	4'5- 27/32"	4'3- 27/32"	237.0	0.601	1.898	27.059	0.070 ¹
T6	92.5938 - 90	1	4'11- 13/16"	4'9- 9/16"	230.3	0.785	1.794	35.343	0.051 ¹

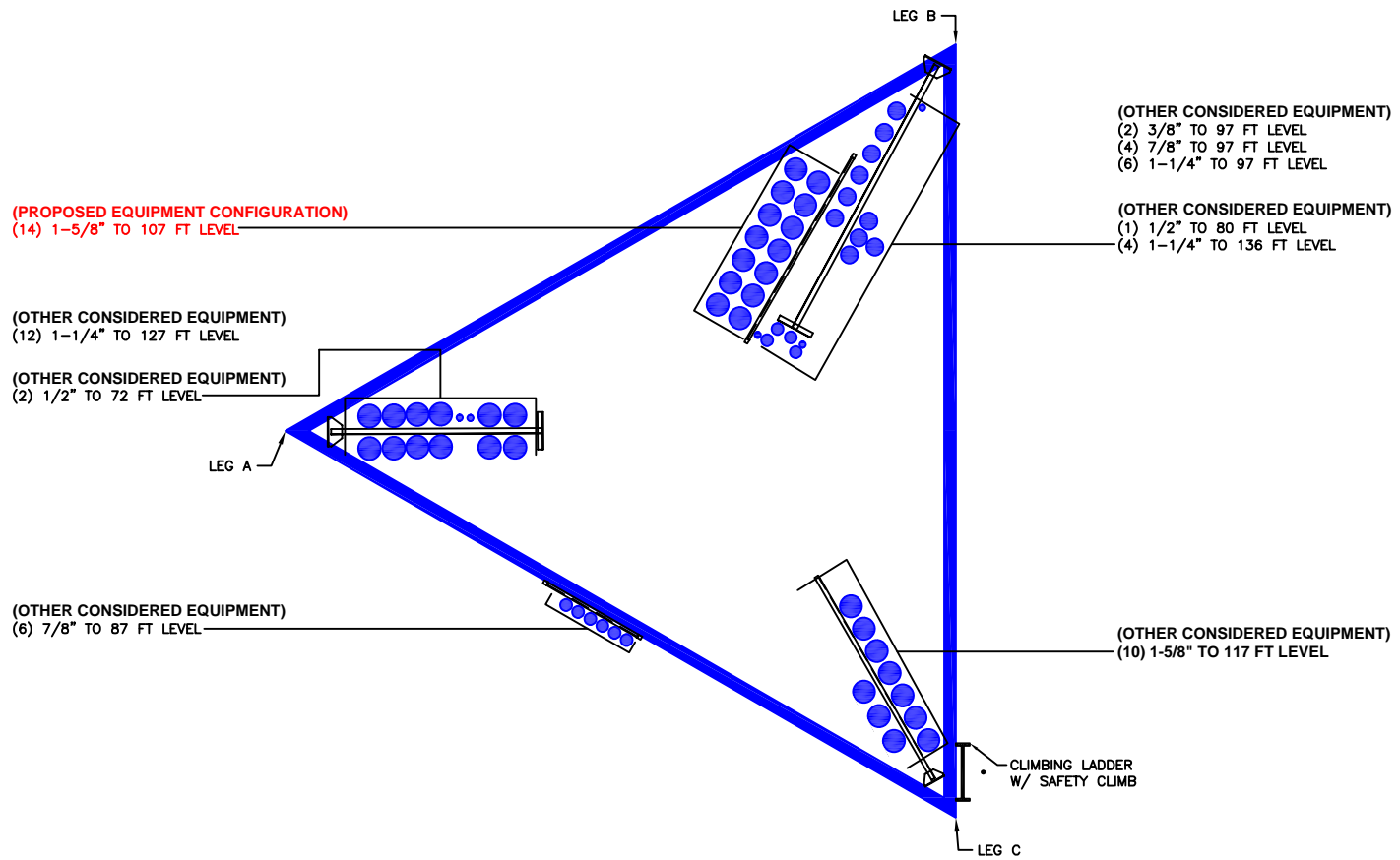
¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	136 - 133.625	Leg	1 1/2	2	-3.068	54.734	5.6	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.584	49.844	9.2	Pass
T3	130 - 110	Leg	2	29	-38.714	117.047	33.1	Pass
T4	110 - 94.9427	Leg	2 1/4	108	-82.276	156.330	52.6	Pass
T5	94.9427 - 92.5938	Leg	2 1/4	150	-90.868	179.339	50.7	Pass
T6	92.5938 - 90	Leg	2 1/4	162	-103.594	185.754	55.8	Pass
T7	90 - 80	Leg	PiRod 105244 w/ (2) 1-1/4" Tie Rod	175	-111.957	249.511	44.9	Pass
T8	80 - 60	Leg	PiRod 105217	184	-156.832	225.602	69.5	Pass
T9	60 - 40	Leg	PiRod 105218	199	-194.856	315.715	61.7	Pass
T10	40 - 20	Leg	PiRod 105218	214	-228.454	315.715	72.4	Pass
T11	20 - 0	Leg	PiRod 105219	229	-259.543	419.861	61.8	Pass
T1	136 - 133.625	Diagonal	3/4	7	-1.006	5.771	17.4	Pass
T2	133.625 - 130	Diagonal	3/4	25	-1.559	5.881	26.5	Pass
T3	130 - 110	Diagonal	7/8	40	-4.177	9.765	42.8	Pass
T4	110 - 94.9427	Diagonal	1	116	-5.699	14.703	38.8	Pass
T5	94.9427 -	Diagonal	1	156	-6.059	14.412	42.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
	92.5938								
T6	92.5938 - 90	Diagonal	1	171	-7.094	14.874	47.7	Pass	
T7	90 - 80	Diagonal	L3x3x3/16	183	-8.127	25.342	32.1	Pass	
							73.6 (b)		
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	191	-6.699	14.567	46.0	Pass	
							65.8 (b)		
T9	60 - 40	Diagonal	L3x3x3/16	202	-6.378	20.182	31.6	Pass	
							54.3 (b)		
T10	40 - 20	Diagonal	L3x3x3/16	217	-6.707	16.112	41.6	Pass	
							54.1 (b)		
T11	20 - 0	Diagonal	L3x3x5/16	232	-9.031	20.965	43.1	Pass	
T2	133.625 - 130	Horizontal	3/4	16	-0.233	3.477	6.7	Pass	
T3	130 - 110	Horizontal	3/4	43	-0.732	2.875	25.4	Pass	
T5	94.9427 - 92.5938	Secondary Horizontal	1 1/2	158	-1.574	50.442	3.1	Pass	
T6	92.5938 - 90	Secondary Horizontal	1 1/2	173	-1.794	49.847	3.6	Pass	
T1	136 - 133.625	Top Girt	6x3/8	4	-0.720	5.142	14.0	Pass	
T3	130 - 110	Top Girt	7/8	31	-0.732	6.540	11.2	Pass	
T4	110 - 94.9427	Top Girt	1	109	-1.773	8.776	20.2	Pass	
T2	133.625 - 130	Bottom Girt	7/8	19	-0.659	6.442	10.2	Pass	
T3	130 - 110	Bottom Girt	7/8	34	-1.768	5.181	34.1	Pass	
T6	92.5938 - 90	Bottom Girt	1	164	-1.794	7.169	25.0	Pass	
							Summary		
							Leg (T10)	72.4	Pass
							Diagonal (T7)	73.6	Pass
							Horizontal (T3)	25.4	Pass
							Secondary Horizontal (T6)	3.6	Pass
							Top Girt (T4)	20.2	Pass
							Bottom Girt (T3)	34.1	Pass
							Bolt Checks	70.1	Pass
							RATING =	73.6	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Truss Leg Reinforcement

BU # :	876338
Site Name:	Waterford
Order:	552701 Rev. 0
Elevation:	90-80

TIA-222 Revision:	H
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Existing Tie Rods	
Diameter, de:	1.25 in
Unbraced Length, Le:	14.18 in
Yield Strength, Fye:	50 ksi

New Tie Rods	
Diameter, dn:	1.25 in
Unbraced Length, Ln:	14.18 in
Offset, X:	0.625 in
Yield Strength, Fyn:	50 ksi

Truss Leg	
Width, w:	12 in
Unbraced Length, Lleg:	10 ft

Reactions from tnx	
Compression, C:	128.86 kip
Tension, T:	115.22 kip

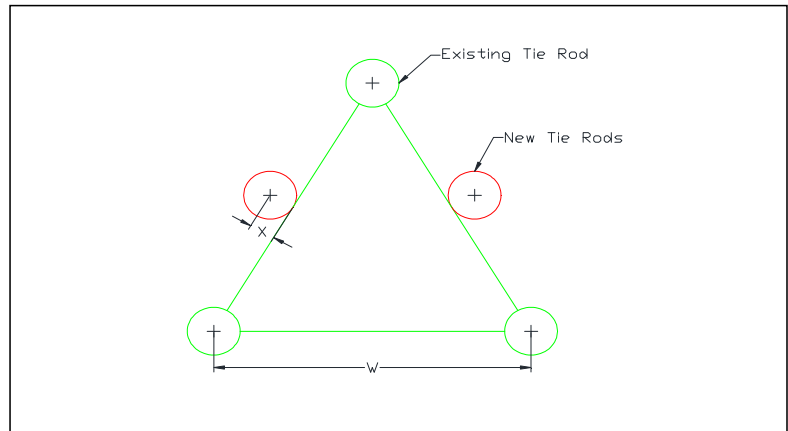
Output from tnx	
KL/r Modified Leg, KLtnx:	35.2

Length Factors	
Length Factor of Existing Tie Rods, Ke:	1
Length Factor of New Tie Rods, Kn:	1
Length Factor of the Leg, Kleg:	1

Results				
	Demand	Capacity	Rating*	Check
Compression (Existing Tie Rods), kip:	25.77	47.51	51.7%	Pass
Compression (New Tie Rods), kip:	25.77	47.51	51.7%	Pass
Compression (Modified Tie Rods), kip:	128.86	257.98	47.6%	Pass
Tension (Existing Tie Rods), kip:	23.04	55.22	39.7%	Pass
Tension (New Tie Rods), kip:	23.04	55.22	39.7%	Pass
Tension (Modified Tie Rods), kip:	115.22	276.12	39.7%	Pass

*Section 15.5 Applied

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.614	in
Leg K Factor Adjustment, K:	1.289	



Self Support Anchor Rod Capacity



Site Info	
BU #	876338
Site Name	Waterford
Order #	552701 Rev. 0

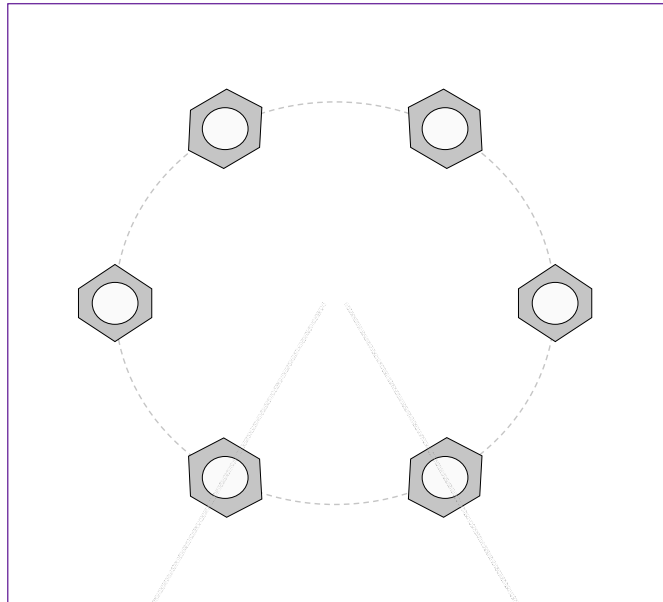
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.25

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	269.55	237.92
Shear Force (kips)	26.92	24.02

*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

*Anchor Rod Eccentricity Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data	
(6) 1-1/4" ϕ bolts (A687 N; Fy=105 ksi, Fu=125 ksi)	
l_{ar} (in):	1.25

Anchor Rod Summary		(units of kips, kip-in)
$Pu_t = 39.65$	$\phi Pn_t = 90.84$	Stress Rating
$Vu = 4$	$\phi Vn = 57.52$	41.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass

SST Unit Base Foundation



BU #: 876338
 Site Name: Waterford
 App. Number: 552701 Rev. 0

TIA-222 Revision: H

Top & Bot. Pad Rein. Different?:	<input type="checkbox"/>
Tower Centroid Offset?:	<input type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Global Moment, M :	3066.61	ft-kips
Global Axial, P :	49.88	kips
Global Shear, V :	39.08	kips
Leg Compression, P_{comp} :	269.55	kips
Leg Comp. Shear, V_{u,comp} :	26.92	kips
Leg Uplift, P_{uplift} :	237.92	kips
Leg Uplift. Shear, V_{u,uplift} :	24.02	kips
Tower Height, H :	136	ft
Base Face Width, BW :	14	ft
BP Dist. Above Fdn, bp_{dist} :	2.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	249.84	39.08	14.9%	Pass
<i>Bearing Pressure (ksf)</i>	6.00	2.68	44.7%	Pass
<i>Overturning (kip*ft)</i>	4596.23	3328.77	72.4%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	859.38	87.49	9.7%	Pass
<i>Pier Flexure (Tension) (kip*ft)</i>	485.38	78.07	15.3%	Pass
<i>Pier Compression (kip)</i>	3374.26	273.69	7.7%	Pass
<i>Pad Flexure (kip*ft)</i>	6695.87	960.49	13.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	777.96	149.28	18.3%	Pass
<i>Pad Shear - Comp 2-way (ksi)</i>	0.164	0.037	21.4%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	5260.90	52.49	1.0%	Pass
<i>Pad Shear - Tension 2-way (ksi)</i>	0.164	0.037	21.2%	Pass
<i>Flexural 2-way (Tension) (kip*ft)</i>	5260.90	46.84	0.8%	Pass

*Rating per TIA-222-H Section 15.5

Soil Rating*:	72.4%
Structural Rating*:	21.4%

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, dpier :	3.0	ft
Ext. Above Grade, E :	0.50	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	15	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Pad Properties		
Depth, D :	6.00	ft
Pad Width, W₁ :	23.00	ft
Pad Thickness, T :	3.25	ft
Pad Rebar Size (Bottom dir. 2), Sp₂ :	9	
Pad Rebar Quantity (Bottom dir. 2), mp₂ :	46	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	3	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Qult :	8.000	ksf
Cohesion, Cu :	0.000	ksf
Friction Angle, φ :	36	degrees
SPT Blow Count, N_{blows} :	25	
Base Friction, μ :		
Neglected Depth, N :	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

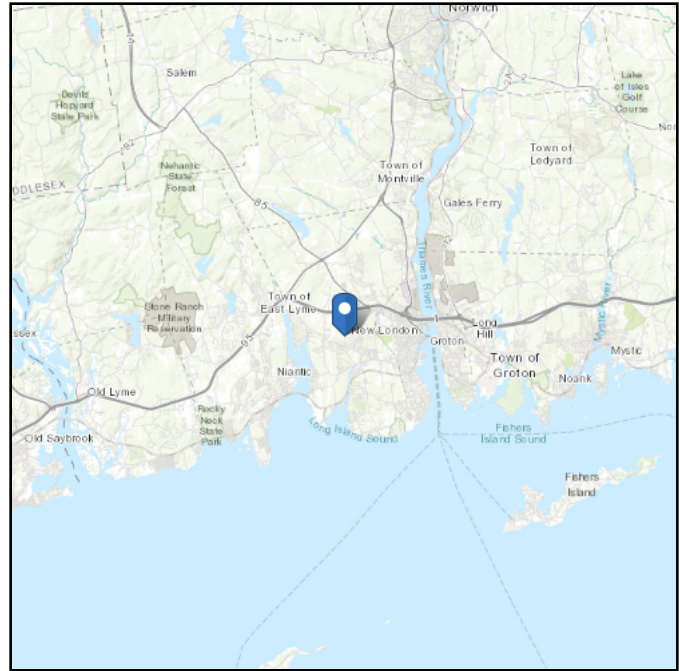
<-- Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 242 ft (NAVD 88)
Latitude: 41.354639
Longitude: -72.150444



Wind

Results:

Wind Speed:	134 Vmph
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	99 Vmph
100-year MRI	109 Vmph

Use 135 mph as required CT Design Criteria for New London County

Data Source: ASCE/SEI 7-10 Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

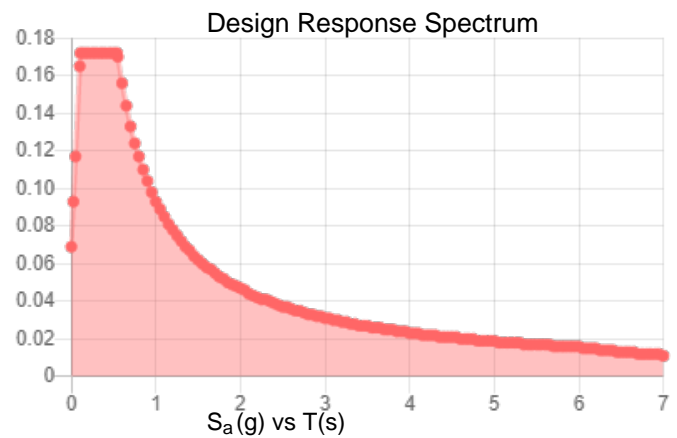
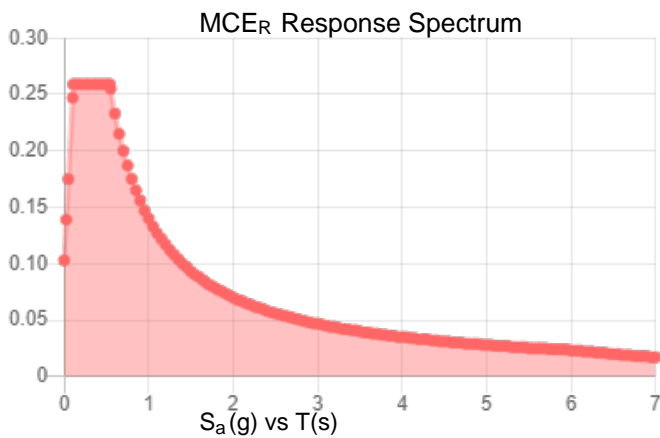
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.162	S_{DS} :	0.172
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.259	PGA _M :	0.129
S_{M1} :	0.14	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu May 06 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 0.75 in. Design Ice: 2*0.75in. = 1.50 in.
Concurrent Temperature: 15 F
Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Thu May 06 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Exhibit E

Mount Analysis



Maser Consulting Connecticut
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
856.797.0412
peter.albano@colliersengineering.com

Post-Mod Antenna Mount Analysis Report and PMI Requirements

Mount Fix

SMART Tool Project #: 10069535
Maser Consulting Connecticut Project #: 21777138A

June 11, 2021

Site Information

Site ID: 467304-VZW / WATERFORD 2 CT
Site Name: WATERFORD 2 CT
Carrier Name: Verizon Wireless
Address: 41 Manitock Hill
Waterford, Connecticut 06385
New London County
Latitude: 41.357875°
Longitude: -72.151189°

Structure Information

Tower Type: 150-Ft Self Support
Mount Type: 12.50-Ft T-Frame

FUZE ID # 16244091

Analysis Results

T-Frame: 82.9% Pass

***Contractor PMI Requirements:

Included at the end of this MA report

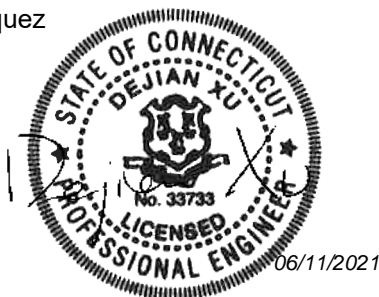
Available & Submitted via portal at <https://pmi.vzwsmart.com>

Contractor - Please Review Specific Site PMI Requirements Upon Award

Requirements also Noted on Mount Modification Drawings

Requirements may also be Noted on A & E drawings

Report Prepared By: Abigail Enriquez



Executive Summary:

The objective of this report is to summarize the analysis results of the antenna support mount including the proposed modifications at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

Sources of Information:

Document Type	Remarks
<i>Radio Frequency Data Sheet (RFDS)</i>	<i>Verizon RFDS Site ID: 325076, dated February 11, 2021</i>
<i>Mount Mapping Report</i>	<i>HUDSON DESIGN GROUP, LLC, Site ID: 467304, dated March 22, 2021</i>
<i>Previous Mount Analysis Report</i>	<i>Maser Consulting Connecticut, Project # 21777138A, dated May 6, 2021</i>
<i>Mount Modification Drawings</i>	<i>Maser Consulting Connecticut, Project # 21777138A, dated June 11, 2021</i>

Analysis Criteria:

Codes and Standards:	ANSI/TIA-222-H
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), V_{ULT} : 126 mph Ice Wind Speed (3-sec. Gust): 50 mph Design Ice Thickness: 1.00 in Risk Category: II Exposure Category: B Topographic Category: 1 Topographic Feature Considered: N/A Topographic Method: N/A Ground Elevation Factor, K_e : 0.994
Seismic Parameters:	S_s : 0.194 S_1 : 0.053
Maintenance Parameters:	Wind Speed (3-sec. Gust): 30 mph Maintenance Live Load, L_v : 250 lbs. Maintenance Live Load, L_m : 500 lbs.
Analysis Software:	RISA-3D (V17)

Final Loading Configuration:

The following equipment has been considered for the analysis of the mounts:

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
105.8	107.0	6	JMA Wireless	MX06FRO660-03	Added
		3	Samsung	MT6407-77A	
		3	Samsung	B2/B66A RRH-BR049	
		3	Samsung	B5/B13 RRH-BR04C	
		3	Antel	BXA-80063/4CF	Retained
		1	Raycap	RRFDC-6627-PF-48*	

* Equipment to be flush mounted directly to the Self Support. They are not mounted on T-Frame mounts and are not included in this mount analysis.

The recent mount mapping reported existing OVP units. It is acceptable to install up to any three (3) of the OVP model numbers listed below as required at any location other than the mount face without affecting the structural capacity of the mount. If OVP units are installed on the mount face, a mount re-analysis may be required unless replacing an existing OVP.

Model Number	Ports	AKA
DB-B1-6C-12AB-0Z	6	OVP-6
RVZDC-6627-PF-48	12	OVP-12

Standard Conditions:

1. All engineering services are performed on the basis that the information provided to Maser Consulting Connecticut and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Maser Consulting Connecticut to verify deviation will not adversely impact the analysis.
2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.

Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping and reported in the Mount Mapping Report are assumed to be corrected and documented as part of the PMI process and are not considered in the mount analysis.

The mount analysis and the mount mapping are not a condition assessment of the mount. Proper maintenance and condition assessments are still required post analysis.

