EMPIRE telecom

June 9, 2017

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Street
New Britain, CT 06051

Regarding:	Notice of Exempt Modification – Swap Antennas &
Property Address:	2 Huckleberry Hill Road Brookfield, CT 06804
AT&T Site:	CT5075

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 60-foot flagpole at the above-referenced address, latitude 41.452591900, longitude -73.403898900. Said self-support is owned by American Tower Corporation. The existing equipment area is approximately 11' x 17' totaling 187 square feet.

AT&T desires to modify its existing telecommunications facility by swapping three antennas, swapping (3) TMAs, adding (3) TMAS and adding (3) remote radio heads ("RRHs"). The centerline height of said antennas is and will remain at 57 feet. Antennas are mounted within the canister.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to First Selectman of Brookfield Stephen C. Dunn, as well as to Alice Dew, Land Use Manager. A copy of this letter is also being sent to the flagpole and property owner the Regional YMCA of Western Connecticut and Eastern Putnam County, Inc.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The antennas to be swapped will be installed at the existing height of 57 feet on the 60-foot flagpole.

2. The proposed modifications will not involve any changes to ground-mounted equipment, and therefore will not require an extension of the site boundary.

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

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (attached) for AT&T's modified facility is herein provided.

5. The proposed modifications will not case a change or alteration in the physical or environmental characteristics of the site.

6. The flagpole and its foundation can support AT&T's proposed modifications (please see attached structural analysis completed by Centek Engineering, Inc. dated May 11, 2017).

For the foregoing reasons, AT&T respectfully requests that the proposed installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Sarah Snell

Sarah Snell
Site Acquisition Specialist

cc: Stephen C. Dunn, First Selectman of Brookfield (municipality)
Alice Dew, Land Use Manager Town of Brookfield
Regional YMCA of Western Connecticut and Eastern Putnam County, Inc. (land and flagpole owner)

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E: ssnell@empiretelecomm.com

TOWN OF BROOKFIELD CONNECTICUT

GIS & Real Property Information

100 Pocono Road
Brookfield, CT 06804

Property Search

Name: ex. Smith

House No:
2

Street:
HUCKLEBERRY HILL RD

Parcel Id: ex. 64-216

GO

Information Updates

GIS Parcel Maps Updated
October 2015

Property Info Data Updated
Weekly

Current Parcel Count
6,115 +/-

Detailed Parcel Information

GIS ID
D12030

Parcel ID
D12030

Unique ID
2590

Owner
REGIONAL YOUNG MENS CHRISTIAN

Location
2 HUCKLEBERRY HILL RD

MAILING ADDRESS
2 HUCKLEBERRY HILL RD
BROOKFIELD CT 06804

Quick Links: Quick Map Property Card Assessor Map FEMA Panel

Scroll Down For Complete Property Detail

PARCEL VALUATIONS

	Appraised Value	Assessed Value
Buildings	3737110	2615980
Land	1196500	837550

Town of Brookfield, CT Assessors Map

MAP DISCLAIMER-NOTICE OF LIABILITY
This map is for assessment purposes only. It is not for legal description or conveyances.
All information should be verified by the end user. The Town of Brookfield and its mapping contractors assume no legal responsibility for the information contained herein.
All effort has gone into creating an accurate product utilizing the existing sources but all data should be verified by a surveyor prior to making determinations.

2 Huckleberry Hill Rd.

Brookfield Town Line	Town Road	<all other values>	BUILDING	POOL	RECREATION	UNFORESTED	BENCH; BOARDWALK	RAILROAD	<all other values>	FIRE_HYDRANT	TREE_CONIFER
Brookfield Parcels	State Highway	BRIDGE	CONSTRUCTION	TRAIL	BEACH	WATER	DOCK_PIER	STONEWALL	ANTENNA; CELL_TOWER; FLAGPOLE	LIGHT_POLE; UTPOLE_LIGHT	TREE_DECIDUOUS
Private Road	Federal Highway	PAVED AREA	BLEACHERS	PATIO	DAM, STRUCTURE	FORESTED WATER	FENCE; RETAINING_WALL; WALL; RIPRAP	TRAIL	MANHOLE	UTILITY_POLE	
		UNPAVED AREA	DECK	AGRICULTURE	FORESTED	FORESTED WETLAND	GUIDERAIL; GUIDERAIL_DOUBLE; HEADWALL; JERSEY_BARRIER	WATER_LAKE; WATER_RIVER; WATER_STREAM	CROSS_COUNTRY_POLE; TRANSMISSION_TOWER		
						UNFORESTED WETLAND	PAVED_DRAIN; PIPELINE				

Map Number: D12

100 50 0 100 200 Feet

Sharlow Technology Group
860-778-8963

WIRELESS COMMUNICATIONS FACILITY
CT5075 - LTE 2C
BROOKFIELD WEST
2 HUCKLEBERRY HILL ROAD
BROOKFIELD, CT 06804

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

   A. REMOVE AND REPLACE EXISTING POSITION 1 ANTENNA FOR (3) NEW PROPOSED 12-PORT ANTENNA, (1) PER SECTOR.
   B. INSTALL (6) NEW RRUS-12'S ON NEW SUPPORT FRAME WITHIN EXISTING COMPOUND.
   C. REMOVE (3) EXISTING TMA'S FOR (6) NEW TMA'S.
   D. INSTALL (18) NEW SURGE ARRESTORS WITHIN EXISTING COMPOUND
   E. REMOVE EXISTING DIPLEXERS WITHIN EXISTING COMPOUND FOR (12) NEW PENTAPLEXERS.
   F. DECOMMISSION EXISTING UMTS CABINET WITHIN EXISTING COMPOUND
   G. DECOMMISSION EXISTING RXAIT CABINET WITHIN EXISTING COMPOUND
   H. REMOVE AND REPLACE EXISTING DUL FOR NEW DUS41 AND INSTALL NEW XMU UNIT.
   I. REMOVE (3) EXISTING RRUS-11'S WITHIN EXISTING COMPOUND
   J. REMOVE AND REPLACE EXISTING DC6 BOX WITHIN EXISTING COMPOUND FOR (1) NEW DC12 BOX.
   K. REMOVE AND REPLACE EXISTING CANISTER WITH A NEW ±3'ø CANISTER TO ACCOMMODATE PROPOSED 12-PORT ANTENNAS. (BY OTHERS)

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5075
AT&T SITE NAME:	BROOKFIELD WEST
SITE ADDRESS:	2 HUCKLEBERRY HILL ROAD BROOKFIELD, CT 06804
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-27'-08.67" N LONGITUDE: 73°-24'-14.39" W GROUND ELEVATION: ±379' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

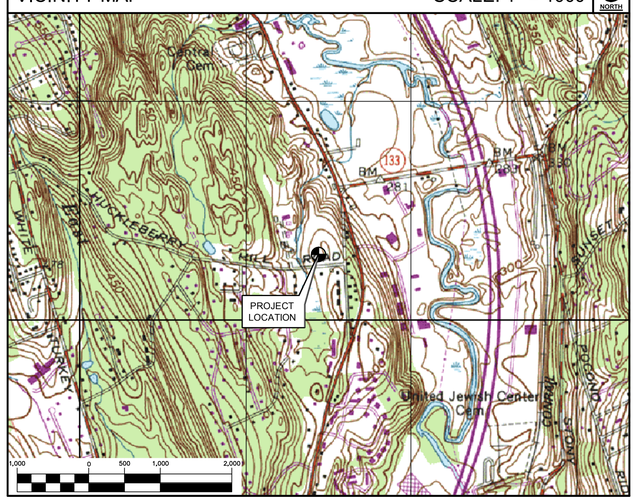
FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT
TO: 2 HUCKLEBERRY HILL ROAD, BROOKFIELD, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.36 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.30 MI
4.	TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN	9.06 MI
5.	MERGE ONTO I-691 W via EXIT 18 TOWARD MERIDEN/WATERBURY	7.98 MI
6.	MERGE ONTO I-84 W via EXIT 1 ON THE LEFT TOWARD WATERBURY/DANBURY	33.12 MI
7.	MERGE ONTO US-7 N/US-202 E via EXIT 7 TOWARD BROOKFIELD/NEW MILFORD	0.90 MI
8.	TAKE THE US-202 E EXIT, EXIT 11, TOWARD FEDERAL RD	0.25 MI
9.	TURN LEFT ONTO US-202 E/WHITE TURKEY RD	0.24 MI
10.	TURN RIGHT ONTO US-202 E/FEDERAL RD	1.19 MI
11.	TURN SLIGHT LEFT ONTO OLD NEW MILFORD RD.	0.22 MI
12.	TAKE THE 1ST LEFT ONTO HUCKLEBERRY HILL RD	0.03 MI
13.	2 HUCKLEBERRY HILL RD IS ON THE RIGHT	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



SHEET INDEX

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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	05/12/17	KAWJR	CAG	PRELIMINARY CDs - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
BROOKFIELD WEST
CT5075 - LTE 2C
2 HUCKLEBERRY HILL ROAD
BROOKFIELD, CT 06804

DATE: 04/18/17
SCALE: AS NOTED
JOB NO. 17004.21

TITLE SHEET

T-1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90–110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325–N
   G. U–BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:

   A. SHERWIN WILLIAMS POLANE–B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.

2. COAXIAL CABLES:

   A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH–PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON–PETROLEUM–BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

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NOTES, SPECIFICATIONS AND DETAILS

N–1

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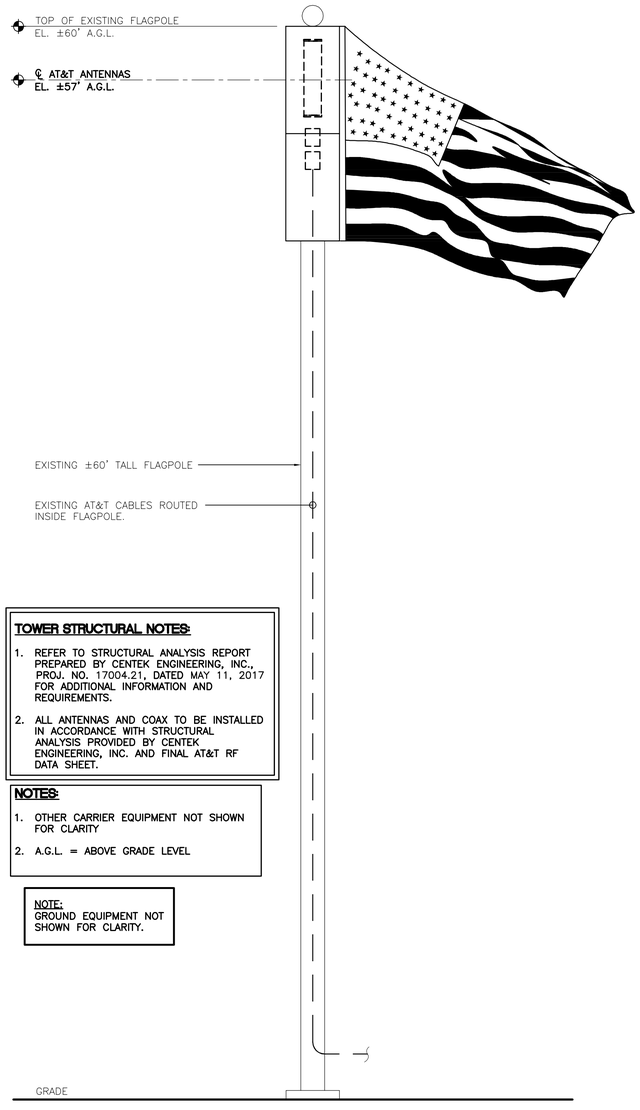


TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 17004.21, DATED MAY 11, 2017 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL AT&T RF DATA SHEET.

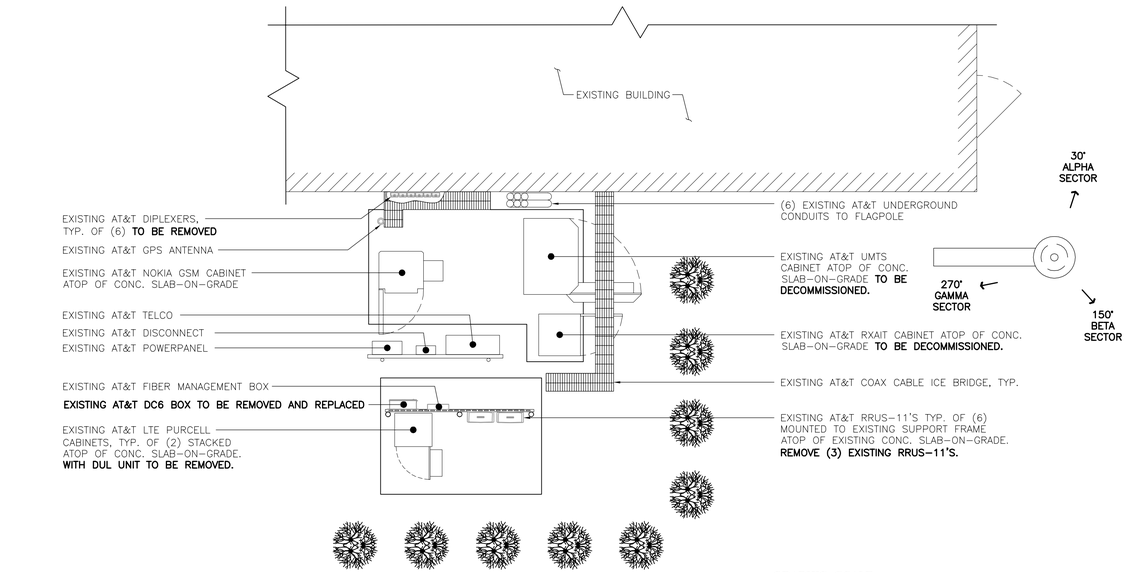
NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

3 / C-1 **TOWER ELEVATION**
SCALE: 1/4" = 1'-0"

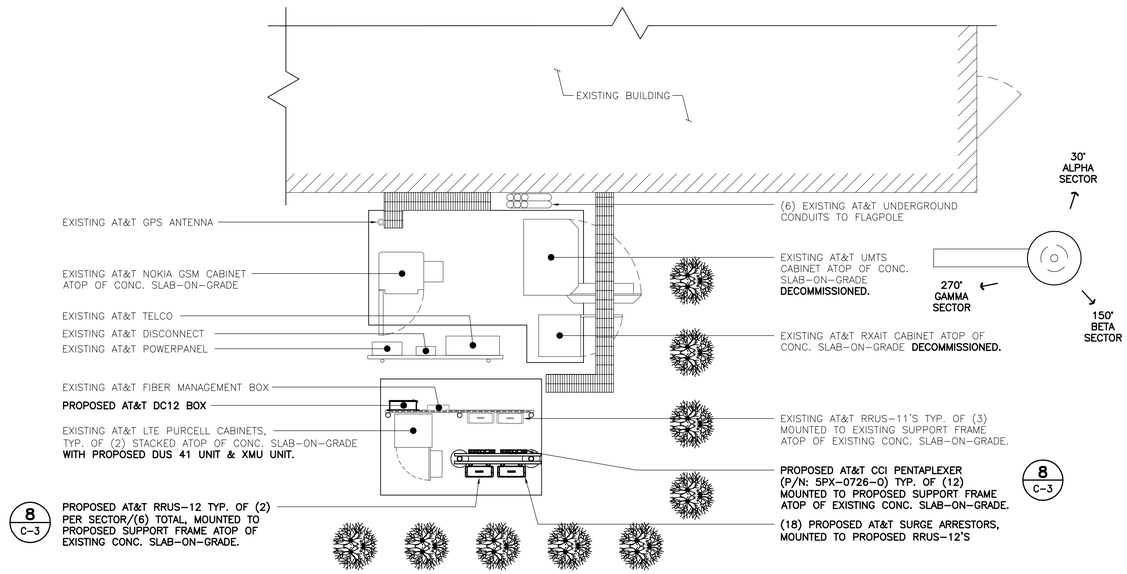
GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.



1 / C-1 **EXISTING COMPOUND PLAN**
SCALE: 1/4" = 1'-0"

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.



2 / C-1 **PROPOSED COMPOUND PLAN**
SCALE: 1/4" = 1'-0"

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.

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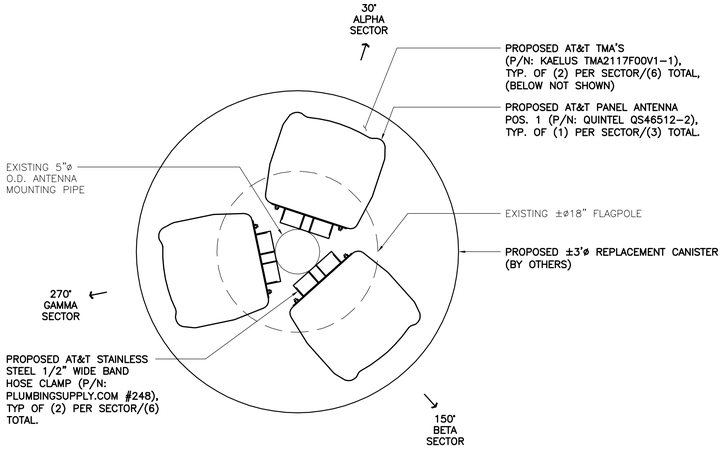
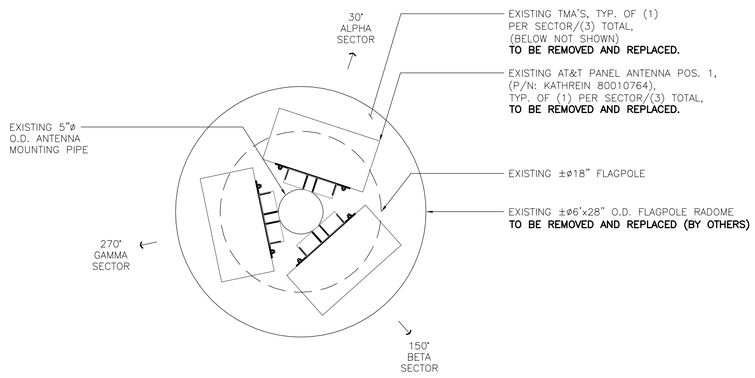
PLANS AND ELEVATION

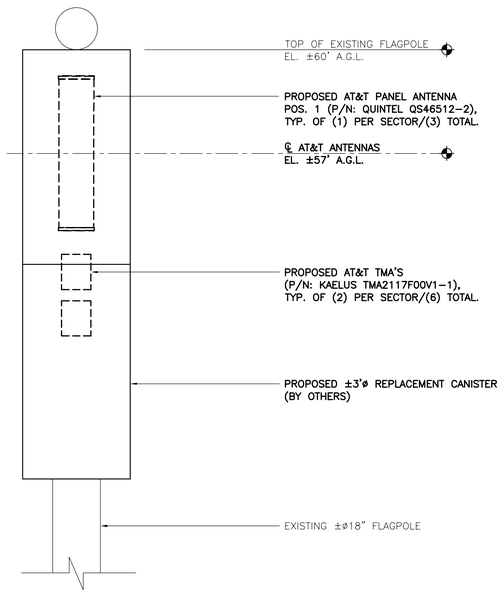
C-1
Sheet No. 3 of 8



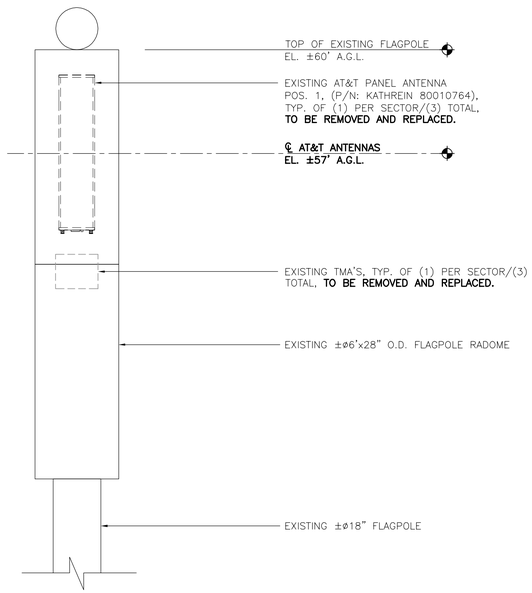
2 C-2 **PROPOSED ANTENNA PLAN**
SCALE: 1 1/2" = 1'-0"
NORTH



1 C-2 **EXISTING ANTENNA PLAN**
SCALE: 1 1/2" = 1'-0"
NORTH



4 C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 1/2" = 1'-0"



3 C-2 **EXISTING ANTENNA ELEVATION**
SCALE: 1/2" = 1'-0"

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LTE 2C
EQUIPMENT
DETAILS

C-2

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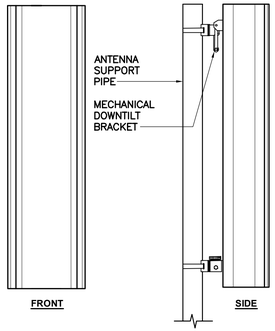


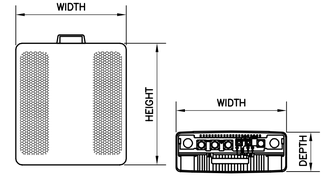
QUINTEL BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS46512-2	52"L x 12"W x 10.8"D	75 LBS.

