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August 7, 2019

VIA EMAIL & OVERNIGHT DELIVERY
Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Tower Sharing Request by New Cingular Wireless PCS, LLC
Facility as Approved in Siting Council Docket 391
Premises: 232 Shore Road, Old Lyme, Connecticut

Dear Members of the Siting Council:

Pursuant to Connecticut General Statutes (C.G.S.) § 16-50aa, New Cingular Wireless PCS, LLC ("AT&T") hereby requests an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of a communications tower and associated compound at the parcel identified as 232 Shore Road in the Town of Old Lyme (the "Shore Road Facility"). The Certificate Holder and tower owner is American Tower Corporation. ("American Tower"). AT&T and American Tower have agreed to share the use of the Shore Road Facility as detailed below. Additionally, annexed here as **Attachment 5** is the Letter of Authorization between the Applicant and the Certificate Holder authorizing the Applicant to prepare and file an application for the Applicant's use of the existing tower.

The Shore Road Facility

The Shore Road Facility consists of an approximately one hundred and ten-foot (110') monopole (the "Tower") and associated equipment for wireless communications use by T-Mobile Northeast, LLC ("T-Mobile") and Cellco Partnership d/b/a Verizon Wireless ("Cellco"). The tower and compound are located on an approximately 5-acre parcel owned by ATSSLSS, LLC.

By Decision and Order ("D&O") dated September 23, 2010, the Council granted T-Mobile a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility located at the Shore Road Property. That D&O permitted the Tower to be constructed up to 110-feet. On July 11, 2013, the Council approved the transfer of the Certificate of Environmental Compatibility and Public Need from T-Mobile to Bay Communications II, LLC ("Bay"). On October 8, 2013, Bay notified the Council of its intent to commence site construction on October 10, 2013. In December of 2017, Bay merged with Municipal Communications, LLC into Municipal Bay, LLC ("Muni Bay"). On

September 20, 2018, American Towers LLC ("American Tower") acquired Muni Bay and gained control and operation of the Tower. The Certificate of Environmental Compatibility and Public Need was formally transferred to American Tower by approval of the Council on December 6, 2018.

The D&O dated September 23, 2010 included a condition requiring antennas be attached to the Tower via T-arm mounts. By petition dated May 16, 2019, AT&T requested that the evidentiary proceeding be reopened and that the D&O be modified by eliminating the condition requiring the use of T-arm mounts so that AT&T could attach its antennas using a V-Boom mount system since T-arm mounts were deemed unacceptable for supporting AT&T's proposed equipment. On July 18, 2019, the CSC reopened the evidentiary hearing and modified the D&O in Docket No. 391 eliminating the requirement that wireless antennas be attached to the Tower via T-arm mounts as shown on the D&O dated July 18, 2019 annexed hereto as **Attachment 6**.

AT&T Wireless' Facility

As depicted on the enclosed plans annexed hereto as **Attachment 1** prepared by Maser Consultant P.A. last updated July 30, 2019, including a site plan, compound and equipment layout and tower elevation, AT&T proposes the shared use of the Shore Road Facility to provide FCC licensed services. AT&T will install 9 antennas, 15 remote radiohead units, and 3 DC-6 surge suppressor domes on a v-boom antenna mount at approximately the 109-foot level of the Tower. As also depicted on the drawings, within the existing compound AT&T will install an 8' x 8' walk in equipment cabinet on an 8'x'8' concrete pad and a 20kw backup diesel generator on a 6'x4' concrete pad.

Connecticut General Statutes § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1)). Further, upon approval of such shared use, it is exclusive, and no local zoning or land use approvals are required. (C.G.S. § 16-50x). Shared use of the Shore Road Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility: As evidenced in the Tower Analysis prepared by Maser Consulting P.A. and dated July 22, 2019 annexed hereto as **Attachment 2** and the Antenna Mount Analysis prepared by Maser Consulting P.A. and dated June 28, 2019 annexed hereto as **Attachment 3**, AT&T confirmed that the Tower is designed to support the addition of AT&T's antennas and tower mounted equipment in addition to the existing loading. The proposed shared use of the Tower is therefore technically feasible.

B. Legal Feasibility: Pursuant to C.G.S. § 16-50aa, the Council is authorized to issue an order approving shared use of the existing Shore Road Facility. (C.G.S. § 16-50aa(c)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of the Tower would permit the Applicant to obtain a building permit for the proposed installation. Notably, the Tower is subject to the approval granted in Docket 391 which was recently modified to permit AT&T's proposed attachment utilizing a v-boom mounting system. In addition, Condition 6 of the Decision and Order in Docket 391 mandates that the Tower be available for shared use where feasible and such is the case with this proposal.

C. Environmental Feasibility: The proposed shared use would have a minimal environmental effect, for the following reasons:

1. The proposed installation would have a *de minimis* visual impact and would not cause any significant change or alteration in the physical or environmental characteristics of the approved facility;

2. The installation by AT&T would reach approximately three feet (3') beyond the existing one hundred and ten-foot (110') tower height. AT&T's application does not involve the extension of the Tower itself and does not create any height increase beyond what is permitted by Federal Communications Commission regulations and the Councils Decision and Order in Docket 391;

3. The proposed installation will not increase the noise levels at the facility boundaries by six decibels or more;

4. Operation of AT&T's antennas at this site will not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. AT&T's proposed antenna installation along with other carriers is calculated to be within 27.26% of FCC Standard for General Public/Uncontrolled Maximum Permissible Exposure (MPE). Please see the attached Calculated Radio Frequency Emissions report dated March 15, 2019, prepared by Marc Salas, RF Engineer, and approved by Keith Vellante, Director of RF Services, C Squared Systems, LLC, annexed hereto as **Attachment 4**; and

5. The proposed shared use of the Shore Road Facility would not require any water or sanitary facilities or discharges into any waterbodies. The only air emissions would be from weekly testing of the emergency back-up

generator and its use during a power outage. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility: The Applicant and the Certificate Holder entered into a mutual agreement to share use of the Shore Road Facility on terms agreeable to both parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety: As stated above and evidenced in attachments hereto the tower is structurally capable of supporting AT&T's installation and emissions are well within the maximum permitted by the FCC and the Connecticut Department of Health. Further, the addition of AT&T's telecommunications service in the Old Lyme area through shared use of the Shore Road Facility is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area of the State.

Conclusion

As explained above, the proposed shared use of the Shore Road Facility satisfies the criteria set forth in C.G.S. §16-50aa and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in the State of Connecticut. AT&T therefore requests the Siting Council issue an order approving the proposed shared use of the Shore Road Facility.

If the Council or its staff have any questions or comments, please feel free to contact our office. Thank you for your consideration.

Respectfully submitted,

Lucia Chiocchio
On behalf of AT&T

Attachments

cc: Bonnie Reemsnyder, First Selectwoman, Old Lyme
American Tower Corporation
AT&T
C Squared Systems, LLC
Daniel Patrick, Esq.
Julie Durkin
Riddar Nget

ATTACHMENT 1

PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
   A. LIMITED FIELD OBSERVATION BY MASER CONSULTING ON 10/24/18.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. THE PROPOSED FACILITY WILL CAUSE AN INSIGNIFICANT OR "DE-MINIMUS" INCREASE IN STORM WATER RUNOFF, THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION.
15. THE TOWER, MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EIA/TIA-222-G AS PER IBC REQUIREMENTS.
16. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
17. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
18. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS.
19. CONTRACTOR SHALL CONTACT STATE SPECIFIC ONE CALL SYSTEM THREE WORKING DAYS PRIOR TO ANY EARTH MOVING ACTIVITIES.

at&t

SITE NAME: OLD LYME-SHORE RD
FA NUMBER: 10133919
SITE NUMBER: CT1273S
1C - MRCTB033436
232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

ZONING DRAWINGS

PROPERTY OWNER

OWNER:	ATSSLSS LLC.
ADDRESS:	P.O. BOX 833 OLD LYME, CT 06371
TAX LOT ID:	8-36-2

27.95' AMSL (AS PER USGS NATIONAL MAP)

VICINITY MAP

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND 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 THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC
2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70
3. 2017 NFPA 101
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
5. AMERICAN CONCRETE INSTITUTE
6. TIA-222-G
7. TIA 607 FOR GROUNDING
8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2 LATEST EDITION
9. TELCORDIA GR-1275
10. ANSI T1.311
11. PROPOSED USE: UNMANNED TELECOM FACILITY
12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
13. CONSTRUCTION TYPE: IIB
14. USE GROUP: U

PROJECT INFORMATION

SITE INFORMATION

LATITUDE:	41.2917167° N
LONGITUDE:	72.2869944° W
JURISDICTION:	TOWN OF OLD LYME

APPLICANT/LESSEE

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE ROAD
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701

STRUCTURE OWNER

COMPANY:	AMERICAN TOWER CORPORATION
ADDRESS:	10 PRESIDENTIAL WAY
CITY, STATE, ZIP:	WOBURN, MA 01201

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	TODD OLIVER
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	KRIS SMITH
E-MAIL:	KRIS.SMITH@SMARTLINKLLC.COM

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	ROBERT PICARD
E-MAIL:	ROBERT.PICARD@SMARTLINKLLC.COM

ENGINEER

COMPANY:	MASER CONSULTING P.A.
ADDRESS:	331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP:	RED BANK, NJ 07701
CONTACT:	ROBERT ANDREWS
PHONE:	(856) 797-0412
E-MAIL:	RANDREWS@MASERCONSULTING.COM

PROJECT DESCRIPTION/ SCOPE OF WORK

- INSTALL (15) NEW RRU'S, (4) PER SECTOR
- INSTALL (9) NEW PANEL ANTENNAS, (3) PER SECTOR
- INSTALL (3) NEW ANTENNA SECTOR FRAMES
- INSTALL (3) NEW DC-6 SURGE SUPPR. DOMES, (1) PER SECTOR
- INSTALL (2) NEW 18-PAIR FIBER TRUNKS
- INSTALL (6) NEW 6/C DC CABLES
- PROPOSED SABRE V-BOOM ASSEMBLY W/ TIE-BACK, (1) PER SECTOR
- PROPOSED SABRE 12" STAND-OFF ARM, (1) PER SECTOR
- INSTALL (1) NEW GENERAC 20kW GENERATOR
- INSTALL (1) 4'x6' CONCRETE PAD
- INSTALL (1) NEW GENERATOR
- INSTALL (1) 6'-8"x6'-8" W.I.C.
- INSTALL (1) NEW 8'x8' CONCRETE PAD FOR W.I.C.

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 2591275, VERSION 3.00, LAST UPDATED 01/22/2019.

SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
AM-1	ABUTTERS MAP AND LIST
SP-1	SITE PLAN & TAX MAP
Z-1	COMPOUND PLAN
Z-2	EQUIPMENT LAYOUT AND ELEVATION VIEW
Z-3	ANTENNA LAYOUT AND ANTENNA SCHEDULE
A-1	DETAILS

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SCALE:	JOB NUMBER:
AS SHOWN	18946101A

REV	DATE	DESCRIPTION	BY	CHK
0	3/6/19	ISSUED FOR ZONING	ACOA	MA

STATE OF CONNECTICUT
PETROS L. TSOUKALAS
32577
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER 32577
REGISTERED PROFESSIONAL ENGINEER

SITE NAME:
OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S
232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5669
Phone: .732.383.1950
Fax: .732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: TITLE SHEET

SHEET NUMBER: T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR 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.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. 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.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - SMARTLINK
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. 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 THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
33. 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, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. THE AREAS OF THE OWNER'S 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.
35. SUBCONTRACTOR 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.
36. 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.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
50. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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SCALE :	JOB NUMBER :
AS SHOWN	18946101A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
PROFESSIONAL ENGINEER

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SITE NAME:

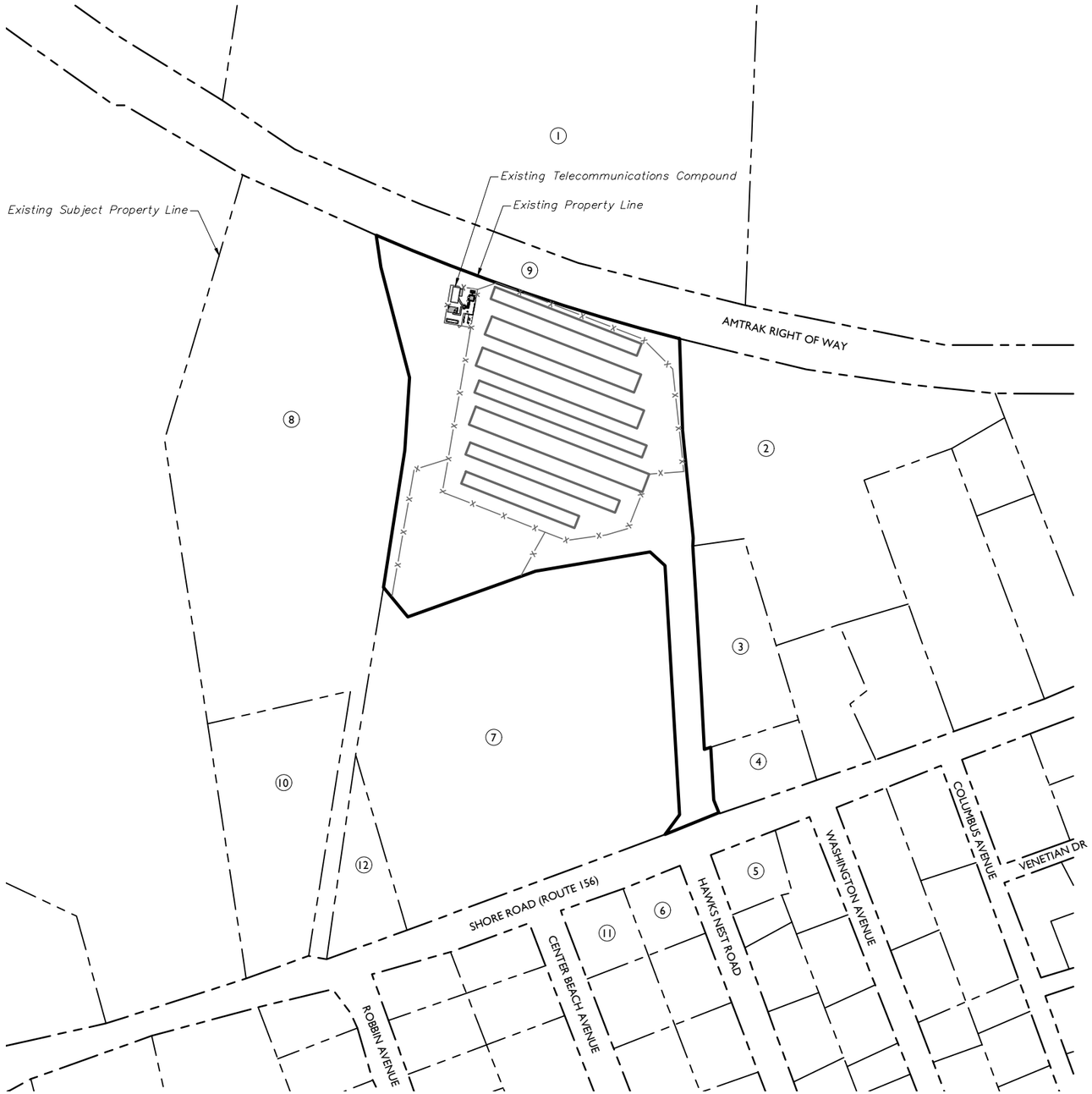
OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5669
Phone: .732.383.1950
Fax: .732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1



ABUTTERS MAP

100 80 60 40 20 0 50 100 200

SCALE : 1" = 100' FOR 22"X34"
(SCALE : 1" = 200' FOR 11"X17")

SUBJECT PROPERTY:

MAP 8, LOT LOT 36-2
232 SHORE ROAD

GARY D. SMITH
P.O. BOX 833
OLD LYME, CT 06371
ACRES = 5.0

ABUTTERS:

1. MAP 8, LOT 42B AND MAP 9, LOT 2
   14 CROSS LANE, OLD LYME
   TOWN OF OLD LYME
   MAILING: 52 LYME STREET
   OLD LYME, CT 06371

2. MAP 8, LOT 37
   240-1 SHORE ROAD, OLD LYME
   RICHARD M. BATTALINO
   MAILING: P.O. BOX 487
   SOUTH LYME, CT 06376

3. MAP 82, LOT 2
   236-1 SHORE ROAD, OLD LYME
   DONALD GALE & SHARON K. GALE
   MAILING: P.O. BOX 37
   SALEM, NY 10590

4. MAP 82, LOT 1
   236 SHORE ROAD, OLD LYME
   ROGER CRAMPTON
   MAILING: 170 BOSTON POST ROAD
   SUITE 122
   MADISON, CT 06443

5. MAP 82, LOT 23
   2 HAWKS NEST ROAD, OLD LYME
   JOANNE SIPALA
   MAILING: P.O. BOX 4115
   OLD LYME, CT 06371

6. MAP 82, LOT 32
   1 HAWKS NEST ROAD, OLD LYME
   MICHELE M. JOHNSON
   MAILING: 1 HAWKS NEST ROAD
   OLD LYME, CT 06371

7. MAP 8, LOT 36-1
   230 SHORE ROAD, OLD LYME
   CAPITAL HOLDING OF CT, INC.
   MAILING: 230 SHORE ROAD
   OLD LYME, CT 06371

8. MAP 8, LOT 34
   226 SHORE ROAD, OLD LYME
   GARVIN FAMILY CORP., INC.
   MAILING: 11 STONEWOOD DRIVE
   OLD LYME, CT 06371

9. NO MAP OR LOT REFERENCES (RAILROAD)
   NATIONAL RAILROAD PASSENGER CORP.
   ADJACENT TO THE SUBJECT PARCEL
   MAILING: 711 3RD AVENUE
   NEW YORK, NY 10017
   ADDITIONAL MAILING: 400 NORTH CAPITAL STREET, N W
   WASHINGTON, DC, 20001

10. MAP 8, LOT 33
    224 SHORE ROAD, OLD LYME
    PETER J. LODI, SR.
    MAILING: 146 OLD COLCHESTER ROAD
    SALEM, CT 06420

11. MAP 82, LOT 33
    2 CENTER BEACH AVENUE, OLD LYME
    JEFFREY BEADLE
    MAILING: 104 KIRKLAND STREET
    DEEP RIVER, CT 06417

12. MAP 8, LOT 35
    228 SHORE ROAD, OLD LYME
    CASEY CONRAD
    MAILING: 228 SHORE ROAD
    OLD LYME, CT 06371

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SCALE : AS SHOWN
JOB NUMBER : 18946101A

REV	DATE	DESCRIPTION	BY	CHECKED BY
0	7/30/19	ISSUED FOR REVIEW	AJC	PAR

STATE OF CONNECTICUT
PETROS C. TSOUKALAS
32577
REGISTERED PROFESSIONAL ENGINEER

PETROS C. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER / LICENSE NUMBER 32577

SITE NAME:

OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5669
Phone: .732.383.1950
Fax: .732.383.1984
email: solutions@maserconsulting.com

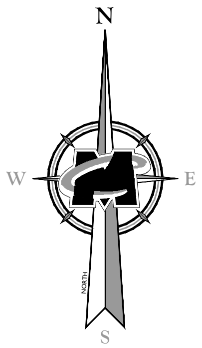
SHEET TITLE :
ABUTTERS MAP AND LIST

SHEET NUMBER :
AM-1

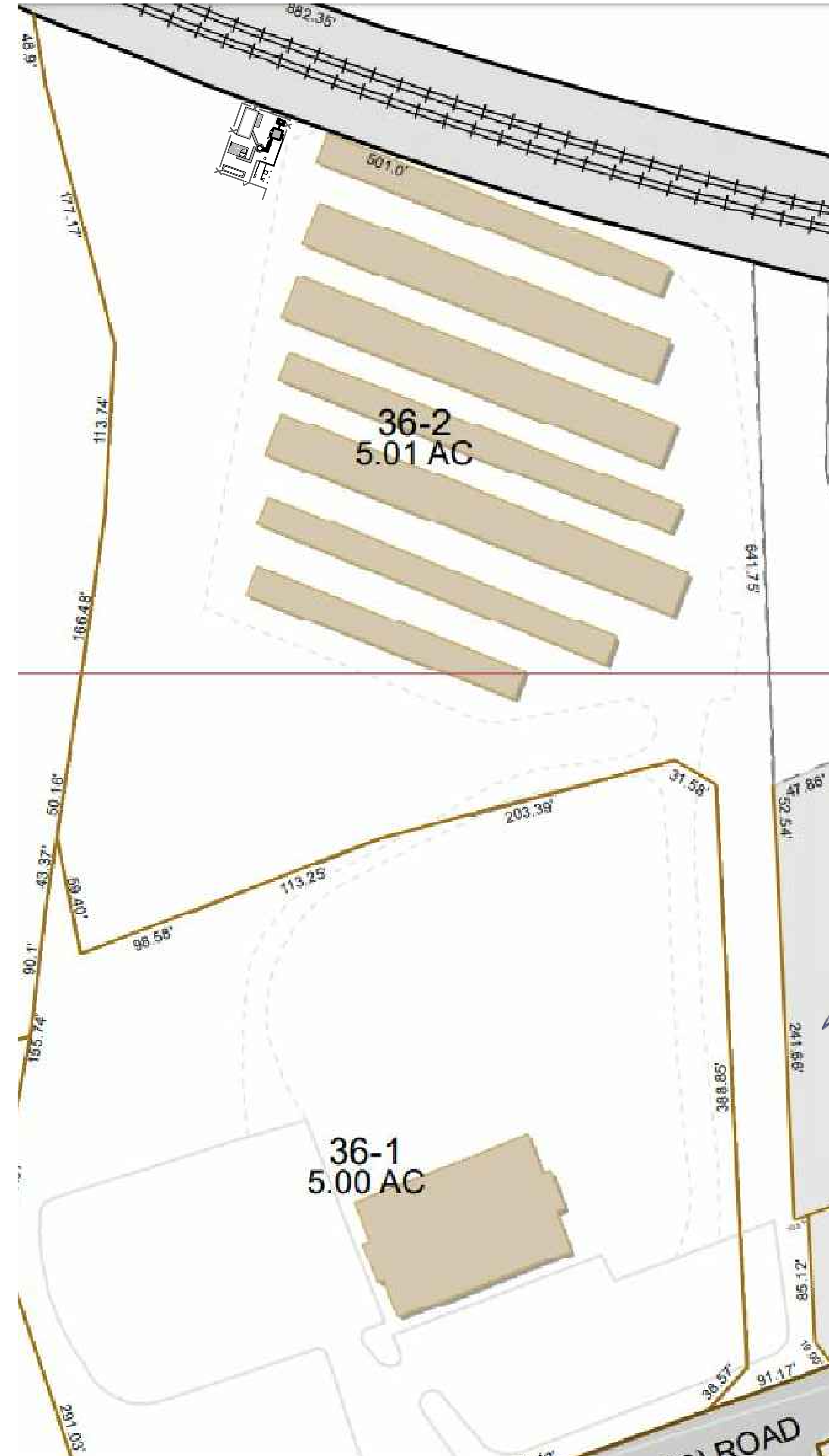
PROPERTY OWNER

OWNER:	ATSSLSS LLC.
ADDRESS:	P.O. BOX 833
	OLD LYME, CT 06371
TAX LOT ID:	8-36-2

27.95' AMSL (AS PER USGS NATIONAL MAP)



SITE PLAN



TAX MAP

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SCALE :	JOB NUMBER :
AS SHOWN	18946101A

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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SITE NAME:

OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

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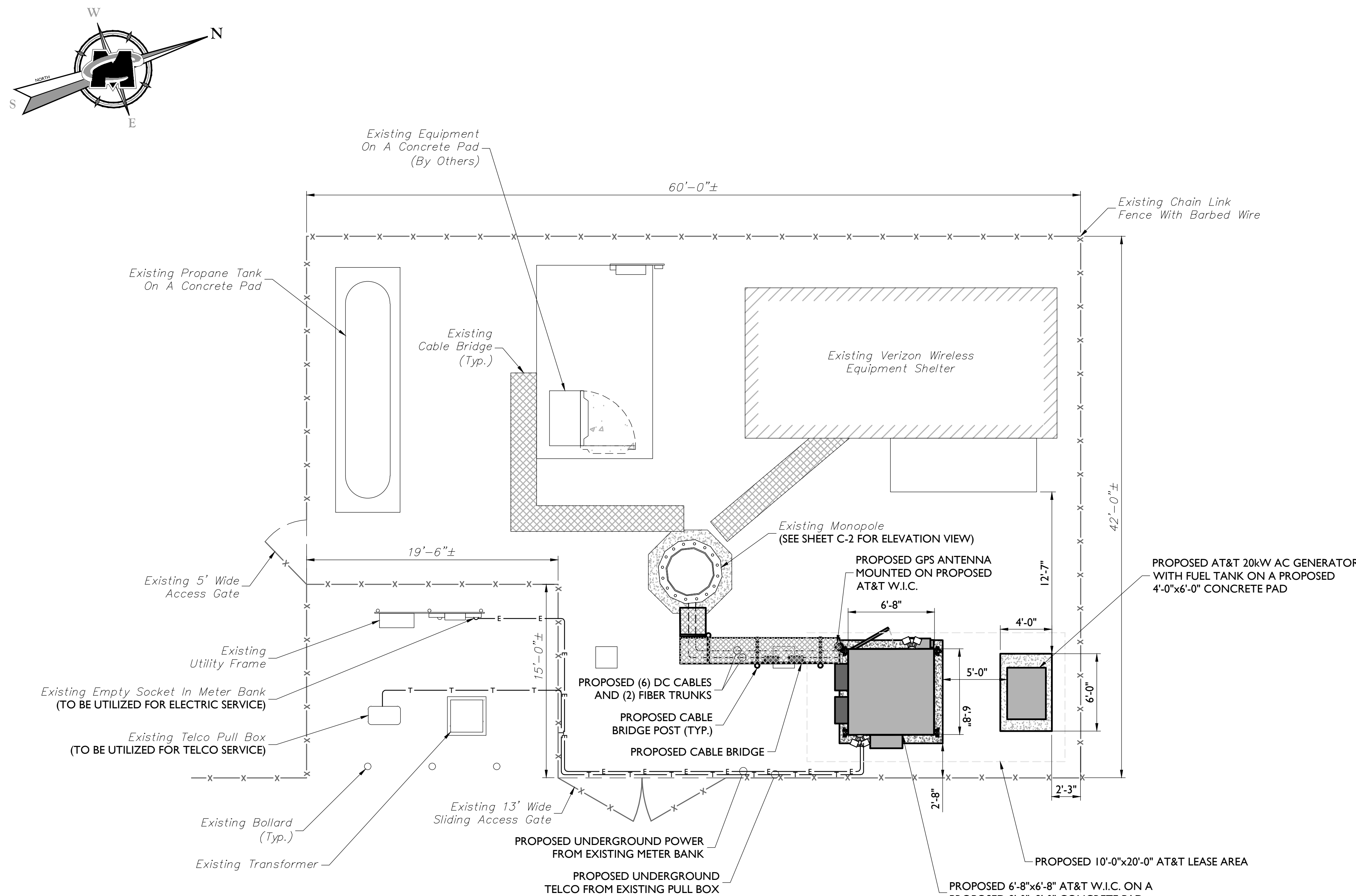
Fax: .732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
SITE PLAN & TAX MAP

