Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

October 17, 2014

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **T-Mobile-Exempt Modification - Crown Site BU: 826222**
T-Mobile Site ID: CT11217A
Located at: 201 Main Street, Newtown, CT 06470

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable E. Patricia Llodra, First Selectman for the Town of Newtown and Bluelinx Corp, Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **201 Main Street, Newtown, CT 06470**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. T-Mobile's replacement antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.

5. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable E. Patricia Llodra, First Selectman
Newtown Municipal Center
3 Primrose Street
Newtown, CT 06470

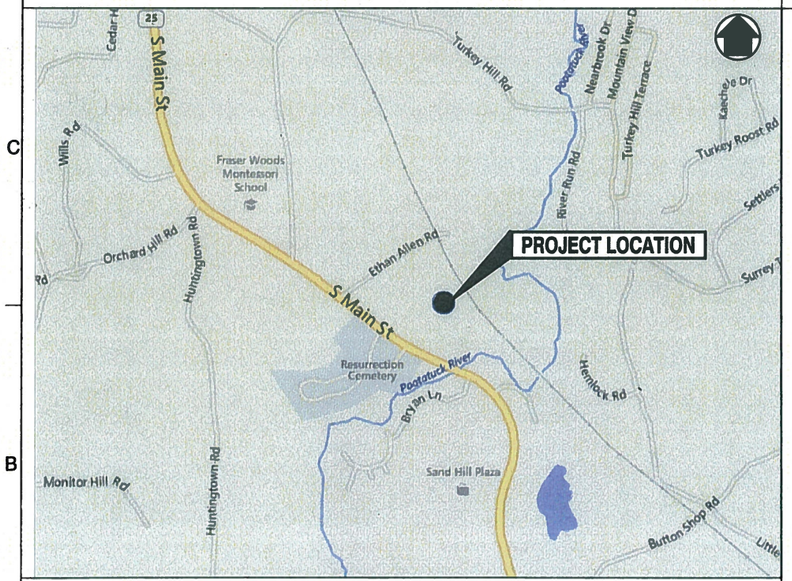
cc: Bluelinx Corp
4300 Wildwood Pkwy
Atlanta, GA 30339

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11217A
CROWN CASTLE BU #: 826222
SITE NAME: NEWTOWN/RT-25
201 MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SITE CONFIGURATION: 702CU

SITE INFORMATION



KEY MAP
N.T.S.

DIRECTIONS: (FROM PARSIPPANY):

START OUT GOING WEST ON SYLVAN WAY TOWARD CENTURY DR. TURN RIGHT ONTO LITTLETON RD/US-202 N. KEEP LEFT AT THE FORK TO GO ON LITTLETON RD E. MERGE ONTO I-287 N. MERGE ONTO I-87 S/I-287 E/NEW YORK TRWY S TOWARD I-87 S/TAPPAN ZEE BRG/NEW YORK CITY. TAKE THE I-87 S EXIT TOWARD SAW MILL PKWY S/NEW YORK CITY. TAKE THE NY-119/SAW MILL PKWY N. EXIT 8A. TOWARD ELMSFORD. MERGE ONTO SAW MILL RIVER PKWY N VIA THE RAMP ON THE LEFT TOWARD KATONAH. MERGE ONTO I-684 N VIA THE EXIT ON THE LEFT. MERGE ONTO I-84 E VIA EXIT 9E TOWARD DANBURY. TAKE THE CT-25. EXIT 9. TOWARD BROOKFIELD. MERGE ONTO HAWLEYVILLE RD/CT-25 TOWARD NEWTOWN. TURN LEFT ONTO US-6 E/CT-25/MOUNT PLEASANT RD. CONTINUE TO FOLLOW CT-25. 201 S MAIN ST IS ON THE LEFT.

PROJECT INFORMATION

T-MOBILE SITE #:	CT11217A
CROWN CASTLE BU #:	826222
SITE ADDRESS:	201 MAIN STREET NEWTOWN, CT 06470 FAIRFIELD COUNTY
LATITUDE:	N 41° 22' 41.32"
LONGITUDE:	W 73° 16' 26.94"
TOWER OWNER:	CROWN CASTLE 1200 MACARTHUR BLVD., SUITE 200 MAHWAH, NJ 07430
CONTACT:	PETER TISI (201) 236-9224
APPLICANT:	T-MOBILE NORTHEAST, LLC 4 SYLVAN WAY PARSIPPANY, NJ 07054
CONTACT:	PHONE #: (973) 397-4800 FAX #: (973) 292-8893
ENGINEER:	DEWBERRY ENGINEERS INC. 600 PARSIPPANY ROAD, SUITE 301 PARSIPPANY, NJ 07054
CONTACT:	GREG NAWROTZKI (973) 576-9653
SCOPE OF WORK:	REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (3) NEW ANTENNAS, ADD (3) NEW RRU'S.

SHEET INDEX

SHEET NO.	SHEET DESCRIPTION
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C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

APPROVALS

T-MOBILE DATE

OWNER/ LANDLORD DATE

RF ENGINEER DATE

ZONING DATE

CONSTRUCTION DATE

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
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PHONE: 973.739.9400
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4 SYLVAN WAY
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PHONE: (973) 397-4800
FAX: (973) 292-8893

NEWTOWN/RT-25

CT11217A

201 MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SEAL

STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER
JIANG YU 24382
CT PROFESSIONAL LICENSE NO. 24382

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
0	09/15/14	HMP	ISSUED AS FINAL
A	09/02/14	HMP	ISSUED FOR REVIEW

REVISIONS

DRAWN BY HMP
CHECKED BY BSH
APPROVED BY GHN
DATE 09/02/14

TITLE
TITLE SHEET

PROJECT NO. 50066258/50066280

T - 1

SHEET NO.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CROWN CASTLE
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T–MOBILE SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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PARSIPPANY, NJ 07054
PHONE: 973.739.9400
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T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
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FAX: (973) 292-8893

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DRAWN BY HMP
CHECKED BY BSH
APPROVED BY GHN
DATE 09/02/14

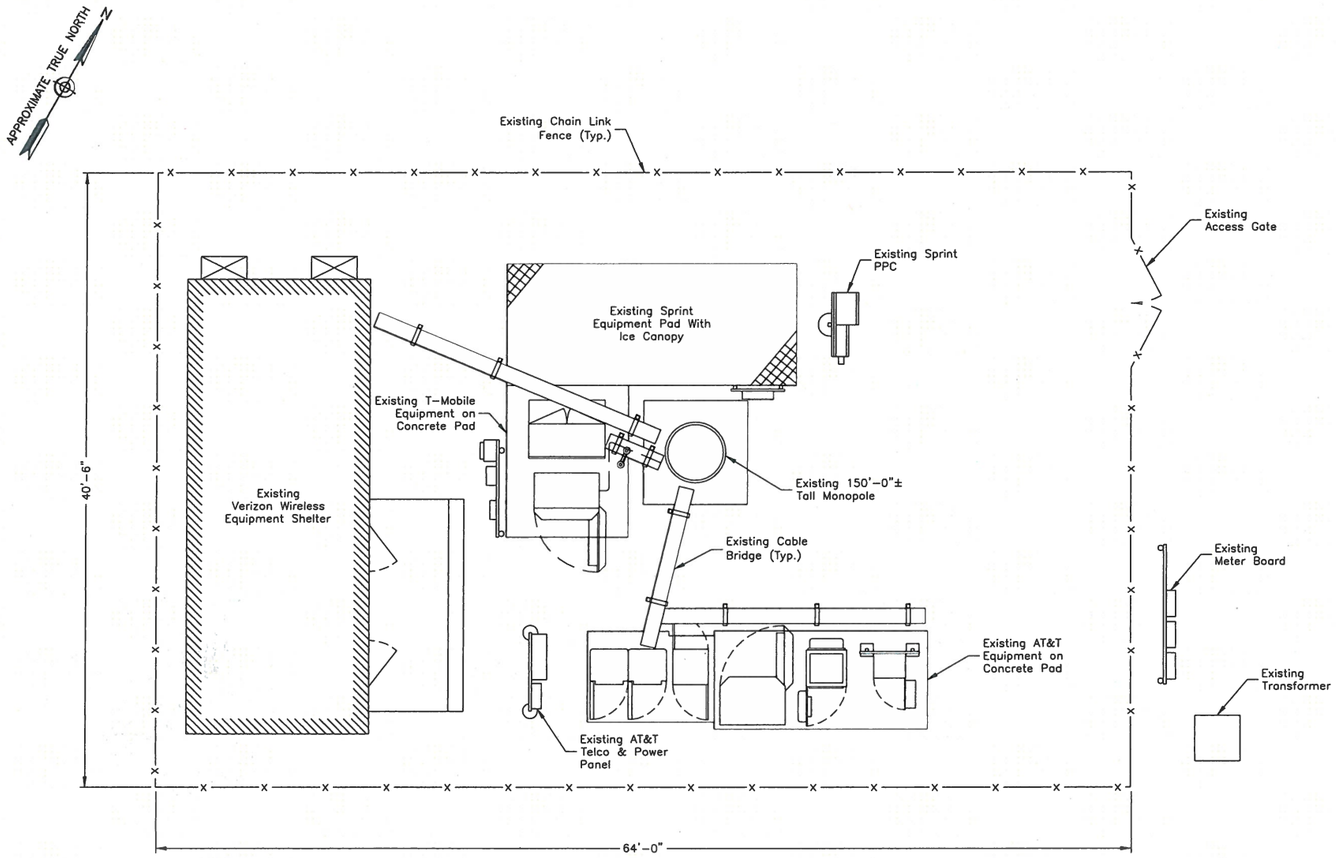
TITLE

GENERAL NOTES

PROJECT NO. 50066258/50066280

G - 1

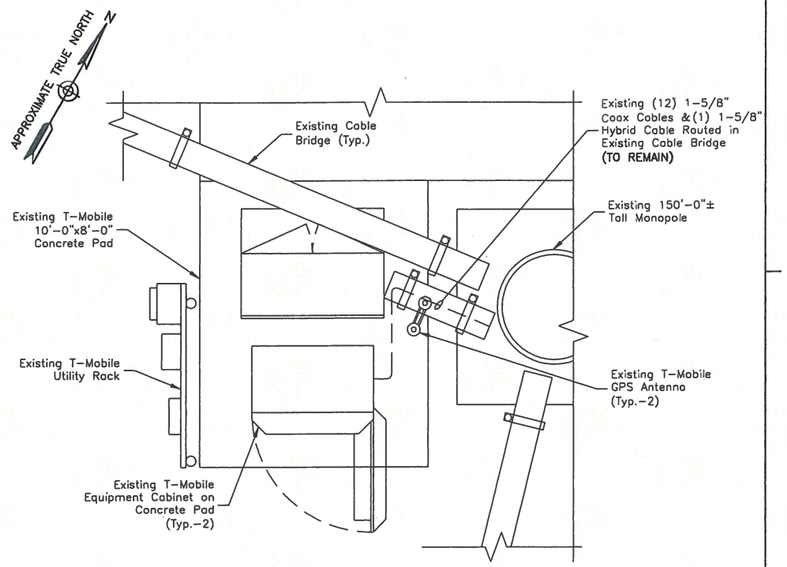
SHEET NO.