1 / C-3 **PROPOSED ANTENNA DETAIL**
SCALE: 1/2" = 1'-0"

SURGE ARESSTOR		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: APTDC-BDFDM-DB	3.46"H x 3.46"W x 1.65"D	1.32 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.		

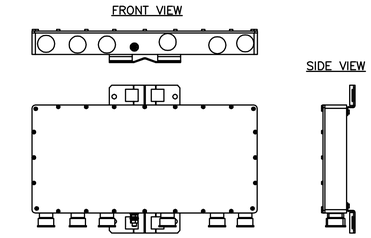
2 / C-3 **COMMSCOPE APTDC-BDFDM-DB DETAIL**
SCALE: NOT TO SCALE



FRONT VIEW BOTTOM VIEW

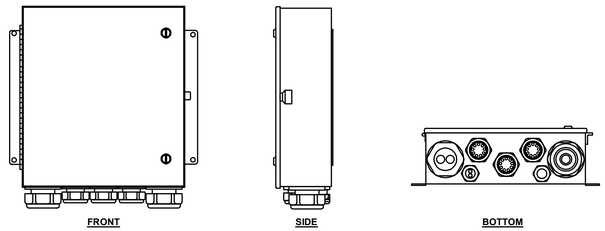
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 / C-3 **ERICSSON RRUS 12 DETAIL**
SCALE: 1" = 1'-0"



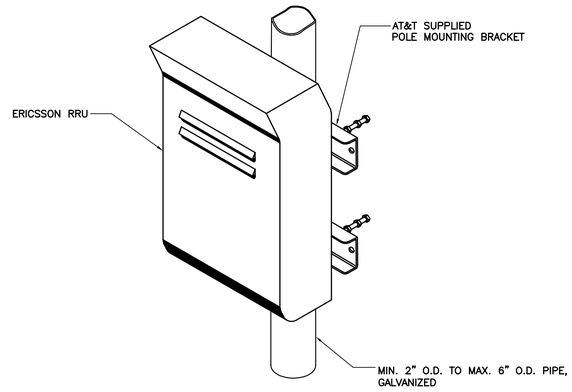
PENTAPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: 5PX-0726-O	11.44"H x 17.44"W x 1.95"D	15.6 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.		

4 / C-3 **PENTAPLEXER DETAIL**
SCALE: NONE



SURGE ARRESTOR			
ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
MAKE: RAYCAP MODEL: DC12-48-60-O-25E	ONE (1)	EXISTING COMPOUND	56.3 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING. 2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.			

5 / C-3 **SURGE ARRESTOR DETAIL**
NOT TO SCALE

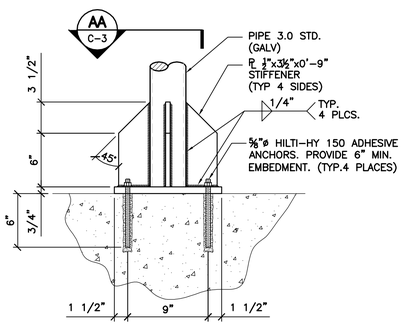


ISOMETRIC VIEW

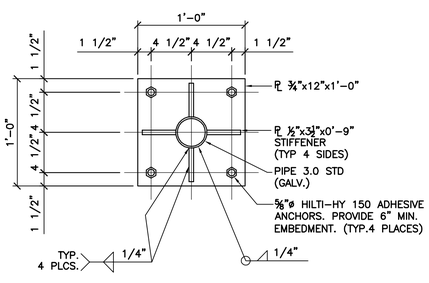
NOTES:

1. AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

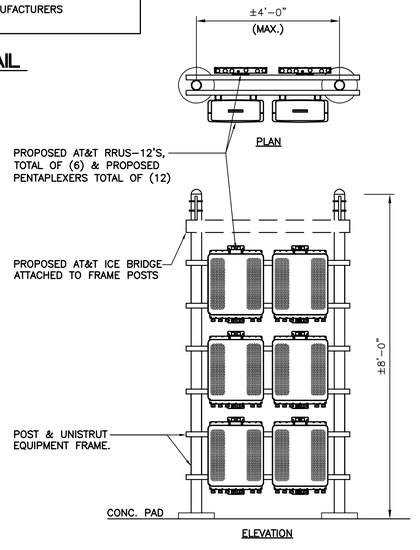
6 / C-3 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NTS



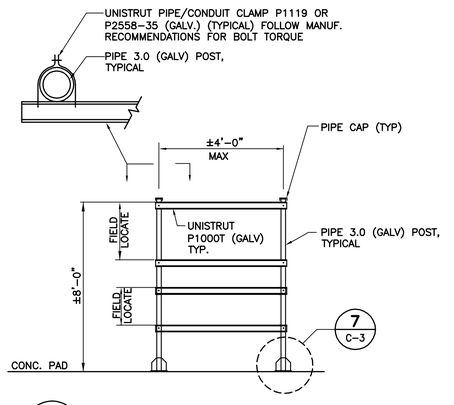
7 / C-3 **FRAME TO CONCRETE CONNECTION DETAIL**
NOT TO SCALE



AA / C-3 **FRAME BASE PLATE PLAN DETAIL**
NOT TO SCALE



8 / C-3 **EQUIPMENT MOUNTING FRAME DETAIL**
NOT TO SCALE



9 / C-3 **EQUIPMENT MOUNTING FRAME DETAIL**
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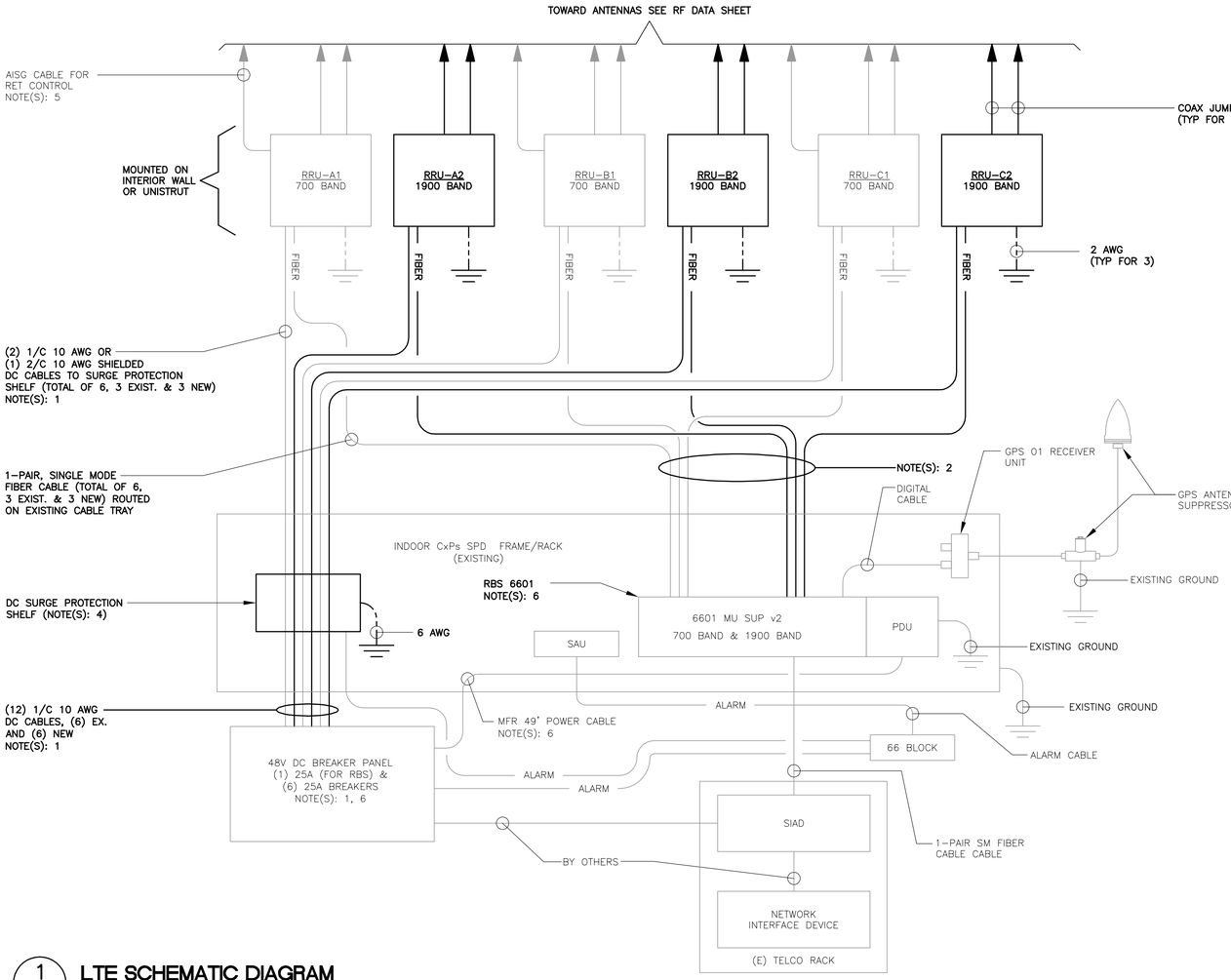
LTE 2C EQUIPMENT DETAILS

C-3

Sheet No. 5 of 8



1 E-1

LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE II) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

   TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

   THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

   1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
   2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
   3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

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at&t

EMPIRE telecom

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Centered on Solutions℠
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(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

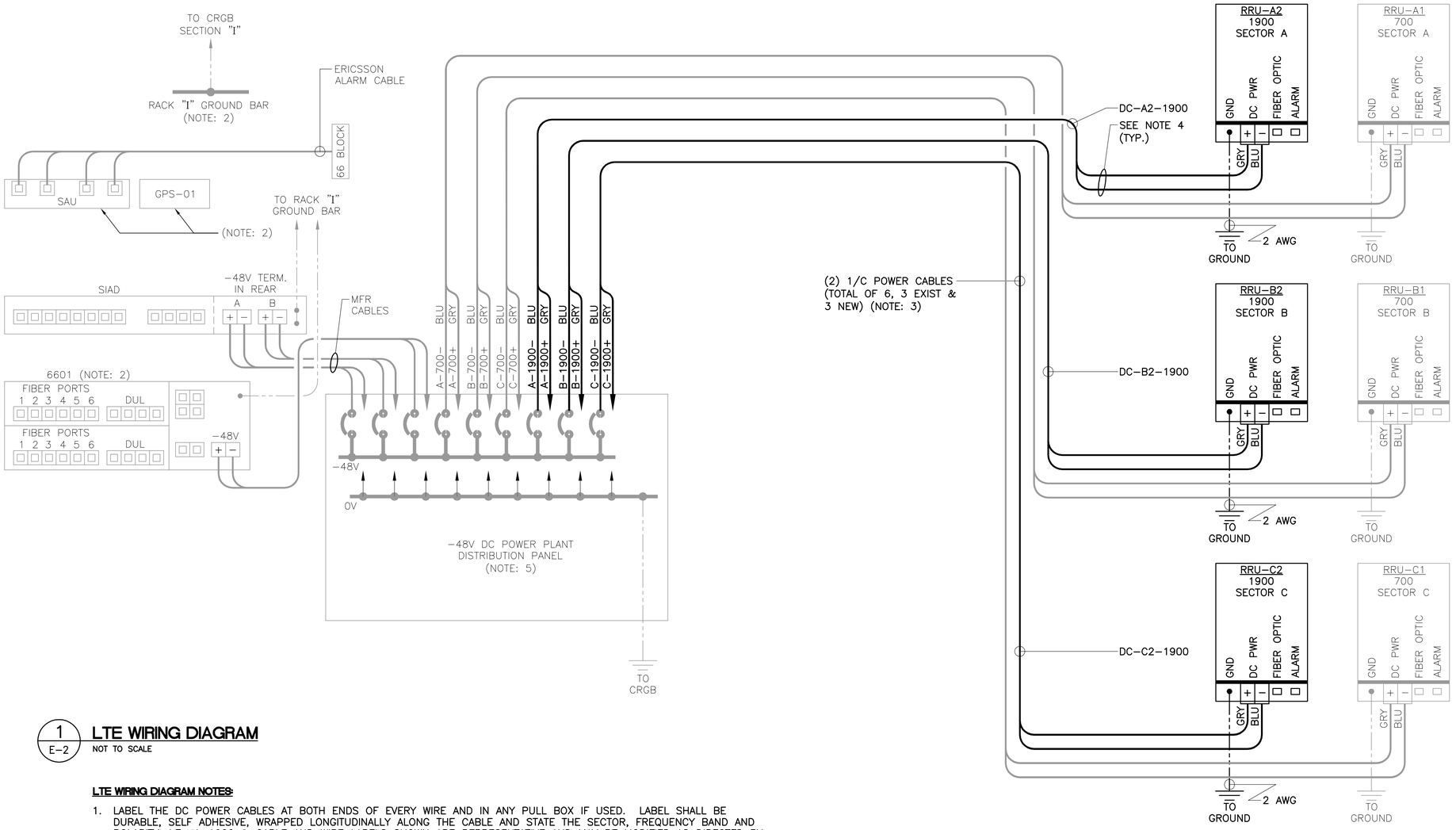
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
BROOKFIELD WEST
CT5075 - LTE 2C
2 HUCKLEBERRY HILL ROAD
BROOKFIELD, CT 06804

DATE:	04/18/17
SCALE:	AS NOTED
JOB NO.	17004.21

LTE SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 6 of 8



1/E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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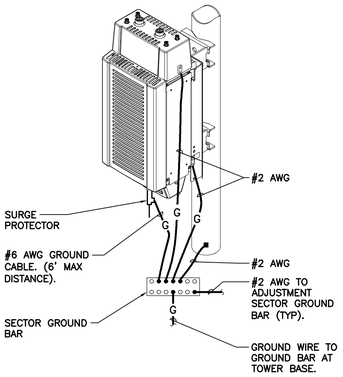
LTE WIRING DIAGRAM

E-2

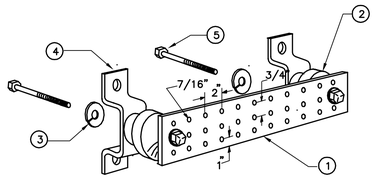
Sheet No. 7 of 8

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



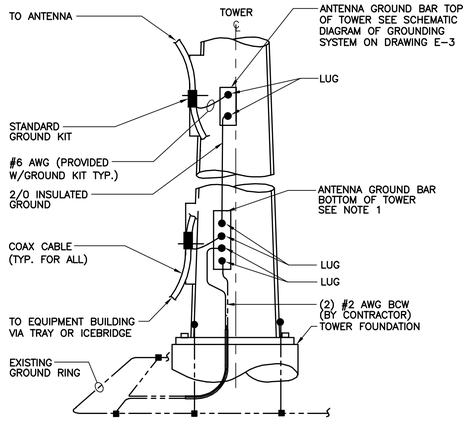
4 E-3 **RRU POLE MOUNT GROUNDING**
NOT TO SCALE



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

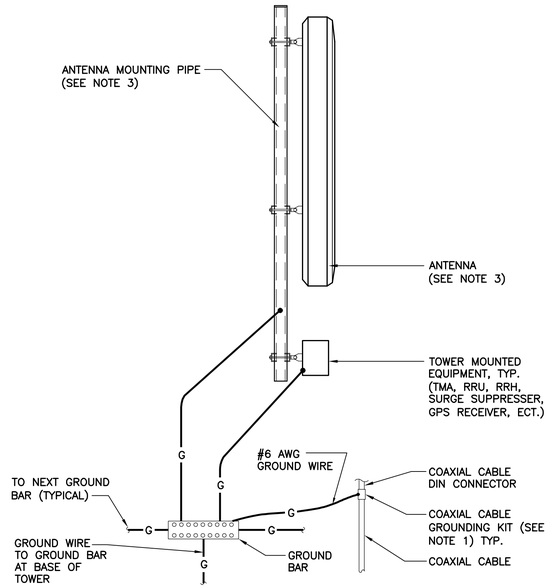
3 E-3 **GROUND BAR DETAIL**
NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

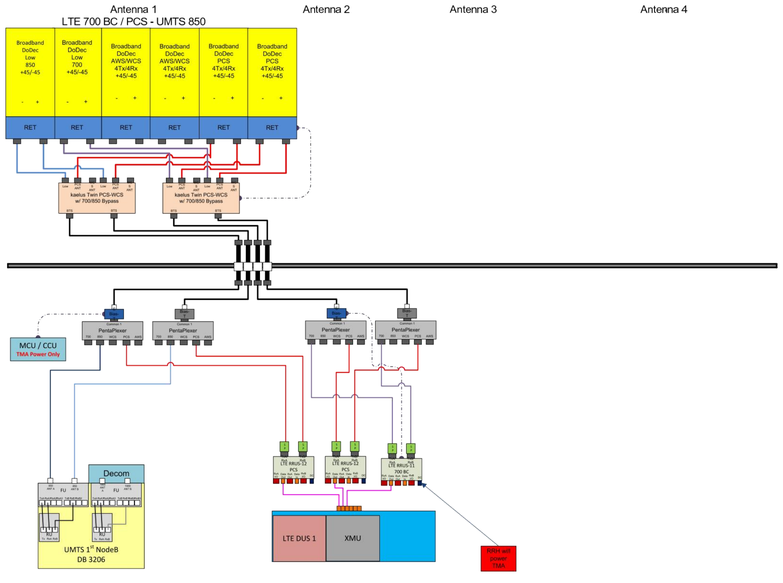
2 E-3 **ANTENNA CABLE GROUNDING - TOWER**
NOT TO SCALE



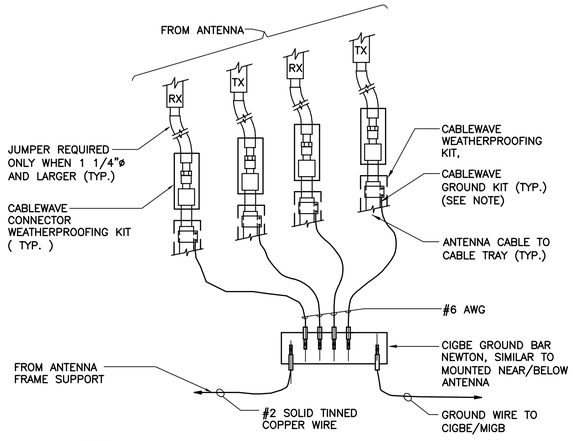
NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 E-3 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



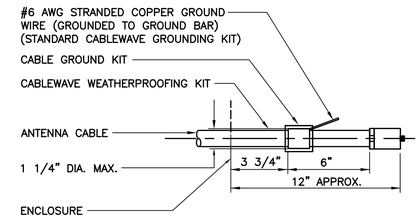
7 E-3 **RF PLUMBING DIAGRAM**
NOT TO SCALE



NOTE:

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

6 E-3 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE



NOTE:

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

5 E-3 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

60-ft Existing Flagpole

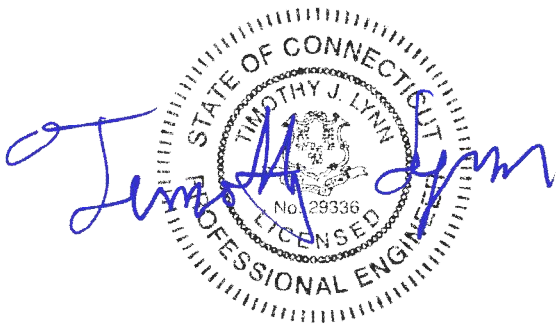
AT&T Mobility – LTE 2C

AT&T Site Ref: CT5075
Brookfield West

2 Huckleberry Hill Road
Brookfield, CT

Centek Project No. 17004.21

Date: May 11, 2017



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T Mobility on the existing flagpole (tower) located in Brookfield, Connecticut.