SHEET NUMBER :
SP-1



COMPOUND PLAN

SCALE : 1" = 6' FOR 22"X34"
(SCALE : 1" = 12' FOR 11"X17")

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SCALE :	JOB NUMBER :
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STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
LICENSED
PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: 32577

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SITE NAME:

OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
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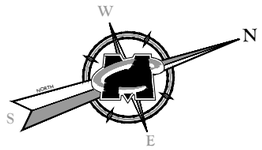
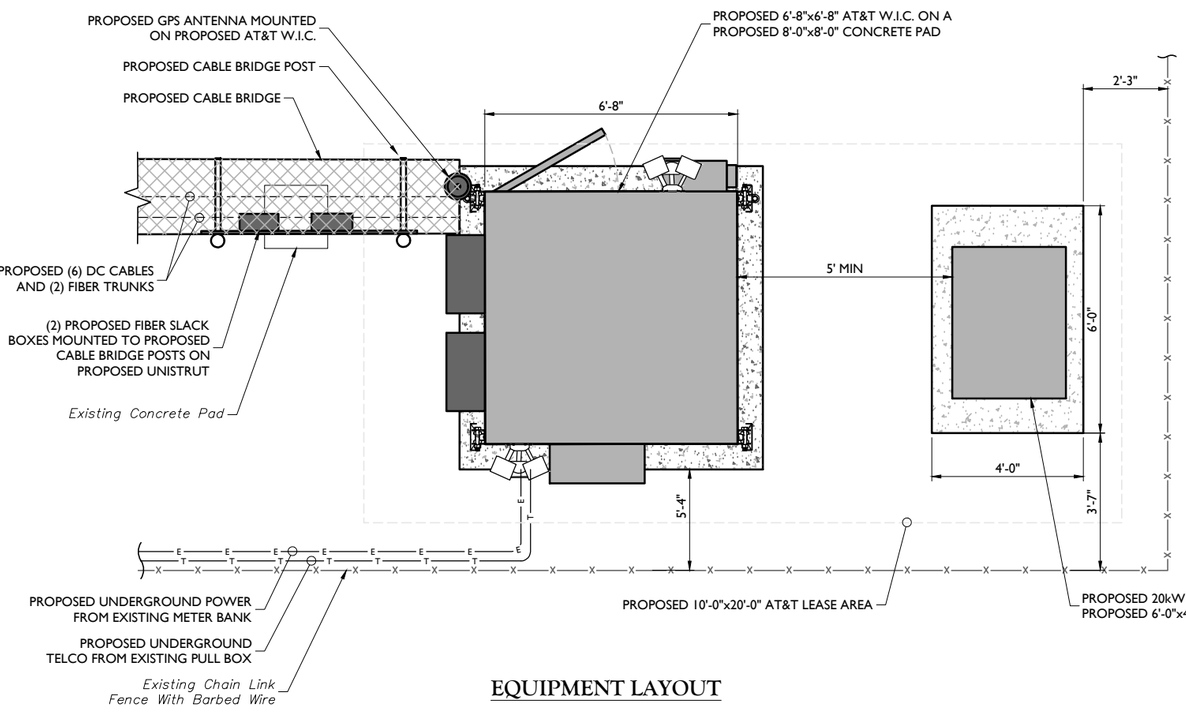
email: solutions@maserconsulting.com

SHEET TITLE :
COMPOUND PLAN

SHEET NUMBER :
Z-1





EQUIPMENT LAYOUT

2 1/4 1/2 0 1 2 4

SCALE : 1" = 2' FOR 22"X34"
(SCALE : 1" = 4' FOR 11"X17")

PROPERTY OWNER

OWNER:	ATSSLSS LLC.
ADDRESS:	P.O. BOX 833
	OLD LYME, CT 06371
TAX LOT ID:	8-36-2

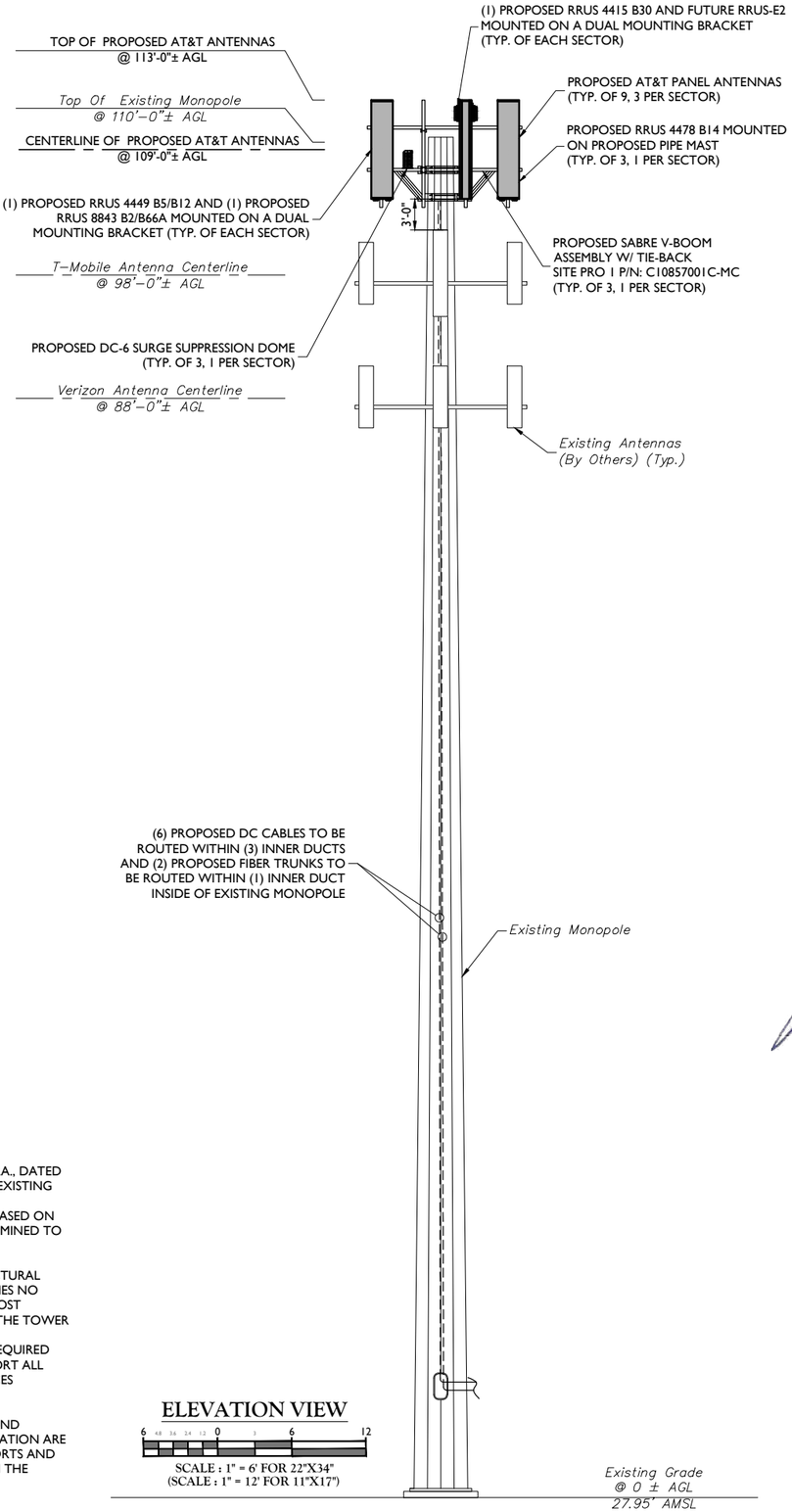
27.95' AMSL (AS PER USGS NATIONAL MAP)

STRUCTURAL NOTES:

1. AN ANTENNA MOUNT ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., DATED 06/28/19 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE ANTENNA MOUNT HAS BEEN DETERMINED TO HAVE SUFFICIENT CAPACITY.

2. MASER CONSULTING P.A. HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER OR TOWER FOUNDATION AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY AS REQUIRED UNDER THE MOST CURRENT LOCAL, STATE AND FEDERAL CODES. A STRUCTURAL ANALYSIS OF THE TOWER OR TOWER FOUNDATION MUST BE PREPARED BY AN APPROPRIATE LICENSED STRUCTURAL ENGINEER CERTIFYING THAT THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS, CABLES AND APPURTENANCES COMPLIES WITH THE MOST CURRENT LOCAL, STATE AND FEDERAL CODES.

3. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE TOWER STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE TOWER STRUCTURAL ANALYSIS.



ELEVATION VIEW

6 3/4 3/6 1/2 0 1 6 12

SCALE : 1" = 6' FOR 22"X34"
(SCALE : 1" = 12' FOR 11"X17")

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JOB NUMBER : 18946101A

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0	7/15/19	RELEASED FOR ZONING	GD	RA

STATE OF CONNECTICUT
32577
PETROS ELENSOUKAS
LICENSED PROFESSIONAL ENGINEER

SITE NAME:

OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

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Phone: .732.383.1950
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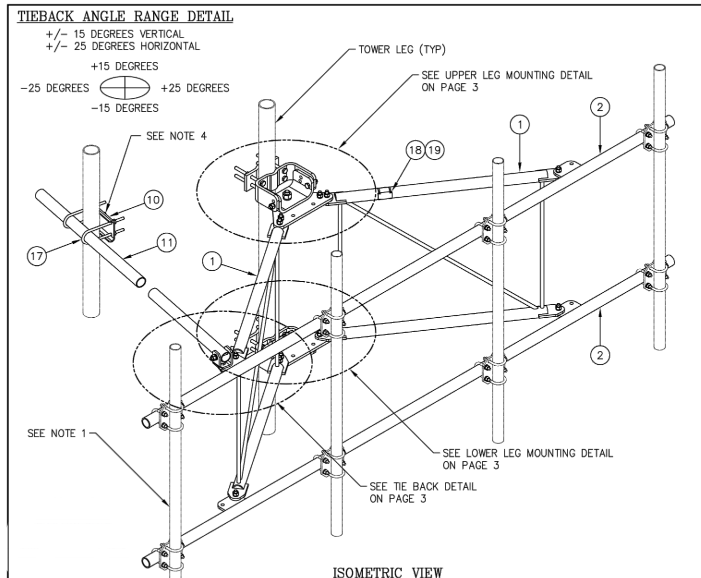
email: solutions@maserconsulting.com

SHEET TITLE :
EQUIPMENT LAYOUT AND ELEVATION VIEW

SHEET NUMBER :
Z-2



ISOMETRIC VIEW

C10857001C 12' HD V-BOOM ASSEMBLY W/TIEBACK				
ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	CW01222	WELDMENT, STANDOFF ARM	126
2.	2	CW01223	WELDMENT, FACE PIPE	147
3.	2	CS03109	PLATE, ROTATING	34
4.	1	CS03110	PLATE, PIVOTING (UPPER)	16
5.	1	CS03111	PLATE, LEG CLAMP (UPPER)	17
6.	1	CS03112	PLATE, PIVOTING (LOWER)	14
7.	1	CS03113	PLATE, LEG CLAMP (LOWER)	17
8.	2	CS03114	PLATE, LEG CLAMP (BACK)	14
9.	1	CS00098	PLATE, TIE BACK SWIVEL	3
10.	1	CS03285	PLATE, TIE BACK CLAMP	4
11.	1	CS03333	PIPE, TIE BACK	38
12.	2	C40026073	BOLT ASSEMBLY, 1 ø X 3 A325	4
13.	8	C40140004	BOLT ASSEMBLY, 5/8 ø X 8 A307	13
14.	1	C40026033	BOLT ASSEMBLY, 5/8 ø X 4 1/2 A325	1
15.	12	C40026025	BOLT ASSEMBLY, 5/8 ø X 2 1/2 A325	6
16.	5	C40026024	BOLT ASSEMBLY, 5/8 ø X 2 1/4 A325	3
17.	2	C40034183	U-BOLT ASSEMBLY, 1/2 ø X 2 9/16 C-C	3
18.	1	Z30992001	MOUNT CLASSIFICATION TAG C10857001C	1
19.	2	C40062103	STAINLESS STEEL SELF-LOCKING CABLE TIE	1
			TOTAL WEIGHT	462

PACKAGING NOTE

CK00386 INCLUDES ITEMS 1, 3, 4, 5, 6, 7, 12 & 15 (8 QTY)
CK00387 INCLUDES ITEMS 2, 8, 9, 10, 11, 13, 14, 15 (4 QTY), 16, 17, 18 & 19

This mount satisfies the Heavy-10 requirements as specified in AT&T RPF No. 20160229.002.P for Antenna Sector Mounts.
It satisfies ANSI/TIA-222-G for the following parameters:
Structure Class II, Exposure Category C, Topographic Category 1
Mount and antenna centerline at 300' AGL
Gust effect factor = 1.0, Wind direction probability factor = 0.95
Four mount pipes symmetrically placed as shown
Bare condition
Basic wind speed = 120 mph
$(EPA)_N = (EPA)_T$ = 15.0 sq.ft. per mount pipe
Factored Weight = 663 lbs per mount pipe
Iced condition
Basic wind speed = 60 mph, Design ice thickness, t_i = 1.0 in
$(EPA)_N = (EPA)_T$ = 24.0 sq.ft. per mount pipe
Factored Weight = 1325 lbs per mount pipe

Mount EPA's in accordance with ANSI/TIA-222-G:
$(EPA)_N$ = 9.12 sq.ft.
$(EPA)_T$ = 5.23 sq.ft.
***Excludes mount pipes**

NOTES:
1. MOUNTING PIPES & CROSSOVER PLATE KITS MUST BE PURCHASED SEPARATELY.
2. QUANTITIES SHOWN IN LISTS OF MATERIAL ARE FOR ONE (1) V-BOOM ONLY.
3. THIS V-BOOM WILL MOUNT TO THE FOLLOWING: 1 1/2"ø TO 5 9/16"ø ROUND LEG.
4. TIEBACK MUST BE CONNECTED TO A RIGID MEMBER THAT PROVIDES ADEQUATE SUPPORT WITHIN THE LIMITS NOTED ABOVE IN THE TIEBACK ANGLE RANGE DETAIL UNLESS APPROVED BY THE ENGINEER OF RECORD.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries Towers and Poles

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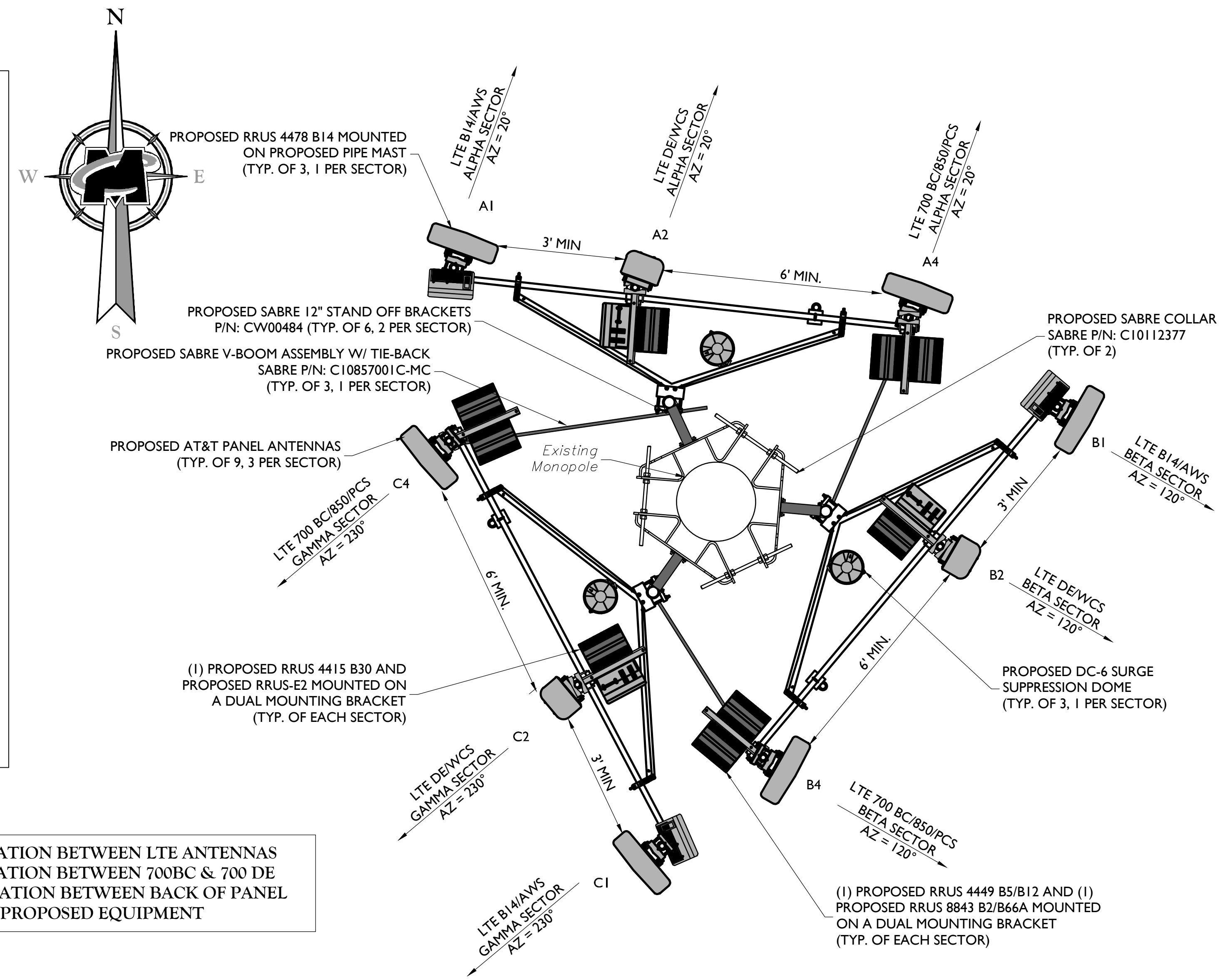
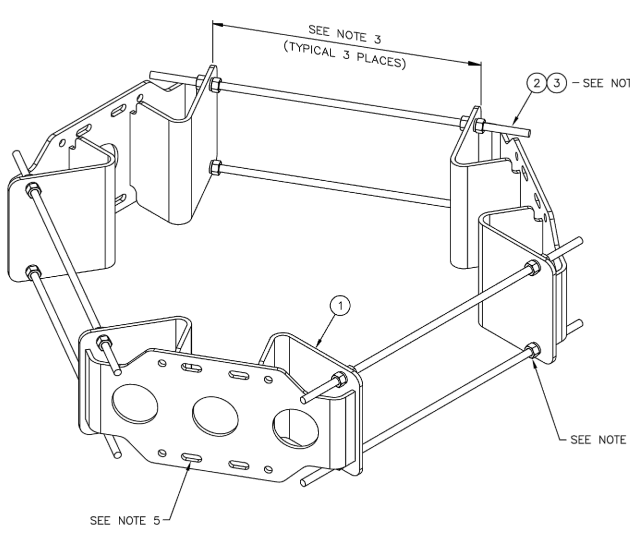
12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

DATE 12/22/15 | DRAWN BY WRF | CHECKED BY EK | SIZE B | DRAWING NO. C10857001C | REV 2 | SCALE None | PAGE 1 OF 3

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE
8 INCH MINIMUM SEPARATION BETWEEN BACK OF PANEL ANTENNA TO EXISTING/PROPOSED EQUIPMENT



PROPOSED ANTENNA LAYOUT
NOT TO SCALE



ISOMETRIC VIEW

C10112377 TRI-COLLAR ASSEMBLY (10"-40" MONOPOLE)				
ITEM	QTY.	PART. NO.	DESCRIPTION	WEIGHT
1.	3	CW01324	WELDMENT, TRI-COLLAR (10"-40" MONOPOLE)	166
2.	6	C40094012	THREADED ROD ASSEMBLY 5/8 X 2'-9"	25
3.	6	C40094002	THREADED ROD ASSEMBLY 5/8 X 1'-6"	17
			TOTAL WEIGHT	208

NOTES:
1. THERE ARE (2) LENGTHS OF THREADED ROD SUPPLIED TO ACCOMMODATE DIAMETERS LISTED BELOW
   USE 5/8 X 1'-6" THREADED ROD ASSEMBLY FOR 10"-24" MONOPOLE DIAMETERS
   USE 5/8 X 2'-9" THREADED ROD ASSEMBLY FOR 24"-40" MONOPOLE DIAMETERS (SEE NOTE 2)
2. THREADED ROD MAY BE SHORTENED IF REQUIRED, FIELD CUT AND COLD GALV SPRAY TO SUIT.
3. THIS DISTANCE MUST BE EQUAL IN ALL (3) THREE LOCATIONS TO ENSURE THE STRUCTURAL INTEGRITY OF THE THREADED RODS AS WELL AS 120° SEPARATION.
4. FOR MONOPOLES 13" DIA. OR SMALLER, ONLY (1) ONE NUT AND (1) ONE LOCKWASHER ARE REQUIRED BETWEEN THE TRI-COLLAR BRACKETS.
   FOR MONOPOLES LARGER THAN 13" DIA., (2) TWO NUTS AND (2) TWO LOCKWASHERS ARE REQUIRED BETWEEN THE TRI-COLLAR BRACKETS.
5. THE MOUNTING SLOTS NOTED WILL ACCOMMODATE 2 3/8"-4 1/2" O.D. MOUNTING PIPES.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL
REV | DATE | DRW | CHK | DESCRIPTION

Sabre Industries Towers and Poles

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TRI-COLLAR BRACKET ASSEMBLY FOR MONOPOLES (10"-40" DIA.) (CIRCUMFERENCE 31.4" TO 125.7")

DATE 04/15/16 | DRAWN BY WRF | CHECKED BY KLE | SIZE B | DRAWING NO. C10112377 | REV 0 | SCALE None | PAGE 1 OF 1

ANTENNA SCHEDULE

SECTOR		PROPOSED ANTENNA	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH (DEG.)	ANT. CL. ELEV. (ft.)	REMOTE RADIO/TMA CONFIGURATION	TRANSMISSION CABLE QUANTITY	TRANSMISSION CABLE TYPE	TRANSMISSION CABLE STATUS
Sector 1	1	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	20	109'	(1) RRUS 4478 B14	1 2	FIBER DC	PROPOSED
	2	CCI HPA65R-BU8A	LTE	PROPOSED	96.00	11.70	7.60	12.60	20	109'	(1) RRUS 4415 B30 (1) RRUS-E2	-	-	-
	3	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	20	109'	(1) RRUS 4449 B5/B12 (1) RRUS 8843 B2/B66A	-	-	-
	4		-	-					-	-	-	-	-	-
Sector 2	1	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	120	109'	(1) RRUS 4478 B14	1 2	FIBER DC	PROPOSED
	2	CCI HPA65R-BU8A	LTE	PROPOSED	96.00	11.70	7.60	12.60	120	109'	(1) RRUS 4415 B30 (1) RRUS-E2	-	-	-
	3	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	120	109'	(1) RRUS 4449 B5/B12 (1) RRUS 8843 B2/B66A	-	-	-
	4		-	-					-	-	-	-	-	-
Sector 3	1	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	230	109'	(1) RRUS 4478 B14	2	DC	PROPOSED
	2	CCI HPA65R-BU8A	LTE	PROPOSED	96.00	11.70	7.60	12.60	230	109'	(1) RRUS 4415 B30 (1) RRUS-E2	-	-	-
	3	KMW EPBQ-654L8H8-L2	LTE	PROPOSED	96.00	21.00	6.30	95.40	230	109'	(1) RRUS 4449 B5/B12 (1) RRUS 8843 B2/B66A	-	-	-
	4		-	-					-	-	-	-	-	-
GPS	1	-	-	-	-	-	-	-	-	-	-	1	1/2" COAX	REMAIN
	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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SCALE: AS SHOWN | JOB NUMBER: 18946101A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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STATE OF CONNECTICUT · PETROS TSOUKALAS · 32577 · PROFESSIONAL ENGINEER · LICENSED

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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:

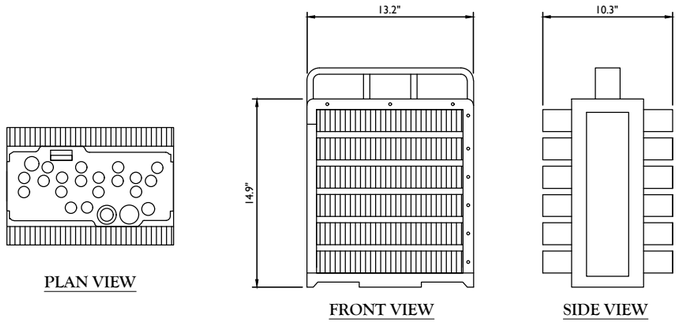
OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
ANTENNA LAYOUTS AND ANTENNA SCHEDULE

SHEET NUMBER:
Z-3

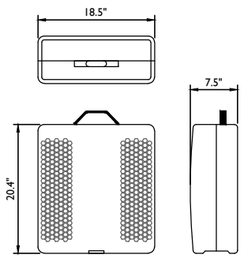


PLAN VIEW FRONT VIEW SIDE VIEW

WEIGHT = 72.0 LBS W/O MOUNTING HARDWARE
(INCLUDES SUNSHIELD AND DOUBLE FILTER CHASSIS)
WEIGHT: 72.0 LBS

ERICSSON DUAL BAND RRU-8843 B2+B66A DETAIL

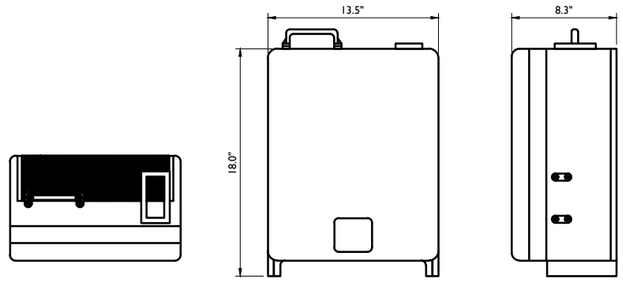
NOT TO SCALE



WEIGHT WITHOUT BRACKETS = 58 LBS

ERICSSON RRUS 12

NOT TO SCALE

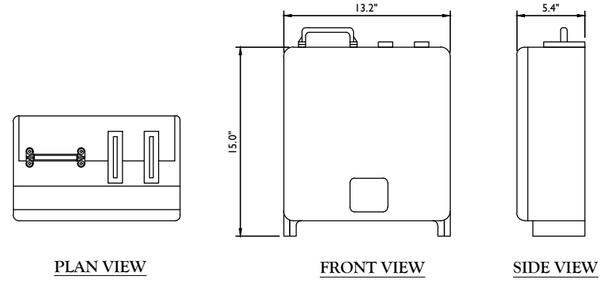


PLAN VIEW FRONT VIEW SIDE VIEW

WEIGHT INCLUDES SUNSHIELD = 59.9 LBS

ERICSSON RRUS 4478 B14

NOT TO SCALE

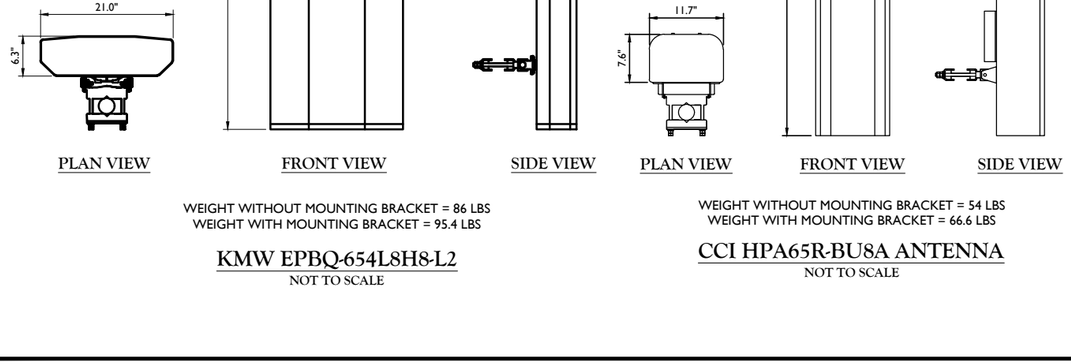


PLAN VIEW FRONT VIEW SIDE VIEW

WEIGHT INCLUDES SUNSHIELD = 44 LBS

ERICSSON RRUS 4415 B30

NOT TO SCALE



PLAN VIEW FRONT VIEW SIDE VIEW PLAN VIEW FRONT VIEW SIDE VIEW

WEIGHT WITHOUT MOUNTING BRACKET = 86 LBS
WEIGHT WITH MOUNTING BRACKET = 95.4 LBS

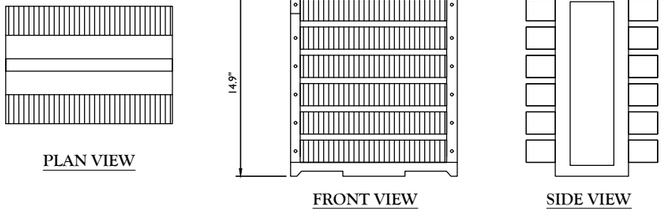
KMW EPBQ-654L8H8-L2

NOT TO SCALE

WEIGHT WITHOUT MOUNTING BRACKET = 54 LBS
WEIGHT WITH MOUNTING BRACKET = 66.6 LBS

CCI HPA65R-BU8A ANTENNA

NOT TO SCALE



PLAN VIEW FRONT VIEW SIDE VIEW

WEIGHT = 73 LBS W/O MOUNTING HARDWARE
DIMENSIONS (H X W X D): 14.9"H X 13.2"W X10.4"
(INCLUDES SUNSHIELD) WEIGHT: 73.0 LBS

ERICSSON DUAL BAND RRUS-4449 B5+B12 DETAIL

NOT TO SCALE

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SCALE : AS SHOWN
JOB NUMBER : 18946101A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	7/31/19	ISSUED FOR CONSTRUCTION	AJC	RA

STATE OF CONNECTICUT
PETROS C. TSOUKALAS
32577
PROFESSIONAL ENGINEER

PETROS C. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER / LICENSE NUMBER: 32577

SITE NAME:

OLD LYME - SHORE RD
FA# 10133919
SITE# CT1273S

232 SHORE ROAD
OLD LYME, CT 06371
NEW LONDON COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5669
Phone: .732.383.1950
Fax: .732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE : CONSTRUCTION DETAILS

SHEET NUMBER : A-1

ATTACHMENT 2

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Tower Analysis

FOR

NSB – Old Lyme Shore Road - CT1273

FA Number: 10133919
232 Shore Road
Old Lyme, CT 06371
New London County

Monopole Utilization: 57.8%

July 22, 2019

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

MC Project No. 18946101A

Objective:

The objective of this report is to determine the capacity of the existing monopole at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

Document Type	Remarks	Source
Structural Design Report	*Sabre Towers & Poles Job #: 41153 Dated April 28, 2011*	*Sabre Towers & Poles*
T-Mobile Loading	*Site #: CT0009*	*Smartlink, LLC*
Verizon Loading	*-*	*Smartlink, LLC*
Radio Frequency Data Sheet (RFDS)	*RFDS ID 2591275 Dated January 22, 2019*	*Smartlink, LLC*
Site Visit	*Dated October 24, 2018*	*Maser Consulting Connecticut*
Mount Assembly Drawing	*Sabre Industries Drawing #: C10857001A*	*Sabre Industries*

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, incorporating the 2012 IBC.
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 135 (3 Second Gust)
    - Exposure Category – C
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 3/4”

Maser Consulting Connecticut understands the final **AT&T** loading to the following:

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
6	KMW	EPBQ-654L8H8-L2	Proposed	Alpha, Beta, & Gamma
3	CCI	HPA65R-BU8A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4478 B14	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4415 B30	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4449 B5/B12	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 8843 B2 B66A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS E2 B29	Proposed	Alpha, Beta, & Gamma
3	RAYCAP	DC6-48-60-18-8F	Proposed	Alpha, Beta, & Gamma

See the Material Take-Off sheet in Appendix A for final appurtenance loading.

Monopole Member Information:

See the Material Take-Off sheet in Appendix A for monopole information.

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing monopole is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.

- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- 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 we supply.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing monopole was analyzed for the loading in the applicable codes and standards. The monopole has been determined to be structurally **ADEQUATE** to support the proposed and existing loading, based upon the aforementioned assumptions. The monopole and its baseplate have been determined to be stressed to a maximum of **57.8%** and **49.7%** of their structural capacity. The foundation has been determined to be stressed to **29.0%** of its structural capacity. Therefore, the proposed **AT&T** installation **CAN** be installed as intended in all sectors.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,

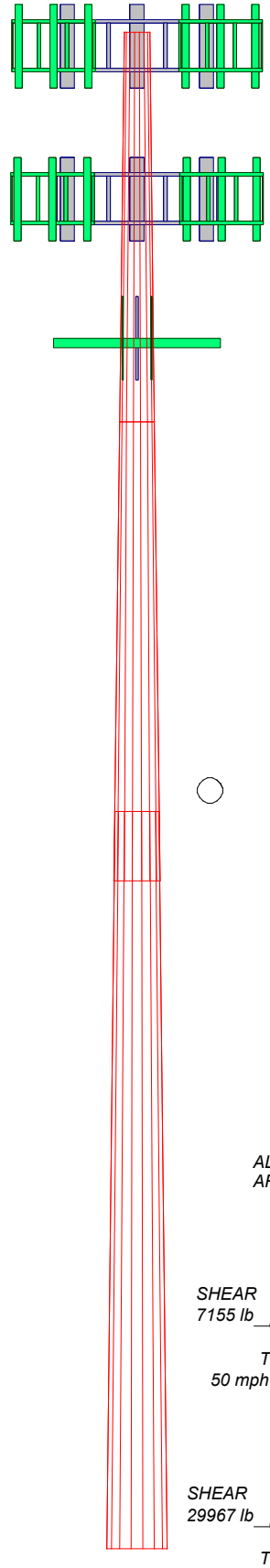
Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Carol Luengas
Engineer

APPENDIX A

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	28.00	18	0.1875		22.2500	30.0900		1473.3
2	33.00	18	0.3125	5.00	30.0900	39.3300	A572-65	3831.2
3	53.00	18	0.3750		37.3050	52.4000		9547.5
								14852.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
(3) 8' x 2" Mount Pipe (ATI)	109	(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98
(3) 8' x 2" Mount Pipe (ATI)	109		
(3) 8' x 2" Mount Pipe (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) DB-T1-6Z-8AB-0Z (Verizon)	88
DC6-48-06-18-8F (ATI)	109	Small Platform 10' (Verizon)	88
DC6-48-06-18-8F (ATI)	109	BXA-70063-6CF (Verizon)	88
DC6-48-06-18-8F (ATI)	109	BXA-70063-6CF (Verizon)	88
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98	BXA-70063-6CF (Verizon)	88
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98		

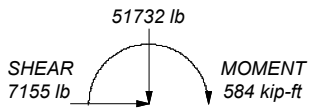
MATERIAL STRENGTH

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

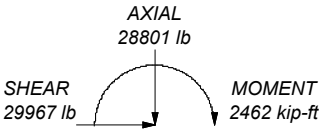
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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 0.00 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 57.8%

ALL REI
ARE FAC
A



TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 0 kip-ft
REACTIONS - 135 mph WIND

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2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
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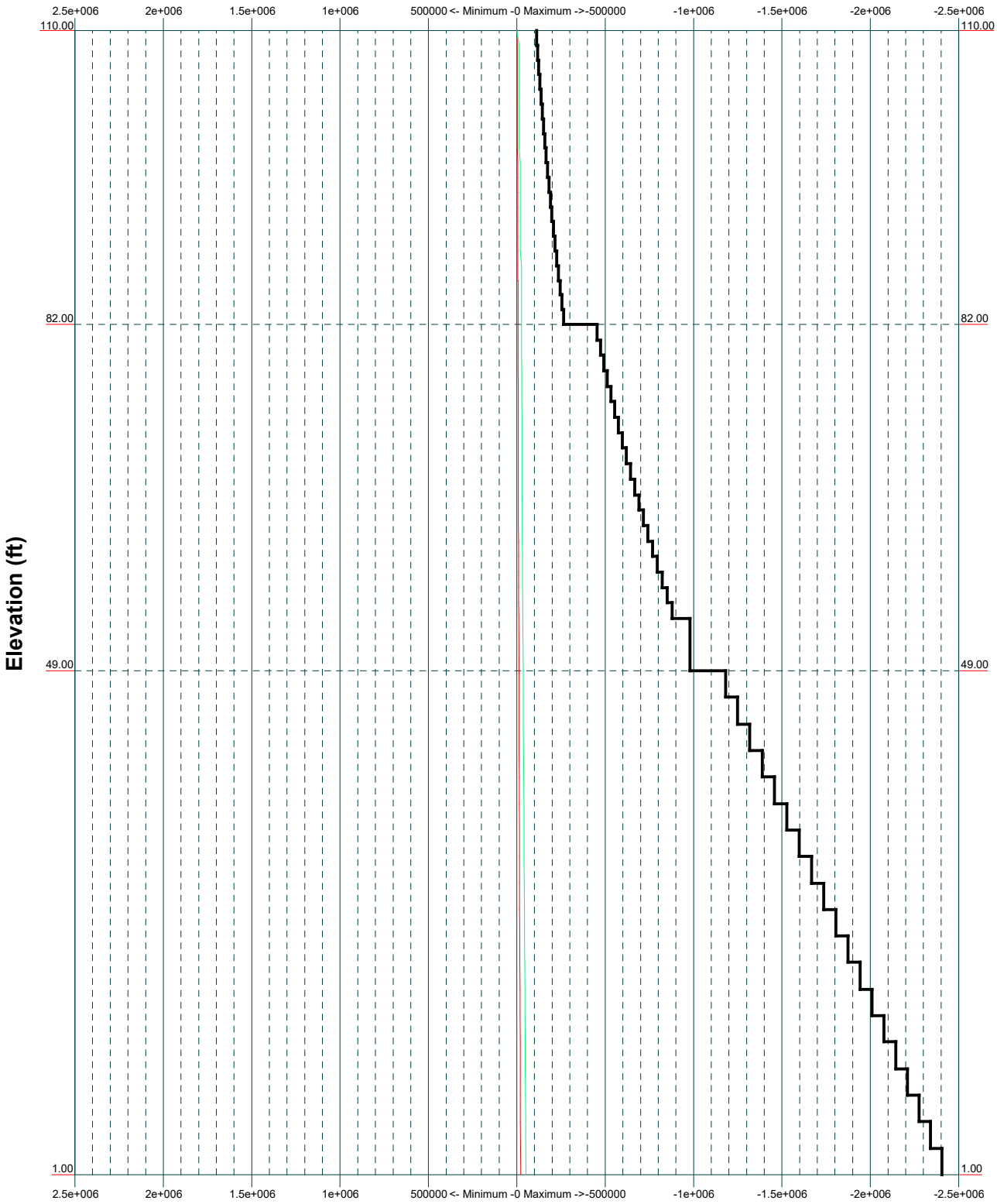
FAX:

Job: **18946101A**			
Project: **CTL01273**			
Client: AT&T	Drawn by: CLuengas	App'd:	
Code: TIA-222-G	Date: 06/05/19	Scale: NTS	
Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-1	

TIA-222-G - 135 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— **Leg Compression (lb)**



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	Project: ***CTL01273***		
	Client: AT&T	Drawn by: CLuengas	App'd:
	Code: TIA-222-G	Date: 06/05/19	Scale: NTS
	Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-3

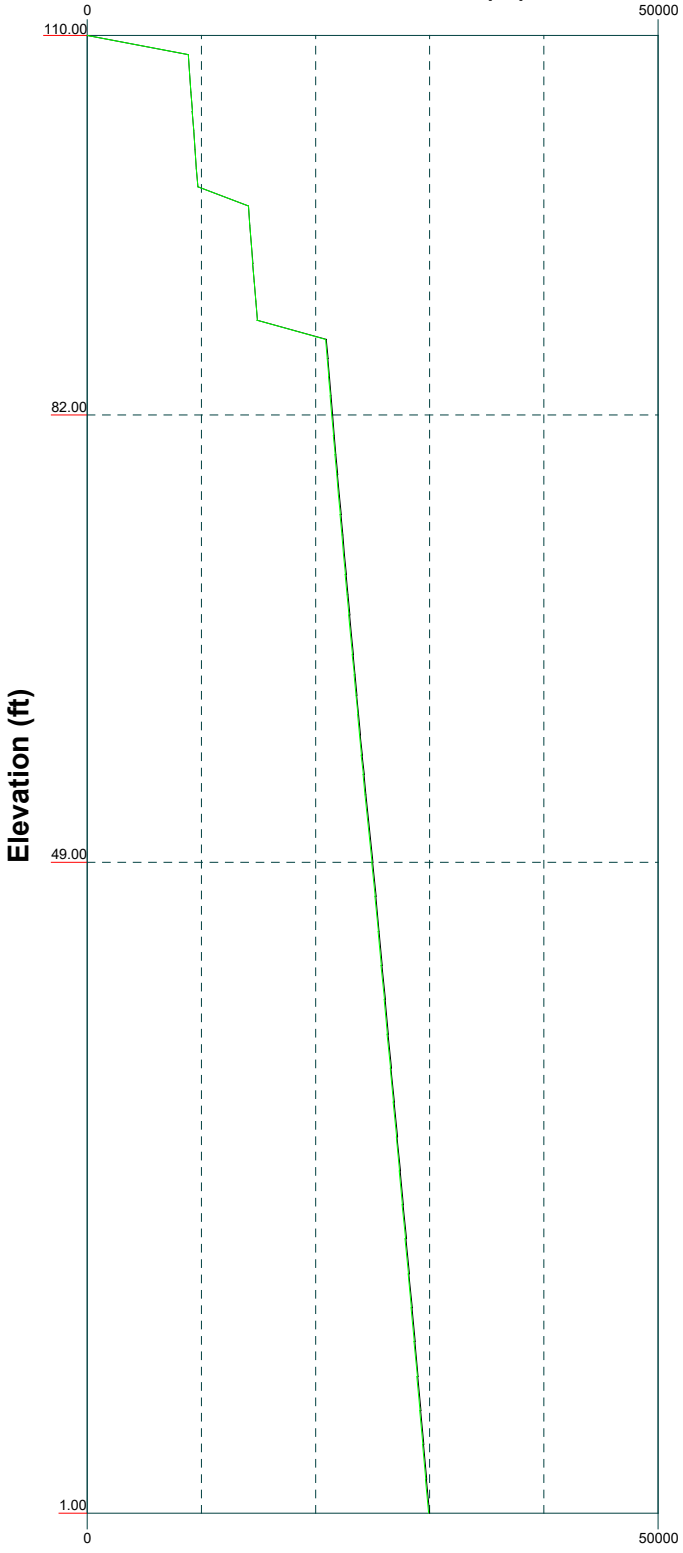
TIA-222-G - 135 mph/50 mph 0.7500 in Ice Exposure C

Vx Vz

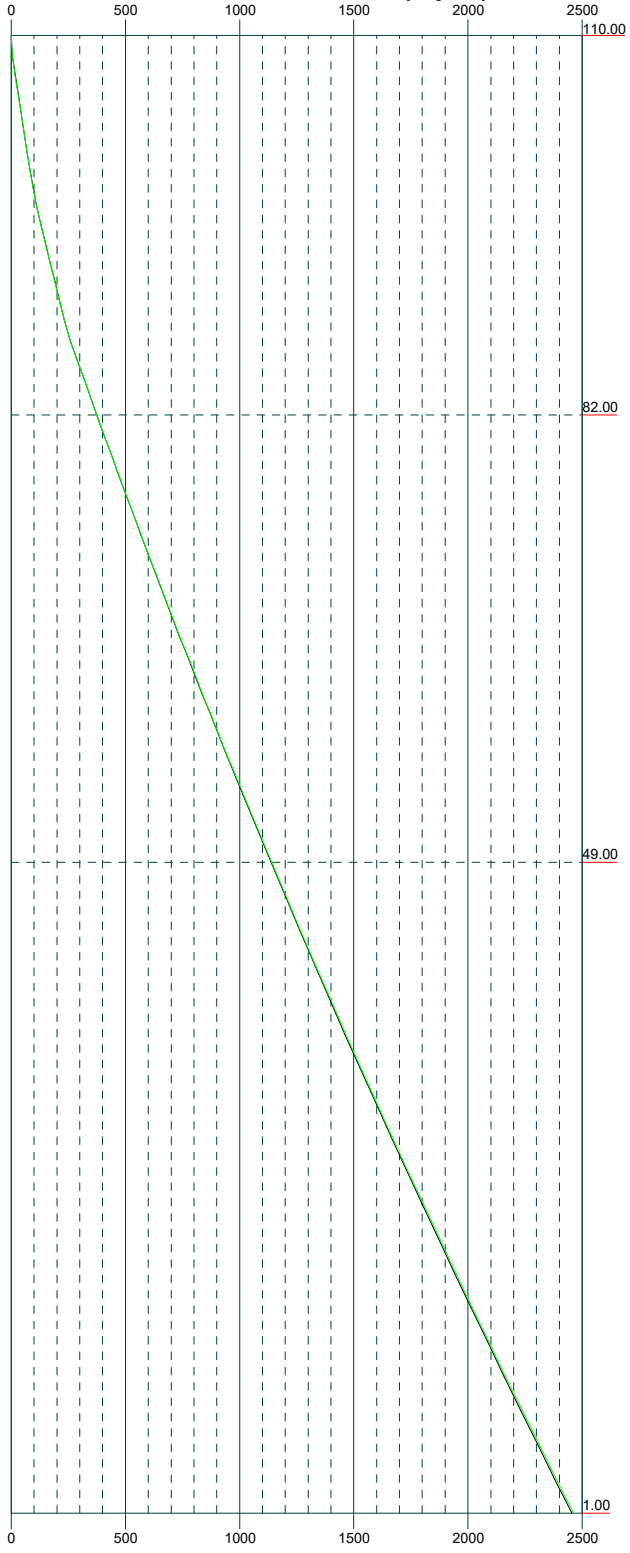
Maximum Values

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (kip-ft)