3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped by Maser Consulting Connecticut, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.
4. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.

5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.
6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.
7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
 - o Channel, Solid Round, Angle, Plate ASTM A36 (Gr. 36)
 - o HSS (Rectangular) ASTM 500 (Gr. B-46)
 - o Pipe ASTM A53 (Gr. B-35)
 - o Threaded Rod F1554 (Gr. 36)
 - o Bolts ASTM A325
8. Any mount modifications listed under Sources of Information are assumed to have been installed per the design specifications.

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Maser Consulting Connecticut.

Analysis Results:

Component	Utilization %	Pass/Fail
<i>Mod Tieback</i>	27.6%	<i>Pass</i>
<i>MOD Bracing</i>	27.4%	<i>Pass</i>
<i>Tieback</i>	13.3%	<i>Pass</i>
<i>Dual Mount Pipe</i>	38.8%	<i>Pass</i>
<i>Mount Pipe</i>	52.1%	<i>Pass</i>
<i>Standoff</i>	63.0%	<i>Pass</i>
<i>Mast Pipe</i>	54.5%	<i>Pass</i>
<i>Face Horizontal Pipe</i>	82.9%	<i>Pass</i>
<i>Connection check</i>	16.0%	<i>Pass</i>

Structure Rating – (Controlling Utilization of all Components)	82.9%
---	--------------

Recommendation:


The existing mounts will be **SUFFICIENT** for the final loading after the proposed modifications are successfully completed.

ANSI/ASSP rigging plan review services compliant with the requirements of ANSI/TIA 322 are available for a Construction Class IV site or other, if required. Separate review fees will apply.

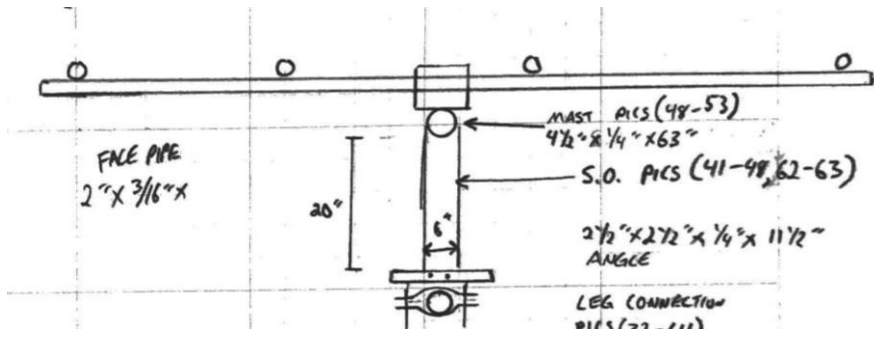
Attachments:

1. Mount Photos
2. Mount Mapping Report (for reference only)
3. Analysis Calculations
- 4. Contractor Required PMI Report Deliverables**
5. Antenna Placement Diagrams
6. TIA Adoption and Wind Speed Usage Letter

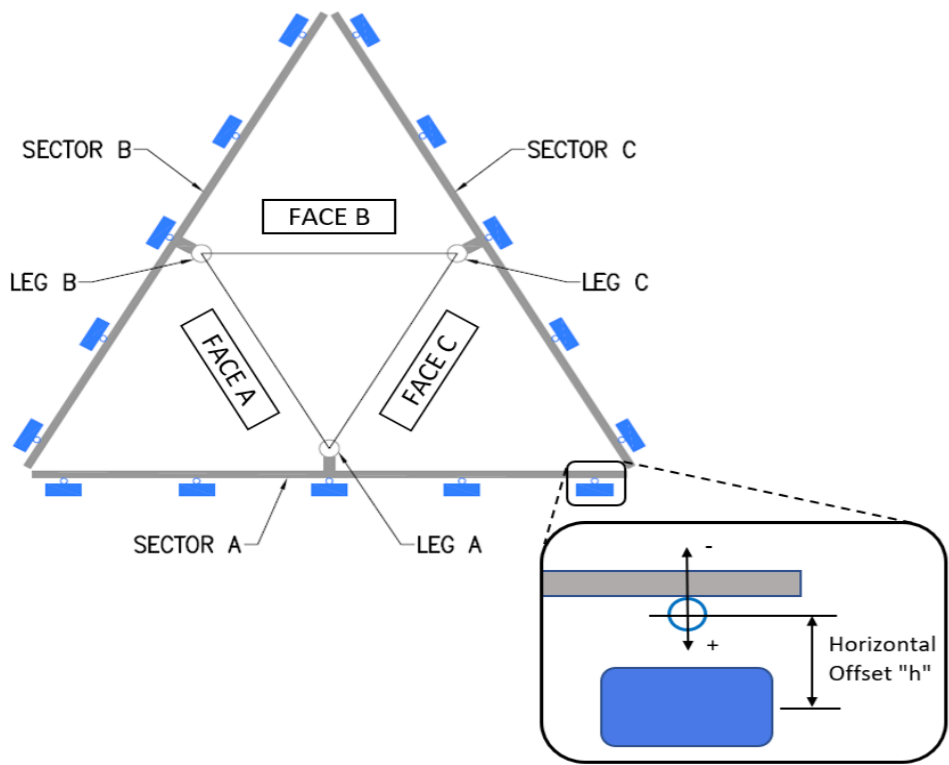


	Antenna Mount Mapping Form (PATENT PENDING)		FCC #	
	Tower Owner:	CROWN CASTLE	Mapping Date:	3/22/2021
	Site Name:	WATERFORD 2 CT	Tower Type:	Self Support
	Site Number or ID:	467304	Tower Height (Ft.):	150
Mapping Contractor:	HUDSON DESIGN GROUP, LLC.	Mount Elevation (Ft.):	106	

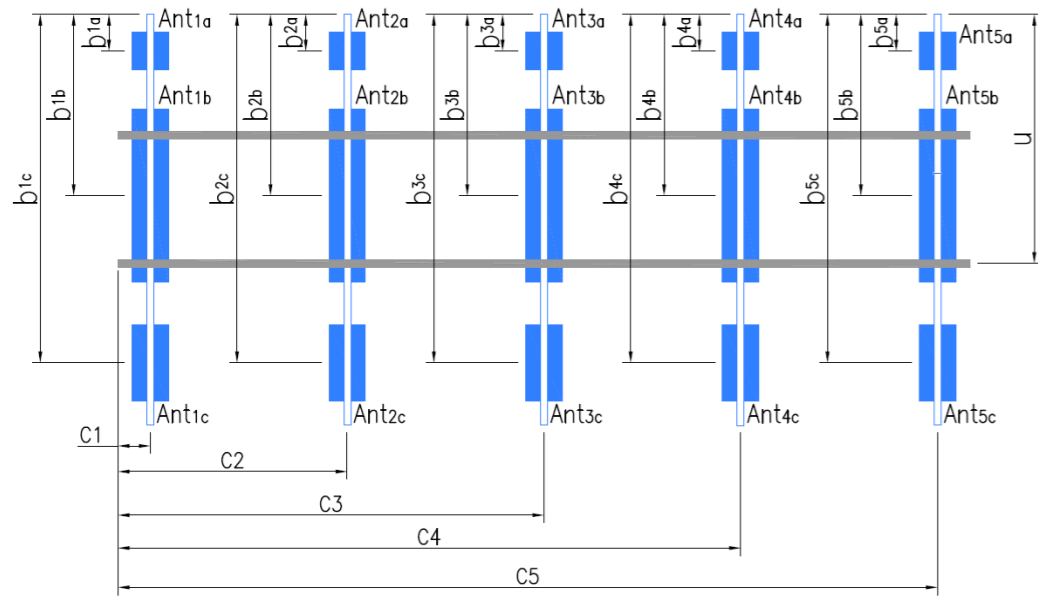
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Mount Pipe Configuration and Geometries [Unit = Inches]							
Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."
A1	2" STD. PIPE X 72" LONG	57.00	3.50	C1	2" STD. PIPE X 72" LONG	57.00	3.50
A2	2" STD. PIPE X 72" LONG	57.00	43.50	C2	2" STD. PIPE X 72" LONG	57.00	43.50
A3	2" STD. PIPE X 72" LONG	57.00	86.50	C3	2" STD. PIPE X 72" LONG	57.00	86.50
A4	2" STD. PIPE X 72" LONG	57.00	146.50	C4	2" STD. PIPE X 72" LONG	57.00	146.50
A5				C5			
A6				C6			
B1	2" STD. PIPE X 72" LONG	57.00	3.50	D1			
B2	2" STD. PIPE X 72" LONG	57.00	43.50	D2			
B3	2" STD. PIPE X 72" LONG	57.00	86.50	D3			
B4	2" STD. PIPE X 72" LONG	57.00	146.50	D4			
B5				D5			
B6				D6			
Distance between bottom rail and mount CL elevation (dim d). Unit is inches. See 'Mount Elev Ref' tab for details. :							38.00
Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) :							9.5
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) :							1.83
Please enter additional information or comments below.							
Tower Face Width at Mount Elev. (ft.):		4.5		Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):		2.25	



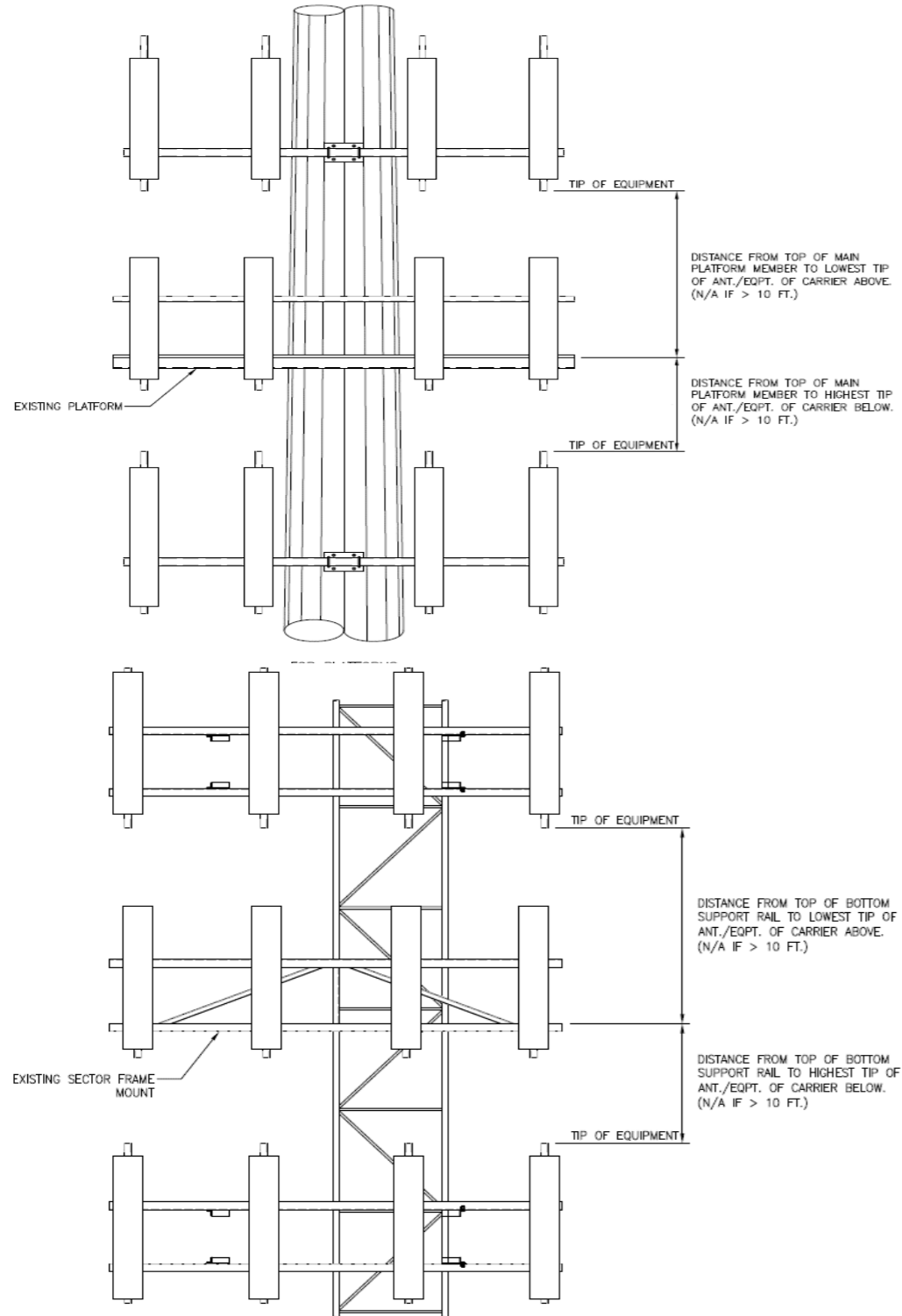
Ants. Items	Enter antenna model. If not labeled, enter "Unknown".						Mounting Locations [Units are inches and degrees]			Photos of antennas
	Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Antenna Center-line (Ft.)	Vertical Distances "b _{1a} , b _{2a} , b _{3a} , b _{1b} ..." (Inches)	Horiz. Offset "h" (Use "-" if Ant. is behind)	Antenna Azimuth (Degrees)	
Sector A										
Ant _{1a}	B66a RRH 4X45	12.00	7.00	25.50		104.583	36.00	-6.00		73,86
Ant _{1b}										
Ant _{1c}										
Ant _{2a}										
Ant _{2b}	(2) SBNHH-1D65B	12.00	7.50	73.00		104.333	39.00	10.50	25.00	24,86
Ant _{2c}										
Ant _{3a}	B13 RRH4X30	12.00	8.00	21.00		104.667	35.00	-6.00		85,87
Ant _{3b}	BXA-70063-6BF-EDIN	11.00	5.00	70.00		104.5	37.00	11.50	25.00	26,87
Ant _{3c}										
Ant _{4a}									25.00	
Ant _{4b}	BXA-80083-4CF-EDIN	11.00	5.00	48.00		105.333	27.00	10.00		88
Ant _{4c}										
Ant _{5a}										
Ant _{5b}										
Ant _{5c}										
Ant on Standoff	B25 RRH 4X30	12.00	7.00	20.00						87,104
Ant on Standoff										
Ant on Tower	RRFDC-6627-PF-48	15.00	10.00	28.00						95,96
Ant on Tower										



Antenna Layout (Looking Out From Tower)

Mount Azimuth (Degree) for Each Sector			Tower Leg Azimuth (Degree) for Each Sector			Sector B										
Sector A:	25.00	Deg	Leg A:	96.00	Deg	Ant _{1a}	B66a RRH 4X45	12.00	7.00	25.50		104.583	36.00	-6.00		73,89
Sector B:	150.00	Deg	Leg B:	216.00	Deg	Ant _{1b}										
Sector C:	280.00	Deg	Leg C:	336.00	Deg	Ant _{1c}										
Sector D:		Deg	Leg D:		Deg	Ant _{2a}										

Climbing Facility Information		
Location:	195.00 Deg	Outside Face B
Climbing Facility	Corrosion Type:	Good condition.
	Access:	Climbing path was unobstructed.
	Condition:	Good condition.



Ant _{2b}	(2) SBNHH-1D65B	12.00	7.50	73.00	(2)	104.333	39.00	10.50	150.00	24,89
Ant _{2c}										
Ant _{3a}	B13 RRH4X30	12.00	8.00	21.00		104.667	35.00	-6.00		85,90
Ant _{3b}	BXA-70063-6BF-EDIN	11.00	5.00	70.00		104.5	37.00	11.50	150.00	26,90
Ant _{3c}										
Ant _{4a}										
Ant _{4b}	BXA-80083-4CF-EDIN	11.00	5.00	48.00		105.333	27.00	10.00	150.00	91
Ant _{4c}										
Ant _{5a}										
Ant _{5b}										
Ant _{5c}										
Ant on Standoff	B25 RRH 4X30	12.00	7.00	20.00						90,104
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Sector C											
Ant _{1a}	B66a RRH 4X45	12.00	7.00	25.50		104.583	36.00	-6.00		73,92	
Ant _{1b}											
Ant _{1c}											
Ant _{2a}											
Ant _{2b}	(2) SBNHH-1D65B	12.00	7.50	73.00	(2)	104.333	39.00	10.50	280.00	24,92	
Ant _{2c}											
Ant _{3a}	B13 RRH4X30	12.00	8.00	21.00		104.667	35.00	-6.00		85,94	
Ant _{3b}	BXA-70063-6BF-EDIN	11.00	5.00	70.00		104.5	37.00	11.50	280.00	26,94	
Ant _{3c}											
Ant _{4a}											
Ant _{4b}	BXA-80083-4CF-EDIN	11.00	5.00	48.00		105.333	27.00	10.00	280.00	26,94	
Ant _{4c}											
Ant _{5a}											
Ant _{5b}											
Ant _{5c}											
Ant on Standoff	B25 RRH 4X30	12.00	7.00	20.00						93,104	
Ant on Standoff											
Ant on Tower											
Ant on Tower											

Sector D											
Ant _{1a}											
Ant _{1b}											
Ant _{1c}											
Ant _{2a}											
Ant _{2b}											
Ant _{2c}											
Ant _{3a}											
Ant _{3b}											
Ant _{3c}											
Ant _{4a}											
Ant _{4b}											
Ant _{4c}											
Ant _{5a}											
Ant _{5b}											
Ant _{5c}											
Ant on Standoff											
Ant on Standoff											
Ant on Tower											
Ant on Tower											

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #

1		
2	(12) 1-5/8"Ø COAX, (2) 1-1/4"Ø HYBRID	115
3		
4		
5		
6		
7		
8		

Mapping Notes

1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

Standard Conditions

1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.



Antenna Mount Mapping Form (PATENT PENDING)

FCC #

Tower Owner:	CROWN CASTLE	Mapping Date:	3/22/2021
Site Name:	WATERFORD 2 CT	Tower Type:	Self Support
Site Number or ID:	467304	Tower Height (Ft.):	150
Mapping Contractor:	HUDSON DESIGN GROUP, LLC.	Mount Elevation (Ft.):	106

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Please Insert Sketches of the Antenna Mount

DATE: 03222021

Project Name: _____

Project No.: WATERFORD 2 CT

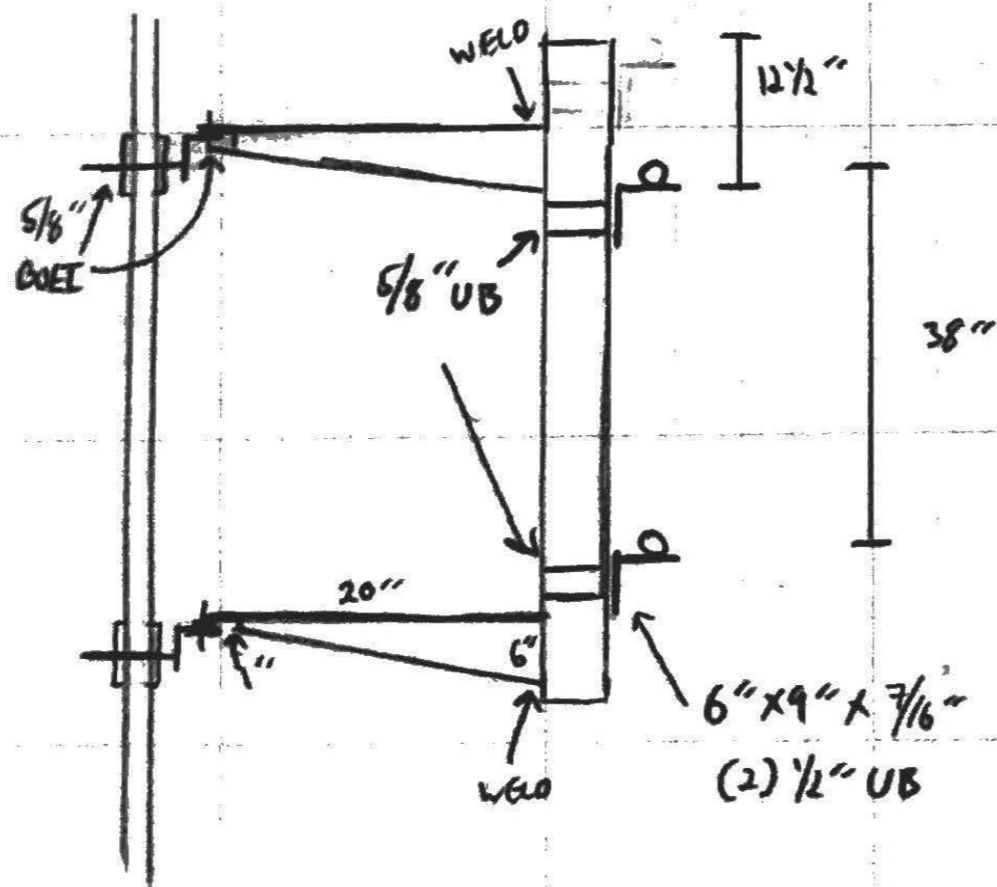
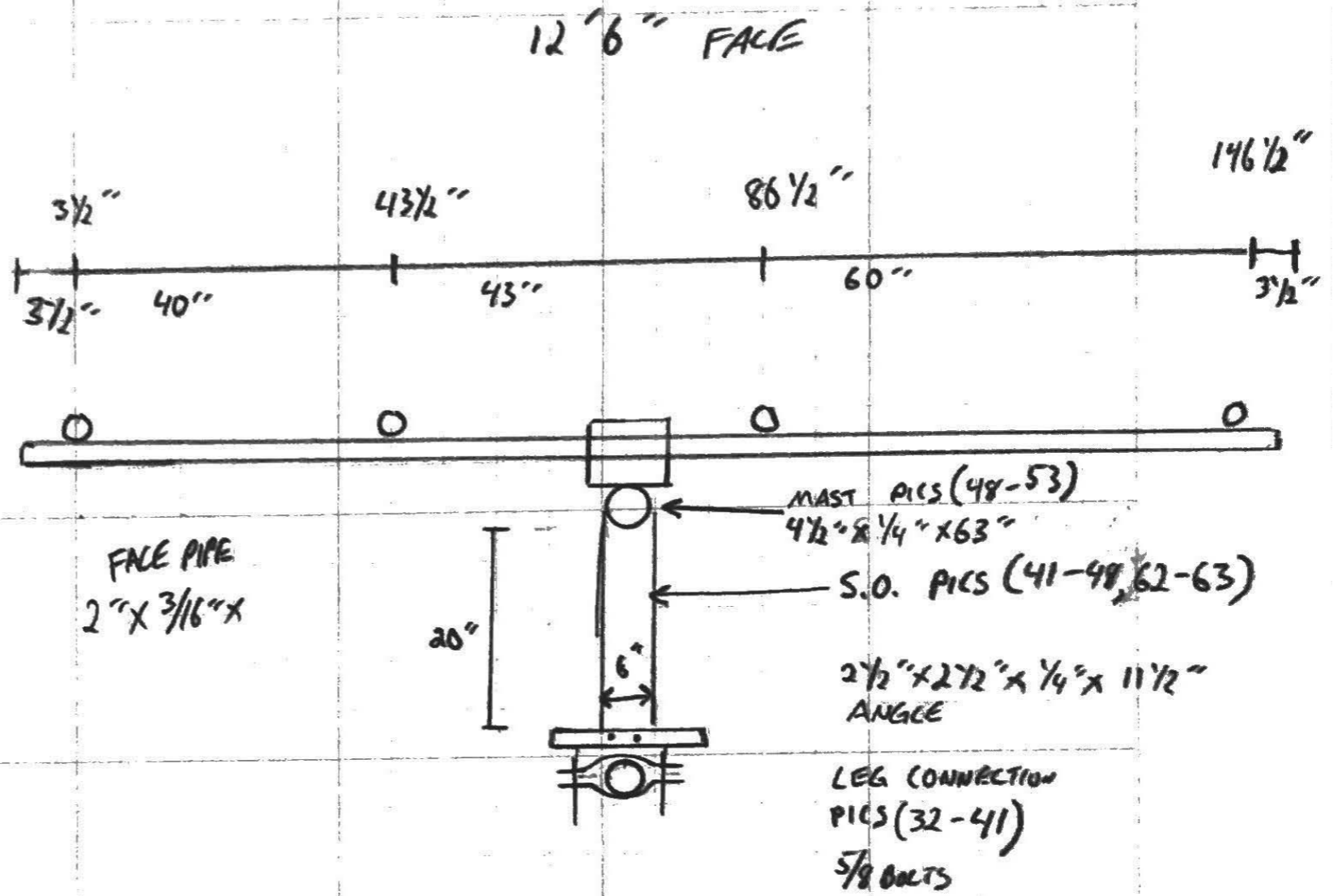
Design By: [Signature] Chk'd By: _____ Page 2 of 2