The host tower is a 48-ft tall, one-section, eighteen sided, flagpole, originally designed Paul J. Ford and Co.; project no. 29203-152 dated June 6, 2001 and manufactured by PennSummit Tubular project no. 20183. The tower geometry, structure member sizes and foundation system information were obtained from a previous structural analysis report prepared by Davinci Engineering Inc. job no. 08242-1273 dated June 18, 2008.

Antenna and appurtenance information were obtained from an AT&T RF data sheet.

The tower is made up of one (1) vertical pole section and two (2) 6-ft tall x 28" diameter concealment sections. The diameter of the pole (flat-flat) is 18-in at the top and 18-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- AT&T (EXISTING TO REMAIN):
  Cables: Twelve (12) 1-5/8" ∅ coax cables running on the interior of the existing flagpole.
- AT&T (EXISTING TO REMOVE):
  Antennas: Three (3) Kathrein 800-10764 panel antennas mounted within the existing concealment canister with a RAD center elevation of 57-ft. Three (3) CCI DTMABP7819VG12A TMAs mounted within the existing concealment canister with a RAD center elevation of 51-ft.
- **AT&T (Proposed):**
  Antennas: Three (3) Qunitel QS46512-2 panel antennas mounted within a proposed 36"∅ x 6-ft tall concealment canister with a RAD center elevation of 57-ft. Six (6) Kaelus TMA2117F00V1-1 TMAs mounted within a proposed 36"∅ x 6-ft tall concealment canister concealment canister with a RAD center elevation of 51-ft.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing flagpole was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield County; v = 90-110 mph	*[Annex B of TIA-222-G-2005]*
	Brookfield; v = 93 mph	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 93 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **38.6%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L1)	0.00'-48.00'	38.6%	**PASS**

Foundation and Anchors

The existing foundation consists of a 4 ∅ x 15.5-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from the the aforementioned DaVinci structural report dated June 18, 2008. The base of the tower is connected to the foundation by means of (4) 2.25"∅, ASTM A615-75 anchor bolts embedded into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	3 kips
	Compression	6 kips
	Moment	105 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	11.1%	**PASS**
	Lateral Deflection	0.13 in.	**PASS**

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	22.2%	**PASS**
Base Plate	Bending	36.7%	**PASS**

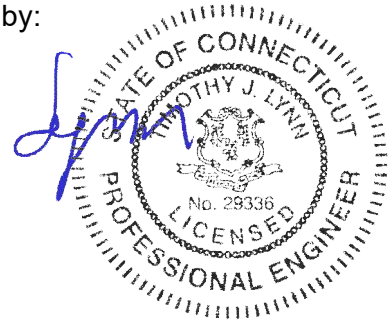
C o n c l u s i o n

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

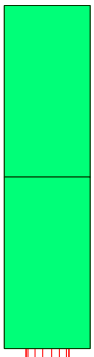
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

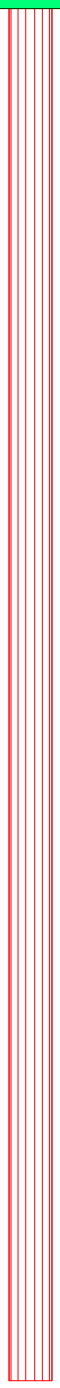
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



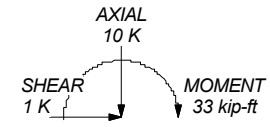
48.0 ft



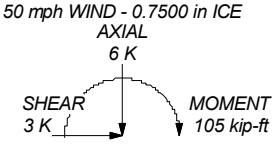
0.0 ft

Section	1
Length (ft)	48.00
Number of Sides	18
Thickness (in)	0.1875
Top Dia (in)	18.0000
Bot Dia (in)	18.0000
Grade	A607-65
Weight (K)	1.7

ALL REACTIONS ARE FACTORED



50 mph WIND - 0.7500 in ICE



REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12'x18' Flag	58	36" diameter x 6-ft Concealment	51
36" diameter x 6-ft Concealment	57	(2) TMA2117F00V1-1 (AT⌶ Porposed)	51
QS46512-2 (AT⌶ Porposed)	57	(2) TMA2117F00V1-1 (AT⌶ Porposed)	51
QS46512-2 (AT⌶ Porposed)	57	(2) TMA2117F00V1-1 (AT⌶ Porposed)	51
QS46512-2 (AT⌶ Porposed)	57		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 38.6%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **17004.21 - CT5075 Brookfield West**			
Project: **60-ft Flagpole - 2 Huckleberry Hill Road Brookfield, CT**			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/11/17	Scale: NTS	
Path: J:\Jobs\1700400.W\21_Brookfield West CT5075\04_Structural\Backup Documentation\ER Rlesi60' Flagpole Brookfield_CT.eri		Dwg No. E-1	

Tower Input Data

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

Basic wind speed of 93 mph.
Structure Class 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.
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				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	48.00-0.00	48.00		18	18.0000	18.0000	0.1875	0.7500	A607-65 (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	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136

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 48.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8 (AT&T Existing)	C	No	Inside Pole	48.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	48.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.60

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	48.00-0.00	A	1.459	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.60

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	48.00-0.00	0.0000	0.0000	0.0000	0.0000

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 ft	Vert ft	ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
36" diameter x 6-ft Concealment	C	None				0.0000	57.00	No Ice	9.00	9.00	1.00
								1/2" Ice	13.13	13.13	1.17
								1" Ice	13.67	13.67	1.34
36" diameter x 6-ft Concealment	C	None				0.0000	51.00	No Ice	9.00	9.00	1.00
								1/2" Ice	13.13	13.13	1.17
								1" Ice	13.67	13.67	1.34
12'x18' Flag	C	None				0.0000	58.00	No Ice	8.46	8.46	0.10
								1/2" Ice	8.46	8.46	0.20
								1" Ice	8.46	8.46	0.30
QS46512-2 (AT&T Porposed)	A	From Face	1.00	0.00	0.00	0.0000	57.00	No Ice	0.00	0.00	0.08
								1/2" Ice	0.00	0.00	0.12
								1" Ice	0.00	0.00	0.17
QS46512-2 (AT&T Porposed)	B	From Face	1.00	0.00	0.00	0.0000	57.00	No Ice	0.00	0.00	0.08
								1/2" Ice	0.00	0.00	0.12
								1" Ice	0.00	0.00	0.17
QS46512-2 (AT&T Porposed)	C	From Face	1.00	0.00	0.00	0.0000	57.00	No Ice	0.00	0.00	0.08
								1/2" Ice	0.00	0.00	0.12
								1" Ice	0.00	0.00	0.17
(2) TMA2117F00V1-1 (AT&T Porposed)	A	From Face	1.00	0.00	0.00	0.0000	51.00	No Ice	0.00	0.00	0.02
								1/2" Ice	0.00	0.00	0.02
								1" Ice	0.00	0.00	0.03
(2) TMA2117F00V1-1 (AT&T Porposed)	B	From Face	1.00	0.00	0.00	0.0000	51.00	No Ice	0.00	0.00	0.02
								1/2" Ice	0.00	0.00	0.02
								1" Ice	0.00	0.00	0.03
(2) TMA2117F00V1-1 (AT&T Porposed)	C	From Face	1.00	0.00	0.00	0.0000	51.00	No Ice	0.00	0.00	0.02
								1/2" Ice	0.00	0.00	0.02
								1" Ice	0.00	0.00	0.03

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

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 48.00-0.00	25.09	0.946	20	73.111	A	0.000	73.111	73.111	100.00	0.000	0.000
					B	0.000	73.111		100.00	0.000	0.000
					C	0.000	73.111		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 48.00-0.00	25.09	0.946	6	1.4595	84.787	A	0.000	84.787	84.787	100.00	0.000	0.000
						B	0.000	84.787		100.00	0.000	0.000
						C	0.000	84.787		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 48.00-0.00	25.09	0.946	7	73.111	A	0.000	73.111	73.111	100.00	0.000	0.000
					B	0.000	73.111		100.00	0.000	0.000
					C	0.000	73.111		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	20	1	1	73.111	1.03	21.43	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	25.81 kip-ft	1.03		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	20	1	1	73.111	1.03	21.43	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	25.81 kip-ft	1.03		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	20	1	1	73.111	1.03	21.43	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	25.81 kip-ft	1.03		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	3.41	A	1	1.2	6	1	1	84.787	0.64	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	0.60	3.41						OTM	15.97 kip-ft	0.64		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	3.41	A	1	1.2	6	1	1	84.787	0.64	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	0.60	3.41						OTM	15.97 kip-ft	0.64		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	3.41	A	1	1.2	6	1	1	84.787	0.64	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	0.60	3.41						OTM	15.97 kip-ft	0.64		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	7	1	1	73.111	0.38	7.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	9.61 kip-ft	0.38		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	7	1	1	73.111	0.38	7.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	9.61 kip-ft	0.38		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 48.00-0.00	0.60	1.73	A	1	0.65	7	1	1	73.111	0.38	7.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	0.60	1.73						OTM	9.61 kip-ft	0.38		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	1.73					
Bracing Weight	0.00					
Total Member Self-Weight	1.73			0.00	0.00	
Total Weight	4.79			0.00	0.00	
Wind 0 deg - No Ice		0.00	-1.71	-63.63	0.00	0.00
Wind 30 deg - No Ice		0.86	-1.48	-55.11	-31.82	0.00
Wind 60 deg - No Ice		1.48	-0.86	-31.82	-55.11	0.00
Wind 90 deg - No Ice		1.71	0.00	0.00	-63.63	0.00
Wind 120 deg - No Ice		1.48	0.86	31.82	-55.11	0.00
Wind 150 deg - No Ice		0.86	1.48	55.11	-31.82	0.00
Wind 180 deg - No Ice		0.00	1.71	63.63	0.00	0.00
Wind 210 deg - No Ice		-0.86	1.48	55.11	31.82	0.00
Wind 240 deg - No Ice		-1.48	0.86	31.82	55.11	0.00
Wind 270 deg - No Ice		-1.71	0.00	0.00	63.63	0.00
Wind 300 deg - No Ice		-1.48	-0.86	-31.82	55.11	0.00
Wind 330 deg - No Ice		-0.86	-1.48	-55.11	31.82	0.00
Member Ice	1.68					
Total Weight Ice	8.55			0.00	0.00	
Wind 0 deg - Ice		0.00	-0.91	-31.17	0.00	0.00
Wind 30 deg - Ice		0.46	-0.79	-26.99	-15.58	0.00
Wind 60 deg - Ice		0.79	-0.46	-15.58	-26.99	0.00
Wind 90 deg - Ice		0.91	0.00	0.00	-31.17	0.00
Wind 120 deg - Ice		0.79	0.46	15.58	-26.99	0.00
Wind 150 deg - Ice		0.46	0.79	26.99	-15.58	0.00
Wind 180 deg - Ice		0.00	0.91	31.17	0.00	0.00
Wind 210 deg - Ice		-0.46	0.79	26.99	15.58	0.00
Wind 240 deg - Ice		-0.79	0.46	15.58	26.99	0.00
Wind 270 deg - Ice		-0.91	0.00	0.00	31.17	0.00
Wind 300 deg - Ice		-0.79	-0.46	-15.58	26.99	0.00
Wind 330 deg - Ice		-0.46	-0.79	-26.99	15.58	0.00
Total Weight	4.79			0.00	0.00	
Wind 0 deg - Service		0.00	-0.64	-23.70	0.00	0.00
Wind 30 deg - Service		0.32	-0.55	-20.52	-11.85	0.00
Wind 60 deg - Service		0.55	-0.32	-11.85	-20.52	0.00
Wind 90 deg - Service		0.64	0.00	0.00	-23.70	0.00
Wind 120 deg - Service		0.55	0.32	11.85	-20.52	0.00
Wind 150 deg - Service		0.32	0.55	20.52	-11.85	0.00
Wind 180 deg - Service		0.00	0.64	23.70	0.00	0.00
Wind 210 deg - Service		-0.32	0.55	20.52	11.85	0.00
Wind 240 deg - Service		-0.55	0.32	11.85	20.52	0.00
Wind 270 deg - Service		-0.64	0.00	0.00	23.70	0.00
Wind 300 deg - Service		-0.55	-0.32	-11.85	20.52	0.00
Wind 330 deg - Service		-0.32	-0.55	-20.52	11.85	0.00

Load Combinations

Comb. No.	Description

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	48 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.50	0.00	0.00
			Max. Mx	8	-5.74	-105.40	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-5.74	0.00	105.40
			Max. Vy	8	2.75	-105.40	0.00
			Max. Vx	2	-2.75	0.00	105.40
			Max. Torque	4			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	9.50	0.00	0.91
	Max. H_x	21	4.31	2.74	0.00
	Max. H_z	3	4.31	0.00	2.74
	Max. M_x	2	105.40	0.00	2.74
	Max. M_z	8	105.40	-2.74	0.00
	Max. Torsion	12	0.00	-1.37	-2.37
	Min. Vert	5	4.31	-1.37	2.37
	Min. H_x	9	4.31	-2.74	0.00
	Min. H_z	15	4.31	0.00	-2.74
	Min. M_x	14	-105.40	0.00	-2.74
	Min. M_z	20	-105.40	2.74	0.00
	Min. Torsion	4	-0.00	-1.37	2.37