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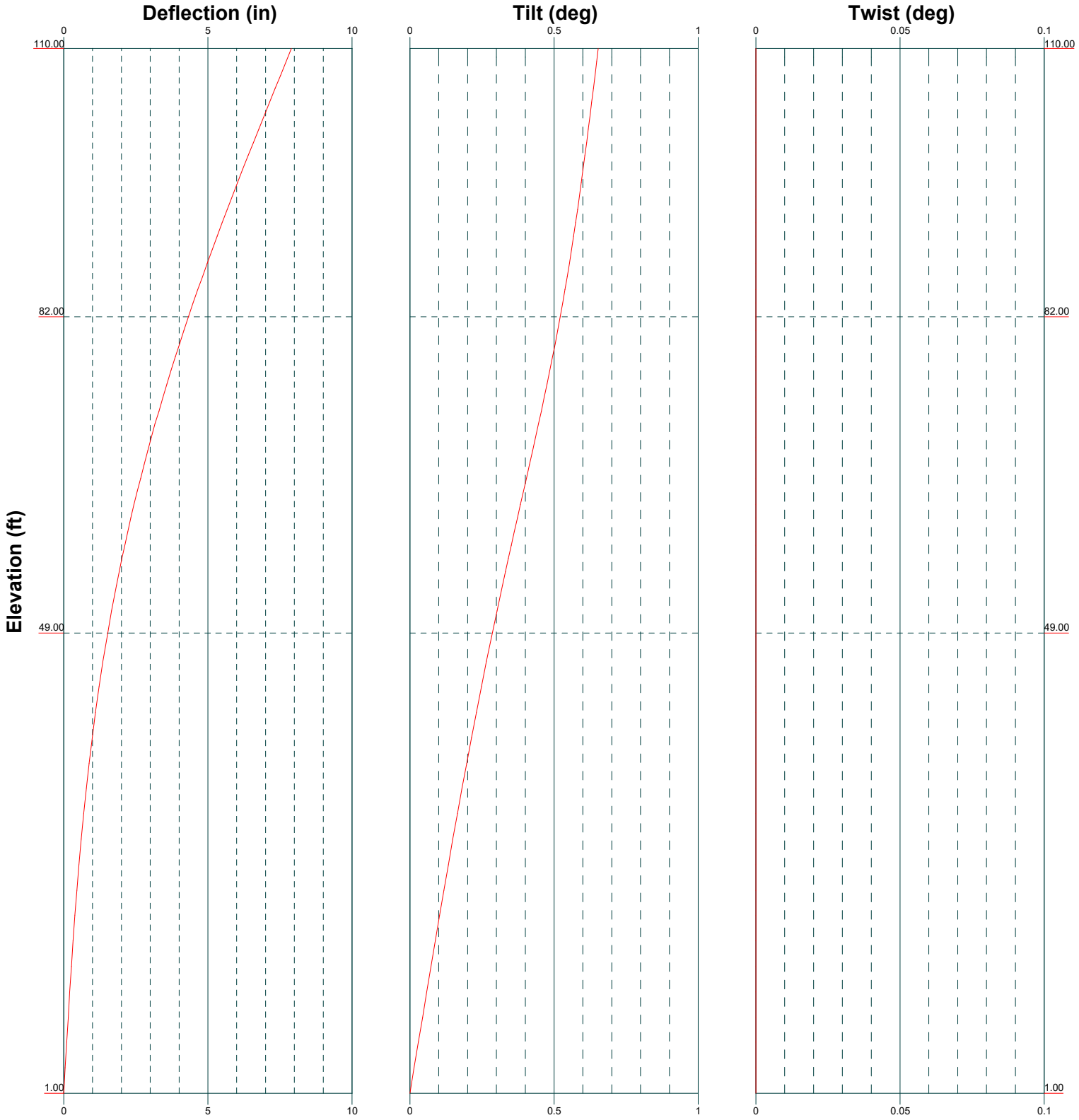
Job: ***18946101A***		
Project: ***CTL01273***		
Client: AT&T	Drawn by: CLuengas	App'd:
Code: TIA-222-G	Date: 06/05/19	Scale: NTS
Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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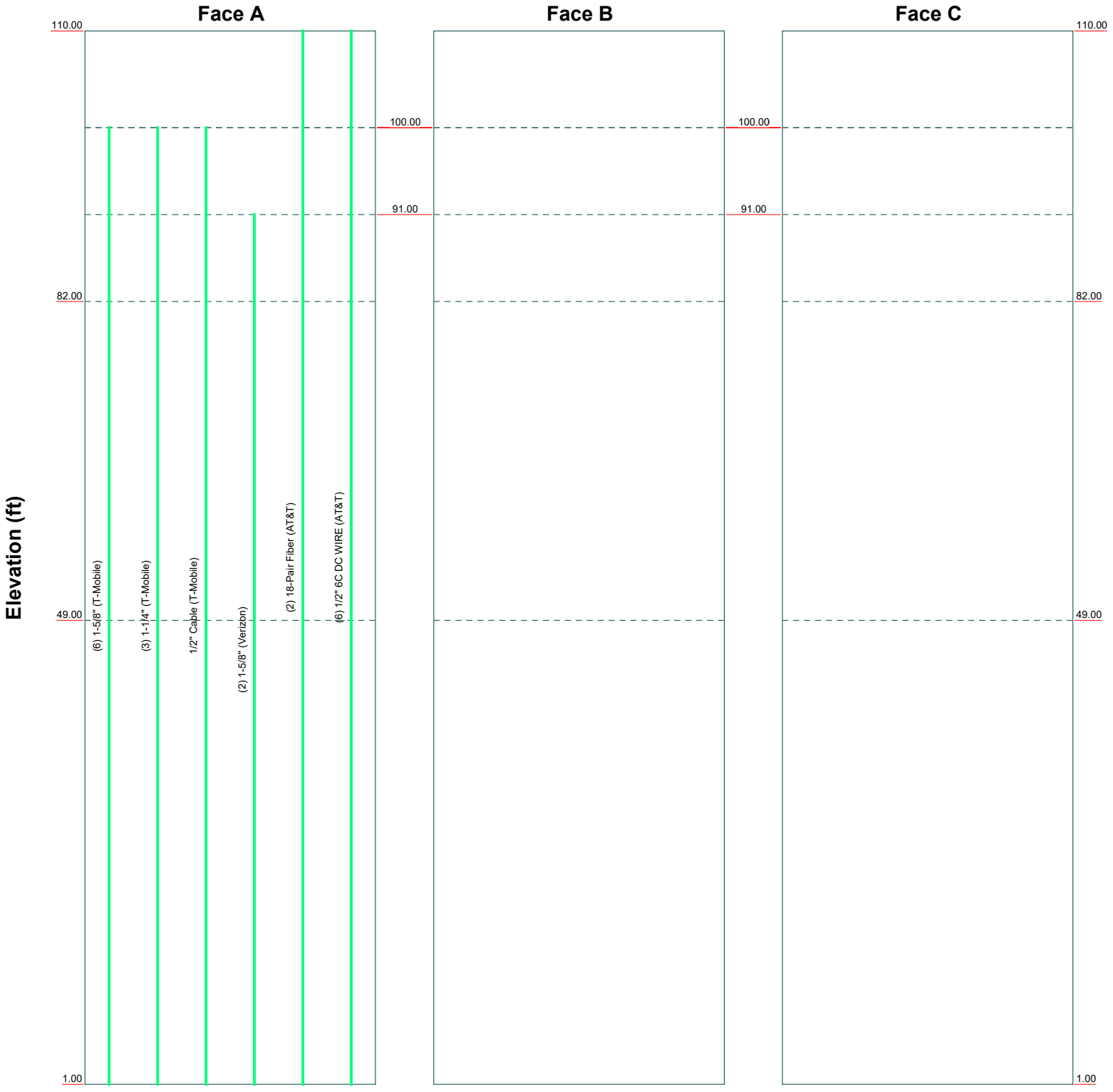
Project: ***CTL01273***		
Client: AT&T	Drawn by: CLuengas	App'd:
Code: TIA-222-G	Date: 06/05/19	Scale: NTS
Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-5

Feed Line Distribution Chart
1' - 110'

Round | Flat | App In Face | App Out Face | Truss Leg



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Project: ***CTL01273***		
Client: AT&T	Drawn by: CLuengas	App'd:
Code: TIA-222-G	Date: 06/05/19	Scale: NTS
Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-7

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
ASCE 7-10 Wind Data is used.
Basic wind speed of 135 mph.
Risk Category II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	110.00-82.00	28.00	0.00	18	22.2500	30.0900	0.1875	0.7500	A572-65 (65 ksi)
L2	82.00-49.00	33.00	5.00	18	30.0900	39.3300	0.3125	1.2500	A572-65 (65 ksi)
L3	49.00-1.00	53.00		18	37.3050	52.4000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.5643	13.1299	807.4392	7.8322	11.3030	71.4358	1615.9408	6.5662	3.5860	19.125
	30.5253	17.7957	2010.3336	10.6154	15.2857	131.5171	4023.3125	8.8996	4.9658	26.484
L2	30.5060	29.5356	3308.7130	10.5710	15.2857	216.4578	6621.7796	14.7706	4.7458	15.187
	39.8885	38.7005	7443.4232	13.8512	19.9796	372.5504	14896.6406	19.3539	6.3721	20.391
L3	39.2687	43.9559	7573.7953	13.1101	18.9509	399.6528	15157.5564	21.9821	5.9057	15.748
	53.1505	61.9228	21174.4387	18.4689	26.6192	795.4574	42376.7393	30.9673	8.5624	22.833

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 110.00-82.00				1	1	1			
L2 82.00-49.00				1	1	1			
L3 49.00-1.00				1	1	1			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	
Anchor bolt grade	A615
Anchor bolt size	2.2500 in
Number of bolts	24
Embedment length	45.0000 in
f'_c	5 ksi
Grout space	12.0000 in
Base plate grade	A572-50
Base plate thickness	2.7500 in
Bolt circle diameter	58.7500 in
Outer diameter	62.7500 in
Inner diameter	52.4000 in
Corner clipped	16.0000 in
Base plate type	Plain Plate

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 ft^2/ft	Weight plf
1-5/8" (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
1-1/4" (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	3	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1/2" Cable (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
1-5/8" (Verizon)	A	No	Yes	Inside Pole	91.00 - 1.00	2	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
18-Pair Fiber (AT&T)	A	No	Yes	Inside Pole	110.00 - 1.00	2	No Ice	0.00	3.00
							1/2" Ice	0.00	3.00
							1" Ice	0.00	3.00
1/2" 6C DC WIRE (AT&T)	A	No	Yes	Inside Pole	110.00 - 1.00	6	No Ice	0.00	1.00
							1/2" Ice	0.00	1.00
							1" Ice	0.00	1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	110.00-82.00	A	0.000	0.000	0.000	0.000	502.68
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	82.00-49.00	A	0.000	0.000	0.000	0.000	735.90
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	49.00-1.00	A	0.000	0.000	0.000	0.000	1070.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	110.00-82.00	A	1.668	0.000	0.000	0.000	0.000	502.68
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	82.00-49.00	A	1.605	0.000	0.000	0.000	0.000	735.90
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	49.00-1.00	A	1.458	0.000	0.000	0.000	0.000	1070.40
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
LNX-6515DS-VTM (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
LNX-6515DS-VTM (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
LNX-6515DS-VTM (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
RRUS-11 (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
RRUS-11 (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
RRUS-11 (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
12' T-Arm (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
12' T-Arm (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
12' T-Arm (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
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Small Platform 10' (Verizon)	A	None		0.0000	88.00	No Ice 1/2" Ice 1" Ice	15.00 22.50 33.75	15.00 22.50 33.75	400.00 450.00 500.00
BXA-70063-6CF (Verizon)	A	From Leg	0.00 0.00	0.0000	88.00	No Ice 1/2" Ice	7.62 8.07	4.62 5.06	36.00 80.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00					1" Ice	8.52	5.51	131.71
BXA-70063-6CF	B	From Leg	0.00			0.0000	88.00	No Ice	7.62	4.62	36.00
(Verizon)			0.00					1/2" Ice	8.07	5.06	80.90
			0.00					1" Ice	8.52	5.51	131.71
BXA-70063-6CF	C	From Leg	0.00			0.0000	88.00	No Ice	7.62	4.62	36.00
(Verizon)			0.00					1/2" Ice	8.07	5.06	80.90
			0.00					1" Ice	8.52	5.51	131.71
(2) SBNHH-1D45B	A	From Leg	0.00			0.0000	88.00	No Ice	11.40	5.28	64.40
(Verizon)			0.00					1/2" Ice	11.89	5.74	129.99
			0.00					1" Ice	12.38	6.20	202.07
(2) SBNHH-1D45B	B	From Leg	0.00			0.0000	88.00	No Ice	11.40	5.28	64.40
(Verizon)			0.00					1/2" Ice	11.89	5.74	129.99
			0.00					1" Ice	12.38	6.20	202.07
(2) SBNHH-1D45B	C	From Leg	0.00			0.0000	88.00	No Ice	11.40	5.28	64.40
(Verizon)			0.00					1/2" Ice	11.89	5.74	129.99
			0.00					1" Ice	12.38	6.20	202.07
(4) 6' x 2" Pipe Mount	A	From Leg	0.00			0.0000	88.00	No Ice	1.20	1.20	20.00
(Verizon)			0.00					1/2" Ice	1.80	1.80	29.39
			0.00					1" Ice	2.17	2.17	42.81
(4) 6' x 2" Pipe Mount	B	From Leg	0.00			0.0000	88.00	No Ice	1.20	1.20	20.00
(Verizon)			0.00					1/2" Ice	1.80	1.80	29.39
			0.00					1" Ice	2.17	2.17	42.81
(4) 6' x 2" Pipe Mount	C	From Leg	0.00			0.0000	88.00	No Ice	1.20	1.20	20.00
(Verizon)			0.00					1/2" Ice	1.80	1.80	29.39
			0.00					1" Ice	2.17	2.17	42.81
RRH2x40-07-U	A	From Leg	0.00			0.0000	88.00	No Ice	1.82	1.52	60.00
(Verizon)			0.00					1/2" Ice	1.99	1.69	77.37
			0.00					1" Ice	2.18	1.86	97.53
RRH2x40-07-U	B	From Leg	0.00			0.0000	88.00	No Ice	1.82	1.52	60.00
(Verizon)			0.00					1/2" Ice	1.99	1.69	77.37
			0.00					1" Ice	2.18	1.86	97.53
RRH2x40-07-U	C	From Leg	0.00			0.0000	88.00	No Ice	1.82	1.52	60.00
(Verizon)			0.00					1/2" Ice	1.99	1.69	77.37
			0.00					1" Ice	2.18	1.86	97.53
(2) RRH2X40-AWS	A	From Leg	0.00			0.0000	88.00	No Ice	2.16	1.42	50.00
(Verizon)			0.00					1/2" Ice	2.36	1.59	67.40
			0.00					1" Ice	2.57	1.77	87.69
(2) RRH2X40-AWS	B	From Leg	0.00			0.0000	88.00	No Ice	2.16	1.42	50.00
(Verizon)			0.00					1/2" Ice	2.36	1.59	67.40
			0.00					1" Ice	2.57	1.77	87.69
(2) RRH2X40-AWS	C	From Leg	0.00			0.0000	88.00	No Ice	2.16	1.42	50.00
(Verizon)			0.00					1/2" Ice	2.36	1.59	67.40
			0.00					1" Ice	2.57	1.77	87.69
(2) DB-T1-6Z-8AB-0Z	B	From Leg	0.00			0.0000	88.00	No Ice	3.80	2.51	32.00
(Verizon)			0.00					1/2" Ice	4.05	2.73	63.52
			0.00					1" Ice	4.31	2.95	98.80
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Sabre C10857001C	A	From Leg	0.00			0.0000	109.00	No Ice	9.12	5.23	462.00
(AT&T)			0.00					1/2" Ice	15.94	8.82	700.00
			0.00					1" Ice	22.76	12.41	938.00
Sabre C10857001C	B	From Leg	0.00			0.0000	109.00	No Ice	9.12	5.23	462.00
(AT&T)			0.00					1/2" Ice	15.94	8.82	700.00
			0.00					1" Ice	22.76	12.41	938.00
Sabre C10857001C	C	From Leg	0.00			0.0000	109.00	No Ice	9.12	5.23	462.00
(AT&T)			0.00					1/2" Ice	15.94	8.82	700.00
			0.00					1" Ice	22.76	12.41	938.00
(2) EPBQ-654L8H8-L2	A	From Leg	0.00			0.0000	109.00	No Ice	18.09	7.03	97.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
(2) EPBQ-654L8H8-L2	B	From Leg	0.00	0.0000	109.00	No Ice	18.09	7.03	97.00
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
(2) EPBQ-654L8H8-L2	C	From Leg	0.00	0.0000	109.00	No Ice	18.09	7.03	97.00
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
HPA65R-BU8A	A	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
HPA65R-BU8A	B	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
HPA65R-BU8A	C	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
RRU B14 4478	A	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	B	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	C	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRUS 4415	A	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS 4415	B	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS 4415	C	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS E2	A	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS E2	B	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS E2	C	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS 4449 B5/12	A	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 4449 B5/12	B	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 4449 B5/12	C	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 8843 B2 B66A	A	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
RRUS 8843 B2 B66A	B	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
RRUS 8843 B2 B66A	C	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
DC6-48-06-18-8F	A	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
DC6-48-06-18-8F	B	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
DC6-48-06-18-8F	C	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
8' x 2" Mount Pipe	B	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
8' x 2" Mount Pipe	C	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	95.30	1.253	56	61.938	A	0.000	61.938	61.938	100.00	0.000	0.000
110.00-82.00					B	0.000	61.938		100.00	0.000	0.000
					C	0.000	61.938		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	51	96.792	A	0.000	96.792	96.792	100.00	0.000	0.000
					B	0.000	96.792		100.00	0.000	0.000
					C	0.000	96.792		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	41	184.838	A	0.000	184.838	184.838	100.00	0.000	0.000
					B	0.000	184.838		100.00	0.000	0.000
					C	0.000	184.838		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 110.00-82.00	95.30	1.253	8	1.6678	69.721	A	0.000	69.721	69.721	100.00	0.000	0.000
						B	0.000	69.721		100.00	0.000	0.000
						C	0.000	69.721		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	7	1.6052	105.621	A	0.000	105.621	105.621	100.00	0.000	0.000
						B	0.000	105.621		100.00	0.000	0.000
						C	0.000	105.621		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	6	1.4584	197.680	A	0.000	197.680	197.680	100.00	0.000	0.000
						B	0.000	197.680		100.00	0.000	0.000
						C	0.000	197.680		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	95.30	1.253	10	61.938	A	0.000	61.938	61.938	100.00	0.000	0.000
110.00-82.00					B	0.000	61.938		100.00	0.000	0.000
					C	0.000	61.938		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	9	96.792	A	0.000	96.792	96.792	100.00	0.000	0.000
					B	0.000	96.792		100.00	0.000	0.000
					C	0.000	96.792		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	7	184.838	A	0.000	184.838	184.838	100.00	0.000	0.000
					B	0.000	184.838		100.00	0.000	0.000
					C	0.000	184.838		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70	11449.73		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									kip-ft			

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70 kip-ft	11449.73		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70 kip-ft	11449.73		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	14851.96					
Bracing Weight	0.00					
Total Member Self-Weight	14851.96			-0.22	-0.07	
Total Weight	24001.14			-0.22	-0.07	
Wind 0 deg - No Ice		-66.88	-29891.39	-2413.62	5.75	0.31
Wind 90 deg - No Ice		29968.62	66.88	5.60	-2420.19	-0.50
Wind 180 deg - No Ice		66.88	29891.39	2413.19	-5.88	-0.31
Member Ice	8042.28					
Total Weight Ice	46508.78			-0.63	-0.31	
Wind 0 deg - Ice		-10.06	-7143.67	-559.90	0.56	0.05
Wind 90 deg - Ice		7155.29	10.06	0.25	-560.59	-0.20
Wind 180 deg - Ice		10.06	7143.67	558.64	-1.19	-0.05
Total Weight	24001.14			-0.22	-0.07	
Wind 0 deg - Service		-11.82	-5282.95	-426.76	0.96	0.05
Wind 90 deg - Service		5296.60	11.82	0.81	-427.79	-0.09
Wind 180 deg - Service		11.82	5282.95	426.33	-1.09	-0.05

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 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	110 - 82	Pole	Max Tension	6	0.01	0.00	0.00
			Max. Compression	8	-26649.38	-0.33	0.68
			Max. Mx	4	-9473.17	-374.72	-0.17
			Max. My	2	-9479.83	0.35	374.42
			Max. Vy	4	21499.55	-374.72	-0.17
			Max. Vx	2	-21421.25	0.35	374.42
			Max. Torque	5			0.67
L2	82 - 49	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-33234.77	-0.33	0.68
			Max. Mx	4	-14362.42	-1016.71	-2.07
			Max. My	2	-14367.04	2.25	1014.21
			Max. Vy	4	24417.33	-1016.71	-2.07
			Max. Vx	2	-24338.90	2.25	1014.21
			Max. Torque	5			0.50
L3	49 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-51732.26	-0.33	0.67
			Max. Mx	4	-28779.22	-2461.76	-5.65
			Max. My	2	-28779.33	5.83	2455.13
			Max. Vy	4	29987.98	-2461.76	-5.65
			Max. Vx	2	-29910.69	5.83	2455.13
			Max. Torque	5			0.50

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	8	51732.26	0.01	-0.03
	Max. H_x	3	21600.98	66.88	29890.07
	Max. H_z	3	21600.98	66.88	29890.07
	Max. M_x	2	2455.13	66.88	29889.54
	Max. M_z	4	2461.76	-29966.76	-66.88
	Max. Torsion	5	0.49	-29967.29	-66.88
	Min. Vert	5	21600.98	-29967.29	-66.88
	Min. H_x	5	21600.98	-29967.29	-66.88
	Min. H_z	7	21600.98	-66.88	-29890.07
	Min. M_x	6	-2454.59	-66.88	-29889.54
	Min. M_z	2	-5.83	66.88	29889.54
	Min. Torsion	3	-0.31	66.88	29890.07

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	24001.14	0.00	-0.00	-0.22	-0.07	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	28801.31	-66.88	-29889.54	-2455.13	5.83	0.31
0.9 Dead+1.0 Wind 0 deg - No Ice	21600.98	-66.88	-29890.07	-2444.18	5.83	0.31

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 90 deg - No Ice	28801.31	29966.76	66.88	5.65	-2461.76	-0.49
0.9 Dead+1.0 Wind 90 deg - No Ice	21600.98	29967.29	66.88	5.69	-2450.84	-0.49
1.2 Dead+1.0 Wind 180 deg - No Ice	28801.31	66.88	29889.54	2454.59	-5.99	-0.31
0.9 Dead+1.0 Wind 180 deg - No Ice	21600.98	66.88	29890.07	2443.78	-5.95	-0.31
1.2 Dead+1.0 Ice+1.0 Temp	51732.26	-0.01	0.03	-0.67	-0.33	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	51732.26	-10.06	-7143.40	-583.13	0.56	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	51732.26	7155.02	10.06	0.17	-583.79	-0.19
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	51732.26	10.06	7143.40	581.65	-1.26	-0.05
Dead+Wind 0 deg - Service	24001.13	-11.82	-5281.90	-432.98	0.98	0.05
Dead+Wind 90 deg - Service	24001.13	5295.54	11.82	0.82	-434.03	-0.09
Dead+Wind 180 deg - Service	24001.13	11.82	5281.90	432.54	-1.11	-0.05

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-24001.14	0.00	-0.00	24001.14	0.00	0.000%
2	-66.88	-28801.37	-29891.39	66.88	28801.31	29889.54	0.004%
3	-66.88	-21601.03	-29891.39	66.88	21600.98	29890.07	0.004%
4	29968.62	-28801.37	66.88	-29966.76	28801.31	-66.88	0.004%
5	29968.62	-21601.03	66.88	-29967.29	21600.98	-66.88	0.004%
6	66.88	-28801.37	29891.39	-66.88	28801.31	-29889.54	0.004%
7	66.88	-21601.03	29891.39	-66.88	21600.98	-29890.07	0.004%
8	0.00	-51732.26	0.00	0.01	51732.26	-0.03	0.000%
9	-10.06	-51732.26	-7143.67	10.06	51732.26	7143.40	0.001%
10	7155.29	-51732.26	10.06	-7155.02	51732.26	-10.06	0.001%
11	10.06	-51732.26	7143.67	-10.06	51732.26	-7143.40	0.001%
12	-11.82	-24001.14	-5282.95	11.82	24001.13	5281.90	0.004%
13	5296.60	-24001.14	11.82	-5295.54	24001.13	-11.82	0.004%
14	11.82	-24001.14	5282.95	-11.82	24001.13	-5281.90	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00000001	0.00013745
3	Yes	10	0.00000001	0.00011162
4	Yes	10	0.00000001	0.00014769
5	Yes	10	0.00000001	0.00011942
6	Yes	10	0.00000001	0.00014257
7	Yes	10	0.00000001	0.00011551
8	Yes	6	0.00000001	0.00000001
9	Yes	11	0.00000001	0.00012436
10	Yes	11	0.00000001	0.00012440

11	Yes	11	0.00000001	0.00012355
12	Yes	9	0.00000001	0.00013453
13	Yes	9	0.00000001	0.00013493
14	Yes	9	0.00000001	0.00013421

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 82	7.895	13	0.6550	0.0003
L2	82 - 49	4.324	13	0.5194	0.0002
L3	54 - 1	1.827	13	0.3234	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
109.00	Sabre C10857001C	13	7.760	0.6507	0.0012	41339
98.00	(2) AIR 21 B2A/B4P With mount Pipe	13	6.290	0.6026	0.0008	17224
88.00	Small Platform 10'	13	5.025	0.5535	0.0005	9395

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 82	44.778	4	3.7142	0.0014
L2	82 - 49	24.527	4	2.9473	0.0011
L3	54 - 1	10.364	4	1.8348	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
109.00	Sabre C10857001C	4	44.012	3.6902	0.0064	7368
98.00	(2) AIR 21 B2A/B4P With mount Pipe	4	35.680	3.4194	0.0042	3069
88.00	Small Platform 10'	4	28.506	3.1407	0.0025	1673

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
2.7500	24	2.2500	82053.30 201288.96 0.50	84451.57 334139.67 0.34	20.676 45.000 0.46		Bolt T	0.50 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 82 (1)	TP30.09x22.25x0.1875	28.00	109.00	123.2	17.7957	-9473.17	264796.00	0.036
L2	82 - 49 (2)	TP39.33x30.09x0.3125	33.00	109.00	97.9	37.3119	-14362.40	878634.00	0.016
L3	49 - 1 (3)	TP52.4x37.305x0.375	53.00	109.00	70.8	61.9228	-28779.20	2404660.00	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	110 - 82 (1)	TP30.09x22.25x0.1875	374.72	692.93	0.541	0.00	692.93	0.000
L2	82 - 49 (2)	TP39.33x30.09x0.3125	1016.72	2034.18	0.500	0.00	2034.18	0.000
L3	49 - 1 (3)	TP52.4x37.305x0.375	2461.78	4447.30	0.554	0.00	4447.30	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	110 - 82 (1)	TP30.09x22.25x0.1875	21499.70	562570.00	0.038	0.50	1388.88	0.000
L2	82 - 49 (2)	TP39.33x30.09x0.3125	24417.40	1315440.00	0.019	0.49	4078.44	0.000
L3	49 - 1 (3)	TP52.4x37.305x0.375	29988.10	2077210.00	0.014	0.49	8915.17	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 82 (1)	0.036	0.541	0.000	0.038	0.000	0.578 ✔	1.000	4.8.2 ✔
L2	82 - 49 (2)	0.016	0.500	0.000	0.019	0.000	0.517 ✔	1.000	4.8.2 ✔
L3	49 - 1 (3)	0.012	0.554	0.000	0.014	0.000	0.566 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	110 - 82	Pole	TP30.09x22.25x0.1875	1	-9473.17	264796.00	57.8	Pass
L2	82 - 49	Pole	TP39.33x30.09x0.3125	2	-14362.40	878634.00	51.7	Pass
L3	49 - 1	Pole	TP52.4x37.305x0.375	3	-28779.20	2404660.00	56.6	Pass
							Summary	
						Pole (L1)	57.8	Pass
						Base Plate	49.7	Pass
						RATING =	**57.8**	**Pass**

Site Information:

Location: **Old Lyme, CT**

Tower Reactions (Factored from tnx Tower):

Compression: $P_c := 28.8kip$

Shear: $V_F := 30.0kip$

Moment: $M_F := 2462kip \cdot ft$

Material Parameters:

Unit Weight of Concrete: $\gamma_{conc} := 150pcf$

Concrete Compressive Strength: $f_c := 5ksi$

Steel Yield Strength: $f_y := 60ksi$

Strength Reduction Factor:

$\Phi_{s\_bearing} := 0.75$ as per 9.4.1 from TIA-222-G code for bearing

$\Phi_{s\_friction} := 0.75$ as per 9.4.1 from TIA-222-G code for skin friction resistance

$\Phi_{s\_lateral} := 0.75$ as per 9.4.1 from TIA-222-G code for lateral resistance

Soil Parameters:

Ultimate Net Bearing Capacity: $q_{net} := 8000psf \cdot 2 = 16000 \cdot psf$ (assumed for Statrum I fill soil)

Foundation Parameters:

Length of Spread Footing Pad: $L_{pad} := 19ft$

Width of Spread Footing Pad: $W_{pad} := 19ft$

Thickness of Spread Footing Pad: $T_{pad} := 3.5ft$

Above Grade Level: $E_g := 0ft$

Proof load of rock anchors: $P_L := 389kip$

Reinforcement Parameters:

Typical concrete cover $cc := 3\,in$

Vertical rebar size $d_{bar} := 11$

Tie bar size $d_{tie} := 5$

Spread Footing Foundation Resist Moment Calculation:

1) Resistance Moment - Concrete Weight:

$Wt_{conc} := L_{pad} \cdot W_{pad} \cdot T_{pad} \cdot \gamma_{conc} = 189.5 \cdot kip$

$Arm_{conc} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_c := Wt_{conc} \cdot Arm_{conc} = 1800.5 \cdot kip \cdot ft$

2) Resistance Moment - Tower Vertical load

$F_{tower} := P_c = 28.8 \cdot kip$

$Arm_{vert} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_{vert} := F_{tower} \cdot Arm_{vert} = 273.6 \cdot kip \cdot ft$

3) Resistance Moment - Rock Anchor

$F_{ranchor} := 2P_L = 778 \cdot kip$

$Arm_{ranchor} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_{ranchor} := F_{ranchor} \cdot Arm_{ranchor} = 7391 \cdot kip \cdot ft$

Total Resistance Moment:

$Mr_{total} := 0.9ROTM_c + \frac{0.9}{1.2} \cdot ROTM_{vert} + 0.9ROTM_{ranchor} = 8477.5 \cdot kip \cdot ft$

Spread Footing Foundation Overturning Moment Calculation:

$OTM := M_F + V_F \cdot E_g = 2462 \cdot kip \cdot ft$

Spread Footing Foundation Overturning Moment Check:

Overturning Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } Mr_{total} \geq OTM \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{OTM}{Mr_{total}}$$

Usage = 29·%

Spread Footing Foundation Bearing Check: (0.9D + 1.6W + 1.6H)

Vertical Force:

$F_1 := 0.9Wt_{conc} + F_{tower} = 199.4 \cdot kip$

$$e := \frac{L_{pad}}{2} - \frac{OTM}{F_1} = -2.8\,ft \qquad L_{loc} := \frac{L_{pad}}{6} = 3.2\,ft$$

$$P_{max1} := if\left[e \leq L_{loc}, \frac{F_1}{L_{pad} \cdot W_{pad}} \cdot \left[1 + \left(6 \cdot \frac{e}{L_{pad}}\right)\right], 4 \cdot \frac{F_1}{3 \cdot W_{pad} \cdot (L_{pad} - 2 \cdot e)}\right] = 55.4 \cdot psf$$

$$P_{min1} := if\left[e \leq L_{loc}, \frac{F_1}{L_{pad} \cdot W_{pad}} \cdot \left[1 - \left(6 \cdot \frac{e}{L_{pad}}\right)\right], 0\right] = 1049.1 \cdot psf$$

Bearing Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi_{s\_bearing} \cdot q_{net} \geq P_{max1} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{P_{max1}}{\phi_{s\_bearing} \cdot q_{net}}$$

Usage = 0.5·%

Spread Footing Foundation Reinforcement Design:

Reduction factors as per respective ACI sections

$\phi_{shear} := 0.75$ as per ACI 9.3.2.3

$\phi_{compr} := 0.65$ as per ACI 9.3.2.2, for compression-controlled section (other reinforced members)

$\phi_{axten} := 0.9$ as per ACI 9.3.2.1 for tension-controlled section

Pad Rebars Check in Spread Footing:

Bending Moment on Spread Footing Foundation:

Effective Depth of Mat: $d_{mat} := T_{pad} - cc = 3.3\,ft$

$M_{matapp} := M_F = 2462 \cdot kip \cdot ft$

Rebar Check:

Rebar Size: #11

Rebar Area: $A_{bmat} := 1.56in^2$

Rebar Diameter: $d_{bmat} := 1.41in$

Number of Rebar Required: $n_{rebar} := 34$

$Area_{stlmin} := 0.0018 \cdot W_{pad} \cdot T_{pad}$

$Area_{stlmin} = 17.2 \cdot in^2$

Minimum Rebar Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } n_{rebar} \cdot A_{bmat} \geq Area_{stlmin} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Moment Capacity:

$$a_{mat} := \frac{\left(n_{rebar} \cdot A_{bmat}\right) \cdot f_y}{0.85 \cdot f_c \cdot W_{pad}} = 3.3 \cdot in$$

$$M_{matcap} := \phi_{axten} \cdot \left(n_{rebar} \cdot A_{bmat}\right) \cdot f_y \cdot \left(d_{mat} - \frac{a_{mat}}{2}\right) = 8916.6 \cdot kip \cdot ft$$

Bending Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } M_{matcap} \geq M_{matapp} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{M_{matapp}}{M_{matcap}}$$

Usage = 27.6·%

ATTACHMENT 3

Engineers Planners Surveyors Landscape Architects Environmental Scientists

MASER CONSULTING
— CONNECTICUT —

Antenna Mount Analysis

FOR

CT1273_Old Lyme – Shore Road

FA #: 10133919
LTE 1C -MRCTB033436
232 Shore Road
Old Lyme, CT 06371
New London County
Lat/Long: 41.2917167/-72.2869944

Mount Utilization: 71.2%

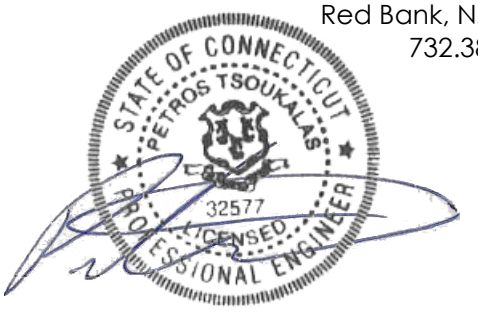
June 28, 2019

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
732.383.1950



Petros E. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

Objective:

The objective of this report is to determine the capacity of the proposed antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

Document Type	Remarks	Source
12' HD V-Boom w/ Tieback	*Sabre Industries P/N C1085701C-MC*	*Sabre Industries*
Ring Mount	*Sabre Industries P/N C10899050*	*Sabre Industries*
Standoff Arm	*Sabre Industries P/N C10114001*	*Sabre Industries*
RFDS	*RFDS ID: 2558017* *Dated September 11, 2018*	*Smartlink, LLC*

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, Incorporating the 2015 International Building Code
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 135 mph (3-Second Gust)
    - Nominal Wind Speed – 105 mph (3-Second Gust)
    - Exposure Category – C
    - Structure Class – II
    - Topographic Factor, K_{zt} – 1.0
    - Ice Wind Speed – 50 mph (3-Second Gust)
    - Design Ice Thickness – ¾"
    - Maintenance Wind Speed – 30 mph
        - Maintenance Live Load – 250 lbs. at the worst-case location on the mount
        - Maintenance Live Load – 250 lbs. at the worst-case antenna location

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

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
6	**KMW**	**EPBQ-654L8H8-L2**	**Proposed**	**Alpha, Beta, & Gamma**
3	**CCI**	**HPA65R-BU8A**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRUS 4478 B14**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRUS 4415 B30**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRUS 4449 B5/B12**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRUS 8843 B2 B66A**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRUS E2 B29**	**Proposed**	**Alpha, Beta, & Gamma**
3	**RAYCAP**	**DC6-48-60-18-8F**	**Proposed**	**Alpha, Beta, & Gamma**

Analysis Approach:

The antenna mount for all sectors has been modeled in RISA-3D (V17), a comprehensive structural analysis program. The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes and standards. The program performs an analysis based on the applicable steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

The scope of this assessment does not include analysis of the supporting tower 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 engineer.

Assumptions:

General Site Design Assumptions:

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.
2. The mounting frames were properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.
3. The connection from the tower to the mount is in good condition and has been analyzed and found sufficient assuming it will achieve its theoretical strength.
4. It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
5. 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.
6. The existing equipment loading has been applied at locations determined from the supplied documentation and field observations. Should the existing equipment configuration differ from what is utilized in this analysis, the results of this analysis are invalid.
7. 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.

Site Specific Assumptions and Design Parameters:

1. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
    - Solid Round — ASTM A572 (Gr. 50)
    - HSS (Rectangular) — ASTM A572 (Gr. 50)
    - Antenna/Mast Pipe — ASTM A53 (Gr. B-35)
    - Threaded Rod — ASTM A307
    - Bolts — ASTM A325
2. All proposed equipment locations are to be as depicted in the rendered diagram in Appendix A of this report. Any changes made to the proposed equipment locations will render this report invalid.
3. All antenna pipes are to be 9' long 2.0 STD pipes.

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

Calculations:

Selected calculations and analysis output can be found in Appendix A of this report.

Analysis Results and Conclusion:

Component	Utilization %	Pass/Fail
Face Horizontal	*61.9*	*Pass*
Mount Pipe	*60.9*	*Pass*
Mast Pipe	*70.3*	*Pass*
Tie Back	*29.9*	*Pass*
Standoff Horizontal	*47.1*	*Pass*
Standoff Diagonal	*23.4*	*Pass*
Standoff Vertical	*4.8*	*Pass*
Mount standoff	*27.7*	*Pass*
Mount to Mast Pipe Connection	*71.2*	*Pass*
Mount to Tower Connection	*18.8*	*Pass*

Structure Rating – *(Controlling Utilization of all Components)*	**71.2%**

Recommendation:

The proposed mounting frames are **sufficient** for the final loading configuration and do not require modifications.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the structural members supporting the **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure. The mount was checked up to, and not including, the bolts that fasten it to the mount collar. However, no structural qualifications are made or implied by this document for the mount collar.

Maser Consulting Connecticut reserves the right to amend this report if additional information regarding the members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Vincent DiGirolamo
Engineer

Disclaimer of Warranties:

The engineering services rendered by Maser Consulting Connecticut in connection with this structural analysis are limited to a computer analysis of the mounting frame structure and theoretical capacity of its main structural members. No allowance has been made for any damaged, bent, missing, loose, or rusted members or connections.

Maser Consulting Connecticut will accept no liability which may arise due to any deficiency in design, material, fabrication, erection, construction, or lack of maintenance. Maser Consulting Connecticut has not performed a site visit of the mounting frame to verify member sizes or equipment loading. Contractor should inspect the condition of the existing structure, mounting frames and connections and notify Maser Consulting Connecticut of any discrepancies or deficiencies before proceeding with installation.

The attached sketch is a schematic representation of the analyzed mounting frames. The contractor shall be responsible for field verifying the existing conditions, proper fit, and clearances in the field. Any mention of structural modifications are reasonable estimates and should not be used as a construction document. Construction documents depicting the required modification are obtainable from Maser Consulting Connecticut but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable manufacturer.

Maser Consulting Connecticut makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of the mounting frames. Maser Consulting Connecticut will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report.

APPENDIX A

Client:	ATT	Computed By:	VD
Site Name:	CTL01273	Date:	3/14/2019
Project No.	18946101A	Verified By:	PET
Title:	Antenna Mount Analysis	Page:	1

Version 4.0

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
6	KMW	EPBQ-654L8H8-L2	Proposed	Alpha, Beta, & Gamma
3	CCI	HPA65R-BU8A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4478 B14	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4415 B30	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4449 B5/B12	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 8843 B2 B66A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS E2 B29	Proposed	Alpha, Beta, & Gamma
3	RAYCAP	DC6-48-60-18-8F	Proposed	Alpha, Beta, & Gamma

Client:	ATT	Computed By:	VD
Site Name:	CTL01273	Date:	3/14/2019
Project No.	18946101A	Verified By:	PET
Title:	Antenna Mount Analysis	Page:	2

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	109	ft		
Ultimate Wind Speed	V_U	135	mph		
Nominal Wind Speed (3 sec. Gust):	V	105	mph	Ref. 1, Eqn. 16-33	
Nominal Wind Speed with Ice (3 sec. gust):	V_i	50.0	mph	(Figure a5-2a, p. 233)	
Maintenance Wind Speed:	V_m	30.0	mph		
Service Wind Speed:	V_s	60.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	0.75	in	(Figure A1-2a, p. 233)	
Exposure Category:		C		Ref. 3, Section 2.6.5.1	
Structure Class:		II		Ref. 3, Table 2-1	
Gust Effect Factor:	G_h	1.00		Ref. 3, Section 2.6.7	
Wind Directionality Factor:	K_d	0.95		Ref. 3, Table 2-2	
Topographic Category:		1		Ref. 3, Section 2.6.6.2	
Wind Load Coefficients					
Importance Factors:					
Non-Iced:	I	1		Ref. 3, Table 2-3	
Iced:	I_{ice}	1		(Table 2-3, P. 39)	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	9.5		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	900	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.85		Ref. 3, Table 2-4	
Terrain Constant:	K_e	1.00		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.289		Ref. 3, Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Ref. 3, Table 2-5	
Height Attenuation Factor:	f	N/A		Ref. 3, Table 2-5	
Height Reduction Factor:	K_h	N/A		Ref. 3, Section 2.6.6.4	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Ref.3, Section 2.6.6.4	$=[1+(K_e\cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.13			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	1.69	in	(Section 2.6.8, p. 16)	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	34.27	psf	Ref. 3, Section 2.6.9.6	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	7.84	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$
Velocity Pressure (Maintenance):	q_{zm}	2.82	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_m^2\cdot I$
Velocity Pressure (Service):	q_{zs}	11.28	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$

II. CALCULATIONS

- ***Wind Load on Appurtenances***

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition								Iced Condition							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$
EPBQ-654L8H8-L2	108.0	2.375	1.200	96.00	21.00	6.30	1.29	1.67	111.4	5.8	1.074	99.38	24.38	9.68	1.27	1.51
HPA65R-BU8A	108.0	2.375	1.200	96.00	11.70	7.60	1.44	1.59	111.4	5.8	1.074	99.38	15.08	10.98	1.38	1.47
RRUS 4478 B14	0.0	0.000	0.000	18.10	13.40	8.30	1.20	1.20	0.0	0.0	0.000	21.48	16.78	11.68	1.20	1.20
RRUS 4415 B30	0.0	0.000	0.000	16.50	3.50	6.30	1.30	1.21	0.0	0.0	0.000	19.88	6.88	9.68	1.22	1.20
RRUS 4449 B5/B12	0.0	0.000	0.000	15.00	13.20	10.40	1.20	1.20	0.0	0.0	0.000	18.38	16.58	13.78	1.20	1.20
RRUS 8843 B2 B66A	0.0	0.000	0.000	14.90	13.20	10.90	1.20	1.20	0.0	0.0	0.000	18.28	16.58	14.28	1.20	1.20
RRUS E2 B29	0.0	0.000	0.000	20.40	18.50	7.50	1.20	1.21	0.0	0.0	0.000	23.78	21.88	10.88	1.20	1.20
DC6-48-60-18-8F	0.0	0.000	0.000	31.40	10.20	10.20	0.71	0.71	0.0	0.0	0.000	34.78	13.58	13.58	0.70	0.70

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition			Maintenance Condition	
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)	
		F_N	F_T		F_N	F_T		F_N	F_T
EPBQ-654L8H8-L2	2	314.0	157.1	**47.7**	86.0	58.2	**201.9**	25.8	12.9
HPA65R-BU8A	2	196.6	174.5	**35.8**	58.6	62.3	**133.8**	16.2	14.4
RRUS 4478 B14	1	69.3	42.9	**59.4**	23.5	16.4	**64.5**	5.7	3.5
RRUS 4415 B30	1	17.8	29.8	**47.4**	9.1	12.6	**30.4**	1.5	2.5
RRUS 4449 B5/B12	1	56.6	44.6	**73.0**	19.9	16.5	**58.5**	4.7	3.7
RRUS 8843 B2 B66A	1	56.2	46.4	**77.0**	19.8	17.0	**59.2**	4.6	3.8
RRUS E2 B29	1	107.8	44.1	**60.0**	34.0	16.9	**88.6**	8.9	3.6
DC6-48-60-18-8F	1	54.3	54.3	**26.2**	18.0	18.0	**71.2**	4.5	4.5

**** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS***

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition						Maintenance Condition
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	Wind Load (plf)
Pipe	Pipe 2.0	156	Round	2.38	1.20	8.14	5.76	5.76	159.38	1.20	4.51	8.40	0.67
Solid Round Bar	0.75	54	Round	0.75	1.20	2.57	4.13	4.13	57.38	0.95	2.57	5.04	0.21
Square HSS	HSS 4X4	12	Square	4.00	1.22	13.96	7.38	7.38	15.38	1.20	5.78	15.17	1.15
Pipe	Pipe 4.0	84	Round	4.50	1.06	13.61	7.88	7.88	87.38	0.89	4.58	12.78	1.12

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class} = \text{"II"} \\ 1.15 & \text{if Class} = \text{"III"} \end{cases}$$

Table 2-3, Pg. 39

Force Coefficient:
(Square)

$$C_{f\_square}(h, w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Force Coefficient:
(Round)

$$C_{f\_round}(h, w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp} = \text{"B"} \\ 900\text{ft} & \text{if Exp} = \text{"C"} \\ 700\text{ft} & \text{if Exp} = \text{"D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if Exp} = \text{"B"} \\ 0.85 & \text{if Exp} = \text{"C"} \\ 1.03 & \text{if Exp} = \text{"D"} \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

$K_z := Kz(z)$ Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \text{ if } Topo = "1" \\ \text{otherwise} \\ \quad K_e \leftarrow \left| \begin{array}{l} 0.90 \text{ if } Exp = "B" \\ 1.00 \text{ if } Exp = "C" \\ 1.10 \text{ if } Exp = "D" \end{array} \right. \quad \text{Table 2-4 p. 40} \\ \quad K_t \leftarrow \left| \begin{array}{l} 0.43 \text{ if } Topo = "2" \\ 0.53 \text{ if } Topo = "3" \\ 0.72 \text{ if } Topo = "4" \end{array} \right. \quad \text{Table 2-5 p. 40} \\ \quad f \leftarrow \left| \begin{array}{l} 1.25 \text{ if } Topo = "2" \\ 2.00 \text{ if } Topo = "3" \\ 1.50 \text{ if } Topo = "4" \end{array} \right. \quad \text{Table 2-5 p. 40} \\ \quad K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \quad \text{Section 2.6.6.4, P. 14} \\ \quad \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 \quad \text{Section 2.6.6.4, P. 14} \end{array} \right.$$

$K_{zt} := Kzt(z)$

Velocity Pressure: Section 2.6.9.6, P. 25

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$$

LOAD EQUATIONS

WIND LOAD

Area (Normal): $AN_{area} = H_{ant} \cdot Want$

Area (Side): $AT_{area} = H_{ant} \cdot Dant$

Force Coefficient (Normal): $C_{fn} = C_{fsquare}(H_{ant}, Want)$

Force Coefficient (Side): $C_{fs} = C_{fsquare}(H_{ant}, Dant)$

Pipe Area (Normal): $AN_p = \max[(L_p - H_{ant}) * Dp\ , 0]$

Pipe Area (Side): $AT_p = L_p \cdot Dp$

Force Coefficient (Normal): $C_{fp} = C_{fround}(Lp, Dp)$

Normal Effective Projected Area: $E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA = max(E_{pan}, Epat)$

Wind Force: $F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

Largest Out-to-Out Dimension: $D_{ant} = \sqrt{{D_{ant}}^2 + {W_{ant}}^2}$

Cross Sectional Area of Ice: $A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz\ )$

Total Ice Dead Load: $DL_{ice\_ant} = \boldsymbol{\rho_i} \cdot (Aice_{\_ant} \cdot Hant\ )$

ICE WIND LOAD

Dimensions: $H_{i_{ant}} = H_{ant} + 2tiz$

$W_{i_{ant}} = W_{ant} + 2tiz$

$D_{i_{ant}} = D_{ant} + 2tiz$

Area (Normal): $AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$

Area (Side): $AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$

Force Coefficient (Normal): $Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$

Force Coefficient (Side): $Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$

Pipe Area (Normal): $AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip}\ , 0]$

Pipe Area (Side): $AT_p = L_{ip} \cdot Dip$

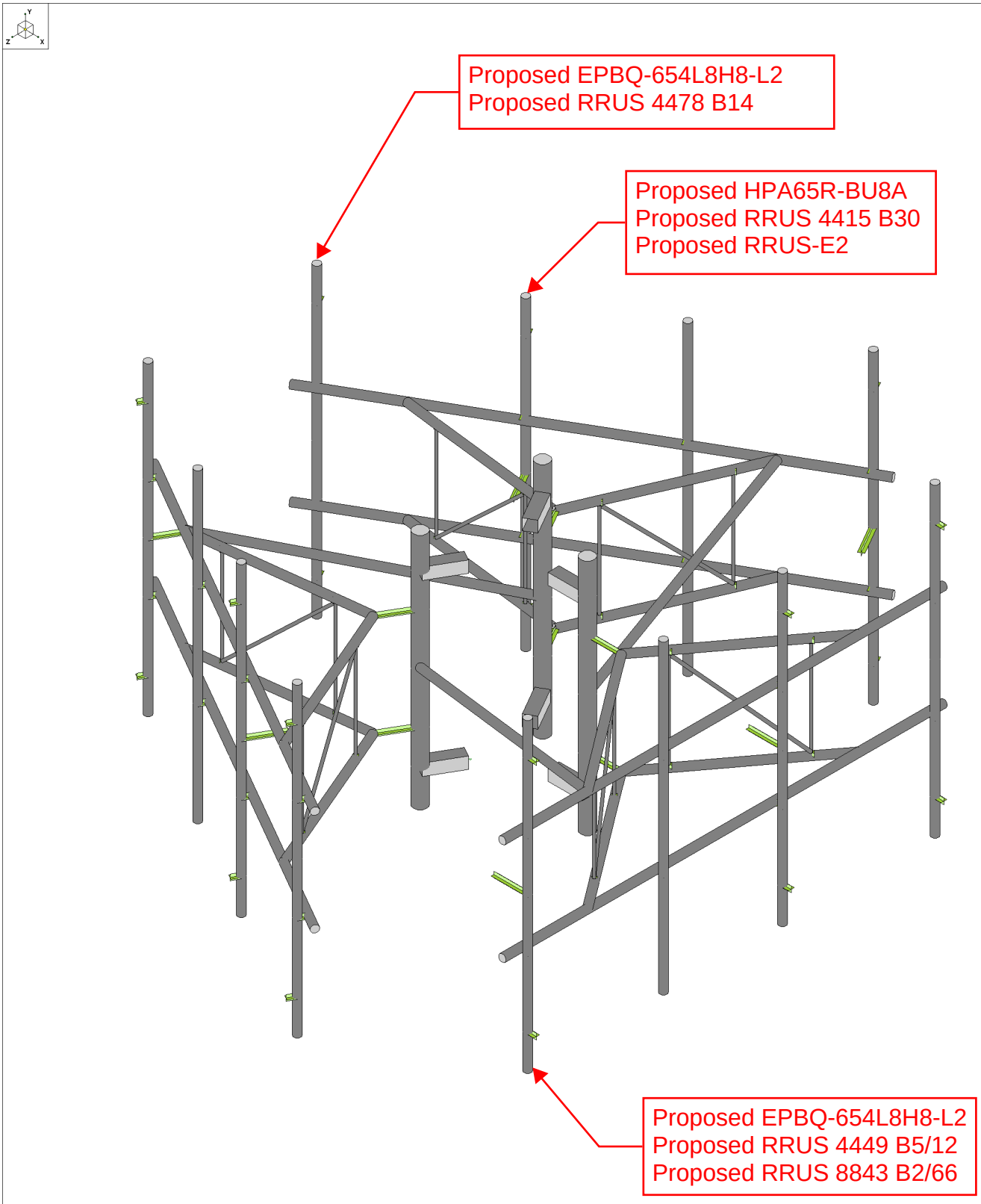
Force Coefficient (Normal): $C_{fp} = C_{fround}(L_{ip}, D_{ip})$

Normal Effective Projected Area: $E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA_i = max(E_{pain}, Epait)$