COMPOUND PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

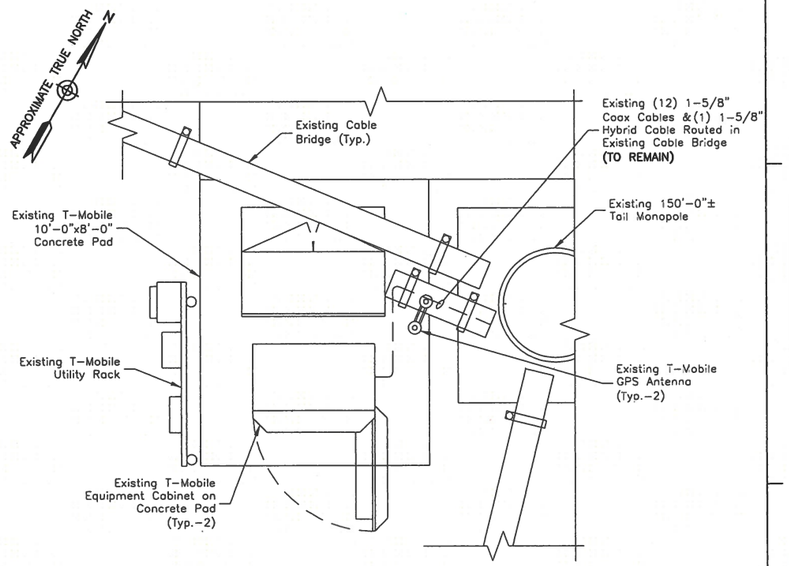
0' 5' 10'



EXISTING EQUIPMENT PLAN 2

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'



PROPOSED EQUIPMENT PLAN 3

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. MOUNT ALL ANTENNAS, RRU'S, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS.

Dewberry®
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600 PARSIPPANY ROAD
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LICENSED PROFESSIONAL ENGINEER

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COMPOUND PLAN & EQUIPMENT PLANS

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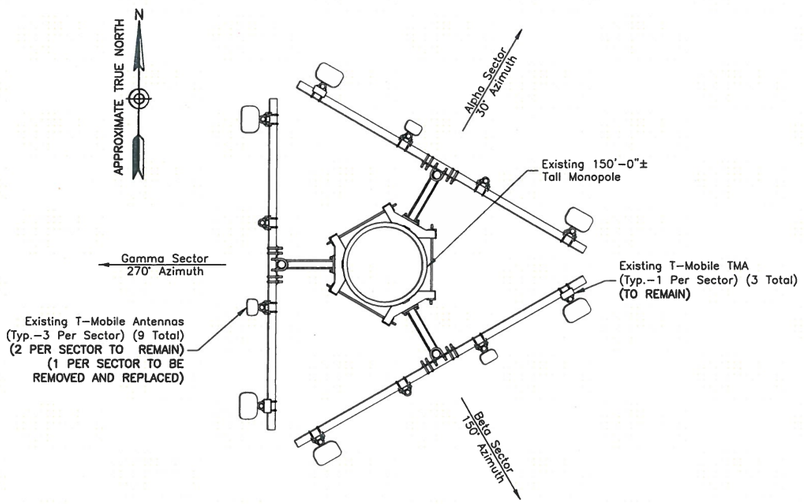
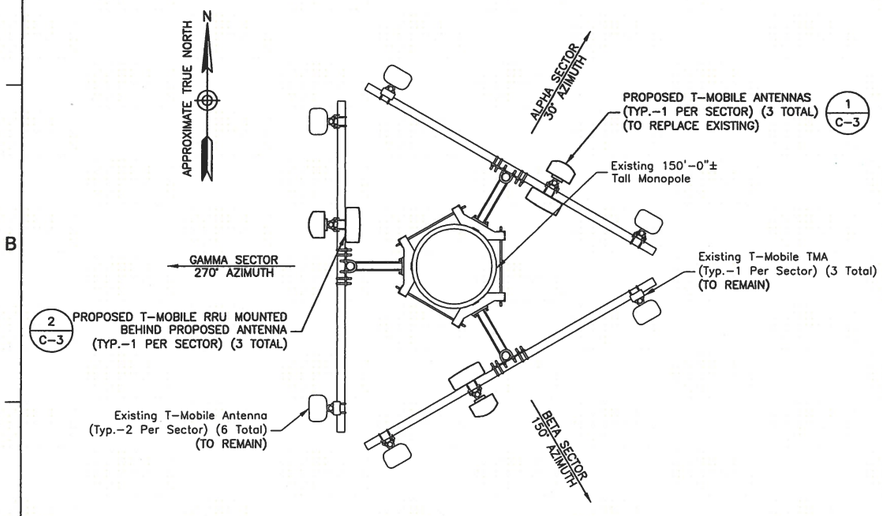
C - 1

SHEET NO.



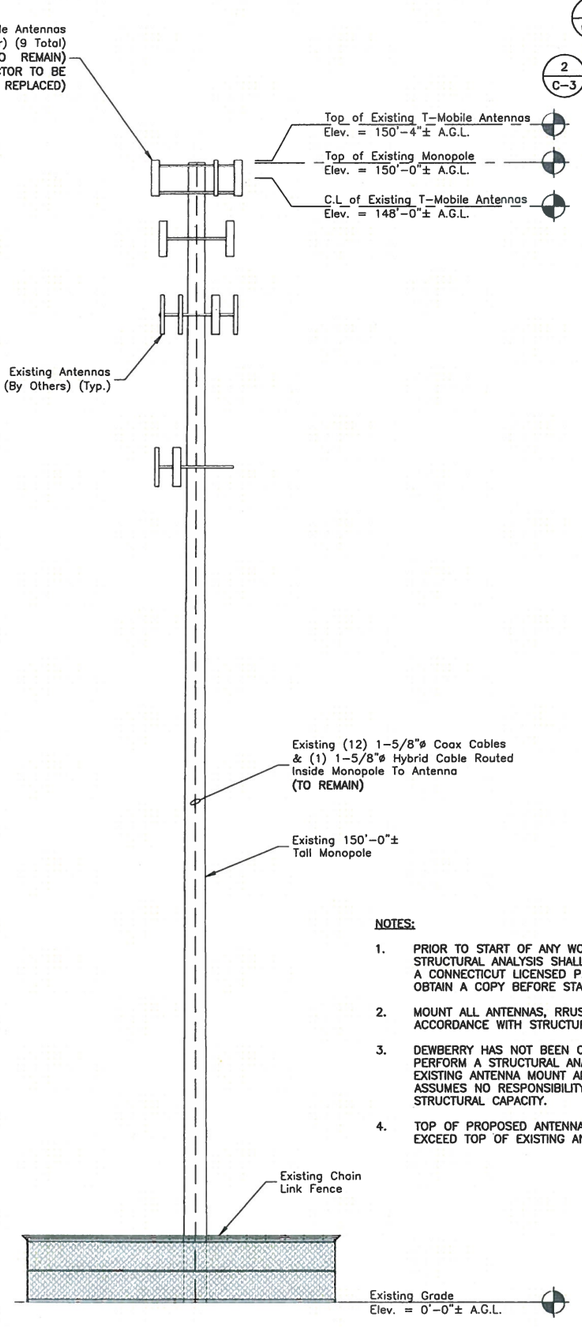
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.



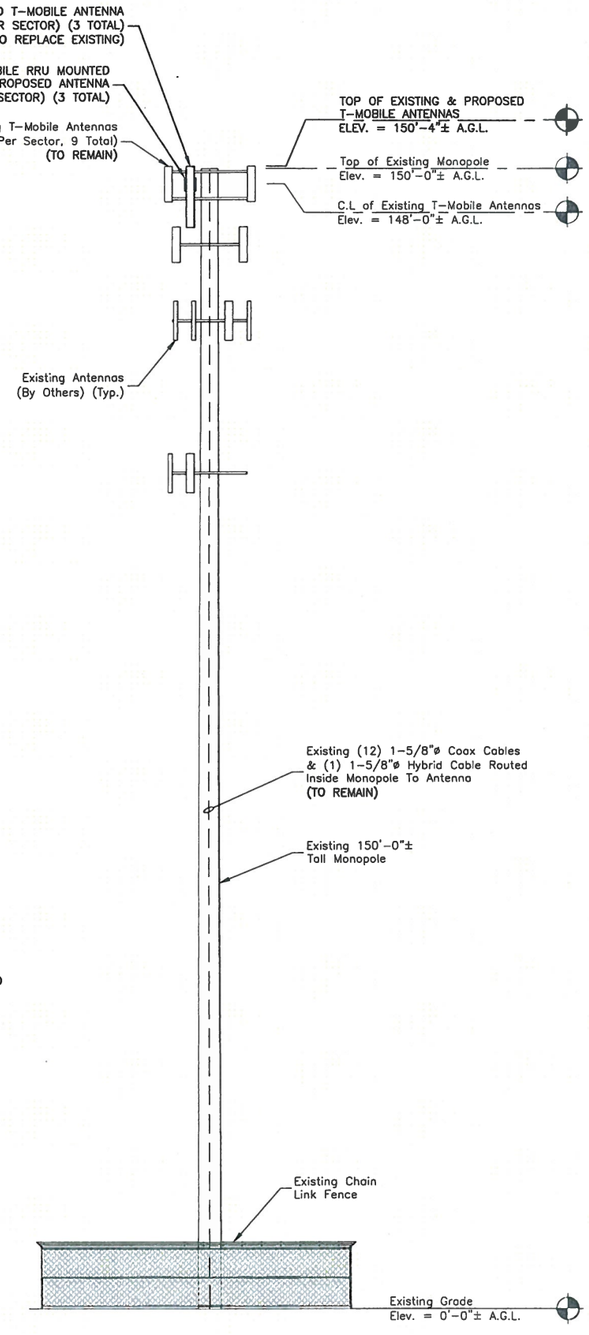
NOTES:

1. PRIOR TO START OF ANY WORK, A PASSING STRUCTURAL ANALYSIS SHALL BE PROVIDED BY A CONNECTICUT LICENSED P.E. CONTRACTOR TO OBTAIN A COPY BEFORE STARTING ANY WORK.
2. MOUNT ALL ANTENNAS, RRUS, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.
3. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.
4. TOP OF PROPOSED ANTENNAS ARE NOT TO EXCEED TOP OF EXISTING ANTENNAS.