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	4.79	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	5.75	0.00	-2.74	-105.40	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	4.31	0.00	-2.74	-104.47	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	5.75	1.37	-2.37	-91.27	-52.70	0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	4.31	1.37	-2.37	-90.47	-52.23	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	5.75	2.37	-1.37	-52.70	-91.27	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	4.31	2.37	-1.37	-52.23	-90.47	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	5.75	2.74	0.00	0.00	-105.40	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	4.31	2.74	0.00	0.00	-104.47	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	5.75	2.37	1.37	52.70	-91.27	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	4.31	2.37	1.37	52.23	-90.47	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	5.75	1.37	2.37	91.27	-52.70	-0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	4.31	1.37	2.37	90.47	-52.23	-0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 180 deg - No Ice	5.75	0.00	2.74	105.40	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	4.31	0.00	2.74	104.47	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	5.75	-1.37	2.37	91.27	52.70	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	4.31	-1.37	2.37	90.47	52.23	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	5.75	-2.37	1.37	52.70	91.27	-0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	4.31	-2.37	1.37	52.23	90.47	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	5.75	-2.74	0.00	0.00	105.40	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	4.31	-2.74	0.00	0.00	104.47	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	5.75	-2.37	-1.37	-52.70	91.27	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	4.31	-2.37	-1.37	-52.23	90.47	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	5.75	-1.37	-2.37	-91.27	52.70	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	4.31	-1.37	-2.37	-90.47	52.23	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	9.50	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	9.50	0.00	-0.91	-33.01	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	9.50	0.46	-0.79	-28.58	-16.50	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	9.50	0.79	-0.46	-16.50	-28.58	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	9.50	0.91	0.00	0.00	-33.01	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	9.50	0.79	0.46	16.50	-28.58	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	9.50	0.46	0.79	28.58	-16.50	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	9.50	0.00	0.91	33.01	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	9.50	-0.46	0.79	28.58	16.50	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	9.50	-0.79	0.46	16.50	28.58	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	9.50	-0.91	0.00	0.00	33.01	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	9.50	-0.79	-0.46	-16.50	28.58	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	9.50	-0.46	-0.79	-28.58	16.50	-0.00
Dead+Wind 0 deg - Service	4.79	0.00	-0.64	-24.39	0.00	0.00
Dead+Wind 30 deg - Service	4.79	0.32	-0.55	-21.12	-12.20	0.00
Dead+Wind 60 deg - Service	4.79	0.55	-0.32	-12.20	-21.12	0.00
Dead+Wind 90 deg - Service	4.79	0.64	0.00	0.00	-24.39	0.00
Dead+Wind 120 deg - Service	4.79	0.55	0.32	12.20	-21.12	0.00
Dead+Wind 150 deg - Service	4.79	0.32	0.55	21.12	-12.20	0.00
Dead+Wind 180 deg - Service	4.79	0.00	0.64	24.39	0.00	0.00
Dead+Wind 210 deg - Service	4.79	-0.32	0.55	21.12	12.20	0.00
Dead+Wind 240 deg - Service	4.79	-0.55	0.32	12.20	21.12	0.00
Dead+Wind 270 deg - Service	4.79	-0.64	0.00	0.00	24.39	0.00
Dead+Wind 300 deg - Service	4.79	-0.55	-0.32	-12.20	21.12	0.00
Dead+Wind 330 deg - Service	4.79	-0.32	-0.55	-21.12	12.20	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-4.79	0.00	0.00	4.79	0.00	0.000%
2	0.00	-5.75	-2.74	0.00	5.75	2.74	0.000%
3	0.00	-4.31	-2.74	0.00	4.31	2.74	0.000%
4	1.37	-5.75	-2.37	-1.37	5.75	2.37	0.000%
5	1.37	-4.31	-2.37	-1.37	4.31	2.37	0.000%
6	2.37	-5.75	-1.37	-2.37	5.75	1.37	0.000%
7	2.37	-4.31	-1.37	-2.37	4.31	1.37	0.000%
8	2.74	-5.75	0.00	-2.74	5.75	0.00	0.000%
9	2.74	-4.31	0.00	-2.74	4.31	0.00	0.000%
10	2.37	-5.75	1.37	-2.37	5.75	-1.37	0.000%
11	2.37	-4.31	1.37	-2.37	4.31	-1.37	0.000%
12	1.37	-5.75	2.37	-1.37	5.75	-2.37	0.000%
13	1.37	-4.31	2.37	-1.37	4.31	-2.37	0.000%
14	0.00	-5.75	2.74	0.00	5.75	-2.74	0.000%
15	0.00	-4.31	2.74	0.00	4.31	-2.74	0.000%
16	-1.37	-5.75	2.37	1.37	5.75	-2.37	0.000%
17	-1.37	-4.31	2.37	1.37	4.31	-2.37	0.000%
18	-2.37	-5.75	1.37	2.37	5.75	-1.37	0.000%
19	-2.37	-4.31	1.37	2.37	4.31	-1.37	0.000%
20	-2.74	-5.75	0.00	2.74	5.75	0.00	0.000%
21	-2.74	-4.31	0.00	2.74	4.31	0.00	0.000%
22	-2.37	-5.75	-1.37	2.37	5.75	1.37	0.000%
23	-2.37	-4.31	-1.37	2.37	4.31	1.37	0.000%
24	-1.37	-5.75	-2.37	1.37	5.75	2.37	0.000%
25	-1.37	-4.31	-2.37	1.37	4.31	2.37	0.000%
26	0.00	-9.50	0.00	0.00	9.50	0.00	0.000%
27	0.00	-9.50	-0.91	0.00	9.50	0.91	0.000%
28	0.46	-9.50	-0.79	-0.46	9.50	0.79	0.000%
29	0.79	-9.50	-0.46	-0.79	9.50	0.46	0.000%
30	0.91	-9.50	0.00	-0.91	9.50	0.00	0.000%
31	0.79	-9.50	0.46	-0.79	9.50	-0.46	0.000%
32	0.46	-9.50	0.79	-0.46	9.50	-0.79	0.000%
33	0.00	-9.50	0.91	0.00	9.50	-0.91	0.000%
34	-0.46	-9.50	0.79	0.46	9.50	-0.79	0.000%
35	-0.79	-9.50	0.46	0.79	9.50	-0.46	0.000%
36	-0.91	-9.50	0.00	0.91	9.50	0.00	0.000%
37	-0.79	-9.50	-0.46	0.79	9.50	0.46	0.000%
38	-0.46	-9.50	-0.79	0.46	9.50	0.79	0.000%
39	0.00	-4.79	-0.64	0.00	4.79	0.64	0.000%
40	0.32	-4.79	-0.55	-0.32	4.79	0.55	0.000%
41	0.55	-4.79	-0.32	-0.55	4.79	0.32	0.000%
42	0.64	-4.79	0.00	-0.64	4.79	0.00	0.000%
43	0.55	-4.79	0.32	-0.55	4.79	-0.32	0.000%
44	0.32	-4.79	0.55	-0.32	4.79	-0.55	0.000%
45	0.00	-4.79	0.64	0.00	4.79	-0.64	0.000%
46	-0.32	-4.79	0.55	0.32	4.79	-0.55	0.000%
47	-0.55	-4.79	0.32	0.55	4.79	-0.32	0.000%
48	-0.64	-4.79	0.00	0.64	4.79	0.00	0.000%
49	-0.55	-4.79	-0.32	0.55	4.79	0.32	0.000%
50	-0.32	-4.79	-0.55	0.32	4.79	0.55	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003373
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00030948
5	Yes	4	0.00000001	0.00021537
6	Yes	4	0.00000001	0.00030948
7	Yes	4	0.00000001	0.00021537
8	Yes	4	0.00000001	0.00003373
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00030948
11	Yes	4	0.00000001	0.00021537
12	Yes	4	0.00000001	0.00030948
13	Yes	4	0.00000001	0.00021537
14	Yes	4	0.00000001	0.00003373
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00030948
17	Yes	4	0.00000001	0.00021537
18	Yes	4	0.00000001	0.00030948
19	Yes	4	0.00000001	0.00021537
20	Yes	4	0.00000001	0.00003373
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00030948
23	Yes	4	0.00000001	0.00021537
24	Yes	4	0.00000001	0.00030948
25	Yes	4	0.00000001	0.00021537
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00019275
28	Yes	4	0.00000001	0.00020561
29	Yes	4	0.00000001	0.00020561
30	Yes	4	0.00000001	0.00019275
31	Yes	4	0.00000001	0.00020561
32	Yes	4	0.00000001	0.00020561
33	Yes	4	0.00000001	0.00019275
34	Yes	4	0.00000001	0.00020561
35	Yes	4	0.00000001	0.00020561
36	Yes	4	0.00000001	0.00019275
37	Yes	4	0.00000001	0.00020561
38	Yes	4	0.00000001	0.00020561
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	2.492	42	0.3744	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
58.00	12'x18' Flag	42	2.492	0.3744	0.0000	Inf
57.00	36" diameter x 6-ft Concealment	42	2.492	0.3744	0.0000	Inf
51.00	36" diameter x 6-ft Concealment	42	2.492	0.3744	0.0000	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	10.781	2	1.6199	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
58.00	12'x18' Flag	2	10.781	1.6199	0.0000	Inf
57.00	36" diameter x 6-ft Concealment	2	10.781	1.6199	0.0000	Inf
51.00	36" diameter x 6-ft Concealment	2	10.781	1.6199	0.0000	Inf

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	48 - 0 (1)	TP18x18x0.1875	48.00	48.00	91.1	10.6007	-5.74	288.63	0.020

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	48 - 0 (1)	TP18x18x0.1875	105.40	287.71	0.366	0.00	287.71	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	48 - 0 (1)	TP18x18x0.1875	2.75	393.79	0.007	0.00	576.13	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	48 - 0 (1)	0.020	0.366	0.000	0.007	0.000	0.386 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	48 - 0	Pole	TP18x18x0.1875	1	-5.74	288.63	38.6	Pass
							Summary	
						Pole (L1)	38.6	Pass
						RATING =	**38.6**	**Pass**

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	60-FT Flagpole Brookfield, CT
Rev. 0: 5/11/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17004.21

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 105 \cdot ft \cdot kips$	(Input From RisaTower)
Shear Force =	$Shear := 3 \cdot kips$	(Input From RisaTower)
Axial Force =	$Axial := 6 \cdot kips$	(Input From RisaTower)

Anchor Bolt Data:

ASTM A615 Grade 75

Number of Anchor Bolts =	$N := 4$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 23 \cdot in$	(User Input)
Bolt "Column" Distance =	$l := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)

Base Plate Data:

Use ASTM A572 Grade 55

Plate Yield Strength =	$Fy_{bp} := 55 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{bp} := 1.75 \cdot in$	(User Input)
Base Plate Diameter =	$D_{bp} := 22 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 18 \cdot in$	(User Input)
	$\eta := 0.5$	For Ungrouted Base Plate per TIA-222-G Section 4.9.9

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 11.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$$d_i := \left\| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 11.50 \cdot in$

$d_2 = 0.00 \cdot in$

$d_3 = -11.50 \cdot in$

$d_4 = -0.00 \cdot in$

$d_5 = \blacksquare \cdot in$

$d_6 = \blacksquare \cdot in$

$d_7 = \blacksquare \cdot in$

$d_8 = \blacksquare \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 9 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 2.50 \cdot in$

$MA_2 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$

$MA_4 = 0.00 \cdot in$

$MA_5 = \blacksquare \cdot in$

$MA_6 = \blacksquare \cdot in$

$MA_7 = \blacksquare \cdot in$

$MA_8 = \blacksquare \cdot in$

Effective Width of Baseplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 10.1 \cdot in$

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 264.5 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.508 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.826 \cdot in^3$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 53.3 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{R_{bc}}{I_p} + \frac{Axial}{N} = 56.3 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 0.8 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 259.815 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 22.2$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed"\right]$

Condition1 = "OK"

Base Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 56.3 \cdot kips$

$C_2 = 1.5 \cdot kips$

$C_3 = -53.3 \cdot kips$

$C_4 = 1.5 \cdot kips$

$C_5 = \blacksquare \cdot kips$

$C_6 = \blacksquare \cdot kips$

$C_7 = \blacksquare \cdot kips$

$C_8 = \blacksquare \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{4 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\,2}\right)} = 18.2 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 49.5 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 36.7 \cdot \%$

Condition2 = $Condition2 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition2 = "Ok"

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Subject:	CAISSON FOUNDATION
Location:	60-ft PennSummit Flagpole Brookfield, CT
Rev. 0: 5/11/17	Prepared by: TJL Checked by: C.F.C. Job No. 17004.21

Caisson Foundation:

Input Data:

Shear Force =	$S := 3k$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 105ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 6k$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 116ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 1160ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 4ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 15.5ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 12$	*USER INPUT*
Area of Rebar =	$Ar := 1.128in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9 \cdot Mn}{Mu} = 9$

Factor of Safety Required = $FS_{reqd} := 1.0$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

LPILE Plus for Windows, Version 5.0 (5.0.47)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\1700400.WI\21_Brookfield West CT5075\04_Structural\Backup Documentation\Foundation\
Name of input data file: Caisson Analysis.lpd
Name of output file: Caisson Analysis.lpo
Name of plot output file: Caisson Analysis.lpp
Name of runtime file: Caisson Analysis.lpr

Time and Date of Analysis

Date: May 11, 2017 Time: 14:11:25

Problem Title

17004.21 - CT5075

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 8

Pile Structural Properties and Geometry

Pile Length = 186.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	48.00000000	260576.2600	1809.5600	3122018.
2	186.0000	48.00000000	260576.2600	1809.5600	3122018.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness

that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   6.000 in
Distance from top of pile to bottom of layer =   42.000 in
p-y subgrade modulus k for top of soil layer =   10.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   10.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   42.000 in
Distance from top of pile to bottom of layer =   186.000 in
p-y subgrade modulus k for top of soil layer =   90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   90.000 lbs/in**3

(Depth of lowest layer extends   0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 4 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.05800
2	42.00	0.05800
3	42.00	0.07200
4	186.00	0.07200

Shear Strength of Soils

Shear strength parameters with depth defined using 4 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	20.00	------	------
2	42.000	0.00000	20.00	------	------
3	42.000	0.00000	34.00	------	------
4	186.000	0.00000	34.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 3000.000 lbs
Bending moment at pile head = 1260000.000 in-lbs
Axial load at pile head = 6000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 48.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	12
Area of Single Bar	=	1.00000 in**2
Number of Rows of Reinforcing Bars	=	7
Area of Steel	=	12.000 in**2
Area of Shaft	=	1809.557 in**2
Percentage of Steel Reinforcement	=	0.663 percent
Cover Thickness (edge to bar center)	=	4.000 in

Unfactored Axial Squash Load Capacity = 5303.77 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.000	20.000
2	2.000	17.321
3	2.000	10.000
4	2.000	0.000
5	2.000	-10.000
6	2.000	-17.321
7	1.000	-20.000