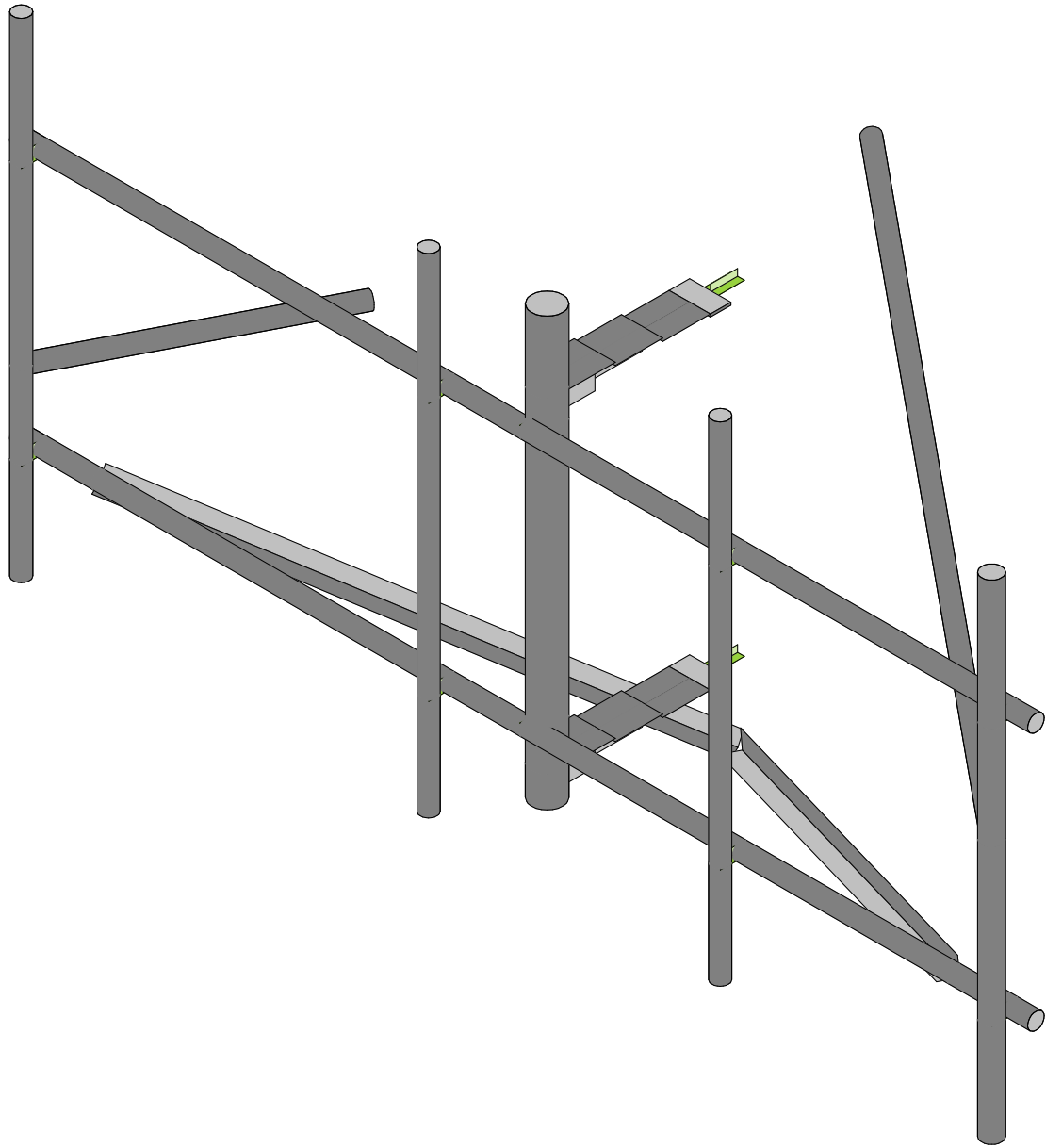
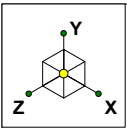
HUDSON Design Group LLC

45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845

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

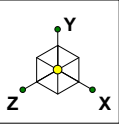
CL = 106' 7"
T-F = 37"
TOWER LEGS = 2 1/4"
FACE = 54" I.D.



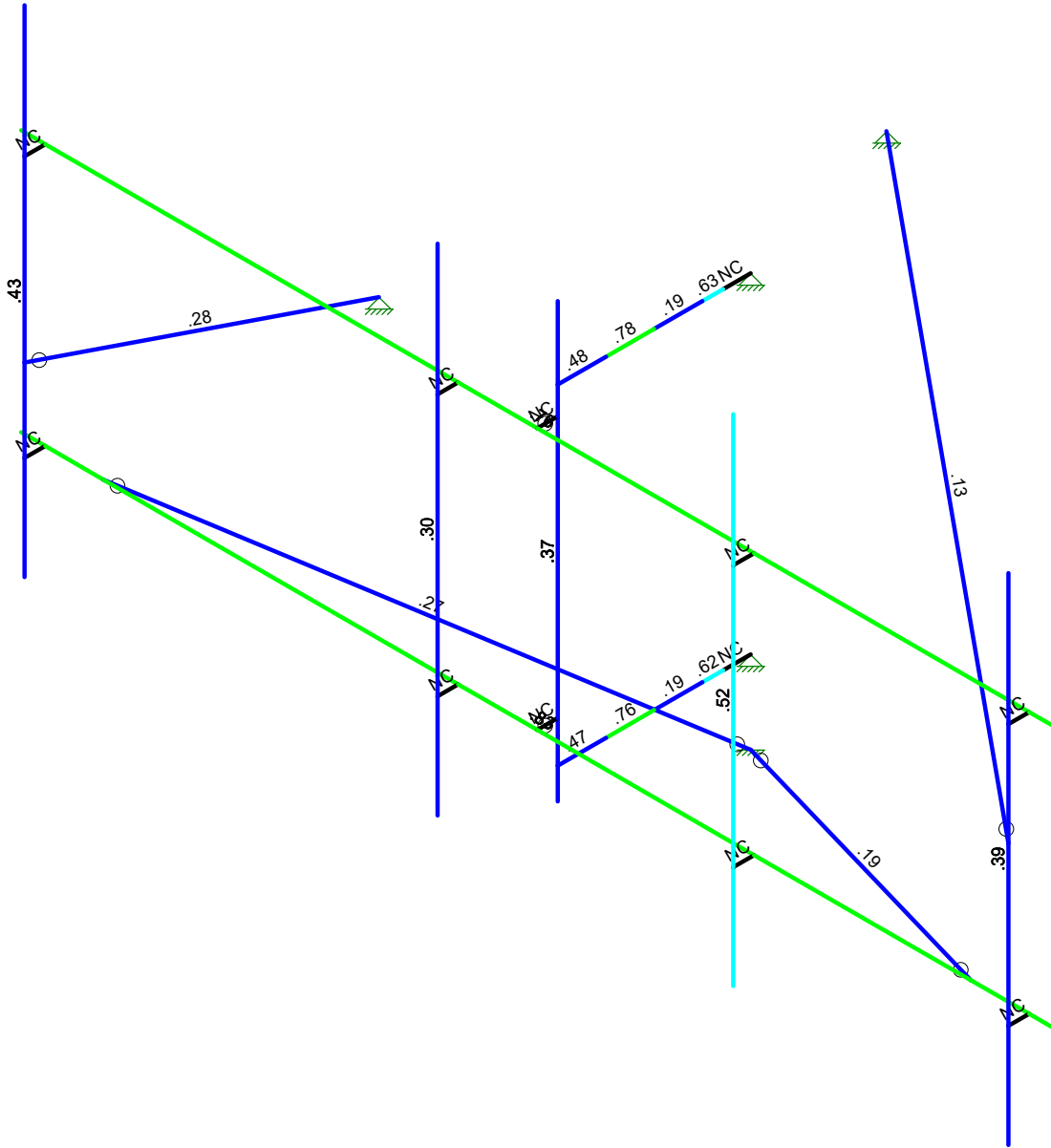


Maser Consulting
AE
21777138A

SK - 1
June 2, 2021 at 10:00 AM
FAILING_467304-VZW_MT_LOT_...

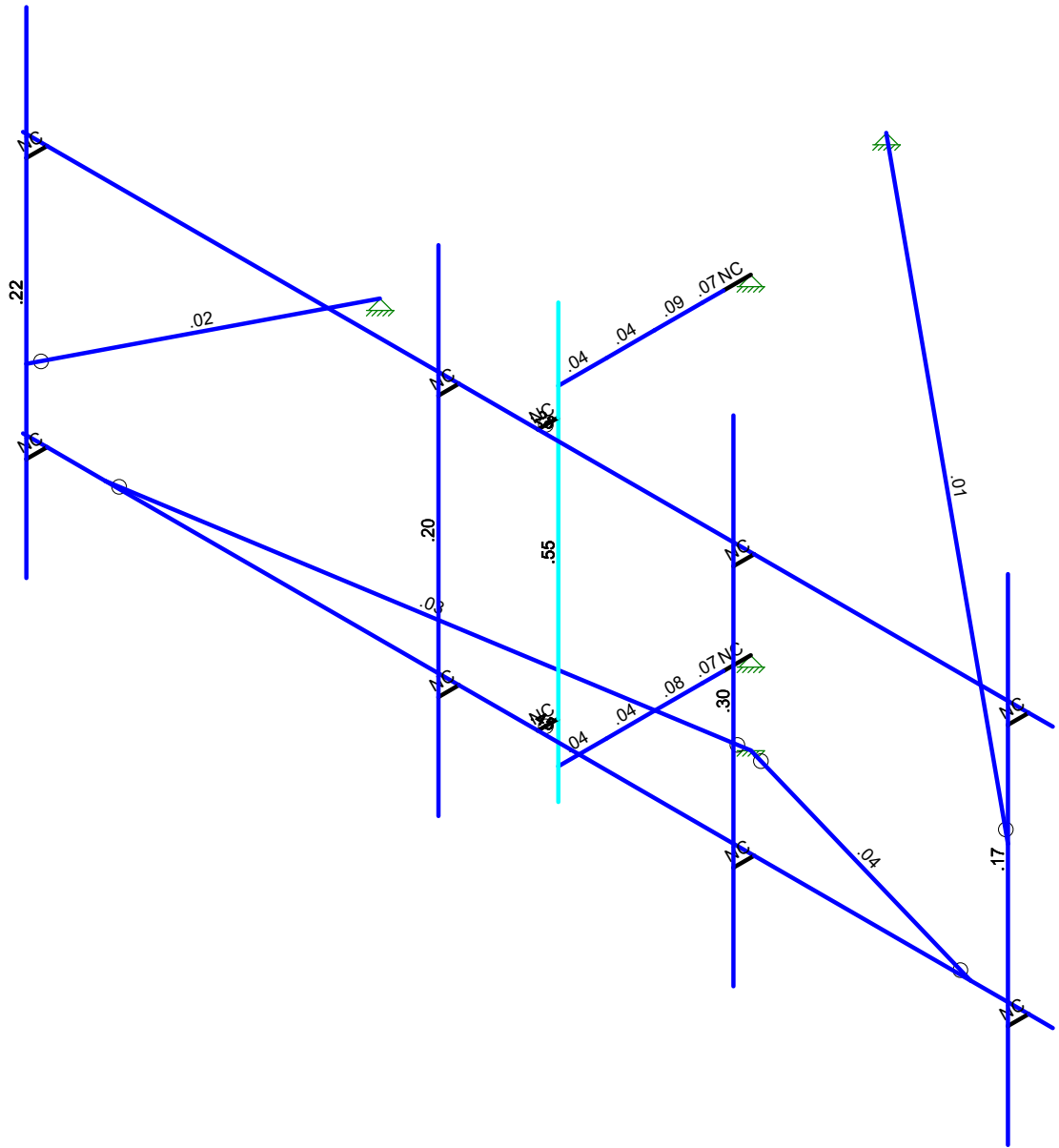
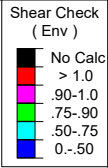
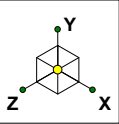


Code Check (Env)	
Black	No Calc
Red	> 1.0
Pink	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.0Wo (0 Deg)

Maser Consulting	SK - 2
AE	June 2, 2021 at 10:00 AM
21777138A	FAILING_467304-VZW_MT_LOT_...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.0Wo (0 Deg)

Maser Consulting		SK - 3
AE		June 2, 2021 at 10:00 AM
21777138A		FAILING_467304-VZW_MT_LOT_...



Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...)	Surface(P...
57	Structure Wi (120 De..	None						38	
58	Structure Wi (150 De..	None						38	
59	Structure Wi (180 De..	None						38	
60	Structure Wi (210 De..	None						38	
61	Structure Wi (240 De..	None						38	
62	Structure Wi (270 De..	None						38	
63	Structure Wi (300 De..	None						38	
64	Structure Wi (330 De..	None						38	
65	Structure Wm (0 Deg)	None						38	
66	Structure Wm (30 De..	None						38	
67	Structure Wm (60 De..	None						38	
68	Structure Wm (90 De..	None						38	
69	Structure Wm (120 D..	None						38	
70	Structure Wm (150 D..	None						38	
71	Structure Wm (180 D..	None						38	
72	Structure Wm (210 D..	None						38	
73	Structure Wm (240 D..	None						38	
74	Structure Wm (270 D..	None						38	
75	Structure Wm (300 D..	None						38	
76	Structure Wm (330 D..	None						38	
77	Lm1	None					1		
78	Lm2	None					1		
79	Lv1	None					1		
80	Lv2	None					1		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	
1	1.2D+1.0Wo (0 Deg)	Yes	Y		1	1.2	39	1.2	3	1	41	1											
2	1.2D+1.0Wo (30 Deg)	Yes	Y		1	1.2	39	1.2	4	1	42	1											
3	1.2D+1.0Wo (60 Deg)	Yes	Y		1	1.2	39	1.2	5	1	43	1											
4	1.2D+1.0Wo (90 Deg)	Yes	Y		1	1.2	39	1.2	6	1	44	1											
5	1.2D+1.0Wo (120 Deg)	Yes	Y		1	1.2	39	1.2	7	1	45	1											
6	1.2D+1.0Wo (150 Deg)	Yes	Y		1	1.2	39	1.2	8	1	46	1											
7	1.2D+1.0Wo (180 Deg)	Yes	Y		1	1.2	39	1.2	9	1	47	1											
8	1.2D+1.0Wo (210 Deg)	Yes	Y		1	1.2	39	1.2	10	1	48	1											
9	1.2D+1.0Wo (240 Deg)	Yes	Y		1	1.2	39	1.2	11	1	49	1											
10	1.2D+1.0Wo (270 Deg)	Yes	Y		1	1.2	39	1.2	12	1	50	1											
11	1.2D+1.0Wo (300 Deg)	Yes	Y		1	1.2	39	1.2	13	1	51	1											
12	1.2D+1.0Wo (330 Deg)	Yes	Y		1	1.2	39	1.2	14	1	52	1											
13	1.2D + 1.0Di + 1.0Wi (0 Deg)	Yes	Y		1	1.2	39	1.2	2	1	40	1	15	1	53	1							
14	1.2D + 1.0Di + 1.0Wi (30 De..	Yes	Y		1	1.2	39	1.2	2	1	40	1	16	1	54	1							
15	1.2D + 1.0Di + 1.0Wi (60 De..	Yes	Y		1	1.2	39	1.2	2	1	40	1	17	1	55	1							
16	1.2D + 1.0Di + 1.0Wi (90 De..	Yes	Y		1	1.2	39	1.2	2	1	40	1	18	1	56	1							
17	1.2D + 1.0Di + 1.0Wi (120 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	19	1	57	1							
18	1.2D + 1.0Di + 1.0Wi (150 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	20	1	58	1							
19	1.2D + 1.0Di + 1.0Wi (180 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	21	1	59	1							
20	1.2D + 1.0Di + 1.0Wi (210 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	22	1	60	1							
21	1.2D + 1.0Di + 1.0Wi (240 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	23	1	61	1							
22	1.2D + 1.0Di + 1.0Wi (270 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	24	1	62	1							
23	1.2D + 1.0Di + 1.0Wi (300 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	25	1	63	1							
24	1.2D + 1.0Di + 1.0Wi (330 D..	Yes	Y		1	1.2	39	1.2	2	1	40	1	26	1	64	1							
25	1.2D + 1.5Lm1 + 1.0Wm (0 ...	Yes	Y		1	1.2	39	1.2	77	1.5	27	1	65	1									
26	1.2D + 1.5Lm1 + 1.0Wm (30...	Yes	Y		1	1.2	39	1.2	77	1.5	28	1	66	1									
27	1.2D + 1.5Lm1 + 1.0Wm (60...	Yes	Y		1	1.2	39	1.2	77	1.5	29	1	67	1									
28	1.2D + 1.5Lm1 + 1.0Wm (90...	Yes	Y		1	1.2	39	1.2	77	1.5	30	1	68	1									

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65 .49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65 .49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65 .49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65 .527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65 .527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65 .49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65 .49	50	1.4	65	1.3

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Face Pipe	Beam	Pipe	A53 Gr.B	Typical
2	M2	N3	N4			Face Pipe	Beam	Pipe	A53 Gr.B	Typical
3	M15	N6	N32			RIGID	None	None	RIGID	Typical
4	M16	N5	N31			RIGID	None	None	RIGID	Typical
5	M17	N46	N34			Mast Pipe	Column	Pipe	A53 Gr.B	Typical
6	M25	N41	N37		90	SO4	Beam	BAR	A36 Gr.36	Typical
7	M26	N40	N36		90	SO4	Beam	BAR	A36 Gr.36	Typical
8	M21	N35	N44			SO1	Beam	W Tee	A36 Gr.36	Typical
9	M22	N33	N43			SO1	Beam	W Tee	A36 Gr.36	Typical
10	M23	N44	N46B			SO2	Beam	W Tee	A36 Gr.36	Typical
11	M24	N43	N45			SO2	Beam	W Tee	A36 Gr.36	Typical
12	M25B	N45	N40			SO3	Beam	W Tee	A36 Gr.36	Typical
13	M26B	N46B	N41			SO3	Beam	W Tee	A36 Gr.36	Typical
14	M27	N48	N37			RIGID	None	None	RIGID	Typical
15	M28	N47	N36			RIGID	None	None	RIGID	Typical
16	M17A	N40A	N32A			RIGID	None	None	RIGID	Typical
17	M18	N39	N31A			RIGID	None	None	RIGID	Typical
18	M19	N38	N30			RIGID	None	None	RIGID	Typical
19	M20	N37A	N29			RIGID	None	None	RIGID	Typical
20	M21A	N35A	N27			RIGID	None	None	RIGID	Typical
21	M22A	N33A	N25			RIGID	None	None	RIGID	Typical
22	M23A	N34A	N26			RIGID	None	None	RIGID	Typical
23	M24A	N36A	N28			RIGID	None	None	RIGID	Typical
24	MP4A	N44A	N48A			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
25	MP3A	N43A	N47B			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
26	MP2A	N42	N46A			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
27	MP1A	N41A	N45A			Dual Mount Pipe	Column	Pipe	A53 Gr.B	Typical
28	M29	N49A	N49			Tieback	Beam	Pipe	A53 Gr.B	Typical
29	M29A	N50	N49B			MOD Bracing	Column	Single Angle	A36 Gr.36	Typical
30	M30	N51	N49B		270	MOD Bracing	Column	Single Angle	A36 Gr.36	Typical
31	M31	N53A	N53			Mod Tieback	Beam	Pipe	A53 Gr.B	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Face Pipe	12.5			Lbyy						Lateral
2	M2	Face Pipe	12.5			Lbyy						Lateral
3	M17	Mast Pipe	5.25			Lbyy						Lateral
4	M25	SO4	.25			Lbyy						Lateral
5	M26	SO4	.25			Lbyy						Lateral
6	M21	SO1	.583			Lbyy						Lateral
7	M22	SO1	.583			Lbyy						Lateral
8	M23	SO2	.583			Lbyy						Lateral
9	M24	SO2	.583			Lbyy						Lateral



Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
10	M25B	SO3	.583			Lbyy						Lateral
11	M26B	SO3	.583			Lbyy						Lateral
12	MP4A	Mount Pipe	6									Lateral
13	MP3A	Mount Pipe	6									Lateral
14	MP2A	Mount Pipe	6									Lateral
15	MP1A	Dual Mount ...	6									Lateral
16	M29	Tieback	10.615			Lbyy						Lateral
17	M29A	MOD Bracing	6.04									Lateral
18	M30	MOD Bracing	6.04									Lateral
19	M31	Mod Tieback	3.187			Lbyy						Lateral