EXISTING ELEVATION (3)

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'



PROPOSED ELEVATION (4)

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

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NEWTOWN/RT-25

CT11217A

201 MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SEAL

STATE OF CONNECTICUT
JIANG YU LEE
No. 23122
REGISTERED PROFESSIONAL ENGINEER
CORRESPONDING LICENSE NO. 023122

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
0	09/15/14	HMP	ISSUED AS FINAL
A	09/02/14	HMP	ISSUED FOR REVIEW

REVISIONS

DRAWN BY HMP
CHECKED BY BSH
APPROVED BY GHN
DATE 09/02/14

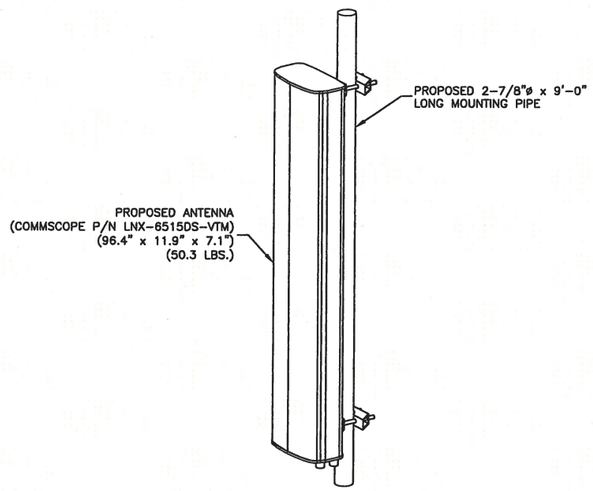
TITLE

ANTENNA LAYOUTS & ELEVATIONS

PROJECT NO. 50066258/50066280

C - 2

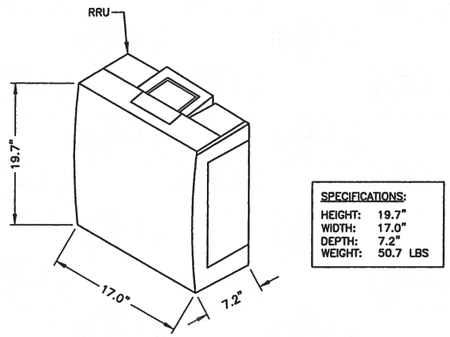
SHEET NO.



NOTE:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL (1)
SCALE: N.T.S.



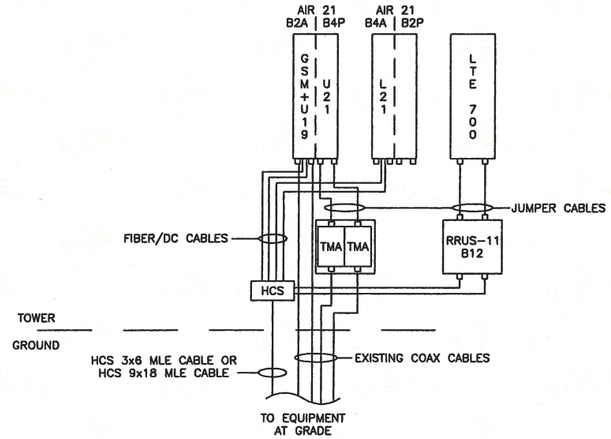
SPECIFICATIONS:	
HEIGHT:	19.7"
WIDTH:	17.0"
DEPTH:	7.2"
WEIGHT:	50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

1. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT (2)
SCALE: N.T.S.



SITE CONFIGURATION 700MHZ (3)
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH	HCS LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN	(4) 1-5/8"	——	198'	198'
	EMS ANTENNA	EXISTING TO BE REMOVED				
	——	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN				
BETA	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN	(4) 1-5/8"	——	198'	
	EMS ANTENNA	EXISTING TO BE REMOVED				
	——	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN				
GAMMA	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN	(4) 1-5/8"	——	198'	
	EMS ANTENNA	EXISTING TO BE REMOVED				
	——	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 ANTENNA	EXISTING TO REMAIN				

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CT11217A

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FAIRFIELD COUNTY

SEAL

SCALE
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REV.	DATE	BY	DESCRIPTION
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REVISIONS

DRAWN BY HMP
CHECKED BY BSH
APPROVED BY GHN
DATE 09/02/14

TITLE

CONSTRUCTION DETAILS

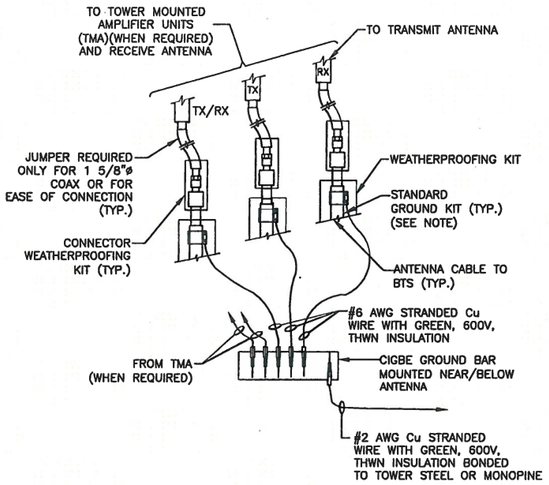
PROJECT NO. 50066258/50066280

C - 3

SHEET NO.

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM T-MOBILE MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

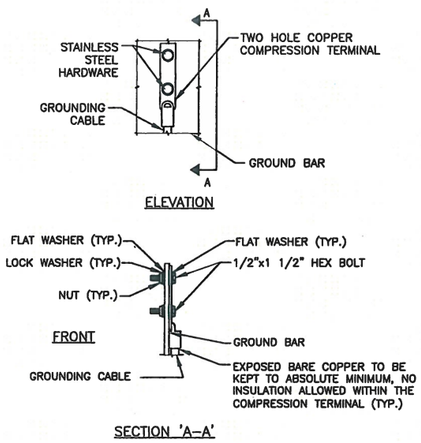


NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

SCALE: N.T.S.

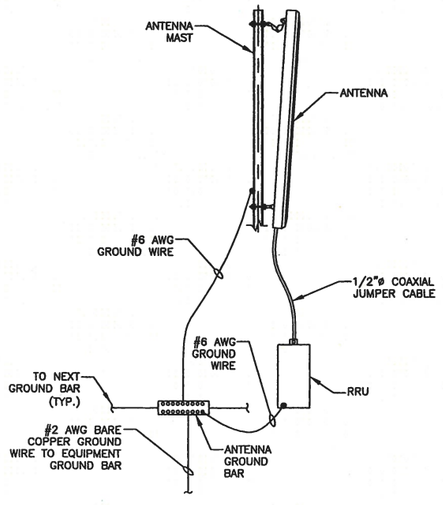


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

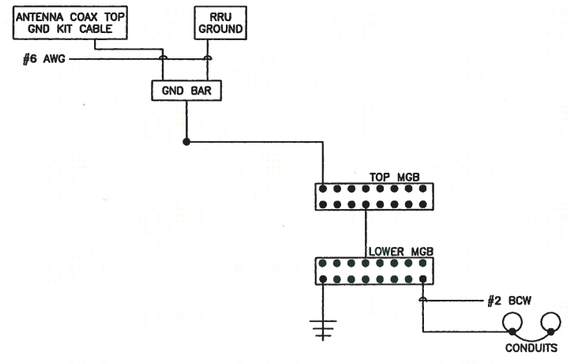
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 3

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.

SCHEMATIC GROUNDING DIAGRAM — 4

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REVISIONS

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APPROVED BY GHN
DATE 09/02/14

TITLE

GROUNDING NOTES & DETAILS

PROJECT NO. 50066258/50066280

E - 1

SHEET NO.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **October 3, 2014**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11217A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	826222
	Crown Castle Site Name:	Newtown/RT-25
	Crown Castle JDE Job Number:	302453
	Crown Castle Work Order Number:	937562
	Crown Castle Application Number:	261531 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-1642.004.7805
Site Data:	**201 Main Street, Newtown, Fairfield County, CT** **Latitude *41° 22' 41.32"*, Longitude *-73° 16' 26.94"*** **150 Foot - Monopole Tower**	

Dear Timothy Howell,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 710816, in accordance with application 261531, revision 1.

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

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

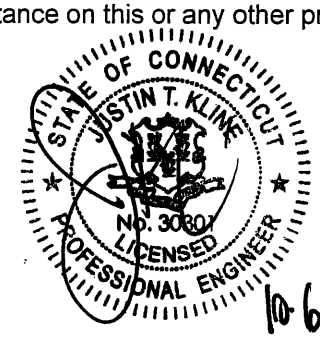
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

This report is only valid if the installed pier reinforcing steel matches the layout as specified in the foundation design drawings referenced in Table 4.

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

Respectfully submitted by:

Seth Tschanen
Structural Designer



10-6-14

tnxTower Report - version 6.1.4.1

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **October 3, 2014**

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

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

Subject: Structural Analysis Report

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	Carrier Site Name:	N/A
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Respectfully submitted by:

Seth Tschanen
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by PIROD MANUFACTURES INC. in October of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	--	--	--
		3	ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Sector Mount [SM 408-3]			
		3	Andrew	TMBXX-6516-R2M w/ Mount Pipe	--	--	3
		3		ETW190VS12UB			
140.0	140.0	3	alcatel lucent	1900MHz RRH	--	--	2
		3	alcatel lucent	800MHZ RRH			
		1	tower mounts	Platform Mount [LP 303-1]	--	--	1
	137.0	3	alcatel lucent	TD-RRH8x20-25	4	1-1/4	2
		6	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
127.0	127.0	3	alcatel lucent	RRH2x40-AWS	1	1-5/8	2
		1	antel	BXA-70063/4CF w/ Mount Pipe			
		3	kathrein	742 213 w/ Mount Pipe			
		1	rfs celwave	DB-B1-6C-8AB-0Z			
		1	antel	BXA-171063-12BF w/ Mount Pipe	12	1-5/8	1
		2	antel	BXA-171063/8CF w/ Mount Pipe			
		6	rfs celwave	APL866513-42T0 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		2	swedcom	SLCP 2x6014 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 304-1]			
110.0	110.0	6	ericsson	RRUS-11	1 1 2 6	3/8 3/4 7/8* 1-1/4	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			

Notes: *Installed in Conduit
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed - Not Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
--	--	--	--	--	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti Geotechnical Engineering, 10/16/2000	3536527	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, A-117711-F-1001206, 10/17/2000	3536528	CCISITES
4- MODIFICATION DRAWINGS	PJF, 37513-1642 BP, 8/20/2013	3963744	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 130625, 06/30/2014	5156735	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was reinforced in conformance with the reference modification drawings by PJF dated 8/20/2013.
5) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.
6) The pictures on CCISites show a square pier while the design documents show a round pier. The pier was analyzed as a square pier with reinforcing steel as specified in the design documents.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 133	Pole	TP26x21.83x0.25	1	-4.67	1032.38	15.0	Pass
L2	133 - 98.45	Pole	TP34.0625x24.7764x0.3125	2	-12.51	1691.15	57.7	Pass
L3	98.45 - 64.8	Pole	TP41.75x32.4841x0.375	3	-19.13	2488.32	70.7	Pass
L4	64.8 - 32	Pole	TP49.0625x39.8387x0.375	4	-27.05	2928.95	81.8	Pass
L5	32 - 0	Pole	TP56.125x46.9597x0.375	5	-37.80	3394.28	89.3	Pass
							Summary	
						Pole (L5)	89.3	Pass
						Rating =	89.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	84.4	Pass
1,3	Base Plate	0	89.3	Pass
1	Base Foundation Steel	0	99.8	Pass
1	Base Foundation Soil Interaction	0	20.0	Pass
1	Micropile	0	96.5	Pass

Structure Rating (max from all components) =	**99.8%**

Notes:
1. See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2. Capacities up to 100% are considered acceptable based on analysis methods used.
3. See assumption #5.