Axial Thrust Force = 6000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi

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-------------
      1108950.  8.871602E+11    0.00000125    0.00003110   24.88159132   95.46738902
     756.95769
      2205089.  8.820357E+11    0.00000250    0.00006123   24.49168539     186.15863
    1485.64719
      3288186.  8.768497E+11    0.00000375    0.00009134   24.35611296     275.08023
    2213.72728
      4358329.  8.716658E+11    0.00000500    0.00012144   24.28824377     362.29590
    2941.79535
      4358329.  6.973326E+11    0.00000625    0.00007497   11.99444818     223.11614
    5801.00627
      4358329.  5.811105E+11    0.00000750    0.00008912   11.88310575     264.02440
    6985.42450
      4358329.  4.980947E+11    0.00000875    0.00010330   11.80600119     304.63260
    8169.22720
      4358329.  4.358329E+11    0.00001000    0.00011750   11.75030851     344.93943
    9352.41053
      4358329.  3.874070E+11    0.00001125    0.00013173   11.70890665     384.94370
   10534.96921
      4358329.  3.486663E+11    0.00001250    0.00014597   11.67752409     424.64427
   11716.89752
      4358329.  3.169694E+11    0.00001375    0.00016023   11.65344000     464.03984
   12898.19080
      4358329.  2.905553E+11    0.00001500    0.00017452   11.63484335     503.12923
   14078.84314
      4358329.  2.682048E+11    0.00001625    0.00018883   11.62047529     541.91100
   15258.85102
      4358329.  2.490474E+11    0.00001750    0.00020317   11.60944605     580.38416
   16438.20613
      4358329.  2.324442E+11    0.00001875    0.00021752   11.60109186     618.54710
   17616.90630
      4358329.  2.179164E+11    0.00002000    0.00023190   11.59492636     656.39880
   18794.94271
      4358329.  2.050978E+11    0.00002125    0.00024630   11.59056902     693.93775
   19972.31184
      4358329.  1.937035E+11    0.00002250    0.00026072   11.58772802     731.16266
   21149.00746
      4358329.  1.835086E+11    0.00002375    0.00027517   11.58617163     768.07211
   22325.02429
      4358329.  1.743332E+11    0.00002500    0.00028964   11.58571959     804.66500
   23500.35330
      4358329.  1.660316E+11    0.00002625    0.00030414   11.58621454     840.93945
   24674.99418
      4412026.  1.604373E+11    0.00002750    0.00031866   11.58754206     876.89453
   25848.93521
      4605881.  1.602046E+11    0.00002875    0.00033320   11.58959913     912.52868
   27022.17172
      4799451.  1.599817E+11    0.00003000    0.00034777   11.59229994     947.84031
   28194.69905
```

4992734.	1.597675E+11	0.00003125	0.00036236	11.59557581	982.82808
29366.50942					
5185728.	1.595609E+11	0.00003250	0.00037698	11.59936666	1017.49044
30537.59692					
5378429.	1.593609E+11	0.00003375	0.00039162	11.60362101	1051.82583
31707.95594					
5570839.	1.591668E+11	0.00003500	0.00040629	11.60829878	1085.83295
32877.57674					
5762953.	1.589780E+11	0.00003625	0.00042098	11.61336279	1119.51028
34046.45237					
5954768.	1.587938E+11	0.00003750	0.00043570	11.61877584	1152.85582
35214.58127					
6146283.	1.586138E+11	0.00003875	0.00045045	11.62451506	1185.86839
36381.95121					
6337497.	1.584374E+11	0.00004000	0.00046522	11.63055468	1218.54626
37548.55658					
6528406.	1.582644E+11	0.00004125	0.00048002	11.63687468	1250.88791
38714.38867					
6719008.	1.580943E+11	0.00004250	0.00049485	11.64345503	1282.89156
39879.44168					
6909299.	1.579268E+11	0.00004375	0.00050970	11.65027857	1314.55546
41043.70907					
7099280.	1.577618E+11	0.00004500	0.00052458	11.65733385	1345.87821
42207.17932					
7288945.	1.575988E+11	0.00004625	0.00053949	11.66460371	1376.85764
43369.85027					
7478295.	1.574378E+11	0.00004750	0.00055442	11.67208242	1407.49258
44531.70646					
7667323.	1.572784E+11	0.00004875	0.00056939	11.67975283	1437.78054
45692.74944					
8044415.	1.569642E+11	0.00005125	0.00059940	11.69565153	1497.31010
48012.33791					
8420196.	1.566548E+11	0.00005375	0.00062953	11.71223688	1555.43139
50328.55076					
8794645.	1.563493E+11	0.00005625	0.00065978	11.72946024	1612.12925
52641.31798					
9167741.	1.560466E+11	0.00005875	0.00069015	11.74728441	1667.38821
54950.56418					
9539458.	1.557462E+11	0.00006125	0.00072065	11.76567793	1721.19210
57256.21458					
9909774.	1.554474E+11	0.00006375	0.00075127	11.78461790	1773.52446
59558.18766					
10217847.	1.542316E+11	0.00006625	0.00078034	11.77871561	1821.54170
60000.00000					
10510337.	1.528776E+11	0.00006875	0.00080912	11.76900816	1867.55227
60000.00000					
10733551.	1.506463E+11	0.00007125	0.00083592	11.73225546	1908.94629
60000.00000					
10887577.	1.476282E+11	0.00007375	0.00086071	11.67067480	1945.96094

60000.00000					
11040995.	1.447999E+11	0.00007625	0.00088557	11.61401796	1981.97536
60000.00000					
11193801.	1.421435E+11	0.00007875	0.00091049	11.56183290	2016.98205
60000.00000					
11345986.	1.396429E+11	0.00008125	0.00093549	11.51371622	2050.97247
60000.00000					
11497539.	1.372840E+11	0.00008375	0.00096055	11.46931314	2083.93794
60000.00000					
11648461.	1.350546E+11	0.00008625	0.00098569	11.42832041	2115.87079
60000.00000					
11798734.	1.329435E+11	0.00008875	0.00101090	11.39045477	2146.76140
60000.00000					
11948358.	1.309409E+11	0.00009125	0.00103619	11.35547590	2176.60135
60000.00000					
12012924.	1.281379E+11	0.00009375	0.00105800	11.28532076	2201.26154
60000.00000					
12073202.	1.254359E+11	0.00009625	0.00107969	11.21760321	2224.94876
60000.00000					
12142034.	1.229573E+11	0.00009875	0.00110566	11.19656324	2252.41563
60000.00000					
12200188.	1.204957E+11	0.00010125	0.00112684	11.12932634	2273.73467
60000.00000					
12258008.	1.181495E+11	0.00010375	0.00114808	11.06580019	2294.31009
60000.00000					
12315497.	1.159106E+11	0.00010625	0.00116936	11.00573301	2314.13717
60000.00000					
12372643.	1.137714E+11	0.00010875	0.00119069	10.94888449	2333.20982
60000.00000					
12429450.	1.117254E+11	0.00011125	0.00121207	10.89504862	2351.52322
60000.00000					
12485909.	1.097662E+11	0.00011375	0.00123351	10.84402800	2369.07143
60000.00000					
12542024.	1.078884E+11	0.00011625	0.00125499	10.79565096	2385.84930
60000.00000					
12597781.	1.060866E+11	0.00011875	0.00127653	10.74974871	2401.85041
60000.00000					
12653183.	1.043561E+11	0.00012125	0.00129812	10.70617819	2417.06941
60000.00000					
12708229.	1.026928E+11	0.00012375	0.00131977	10.66480494	2431.50048
60000.00000					
12762905.	1.010923E+11	0.00012625	0.00134147	10.62549734	2445.13703
60000.00000					
12817218.	9.955121E+10	0.00012875	0.00136322	10.58814669	2457.97343
60000.00000					
12871160.	9.806598E+10	0.00013125	0.00138503	10.55264425	2470.00320
60000.00000					
12924723.	9.663345E+10	0.00013375	0.00140690	10.51888990	2481.21981
60000.00000					

12977908.	9.525070E+10	0.00013625	0.00142883	10.48679495	2491.61689
60000.00000					
13030712.	9.391504E+10	0.00013875	0.00145081	10.45627642	2501.18785
60000.00000					
13083122.	9.262387E+10	0.00014125	0.00147285	10.42725134	2509.92560
60000.00000					
13135727.	9.137897E+10	0.00014375	0.00149500	10.40000010	2517.84119
60000.00000					
13231786.	9.047375E+10	0.00014625	0.00152100	10.40000010	2526.07539
60000.00000					
13244566.	8.903910E+10	0.00014875	0.00154689	10.39927340	2533.06632
60000.00000					
13315497.	8.660486E+10	0.00015375	0.00158789	10.32775640	2541.59658
60000.00000					
13341029.	8.403798E+10	0.00015875	0.00162464	10.23395205	2546.70467
60000.00000					
13365755.	8.162293E+10	0.00016375	0.00166156	10.14690542	2549.47224
60000.00000					
13389340.	7.934424E+10	0.00016875	0.00169864	10.06603575	2547.93213
60000.00000					
13411715.	7.718973E+10	0.00017375	0.00173591	9.99082804	2541.77888
60000.00000					
13433635.	7.515320E+10	0.00017875	0.00177335	9.92083025	2546.44013
60000.00000					
13455084.	7.322495E+10	0.00018375	0.00181097	9.85563612	2549.18898
60000.00000					
13476017.	7.139612E+10	0.00018875	0.00184880	9.79494524	2549.48406
60000.00000					
13496148.	6.965754E+10	0.00019375	0.00188689	9.73880339	2543.85399
60000.00000					
13515925.	6.800465E+10	0.00019875	0.00192514	9.68626356	2541.82147
60000.00000					
13535337.	6.643110E+10	0.00020375	0.00196355	9.63707399	2546.10368
60000.00000					
13571163.	6.501156E+10	0.00020875	0.00200400	9.60000086	2548.95048
60000.00000					
13671056.	6.395816E+10	0.00021375	0.00205200	9.60000086	2549.09742
60000.00000					
13671056.	6.249626E+10	0.00021875	0.00209387	9.57199144	2543.50669
60000.00000					
13671056.	6.109969E+10	0.00022375	0.00213173	9.52729940	2538.61984
60000.00000					
13671056.	5.976418E+10	0.00022875	0.00216972	9.48513365	2542.10076
60000.00000					
13671056.	5.848580E+10	0.00023375	0.00220785	9.44534826	2545.76373
60000.00000					
13671056.	5.726097E+10	0.00023875	0.00224611	9.40780306	2548.30583
60000.00000					
13681019.	5.612726E+10	0.00024375	0.00228452	9.37237501	2549.70778

60000.00000					
13696232.	5.506023E+10	0.00024875	0.00232312	9.33915854	2548.72635
60000.00000					
13710998.	5.403349E+10	0.00025375	0.00236196	9.30819941	2544.36926
60000.00000					
13725624.	5.304589E+10	0.00025875	0.00240090	9.27883387	2539.99415
60000.00000					
13740101.	5.209517E+10	0.00026375	0.00243994	9.25097609	2535.60079
60000.00000					
13754431.	5.117928E+10	0.00026875	0.00247910	9.22455168	2538.70900
60000.00000					
13768609.	5.029629E+10	0.00027375	0.00251836	9.19948912	2542.72522
60000.00000					
13782629.	4.944441E+10	0.00027875	0.00255773	9.17572260	2545.87626
60000.00000					
13796490.	4.862199E+10	0.00028375	0.00259722	9.15319204	2548.14852
60000.00000					
13810190.	4.782750E+10	0.00028875	0.00263682	9.13184309	2549.52796
60000.00000					
13823727.	4.705950E+10	0.00029375	0.00267654	9.11162424	2549.99998
60000.00000					
13836792.	4.631562E+10	0.00029875	0.00271655	9.09306192	2546.19407
60000.00000					
13849756.	4.559590E+10	0.00030375	0.00275665	9.07537508	2542.31883
60000.00000					
13862632.	4.489921E+10	0.00030875	0.00279682	9.05852079	2538.42951
60000.00000					
13875414.	4.422443E+10	0.00031375	0.00283707	9.04246187	2534.52599
60000.00000					
13888104.	4.357052E+10	0.00031875	0.00287741	9.02716684	2530.60793
60000.00000					
13900692.	4.293650E+10	0.00032375	0.00291783	9.01260138	2534.55595
60000.00000					
13913183.	4.232147E+10	0.00032875	0.00295834	8.99873972	2538.75870
60000.00000					
13925571.	4.172456E+10	0.00033375	0.00299893	8.98555326	2542.31041
60000.00000					
13937858.	4.114497E+10	0.00033875	0.00303961	8.97301912	2545.20198
60000.00000					
13950037.	4.058193E+10	0.00034375	0.00308038	8.96111155	2547.42380
60000.00000					
13962111.	4.003473E+10	0.00034875	0.00312125	8.94981050	2548.96615
60000.00000					
13985857.	3.898497E+10	0.00035875	0.00320332	8.92910814	2549.04175
60000.00000					
14008799.	3.798996E+10	0.00036875	0.00328603	8.91126966	2542.25121
60000.00000					
14031524.	3.704693E+10	0.00037875	0.00336898	8.89499903	2535.41908
60000.00000					

14054017.	3.615181E+10	0.00038875	0.00345217	8.88019037	2528.54434
60000.00000					
14076281.	3.530102E+10	0.00039875	0.00353562	8.86675787	2525.95923
60000.00000					
14085065.	3.445887E+10	0.00040875	0.00361231	8.83746386	2532.91751
60000.00000					
14085065.	3.363598E+10	0.00041875	0.00368500	8.79999876	2537.83369
60000.00000					
14085065.	3.285146E+10	0.00042875	0.00377300	8.79999876	2544.40486
60000.00000					
14085065.	3.210271E+10	0.00043875	0.00386100	8.79999876	2548.45551
60000.00000					

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 13925.89450 in-kip

Axial Thrust Force = 6000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
1108950.	8.871602E+11	0.00000125	0.00003110	24.88159132	95.46738902	756.95769
2205089.	8.820357E+11	0.00000250	0.00006123	24.49168539	186.15863	1485.64719
3288186.	8.768497E+11	0.00000375	0.00009134	24.35611296	275.08023	2213.72728
4358329.	8.716658E+11	0.00000500	0.00012144	24.28824377	362.29590	2941.79535
4358329.	6.973326E+11	0.00000625	0.00007497	11.99444818	223.11614	5801.00627
4358329.	5.811105E+11	0.00000750	0.00008912	11.88310575	264.02440	6985.42450
4358329.	4.980947E+11	0.00000875	0.00010330	11.80600119	304.63260	8169.22720
4358329.	4.358329E+11	0.00001000	0.00011750	11.75030851	344.93943	9352.41053
4358329.	3.874070E+11	0.00001125	0.00013173	11.70890665	384.94370	10534.96921
4358329.	3.486663E+11	0.00001250	0.00014597	11.67752409	424.64427	11716.89752

4358329.	3.169694E+11	0.00001375	0.00016023	11.65344000	464.03984
12898.19080					
4358329.	2.905553E+11	0.00001500	0.00017452	11.63484335	503.12923
14078.84314					
4358329.	2.682048E+11	0.00001625	0.00018883	11.62047529	541.91100
15258.85102					
4358329.	2.490474E+11	0.00001750	0.00020317	11.60944605	580.38416
16438.20613					
4358329.	2.324442E+11	0.00001875	0.00021752	11.60109186	618.54710
17616.90630					
4358329.	2.179164E+11	0.00002000	0.00023190	11.59492636	656.39880
18794.94271					
4358329.	2.050978E+11	0.00002125	0.00024630	11.59056902	693.93775
19972.31184					
4358329.	1.937035E+11	0.00002250	0.00026072	11.58772802	731.16266
21149.00746					
4358329.	1.835086E+11	0.00002375	0.00027517	11.58617163	768.07211
22325.02429					
4358329.	1.743332E+11	0.00002500	0.00028964	11.58571959	804.66500
23500.35330					
4358329.	1.660316E+11	0.00002625	0.00030414	11.58621454	840.93945
24674.99418					
4412026.	1.604373E+11	0.00002750	0.00031866	11.58754206	876.89453
25848.93521					
4605881.	1.602046E+11	0.00002875	0.00033320	11.58959913	912.52868