Member Point Loads (BLC 1 : Antenna D)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	Y	-23	.25
2	MP1A	My	-.017	.25
3	MP1A	Mz	.015	.25
4	MP1A	Y	-23	4.25
5	MP1A	My	-.017	4.25
6	MP1A	Mz	.015	4.25
7	MP1A	Y	-23	.25
8	MP1A	My	0	.25
9	MP1A	Mz	-.015	.25
10	MP1A	Y	-23	4.25
11	MP1A	My	0	4.25
12	MP1A	Mz	-.015	4.25
13	MP2A	Y	-43.55	1.25
14	MP2A	My	-.033	1.25
15	MP2A	Mz	0	1.25
16	MP2A	Y	-43.55	3.25
17	MP2A	My	-.033	3.25
18	MP2A	Mz	0	3.25
19	MP1A	Y	-84.4	3.5
20	MP1A	My	.042	3.5
21	MP1A	Mz	0	3.5
22	MP2A	Y	-70.3	3.5
23	MP2A	My	.035	3.5
24	MP2A	Mz	0	3.5
25	MP4A	Y	-4.95	1.25
26	MP4A	My	-.004	1.25
27	MP4A	Mz	0	1.25
28	MP4A	Y	-4.95	3.25
29	MP4A	My	-.004	3.25
30	MP4A	Mz	0	3.25

Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	Y	-80.115	.25
2	MP1A	My	-.06	.25
3	MP1A	Mz	.053	.25
4	MP1A	Y	-80.115	4.25
5	MP1A	My	-.06	4.25
6	MP1A	Mz	.053	4.25
7	MP1A	Y	-80.115	.25
8	MP1A	My	0	.25
9	MP1A	Mz	-.053	.25



Member Point Loads (BLC 14 : Antenna Wo (330 Deg)) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft. %]
7	MP1A	X	-80.085	.25
8	MP1A	Z	-138.711	.25
9	MP1A	Mx	.092	.25
10	MP1A	X	-80.085	4.25
11	MP1A	Z	-138.711	4.25
12	MP1A	Mx	.092	4.25
13	MP2A	X	-34.55	1.25
14	MP2A	Z	-59.842	1.25
15	MP2A	Mx	.026	1.25
16	MP2A	X	-34.55	3.25
17	MP2A	Z	-59.842	3.25
18	MP2A	Mx	.026	3.25
19	MP1A	X	-29.738	3.5
20	MP1A	Z	-51.508	3.5
21	MP1A	Mx	-.015	3.5
22	MP2A	X	-28.708	3.5
23	MP2A	Z	-49.725	3.5
24	MP2A	Mx	-.014	3.5
25	MP4A	X	-35.565	1.25
26	MP4A	Z	-61.6	1.25
27	MP4A	Mx	.027	1.25
28	MP4A	X	-35.565	3.25
29	MP4A	Z	-61.6	3.25
30	MP4A	Mx	.027	3.25

Member Point Loads (BLC 15 : Antenna Wi (0 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft. %]
1	MP1A	X	0	.25
2	MP1A	Z	-29.322	.25
3	MP1A	Mx	-.02	.25
4	MP1A	X	0	4.25
5	MP1A	Z	-29.322	4.25
6	MP1A	Mx	-.02	4.25
7	MP1A	X	0	.25
8	MP1A	Z	-29.322	.25
9	MP1A	Mx	.02	.25
10	MP1A	X	0	4.25
11	MP1A	Z	-29.322	4.25
12	MP1A	Mx	.02	4.25
13	MP2A	X	0	1.25
14	MP2A	Z	-14.453	1.25
15	MP2A	Mx	0	1.25
16	MP2A	X	0	3.25
17	MP2A	Z	-14.453	3.25
18	MP2A	Mx	0	3.25
19	MP1A	X	0	3.5
20	MP1A	Z	-12.163	3.5
21	MP1A	Mx	0	3.5
22	MP2A	X	0	3.5
23	MP2A	Z	-12.163	3.5
24	MP2A	Mx	0	3.5
25	MP4A	X	0	1.25
26	MP4A	Z	-14.497	1.25
27	MP4A	Mx	0	1.25
28	MP4A	X	0	3.25
29	MP4A	Z	-14.497	3.25

Member Point Loads (BLC 17 : Antenna Wi (60 Deg)) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
20	MP1A	Z	-4.69	3.5
21	MP1A	Mx	.004	3.5
22	MP2A	X	7.207	3.5
23	MP2A	Z	-4.161	3.5
24	MP2A	Mx	.004	3.5
25	MP4A	X	8.059	1.25
26	MP4A	Z	-4.653	1.25
27	MP4A	Mx	-.006	1.25
28	MP4A	X	8.059	3.25
29	MP4A	Z	-4.653	3.25
30	MP4A	Mx	-.006	3.25

Member Point Loads (BLC 18 : Antenna Wi (90 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	22.171	.25
2	MP1A	Z	0	.25
3	MP1A	Mx	-.017	.25
4	MP1A	X	22.171	4.25
5	MP1A	Z	0	4.25
6	MP1A	Mx	-.017	4.25
7	MP1A	X	22.171	.25
8	MP1A	Z	0	.25
9	MP1A	Mx	0	.25
10	MP1A	X	22.171	4.25
11	MP1A	Z	0	4.25
12	MP1A	Mx	0	4.25
13	MP2A	X	6.142	1.25
14	MP2A	Z	0	1.25
15	MP2A	Mx	-.005	1.25
16	MP2A	X	6.142	3.25
17	MP2A	Z	0	3.25
18	MP2A	Mx	-.005	3.25
19	MP1A	X	8.452	3.5
20	MP1A	Z	0	3.5
21	MP1A	Mx	.004	3.5
22	MP2A	X	7.041	3.5
23	MP2A	Z	0	3.5
24	MP2A	Mx	.004	3.5
25	MP4A	X	7.575	1.25
26	MP4A	Z	0	1.25
27	MP4A	Mx	-.006	1.25
28	MP4A	X	7.575	3.25
29	MP4A	Z	0	3.25
30	MP4A	Mx	-.006	3.25

Member Point Loads (BLC 19 : Antenna Wi (120 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	20.749	.25
2	MP1A	Z	11.979	.25
3	MP1A	Mx	-.008	.25
4	MP1A	X	20.749	4.25
5	MP1A	Z	11.979	4.25
6	MP1A	Mx	-.008	4.25
7	MP1A	X	20.749	.25
8	MP1A	Z	11.979	.25
9	MP1A	Mx	-.008	.25



Member Point Loads (BLC 21 : Antenna Wi (180 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	0	.25
2	MP1A	Z	29.322	.25
3	MP1A	Mx	.02	.25
4	MP1A	X	0	4.25
5	MP1A	Z	29.322	4.25
6	MP1A	Mx	.02	4.25
7	MP1A	X	0	.25
8	MP1A	Z	29.322	.25
9	MP1A	Mx	-.02	.25
10	MP1A	X	0	4.25
11	MP1A	Z	29.322	4.25
12	MP1A	Mx	-.02	4.25
13	MP2A	X	0	1.25
14	MP2A	Z	14.453	1.25
15	MP2A	Mx	0	1.25
16	MP2A	X	0	3.25
17	MP2A	Z	14.453	3.25
18	MP2A	Mx	0	3.25
19	MP1A	X	0	3.5
20	MP1A	Z	12.163	3.5
21	MP1A	Mx	0	3.5
22	MP2A	X	0	3.5
23	MP2A	Z	12.163	3.5
24	MP2A	Mx	0	3.5
25	MP4A	X	0	1.25
26	MP4A	Z	14.497	1.25
27	MP4A	Mx	0	1.25
28	MP4A	X	0	3.25
29	MP4A	Z	14.497	3.25
30	MP4A	Mx	0	3.25

Member Point Loads (BLC 22 : Antenna Wi (210 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	-13.767	.25
2	MP1A	Z	23.845	.25
3	MP1A	Mx	.026	.25
4	MP1A	X	-13.767	4.25
5	MP1A	Z	23.845	4.25
6	MP1A	Mx	.026	4.25
7	MP1A	X	-13.767	.25
8	MP1A	Z	23.845	.25
9	MP1A	Mx	-.016	.25
10	MP1A	X	-13.767	4.25
11	MP1A	Z	23.845	4.25
12	MP1A	Mx	-.016	4.25
13	MP2A	X	-6.188	1.25
14	MP2A	Z	10.717	1.25
15	MP2A	Mx	.005	1.25
16	MP2A	X	-6.188	3.25
17	MP2A	Z	10.717	3.25
18	MP2A	Mx	.005	3.25
19	MP1A	X	-5.618	3.5
20	MP1A	Z	9.73	3.5
21	MP1A	Mx	-.003	3.5
22	MP2A	X	-5.441	3.5
23	MP2A	Z	9.425	3.5



Company : Maser Consulting
 Designer : AE
 Job Number : 21777138A
 Model Name :

June 2, 2021
 10:00 AM
 Checked By: DX

Member Point Loads (BLC 27 : Antenna Wm (0 Deg)) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft, %]
27	MP4A	Mx	0	1.25
28	MP4A	X	0	3.25
29	MP4A	Z	-4.64	3.25
30	MP4A	Mx	0	3.25

Member Point Loads (BLC 28 : Antenna Wm (30 Deg))

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft, %]
1	MP1A	X	4.54	.25
2	MP1A	Z	-7.863	.25
3	MP1A	Mx	-.009	.25
4	MP1A	X	4.54	4.25
5	MP1A	Z	-7.863	4.25
6	MP1A	Mx	-.009	4.25
7	MP1A	X	4.54	.25
8	MP1A	Z	-7.863	.25
9	MP1A	Mx	.005	.25
10	MP1A	X	4.54	4.25
11	MP1A	Z	-7.863	4.25
12	MP1A	Mx	.005	4.25
13	MP2A	X	1.959	1.25
14	MP2A	Z	-3.392	1.25
15	MP2A	Mx	-.001	1.25
16	MP2A	X	1.959	3.25
17	MP2A	Z	-3.392	3.25
18	MP2A	Mx	-.001	3.25
19	MP1A	X	1.686	3.5
20	MP1A	Z	-2.92	3.5
21	MP1A	Mx	.000843	3.5
22	MP2A	X	1.627	3.5
23	MP2A	Z	-2.819	3.5
24	MP2A	Mx	.000814	3.5
25	MP4A	X	2.016	1.25
26	MP4A	Z	-3.492	1.25
27	MP4A	Mx	-.002	1.25
28	MP4A	X	2.016	3.25
29	MP4A	Z	-3.492	3.25
30	MP4A	Mx	-.002	3.25

Member Point Loads (BLC 29 : Antenna Wm (60 Deg))

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft, %]
1	MP1A	X	6.786	.25
2	MP1A	Z	-3.918	.25
3	MP1A	Mx	-.008	.25
4	MP1A	X	6.786	4.25
5	MP1A	Z	-3.918	4.25
6	MP1A	Mx	-.008	4.25
7	MP1A	X	6.786	.25
8	MP1A	Z	-3.918	.25
9	MP1A	Mx	.003	.25
10	MP1A	X	6.786	4.25
11	MP1A	Z	-3.918	4.25
12	MP1A	Mx	.003	4.25
13	MP2A	X	2.175	1.25
14	MP2A	Z	-1.256	1.25
15	MP2A	Mx	-.002	1.25
16	MP2A	X	2.175	3.25



Member Point Loads (BLC 32 : Antenna Wm (150 Deg)) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
30	MP4A	Mx	-.002	3.25

Member Point Loads (BLC 33 : Antenna Wm (180 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	0	.25
2	MP1A	Z	9.702	.25
3	MP1A	Mx	.006	.25
4	MP1A	X	0	4.25
5	MP1A	Z	9.702	4.25
6	MP1A	Mx	.006	4.25
7	MP1A	X	0	.25
8	MP1A	Z	9.702	.25
9	MP1A	Mx	-.006	.25
10	MP1A	X	0	4.25
11	MP1A	Z	9.702	4.25
12	MP1A	Mx	-.006	4.25
13	MP2A	X	0	1.25
14	MP2A	Z	4.62	1.25
15	MP2A	Mx	0	1.25
16	MP2A	X	0	3.25
17	MP2A	Z	4.62	3.25
18	MP2A	Mx	0	3.25
19	MP1A	X	0	3.5
20	MP1A	Z	3.676	3.5
21	MP1A	Mx	0	3.5
22	MP2A	X	0	3.5
23	MP2A	Z	3.676	3.5
24	MP2A	Mx	0	3.5
25	MP4A	X	0	1.25
26	MP4A	Z	4.64	1.25
27	MP4A	Mx	0	1.25
28	MP4A	X	0	3.25
29	MP4A	Z	4.64	3.25
30	MP4A	Mx	0	3.25

Member Point Loads (BLC 34 : Antenna Wm (210 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	-4.54	.25
2	MP1A	Z	7.863	.25
3	MP1A	Mx	.009	.25
4	MP1A	X	-4.54	4.25
5	MP1A	Z	7.863	4.25
6	MP1A	Mx	.009	4.25
7	MP1A	X	-4.54	.25
8	MP1A	Z	7.863	.25
9	MP1A	Mx	-.005	.25
10	MP1A	X	-4.54	4.25
11	MP1A	Z	7.863	4.25
12	MP1A	Mx	-.005	4.25
13	MP2A	X	-1.959	1.25
14	MP2A	Z	3.392	1.25
15	MP2A	Mx	.001	1.25
16	MP2A	X	-1.959	3.25
17	MP2A	Z	3.392	3.25
18	MP2A	Mx	.001	3.25
19	MP1A	X	-1.686	3.5



Member Point Loads (BLC 34 : Antenna Wm (210 Deg)) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
20	MP1A	Z	2.92	3.5
21	MP1A	Mx	-.000843	3.5
22	MP2A	X	-1.627	3.5
23	MP2A	Z	2.819	3.5
24	MP2A	Mx	-.000814	3.5
25	MP4A	X	-2.016	1.25
26	MP4A	Z	3.492	1.25
27	MP4A	Mx	.002	1.25
28	MP4A	X	-2.016	3.25
29	MP4A	Z	3.492	3.25
30	MP4A	Mx	.002	3.25

Member Point Loads (BLC 35 : Antenna Wm (240 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	-6.786	.25
2	MP1A	Z	3.918	.25
3	MP1A	Mx	.008	.25
4	MP1A	X	-6.786	4.25
5	MP1A	Z	3.918	4.25
6	MP1A	Mx	.008	4.25
7	MP1A	X	-6.786	.25
8	MP1A	Z	3.918	.25
9	MP1A	Mx	-.003	.25
10	MP1A	X	-6.786	4.25
11	MP1A	Z	3.918	4.25
12	MP1A	Mx	-.003	4.25
13	MP2A	X	-2.175	1.25
14	MP2A	Z	1.256	1.25
15	MP2A	Mx	.002	1.25
16	MP2A	X	-2.175	3.25
17	MP2A	Z	1.256	3.25
18	MP2A	Mx	.002	3.25
19	MP1A	X	-2.392	3.5
20	MP1A	Z	1.381	3.5
21	MP1A	Mx	-.001	3.5
22	MP2A	X	-2.089	3.5
23	MP2A	Z	1.206	3.5
24	MP2A	Mx	-.001	3.5
25	MP4A	X	-2.44	1.25
26	MP4A	Z	1.409	1.25
27	MP4A	Mx	.002	1.25
28	MP4A	X	-2.44	3.25
29	MP4A	Z	1.409	3.25
30	MP4A	Mx	.002	3.25

Member Point Loads (BLC 36 : Antenna Wm (270 Deg))

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	-7.213	.25
2	MP1A	Z	0	.25
3	MP1A	Mx	.005	.25
4	MP1A	X	-7.213	4.25
5	MP1A	Z	0	4.25
6	MP1A	Mx	.005	4.25
7	MP1A	X	-7.213	.25
8	MP1A	Z	0	.25
9	MP1A	Mx	0	.25

Member Distributed Loads (BLC 59 : Structure Wi (180 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft, %]	End Location[ft, %]
35	M30	X	0	0	0	%100
36	M30	Z	2.862	2.862	0	%100
37	M31	X	0	0	0	%100
38	M31	Z	.446	.446	0	%100

Member Distributed Loads (BLC 60 : Structure Wi (210 Deg))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft, %]	End Location[ft, %]
1	M1	X	-.947	-.947	0	%100
2	M1	Z	1.639	1.639	0	%100
3	M2	X	-.947	-.947	0	%100
4	M2	Z	1.639	1.639	0	%100
5	M17	X	-1.592	-1.592	0	%100
6	M17	Z	2.757	2.757	0	%100
7	M25	X	-.115	-.115	0	%100
8	M25	Z	.199	.199	0	%100
9	M26	X	-.115	-.115	0	%100
10	M26	Z	.199	.199	0	%100
11	M21	X	-.501	-.501	0	%100
12	M21	Z	.867	.867	0	%100
13	M22	X	-.501	-.501	0	%100
14	M22	Z	.867	.867	0	%100
15	M23	X	-.501	-.501	0	%100
16	M23	Z	.867	.867	0	%100
17	M24	X	-.501	-.501	0	%100
18	M24	Z	.867	.867	0	%100
19	M25B	X	-.501	-.501	0	%100
20	M25B	Z	.867	.867	0	%100
21	M26B	X	-.501	-.501	0	%100
22	M26B	Z	.867	.867	0	%100
23	MP4A	X	-1.262	-1.262	0	%100
24	MP4A	Z	2.186	2.186	0	%100
25	MP3A	X	-1.262	-1.262	0	%100
26	MP3A	Z	2.186	2.186	0	%100
27	MP2A	X	-1.262	-1.262	0	%100
28	MP2A	Z	2.186	2.186	0	%100
29	MP1A	X	-1.399	-1.399	0	%100
30	MP1A	Z	2.422	2.422	0	%100
31	M29	X	-1.229	-1.229	0	%100
32	M29	Z	2.128	2.128	0	%100
33	M29A	X	-.617	-.617	0	%100
34	M29A	Z	1.068	1.068	0	%100
35	M30	X	-1.744	-1.744	0	%100
36	M30	Z	3.021	3.021	0	%100
37	M31	X	-.002	-.002	0	%100
38	M31	Z	.004	.004	0	%100

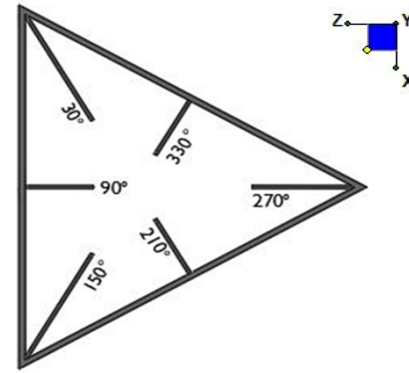
Member Distributed Loads (BLC 61 : Structure Wi (240 Deg))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft, %]	End Location[ft, %]
1	M1	X	-.546	-.546	0	%100
2	M1	Z	.316	.316	0	%100
3	M2	X	-.546	-.546	0	%100
4	M2	Z	.316	.316	0	%100
5	M17	X	-2.757	-2.757	0	%100
6	M17	Z	1.592	1.592	0	%100
7	M25	X	-.598	-.598	0	%100
8	M25	Z	.345	.345	0	%100

I. Mount-to-Tower Connection Check

RISA Model Data

Nodes (labeled per RISA)	Orientation (per graphic of typical platform)
N48	90
N47	90



TYPICAL PLATFORM

Tower Connection Bolt Checks

Any moment resistance?:

Bolt Quantity per Reaction:

d_x (in) (Delta X of typ. bolt config. sketch):

d_y (in) (Delta Y of typ. bolt config. sketch):

Bolt Type:

Bolt Diameter (in):

Required Tensile Strength (kips):

Required Shear Strength (kips):

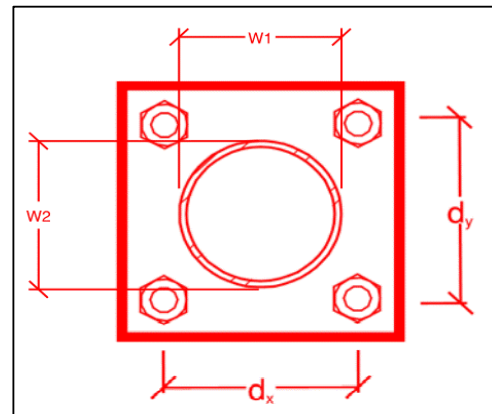
Tensile Strength / bolt (kips):

Shear Strength / bolt (kips):

Tensile Capacity Overall:

Shear Capacity Overall:

no
2
A307
0.625
1.2
1.9
10.0
6.0
5.9%*
16.0%



*Note: Tension reduction not required if tension or shear capacity < 30%

Mount Desktop – Post Modification Inspection (PMI) Report Requirements

Documents & Photos Required from Contractor – Mount Modification

Purpose – to provide TES the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the modification was completed in accordance with the modification drawings.
- Contractor shall relay any data that can impact the performance of the mount or the mount modification, this includes safety issues.

Base Requirements:

- Any special photos outside of the standard requirements will be indicated on the drawings
- Provide “as built drawings” showing contractor’s name, preparer’s signature, and date. Any deviations from the drawings (proposed modification) must be shown.
- Notation that all hardware was properly installed, and the existing hardware was inspected for any issues.
- Verification that loading is as communicated in the modification drawings. NOTE If loading is different than what is conveyed in the modification drawing contact TES immediately.
- Each photo should be time and date stamped
- Photos should be high resolution and submitted in a Zip File and should be organized in the file structure as depicted in Schedule A attached.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope.
- The photos in the file structure should be uploaded to <https://pmi.vzsmart.com> as depicted on the drawings

Photo Requirements:

- Base and “During Installation Photos”
 - Base pictures include
 - Photo of Gate Signs showing the tower owner, site name, and number
 - Photo of carrier shelter showing the carrier site name and number if available
 - Photos of the galvanizing compound and/or paint used (if applicable), clearly showing the label and name
 - “During Installation Photos if provided - must be placed only in this folder
- Photos taken at ground level
 - Overall tower structure before and after installation of the modifications
 - Photos of the appropriate mount before and after installation of the modifications; if the mounts are at different rad elevations, pictures must be provided for all elevations that the modifications were installed

- Photos taken at Mount Elevation
 - Photos showing each individual sector before and also after installation of modifications. Each entire sector must be in one photo to show in the inter-connection of members.
 - These photos should also certify that the placement and geometry of the equipment on the mount is as depicted on the sketch and table in the mount analysis
 - Close-up photos of each installed modification per the modification drawings; pictures should also include connection hardware (U-bolts, bolts, nuts, all-threaded rods, etc.)
 - Photos showing the measurements of the installed modification member sizes (i.e. lengths, widths, depths, diameters, thicknesses)
 - Photos showing the elevation or distances of the installed modifications from the appropriate reference locations shown in the modification drawings
 - Photos showing the installed modifications onto the tower with tape drop measurements (if applicable) (i.e. ring/collar mounts, tie-backs, V-bracing kits, etc.); if the existing mount elevation needs to be changed according to the modification drawings, a tape drop measurement shall be provided before the elevation change
 - Photos showing the safety climb wire rope above and below the mount prior to modification.
 - Photos showing the climbing facility and safety climb if present.