4.1) Recommendations

- Map the foundation, including a rebar scan to verify the dimensions of the foundation pier and the quantity and orientation of the pier steel.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.0000-133.0000	17.0000	2.95	18	21.8300	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	133.0000-98.4500	37.5000	3.85	18	24.7764	34.0625	0.3125	0.1250	A572-65 (65 ksi)
L3	98.4500-64.8000	37.5000	4.70	18	32.4841	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	64.8000-32.0000	37.5000	5.50	18	39.8387	49.0625	0.3750	0.1875	A572-65 (65 ksi)
L5	32.0000-0.0000	37.5000		18	46.9597	56.1250	0.3750	0.1875	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.1668	17.1237	1007.4853	7.6609	11.0896	90.8492	2016.2962	8.5635	3.4021	13.608
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.9004	24.2651	1834.7230	8.6847	12.5864	145.7703	3671.8603	12.1349	4.2066	13.461
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.8410	18.691
L3	33.9512	38.2179	4978.0706	11.3987	16.5019	301.6659	9962.6915	19.1126	5.0572	13.486
	42.3941	49.2466	10650.9822	14.6881	21.2090	502.1916	21315.9793	24.6280	6.6880	17.835
L4	41.6271	46.9716	9242.0494	14.0096	20.2380	456.6670	18496.2597	23.4903	6.8136	18.17
	49.8194	57.9503	17355.1378	17.2841	24.9238	696.3293	34733.1119	28.9807	8.4370	22.499
L5	49.0491	55.4474	15202.1423	16.5376	23.8555	637.2591	30424.2880	27.7290	8.0669	21.512
	56.9908	66.3564	26056.1506	19.7913	28.5115	913.8821	52146.5865	33.1845	9.6800	25.813

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.0000-133.0000				1	1	1		
L2 133.0000-98.4500				1	1	1		
L3 98.4500-64.8000				1	1	1		
L4 64.8000-32.0000				1	1	1		
L5 32.0000-0.0000				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
LDF7-50A(1-5/8")	C	No	Inside Pole	148.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	148.0000 - 0.0000	1	No Ice	0.0000	1.07
						1/2" Ice	0.0000	1.07
						1" Ice	0.0000	1.07
						2" Ice	0.0000	1.07
						4" Ice	0.0000	1.07
***								
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	140.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
						2" Ice	0.0000	1.20
						4" Ice	0.0000	1.20
HB114-21U3M12-XXXF(1-1/4")	C	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	1.22
						1/2" Ice	0.0000	1.22
						1" Ice	0.0000	1.22
						2" Ice	0.0000	1.22
						4" Ice	0.0000	1.22
***								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	2	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.9980	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	10	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
						2" Ice	0.0000	11.02
						4" Ice	0.0000	30.52
***								
LDF2-50A(3/8")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.08
						1" Ice	0.0000	0.08
						2" Ice	0.0000	0.08
						4" Ice	0.0000	0.08
LDF5-50A(7/8")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
LDF6-50A(1-1/4")	C	No	Inside Pole	110.0000 - 0.0000	6	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
9776(3/4")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
						2" Ice	0.0000	0.31
						4" Ice	0.0000	0.31
2" (Nominal) Conduit	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
						2" Ice	0.0000	0.72
						4" Ice	0.0000	0.72

Feed Line/Linear Appurtenances Section Areas

Tower Section n	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	150.0000-	A	0.000	0.000	0.000	0.000	0.00
	133.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.20
L2	133.0000-	A	0.000	0.000	0.000	0.000	0.00
	98.4500	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.306	0.93
L3	98.4500-64.8000	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	13.325	1.10
L4	64.8000-32.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.989	1.07
L5	32.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.672	1.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.0000-	A	0.893	0.000	0.000	0.000	0.000	0.00
	133.0000	B		0.000	0.000	0.000	0.000	0.00

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
		C		0.000	0.000	0.000	0.000	0.20
L2	133.0000-98.4500	A	0.871	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	21.504	2.11
L3	98.4500-64.8000	A	0.836	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	25.053	2.45
L4	64.8000-32.0000	A	0.785	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	23.953	2.32
L5	32.0000-0.0000	A	0.750	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	22.721	2.18

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.0000-133.0000	0.0000	0.0000	0.0000	0.0000
L2	133.0000-98.4500	-0.3849	0.2222	-0.6322	0.3650
L3	98.4500-64.8000	-0.4567	0.2637	-0.7532	0.4349
L4	64.8000-32.0000	-0.4653	0.2686	-0.7702	0.4447
L5	32.0000-0.0000	-0.4715	0.2722	-0.7730	0.4463

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8155 7.3373 7.8532 8.9160 11.1650	5.6334 6.4717 7.2478 8.8537 12.2804	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8155 7.3373 7.8532 8.9160 11.1650	5.6334 6.4717 7.2478 8.8537 12.2804	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A	C	From Face	4.0000	0.00	148.0000	No Ice	6.8155	5.6334	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B2P w/ Mount Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.3373 7.8532 8.9160 11.1650	6.4717 7.2478 8.8537 12.2804	0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.4083 0.4969 0.5941 0.8145 1.3590	0.2042 0.2733 0.3511 0.5326 0.9992	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.4083 0.4969 0.5941 0.8145 1.3590	0.2042 0.2733 0.3511 0.5326 0.9992	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.4083 0.4969 0.5941 0.8145 1.3590	0.2042 0.2733 0.3511 0.5326 0.9992	0.01 0.01 0.02 0.03 0.08
Sector Mount [SM 408-3]	C	None		0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	22.4500 33.5000 44.5500 66.6500 110.8500	22.4500 33.5000 44.5500 66.6500 110.8500	1.02 1.47 1.93 2.84 4.66
***									
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	11.6828 12.4043 13.1351 14.6007 17.8748	9.8418 11.3657 12.9138 15.2672 20.1392	0.08 0.17 0.27 0.51 1.15
RRUS 11 B12	A	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3339 5.5006	1.3611 1.5404 1.7284 2.1303 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3339 5.5006	1.3611 1.5404 1.7284 2.1303 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Face	4.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	3.3056 3.5497 3.8025 4.3339 5.5006	1.3611 1.5404 1.7284 2.1303 3.0377	0.05 0.07 0.10 0.15 0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
***									
(2) APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
(2) APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
(2) APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
1900MHz RRH	A	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9069 3.1446 3.3909 3.9094 5.0502	3.8014 4.0650 4.3372 4.9076 6.1520	0.04 0.08 0.11 0.19 0.41
1900MHz RRH	B	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9069 3.1446 3.3909 3.9094 5.0502	3.8014 4.0650 4.3372 4.9076 6.1520	0.04 0.08 0.11 0.19 0.41
1900MHz RRH	C	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9069 3.1446 3.3909 3.9094 5.0502	3.8014 4.0650 4.3372 4.9076 6.1520	0.04 0.08 0.11 0.19 0.41
800MHZ RRH	A	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	B	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice	2.4899 2.7061 2.9310	2.0685 2.2705 2.4812	0.05 0.07 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
800MHZ RRH	C	From Face	4.0000 0.00 0.00	0.00	140.0000	No Ice	2.4899	2.0685	0.05
						1/2" Ice	2.7061	2.2705	0.07
						1" Ice	2.9310	2.4812	0.10
						2" Ice	3.4068	2.9284	0.16
						4" Ice	4.4620	3.9265	0.32
TD-RRH8x20-25	A	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
TD-RRH8x20-25	B	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
TD-RRH8x20-25	C	From Face	4.0000 0.00 -3.00	0.00	140.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
Platform Mount [LP 303-1]	C	None		0.00	140.0000	No Ice	14.6600	14.6600	1.25
						1/2" Ice	18.8700	18.8700	1.48
						1" Ice	23.0800	23.0800	1.71
						2" Ice	31.5000	31.5000	2.18
						4" Ice	48.3400	48.3400	3.10
****									
(2) APL866513-42T0 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice	4.5308	4.9208	0.03
						1/2" Ice	4.9675	5.5962	0.08
						1" Ice	5.4135	6.2837	0.13
						2" Ice	6.3370	7.7123	0.25
						4" Ice	8.3197	10.8330	0.60
(2) APL866513-42T0 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice	4.5308	4.9208	0.03
						1/2" Ice	4.9675	5.5962	0.08
						1" Ice	5.4135	6.2837	0.13
						2" Ice	6.3370	7.7123	0.25
						4" Ice	8.3197	10.8330	0.60
(2) APL866513-42T0 w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice	4.5308	4.9208	0.03
						1/2" Ice	4.9675	5.5962	0.08
						1" Ice	5.4135	6.2837	0.13
						2" Ice	6.3370	7.7123	0.25
						4" Ice	8.3197	10.8330	0.60
(2) BXA-171063/8CF w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice	3.1574	3.3303	0.03
						1/2" Ice	3.5312	3.9423	0.06
						1" Ice	3.9415	4.5633	0.10
						2" Ice	4.8273	5.8553	0.19
						4" Ice	6.7342	8.8407	0.48
(2) SLCP 2x6014 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice	7.4514	6.9545	0.04
						1/2" Ice	7.9606	7.7563	0.10
						1" Ice	8.4698	8.5195	0.18
						2" Ice	9.5191	10.0997	0.34
						4" Ice	11.7421	13.4750	0.80
BXA-171063-12BF w/	C	From Face	4.0000	0.00	127.0000	No Ice	4.9710	5.2283	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	5.5211 6.0361 7.0911 9.3593	6.3892 7.2610 9.0462 12.8165	0.09 0.14 0.27 0.67
(2) FD9R6004/2C-3L	A	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
***									
742 213 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3729 5.9502 6.5014 7.6106 9.9329	4.6203 6.0004 6.9816 8.8524 12.7940	0.05 0.09 0.15 0.28 0.68
742 213 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3729 5.9502 6.5014 7.6106 9.9329	4.6203 6.0004 6.9816 8.8524 12.7940	0.05 0.09 0.15 0.28 0.68
742 213 w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3729 5.9502 6.5014 7.6106 9.9329	4.6203 6.0004 6.9816 8.8524 12.7940	0.05 0.09 0.15 0.28 0.68
BXA-70063/4CF w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6158 4.2169 4.8343 6.1609 9.1826	0.03 0.07 0.12 0.23 0.57
RRH2x40-AWS	A	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	B	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.04 0.06 0.08 0.13 0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
DB-B1-6C-8AB-0Z	C	From Face	4.0000 0.00 0.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.6000 5.9154 6.2395 6.9136 8.3654	2.3333 2.5580 2.7914 3.2840 4.3728	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 304-1]	C	None		0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.4600 22.4400 27.4200 37.3800 57.3000	17.4600 22.4400 27.4200 37.3800 57.3000	1.35 1.62 1.90 2.45 3.55
*** *** ***									
7770.00 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66
P65-16-XLH-RR w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	6.3625 7.5378 8.4270 10.2390 14.0988	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	6.3625 7.5378 8.4270 10.2390 14.0988	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6375 9.2903 9.9098 11.1763 13.8289	6.3625 7.5378 8.4270 10.2390 14.0988	0.08 0.14 0.22 0.39 0.89
(2) LGP21401	A	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2880 1.4453 1.6112 1.9690 2.7882	0.3640 0.4785 0.6017 0.8739 1.5220	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Face	4.0000 0.00 0.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2880 1.4453 1.6112 1.9690 2.7882	0.3640 0.4785 0.6017 0.8739 1.5220	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Face	4.0000	0.00	110.0000	No Ice	1.2880	0.3640	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00					1/2" Ice	1.4453	0.4785	0.02
			0.00					1" Ice	1.6112	0.6017	0.03
								2" Ice	1.9690	0.8739	0.05
								4" Ice	2.7882	1.5220	0.14
(2) RRUS-11	A	From Face	4.0000			0.00	110.0000	No Ice	3.2486	1.3726	0.05
			0.00					1/2" Ice	3.4905	1.5510	0.07
			0.00					1" Ice	3.7411	1.7380	0.09
								2" Ice	4.2682	2.1381	0.15
								4" Ice	5.4260	3.0418	0.31
(2) RRUS-11	B	From Face	4.0000			0.00	110.0000	No Ice	3.2486	1.3726	0.05
			0.00					1/2" Ice	3.4905	1.5510	0.07
			0.00					1" Ice	3.7411	1.7380	0.09
								2" Ice	4.2682	2.1381	0.15
								4" Ice	5.4260	3.0418	0.31
(2) RRUS-11	C	From Face	4.0000			0.00	110.0000	No Ice	3.2486	1.3726	0.05
			0.00					1/2" Ice	3.4905	1.5510	0.07
			0.00					1" Ice	3.7411	1.7380	0.09
								2" Ice	4.2682	2.1381	0.15
								4" Ice	5.4260	3.0418	0.31
DC6-48-60-18-8F	A	From Face	4.0000			0.00	110.0000	No Ice	2.5667	2.5667	0.02
			0.00					1/2" Ice	2.7978	2.7978	0.04
			0.00					1" Ice	3.0377	3.0377	0.07
								2" Ice	3.5432	3.5432	0.13
								4" Ice	4.6580	4.6580	0.30
Platform Mount [LP 303-1]	C	None				0.00	110.0000	No Ice	14.6600	14.6600	1.25
								1/2" Ice	18.8700	18.8700	1.48
								1" Ice	23.0800	23.0800	1.71
								2" Ice	31.5000	31.5000	2.18
								4" Ice	48.3400	48.3400	3.10