27022.17172					
4799451.	1.599817E+11	0.00003000	0.00034777	11.59229994	947.84031
28194.69905					
4992734.	1.597675E+11	0.00003125	0.00036236	11.59557581	982.82808
29366.50942					
5185728.	1.595609E+11	0.00003250	0.00037698	11.59936666	1017.49044
30537.59692					
5378429.	1.593609E+11	0.00003375	0.00039162	11.60362101	1051.82583
31707.95594					
5570839.	1.591668E+11	0.00003500	0.00040629	11.60829878	1085.83295
32877.57674					
5762953.	1.589780E+11	0.00003625	0.00042098	11.61336279	1119.51028
34046.45237					
5954768.	1.587938E+11	0.00003750	0.00043570	11.61877584	1152.85582
35214.58127					
6146283.	1.586138E+11	0.00003875	0.00045045	11.62451506	1185.86839
36381.95121					
6337497.	1.584374E+11	0.00004000	0.00046522	11.63055468	1218.54626
37548.55658					
6528406.	1.582644E+11	0.00004125	0.00048002	11.63687468	1250.88791
38714.38867					
6719008.	1.580943E+11	0.00004250	0.00049485	11.64345503	1282.89156
39879.44168					
6909299.	1.579268E+11	0.00004375	0.00050970	11.65027857	1314.55546

41043.70907
7099280. 1.577618E+11 0.00004500 0.00052458 11.65733385 1345.87821
42207.17932
7288945. 1.575988E+11 0.00004625 0.00053949 11.66460371 1376.85764
43369.85027
7478295. 1.574378E+11 0.00004750 0.00055442 11.67208242 1407.49258
44531.70646
7667323. 1.572784E+11 0.00004875 0.00056939 11.67975283 1437.78054
45692.74944
8044415. 1.569642E+11 0.00005125 0.00059940 11.69565153 1497.31010
48012.33791
8420196. 1.566548E+11 0.00005375 0.00062953 11.71223688 1555.43139
50328.55076
8794645. 1.563493E+11 0.00005625 0.00065978 11.72946024 1612.12925
52641.31798
9167741. 1.560466E+11 0.00005875 0.00069015 11.74728441 1667.38821
54950.56418
9539458. 1.557462E+11 0.00006125 0.00072065 11.76567793 1721.19210
57256.21458
9909774. 1.554474E+11 0.00006375 0.00075127 11.78461790 1773.52446
59558.18766
10217847. 1.542316E+11 0.00006625 0.00078034 11.77871561 1821.54170
60000.00000
10510337. 1.528776E+11 0.00006875 0.00080912 11.76900816 1867.55227
60000.00000
10733551. 1.506463E+11 0.00007125 0.00083592 11.73225546 1908.94629
60000.00000
10887577. 1.476282E+11 0.00007375 0.00086071 11.67067480 1945.96094
60000.00000
11040995. 1.447999E+11 0.00007625 0.00088557 11.61401796 1981.97536
60000.00000
11193801. 1.421435E+11 0.00007875 0.00091049 11.56183290 2016.98205
60000.00000
11345986. 1.396429E+11 0.00008125 0.00093549 11.51371622 2050.97247
60000.00000
11497539. 1.372840E+11 0.00008375 0.00096055 11.46931314 2083.93794
60000.00000
11648461. 1.350546E+11 0.00008625 0.00098569 11.42832041 2115.87079
60000.00000
11798734. 1.329435E+11 0.00008875 0.00101090 11.39045477 2146.76140
60000.00000
11948358. 1.309409E+11 0.00009125 0.00103619 11.35547590 2176.60135
60000.00000
12012924. 1.281379E+11 0.00009375 0.00105800 11.28532076 2201.26154
60000.00000
12073202. 1.254359E+11 0.00009625 0.00107969 11.21760321 2224.94876
60000.00000
12142034. 1.229573E+11 0.00009875 0.00110566 11.19656324 2252.41563
60000.00000

12200188.	1.204957E+11	0.00010125	0.00112684	11.12932634	2273.73467
60000.00000					
12258008.	1.181495E+11	0.00010375	0.00114808	11.06580019	2294.31009
60000.00000					
12315497.	1.159106E+11	0.00010625	0.00116936	11.00573301	2314.13717
60000.00000					
12372643.	1.137714E+11	0.00010875	0.00119069	10.94888449	2333.20982
60000.00000					
12429450.	1.117254E+11	0.00011125	0.00121207	10.89504862	2351.52322
60000.00000					
12485909.	1.097662E+11	0.00011375	0.00123351	10.84402800	2369.07143
60000.00000					
12542024.	1.078884E+11	0.00011625	0.00125499	10.79565096	2385.84930
60000.00000					
12597781.	1.060866E+11	0.00011875	0.00127653	10.74974871	2401.85041
60000.00000					
12653183.	1.043561E+11	0.00012125	0.00129812	10.70617819	2417.06941
60000.00000					
12708229.	1.026928E+11	0.00012375	0.00131977	10.66480494	2431.50048
60000.00000					
12762905.	1.010923E+11	0.00012625	0.00134147	10.62549734	2445.13703
60000.00000					
12817218.	9.955121E+10	0.00012875	0.00136322	10.58814669	2457.97343
60000.00000					
12871160.	9.806598E+10	0.00013125	0.00138503	10.55264425	2470.00320
60000.00000					
12924723.	9.663345E+10	0.00013375	0.00140690	10.51888990	2481.21981
60000.00000					
12977908.	9.525070E+10	0.00013625	0.00142883	10.48679495	2491.61689
60000.00000					
13030712.	9.391504E+10	0.00013875	0.00145081	10.45627642	2501.18785
60000.00000					
13083122.	9.262387E+10	0.00014125	0.00147285	10.42725134	2509.92560
60000.00000					
13135727.	9.137897E+10	0.00014375	0.00149500	10.40000010	2517.84119
60000.00000					
13231786.	9.047375E+10	0.00014625	0.00152100	10.40000010	2526.07539
60000.00000					
13244566.	8.903910E+10	0.00014875	0.00154689	10.39927340	2533.06632
60000.00000					
13315497.	8.660486E+10	0.00015375	0.00158789	10.32775640	2541.59658
60000.00000					
13341029.	8.403798E+10	0.00015875	0.00162464	10.23395205	2546.70467
60000.00000					
13365755.	8.162293E+10	0.00016375	0.00166156	10.14690542	2549.47224
60000.00000					
13389340.	7.934424E+10	0.00016875	0.00169864	10.06603575	2547.93213
60000.00000					
13411715.	7.718973E+10	0.00017375	0.00173591	9.99082804	2541.77888

60000.00000					
13433635.	7.515320E+10	0.00017875	0.00177335	9.92083025	2546.44013
60000.00000					
13455084.	7.322495E+10	0.00018375	0.00181097	9.85563612	2549.18898
60000.00000					
13476017.	7.139612E+10	0.00018875	0.00184880	9.79494524	2549.48406
60000.00000					
13496148.	6.965754E+10	0.00019375	0.00188689	9.73880339	2543.85399
60000.00000					
13515925.	6.800465E+10	0.00019875	0.00192514	9.68626356	2541.82147
60000.00000					
13535337.	6.643110E+10	0.00020375	0.00196355	9.63707399	2546.10368
60000.00000					
13571163.	6.501156E+10	0.00020875	0.00200400	9.60000086	2548.95048
60000.00000					
13671056.	6.395816E+10	0.00021375	0.00205200	9.60000086	2549.09742
60000.00000					
13671056.	6.249626E+10	0.00021875	0.00209387	9.57199144	2543.50669
60000.00000					
13671056.	6.109969E+10	0.00022375	0.00213173	9.52729940	2538.61984
60000.00000					
13671056.	5.976418E+10	0.00022875	0.00216972	9.48513365	2542.10076
60000.00000					
13671056.	5.848580E+10	0.00023375	0.00220785	9.44534826	2545.76373
60000.00000					
13671056.	5.726097E+10	0.00023875	0.00224611	9.40780306	2548.30583
60000.00000					
13681019.	5.612726E+10	0.00024375	0.00228452	9.37237501	2549.70778
60000.00000					
13696232.	5.506023E+10	0.00024875	0.00232312	9.33915854	2548.72635
60000.00000					
13710998.	5.403349E+10	0.00025375	0.00236196	9.30819941	2544.36926
60000.00000					
13725624.	5.304589E+10	0.00025875	0.00240090	9.27883387	2539.99415
60000.00000					
13740101.	5.209517E+10	0.00026375	0.00243994	9.25097609	2535.60079
60000.00000					
13754431.	5.117928E+10	0.00026875	0.00247910	9.22455168	2538.70900
60000.00000					
13768609.	5.029629E+10	0.00027375	0.00251836	9.19948912	2542.72522
60000.00000					
13782629.	4.944441E+10	0.00027875	0.00255773	9.17572260	2545.87626
60000.00000					
13796490.	4.862199E+10	0.00028375	0.00259722	9.15319204	2548.14852
60000.00000					
13810190.	4.782750E+10	0.00028875	0.00263682	9.13184309	2549.52796
60000.00000					
13823727.	4.705950E+10	0.00029375	0.00267654	9.11162424	2549.99998
60000.00000					

13836792.	4.631562E+10	0.00029875	0.00271655	9.09306192	2546.19407
60000.00000					
13849756.	4.559590E+10	0.00030375	0.00275665	9.07537508	2542.31883
60000.00000					
13862632.	4.489921E+10	0.00030875	0.00279682	9.05852079	2538.42951
60000.00000					
13875414.	4.422443E+10	0.00031375	0.00283707	9.04246187	2534.52599
60000.00000					
13888104.	4.357052E+10	0.00031875	0.00287741	9.02716684	2530.60793
60000.00000					
13900692.	4.293650E+10	0.00032375	0.00291783	9.01260138	2534.55595
60000.00000					
13913183.	4.232147E+10	0.00032875	0.00295834	8.99873972	2538.75870
60000.00000					
13925571.	4.172456E+10	0.00033375	0.00299893	8.98555326	2542.31041
60000.00000					
13937858.	4.114497E+10	0.00033875	0.00303961	8.97301912	2545.20198
60000.00000					
13950037.	4.058193E+10	0.00034375	0.00308038	8.96111155	2547.42380
60000.00000					
13962111.	4.003473E+10	0.00034875	0.00312125	8.94981050	2548.96615
60000.00000					
13985857.	3.898497E+10	0.00035875	0.00320332	8.92910814	2549.04175
60000.00000					
14008799.	3.798996E+10	0.00036875	0.00328603	8.91126966	2542.25121
60000.00000					
14031524.	3.704693E+10	0.00037875	0.00336898	8.89499903	2535.41908
60000.00000					
14054017.	3.615181E+10	0.00038875	0.00345217	8.88019037	2528.54434
60000.00000					
14076281.	3.530102E+10	0.00039875	0.00353562	8.86675787	2525.95923
60000.00000					
14085065.	3.445887E+10	0.00040875	0.00361231	8.83746386	2532.91751
60000.00000					
14085065.	3.363598E+10	0.00041875	0.00368500	8.79999876	2537.83369
60000.00000					
14085065.	3.285146E+10	0.00042875	0.00377300	8.79999876	2544.40486
60000.00000					
14085065.	3.210271E+10	0.00043875	0.00386100	8.79999876	2548.45551
60000.00000					

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 13925.89450 in-kip

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Computed Values of Load Distribution and Deflection

Caisson Analysis.lpo
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head = 3000.000 lbs
Specified moment at pile head = 1260000.000 in-lbs
Specified axial load at pile head = 6000.000 lbs

Depth X	Deflect. y	Moment M	Shear V	Slope S	Total Stress	Flx. Rig. EI	Soil Res. Es*h p
in	in	lbs-in	lbs	Rad.	lbs/in**2	lbs-in**2	lbs/in F/L
0.000	0.130730	1.26E+06	3000.000	-0.001077	119.366	8.86E+11	0.000 0.000
14.880	0.114861	1.30E+06	2953.157	-0.001056	123.474	8.86E+11	-10.200 165.168
29.760	0.099318	1.35E+06	2696.124	-0.001033	127.377	8.85E+11	-23.598 441.936
44.640	0.084111	1.38E+06	1822.326	-0.001010	130.756	8.85E+11	-200.190 4426.909
59.520	0.069251	1.39E+06	-1630.630	-0.000987	130.996	8.85E+11	-257.561 6917.821
74.400	0.054735	1.33E+06	-5652.467	-0.000964	126.047	8.85E+11	-276.876 9408.733
89.280	0.040552	1.22E+06	-9686.778	-0.000943	115.513	8.86E+11	-259.438 11900.
104.160	0.026672	1.05E+06	-13195.	-0.000924	99.748	8.87E+11	-206.357 14391.
119.040	0.013052	8.31E+05	-15654.	-0.000908	79.832	8.87E+11	-118.463 16881.
133.920	-0.000361	5.89E+05	-16549.	-0.000896	57.558	8.87E+11	3.756 19372.
148.800	-0.013627	3.49E+05	-15371.	-0.000888	35.418	8.87E+11	160.173 21863.
163.680	-0.026805	1.44E+05	-11611.	-0.000884	16.602	8.87E+11	350.972 24354.
178.560	-0.039945	18294.	-4752.666	-0.000883	5.001	8.87E+11	576.525 26845.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection	=	0.13072962 in
Computed slope at pile head	=	-0.00107718
Maximum bending moment	=	1391413. lbs-in
Maximum shear force	=	-16549.15765 lbs
Depth of maximum bending moment	=	52.08000000 in
Depth of maximum shear force	=	133.92000 in
Number of iterations	=	5
Number of zero deflection points	=	1

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 3000.000	M= 1.26E+06	6000.0000	0.1307296	1391413.	-16549.1577

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

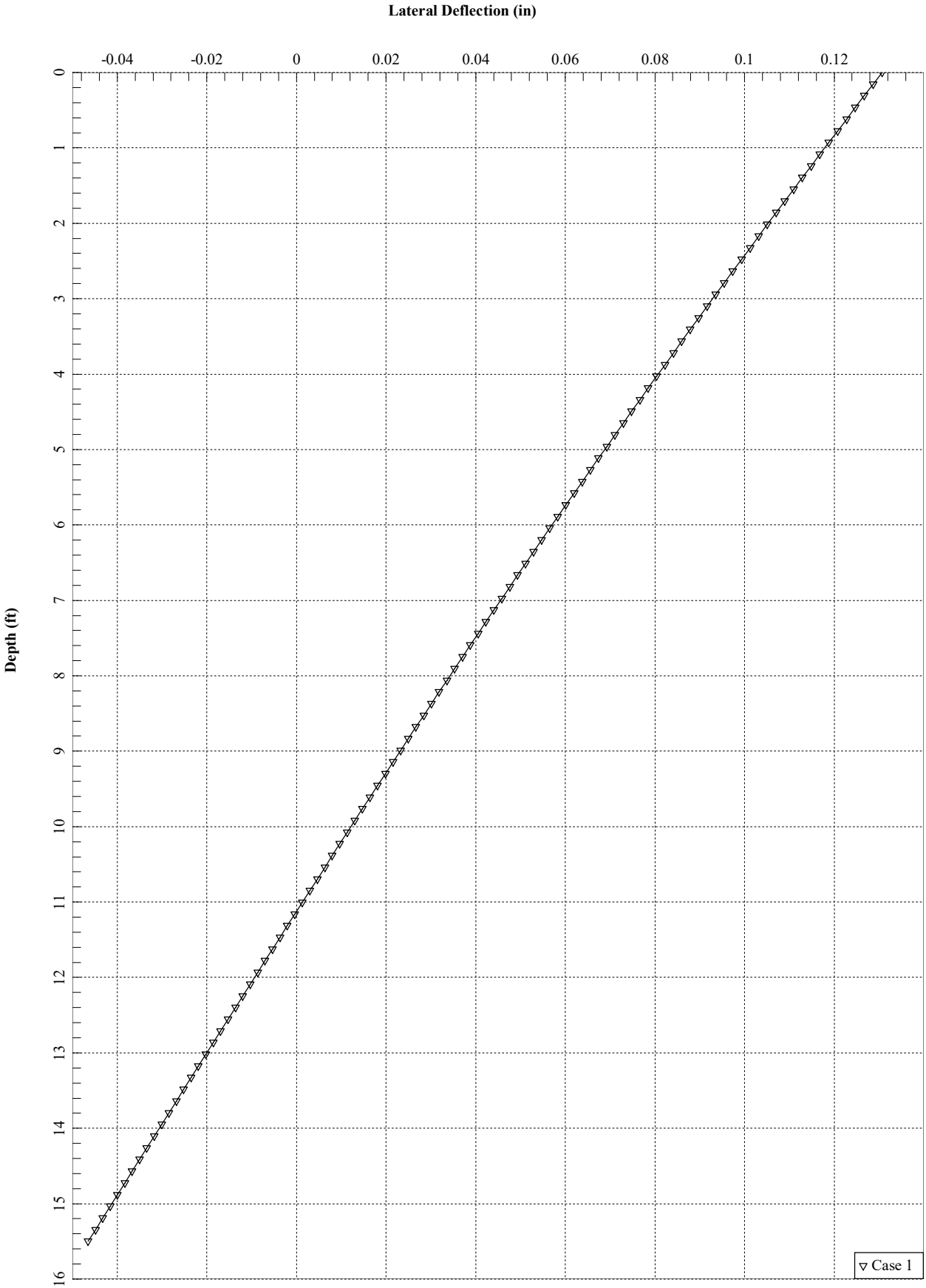
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00046313	300.00000	35124.58653	647771.46754	75842349.
0.00139415	903.08999	105735.53975	647771.46754	75842349.
0.00220967	1431.36376	167586.86548	647771.46754	75842349.

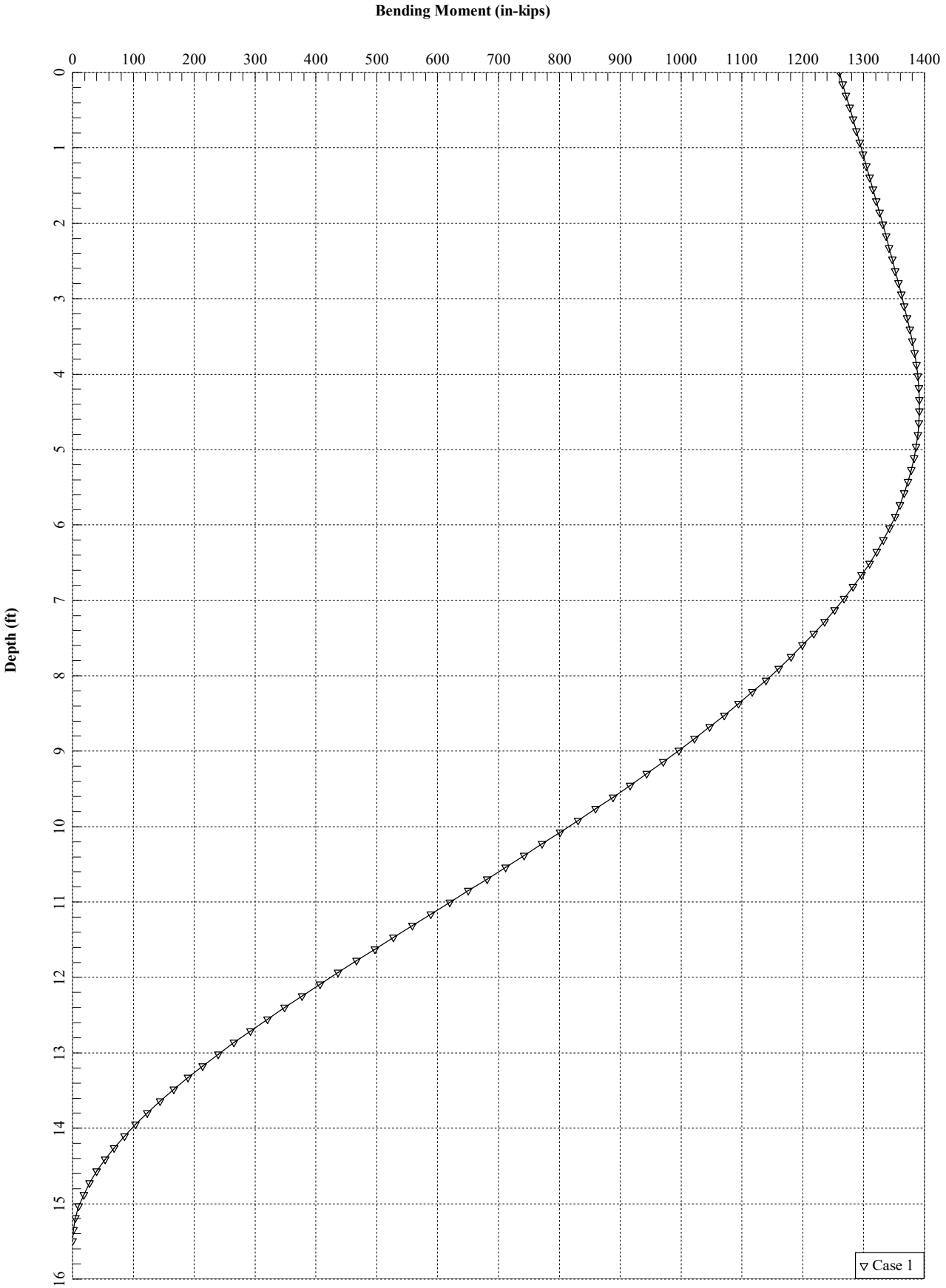
0.00278830	1806.17997	211471.07949	647771.46754	75842349.
0.00323711	2096.91001	245510.32036	647771.46754	75842349.
0.00360382	2334.45375	273322.40524	647771.46754	75842349.
0.00391387	2535.29412	296837.18793	647771.46754	75842349.
0.00418245	2709.26996	317206.61922	647771.46754	75842349.
0.00441935	2862.72753	335173.73096	647771.46754	75842349.
0.00463126	3000.00000	351245.86013	647771.46754	75842349.

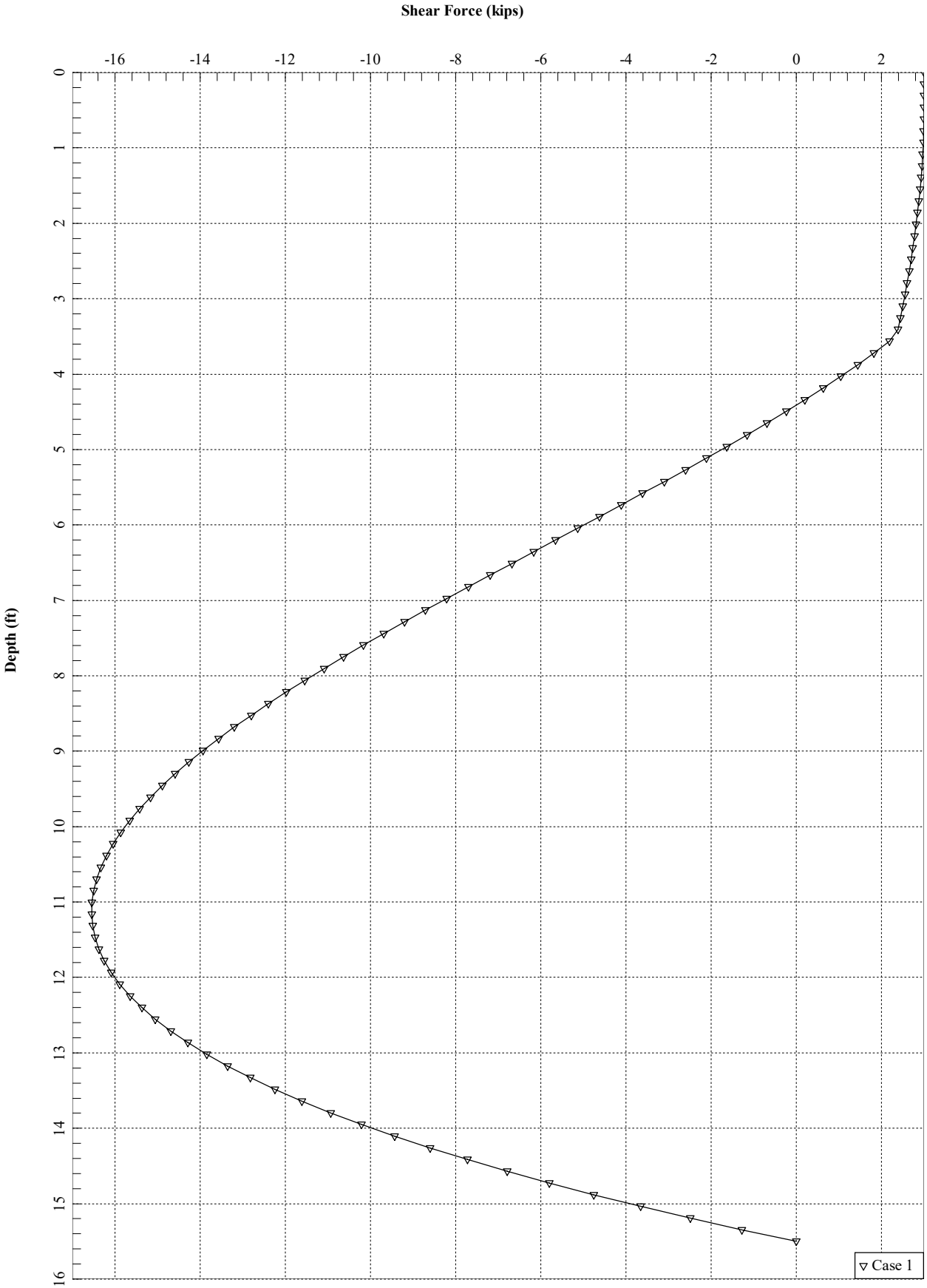
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00001214	920.98979	126000.00188	75842349.	1.037594E+10
0.00003656	2772.45547	379297.79454	75842349.	1.037594E+10
0.00005794	4394.23795	601172.78095	75842349.	1.037594E+10
0.00007311	5544.91094	758595.58907	75842349.	1.037594E+10
0.00008488	6437.44225	880702.20546	75842349.	1.037594E+10
0.00009449	7166.69342	980470.57548	75842349.	1.037594E+10
0.00010262	7783.26651	1064824.	75842349.	1.037594E+10
0.00010967	8317.36658	1137893.	75841790.	1.037586E+10
0.00011588	8788.47817	1202346.	75838056.	1.037535E+10
0.00012145	9209.90612	1260000.	75832501.	1.037458E+10

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (in)
-0.04
-0.02
0
0.02
0.04
0.06
0.08
0.1
0.12
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
▽ Case 1


Bending Moment (in-kips)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
▽ Case 1


Shear Force (kips)
-16
-14
-12
-10
-8
-6
-4
-2
0
2
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Case 1

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV5075	DATE:	01/13/2017	RF DESIGN ENG:	Mohammed Rahman
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	
REVISION:	FINAL	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	MR673A@ATT.COM
INITIATIVE /PROJECT:	LTE 2C Bronze Standard -Add 5216, Add XMU.				

RF PERF ENG:		RFDS PROGRAM TYPE:	2017 LTE Next Carrier		
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE 2C		
RF PERF EMAIL:		STATE/STATUS:	Final/Modification Recommended		
RFDS VERSION:	3.00	RFDS ID:	1602801		
GSM FREQUENCY:		Created By:	mr673a	Updated By:	mb497j
UMTS FREQUENCY:	850	Date Created:	1/13/2017 2:49:04 PM	Date Updated:	5/3/2017 6:49:22 PM
LTE FREQUENCY:	700, 1900				
I-PLAN JOB # 1:	NER-RCTB-12-04539	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 2C		