Material Certification:

- Materials utilized must be as per specification on the drawings or the equivalent as validated by TES.
 - If the drawings are as specified on the drawings
 - The contractor should provide the packing list or the materials utilized to perform the mount modification
 - If an equivalent is utilized
 - It is required that the TES certification of such is included in the contractor submission package. There may be an additional charge for this certification if the equivalent submission doesn't meet specifications as prescribed in the drawings.
- The contractor must certify that the materials meet these specifications by one of these methods.

The Material utilized was as specified on the TES Mount Modification Drawings and included in the Material certification folder is a packing list or invoice for these materials


















The material utilized was an "equivalent" and included as part of the contractor submission is the TES certification, invoices, or specifications validating accepted status

Certifying Individual: Company _____

Name _____

Signature _____

Schedule A – Photo & Document File Structure

-  VzW Site Number / Name
 -  Base & “During Installation” Photos
 -  Pre-Installation Photos
 -  Alpha
 -  Beta
 -  Gamma
 -  Ground Level
 -  Tape Drop
 -  Post-Installation Photos
 -  Alpha
 -  Beta
 -  Gamma
 -  Ground Level
 -  Tape Drop
 -  Photos of climbing facility and safety climb – If Present
-  Certifications – Submission of this document including certifications
-  Specific Required Additional Photos

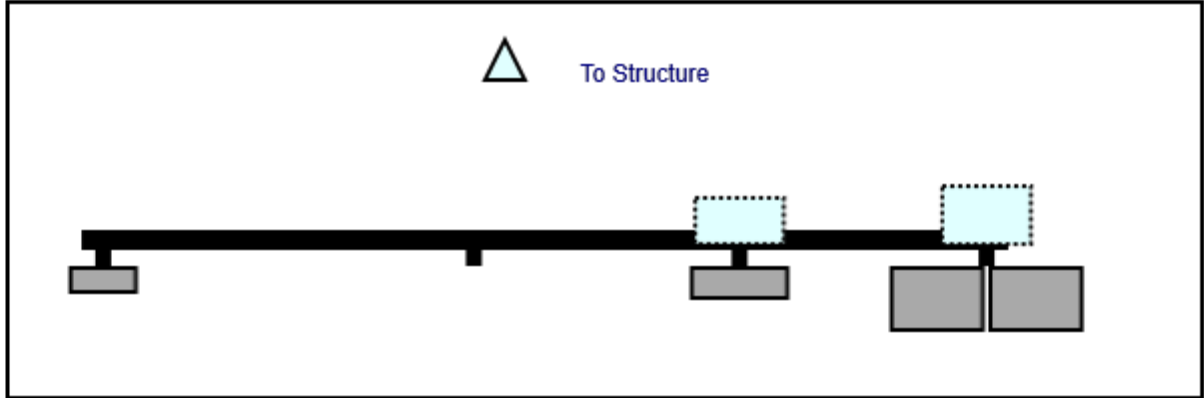
Sector: **A**
 Structure Type: Self Support
 Mount Elev: 105.80

6/2/2021

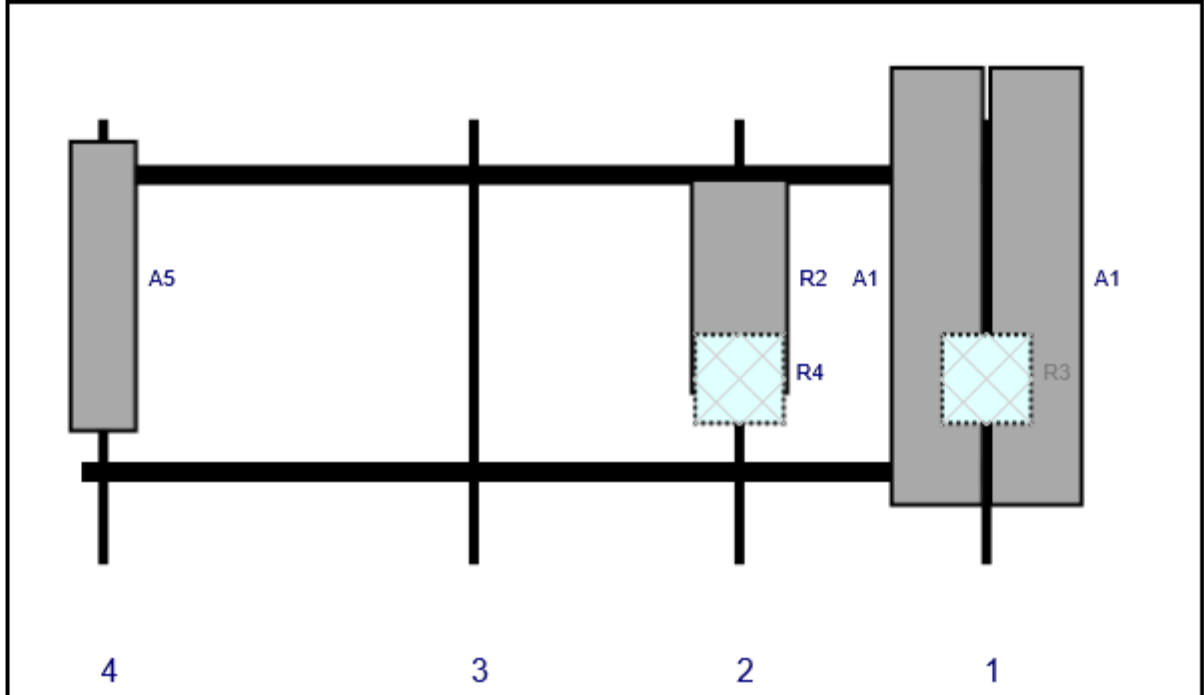


Page: 1

Plan View



Front View
Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	MX06FRO660-03	71.3	15.4	146.5	1	a	Front	27	8	Added	
A1	MX06FRO660-03	71.3	15.4	146.5	1	b	Front	27	-8	Added	
R3	B2/B66A RRH-BR049 (RFV01U-D1A)	15	15	146.5	1	a	Behind	42	0	Added	
R2	MT6407-77A	35.1	16.1	106.5	2	a	Front	27	0	Added	
R4	B5/B13 RRH-BR04C (RFV01U-D2A)	15	15	106.5	2	a	Behind	42	0	Added	
A5	BXA-80063/4CF	47.4	11.2	3.5	4	a	Front	27	0	Retained	03/22/2021

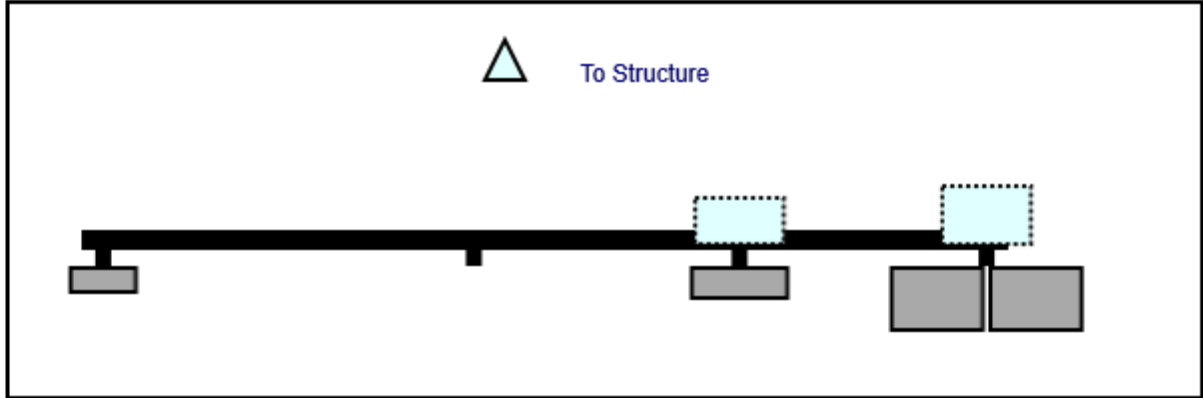
Sector: **B**
 Structure Type: Self Support
 Mount Elev: 105.80

6/2/2021

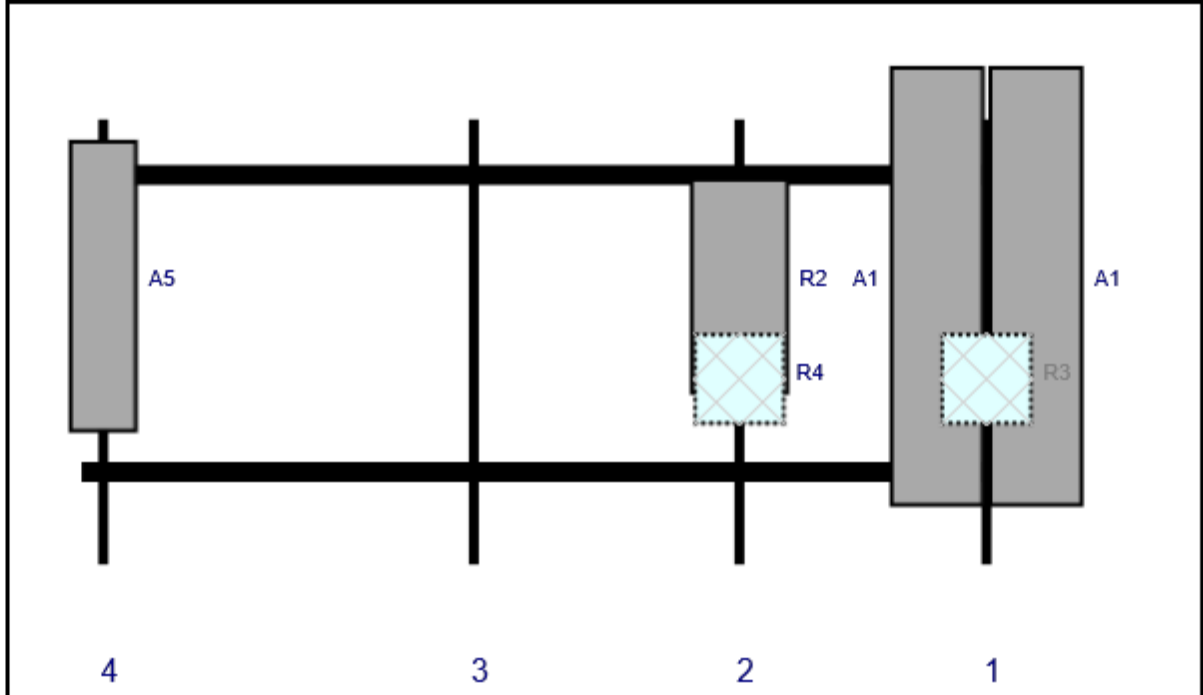
Page: 2



Plan View



Front View
Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	MX06FRO660-03	71.3	15.4	146.5	1	a	Front	27	8	Added	
A1	MX06FRO660-03	71.3	15.4	146.5	1	b	Front	27	-8	Added	
R3	B2/B66A RRH-BR049 (RFV01U-D1A)	15	15	146.5	1	a	Behind	42	0	Added	
R2	MT6407-77A	35.1	16.1	106.5	2	a	Front	27	0	Added	
R4	B5/B13 RRH-BR04C (RFV01U-D2A)	15	15	106.5	2	a	Behind	42	0	Added	
A5	BXA-80063/4CF	47.4	11.2	3.5	4	a	Front	27	0	Retained	03/22/2021

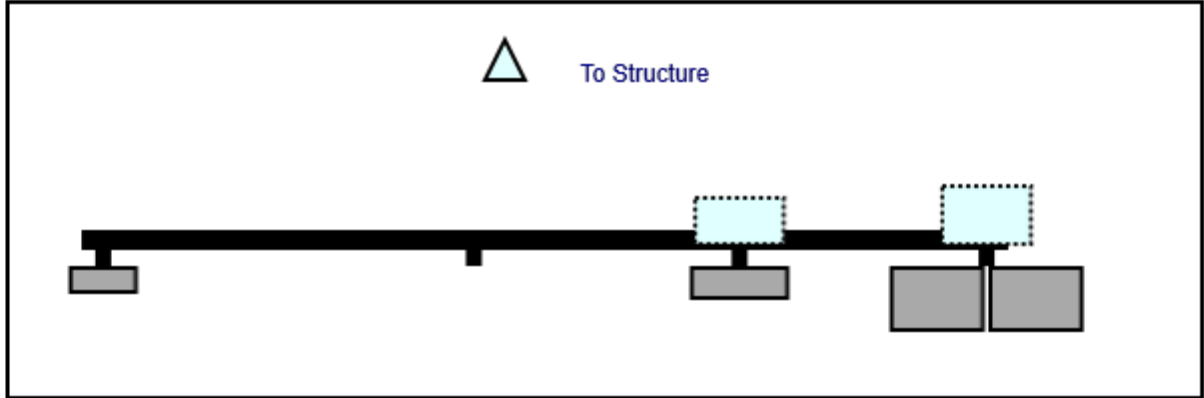
Sector: C
 Structure Type: Self Support
 Mount Elev: 105.80

6/2/2021

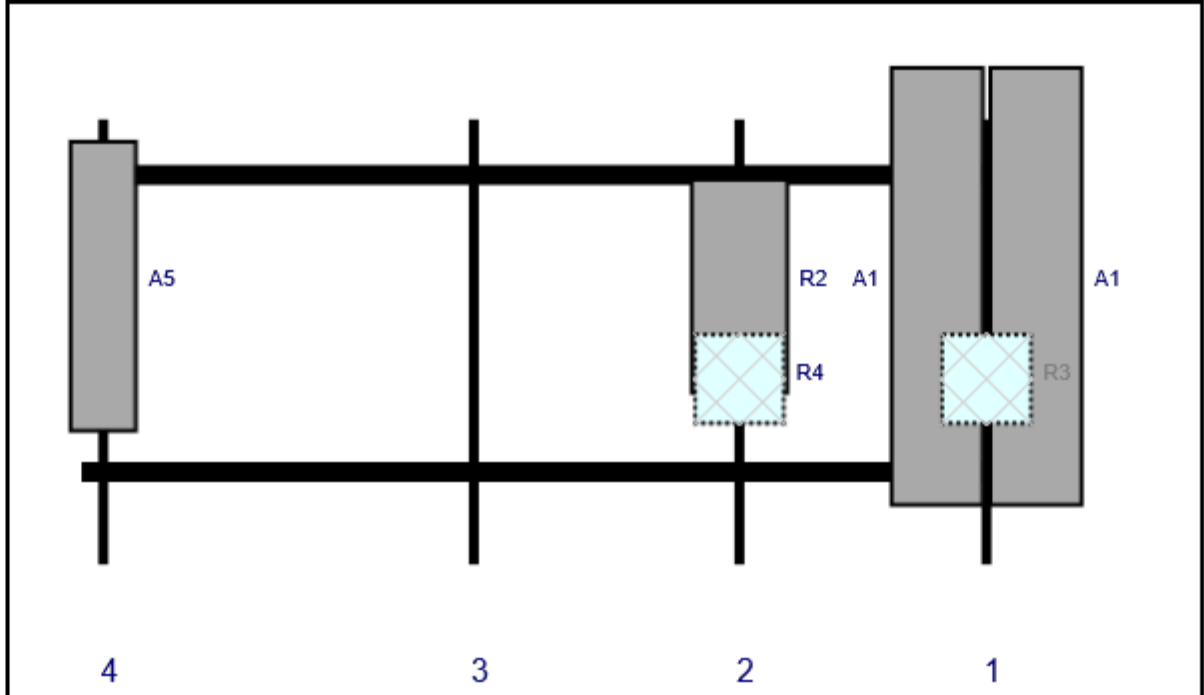
Page: 3



Plan View



Front View
Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
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A1	MX06FRO660-03	71.3	15.4	146.5	1	b	Front	27	-8	Added	
R3	B2/B66A RRH-BR049 (RFV01U-D1A)	15	15	146.5	1	a	Behind	42	0	Added	
R2	MT6407-77A	35.1	16.1	106.5	2	a	Front	27	0	Added	
R4	B5/B13 RRH-BR04C (RFV01U-D2A)	15	15	106.5	2	a	Behind	42	0	Added	
A5	BXA-80063/4CF	47.4	11.2	3.5	4	a	Front	27	0	Retained	03/22/2021

Subject: TIA-222-H Usage

Site Information

Site ID:	467304-VZW / WATERFORD 2 CT
Site Name:	WATERFORD 2 CT
Carrier Name:	Verizon Wireless
Address:	41 Manitock Hill Waterford, Connecticut 6385 New London County
Latitude:	41.357875°
Longitude:	-72.151189°

Structure Information

Tower Type:	150-Ft Self Support
Mount Type:	12.50-Ft T-Frame

To Whom It May Concern,

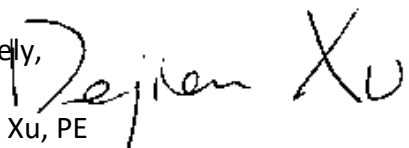
We respectfully submit the above referenced Antenna Mount Structural Analysis report in conformance with ANSI/TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures.

The 2015 International Building Code states that, in Section 3108, telecommunication towers shall be designed and constructed in accordance with the provisions of TIA-222. The TIA-222-H is the latest revision of the TIA-222 Standard, effective as of January 01, 2018.

As with all ANSI standards and engineering best practice is to apply the most current revision of the standard. This ensures the engineer is applying all updates. As an example, the TIA-222-H standard includes updates to bring it in line with the latest AISC and ACI standards and it also incorporates the latest wind speed map by ASCE 7 based on updated studies of the wind data.

The TIA-222-H standard clarifies these specific requirements for the antenna mount analysis such as modeling method, seismic analysis, 30-degree increment wind direction and maintenance loading. Therefore, it is our opinion that TIA-222-H is the most appropriate standard for antenna mount structural analysis and is acceptable for use at this site to ensure the engineer is taking into account the most current engineering standard available.

Sincerely,


Dejian Xu, PE
Technical Manager

PROJECT NOTES

- SEE MODIFICATION NOTES
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
- THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- 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 POTENTIALLY DANGEROUS EXPOSURE LEVELS.
- NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
- THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).



MOUNT MODIFICATION DRAWINGS EXISTING 12.50' T-FRAME

**SITE NAME: WATERFORD 2 CT
SITE NUMBER: 467304**

**41 MANITOCK HILL
WATERFORD, CT 06385
NEW LONDON COUNTY**

PROJECT INFORMATION	
SITE INFORMATION	
LATITUDE:	41.357875° N
LONGITUDE:	-72.151189° W
JURISDICTION:	NEW LONDON COUNTY
APPLICANT/LESSEE	
COMPANY:	VERIZON WIRELESS
CLIENT REPRESENTATIVE	
COMPANY:	VERIZON WIRELESS
ADDRESS:	118 FLANDERS ROAD, THIRD FLOOR
CITY, STATE, ZIP:	WESTBOROUGH, MA 01581
CONTACT:	ANDREW CANDIELLO
EMAIL:	ANDREW.CANDIELLO@VERIZONWIRELESS.COM
PROJECT MANAGER	
COMPANY:	MASER CONSULTING
CONTACT:	PETER ALBANO
PHONE:	856-797-0412
E-MAIL:	PETER.ALBANO@COLLIERSENGINEERING.COM

SHEET INDEX	
SHEET	DESCRIPTION
T-1	TITLE SHEET
S-1	BILL OF MATERIALS
S-2	MODIFICATION NOTES
S-3	MODIFICATION NOTES
S-4	MODIFICATION DETAILS
S-5	MODIFICATION DETAILS
S-6	MOUNT PHOTOS
	SPECIFICATION SHEETS

CONTRACTOR PMI REQUIREMENTS	
PMI LOCATION:	HTTPS://PMI.VZWSMART.COM
SMART TOOL PROJECT #:	10069535
VZW LOCATION CODE (PSLC):	467304
FUZE ID:	16244091

REFERENCED DOCUMENTS	
	FAILING MOUNT ANALYSIS REPORT
SMART TOOL PROJECT #:	10039586
MASER CONSULTING PROJECT #:	21777138A
ANALYSIS DATE:	5/6/2021

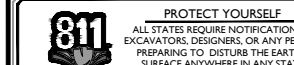
PMI REQUIREMENTS EMBEDDED WITHIN MOUNT MODIFICATION REPORT



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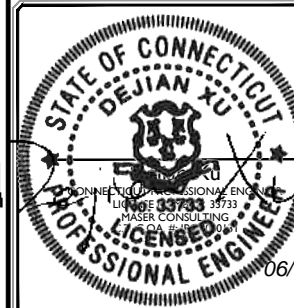
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SCALE: AS SHOWN JOB NUMBER: 21777138A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	6/11/2021	ISSUED FOR CONSTRUCTION	ZDB	DX



06/11/2021

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SITE NAME:
**WATERFORD 2 CT
467304**
**41 MANITOCK HILL
WATERFORD, CT 06385
NEW LONDON COUNTY**

MT. LAUREL OFFICE
2000 Madison Drive
Suite 100
Mount Laurel, NJ 08054
Phone: 856.797.0412
Fax: 856.722.1120

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

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BILL OF MATERIALS

VZWSMART KITS

QUANTITY	MANUFACTURER	PART NUMBER	DESCRIPTION	NOTES
3	VZWSMART	VZWSMART-SFK1	TIE BACK ASSEMBLY	CONTRACTOR TO VERIFY THE LENGTH REQUIRED AND TRIM AS NECESSARY IN ACCORDANCE WITH THE 'STRUCTURAL STEEL' NOTES ON SHEET S-2
3		VZWSMART-SFK3	V-BRACING KIT	CONTRACTOR TO VERIFY THE LENGTH REQUIRED AND TRIM AS NECESSARY IN ACCORDANCE WITH THE 'STRUCTURAL STEEL' NOTES ON SHEET S-2
12		VZWSMART-MSK1	CROSSOVER PLATE	

OTHER REQUIRED PARTS

QUANTITY	MANUFACTURER	PART NUMBER	DESCRIPTION	NOTES
3	-	-	72" LONG, P2.5 STD	GALVANIZED

NOTE: ALL MATERIALS REQUIRED FOR THE DESIGNED MODIFICATIONS BUT NOT LISTED IN THIS SHEET ARE ASSUMED TO BE PROVIDED BY THE CONTRACTOR

VZWSMART KITS - APPROVED VENDORS

COMMSCOPE	
CONTACT	SALVADOR ANGUIANO
PHONE	(817) 304-7492
EMAIL	SALVADOR.ANGUIANO@COMMSCOPE.COM
WEBSITE	WWW.COMMSCOPE.COM
METROSITE FABRICATORS, LLC	
CONTACT	KENT RAMEY
PHONE	(706) 335-7045 (O), (706) 982-9788 (M)
EMAIL	KENT@METROSITELLC.COM
WEBSITE	METROSITEFABRICATORS.COM
PERFECTVISION	
CONTACT	WIRELESS SALES
PHONE	(844) 887-6723
EMAIL	WWW.PERFECT-VISION.COM
WEBSITE	WIRELESSSALES@PERFECT-VISION.COM
SABRE INDUSTRIES, INC.	
CONTACT	ANGIE WELCH
PHONE	(866) 428-6937
EMAIL	AKWELCH@SABREINDUSTRIES.COM
WEBSITE	WWW.SABRESITESOLUTIONS.COM
SITE PRO 1	
CONTACT	PAULA BOSWELL
PHONE	(972) 236-9843
EMAIL	PAULA.BOSWELL@VALMONT.COM
WEBSITE	WWW.SITEPRO1.COM