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.0000-133.0000	141.2530	1.515	28.022	33.880	A	0.000	33.880	33.880	100.00	0.000	0.000
					B	0.000	33.880		100.00	0.000	0.000
					C	0.000	33.880		100.00	0.000	0.000
L2 133.0000-98.4500	115.0815	1.429	26.402	85.755	A	0.000	85.755	85.755	100.00	0.000	0.000
					B	0.000	85.755		100.00	0.000	0.000
					C	0.000	85.755		100.00	0.000	11.306
L3 98.4500-64.8000	81.2529	1.294	23.880	105.416	A	0.000	105.416	105.416	100.00	0.000	0.000
					B	0.000	105.416		100.00	0.000	0.000
					C	0.000	105.416		100.00	0.000	13.325
L4 64.8000-32.0000	48.3113	1.115	20.514	123.078	A	0.000	123.078	123.078	100.00	0.000	0.000
					B	0.000	123.078		100.00	0.000	0.000
					C	0.000	123.078		100.00	0.000	12.989
L5 32.0000-0.0000	15.6006	1	18.496	139.239	A	0.000	139.239	139.239	100.00	0.000	0.000
					B	0.000	139.239		100.00	0.000	0.000
					C	0.000	139.239		100.00	0.000	12.672

Tower Pressure - With Ice

G_H = 1.690

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 150.0000-133.0000	141.2530	1.515	5.483	0.8930	36.410	A	0.000	36.410	36.410	100.00	0.000	0.000
						B	0.000	36.410		100.00	0.000	0.000
						C	0.000	36.410		100.00	0.000	0.000
L2 133.0000-98.4500	115.0815	1.429	5.166	0.8713	90.897	A	0.000	90.897	90.897	100.00	0.000	0.000
						B	0.000	90.897		100.00	0.000	0.000
						C	0.000	90.897		100.00	0.000	21.504
L3 98.4500-64.8000	81.2529	1.294	4.673	0.8356	110.303	A	0.000	110.303	110.303	100.00	0.000	0.000
						B	0.000	110.303		100.00	0.000	0.000
						C	0.000	110.303		100.00	0.000	25.053
L4 64.8000-32.0000	48.3113	1.115	4.014	0.7851	127.646	A	0.000	127.646	127.646	100.00	0.000	0.000
						B	0.000	127.646		100.00	0.000	0.000
						C	0.000	127.646		100.00	0.000	23.953
L5 32.0000-0.0000	15.6006	1	3.619	0.7500	143.426	A	0.000	143.426	143.426	100.00	0.000	0.000
						B	0.000	143.426		100.00	0.000	0.000
						C	0.000	143.426		100.00	0.000	22.721

Tower Pressure - Service

G_H = 1.690

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 150.0000-133.0000	141.2530	1.515	9.696	33.880	A	0.000	33.880	33.880	100.00	0.000	0.000
					B	0.000	33.880		100.00	0.000	0.000
					C	0.000	33.880		100.00	0.000	0.000
L2 133.0000-98.4500	115.0815	1.429	9.135	85.755	A	0.000	85.755	85.755	100.00	0.000	0.000
					B	0.000	85.755		100.00	0.000	0.000
					C	0.000	85.755		100.00	0.000	11.306
L3 98.4500-64.8000	81.2529	1.294	8.263	105.416	A	0.000	105.416	105.416	100.00	0.000	0.000
					B	0.000	105.416		100.00	0.000	0.000
					C	0.000	105.416		100.00	0.000	13.325
L4 64.8000-32.0000	48.3113	1.115	7.098	123.078	A	0.000	123.078	123.078	100.00	0.000	0.000
					B	0.000	123.078		100.00	0.000	0.000
					C	0.000	123.078		100.00	0.000	12.989
L5 32.0000-0.0000	15.6006	1	6.400	139.239	A	0.000	139.239	139.239	100.00	0.000	0.000
					B	0.000	139.239		100.00	0.000	0.000
					C	0.000	139.239		100.00	0.000	12.672

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice

Comb. No.	Description
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 133	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	14	-10.08	0.01	-0.01
			Max. Mx	11	-4.68	76.66	-0.01
			Max. My	8	-4.67	-0.00	-76.69
			Max. Vy	11	-11.05	76.66	-0.01
			Max. Vx	8	11.06	-0.00	-76.69
			Max. Torque	7			-0.00
L2	133 - 98.45	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.10	1.23	-1.27
			Max. Mx	11	-12.53	642.14	-1.03
			Max. My	8	-12.51	1.05	-647.41
			Max. Vy	11	-22.23	642.14	-1.03
			Max. Vx	8	22.45	1.05	-647.41
			Max. Torque	2			-1.45
L3	98.45 - 64.8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.11	3.56	-2.64
			Max. Mx	11	-19.15	1424.31	-2.23
			Max. My	8	-19.13	2.43	-1436.35
			Max. Vy	11	-25.43	1424.31	-2.23
			Max. Vx	8	25.64	2.43	-1436.35
			Max. Torque	2			-0.86
L4	64.8 - 32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.39	6.16	-4.15
			Max. Mx	11	-27.06	2286.62	-3.45
			Max. My	8	-27.05	3.89	-2305.19
			Max. Vy	11	-28.35	2286.62	-3.45
			Max. Vx	8	28.56	3.89	-2305.19
			Max. Torque	2			-0.73
L5	32 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.89	9.41	-6.02
			Max. Mx	11	-37.80	3409.15	-4.91
			Max. My	8	-37.80	5.68	-3435.21
			Max. Vy	11	-31.46	3409.15	-4.91
			Max. Vx	8	31.67	5.68	-3435.21
			Max. Torque	2			-0.60

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	56.89	-0.00	0.00
	Max. H_x	11	37.82	31.44	-0.03
	Max. H_z	2	37.82	-0.03	31.65
	Max. M_x	2	3432.37	-0.03	31.65
	Max. M_z	5	3404.79	-31.44	0.03
	Max. Torsion	9	0.50	15.75	-27.42
	Min. Vert	8	37.82	0.03	-31.65
	Min. H_x	5	37.82	-31.44	0.03
	Min. H_z	8	37.82	0.03	-31.65
	Min. M_x	8	-3435.21	0.03	-31.65
	Min. M_z	11	-3409.15	31.44	-0.03
	Min. Torsion	3	-0.50	-15.75	27.42