I-PLAN JOB # 2:	NER-RCTB-17-00006	IPLAN PRD GRP || SUB GRP #2:	LTE Multi Carrier || Software Carrier		
I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:			
I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:			
I-PLAN JOB # 5:		IPLAN PRD GRP || SUB GRP #5:			
I-PLAN JOB # 6:		IPLAN PRD GRP || SUB GRP #6:			
I-PLAN JOB # 7:		IPLAN PRD GRP || SUB GRP #7:			
I-PLAN JOB # 8:		IPLAN PRD GRP || SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	24484	FA LOCATION CODE:	10070956	LOCATION NAME:	BROOKFIELD WEST
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	2 HUCKLEBERRY HILL ROAD	CITY:	BROOKFIELD	STATE:	CT
ZIP CODE:	06804	COUNTY:	FAIRFIELD	LONG (DEC. DEG.):	-73.4038989
LATITUDE (D-M-S):	41d 27m9.33084s	LONGITUDE (D-M-S):	-73d -24m-14.03604s	LAT (DEC. DEG.):	41.4525919
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	FROM I-84 TAKE EXIT 7 HEADING US-7 N / US-202 TOWARDS NEW MILFORD/BROOKFIELD. TAKE EXIT 11 TOWARDS FEDERAL ROAD. TURN LEFT ONTO WHITE TURKEY ROAD. TURN RIGHT ONTO FEDERAL ROAD/US-202. TURN SLIGHT LEFT ONTO NEW MILFORD RD. TURN LEFT ONTO HUCKLEBERRY HILL R				

ORACLE PTN # 1:	2051A08YRX	PACE JOB # 1:	MRCTB021410		
ORACLE PTN # 2:	2051A08Z4S	PACE JOB # 2:	MRCTB021960		
ORACLE PTN # 3:		PACE JOB # 3:			
ORACLE PTN # 4:		PACE JOB # 4:			
ORACLE PTN # 5:		PACE JOB # 5:			
ORACLE PTN # 6:		PACE JOB # 6:			
ORACLE PTN # 7:		PACE JOB # 7:			
ORACLE PTN # 8:		PACE JOB # 8:			
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:			
AM STUDY REQ'D (Y/N):	No	SEARCH_RING_ID:			
FREQ COORD:		BTA:		MSA / RSA:	
OPS DISTRICT:	CT-South	LAC(GSM):	05015		
OPS ZONE:	NE_CT_S_FRFD_NW_CS	LAC(UMTS):	05995		
RF DISTRICT:	NPO Triage	BSC(GSM):	BRPTCTBSC06		
RF ZONE:	Hotseat	RNC(UMTS):	BRPTCT04CR0R03		
PARENT NAME(GSM):	BRIDGEPORT BSC 06	MME POOL ID(LTE):	FF01		
PARENT NAME(UMTS):	BRIDGEPORT RNC03				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No)::	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	z_KNLB312,z_KNLB312,z_KNLB312

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	MONOPOLE
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	60.00	FCC ASR NUMBER:	NR
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	60.00		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:			
MARKET LOCATION 850 MHz Band:			
MARKET LOCATION 1900 MHz Band:			
MARKET LOCATION AWS Band:			
MARKET LOCATION WCS Band:			
MARKET LOCATION Future Band:			

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR B	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR C	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR B	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR C	BROOKFIELD POLICE DEPARTMENT	1308		INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS							
RBS ID:	24732	218849	290907	401756	360136							
CTS COMMON ID:	321P5075	CTV5075	CTU5075	CTV4075	CTL05075							
CELL ID / BCF:	NYNYCT5075	CTV5075	CTV5075	CTV4075	CTL05075							
BTA/TID:	321P	321U	321W	321W	321L							
4-9 DIGIT SITE ID:	5075	5075	5075	04075	5075							
COW OR TOY?:	No	No	No	No	No							
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND	GROUND	GROUND	GROUND	INTERNAL							
BASE STATION TYPE:	BASE	BASE	OVERLAY	OVERLAY	BASE							
EQUIPMENT NAME:	BROOKFIELD WEST	BROOKFIELD WEST	BROOKFIELD WEST	BROOKFIELD WEST	BROOKFIELD WEST							
DISASTER PRIORITY:	3	1	0	0	3							

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS							
RBS ID:		218849	290907	401756	360136							
CTS COMMON ID:		CTV5075	CTU5075	CTV4075	CTL05075							
CELL ID / BCF:		CTV5075	CTV5075	CTV4075	CTL05075							
BTA/TID:		321U	321W	321W	321L							
4-9 DIGIT SITE ID:		5075	5075	04075	5075							
COW OR TOY?:		No	No	No	No							
CELL SITE TYPE:		SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:		MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:		GROUND	GROUND	GROUND	INTERNAL							
BASE STATION TYPE:		BASE	OVERLAY	OVERLAY	BASE							
EQUIPMENT NAME:		BROOKFIELD WEST	BROOKFIELD WEST	BROOKFIELD WEST	BROOKFIELD WEST							
DISASTER PRIORITY:		1	0	0	3							

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	NOKIA	ERICSSON	ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:	ULTRASITE	3106 OUTDOOR	3106 OUTDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU							
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:	Yes	Yes	Yes	Yes	Yes							
NODE B NUMBER:	0	0	0	0	5075							

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:		ERICSSON	ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:		3106 OUTDOOR	3106 OUTDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU							
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:		Yes	Yes	Yes	Yes							
NODE B NUMBER:		0	0	0	5075							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS														
CTS Common ID	321P5075	CTV5075	CTU5075	CTV4075	CTL05075														
Soft Sector IDs	321P50751	CTV50751	CTU50757	CTV4075A	CTL05075_7A_1														
	321P50752	CTV50752	CTU50758	CTV4075B	CTL05075_7B_1														
	321P50753	CTV50753	CTU50759	CTV4075C	CTL05075_7C_1														

Section 8 - RBS/SECTOR ASSOCIATION - final

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS														
CTS Common ID		CTV5075	CTU5075	CTV4075	CTL05075														
Soft Sector IDs		CTV50751			CTL05075_7A_1														
		CTV50752			CTL05075_7B_1														
		CTV50753			CTL05075_7C_1														
					CTL05075_9A_1														
					CTL05075_9A_2														
					CTL05075_9B_1														
					CTL05075_9B_2														
					CTL05075_9C_1														
					CTL05075_9C_2														

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																		
USEID (excluding Hard Sector)	24484.1900.25G.1	24484.850.3G.1	24484.1900.3G.2	24484.850.3G.2																					
SECTOR A SOFT SECTOR ID	321P50751	CTV50751	CTU50757	CTV4075A	CTL05075_7A_1																				
SECTOR B	321P50752	CTV50752	CTU50758	CTV4075B	CTL05075_7B_1																				
SECTOR C	321P50753	CTV50753	CTU50759	CTV4075C	CTL05075_7C_1																				
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																		
USEID (excluding Hard Sector)		24484.850.3G.1																							
SECTOR A SOFT SECTOR ID		CTV50751			CTL05075_7A_1	CTL05075_9A_1	CTL05075_9A_2																		
SECTOR B		CTV50752			CTL05075_7B_1	CTL05075_9B_1	CTL05075_9B_2																		
SECTOR C		CTV50753			CTL05075_7C_1	CTL05075_9C_1	CTL05075_9C_2																		
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - existing

	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																			
USEID (excluding Hard Sector)	24484.1900.25G.1	24484.850.3G.1	24484.1900.3G.2	24484.850.3G.2																						
SECTOR A CELL NUMBER	0	0	0	0	15																					
SECTOR B	0	0	0	0	16																					
SECTOR C	0	0	0	0	17																					
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - Cell Number - final

	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																			
USEID (excluding Hard Sector)		24484.850.3G.1																								
SECTOR A CELL NUMBER		0			15	8	178																			
SECTOR B		0			16	9	179																			
SECTOR C		0			17	10	180																			
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 10 - CID/SAC - existing

		GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																				
SECTOR A	CID/SAC	50751	50751	50757	40751																							
SECTOR B		50752	50752	50758	40752																							
SECTOR C		50753	50753	50759	40753																							
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 10 - CID/SAC - final

		GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900																				
SECTOR A	CID/SAC		50751																									
SECTOR B			50752																									
SECTOR C			50753																									
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	80010764													
ANTENNA VENDOR	Kathrein													
ANTENNA SIZE (H x W x D)	55.2X11.8X6													
ANTENNA WEIGHT	40.8													
AZIMUTH	30													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	1	APTDC-BDFDM-DBW												
DIPLEXER (QTY/MODEL)	1	CCI TPX-070821												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI DTMABP7819VG12A Twin PCS w/ 700-850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		24484.A.850.3G.1	CTV50751	CTV50751		UMTS 850	80010764_866MHz_02DT	15		2	BOTTOM	Andrew 7/8	90.023045	YES								
	PORT 2		24484.A.700.4G.1	CTL05075_7A_1	CTL05075_7A_1		LTE 700	80010764_716MHz_02DT	14.39		2	BOTTOM	Andrew 7/8	90.023045									
	PORT 3		24484.A.1900.3G.2	CTU50757	CTU50757		UMTS 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045									
	PORT 4		24484.A.1900.25G.1	321P50751			GSM 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045					11.22	339.62			

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	80010764													
ANTENNA VENDOR	Kathrein													
ANTENNA SIZE (H x W x D)	55.2X11.8X6													
ANTENNA WEIGHT	40.8													
AZIMUTH	150													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	1	APTDC-BDFDM-DBW												
DIPLEXER (QTY/MODEL)	1	CCI TPX-070821												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI DTMABP7819VG12A Twin PCS w/ 700-850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		24484.B.850.3G.1	CTV50752	CTV50752		UMTS 850	80010764_866MHz_01DT	14.89		1	BOTTOM	Andrew 7/8	90.023045	YES								
	PORT 2		24484.B.700.4G.1	CTL05075_7B_1	CTL05075_7B_1		LTE 700	80010764_716MHz_01DT	14.39		1	BOTTOM	Andrew 7/8	90.023045									
	PORT 3		24484.B.1900.3G.2	CTU50758	CTU50758		UMTS 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045									
	PORT 4		24484.B.1900.25G.1	321P50752			GSM 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045					11.22	339.62			

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	80010764													
ANTENNA VENDOR	Kathrein													
ANTENNA SIZE (H x W x D)	55.2X11.8X6													
ANTENNA WEIGHT	40.8													
AZIMUTH	270													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	1	APTDC-BDFDM-DBW												
DIPLEXER (QTY/MODEL)	1	CCI TPX-070821												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	CCI DTMABP7819VG12A Twin PCS w/ 700-850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		24484.C.850.3G.1	CTV50753	CTV50753		UMTS 850	80010764_866MHz_00DT	14.89		0	BOTTOM	Andrew 7/8	90.023045	YES								
	PORT 2		24484.C.700.4G.1	CTL05075_7C_1	CTL05075_7C_1		LTE 700	80010764_716MHz_00DT	14.39		0	BOTTOM	Andrew 7/8	90.023045									
	PORT 3		24484.C.1900.3G.2	CTU50759	CTU50759		UMTS 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045									
	PORT 4		24484.C.1900.25G.1	321P50753			GSM 1900	80010764_1950MHz_00DT	17.6		0	BOTTOM	Andrew 7/8	90.023045					11.22	339.62			

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
Existing Antenna?														
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	30													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	6	APTDC-BDFDM-DB (4) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)														
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - USE Existing 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7		24484.A.1900.4G.2	CTL05075_9A_1	CTL05075_9A_1		LTE 1900	QS66512-2_722MHz_03DT	13.5		3	BOTTOM	Andrew 7/8	90.023045						3664.3757		2	

	PORT 8		24484.A.1900.4G.2	CTL05075_9A_2	CTL05075_9A_2		LTE 1900	QS66512-2_722MHz_03DT	13.5		3	BOTTOM	Andrew 7/8	90.023045						3664.3757		2	

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
Existing Antenna?														
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	150													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	6	APTDC-BDFDM-DB (4) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)														
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - Use Existing 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7		24484.B.1900.4G.2	CTL05075_9B_1	CTL05075_9B_1		LTE 1900	QS66512-2_722MHz_06DT	13.1		6	BOTTOM	Andrew 7/8	90.023045						3664.3757		10	

	PORT 8		24484.B.1900.4G.2	CTL05075_9B_2	CTL05075_9B_2		LTE 1900	QS66512-2_722MHz_06DT	13.1		6	BOTTOM	Andrew 7/8	90.023045						3664.3757		10	

Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
Existing Antenna?														
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	270													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	6	APTDC-BDFDM-DB (4) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)														
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - Use Exsting 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 7		24484.C.1900.4G.2	CTL05075_9C_1	CTL05075_9C_1		LTE 1900	QS66512-2_722MHz_02DT	13.6		2	BOTTOM	Andrew 7/8	90.023045						3664.3757		18	

	PORT 8		24484.C.1900.4G.2	CTL05075_9C_2	CTL05075_9C_2		LTE 1900	QS66512-2_722MHz_02DT	13.6		2	BOTTOM	Andrew 7/8	90.023045						3664.3757		18	

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	30													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	4													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	8	APTDC-BDFDM-DB (6) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - Use Existing 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24484.A.850.3G.1	24484.A.850.3G.1	CTV50751	CTV50751		UMTS 850	QS46512-2_850MHz_02DT	12.2		2	BOTTOM	Andrew 7/8	90.023045						413.05		1	
	PORT 2	24484.A.700.4G.1	24484.A.700.4G.1	CTL05075_7A_1	CTL05075_7A_1		LTE 700	QS46512-	12.6		2	BOTTOM	Andrew 7/8	90.023045						1475.7065		1	