Wind Force: $F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

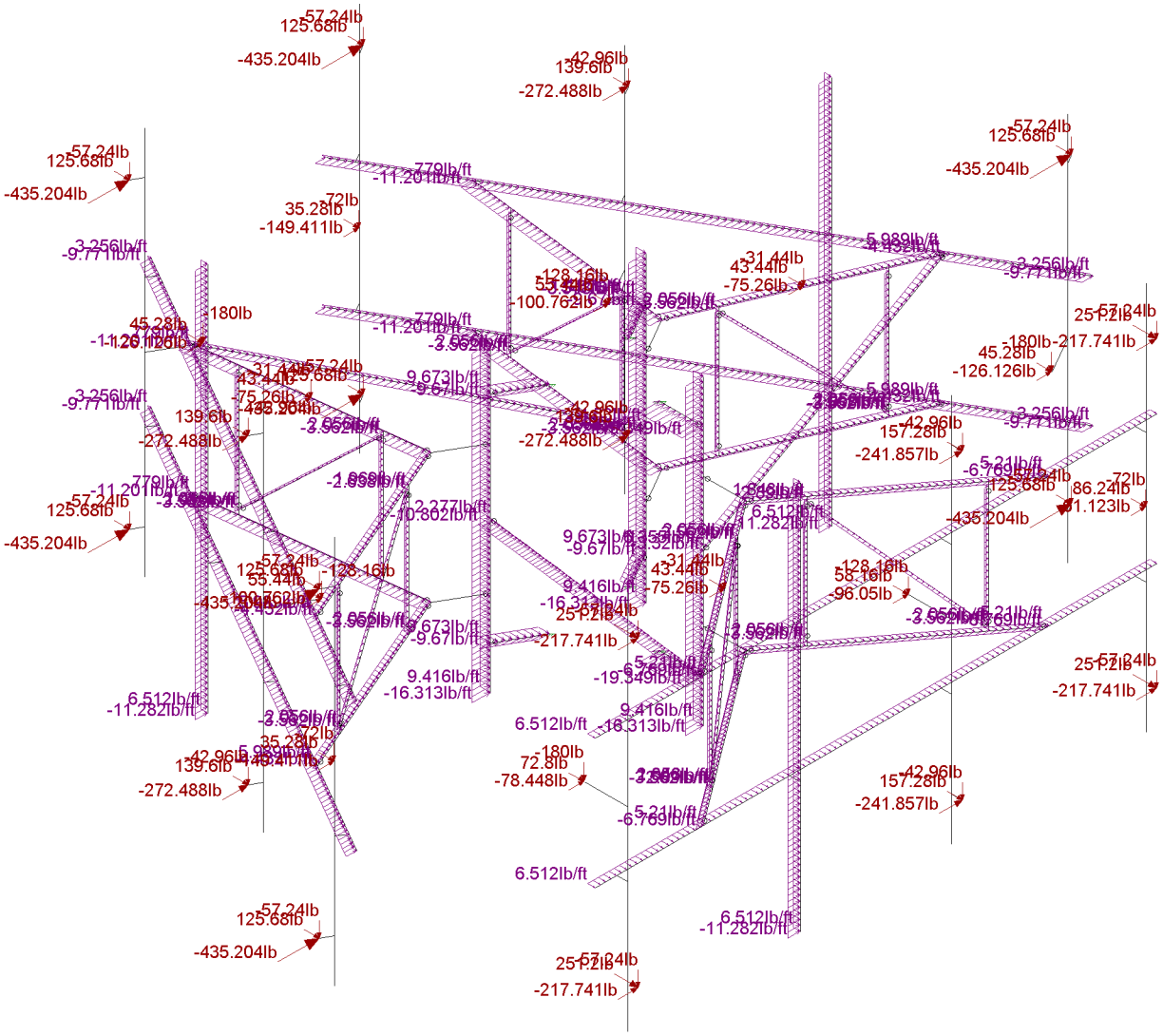


Envelope Only Solution

Maser Consulting P.A.		SK - 1
CL	Mount analysis	Mar 14, 2019 at 2:11 PM
18946101A	Rendered Model	MAL04198.r3d

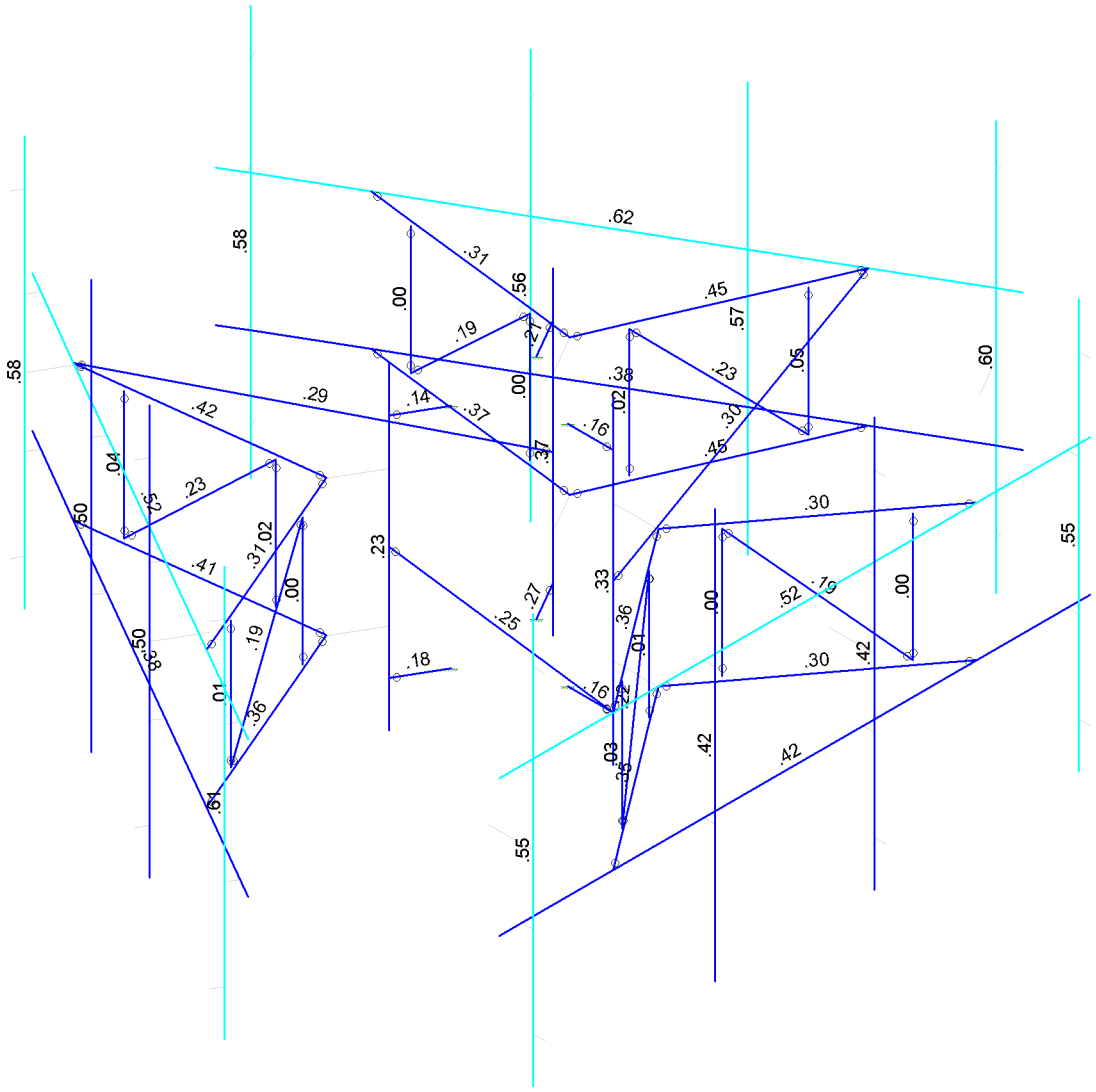
Envelope Only Solution

Maser Consulting P.A.		SK - 2
CL	Mount analysis	Mar 14, 2019 at 2:11 PM
18946101A	Member Shapes	MAL04198.r3d



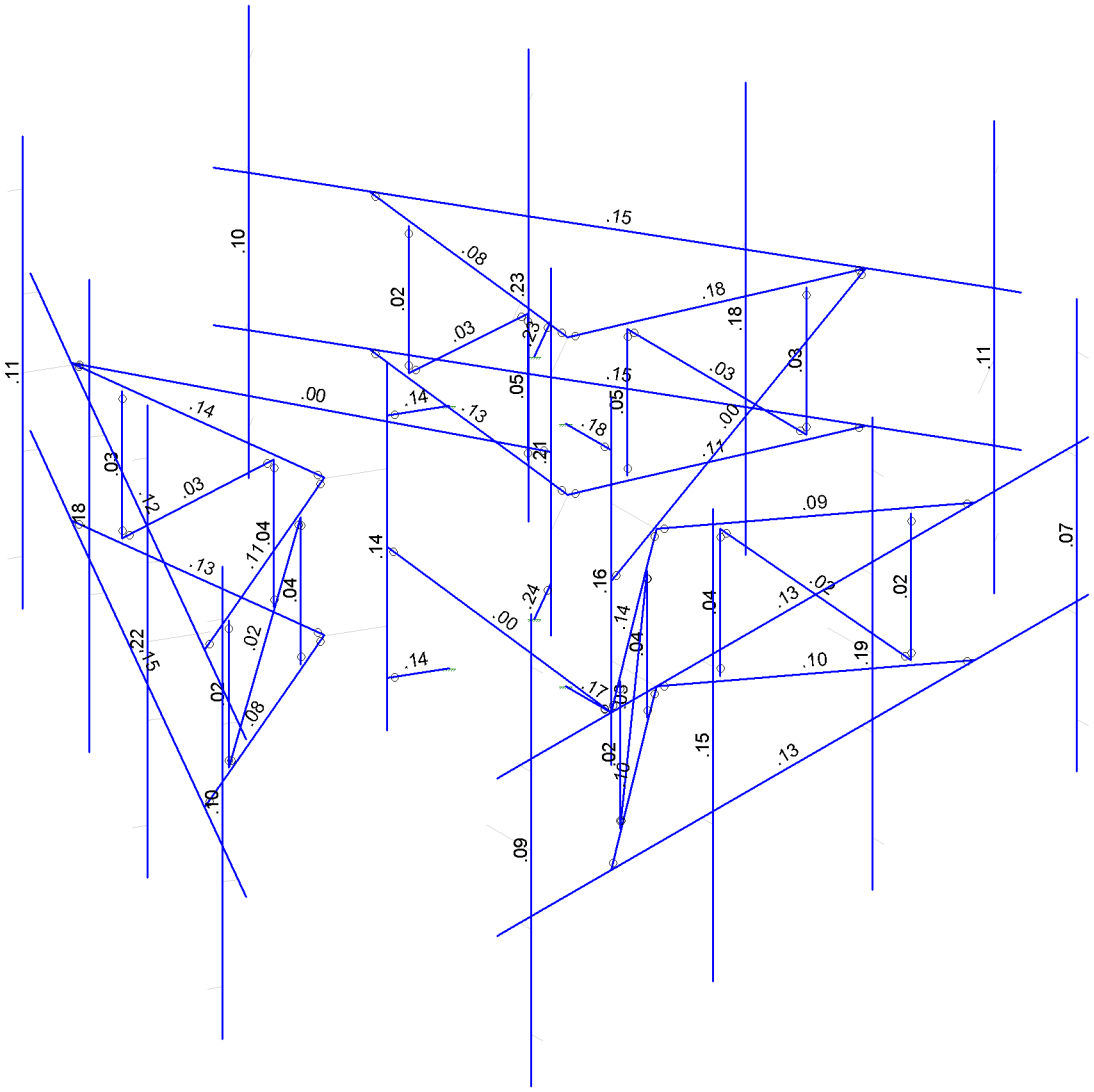
Loads: LC 12, 1.2D+1.6W11
Envelope Only Solution

Maser Consulting P.A.		SK - 3
CL	Mount analysis	Mar 14, 2019 at 2:11 PM
18946101A	Worst Case Loading	MAL04198.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Maser Consulting P.A.		SK - 4
CL	Mount analysis	Mar 14, 2019 at 2:11 PM
18946101A	Bending Check	MAL04198.r3d

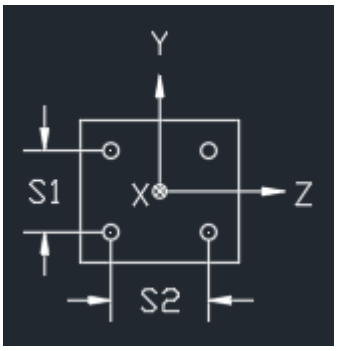


Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Maser Consulting P.A.		SK - 5
CL	Mount analysis	Mar 14, 2019 at 2:11 PM
18946101A	Shear Check	MAL04198.r3d

Mount to Mast Pipe Connection Check - Threaded Rods:

Applied Tension:	$Rx := 5593 \cdot lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Ry := 1989 lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Rz := 1746 \cdot lbf$	From Risa 3D LRFD Loading
Applied Torque:	$Mx := 251 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$My := 0 lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$Mz := 1993 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Number of Threaded Rods:	$n := 4$	Per Specifications
Threaded Rods Vertical Spacing:	$S_1 := 2in$	Per Specifications
Threaded Rods Horizontal Spacing:	$S_2 := 7in$	Per Specifications
Applied Tension at Threaded Rods:	$P_{a.t} := \frac{Rx}{n} + \frac{2My}{n \cdot S_2} + \frac{2Mz}{n \cdot S_1} = 7377.3\,lbf$	
Applied Shear at Threaded Rods:	$P_{a.v} := \frac{\sqrt{Ry^2 + Rz^2}}{n} + \frac{2Mx}{n\sqrt{S_1^2 + S_2^2}} = 868.5\,lbf$	
Threaded Rods Type Used:	**A307**	
Nominal Tensile Stress, Fnt:	$F_{n.t} := 45ksi$	AISC, Table J3-2, P. 16.1-120
Nominal Shear Stress, Fnv:	$F_{n.v} := 27ksi$	AISC, Table J3-2, P. 16.1-120
Nominal Threaded Rods Diameter:	$d_b := \frac{5}{8}in$	Per Specifications
Gross Area of the Threaded Rods:	$A_{b.g} := 0.307in^2$	AISC, Table 7-18, P. 7-83
Net Area of the Threaded Rods:	$A_{b.n} := 0.226in^2$	AISC, Table 7-18, P. 7-83
Strength Reduction Factor, ϕ:	$\phi := 0.75$	
Applied Tensile Stress:	$F_{a.t} := \frac{P_{a.t}}{A_{b.g}} = 24 \cdot ksi$	
Applied Shear Stress:	$F_{a.v} := \frac{P_{a.v}}{A_{b.g}} = 2.8 \cdot ksi$	



Combined Tension And Shear Check

Nominal Tensile Stress, Fnt	$F_{n.t} = 45 \cdot ksi$
Nominal Shear Stress, Fnv	$F_{n.v} = 27 \cdot ksi$

Nominal Tensile Reduced Fntr

$$F_{n.t.r} := 1.3 \cdot F_{n.t} - \frac{F_{n.t}}{\phi \cdot F_{n.v}} \cdot \frac{P_{a.v}}{A_{b.g}} = 52.2 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

$$F_{n.t.r} := \begin{cases} F_{n.t.r} & \text{if } F_{n.t.r} \le F_{n.t} \\ F_{n.t} & \text{otherwise} \end{cases} = 45 \cdot ksi$$

Nominal Shear Reduced Fntv

$$F_{n.v.r} := 1.3 \cdot F_{n.v} - \frac{F_{n.v}}{\phi \cdot F_{n.t}} \cdot \frac{P_{a.t}}{A_{b.g}} = 15.9 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

$$F_{n.v.r} := \begin{cases} F_{n.v.r} & \text{if } F_{n.v.r} \le F_{n.v} \\ F_{n.v} & \text{otherwise} \end{cases} = 15.9 \cdot ksi$$

Avalaible Tensile Stress:

$$F_{n.t} := \begin{cases} F_{n.t} & \text{if } \frac{F_{a.t}}{F_{n.t}} \le 30\% \\ F_{n.t.r} & \text{otherwise} \end{cases} = 45 \cdot ksi$$

Threaded Rods Nominal Tensile Strength

$$R_{n.t} := F_{n.t} \cdot A_{b.g} = 13.8 \cdot kip$$

Tension Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.t} \ge P_{a.t} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

Check = "OK"

Tension Ratio

$$Ratio_t := \frac{P_{a.t}}{\phi \cdot R_{n.t}} \qquad Ratio_t = 71.2 \cdot \%$$

Avalaible Shear Stress:

$$F_{n.v} := \begin{cases} F_{n.v} & \text{if } \frac{F_{a.v}}{F_{n.v}} \le 30\% \\ F_{n.v.r} & \text{otherwise} \end{cases} = 27 \cdot ksi$$

Threaded Rods Nominal Shear Strength

$$R_{n.v} := F_{n.v} \cdot A_{b.g} = 8.3 \cdot kip$$

Shear Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.v} \ge P_{a.v} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

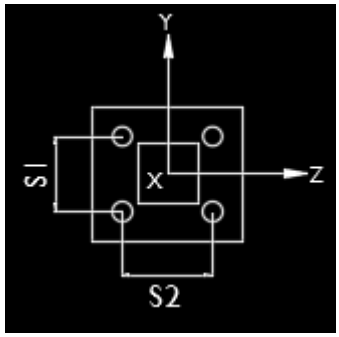
Check = "OK"

Shear Ratio

$$Ratio_v := \frac{P_{a.v}}{\phi \cdot R_{n.v}} = 14 \cdot \%$$

Standoff Arm to Ring Mount Kit Connection Check:

Applied Tension:	$Rx := 4252 \cdot lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Ry := 2854 lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Rz := 1770 \cdot lbf$	From Risa 3D LRFD Loading
Applied Torque:	$Mx := 1795 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$My := 1710 lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$Mz := 1118 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Number of Bolts:	$n := 4$	Per Specifications
Bolts Vertical Spacing:	$S_1 := 6in$	Assumed
Bolts Horizontal Spacing:	$S_2 := 6in$	Assumed
Applied Tension at Bolt:	$P_{a.t} := \frac{Rx}{n} + \frac{2My}{n \cdot S_2} + \frac{2Mz}{n \cdot S_1} = 3891\,lbf$	
Applied Shear at Bolt:	$P_{a.v} := \frac{\sqrt{Ry^2 + Rz^2}}{n} + \frac{2Mx}{n\sqrt{S_1^2 + S_2^2}} = 2108.8\,lbf$	
Bolt Type Used:	**A325N**	
Nominal Tensile Stress, Fnt:	$F_{n.t} := 90ksi$	AISC, Table J3-2, P. 16.1-104
Nominal Shear Stress, Fnv:	$F_{n.v} := 54ksi$	AISC, Table J3-2, P. 16.1-104
Nominal Bolt Diameter:	$d_b := \frac{5}{8}in$	Per Specifications
Gross Area of the Bolt:	$A_{b.g} := 0.307in^2$	AISC, Table 7-18, P. 7-83
Net Area of the Bolt:	$A_{b.n} := 0.226in^2$	AISC, Table 7-18, P. 7-83
Strength Reduction Factor, ϕ:	$\phi := 0.75$	
Applied Tensile Stress:	$F_{a.t} := \frac{P_{a.t}}{A_{b.g}} = 12.7 \cdot ksi$	
Applied Shear Stress:	$F_{a.v} := \frac{P_{a.v}}{A_{b.g}} = 6.9 \cdot ksi$	



Combined Tension And Shear Check

Nominal Tensile Stress, Fnt	$F_{n.t} = 90 \cdot ksi$
Nominal Shear Stress, Fnv	$F_{n.v} = 54 \cdot ksi$

Nominal Tensile Reduced Fntr

$$F_{n.t.r} := 1.3 \cdot F_{n.t} - \frac{F_{n.t}}{\phi \cdot F_{n.v}} \cdot \frac{P_{a.v}}{A_{b.g}} = 101.7 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

$$F_{n.t.r} := \begin{cases} F_{n.t.r} & \text{if } F_{n.t.r} \le F_{n.t} \\ F_{n.t} & \text{otherwise} \end{cases} = 90 \cdot ksi$$

Nominal Shear Reduced Fntv

$$F_{n.v.r} := 1.3 \cdot F_{n.v} - \frac{F_{n.v}}{\phi \cdot F_{n.t}} \cdot \frac{P_{a.t}}{A_{b.g}} = 60.1 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

$$F_{n.v.r} := \begin{cases} F_{n.v.r} & \text{if } F_{n.v.r} \le F_{n.v} \\ F_{n.v} & \text{otherwise} \end{cases} = 54 \cdot ksi$$

Avalaible Tensile Stress:

$$F_{n.t} := \begin{cases} F_{n.t} & \text{if } \frac{F_{a.t}}{F_{n.t}} \le 30\% \\ F_{n.t.r} & \text{otherwise} \end{cases} = 90 \cdot ksi$$

Bolt Nominal Tensile Strength

$$R_{n.t} := F_{n.t} \cdot A_{b.g} = 27.6 \cdot kip$$

Tension Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.t} \ge P_{a.t} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

Check = "OK"

Tension Ratio

$$Ratio_t := \frac{P_{a.t}}{\phi \cdot R_{n.t}} \qquad Ratio_t = 18.8 \cdot \%$$

Avalaible Shear Stress:

$$F_{n.v} := \begin{cases} F_{n.v} & \text{if } \frac{F_{a.v}}{F_{n.v}} \le 30\% \\ F_{n.v.r} & \text{otherwise} \end{cases} = 54 \cdot ksi$$

Bolt Nominal Shear Strength

$$R_{n.v} := F_{n.v} \cdot A_{b.g} = 16.6 \cdot kip$$

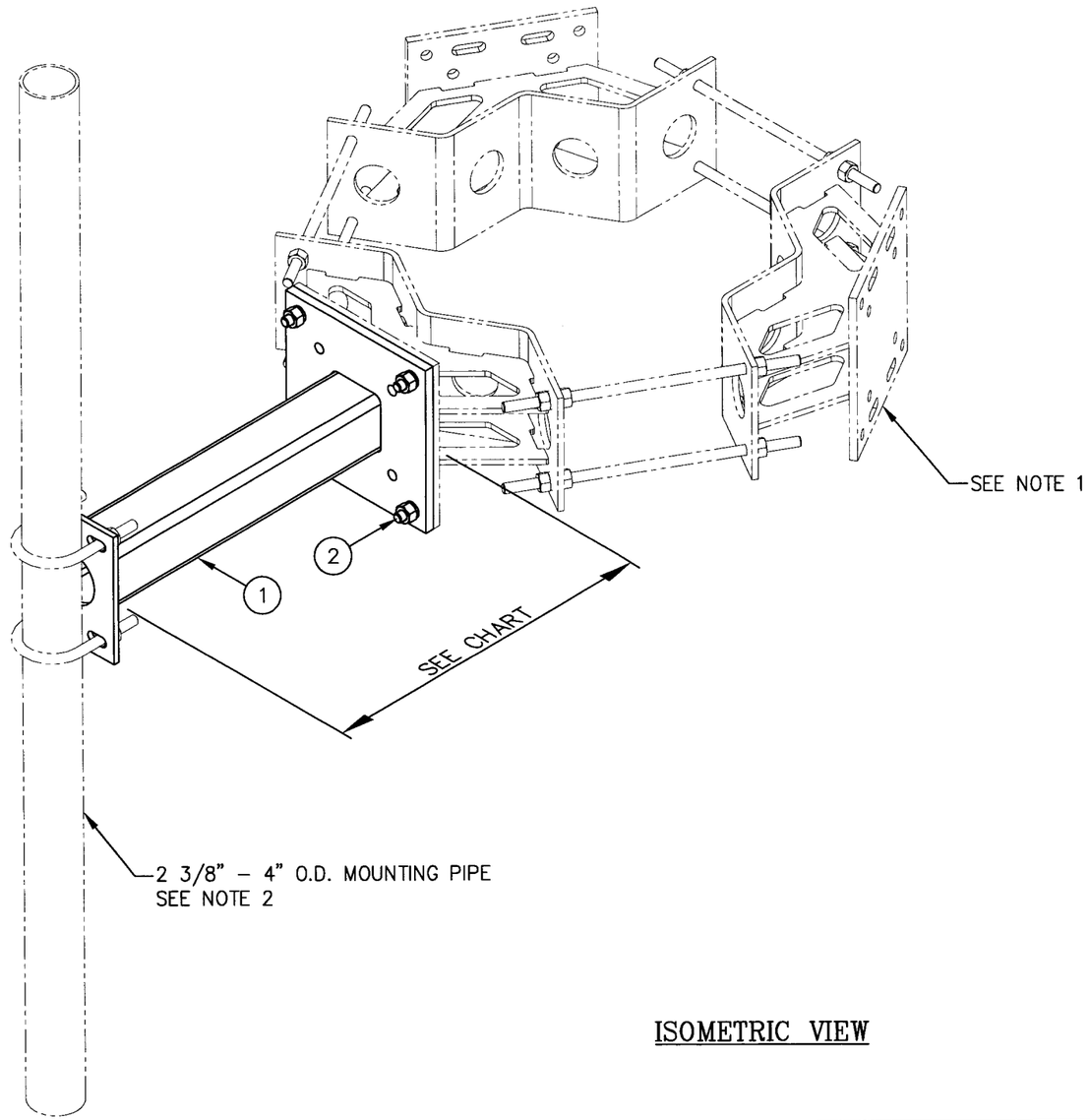
Shear Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.v} \ge P_{a.v} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

Check = "OK"

Shear Ratio

$$Ratio_v := \frac{P_{a.v}}{\phi \cdot R_{n.v}} = 17 \cdot \%$$



ISOMETRIC VIEW

LIST OF MATERIAL					
ITEM	KIT NO.	DWG. NO.	QTY.	DESCRIPTION	WEIGHT
1	C10114001	CW00484	1	1'–0" STANDOFF ARM WELDMENT	38.0#
	C10114002	CW00018	1	2'–0" STANDOFF ARM WELDMENT	50.6#
	C10114003	CW00525	1	3'–0" STANDOFF ARM WELDMENT	63.3#
	C10114004	CW00019	1	4'–0" STANDOFF ARM WELDMENT	76.0#
	C10114005	CW00526	1	5'–0" STANDOFF ARM WELDMENT	88.7#
	C10114006	CW00020	1	6'–0" STANDOFF ARM WELDMENT	101.4#
	C10114007	CW01019	1	0'–8" STANDOFF ARM WELDMENT	33.7#

TYPICAL HARDWARE				
ITEM	PART NO.	QTY.	DESCRIPTION	WEIGHT
2	C40026025	4	BOLT ASSEMBLY, 5/8"ø X 2 1/2 A325	2.0#

NOTES:

1. TRI–COLLAR MOUNTS ARE SHOWN TYPICAL AND MUST BE PURCHASED SEPARATELY.
2. 2 3/8" TO 4" O.D. MOUNTING PIPE & U–BOLTS MUST BE PURCHASED SEPARATELY.
3. QUANTITIES SHOWN ARE FOR ONE (1) STANDOFF ARM.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES

TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"

MATERIAL:

TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
6	9/13/11	DPJ	CE	ADDED 0'–8" STANDOFF ARM & UPDATED TITLE BLOCK.
5	6/16/07	MLC	MC	REDRAWN, ADDED 3' & 5' STANDOFF ARMS
4	10/10/06	MLC	MC	ADDED 1'–0" STANDOFF ARM.
3	10/12/04	MLC	MC	REVISED MOUNTING PIPE SIZE & WEIGHTS.
2	10/11/04	MLC	MC	REVISED MOUNTING PIPE SIZE & WEIGHTS.
1	4/17/03	JKW	MLC	UPDATED PART NUMBERS.