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	37.82	0.00	0.00	1.38	2.13	0.00
Dead+Wind 0 deg - No Ice	37.82	0.03	-31.65	-3432.37	-1.30	0.48
Dead+Wind 30 deg - No Ice	37.82	15.75	-27.42	-2974.35	-1704.44	0.50
Dead+Wind 60 deg - No Ice	37.82	27.24	-15.85	-1718.68	-2950.33	0.39
Dead+Wind 90 deg - No Ice	37.82	31.44	-0.03	-2.07	-3404.79	0.18
Dead+Wind 120 deg - No Ice	37.82	27.22	15.80	1715.48	-2946.85	-0.08
Dead+Wind 150 deg - No Ice	37.82	15.70	27.40	2973.71	-1698.40	-0.32
Dead+Wind 180 deg - No Ice	37.82	-0.03	31.65	3435.21	5.68	-0.48
Dead+Wind 210 deg - No Ice	37.82	-15.75	27.42	2977.18	1708.82	-0.50
Dead+Wind 240 deg - No Ice	37.82	-27.24	15.85	1721.51	2954.70	-0.39
Dead+Wind 270 deg - No Ice	37.82	-31.44	0.03	4.91	3409.15	-0.18
Dead+Wind 300 deg - No Ice	37.82	-27.22	-15.80	-1712.63	2951.22	0.09
Dead+Wind 330 deg - No Ice	37.82	-15.70	-27.40	-2970.87	1702.79	0.33
Dead+Ice	56.89	0.00	-0.00	6.02	9.41	0.00
Dead+Wind 0 deg+Ice	56.89	0.00	-7.58	-849.51	8.92	0.01
Dead+Wind 30 deg+Ice	56.89	3.77	-6.57	-735.18	-416.18	0.07
Dead+Wind 60 deg+Ice	56.89	6.53	-3.79	-422.23	-727.21	0.10
Dead+Wind 90 deg+Ice	56.89	7.54	-0.00	5.49	-840.84	0.11
Dead+Wind 120 deg+Ice	56.89	6.53	3.79	433.37	-726.61	0.09
Dead+Wind 150 deg+Ice	56.89	3.77	6.56	746.77	-415.13	0.04
Dead+Wind 180 deg+Ice	56.89	-0.00	7.58	861.70	10.14	-0.01
Dead+Wind 210 deg+Ice	56.89	-3.77	6.57	747.37	435.23	-0.07
Dead+Wind 240 deg+Ice	56.89	-6.53	3.79	434.42	746.27	-0.10
Dead+Wind 270 deg+Ice	56.89	-7.54	0.00	6.70	859.89	-0.11
Dead+Wind 300 deg+Ice	56.89	-6.53	-3.79	-421.18	745.66	-0.09
Dead+Wind 330 deg+Ice	56.89	-3.77	-6.56	-734.57	434.18	-0.04
Dead+Wind 0 deg - Service	37.82	0.01	-10.95	-1187.99	0.98	0.17
Dead+Wind 30 deg - Service	37.82	5.45	-9.49	-1029.31	-588.95	0.18
Dead+Wind 60 deg - Service	37.82	9.43	-5.48	-594.37	-1020.48	0.14
Dead+Wind 90 deg - Service	37.82	10.88	-0.01	0.21	-1177.92	0.06
Dead+Wind 120 deg - Service	37.82	9.42	5.47	595.12	-1019.27	-0.03
Dead+Wind 150 deg - Service	37.82	5.43	9.48	1030.95	-586.85	-0.11
Dead+Wind 180 deg - Service	37.82	-0.01	10.95	1190.84	3.40	-0.17
Dead+Wind 210 deg - Service	37.82	-5.45	9.49	1032.16	593.33	-0.18
Dead+Wind 240 deg - Service	37.82	-9.43	5.48	597.22	1024.86	-0.14
Dead+Wind 270 deg - Service	37.82	-10.88	0.01	2.63	1182.30	-0.06
Dead+Wind 300 deg - Service	37.82	-9.42	-5.47	-592.28	1023.65	0.03
Dead+Wind 330 deg -	37.82	-5.43	-9.48	-1028.10	591.23	0.11

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						

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	-37.82	0.00	0.00	37.82	0.00	0.000%
2	0.03	-37.82	-31.65	-0.03	37.82	31.65	0.005%
3	15.75	-37.82	-27.42	-15.75	37.82	27.42	0.000%
4	27.24	-37.82	-15.85	-27.24	37.82	15.85	0.000%
5	31.44	-37.82	-0.03	-31.44	37.82	0.03	0.005%
6	27.22	-37.82	15.80	-27.22	37.82	-15.80	0.000%
7	15.70	-37.82	27.40	-15.70	37.82	-27.40	0.000%
8	-0.03	-37.82	31.65	0.03	37.82	-31.65	0.005%
9	-15.75	-37.82	27.42	15.75	37.82	-27.42	0.000%
10	-27.24	-37.82	15.85	27.24	37.82	-15.85	0.000%
11	-31.44	-37.82	0.03	31.44	37.82	-0.03	0.005%
12	-27.22	-37.82	-15.80	27.22	37.82	15.80	0.000%
13	-15.70	-37.82	-27.40	15.70	37.82	27.40	0.000%
14	0.00	-56.89	0.00	-0.00	56.89	0.00	0.000%
15	0.00	-56.89	-7.58	-0.00	56.89	7.58	0.002%
16	3.77	-56.89	-6.57	-3.77	56.89	6.57	0.002%
17	6.53	-56.89	-3.79	-6.53	56.89	3.79	0.002%
18	7.54	-56.89	-0.00	-7.54	56.89	0.00	0.002%
19	6.53	-56.89	3.79	-6.53	56.89	-3.79	0.002%
20	3.77	-56.89	6.56	-3.77	56.89	-6.56	0.002%
21	-0.00	-56.89	7.58	0.00	56.89	-7.58	0.002%
22	-3.77	-56.89	6.57	3.77	56.89	-6.57	0.002%
23	-6.53	-56.89	3.79	6.53	56.89	-3.79	0.002%
24	-7.54	-56.89	0.00	7.54	56.89	-0.00	0.002%
25	-6.53	-56.89	-3.79	6.53	56.89	3.79	0.002%
26	-3.77	-56.89	-6.56	3.77	56.89	6.56	0.002%
27	0.01	-37.82	-10.95	-0.01	37.82	10.95	0.002%
28	5.45	-37.82	-9.49	-5.45	37.82	9.49	0.001%
29	9.43	-37.82	-5.48	-9.43	37.82	5.48	0.001%
30	10.88	-37.82	-0.01	-10.88	37.82	0.01	0.002%
31	9.42	-37.82	5.47	-9.42	37.82	-5.47	0.001%
32	5.43	-37.82	9.48	-5.43	37.82	-9.48	0.001%
33	-0.01	-37.82	10.95	0.01	37.82	-10.95	0.002%
34	-5.45	-37.82	9.49	5.45	37.82	-9.49	0.001%
35	-9.43	-37.82	5.48	9.43	37.82	-5.48	0.001%
36	-10.88	-37.82	0.01	10.88	37.82	-0.01	0.002%
37	-9.42	-37.82	-5.47	9.42	37.82	5.47	0.001%
38	-5.43	-37.82	-9.48	5.43	37.82	9.48	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	7	0.00005969	0.00014812
3	Yes	11	0.00000001	0.00007762
4	Yes	11	0.00000001	0.00007584
5	Yes	7	0.00005974	0.00008152
6	Yes	11	0.00000001	0.00007576
7	Yes	11	0.00000001	0.00007724
8	Yes	7	0.00005968	0.00013136
9	Yes	11	0.00000001	0.00007591
10	Yes	11	0.00000001	0.00007743
11	Yes	7	0.00005973	0.00008529
12	Yes	11	0.00000001	0.00007670
13	Yes	11	0.00000001	0.00007546
14	Yes	4	0.00000001	0.00001429
15	Yes	7	0.00013722	0.00003110
16	Yes	7	0.00013708	0.00011962

17	Yes	7	0.00013709	0.00010980
18	Yes	7	0.00013725	0.00003064
19	Yes	7	0.00013708	0.00011701
20	Yes	7	0.00013707	0.00012055
21	Yes	7	0.00013721	0.00003145
22	Yes	7	0.00013703	0.00011865
23	Yes	7	0.00013702	0.00012736
24	Yes	7	0.00013719	0.00003135
25	Yes	7	0.00013704	0.00011856
26	Yes	7	0.00013704	0.00011629
27	Yes	7	0.00000001	0.00004431
28	Yes	8	0.00000001	0.00009115
29	Yes	8	0.00000001	0.00008482
30	Yes	7	0.00000001	0.00003926
31	Yes	8	0.00000001	0.00008538
32	Yes	8	0.00000001	0.00009071
33	Yes	7	0.00000001	0.00004387
34	Yes	8	0.00000001	0.00008511
35	Yes	8	0.00000001	0.00009050
36	Yes	7	0.00000001	0.00003947
37	Yes	8	0.00000001	0.00008873
38	Yes	8	0.00000001	0.00008436

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 133	30.74	33	1.72	0.00
L2	135.95 - 98.45	25.70	33	1.69	0.00
L3	102.3 - 64.8	14.72	33	1.36	0.00
L4	69.5 - 32	6.78	33	0.92	0.00
L5	37.5 - 0	1.99	33	0.48	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	33	30.02	1.72	0.00	34014
140.0000	(2) APXVSPP18-C-A20 w/ Mount Pipe	33	27.14	1.71	0.00	17009
127.0000	(2) APL866513-42T0 w/ Mount Pipe	33	22.59	1.64	0.00	8018
110.0000	7770.00 w/ Mount Pipe	33	17.02	1.46	0.00	4883

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 133	88.55	8	4.95	0.01
L2	135.95 - 98.45	74.05	8	4.87	0.01
L3	102.3 - 64.8	42.44	8	3.92	0.00
L4	69.5 - 32	19.55	8	2.66	0.00
L5	37.5 - 0	5.73	8	1.39	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	8	86.47	4.95	0.01	11974
140.0000	(2) APXVSPP18-C-A20 w/ Mount Pipe	8	78.20	4.91	0.01	5987
127.0000	(2) APL866513-42T0 w/ Mount Pipe	8	65.07	4.71	0.01	2820
110.0000	7770.00 w/ Mount Pipe	8	49.06	4.20	0.00	1713

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 133 (1)	TP26x21.83x0.25	17.0000	0.0000	0.0	39.00	19.8584	-4.67	774.48	0.006
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	37.5000	0.0000	0.0	39.00	32.5302	-12.51	1268.68	0.010
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	37.5000	0.0000	0.0	39.00	47.8643	-19.13	1866.71	0.010
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	37.5000	0.0000	0.0	39.00	56.3401	-27.05	2197.26	0.012
L5	32 - 0 (5)	TP56.125x46.9597x0.375	37.5000	0.0000	0.0	38.37	66.3564	-37.80	2546.35	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 133 (1)	TP26x21.83x0.25	76.69	7.52	39.00	0.193	0.00	0.00	39.00	0.000
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	647.41	29.56	39.00	0.758	0.00	0.00	39.00	0.000
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	1436.35	36.34	39.00	0.932	0.00	0.00	39.00	0.000
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	2305.19	42.04	39.00	1.078	0.00	0.00	39.00	0.000
L5	32 - 0 (5)	TP56.125x46.9597x0.375	3435.21	45.11	38.37	1.175	0.00	0.00	38.37	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 133 (1)	TP26x21.83x0.25	11.06	0.56	26.00	0.043	0.00	0.00	26.00	0.000
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	22.45	0.69	26.00	0.053	0.87	0.02	26.00	0.001
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	25.64	0.54	26.00	0.041	0.75	0.01	26.00	0.000
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	28.56	0.51	26.00	0.039	0.63	0.01	26.00	0.000
L5	32 - 0 (5)	TP56.125x46.9597x0.375	31.67	0.48	26.00	0.037	0.48	0.00	26.00	0.000