								2_722MHz_02DT															
	PORT 3					Decom	UMTS 1900																
	PORT 4					Decom	GSM 1900																
	PORT 7	24484.A.1900.4G.tmp1,24484.A.1900.4G.tmp2	24484.A.1900.4G.2	CTL05075_9A_1	CTL05075_9A_1		LTE 1900	QS46512-2_1930MHz_03DT	15.7		3	BOTTOM	Andrew 7/8	90.023045						3664.3757		2	
	PORT 8	24484.A.1900.4G.tmp2,24484.B.1900.4G.tmp2	24484.B.1900.4G.2	CTL05075_9A_2	CTL05075_9A_2		LTE 1900	QS66512-2_1930MHz_03DT	15.7		3	BOTTOM	Andrew 7/8	90.023045						3664.3757		2	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	150													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	4													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	8	APTDC-BDFDM-DB (6) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - Use Existing 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24484.B.850.3G.1	24484.B.850.3G.1	CTV50752	CTV50752		UMTS 850	QS46512-2_850MHz_02DT	12.2		1	BOTTOM	Andrew 7/8	90.023045						403.65		9	
	PORT 2	24484.B.700.4G.1	24484.B.700.4G.1	CTL05075_7B_1	CTL05075_7B_1		LTE 700	QS46512-	12.6		2	BOTTOM	Andrew 7/8	90.023045						1475.7065		9	

								2_722MHz_02DT															
	PORT 3					Decom	UMTS 1900																
	PORT 4					Decom	GSM 1900																
	PORT 7	24484.B.1900.4G.tmp1,24484.B.1900.4G.tmp2	24484.B.1900.4G.2	CTL05075_9B_1	CTL05075_9B_1		LTE 1900	QS46512-2_1930MHz_06DT	15.4		6	BOTTOM	Andrew 7/8	90.023045						3664.3757		10	
	PORT 8	24484.B.1900.4G.tmp2	24484.B.1900.4G.2	CTL05075_9B_2	CTL05075_9B_2		LTE 1900	QS66512-2_1930MHz_06DT	15.4		6	BOTTOM	Andrew 7/8	90.023045						3664.3757		10	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	QS46512-2													
ANTENNA VENDOR	Quintel													
ANTENNA SIZE (H x W x D)	52X12X10.8													
ANTENNA WEIGHT	75													
AZIMUTH	270													
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	57.01													
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0													
FEEDER AMOUNT	4													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Internal												
SURGE ARRESTOR (QTY/MODEL)	8	APTDC-BDFDM-DB (6) + Polyphaser 1000860 (2)												
DIPLEXER (QTY/MODEL)	4	CCI Pentaplexer 5PX-0726-O												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH												
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Kaelus TMA2117F00V1-1												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	K SBT 782-11055 - Bottom												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	2	RRUS-12												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C Bronze Standard - All technologies on one antenna - Repalce existing antenna with New 4' 12 port Antenna - Add 4 Pentaplexers - Use Existing 6 Capped GSM Feeder. - Add 2 Kaelus Twin TMA - Add 2 LTE RRUS-12 (Bottom) along with Surge protectors - Decom UMTS 1900 - Decom RxAit - Add 5216 - Add XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	24484.C.850.3G.1	24484.C.850.3G.1	CTV50753	CTV50753		UMTS 850	QS46512-2_850MHz_02DT	12.2		0	BOTTOM	Andrew 7/8	90.023045						403.65		17	
	PORT 2	24484.C.700.4G.1	24484.C.700.4G.1	CTL05075_7C_1	CTL05075_7C_1		LTE 700	QS46512-	12.6		2	BOTTOM	Andrew 7/8	90.023045						1475.7065		17	

								2_722MHz_02DT															
	PORT 3					Decom	UMTS 1900																
	PORT 4					Decom	GSM 1900																
	PORT 7	24484.C.1900.4G.tmp1,24484.C.1900.4G.tmp2	24484.C.1900.4G.2	CTL05075_9C_1	CTL05075_9C_1		LTE 1900	QS46512-2_1930MHz_02DT	15.7		2	BOTTOM	Andrew 7/8	90.023045						3664.3757		18	
	PORT 8	24484.C.1900.4G.tmp2	24484.C.1900.4G.2	CTL05075_9C_2	CTL05075_9C_2		LTE 1900	QS66512-2_1930MHz_02DT	15.7		2	BOTTOM	Andrew 7/8	90.023045						3664.3757		18	

Diagram - Sector	A	Diagram File Name - CT5075_A_B_C_LTE2C_Brnz_Std_04172017.vsd					
Atoll Site Name -	CTV5075	Location Name -	BROOKFIELD WEST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

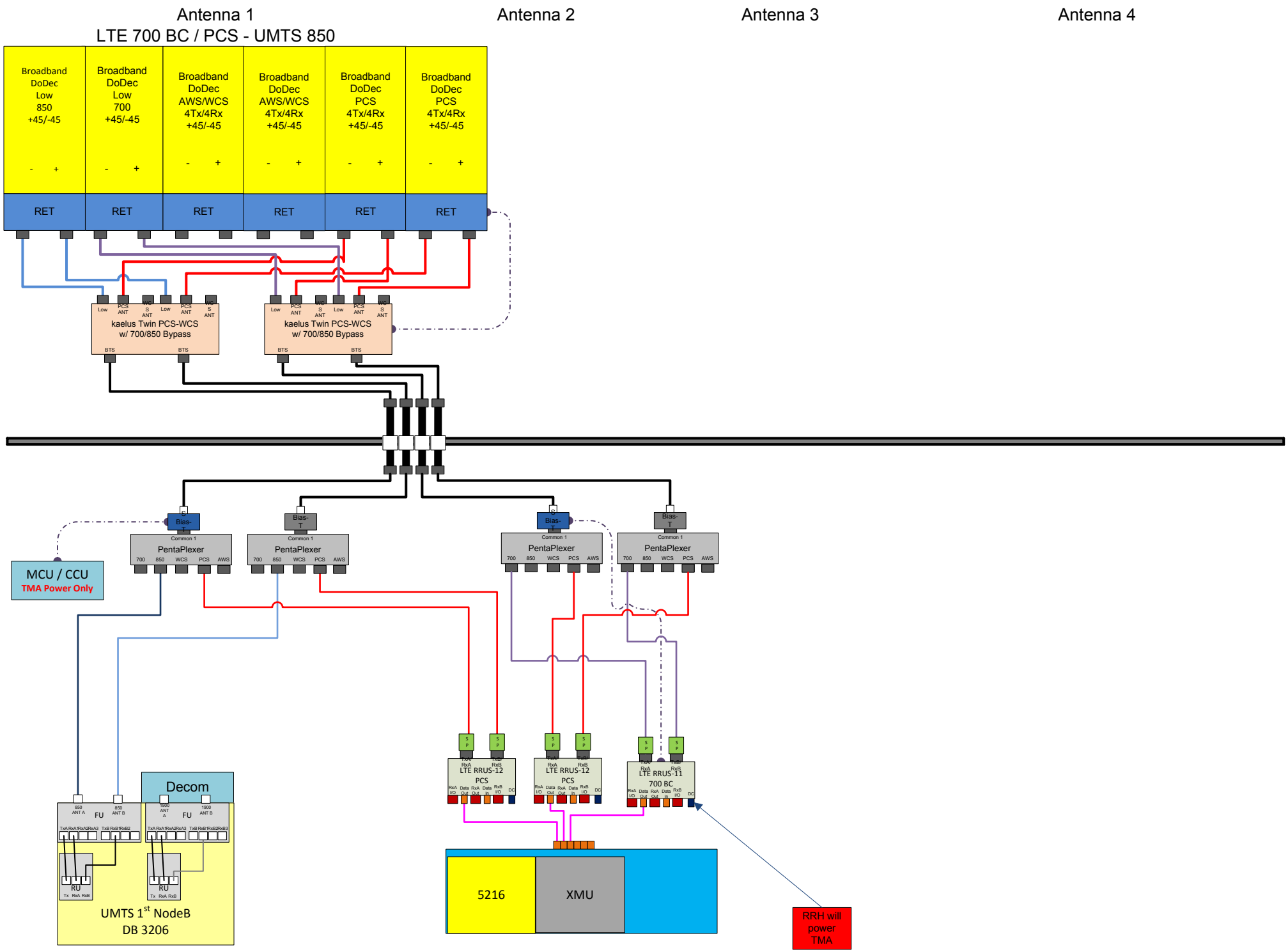


Diagram - Sector	B	Diagram File Name - CT5075_A_B_C_LTE2C_Brnz_Std_04172017.vsd					
Atoll Site Name -	CTV5075	Location Name -	BROOKFIELD WEST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

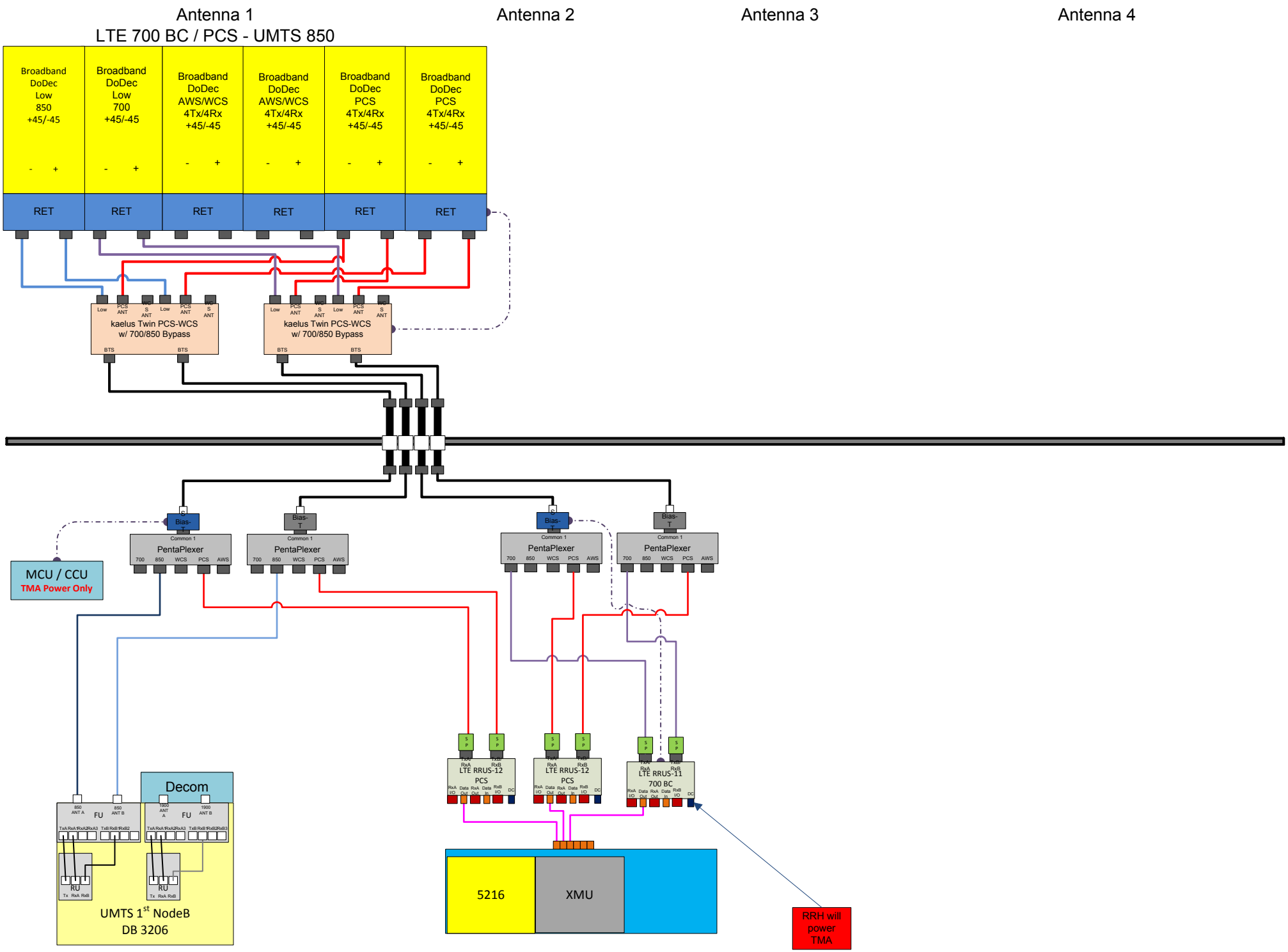
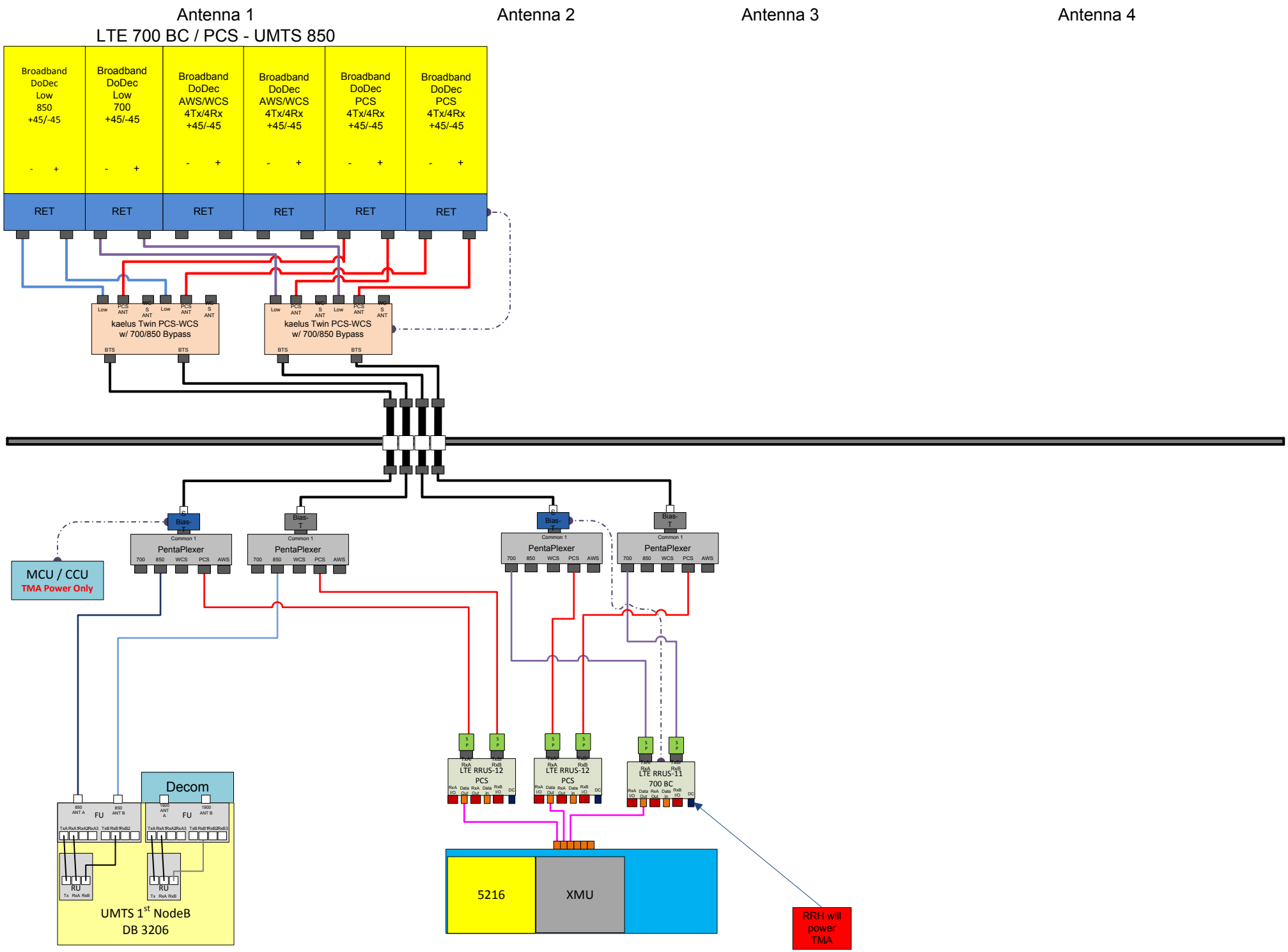


Diagram - Sector	C	Diagram File Name - CT5075_A_B_C_LTE2C_Brnz_Std_04172017.vsd					
Atoll Site Name -	CTV5075	Location Name -	BROOKFIELD WEST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							



NOTES			
Date Time (Central)	Version	ATTUID	Note
1/16/2017 12:54:14 PM	1.00	mr673a	LTE Priliminary RFDS
4/17/2017 6:36:25 PM	2.00	mm093q	RFDS VERSION incremented.
4/17/2017 7:03:01 PM	2.00	mm093q	Updated RFDS to show 2nd Carrier 1900, in Sec 9 / 16/17 and Add 5216 as per RAN notes.
5/3/2017 5:45:27 PM	3.00	mb497j	RFDS VERSION incremented.

WORKFLOW SUMMARY							
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
01/16/2017	Preliminary In Progress	mr673a	Preliminary Submitted for Approval	RC475S	Promote	LTE Priliminary RFDS	NER-RCTB-12-04539 MRCTB021410 SUCCESS 01/16/2017 1:24:17 PM
01/17/2017	Preliminary Submitted for Approval	RC475S	Preliminary Modification Recommended	OM636A	Demote	OTHER - Add missing iplan for BWE	
01/17/2017	Preliminary Modification Recommended	OM636A	Preliminary Submitted for Approval	RC475S	Promote	Updated the iplan and pace to add LTE BWE Software carrier add	
01/18/2017	Preliminary Submitted for Approval	RC475S	Preliminary Approved	LG792W	Promote		
03/02/2017	Preliminary Approved	LG792W	Preliminary Approved	DC5778	Reassign	Successfully Reassigned	
04/04/2017	Preliminary Approved	DC5778	Final RF Approval	OM636A	Promote	Please make final	
04/17/2017	Final RF Approval	OM636A	Final RF Approval	MM093Q	Reassign		
04/17/2017	Final RF Approval	MM093Q	Final Approved	DC5778	Promote	Updated RFDS to show 2nd Carrier 1900, in Sec 9 / 16/17 and Add 5216 as per RAN notes.	NER-RCTB-12-04539 FAILURE 04/17/2017 7:04:30 PM NER-RCTB-17-00006 FAILURE 04/17/2017 7:04:30 PM
04/27/2017	Final Approved	DC5778	Final Modification Recommended	OM636A	Demote	RF needs revision for existing 3 RRUs are a second carrier of UMTS 850 that is not reflected in the RFDS. The RFDS needs to be demoted and then updated to show their existence and plumbing. There are also 6 capped coax cables existing from decommissioned GSM, 6 new are not needed.	
05/02/2017	Final Modification Recommended	OM636A	Final Modification Recommended	MB497J	Reassign	Successfully Reassigned	

Quintel®
New Dimensions in Wireless™

QS46512-2

4ft 65° XXX MultiServ™ 12-Port Antenna

2x698-806MHz / 2x824-894MHz / 4x1850-1990MHz / 4x1695-1780+2110-2400MHz

MultiServ

- Provides 12 antenna Ports in a slim-line form factor
- Optimized Azimuth patterns for Min Inter-Sector Interference
- Industry leading Minimal Wind-Load design
- 700, 850, PCS, AWS & WCS bands in one antenna
- AISG & 3GPP compliant internal remote electrical tilt (RET)
- AWS & PCS Cross band PIM >159dBc

The Quintel MultiServ™ Multiband 12 Port Antenna with patented QTilt™ technology uniquely delivers four independent services in a single slim-line antenna. This enables existing antenna network sites to be upgraded constraint free to add new services such as LTE for 700, 850, PCS, AWS and WCS bands with the replacement of one antenna. The QS46512-2 also provides 4x1695-1780+2110-2400MHz & 4x1850-1990MHz ports as two side-by-side (CLA-2X) arrays, each set of 4x ports having independent tilt, for connection to 2T4R/4T4R services.

Electrical Characteristics	2x Ports 1&2	2x Ports 3&4	4x Ports 5-8			4x Ports 9-12
Operating Frequency (MHz)	**698-806**	**824-894**	**1695-1780 and 2110-2400**			**1850-1990**
	698-806	824-894	1695-1780	2110-2180	2300-2400	1850-1990
Azimuth beamwidth[1]	65°	61°	72°	65°	60°	68°
Elevation beamwidth[1]	15.5°	14°	7.7°	6.2°	5.7°	7.3°
Gain[1] (dBi)	12.7	12.5	15.5	16.0	16.2	15.3
Polarization	±45°	±45°	±45° ±45°			±45° ±45°
Electrical down-tilt range	2°-10°	2°-10°	2° – 10°			2° – 10°
Upper SLL (20° > mainbeam)[1]	-16dB	-19dB	-17.5dB	-16dB	-17dB	-19dB
Front to Back Ratio(180°±10°)[1]	≥25dB	≥24dB	≥34dB	≥28dB	≥30dB	≥28dB
Port to Port isolation[1]	≥26dB	≥29dB	≥30dB	≥30dB	≥30dB	≥30dB
Return loss (VSWR)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB (1.5)	14dB(1.5)
X Polar Discrimination (at 0°)	>16dB	>17.5dB	>21dB	>20dB	>21dB	>18dB
Max Power handling (per any port)	500 watts	500 watts	250 watts			250 watts
Total Composite Power (all ports)	1750 watts					
PIM (3rd Order) (2x43dBm)	>153dBc	>153dBc	>153dBc			>153dBc
XBand PIM (3rd Order) (2x43dBm)			>159dBc			

[1] *Typical Performance across frequency and Downtilt.*

Mechanical Characteristics	
Dimensions	L 52"(1320mm) x W 12"(304mm) x D 10.8"(275mm)
Weight (excl mounting brackets)	75lbs (34kg)
No. of Connectors	12x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Flat Plate Area	2.02ft² (0.19m²)
Wind Load @160km/h (45m/s)	Front: 445N (100 lbs), Side: 267N (60 lbs)
Operating Temperature	-40°C to +65°C

Fully Integrated RET Characteristics	
AISG Standards	V1.1,V 2.0 and 3GPP
Factory Default	AISG 2.0
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
Device Type	SRET Type 1
AISG Data rate	9.6 kbps
No of connectors	RET1 1in/1out.
Connector type	IEC 60130-9 (Ed 3.0)
MTBF	36,000 Operational moves

All specifications are subject to change without notice. Please contact your Quintel representative for complete information.

TMA2117F00V1-1

PCS / WCS Dual Band Twin TMA, with 700/850 bypass, AISG2.0

Designed to be deployed in co-located PCS & WCS systems with wideband antennas, the Kaelus TMA provides internal diplexing and gain in both bands while allowing 700/850 services to pass through to a separate antenna, thereby saving hardware costs.

PRODUCT FEATURES

- Improved base station sensitivity through gain in PCS and WCS bands
- Hardware and software configuration using AISG "Personality" upload
- High Linearity and low noise performance; Bypass provided for 700/850MHz services
- Fail safe bypass mode with lightning protection

TECHNICAL SPECIFICATIONS

Downlink Path, Band 1	PCS
Passband	1930 - 1990
Insertion Loss	0.5dB typ
Return Loss	18dB min
Max Average input power (W)	160
Max PEP Input Power (W)	2000
Intermodulation, 2 x 43dBm TX carriers (dBc)	-153dBc max
Uplink Path, Band 1	
Passband	1850 - 1910
Gain (dB)	3dB to 13dB in 1dB steps
Gain window	+/- 1dB max
Return Loss (Operating)	18dB min
Return Loss (Bypass)	12dB min
Noise Figure	1.4dB typ
Bypass Loss	2.5dB typ

Supply Current, alarm mode	320 +/- 30mA per port (programmable)

AISG MODE OF OPERATION (AUTO SELECTED ON VALID AISG 2.0 FRAMES)

AISG Version	2
AISG Supply Current	400mA @ 8.5V, 120mA @ 30V typical
AISG Connector	IEC60130-9, 8-pin female
AISG Connector Current rating	< 4A peak, 2A continuous, pin 6
Field firmware upgradable	Yes

ENVIRONMENTAL

Temperature range	-40ºC to +65ºC | -40º to +149ºF
Environmental sealing	IP67
Lightning protection	RF port: +/- 5kA max (8/20us), AISG port: +/- 2kA max (8/20us) IEC61312-1
MTBF	>1,000,000 hours
Compliance	EMC:EN301 489, Ingress ETSI EN 300 019 class 4.1, RoHS

MECHANICAL

Connectors	DIN 4.3-10 (F) x 8 long shank, AISG (F) x 1
Dimensions, H x D x W	216 x 300 x 107mm | 8.46 x 11.81 x 4.21in
Finish	Powder coated, light grey (RAL7035)
Weight	8 kg | 17.6lbs est
Mounting	Pole / wall bracket supplied with two metal clamps for 45-178 mm diameter poles

ELECTRICAL BLOCK DIAGRAM

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5075

Brookfield West
2 Huckleberry Hill Road
Brookfield, CT 6804

May 31, 2017

Centerline Communications Project Number: 950006-055

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**9.04 %**

May 31, 2017

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

Emissions Analysis for Site: **CT5075 – Brookfield West**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **2 Huckleberry Hill Road, Brookfield, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **2 Huckleberry Hill Road, Brookfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Quintel QS46512-2	57
B	1	Quintel QS46512-2	57
C	1	Quintel QS46512-2	57

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Quintel QS46512-2	850 MHz / 700 MHz / 1900 MHz (PCS)	10.35 / 10.55 / 13.15	6	300	4,490.83	9.04
						Sector A Composite MPE%	**9.04**
Antenna B1	Quintel QS46512-2	850 MHz / 700 MHz / 1900 MHz (PCS)	10.35 / 10.55 / 13.15	6	300	4,490.83	9.04
						Sector B Composite MPE%	**9.04**
Antenna C1	Quintel QS46512-2	850 MHz / 700 MHz / 1900 MHz (PCS)	10.35 / 10.55 / 13.15	6	300	4,490.83	9.04
						Sector C Composite MPE%	**9.04**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**9.04 %**
No Additional Carriers Located on This Facility	NA
Site Total MPE %:	**9.04 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	9.04 %
AT&T Sector B Total:	9.04 %
AT&T Sector C Total:	9.04 %
Site Total:	9.04 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	325.18	57	8.99	850 MHz	567	1.59%
AT&T 700 MHz LTE	2	681.01	57	18.83	700 MHz	467	4.03%
AT&T 1900 MHz (PCS) LTE	2	1,239.23	57	34.26	1900 MHz (PCS)	1000	3.43%
						Total:	**9.04%**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	9.04 %
Sector B:	9.04 %
Sector C:	9.04 %
AT&T Maximum Total (per sector):	9.04 %
Site Total:	9.04 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.04 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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