NOTE: WHEN SPECIFIED, VZWSMART KITS SHALL BE REQUIRED AND WILL BE VERIFIED DURING THE DESKTOP PMI



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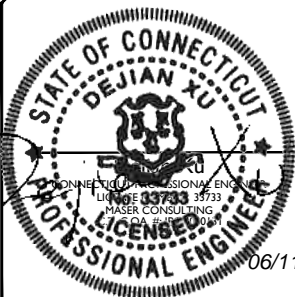
■ NEW JERSEY	■ NEW MEXICO
■ NEW YORK	■ MARYLAND
■ PENNSYLVANIA	■ GEORGIA
■ VIRGINIA	■ TEXAS
■ FLORIDA	■ TENNESSEE
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SCALE: AS SHOWN	JOB NUMBER: 21777138A			
0 6/11/2021	ISSUED FOR CONSTRUCTION	ZDB	DX	
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY




06/11/2021

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SITE NAME:

WATERFORD 2 CT
467304

41 MANITOCK HILL
WATERFORD, CT 06385
NEW LONDON COUNTY



MT. LAUREL OFFICE
2000 Madison Drive
Suite 100
Mount Laurel, NJ 08054
Phone: 856.797.0412
Fax: 856.722.1120

SHEET TITLE:
BILL OF MATERIALS

SHEET NUMBER:
S-1

GENERAL NOTES

1. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE TELECOMMUNICATIONS INDUSTRY STANDARD TIA-222-H. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE MENTIONED CODES.
2. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE TO EXISTING STRUCTURES. ANY DAMAGE TO EXISTING STRUCTURES AS A RESULT OF THE CONTRACTOR'S WORK OR FROM DAMAGE DUE TO OTHER CAUSES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE BEGINNING WORK, ORDERING MATERIAL, AND PREPARING OF SHOP DRAWINGS. ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, NOTIFY THE ENGINEER IMMEDIATELY.
4. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE.
5. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
6. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANS/I/TIA-322 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANS/I/TIA-322 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
7. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS IN ACCORDANCE WITH APPLICABLE SAFETY CODES.
8. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 30-MPH). THE STRUCTURE SHOWN ON THE DRAWINGS IS STRUCTURALLY SOUND ONLY IN THE COMPLETED FORM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE STRUCTURE DURING ERECTION. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT, SHORING, BRACING AND ANY OTHER STRUCTURAL SYSTEMS AS REQUIRED TO RESIST ALL FORCES THAT MAY OCCUR DURING HANDLING AND ERECTION UNTIL THE STRUCTURE IS FULLY COMPLETED. TEMPORARY SUPPORTS, BRACING AND OTHER STRUCTURAL SYSTEMS REQUIRED DURING CONSTRUCTION SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER THEIR USE.
9. ALL INSTALLATIONS PERFORMED ON THIS STRUCTURE SHALL BE COMPLETED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, ANS/I/TIA-322.
10. CONTRACTOR SHALL SECURE SITE BACK TO EXISTING CONDITION UNDER SUPERVISION OF OWNER. ALL FENCE, STONE, GEOFABRIC, GROUNDING, AND SURROUNDING GRADE SHALL BE REPLACED AND REPAIRED AS REQUIRED TO ACHIEVE OWNER APPROVAL. POSITIVE DRAINAGE AWAY FROM TOWER SITE SHALL BE MAINTAINED.
11. CONNECTIONS BETWEEN ITEMS SUPPORTED BY THE STRUCTURE AND THE STRUCTURE NOT SPECIFICALLY DETAILED IN THE CONTRACT DOCUMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR. SUCH CONNECTIONS SHALL BE DESIGNED, COORDINATED AND INSPECTED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF THE PROJECT. SUBMIT SIGNED AND SEALED CALCULATIONS DURING SHOP DRAWING REVIEW.
12. DO NOT SCALE DRAWINGS.
13. DO NOT USE THESE DRAWINGS FOR ANY OTHER SITE.
14. ALL MATERIAL UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS. ANY MATERIAL SUBSTITUTIONS, INCLUDING BUT NOT LIMITED TO ALTERED SIZE AND/OR STRENGTHS, MUST BE APPROVED BY THE OWNER AND ENGINEER IN WRITING.
15. THE MOUNT UNDER NO CIRCUMSTANCES SHOULD BE USED AS A TIE OFF POINT.

DESIGN LOADS

- WIND LOADS
- a. BASIC WIND SPEED (3 SECOND GUST), V = 126 MPH
 - b. EXPOSURE CATEGORY B
 - c. TOPOGRAPHIC CATEGORY I
 - d. MEAN BASE ELEVATION (AMSL) = 173.23'

- ICE LOADS
- a. ICE WIND SPEED (3 SECOND GUST), V = 50 MPH
 - b. ICE THICKNESS = 1.00 IN

- SEISMIC LOADS
- a. SEISMIC DESIGN CATEGORY B
 - b. SHORT TERM MCER GROUND MOTION, S_s = .194
 - c. LONG TERM MCER GROUND MOTION, S_l = .053

STRUCTURAL STEEL

1. DESIGN, DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING PUBLICATIONS EXCEPT AS SPECIFICALLY INDICATED IN THE CONTRACT DOCUMENTS.
 - a. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION (15TH EDITION)
 - b. SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS
 - c. AISC CODE OF STANDARD PRACTICE
2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING UNLESS OTHERWISE SHOWN:

- | | |
|--------------------------------|--------------------------|
| CHANNELS, ANGLES, PLATES, ETC. | ASTM A36 (GR 36) |
| STEEL PIPE | ASTM A53 (GR 35) |
| BOLTS | ASTM A325 |
| NUTS | ASTM A563 |
| LOCK WASHERS | LOCKING STRUCTURAL GRADE |

3. ALL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR VERIFYING THE SUBSTITUTE IS SUITABLE FOR USE AND MEETS ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
4. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
 - a. SUBMIT SHOP DRAWINGS TO PETER.ALBANO@COLLIERSENGINEERING.COM
 - b. PROVIDE MASER CONSULTING PROJECT # AND MASER CONSULTING PROJECT ENGINEER CONTACT IN THE BODY OF THE EMAIL.
5. DRILL NO HOLES IN ANY NEW OR EXISTING STRUCTURAL STEEL MEMBERS OTHER THAN THOSE SHOWN ON STRUCTURAL DRAWINGS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD.
6. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.
7. ALL NEW STEEL SHALL BE HOT BE DIPPED GALVANIZED FOR FULL WEATHER PROTECTION. IN ADDITION ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
8. ALL BOLT ASSEMBLIES FOR STRUCTURAL MEMBERS REPRESENTED IN THIS DRAWING REQUIRE LOCKING DEVICES TO BE INSTALLED IN ACCORDANCE WITH TIA-222-H SECTION 4.9.2 REQUIREMENTS.
9. WHERE CONNECTIONS ARE NOT FULLY DETAILED ON THESE DRAWINGS, FABRICATOR SHALL DESIGN CONNECTIONS TO RESIST LOADS AND FORCES WHERE SHOWN ON DRAWINGS AND AS OUTLINED IN SPECIFICATIONS.
10. FOR MEMBERS BEING REPLACED, PROVIDE NEW BOLTS AND MATCH EXISTING SIZE AND GRADE. MAINTAIN AISC REQUIREMENTS FOR MINIMUM BOLT DISTANCE AND SPACING.
11. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT IS AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
12. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.
13. ALL NEW STEEL SHALL BE HOT BE DIPPED GALVANIZED FOR FULL WEATHER PROTECTION. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO

PROTECT STEEL BY ANY OTHER MEANS.

14. ALL EXISTING PAINTED/GALVANIZED SURFACES DAMAGED DURING REHAB INCLUDING AREAS UNDER STIFFENER PLATES SHALL BE WIRE BRUSHED CLEAN, REPAIRED BY COLD GALVANIZING (ZINGA OR ZINC COTE), AND REPAINTED TO MATCH THE EXISTING FINISH (IF APPLICABLE).
15. ALL HOLES IN STEEL MEMBERS SHALL BE SIZED 1/16" LARGER THAN THE BOLT DIAMETER. STANDARD HOLES SHALL BE USED UNLESS NOTED OTHERWISE.



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SHEET TITLE:
MODIFICATION NOTES

SHEET NUMBER:
S-2

MODIFICATION INSPECTION NOTES

MI CHECKLIST	
CONSTRUCTION/ INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOB APPROVED SHOP DRAWINGS
NA	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
X	ON SITE COLD GALVANIZING VERIFICATION
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	VZW PMI DOCUMENTS
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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

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

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR

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

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

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

GENERAL CONTRACTOR

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

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

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

RECOMMENDATIONS

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

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW THE FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN:

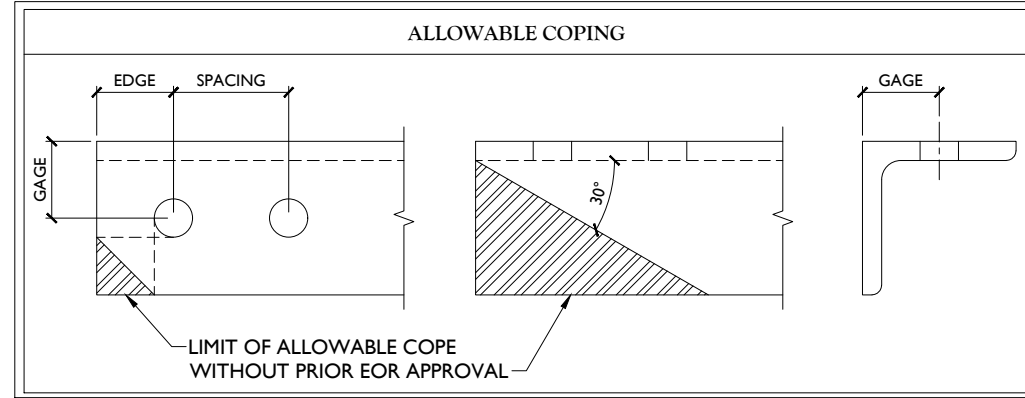
- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.

REQUIRED PHOTOS

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

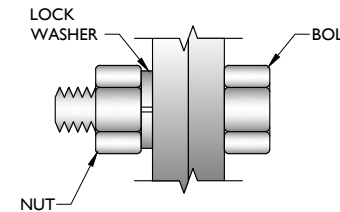
- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR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

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



BOLT DIAMETER	STANDARD HOLE	SHORT SLOT	MIN. EDGE DISTANCE	SPACING
1/2	9/16	9/16 x 11/16	7/8	1 1/2
5/8	11/16	11/16 x 7/8	1 1/8	1 7/8
3/4	13/16	13/16 x 1	1 1/4	2 1/4
7/8	15/16	15/16 x 1 1/8	1 1/2	2 5/8
1	1 1/16	1 1/16 x 1 5/16	1 3/4	3

LEG	GAGE
4	2 1/2
3 1/2	2
3	1 3/4
2 1/2	1 3/8
2	1 1/8



TYP. BOLT ASSEMBLY

NOTES:

- ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.
- THE DIMENSIONS PROVIDED ARE MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS OF PROPOSED MEMBERS WITHIN THESE DRAWINGS MAY VARY FROM THE AISC MINIMUM REQUIREMENTS.
- SHORT SLOT HOLES SHALL ONLY BE USED WHEN DEPICTED IN THE DRAWINGS
- MATCH EXISTING GAGES WHEN APPLICABLE, UNLESS MINIMUM EDGE DISTANCES ARE COMPROMISED.



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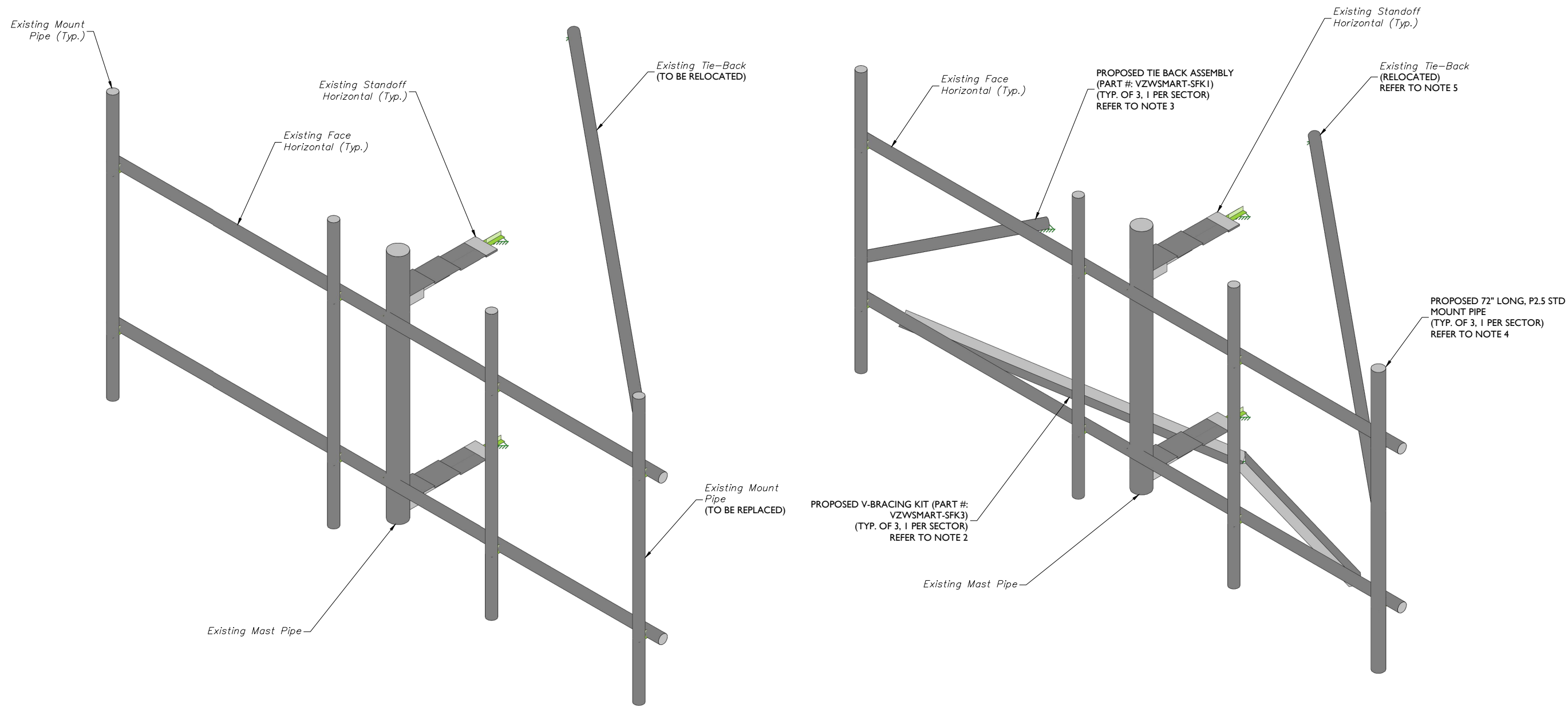
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SHEET TITLE:
MODIFICATION NOTES

SHEET NUMBER:
S-3



1 EXISTING T-FRAME ISOMETRIC VIEW (TYP. ALL SECTORS)
SCALE : N.T.S.

2 PROPOSED T-FRAME ISOMETRIC VIEW (TYP. ALL SECTORS)
SCALE : N.T.S.

STRUCTURAL NOTES:

- PER THE MOUNT MAPPING COMPLETED BY HUDSON DESIGN GROUP LLC. ON 3/22/2021, THE SAFETY CLIMB AND CLIMBING FACILITIES UP TO THE VERIZON MOUNT ELEVATION (105'-10") ARE IN GOOD CONDITION. MASER DOES NOT WARRANT THIS INFORMATION.
- INSTALL SHALL NOT CAUSE HARM TO THE STRUCTURE, CLIMBING FACILITY, SAFETY CLIMB, OR ANY SYSTEM INSTALLED ON THE STRUCTURE. TIMELY NOTICE AND DOCUMENTATION SHALL BE PROVIDED BY CONTRACTORS TO THE EOR (OF STRUCTURAL DESIGN) IF AN OBSTRUCTION WAS REQUIRED TO MEET THE RF SYSTEM DESIGN REQUIREMENTS AND PERFORMANCES.

MODIFICATION NOTES:

- MOUNT MEMBERS NOT SHOWN FOR CLARITY U.N.O.
- CONTRACTOR TO VERIFY THE LENGTH REQUIRED AND TRIM AS NECESSARY IN ACCORDANCE WITH THE 'STRUCTURAL STEEL' NOTES ON SHEET S-2.
- CONNECT NEW TIE BACK TO MOUNT PIPE WITH CROSSOVER PLATES (PART#: VZWSMART-MSK1). CONNECT OTHER END TO ADJACENT TOWER LEG.
- CONNECT NEW MOUNT PIPE TO EXISTING HORIZONTALS WITH CROSSOVER PLATES (PART #: VZWSMART-MSK1).
- REPLACE EXISTING TIE-BACK CONNECTION HARDWARE AT MOUNT PIPE WITH CROSSOVER PLATES (PART #: VZWSMART-MSK1).

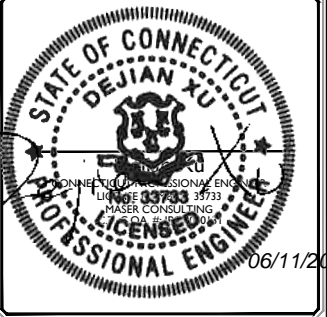
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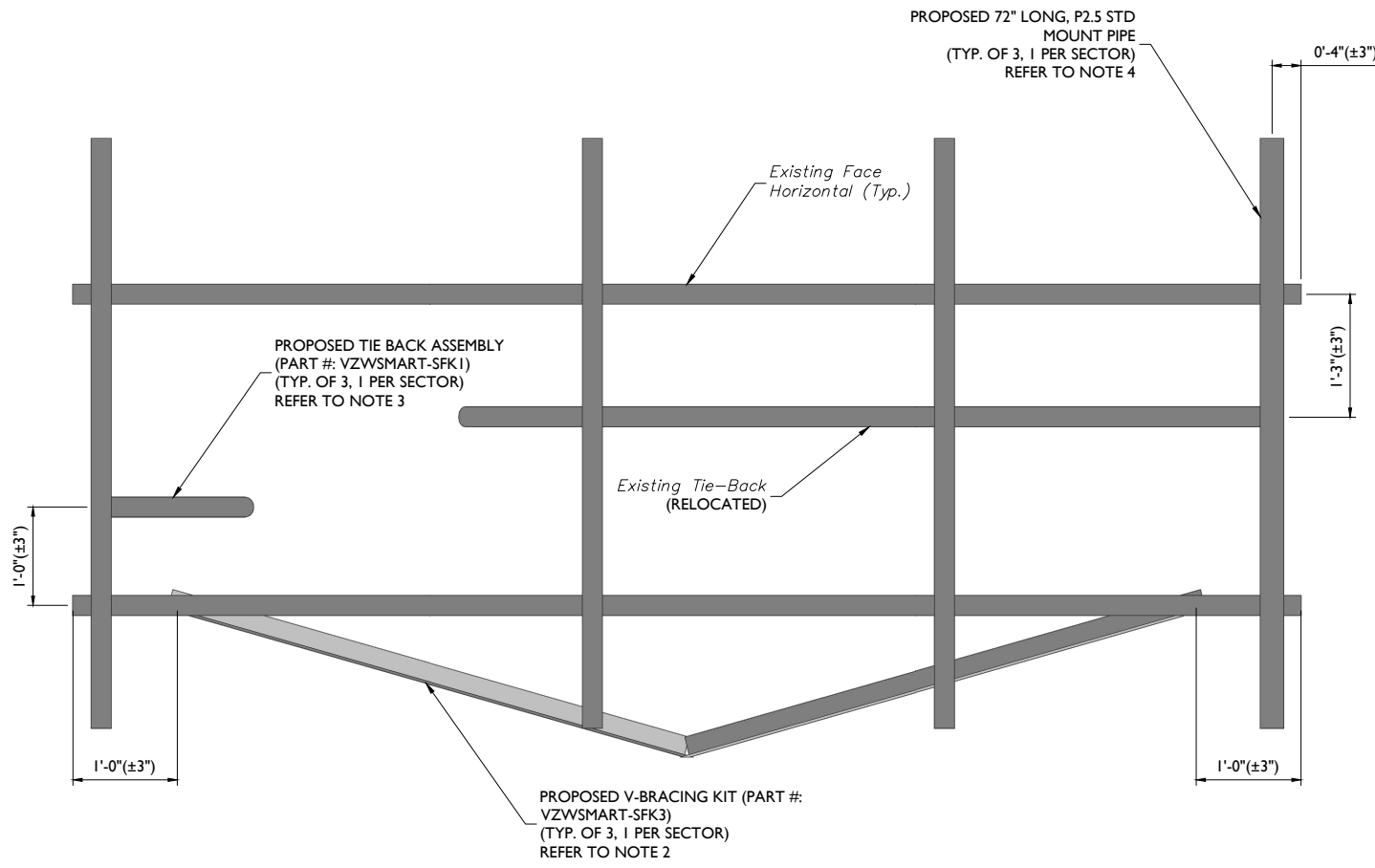
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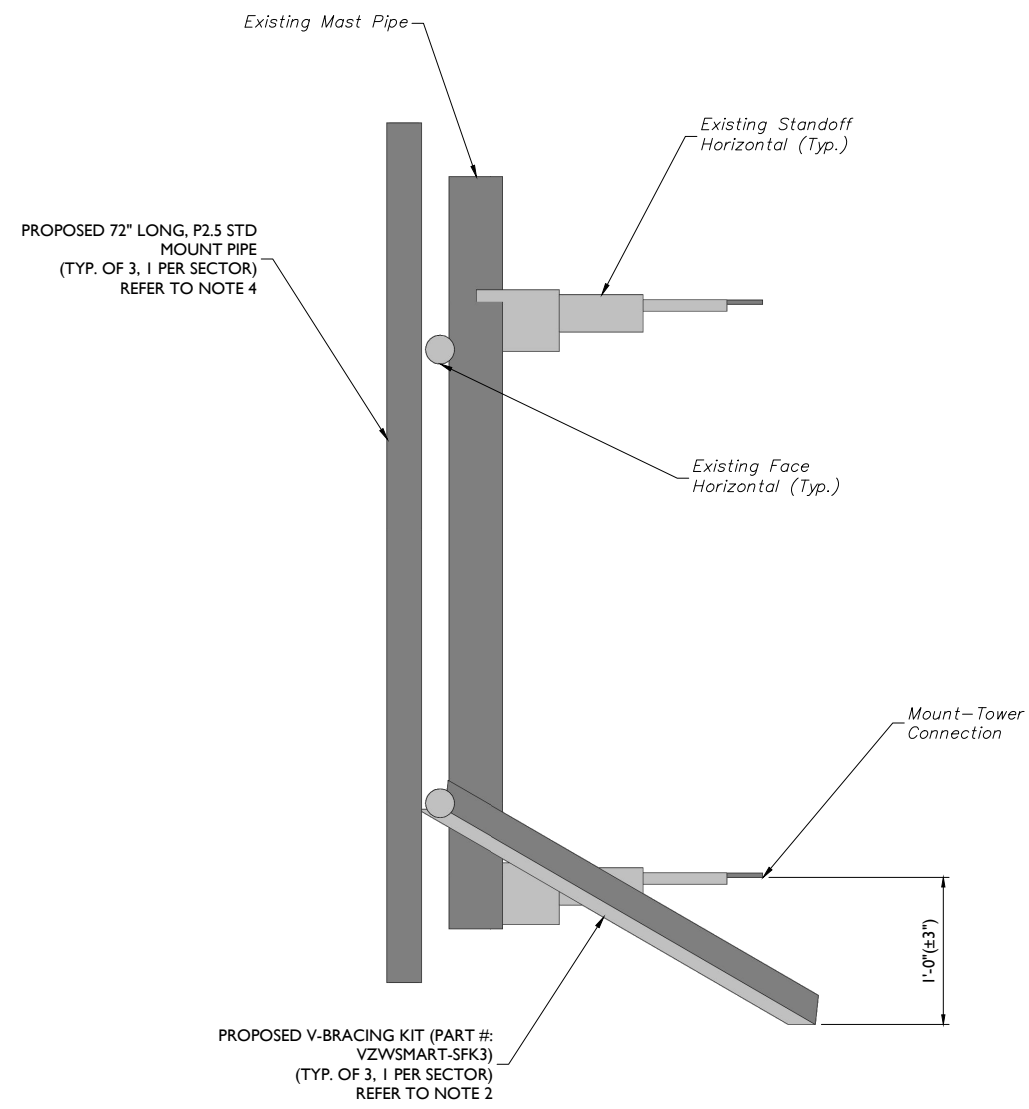
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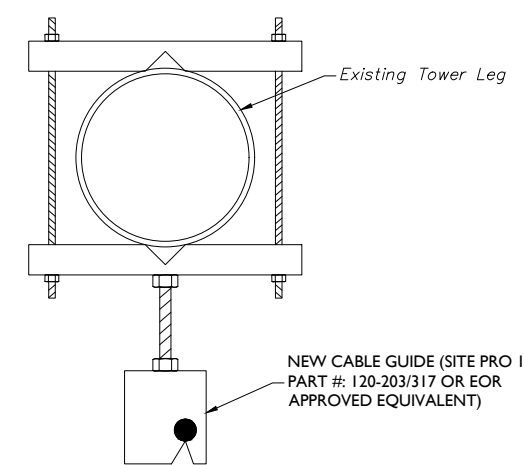
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1 PROPOSED FRONT ELEVATION (TYP. ALL SECTORS)
SCALE: N.T.S.