Pole Interaction Design Data

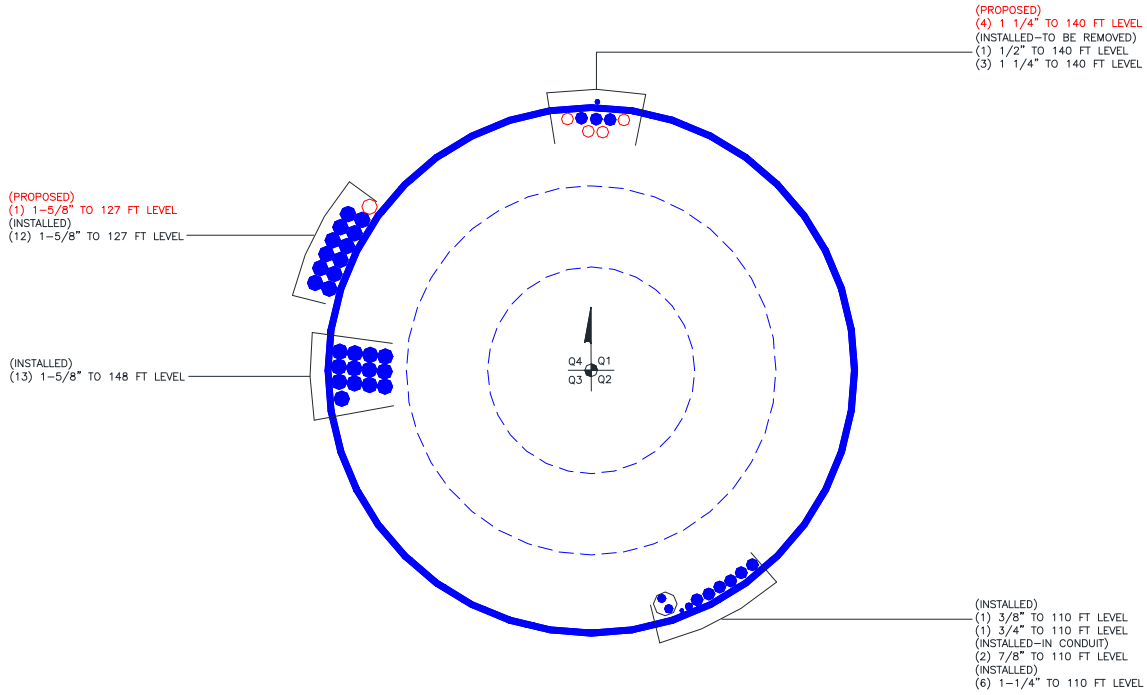
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 133 (1)	0.006	0.193	0.000	0.043	0.000	0.199 ✔	1.333	H1-3+VT ✔
L2	133 - 98.45 (2)	0.010	0.758	0.000	0.053	0.001	0.769 ✔	1.333	H1-3+VT ✔
L3	98.45 - 64.8 (3)	0.010	0.932	0.000	0.041	0.000	0.943 ✔	1.333	H1-3+VT ✔
L4	64.8 - 32 (4)	0.012	1.078	0.000	0.039	0.000	1.091 ✔	1.333	H1-3+VT ✔
L5	32 - 0 (5)	0.015	1.175	0.000	0.037	0.000	1.191 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 133	Pole	TP26x21.83x0.25	1	-4.67	1032.38	15.0	Pass
L2	133 - 98.45	Pole	TP34.0625x24.7764x0.3125	2	-12.51	1691.15	57.7	Pass
L3	98.45 - 64.8	Pole	TP41.75x32.4841x0.375	3	-19.13	2488.32	70.7	Pass
L4	64.8 - 32	Pole	TP49.0625x39.8387x0.375	4	-27.05	2928.95	81.8	Pass
L5	32 - 0	Pole	TP56.125x46.9597x0.375	5	-37.80	3394.28	89.3	Pass
							Summary	
							Pole (L5) 89.3	Pass
							RATING = **89.3**	**Pass**

APPENDIX B

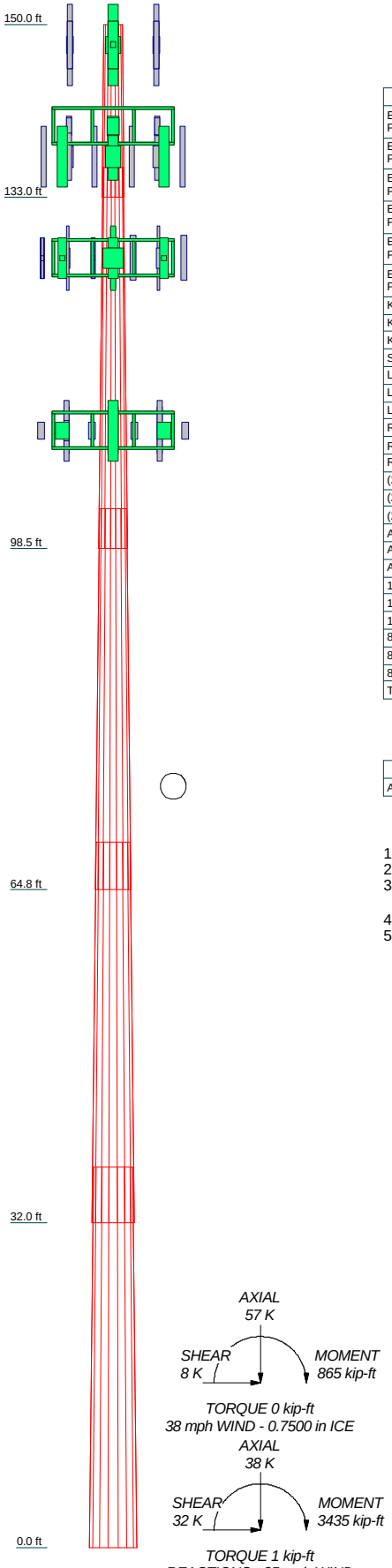
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	17.0000	18	0.2500	2.9500	21.8300	26.0000		1.1
2	37.5000	18	0.3125	3.8500	24.7764	34.0625		3.7
3	37.5000	18	0.3750	4.7000	32.4841	41.7500	A572-65	5.6
4	37.5000	18	0.3750	5.5000	39.8387	49.0625		6.7
5	37.5000	18	0.3750		46.9597	56.1250		7.8
								24.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	TD-RRH8x20-25	140
		TD-RRH8x20-25	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	Platform Mount [LP 303-1]	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	(2) APL866513-42T0 w/ Mount Pipe	127
		(2) APL866513-42T0 w/ Mount Pipe	127
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	(2) APL866513-42T0 w/ Mount Pipe	127
		(2) BXA-171063/8CF w/ Mount Pipe	127
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	(2) SLCP 2x6014 w/ Mount Pipe	127
		BXA-171063-12BF w/ Mount Pipe	127
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	(2) FD9R6004/2C-3L	127
		(2) FD9R6004/2C-3L	127
KRY 112 144/1	148	(2) FD9R6004/2C-3L	127
KRY 112 144/1	148	742 213 w/ Mount Pipe	127
KRY 112 144/1	148	742 213 w/ Mount Pipe	127
Sector Mount [SM 408-3]	148	742 213 w/ Mount Pipe	127
LNX-6515DS-VTM w/ Mount Pipe	148	BXA-70063/4CF w/ Mount Pipe	127
LNX-6515DS-VTM w/ Mount Pipe	148	RRH2x40-AWS	127
LNX-6515DS-VTM w/ Mount Pipe	148	RRH2x40-AWS	127
RRUS 11 B12	148	RRH2x40-AWS	127
RRUS 11 B12	148	DB-B1-6C-8AB-0Z	127
RRUS 11 B12	148	Platform Mount [LP 304-1]	127
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	7770.00 w/ Mount Pipe	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	7770.00 w/ Mount Pipe	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	7770.00 w/ Mount Pipe	110
APXVTM14-C-120 w/ Mount Pipe	140	P65-16-XLH-RR w/ Mount Pipe	110
APXVTM14-C-120 w/ Mount Pipe	140	P65-16-XLH-RR w/ Mount Pipe	110
APXVTM14-C-120 w/ Mount Pipe	140	P65-16-XLH-RR w/ Mount Pipe	110
1900MHz RRH	140	(2) LGP21401	110
1900MHz RRH	140	(2) LGP21401	110
1900MHz RRH	140	(2) LGP21401	110
800MHZ RRH	140	(2) RRUS-11	110
800MHZ RRH	140	(2) RRUS-11	110
800MHZ RRH	140	(2) RRUS-11	110
TD-RRH8x20-25	140	DC6-48-60-18-8F	110
		Platform Mount [LP 303-1]	110

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 89.3%

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

Job:	***150' Monopole / Newtown***		
Project:	***37513-1642.003 / BU 826222***		
Client: Crown Castle	Drawn by: Lohengri Gimeno	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: T:\375 Crown Castle\2013\37513-1642.BU.826222\WO 99501 BU 826222 - 003 54\37513-1642.003.7805.eri		Dwg No. E-1	

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

TIA Rev F

Site Data

BU#:	*826222*
Site Name:	*Newtown/RT-25*
App #:	
Pole Manufacturer:	*Pirod*

Reactions		
Moment:	3435	ft-kips
Axial:	38	kips
Shear:	32	kips

Anchor Rod Data		
Qty:	39	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	61	in

Plate Data		
Diam:	65	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.57	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.5	in
Width:	4.5	in
Height:	8	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	56.125	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	68.3 Kips	Service, ASD
Allowable Tension:	81.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	84.4% **Pass**	

Base Plate Results Shear Check Only

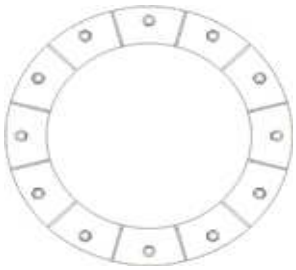
		Stiffened
Base Plate Stress:	Rohn/Pirod, OK	Service, ASD
Allowable Plate Stress:	26.7 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: N/A, Roark

Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A



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

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

Foundation Loads:

Pole weight or tower leg compression =	**38**	(kips)
Horizontal load at top of pier =	**32**	(kips)
Overturning moment at top of pier=	**2661**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**125**	(pcf)
Allowable soil bearing =	**15**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**6**	(ft)
Footing thickness =	**2**	(ft)
Footing width =	**21**	(ft)
Footing length =	**21**	(ft)

Concrete:

Concrete strength =	**4**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

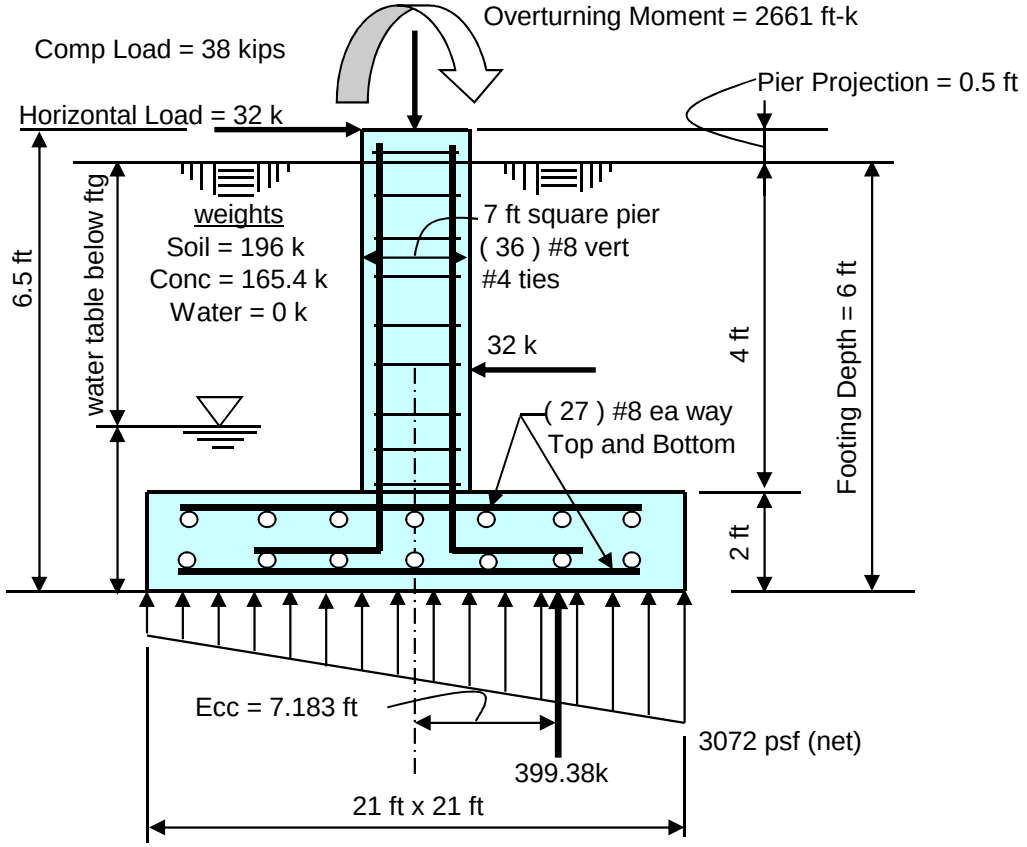
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#8**	bar
quantity of pad rebar =	**27**	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#8**	bar
vertical rebar quantity =	**36**	
size of pier ties =	**#4**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 40.8 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.072 ksf Allowable Net Soil Bearing = 15 ksf **Soil Bearing Stress Ratio = 0.2 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 74 psi **Bending Shear Stress Ratio = 0.59 Okay**
SEE "CHECK OF OVERTURNING CAPACITY" PAGE FOR OVERTURNING CALCUALATIONS & CAPACITY	Pad Bending Moment Capacity= 1800 ft-k Pad Bending Moment = 1422 ft-k **Bending Moment Stress Ratio = 0** **SEE "MICROPILE/ROCK ANCHOR DESIGNFOR MAT OR PAD PIER" PAGE**

Check Overturning Capacity of Foundation System

PJF job no. **37513-1642.003**

Assumptions: 1) Micropile reinforcing has been installed
2) Wind into side of foundation is worst case scenario

Pole base moment =	**3435**	ft-k	
Pole base shear =	**32**	kips	
Pole axial load =	**38**	kips	
Total foundation thickness / height =	**6.5**	feet	
Distance from center of pole to edge of fdn =	**10.5**	feet	
Foundation weight =	**158.3**	kips	
Soil weight (abv fdn) =	**201.3**	kips	
Quantity of piles =	**2**		
Pile yield strength =	**218.1**	kips	
Pile distance to edge of fdn =	**14.75**	feet	(Average of two worst case pile locations)
Overturning resistance (pole/fdn/soil) =	**4174.8**	ft-k	
Overturning resistance (piles) =	**6434.0**	ft-k	
Total overturning resistance =	**10608.8**	ft-k	
Overturning moment at base of foundation =	**3643.0**	ft-k	
Required safety factor against overturning =	**1.5**		
% Capacity =	**51.5%**	**OK**	

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

By: lgr Date: 8/15/2014
Project: 826222
Client: Crown
PROJ#: 37513-1642.003

Revision Date: 6/17/2013

Micropile/Rock Anchor Design for Mat or Pad Pier

TNX Reactions

M =	774	k-ft
A =	0	kips
S =	0	kips

Foundation Parameters

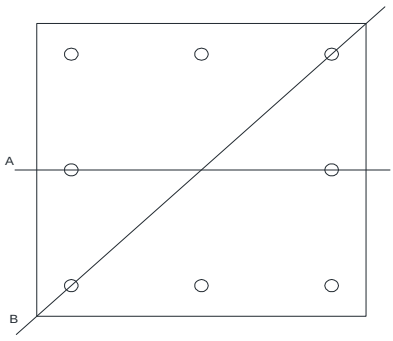
Pier Shape =	R	
Pier Width =	7	ft
Height Above Grade =	0.5	ft
Depth to Bottom =	6	ft
Pad Thickness =	2	ft
Pad Width =	21	ft
Pad Length =	21	ft

Soil Parameters

Unit Weight = 120 pcf

Micropile/Rock Anchor Parameters

Rock Anchor Lockoff =	0	kips
Steel Yield Cap. =	218.1	kips
Steel Ultimate Cap =	260.9	ksi
Total # =	4	



Wind Side (About A)

Bolt #	#	Area, in^2	Ybar, in
1	3	3.07	62.2254
2	1	3.07	39

$I_{boltsA} = \Sigma NA\bar{y}^2 =$ 40331 in^4

M = 9288 k-in

Soil and Foundation Compression = 87.87 kips

				Capacity,k
$f_{1A} = M*y_{bar1}/I_{boltsA}$ = 14.3 ksi	C_{1A} = 131.9 kips	T_{1A} = 0.0 kips		156.54
$f_{2A} = M*y_{bar2}/I_{boltsA}$ = 8.98 ksi	C_{2A} = 115.4 kips	T_{2A} = 0.0 kips		156.54

Wind Into Corner (About B)

Bolt #	#	Area, in^2	Ybar, in
1	1	3.07	88.0625
2	1	3.07	72.125
3	0		
4	0		

$I_{boltsB} = \Sigma NA\bar{y}^2 =$ 39778 in^4

M = 9288 k-in

Soil and Foundation Compression = 87.87 kips

				Capacity,k
$f_{1B} = M*y_{bar1}/I_{boltsB}$ = 20.6 ksi	C_{1B} = 151.0 kips	T_{1B} = 0.0 kips		156.54
$f_{2B} = M*y_{bar2}/I_{boltsB}$ = 16.8 ksi	C_{2B} = 139.6 kips	T_{2B} = 0.0 kips		156.54
$f_{3B} = M*y_{bar3}/I_{boltsB}$ = 0.0 ksi	C_{3B} = 0.0 kips	T_{3B} = 0.0 kips		156.54
$f_{4B} = M*y_{bar4}/I_{boltsB}$ = 0.0 ksi	C_{3B} = 0.0 kips	T_{3B} = 0.0 kips		156.54

Steel Check

Revision = F

Actual Load

Max Tension/Compression Load = 151.0 kips

Capacity

Capacity = 0.6*Steel Ultimate Capacity = 156.5 kips

Stress Ratio = 96.5%

Bending Check (Wind into side)

Distance from center to end of pier = 42.0 in.

Bending Moment = ∑[# of Bolts * (ybar- 42.0 in.)*Tension] = 318.9 k-ft

Additional Pad Bending Moment from Pad & Pier Spreadsheet = 1336.0 k-ft

Use 1750.6 k-ft to analyze bending in pad

Bottom Clear Dist. = 4 in. b = 84.0 in.

f_c' = 4 ksi As = 21.33 in^2

fy = 60 ksi a = 4.48 in.

Number of Bars = 27 d = 19.5 in.

Bar # = 8

Bar Area = 0.790 in.^{2}

Bar Diameter = 1.000 in.

$$a = \frac{A_s * f_y}{0.85 * f'_c * b}$$

$$\emptyset M_n = 0.9 * A_s * f_y * \left(d - \frac{a}{2}\right)$$

øMn = 1969.7 k-ft (Overrided from SPColumn)

Capacity = 88.9%

Micropile Embedment Check

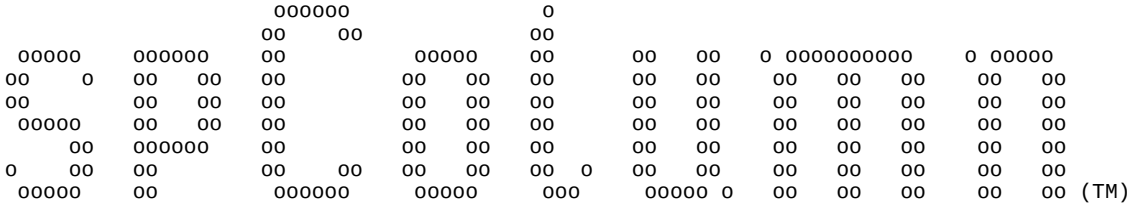
Hole Diameter = 10.5 in

Skin Friction = 30 psi

Actual Embed = 27 ft

Required Embedment = 25.4 ft

Ratio = 94.2%



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: g:\tower\375_crown_castle\2013\37513-1642 bu 826...\37513-1642.003 - pier steel check.col
Project:
Column: Engineer:
Code: ACI 318-05 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Architectural

Material Properties:
==========
f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
==========
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #4 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 28.44 in^2 at rho = 0.40% (Note: rho < 0.50%)
Minimum clear spacing = 5.62 in

36 #8 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	0.00	4652.70	4663.11	1.002	11.10	80.00	0.01863	0.900

*** End of output ***

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

T-Mobile Existing Facility

Site ID: CT11217A

Newtown/Rt-25
201 Main Street
Newtown, CT 06470

October 16, 2014

EBI Project Number: 62141036

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	52.30 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
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October 16, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11217A – Newtown/Rt-25**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **201 Main Street, Newtown, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **201 Main Street, Newtown, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

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

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. 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.

8) The antenna mounting height centerline of the proposed antennas is **148 feet** above ground level (AGL).

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

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	148	Height (AGL):	148	Height (AGL):	148
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	0.83	Antenna B1 MPE%	0.83	Antenna C1 MPE%	0.83
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	148	Height (AGL):	148	Height (AGL):	148
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	0.83	Antenna B2 MPE%	0.83	Antenna C2 MPE%	0.83
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	148	Height (AGL):	148	Height (AGL):	148
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	445.37	ERP (W):	445.37	ERP (W):	445.37
Antenna A3 MPE%	0.33	Antenna B3 MPE%	0.33	Antenna C3 MPE%	0.33

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**5.99**
AT&T	14.64 %
Sprint	3.95 %
Verizon Wireless	27.72 %
Site Total MPE %:	**52.30 %**

T-Mobile Sector 1 Total:	2.00 %
T-Mobile Sector 2 Total:	2.00 %
T-Mobile Sector 3 Total:	2.00 %
Site Total:	52.30 %

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.00 %
Sector 2:	2.00 %
Sector 3 :	2.00 %
T-Mobile Total:	5.99 %
Site Total:	52.30 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **52.30%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803`