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STANDOFF ARM (FITS 2 3/8"ø TO 4"ø MOUNTING PIPE)

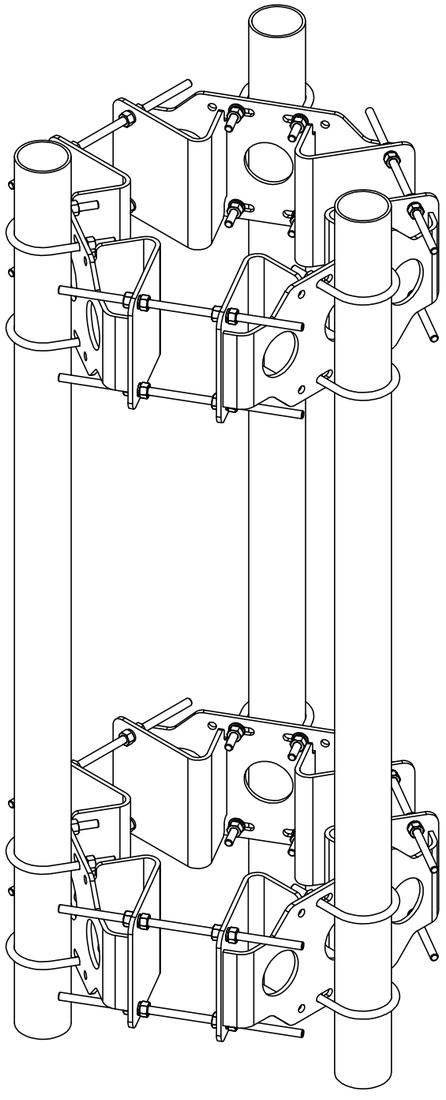
		SIZE	DRAWING NO.	REV
DATE	8/26/00	B	C10114	6
DRAWN BY	KLE			
CHECKED BY	BCT	SCALE None	PAGE 1 OF 1	

NOTE:

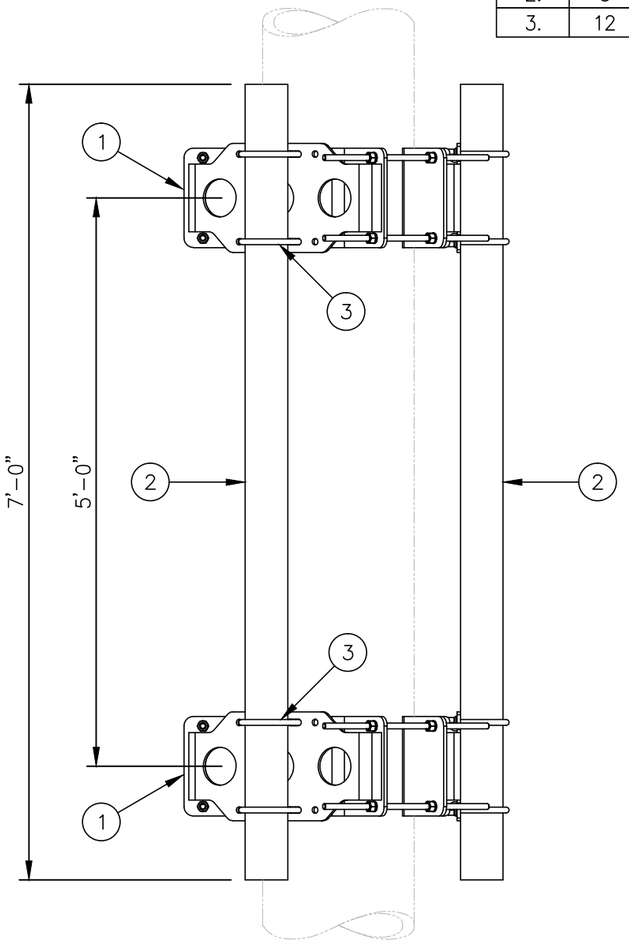
SEE DRAWING C10112377 FOR INSTALLATION OF TRI-COLLAR BRACKET ASSEMBLY

C10899050 4 1/2" O.D. PIPE MOUNT ASSEMBLY

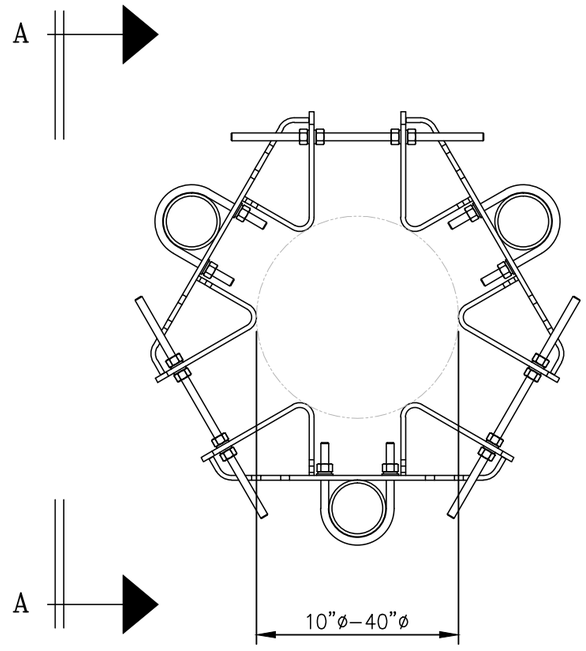
ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	C10112377	TRI-COLLAR BRACKET ASSEMBLY	416
2.	3	C10901407	PIPE, 4 1/2 O.D. X .237 X 7'-0	236
3.	12	C40034032	U-BOLT ASSEMBLY, 5/8 ø X 5 3/16 C-C	26
			TOTAL WEIGHT	678



ISOMETRIC VIEW



VIEW A-A



PLAN VIEW

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES

TOLERANCES: FRACTIONS ± 1/16"
ANGLES ± 1/2 DEG.
DECIMALS ± .010"

MATERIAL:

TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
1	02/03/17	WRF	KLE	COLLAR WAS C10112300

Sabre Industries™
Towers and Poles

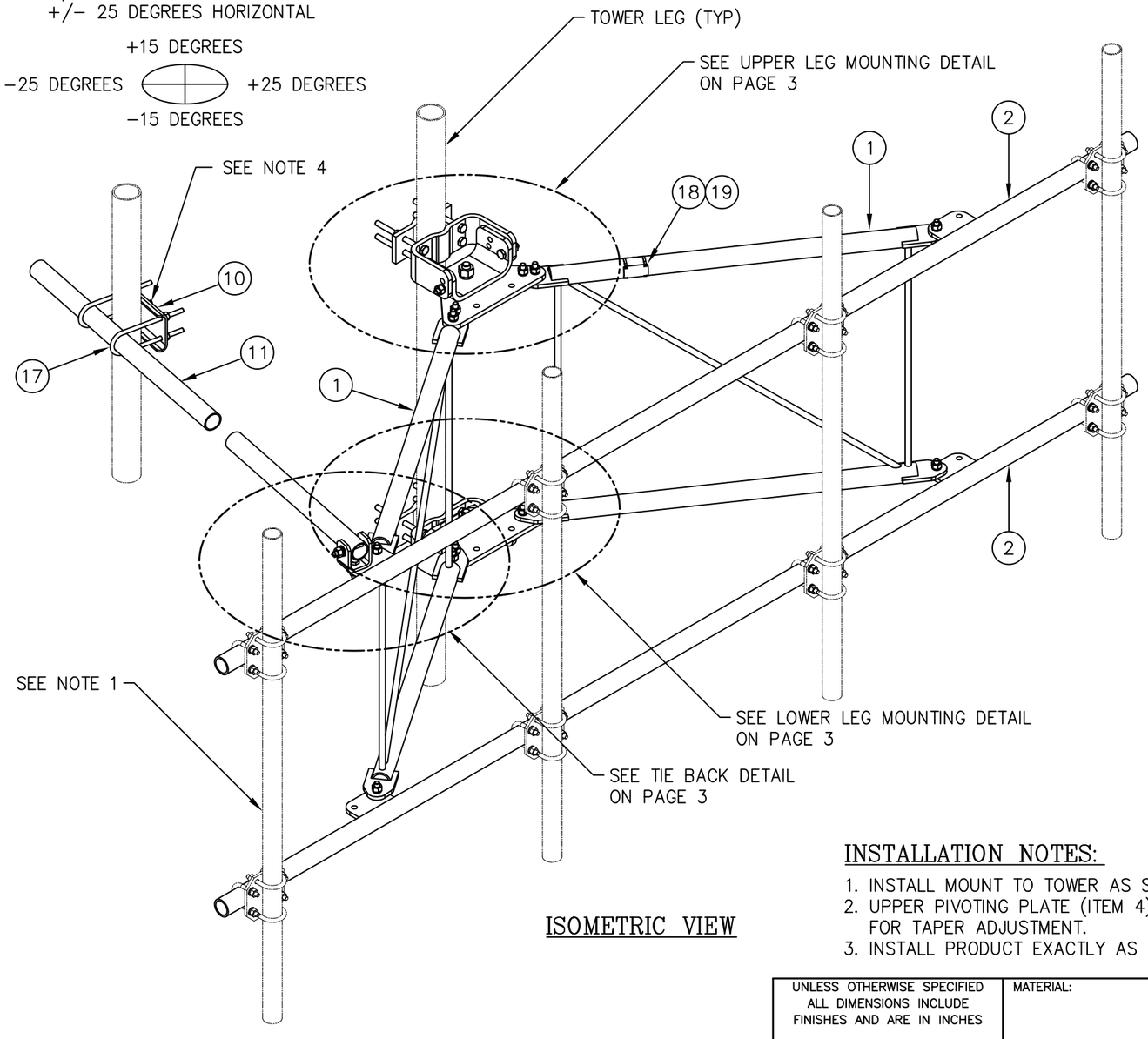
4 1/2" O.D. PIPE MOUNT ASSEMBLY FOR MONOPOLES (FITS 10" TO 40" DIAMETER)

		SIZE	DRAWING NO.	REV
DATE	01/26/16	B	C10899050	1
DRAWN BY	WRF			
CHECKED BY	DLW		SCALE None	PAGE 1 OF 1

TIEBACK ANGLE RANGE DETAIL

+/− 15 DEGREES VERTICAL
+/− 25 DEGREES HORIZONTAL

+15 DEGREES
−25 DEGREES +25 DEGREES
−15 DEGREES



ISOMETRIC VIEW

C10857001C 12' HD V-BOOM ASSEMBLY W/TIEBACK

ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	CW01222	WELDMENT, STANDOFF ARM	126
2.	2	CW01223	WELDMENT, FACE PIPE	147
3.	2	CS03109	PLATE, ROTATING	34
4.	1	CS03110	PLATE, PIVOTING (UPPER)	16
5.	1	CS03111	PLATE, LEG CLAMP (UPPER)	17
6.	1	CS03112	PLATE, PIVOTING (LOWER)	14
7.	1	CS03113	PLATE, LEG CLAMP (LOWER)	17
8.	2	CS03114	PLATE, LEG CLAMP (BACK)	14
9.	1	CS00098	PLATE, TIE BACK SWIVEL	3
10.	1	CS03285	PLATE, TIE BACK CLAMP	4
11.	1	CS03333	PIPE, TIE BACK	38
12.	2	C40026073	BOLT ASSEMBLY, 1 ø X 3 A325	4
13.	8	C40140004	BOLT ASSEMBLY, 5/8 ø X 8 A307	13
14.	1	C40026033	BOLT ASSEMBLY, 5/8 ø X 4 1/2 A325	1
15.	12	C40026025	BOLT ASSEMBLY, 5/8 ø X 2 1/2 A325	6
16.	5	C40026024	BOLT ASSEMBLY, 5/8 ø X 2 1/4 A325	3
17.	2	C40034183	U-BOLT ASSEMBLY, 1/2 ø X 2 9/16 C-C	3
18.	1	Z30992001	MOUNT CLASSIFICATION TAG C10857001C	1
19.	2	C40062103	STAINLESS STEEL SELF-LOCKING CABLE TIE	1
			TOTAL WEIGHT	462

PACKAGING NOTE

CK00386 INCLUDES ITEMS 1, 3, 4, 5, 6, 7, 12 & 15 (8 QTY)
CK00387 INCLUDES ITEMS 2, 8, 9, 10, 11, 13, 14, 15 (4 QTY), 16, 17, 18 & 19

INSTALLATION NOTES:

1. INSTALL MOUNT TO TOWER AS SHOWN, SO THAT WELDED STANDOFF DIAGONAL IS SLOPING DOWNWARD FROM TOWER END TO FACE PIPE END.
2. UPPER PIVOTING PLATE (ITEM 4) HAS THREE HOLES ON EACH SIDE AND UPPER LEG CLAMP PLATE (ITEM 5) HAS TWO HOLES ON EACH SIDE FOR TAPER ADJUSTMENT.
3. INSTALL PRODUCT EXACTLY AS SHOWN IN DRAWING, WITH ALL BOLTS FACING UPWARDS.

NOTES:

1. MOUNTING PIPES & CROSSOVER PLATE KITS MUST BE PURCHASED SEPARATELY.
2. QUANTITIES SHOWN IN LISTS OF MATERIAL ARE FOR ONE (1) V-BOOM ONLY.
3. THIS V-BOOM WILL MOUNT TO THE FOLLOWING: 1 1/2"ø TO 5 9/16"ø ROUND LEG.
4. TIEBACK MUST BE CONNECTED TO A RIGID MEMBER THAT PROVIDES ADEQUATE SUPPORT WITHIN THE LIMITS NOTED ABOVE IN THE TIEBACK ANGLE RANGE DETAIL UNLESS APPROVED BY THE ENGINEER OF RECORD.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"

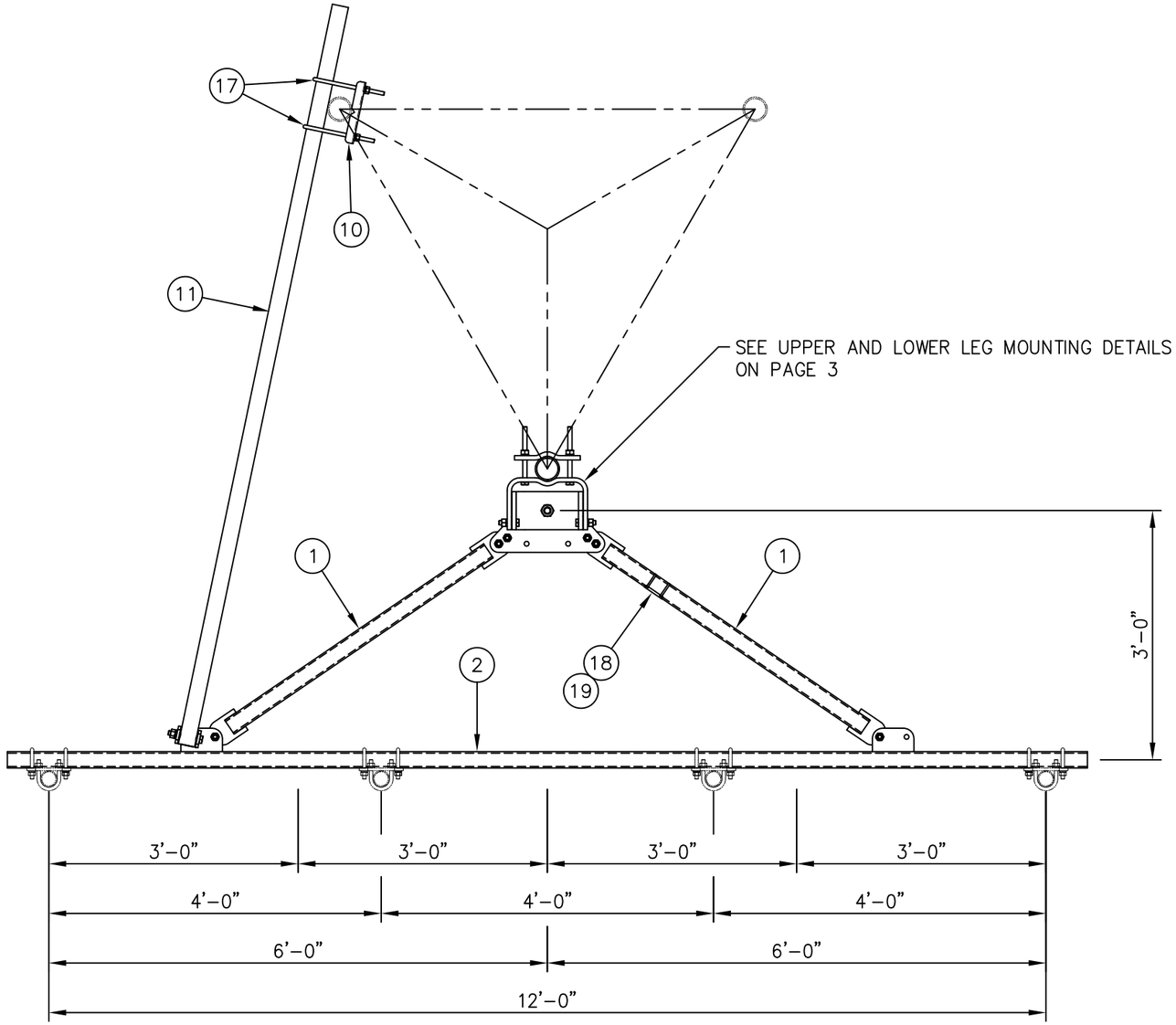
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries™ Towers and Poles

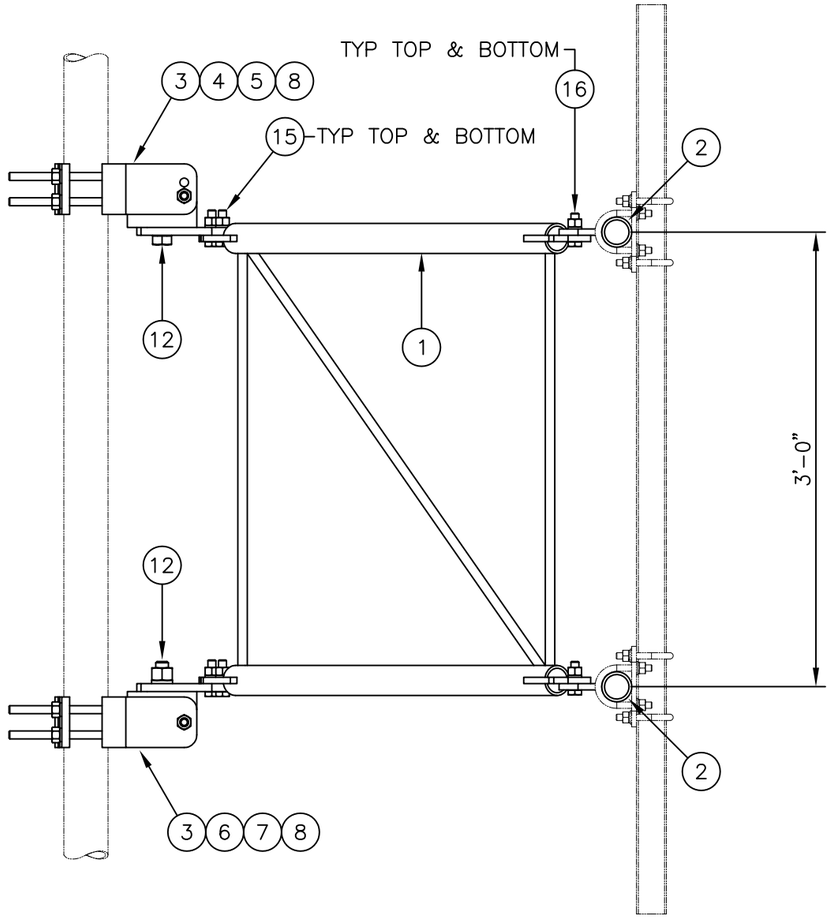
12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

		SIZE	DRAWING NO.	REV
DATE	12/22/15	B	C10857001C	3
DRAWN BY	WRF			
CHECKED BY	EK	SCALE None	PAGE 1 OF 3	



MOUNTING OPTIONS

SHOWING MOUNTING PIPE PLACEMENTS



SIDE VIEW

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES

TOLERANCES: FRACTIONS ± 1/16"
ANGLES ± 1/2 DEG.
DECIMALS ± .010"

MATERIAL:

TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

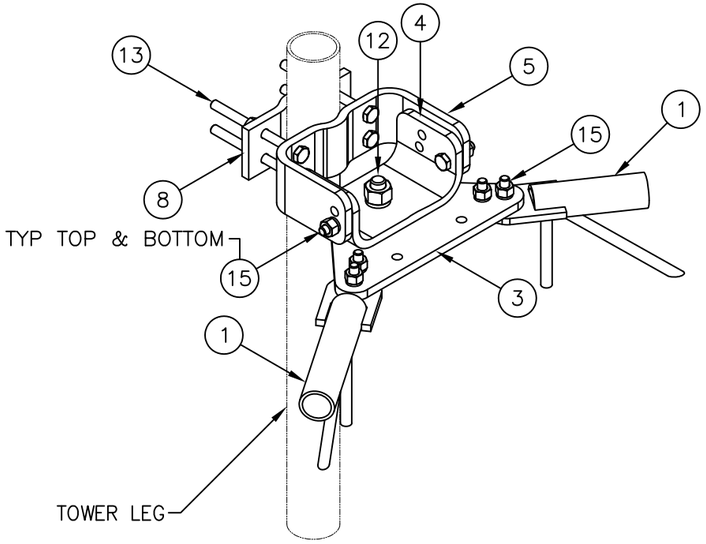
Sabre Industries™
Towers and Poles

12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

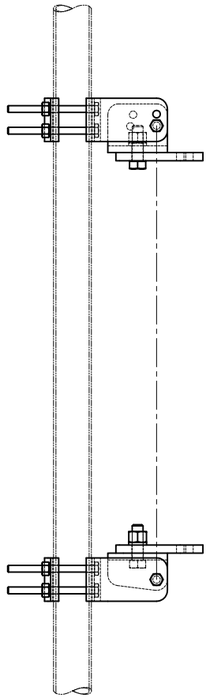
DATE	12/22/15
DRAWN BY	WRF
CHECKED BY	EK

SIZE	DRAWING NO.	REV
B	C10857001C	3

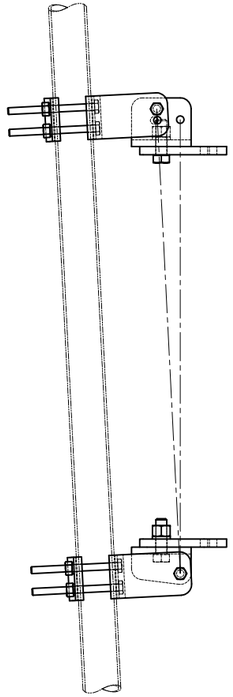
SCALE	PAGE
None	2 OF 3



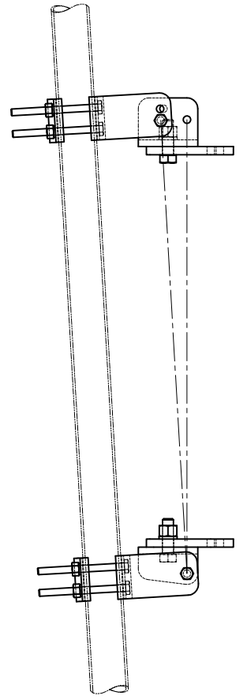
UPPER LEG MOUNTING DETAIL



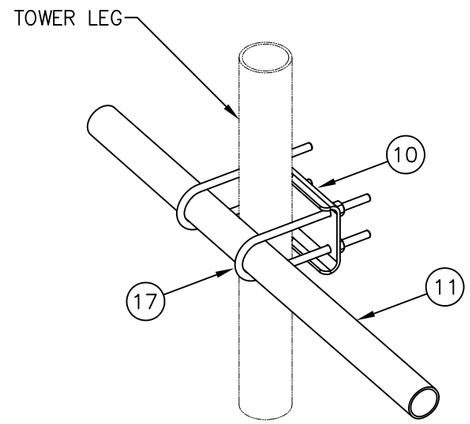
STRAIGHT
TOWER SECTION



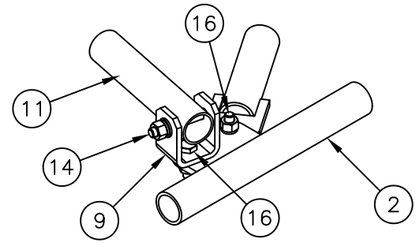
TAPERED
1'–9 IN 20' SLOPE



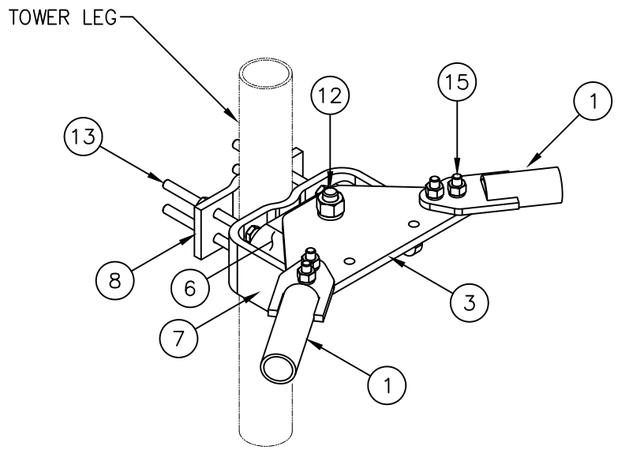
TAPERED
2' IN 20' SLOPE



TIE BACK DETAIL
AT TOWER LEG



TIE BACK DETAIL
AT ANTENNA MOUNTING FRAME



LOWER LEG MOUNTING DETAIL

-------PIVOTING OPTIONS-------

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS INCLUDE
FINISHES AND ARE IN INCHES

TOLERANCES: FRACTIONS ± 1/16"
ANGLES ± 1/2 DEG.
DECIMALS ± .010"

MATERIAL:

TOLERANCES DO NOT APPLY
TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries™
Towers and Poles

12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

DATE	12/22/15
DRAWN BY	WRF
CHECKED BY	EK

SIZE	DRAWING NO.	REV
B	C10857001C	3

SCALE	PAGE
None	3 OF 3

ATTACHMENT 4

C Squared Systems, LLC
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Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT1273

Old Lyme Shore Road

232 Shore Road, Old Lyme, CT 06371

March 15, 2019

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installations of AT&T antenna arrays to be mounted on the existing monopole tower located at 232 Shore Road in Old Lyme, CT. The coordinates of the tower are 41° 17' 30.18" N, 72° 17' 13.18" W.