2 PROPOSED SIDE ELEVATION (TYP. ALL SECTORS)
SCALE: N.T.S.



3 PROPOSED CABLE GUIDE TOWER LEG ATTACHMENT - PLAN VIEW
SCALE: N.T.S.

MODIFICATION NOTES:

1. MOUNT MEMBERS NOT SHOWN FOR CLARITY U.N.O.
2. CONTRACTOR TO VERIFY THE LENGTH REQUIRED AND TRIM AS NECESSARY IN ACCORDANCE WITH THE 'STRUCTURAL STEEL' NOTES ON SHEET S-2.
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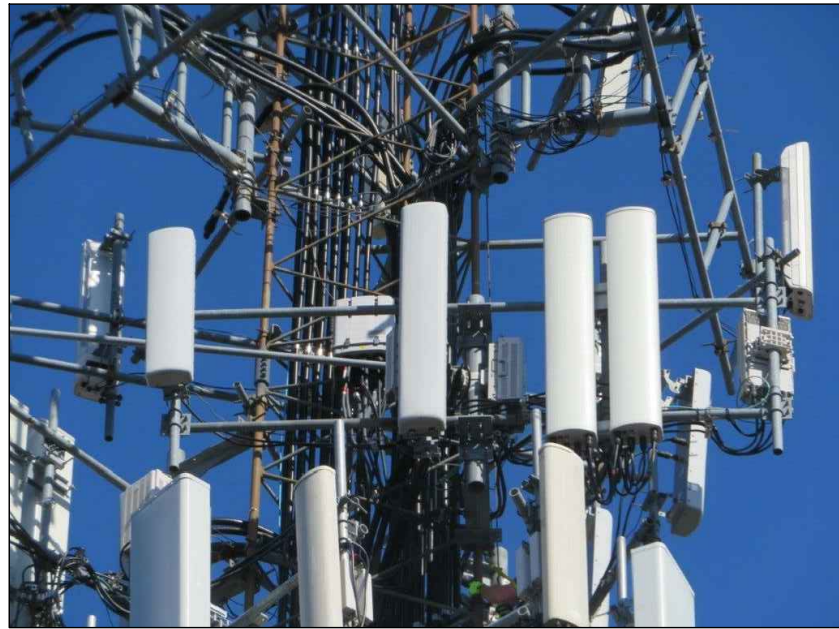
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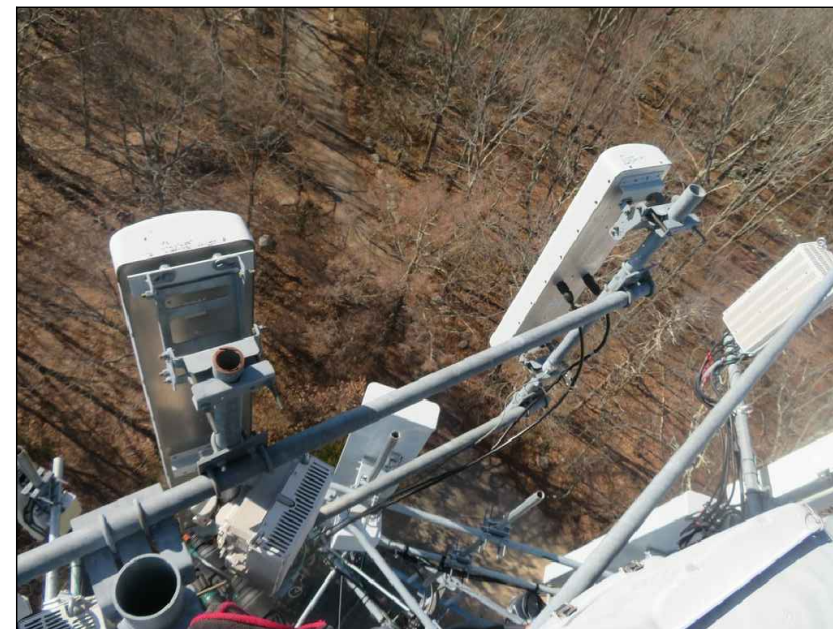
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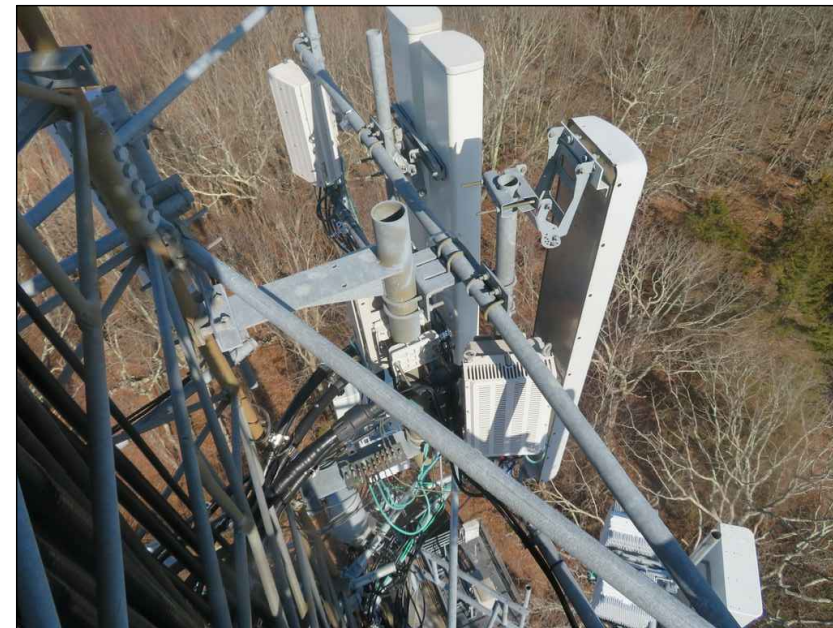
MOUNT PHOTO 1



MOUNT PHOTO 2



MOUNT PHOTO 3



MOUNT PHOTO 4

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- MARYLAND
- PENNSYLVANIA
- GEORGIA
- VIRGINIA
- TEXAS
- FLORIDA
- TENNESSEE
- NORTH CAROLINA
- COLORADO
- SOUTH CAROLINA

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811 PROTECT YOURSELF
 ALL STATES REQUIRE NOTIFICATION OF EXCAVATIONS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
 Know what's below. Call before you dig.
 FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE: AS SHOWN JOB NUMBER: 21777138A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	6/11/2021	ISSUED FOR CONSTRUCTION	ZDB	DX

STATE OF CONNECTICUT
 DEJIAN XU
 LICENSE 03733
 M.A.S.E.R. CONSULTING
 PROFESSIONAL ENGINEER
 06/11/2021

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
 WATERFORD 2 CT
 467304
 41 MANITOCK HILL
 WATERFORD, CT 06385
 NEW LONDON COUNTY

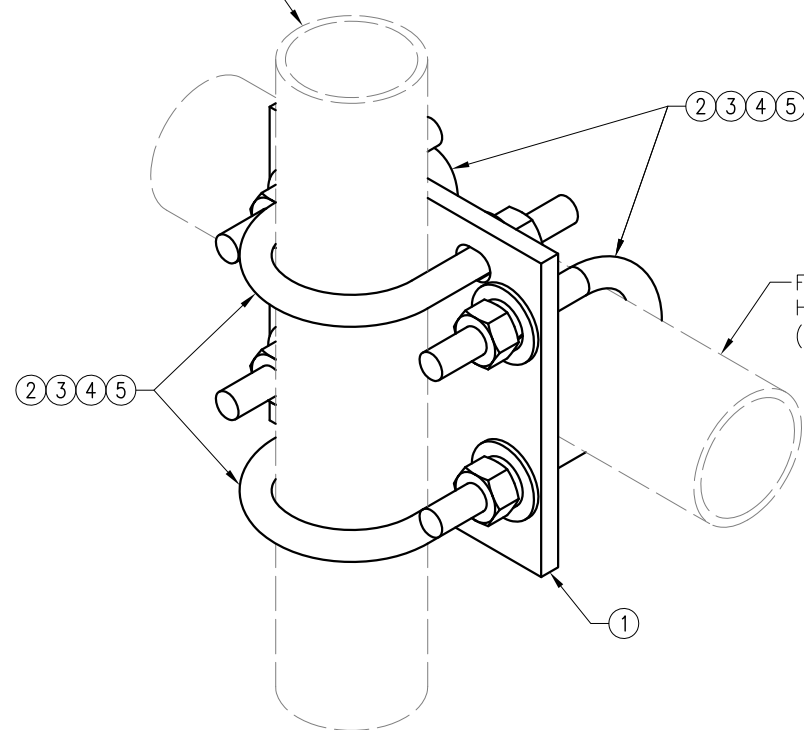
MASER CONSULTING
 MT. LAUREL OFFICE
 2000 Madison Drive
 Suite 100
 Mount Laurel, NJ 08054
 Phone: 856.797.0412
 Fax: 856.722.1120

SHEET TITLE:
 MOUNT PHOTOS

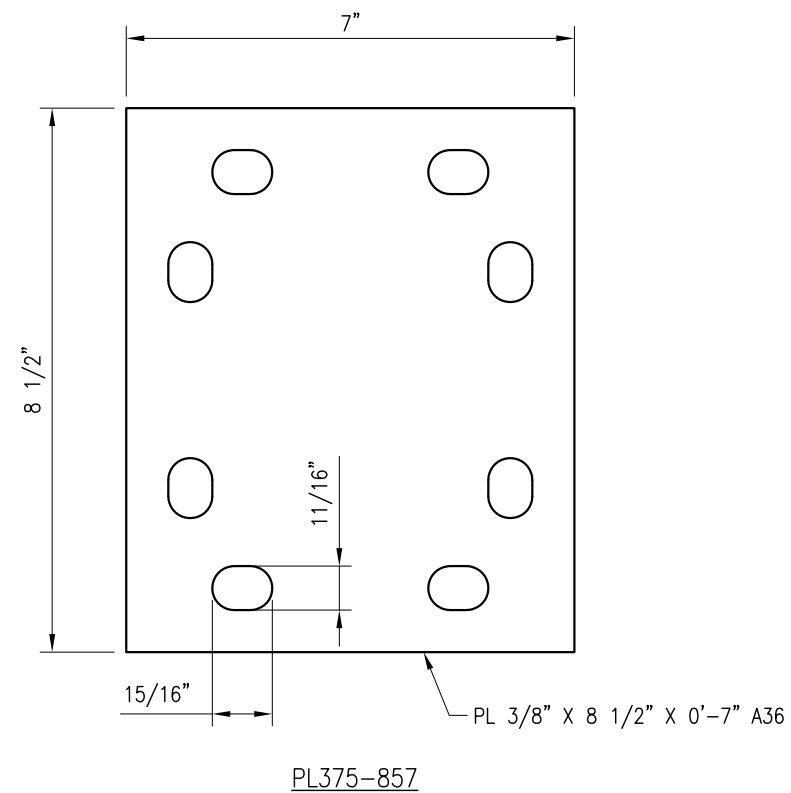
SHEET NUMBER:
 S-6



FITS 2.375" O.D. AND 2.875" O.D.
 VERTICAL PIPE.
 (NOT INCLUDED IN THIS KIT)



FITS 2.375" O.D. AND 2.875" O.D.
 HORIZONTAL PIPE.
 (NOT INCLUDED IN THIS KIT)



NOTES:
 1. HOT-DIPPED GALVANIZED PER ASTM A123.

VZSMART-MSK1 (CROSSOVER PLATE)					
ITEM NO.	QTY.	PART NO.	DESCRIPTION	SHEET #	WT
1	1	PL375-857	PL 3/8" X 8 1/2" X 0'-7" A36	MSK1-F1	6
2	4	MS02-625-300-500	RU-BOLT 5/8" X 3" I.W. X 5" I.L. A36 (OR EQUIV.)	RBC-1	5
3	8	FW-625	5/8" HDG USS FLAT WASHER	---	1
4	8	LW-625	5/8" HDG LOCK WASHER	---	0
5	8	NUT-625	5/8" HDG HEX NUT	---	1
GALVANIZED WT					14

DRAWN BY: H.R. CHECKED BY: HMA

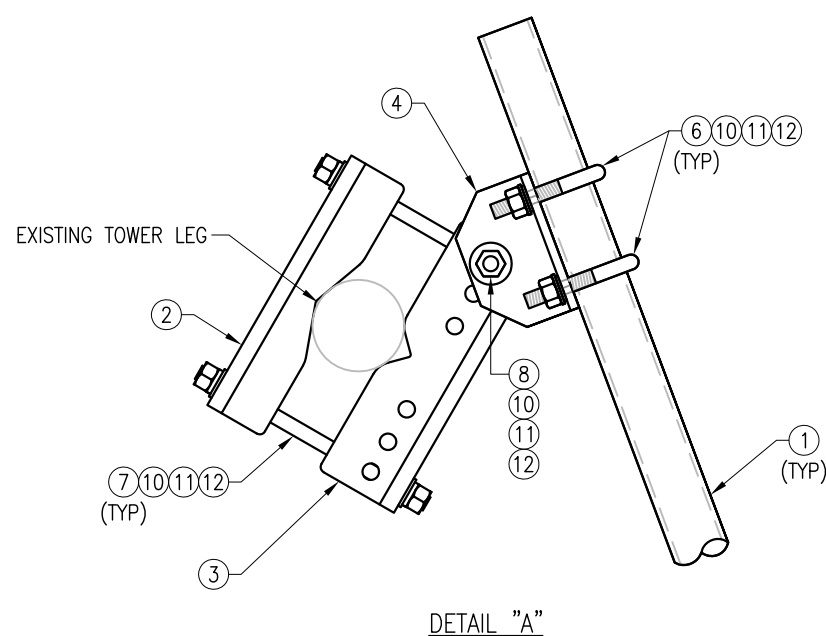
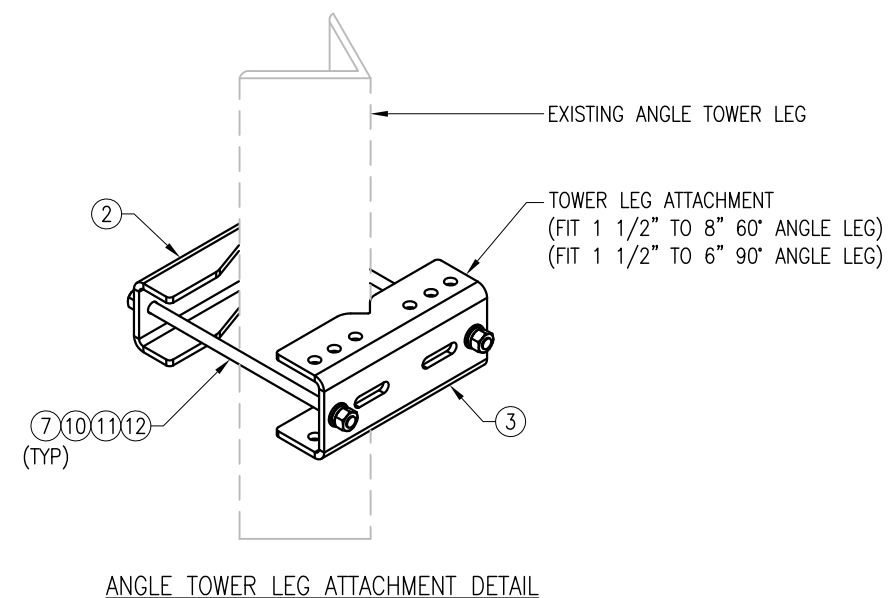
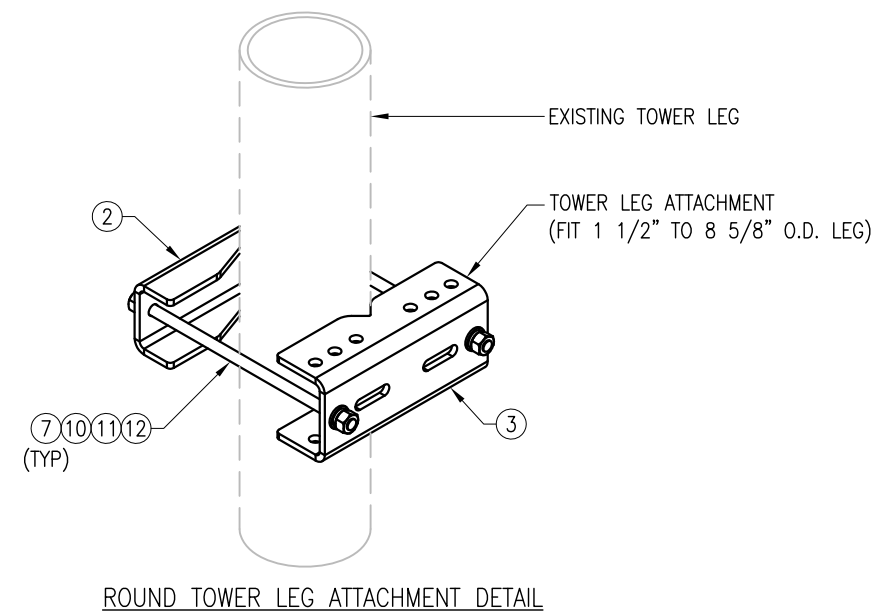
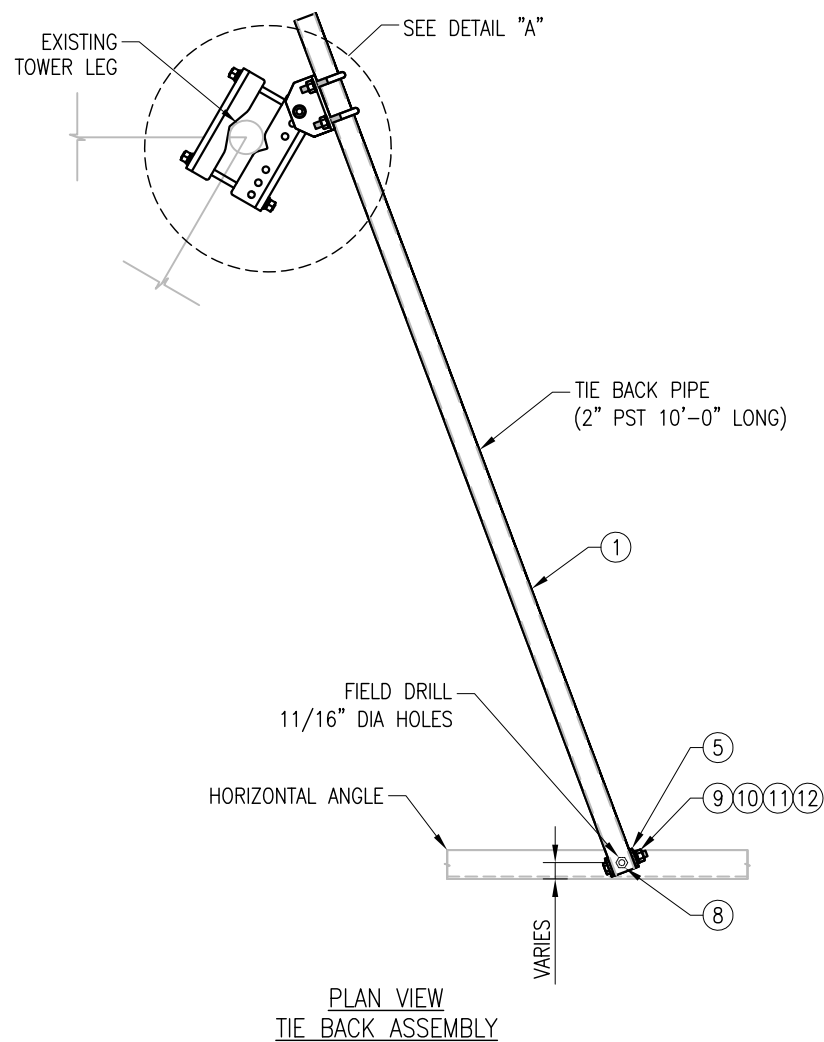
REV.	DESCRIPTION	BY	DATE
1	FIRST ISSUE	H.R.	05/08/20

SHEET TITLE:

VZSMART-MSK1
 CROSSOVER PLATE

SHEET NUMBER: REV #:

VZSMART-MSK1 0



VZWSMART-SFK1 (TIE BACK ASSEMBLY)					
ITEM NO.	QTY.	PART NO.	DESCRIPTION	SHEET #	WT
1	1	PST2375-10	2" PST (2.375" O.D. X 0.154" THK) X 10'-0" A53 GR-B 35KSI	SFK1-F1	38
2	1	BP825-12	PL 3/8" X 8 1/4" X 1'-0" A36 BENT PLATE	SFK1-F2	11
3	1	BP11125-12	PL 3/8" X 11 1/8" X 1'-0" A36 BENT PLATE	SFK1-F3	14
4	1	BP6-9375	PL 3/8" X 6" X 9 3/8" A36 BENT PLATE	SFK1-F4	6
5	1	BP2-875	PL 1/4" X 2" X 8 3/4" A36 BENT PLATE	SFK1-F4	1
6	2	MS02-625-300-500	RU-BOLT 5/8" X 3" I.W. X 5" I.L. A36 (OR EQUIV.)	RBC-1	2
7	2	---	THREADED ROD 5/8" DIA. X 1'-6" F1554-36 HDG	---	0
8	2	---	BOLT 5/8" X 2" A325	---	0
9	1	---	BOLT 5/8" X 4 1/4" A325	---	0
10	11	FW-625	5/8" HDG USS FLAT WASHER	---	1
11	11	LW-625	5/8" HDG LOCK WASHER	---	0
12	11	NUT-625	5/8" HDG HEX NUT	---	1
GALVANIZED WT					72

NOTES:
 1. HOT-DIPPED GALVANIZED PER ASTM A123.