AT&T is proposing the following:

1) Install nine (9) multi-band antennas (three per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % MPE of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet updated 01/22/2019.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times \text{EIRP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Calculation Results

Table 1 below outlines the power density information for the site. The proposed AT&T antennas are directional in nature; therefore, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
AT&T	*110*	*1900*	*2*	*500*	*0.0033*	*1.0000*	0.33%
AT&T	*110*	*880*	*2*	*500*	*0.0033*	*0.5867*	0.57%
AT&T	*110*	*2300*	*1*	*500*	*0.0017*	*1.0000*	0.17%
AT&T	*110*	*700*	*2*	*500*	*0.0033*	*0.4667*	0.71%
AT&T	*110*	*2300*	*1*	*500*	*0.0017*	*1.0000*	0.17%
AT&T	*110*	*1900*	*2*	*500*	*0.0033*	*1.0000*	0.33%
T-Mobile	99	1900	2	953	0.0079	1.0000	0.79%
T-Mobile	99	2100	4	477	0.0079	1.0000	0.79%
T-Mobile	99	700	1	445	0.0019	0.4667	0.40%
Verizon	90	1970	1	3632	0.0185	1.0000	1.85%
Verizon	90	869	9	447	0.0205	0.5793	3.54%
Verizon	90	746	1	1782	0.0091	0.4973	1.83%
Verizon	90	2145	1	4604	0.0235	1.0000	2.35%
AT&T	109	716	1	1730	0.0059	0.4773	1.23%
AT&T	109	734	1	3794	0.0129	0.4893	2.63%
AT&T	109	758	1	3794	0.0129	0.5053	2.55%
AT&T	109	880	1	4066	0.0138	0.5867	2.35%
AT&T	109	1900	1	5743	0.0195	1.0000	1.95%
AT&T	109	2100	1	8614	0.0292	1.0000	2.92%
AT&T	109	2300	1	6153	0.0209	1.0000	2.09%
						Total	**27.26%**

Table 1: Carrier Information[2] [3] [4]

[2] The existing CSC filing for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 12/12/2018. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

[3] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[4] Antenna height listed for AT&T is in reference to the Maser Consulting Construction Drawing dated February 19, 2019.

5. Conclusion

The above analysis verifies that RF exposure at ground level from the proposed site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **27.26% of the FCC General Population/Uncontrolled limit**.

As noted previously, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Marc Salas
RF Engineer
C Squared Systems, LLC

March 15, 2019
Date

Reviewed/Approved By: Keith Vellante
Director of RF Services
C Squared Systems, LLC

March 15, 2019
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[5]

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

(B) Limits for General Population/Uncontrolled Exposure[6]

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

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[5] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[6] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

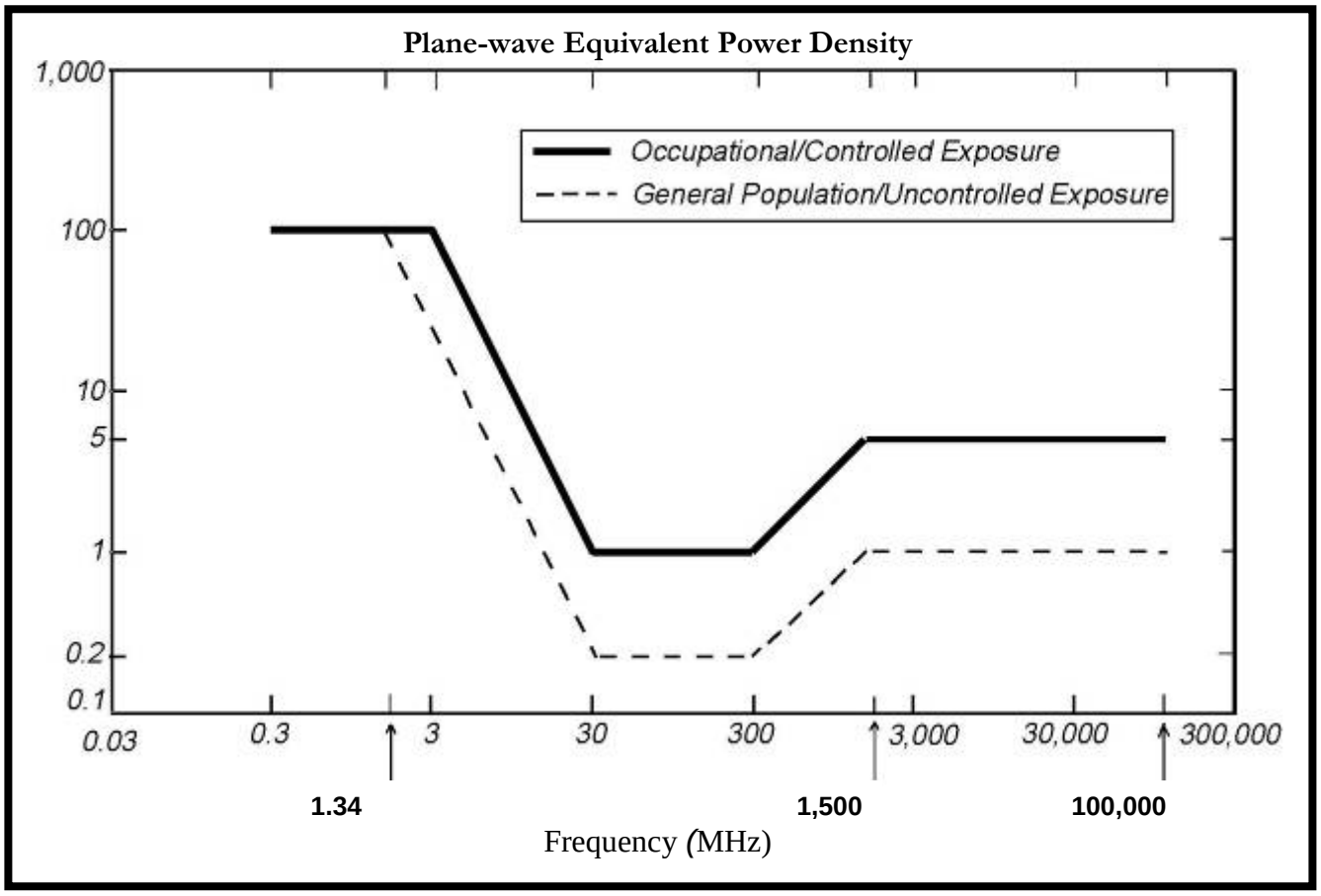
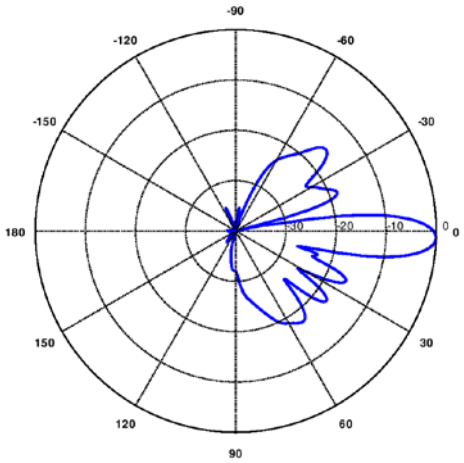


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

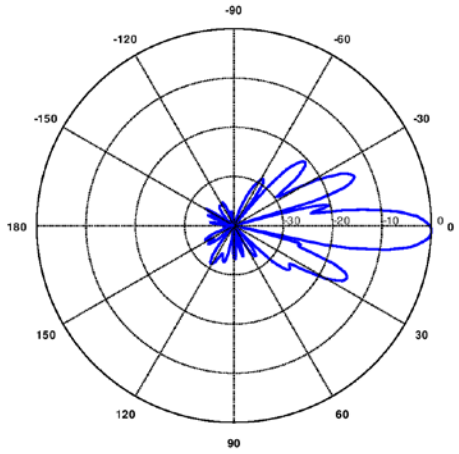
716 MHz

Manufacturer:	CCI
Model #:	HPA65R-BU8A
Frequency Band:	698-806 MHz
Gain:	15.5 dBi
Vertical Beamwidth:	9.7°
Horizontal Beamwidth:	67°
Polarization:	±45°
Dimensions (L x W x D):	96.0” x 11.7” x 7.6”



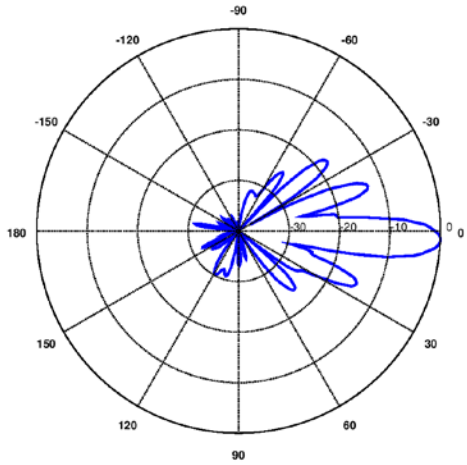
734/758 MHz

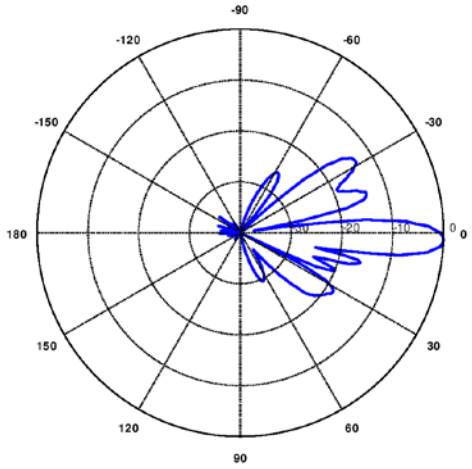
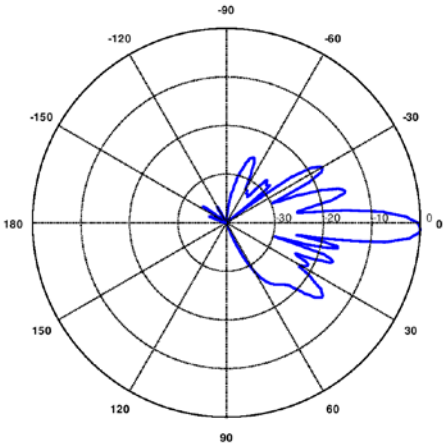
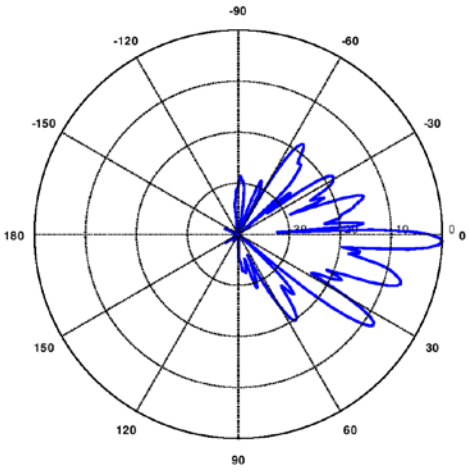
Manufacturer:	KMW
Model #:	EPBQ-654L8H8-L2
Frequency Band:	698-806 MHz
Gain:	15.9 dBi
Vertical Beamwidth:	9.3°
Horizontal Beamwidth:	67°
Polarization:	±45°
Dimensions (L x W x D):	96.0” x 21.0” x 6.3”



880 MHz

Manufacturer:	KMW
Model #:	EPBQ-654L8H8-L2
Frequency Band:	806-894 MHz
Gain:	16.2 dBi
Vertical Beamwidth:	8.7°
Horizontal Beamwidth:	66°
Polarization:	±45°
Dimensions (L x W x D):	96.0” x 21.0” x 6.3”



1900 MHz Manufacturer: KMW Model #: EPBQ-654L8H8-L2 Frequency Band: 1910-2180 MHz Gain: 17.7 dBi Vertical Beamwidth: 7.4° Horizontal Beamwidth: 60° Polarization: ±45° Dimensions (L x W x D): 96.0” x 21.0” x 6.3”	
2100 MHz Manufacturer: KMW Model #: EPBQ-654L8H8-L2 Frequency Band: 1910-2180 MHz Gain: 17.7 dBi Vertical Beamwidth: 7.4° Horizontal Beamwidth: 60° Polarization: ±45° Dimensions (L x W x D): 96.0” x 21.0” x 6.3”	
2300 MHz Manufacturer: CCI Model #: HPA65R-BU8A Frequency Band: 2300-2400 MHz Gain: 18.0 dBi Vertical Beamwidth: 4.0° Horizontal Beamwidth: 60° Polarization: ±45° Dimensions (L x W x D): 96.0” x 11.7” x 7.6”	

ATTACHMENT 5

AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION

ATC SITE # / NAME: 284982/OLD LYME II CT
SITE ADDRESS: 232 Shore Road, Old Lyme, CT 06371
LICENSEE: AT&T d/b/a AT&T Mobility

I, Margaret Robinson, Senior Counsel for American Tower*, owner of the tower facility located at the address identified above (the "Tower Facility"), do hereby authorize AT&T d/b/a AT&T Mobility, its successors and assigns, and/or its agent, (collectively, the "Licensee") to act as American Tower's non-exclusive agent for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for Licensee's telecommunications' installation.

We understand that this application may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by Licensee only of conditions related to Licensee's installation and any such conditions of approval or modifications will be Licensee's sole responsibility.

Signature:

Print Name: Margaret Robinson
Senior Counsel
American Tower*

NOTARY BLOCK

Commonwealth of MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Senior Counsel for American Tower*, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same.

WITNESS my hand and official seal, this 10th day of April, 2019.

NOTARY SEAL

GERARD T. HEFFRON
Notary Public
Commonwealth of Massachusetts
My Commission Expires
August 9, 2024

Notary Public Gerard T. Heffron
My Commission Expires: 8/9/24

*American Tower includes all affiliates and subsidiaries of American Tower Corporation.

ATTACHMENT 6

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

July 19, 2019

Lucia Chiocchio, Esq
Daniel Patrick, Esq.
Cuddy & Feder LLP
445 Hamilton Avenue, 14th floor
White Plains, NY 10601

RE: **DOCKET NO. 391** - American Towers LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut.

Dear Attorney Chiocchio and Attorney Patrick:

During a public meeting held on July 18, 2019, the Connecticut Siting Council (Council) by its Decision and Order dated July 18, 2019, modified the Decision and Order in Docket 391 rendered on September 23, 2010 for the construction, maintenance and operation of a telecommunications facility at 232 Shore Road, Old Lyme, Connecticut and reissued the Certificate of Environmental Compatibility and Public Need (Certificate), thereby eliminating the requirement that wireless antennas be attached to the tower via T-arm mounts.

Enclosed are the Council's Staff report, Modified Decision and Order, and reissued Certificate.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/MP/laf

Enclosures

c: Gregory Mercier, Supervising Attorney, US Tower Division, American Tower Corporation
Parties and Intervenors
State Documents Librarian
The Honorable Bonnie A. Reemsnyder, First Selectwoman, Town of Old Lyme
Kim Barrows, CZET, Land Use Technician, Town of Old Lyme

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
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Web Site: www.ct.gov/csc

Docket No. 391
232 Shore Road, Old Lyme
New Cingular Wireless PCS, LLC Request to Reopen and Modify the Decision and Order
Staff Report
July 18, 2019

Introduction

On September 23, 2010, the Connecticut Siting Council (Council) issued a Certificate of Environmental Compatibility and Public Need (Certificate) to T-Mobile Northeast, LLC (T-Mobile) for the construction, maintenance and operation of a telecommunications facility at 232 Shore Road, Old Lyme, Connecticut. New Cingular Wireless PCS, LLC (AT&T) and Cellco Partnership d/b/a Verizon Wireless (Cellco) participated as intervenors in the Certificate proceeding. On July 16, 2013, the Council approved the transfer of the Certificate from T-Mobile to Bay Communications II, LLC (Bay). On December 7, 2018, the Council approved the transfer of Certificate from Bay to American Towers, LLC (AT), who is the current Certificate Holder.

The Council's Docket No. 391 Decision and Order (D&O), Condition No. 1 specified that, "The wireless antennas shall be attached to the tower via T-arm mounts."

On May 17, 2019, AT&T submitted a Request to Reopen and Modify the D&O Condition No. 1 to allow for other types of antenna mounts to be used at this facility including, but not limited to, V-Boom mounts thereby increasing opportunities for tower sharing from entities that cannot utilize T-arm mounts with current or future antenna designs.

Background Site Information

Development and Management Plan

On August 26, 2011, the Council approved a Development and Management (D&M) Plan for this facility that included a 110-foot monopole, expandable to 160 feet. The D&M Plan approval included T-Mobile's installation consisting of nine panel antennas on T-arm mounts at a centerline height of approximately 99 feet above ground level (agl); Cellco's installation of 12 panel antennas on T-arm mounts at a centerline height of approximately 89 feet agl; and AT&T's installation of six panel antennas on T-arm mounts at a centerline height of approximately 109 feet agl.

Bay submitted a revised D&M Plan for this facility on or about August 14, 2013 to include enhancements to the wetland buffer area, modify the underground utility route and correct the yield point information for the tower. On August 27, 2013, the Council approved the revision to the D&M Plan.

AT&T submitted a revised D&M Plan filing for its co-location on or about October 22, 2013. In the revised D&M Plan filing, AT&T proposed to install 12 panel antennas and 15 remote radio heads (RRHs) at a centerline height of approximately 109-feet agl. On December 13, 2013, the Council approved this revised D&M Plan filing.

AT&T submitted another revised D&M Plan filing for its co-location on or about March 13, 2015. In this revised D&M Plan filing, AT&T proposed to install six panel antenna and 15 RRHs at a centerline height of approximately 109-feet agl. Also in that filing, AT&T confirmed that the tower construction was completed

in fall 2014, and both Cellco and T-Mobile installed their co-locations on the tower and are both on-air[1]. On April 6, 2015, the Council approved AT&T's latest revision to the D&M Plan. AT&T has not installed antennas on this tower to date.

Request to Reopen and Modify

AT&T's May 17, 2019 Request to Reopen and Modify the D&O seeks to allow the use of V-Boom mounts and other antenna mounting designs to promote tower sharing and enhance existing wireless service, as detailed below:

- The current restrictions on antenna mount designs deter wireless carriers, including AT&T, from utilizing the existing tower site due to the inability of T-arm mounting systems to support the antennas and associated equipment now required by wireless carriers to provide state-of-the-art reliable wireless services;
- A Professional Engineer duly licensed in the State of Connecticut has certified that T-arm mounts would not be structurally adequate to support the AT&T's loading for this site, and thus, AT&T proposes V-Boom mounts; and
- The V-Boom mount system would not be more visually intrusive than a T-arm mount system. Specifically, per the AT&T's photosimulations, the different types of mounting systems would only be visible or noticeable in areas within a roughly 0.2-mile radius.

On May 16, 2019, AT&T notified the Town of Old Lyme and abutting property owners of the Request to Reopen and Modify the D&O.

On May 20, 2019, the Council notified Parties and Intervenors (including the Town of Old Lyme) of the Request to Reopen and Modify the D&O and requested that any submission of comments or statements with respect to whether the Request to Reopen and Modify the D&O should be granted or denied including any request for a hearing be submitted to the Council by close of business on June 20, 2019. No comments were received.

[1] At least one wireless carrier had to be fully operational (i.e. on-air) before January 22, 2015, the deadline for construction based on the latest extension of time granted by the Council.

Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
1	232 Shore Rd	41.2907	-72.28579	497.36 Feet	South-East	318	Year Round

Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
1	232 Shore Rd	41.2907	-72.28579	497.36 Feet	South-East	318	Year Round

DOCKET NO. 391 – American Towers LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut.	Connecticut Siting Council July 18, 2019

Decision and Order

In response to the Connecticut Siting Council's (Council) reopening of the record in this docket on July 18, 2019 to consider whether changed conditions exist that would warrant a modification to the original Decision and Order's Condition 1 eliminating the requirement that wireless antennas be attached to the tower via T-arm mounts, the Council hereby rescinds the Decision and Order in Docket 391 rendered on September 23, 2010 and issues this new Decision and Order for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut.

Unless otherwise approved by the Council, the facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless PCS, LLC, T-Mobile, and Cellco Partnership d/b/a Verizon Wireless and other entities, both public and private. The height of the tower may be extended after the date of this Decision and Order pursuant to regulations of the Federal Communications Commission.

2. The tower and foundation shall be designed to accommodate a tower extension up to 160 feet agl.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Old Lyme for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
    b) construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

4. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

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

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

7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Old Lyme public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.

8. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

9. Any request for extension of the time period referred to in Condition 8 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Old Lyme. Any proposed modifications to this Decision and Order shall likewise be so served.

10. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

11. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

13. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

14. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder\transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder\transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

We hereby direct that a copy of the staff report and modified Decision and Order be served on each person listed in the Service List, dated December 6, 2018, and notice of issuance published in the The Day.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

CERTIFICATE

OF

ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

DOCKET NO. 391

Pursuant to General Statutes § 4-181a(b), the Connecticut Siting Council hereby reissues a Certificate of Environmental Compatibility and Public Need to American Towers LLC for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on July 18, 2019.

By order of the Council,

Melanie A. Bachman, Executive Director

July 18, 2019

STATE OF CONNECTICUT)

ss. New Britain, Connecticut : **July 19, 2019**

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Modified Decision and Order and reissued Certificate of Environmental Compatibility and Public Need by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Melanie A. Bachman
Executive Director
Connecticut Siting Council

I certify that a copy of the Modified Decision and Order and reissued Certificate of Environmental Compatibility and Public Need in Docket No. 391 have been forwarded by Certified First Class Return Receipt Requested mail on July 19, 2019, to all parties and intervenors of record as listed on the attached service list, dated December 6, 2018.

ATTEST:

Lisa Fontaine
Fiscal Administrative Officer
Connecticut Siting Council

LIST OF PARTIES AND INTERVENORS
SERVICE LIST

Status Granted	Document Service	Status Holder (name, address & phone number)	Representative (name, address & phone number)
Certificate Transfer *(granted on Dec. 6, 2018)*	☒ E-Mail	American Towers LLC	Gregory Mercier, Esq. American Tower Corporation 10 Presidential Way Woburn, MA 01801 (781) 926-4712 Greg.mercier@americantower.com
Certificate Transfer *(granted on July 11, 2013)*	☒ U.S. Mail	Bay Communications II LLC	James R. Riley, Manager 391 Oakland Street, Second Floor Mansfield, MA 02048 Office: (774) 719-2146 Fax: (774) 719-2135 jriley@baycommunicationsllc.com
Applicant	☒ U.S. Mail	T-Mobile Northeast, LLC	Monte E. Frank, Esq. Cohen and Wolf, P.C. 1115 Broad Street Bridgeport, CT 06604 (203) 368-0211 (203) 394-9901 fax mfrank@cohenandwolf.com
Intervenor *(granted on December 18, 2009)*	☒ U.S. Mail	Cellco Partnership d/b/a Verizon Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597 (860) 275-8200 (860) 275-8299 fax kbaldwin@rc.com
Intervenor *(granted on December 18, 2009)*	☒ U.S. Mail	New Cingular Wireless PCS, LLC (AT&T)	Christopher B Fisher, Esq. Daniel M. Laub, Esq. Cuddy & Feder LLP 445 Hamilton Avenue, 14th Floor White Plains, NY 10601 (914) 761-1300 (914) 761-5372 fax cfisher@cuddyfeder.com dlaub@cuddyfeder.com

LIST OF PARTIES AND INTERVENORS
SERVICE LIST

Status Granted	Document Service	Status Holder (name, address & phone number)	Representative (name, address & phone number)
Party *(granted on December 18, 2009)*	☒ U.S. Mail	Town of Old Lyme	The Honorable Timothy C. Griswold Office of the Selectmen Town of Old Lyme 52 Lyme Street Old Lyme, CT 06371 firstselectman@oldlyme-ct.gov

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

July 19, 2019

TO: Classified/Legal Supervisor (legal@theday.com)
39120190718
The Day Publishing Company
P. O. Box 1231
New London, CT 06320-1231

FROM: Lisa Fontaine, Fiscal Administrative Officer

RE: **DOCKET NO. 391** - American Towers LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut.

Please publish the attached legal notice for one day on the first day possible from receipt of this notice.

Please send an affidavit of publication and invoice to my attention.

Thank you.

MP/laf

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

NOTICE

Pursuant to General Statutes § 4-181a(b), the Connecticut Siting Council (Council) announces that, on July 18, 2019, the Council modified the Decision and Order in Docket 391, dated September 23, 2010, and reissued the Certificate of Environmental Compatibility and Public Need, thereby eliminating the requirement that wireless antennas be attached to the tower via T-arm mounts in DOCKET NO. 391 - American Towers LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut. This record is available for public inspection in the Council's office, Ten Franklin Square, New Britain, Connecticut.