DRAWN BY: BT CHECKED BY: HMA/KW

REV. DESCRIPTION BY DATE
 △ FIRST ISSUE BT 05/08/20

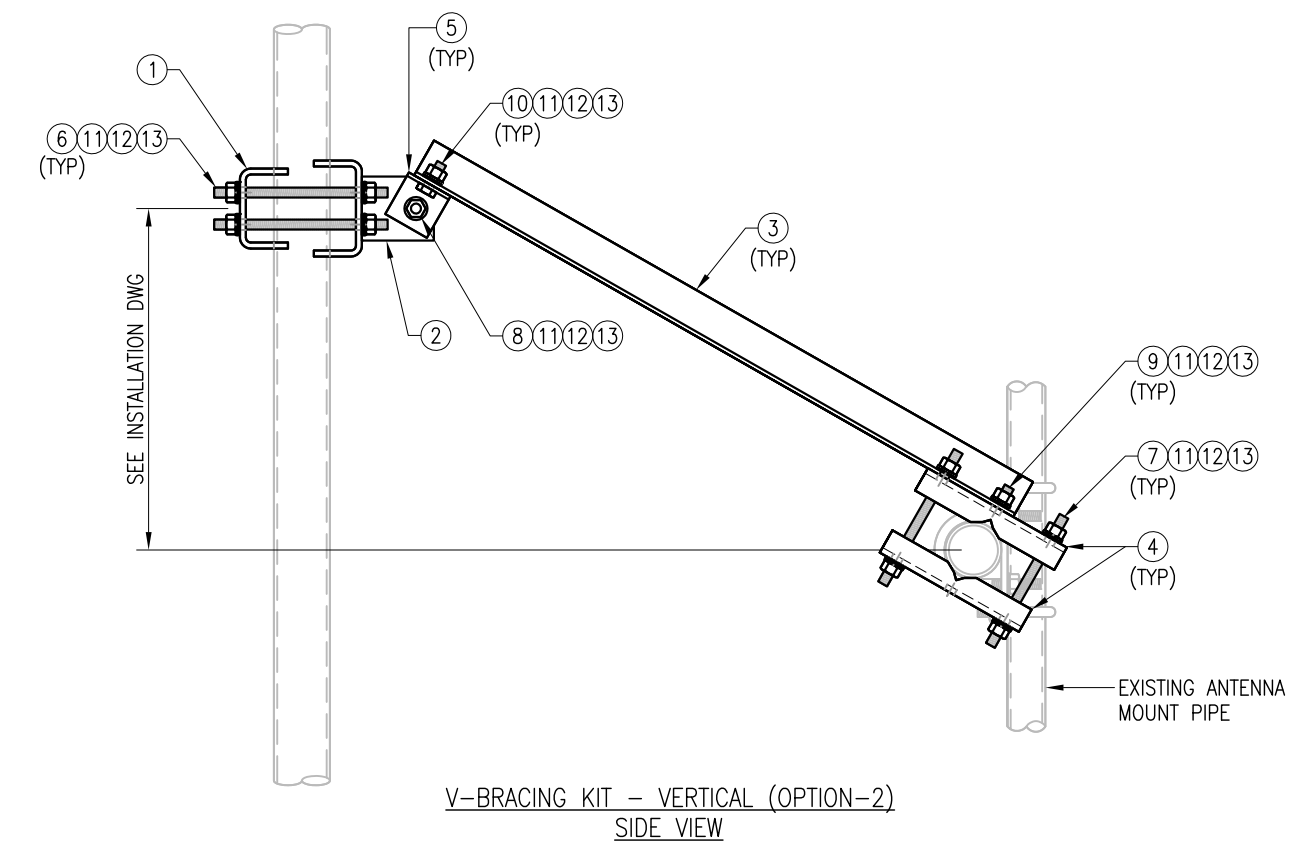
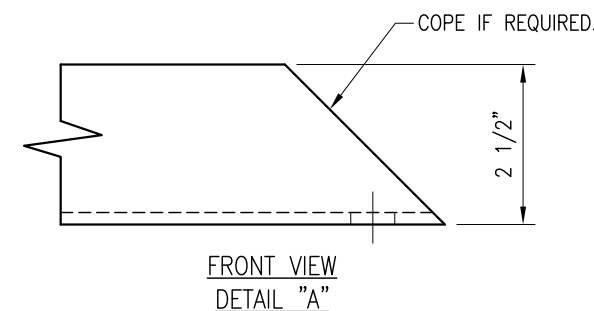
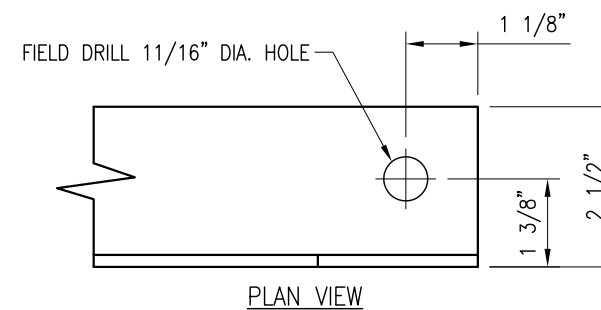
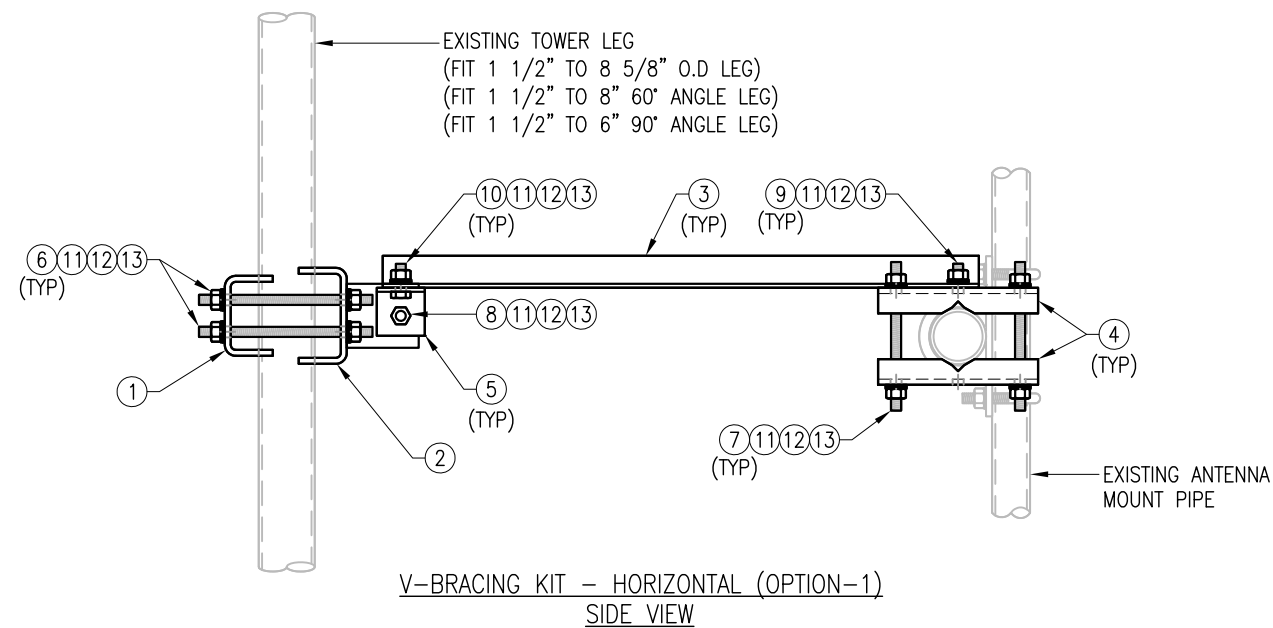
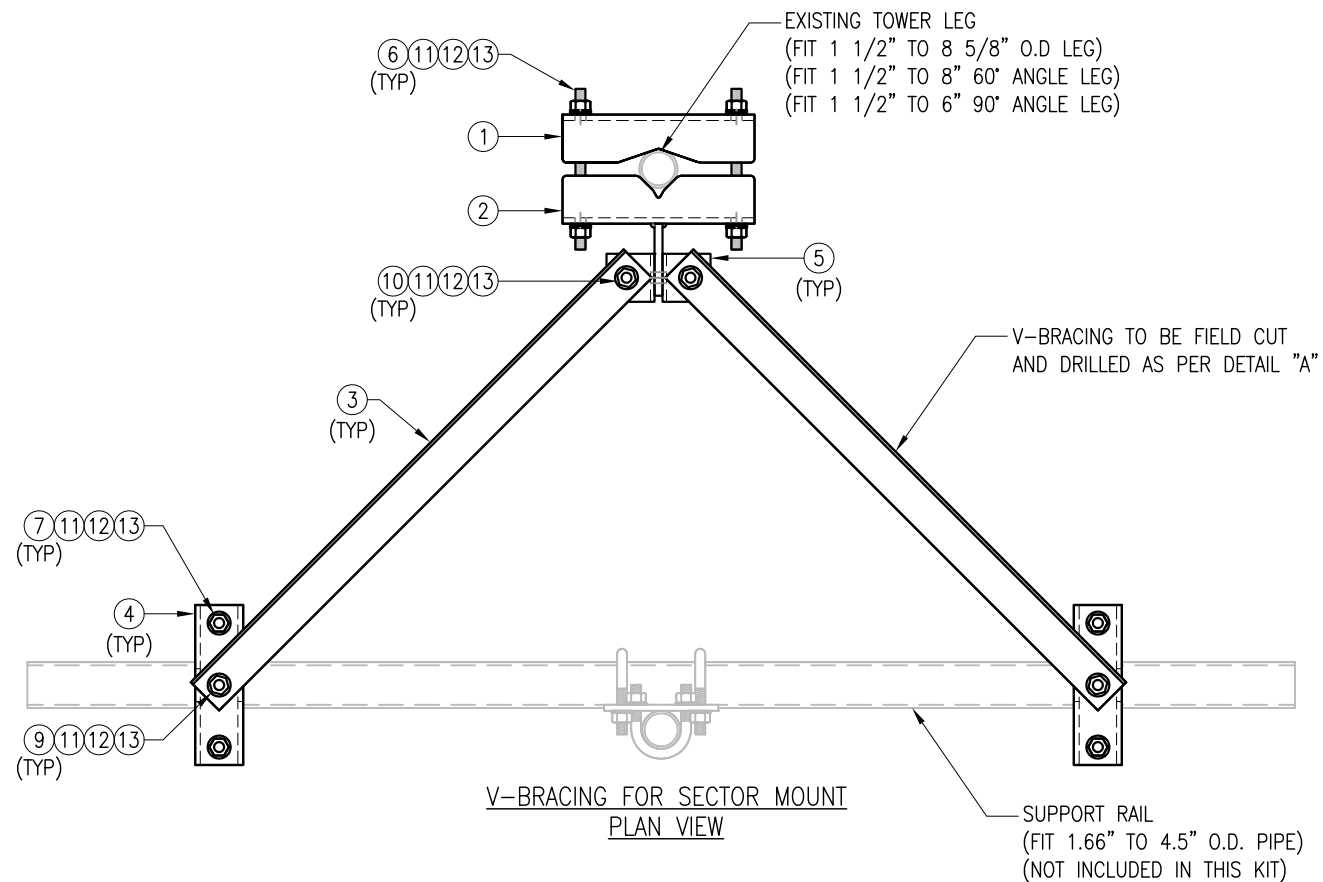
△
 △
 △
 △

SHEET TITLE:

VZWSMART-SFK1
 TIE BACK ASSEMBLY

SHEET NUMBER: REV #:

VZWSMART-SFK1 0



VZSMART-SFK3 (V-BRACING KIT)					
ITEM NO.	QTY.	PART NO.	DESCRIPTION	SHEET #	WT
1	1	BP9625-12	PL 3/8" X 9 5/8" X 1'-0" A36 BENT PLATE	VBSM-F1	12
2	1	BRKW-VBSM	WELDMENT BRACKET	VBSM-F3	16
3	2	L252525-8	L 2 1/2" X 2 1/2" X 1/4" X 8'-0" A36	VBSM-F5	67
4	4	BP6875-10	PL 3/8" X 6 7/8" X 10" A36 BENT PLATE	VBSM-F2	20
5	2	AL-333	L 3" X 3" X 1/4" X 3" A36	VBSM-F2	3
6	4	---	THREADED ROD 5/8" DIA. X 1'-6" F1554-36 HDG	---	---
7	4	---	THREADED ROD 5/8" DIA. X 10" F1554-36 HDG	---	---
8	1	---	BOLT 5/8" X 2 1/4" A325	---	---
9	2	---	BOLT 5/8" X 2" A325	---	---
10	2	---	BOLT 5/8" X 1 3/4" A325	---	---
11	21	FW-625	5/8" HDG USS FLAT WASHER	---	2
12	21	LW-625	5/8" HDG LOCK WASHER	---	0
13	21	NUT-625	5/8" HDG HEX NUT	---	2
GALVANIZED WT					122

NOTES:
 1. HOT-DIPPED GALVANIZED PER ASTM A123.

DRAWN BY: H.R. CHECKED BY: HMA

REV. DESCRIPTION BY DATE
 △ FIRST ISSUE H.R. 05/08/20

SHEET TITLE:

VZSMART-SFK3
 V-BRACING KIT

SHEET NUMBER: REV #:

VZSMART-SFK3 0

Exhibit F

Power Density/RF Emissions Report

Site Name: **WATERFORD 2 CT**
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density
	(MHz)		(watts)	(watts)	(feet)	(mW/cm ²)
VZW 700	751	4	623	2494	107	0.0078
VZW CDMA	872.34	2	414	828	107	0.0026
VZW Cellular	874	4	623	2494	107	0.0078
VZW PCS	1977.5	4	1428	5713	107	0.0179
VZW AWS	2120	4	1530	6122	107	0.0192
VZW CBAND	3730.08	4	6531	26125	107	0.0821

Total Percentage of Maximum Permissible Exposure

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI

**Calculation includes a -10 dB Off Beam Antenna Pattern Adjustment pursuant to Attachments B and C of the Siting Council

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used.


Maximum Permissible Exposure*	Fraction of MPE
(mW/cm ²)	(%)
0.5007	1.56%
0.5816	0.45%
0.5827	1.34%
1.0000	1.79%
1.0000	1.92%
1.0000	8.21%
	15.28%

/IEEE C95.1-1992

It's November 10, 2015 Memorandum for Exempt Modification filing:

Exhibit G

Recipient Mailings



**UNITED STATES
POSTAL SERVICE®**

Click-N-Ship®

P

usps.com 9405 5036 9930 0009 8418 01 0079 5000 0010 6385
US POSTAGE
 Flat Rate Env
 09/21/2021

U.S. POSTAGE PAID
click-n-ship®

Mailed from 01566

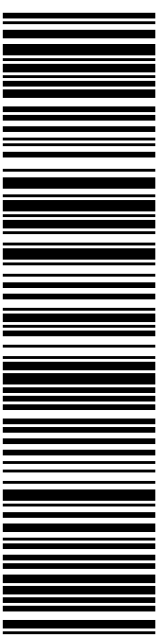
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/24/21
 Ref#: CR-876338
0006

C010

SHIP TO: ROBERT J BRULE
 FIRST SELECTMAN
 15 ROPE FERRY RD
 WATERFORD CT 06385-2806

USPS TRACKING #



9405 5036 9930 0009 8418 01

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0009 8418 01

Trans. #: 544088076	Priority Mail® Postage: \$7.95
Print Date: 09/21/2021	Total: \$7.95
Ship Date: 09/21/2021	
Expected Delivery Date: 09/24/2021	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

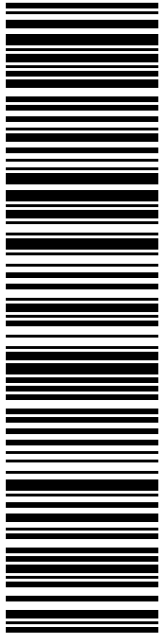
Ref#: CR-876338

To: ROBERT J BRULE
 FIRST SELECTMAN
 15 ROPE FERRY RD
 WATERFORD CT 06385-2806

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Thank you for shipping with the United States Postal Service!
 Check the status of your shipment on the USPS Tracking® page at usps.com



USPS TRACKING #

9405 5036 9930 0009 8418 32

Electronic Rate Approved #038555749

SHIP TO:

SARAH SNELL
1800 W PARK DR
WESTBOROUGH MA 01581-3926

P

usps.com 9405 5036 9930 0009 8418 32 0079 5000 0010 1581
US POSTAGE
Flat Rate Env
09/21/2021

U.S. POSTAGE PAID
click-n-ship®

Mailed from 01566

PRIORITY MAIL 1-DAY™

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Expected Delivery Date: 09/22/21
Ref#: CR-876338
0006

C006



Cut on dotted line.

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3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0009 8418 32

Trans. #: 544088076	Priority Mail® Postage: \$7.95
Print Date: 09/21/2021	Total: \$7.95
Ship Date: 09/21/2021	
Expected Delivery Date: 09/22/2021	

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

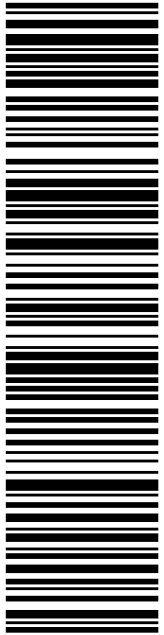
Ref#: CR-876338

To: SARAH SNELL
1800 W PARK DR
WESTBOROUGH MA 01581-3926

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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USPS TRACKING #

9405 5036 9930 0009 8418 25

Electronic Rate Approved #038555749

SHIP TO:

TREASURER'S OFFICE-TOWN OF WATERFORD
181 STATE ST
NEW LONDON CT 06320-6302

P

usps.com 9405 5036 9930 0009 8418 25 0079 5000 0010 6320
US POSTAGE
Flat Rate Env

09/21/2021 Mailed from 01566


U.S. POSTAGE PAID
click-n-ship®

PRIORITY MAIL 2-DAY™

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Expected Delivery Date: 09/24/21
Ref#: CR-876338
0006

C015



UNITED STATES POSTAL SERVICE®

Click-N-Ship®



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2. Place your label so it does not wrap around the edge of the package.
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4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0009 8418 25

Trans. #: 544088076	Priority Mail® Postage: \$7.95
Print Date: 09/21/2021	Total: \$7.95
Ship Date: 09/21/2021	
Expected Delivery Date: 09/24/2021	


From: DEBORAH CHASE Ref#: CR-876338
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

To: TREASURER'S OFFICE-TOWN OF WATERFORD
181 STATE ST
NEW LONDON CT 06320-6302

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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**UNITED STATES
POSTAL SERVICE®**

Click-N-Ship®

P

usps.com 9405 5036 9930 0009 8418 18 0079 5000 0010 6385
US POSTAGE
 Flat Rate Env
 09/21/2021

U.S. POSTAGE PAID
Click-N-Ship®

Mailed from 01566

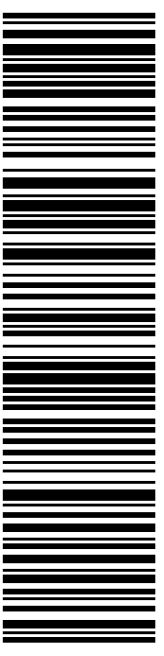
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/24/21
 Ref#: CR-876338
0006

C010

SHIP TO: ABBY PIERSALL
 PLANNING DIRECTOR
 15 ROPE FERRY RD
 WATERFORD CT 06385-2806

USPS TRACKING #



9405 5036 9930 0009 8418 18

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

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2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
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5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0009 8418 18

Trans. #: 544088076	Priority Mail® Postage: \$7.95
Print Date: 09/21/2021	Total: \$7.95
Ship Date: 09/21/2021	
Expected Delivery Date: 09/24/2021	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

Ref#: CR-876338

To: ABBY PIERSALL
 PLANNING DIRECTOR
 15 ROPE FERRY RD
 WATERFORD CT 06385-2806

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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 Check the status of your shipment on the USPS Tracking® page at usps.com

876 338 - Waterford



FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/21/2021

12:25 PM

Product	Qty	Unit Price	Price
Prepaid Mail	1		\$0.00
New London, CT 06320			
Weight: 1 lb 12.50 oz			
Acceptance Date:			
Tue 09/21/2021			
Tracking #:			
9405 5036 9930 0009 8418 25			
Prepaid Mail	1		\$0.00
Waterford, CT 06385			
Weight: 1 lb 12.30 oz			
Acceptance Date:			
Tue 09/21/2021			
Tracking #:			
9405 5036 9930 0009 8418 18			
Prepaid Mail	1		\$0.00
Westborough, MA 01581			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Tue 09/21/2021			
Tracking #:			
9405 5036 9930 0009 8418 32			
Prepaid Mail	1		\$0.00
Waterford, CT 06385			
Weight: 1 lb 12.60 oz			
Acceptance Date:			
Tue 09/21/2021			
Tracking #:			
9405 5036 9930 0009 8418 01			

Grand Total:

\$0.00