



Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

June 5, 2015

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

RE: T-Mobile-Exempt Modification - Crown Site BU: 828054
T-Mobile Site ID: CT11279D
Located at: 300 Governors Highway, South Windsor, CT 06074

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 M. Saud Anwar, Mayor for the Town of South Windsor, and Electron Technologies Corporation, Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **300 Governors Highway, South Windsor, CT**. 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 M. Saud Anwar, Mayor
Town of South Windsor
1540 Sullivan Road
South Windsor, CT 06074

cc: Electron Technologies Corporation
300 Governors Highway, PO Box 316
South Windsor, CT 06074



T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11279D
CROWN CASTLE BU #: 828054
SITE NAME: SOUTH WINDSOR / RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074
HARTFORD COUNTY

Dewberry®
 Dewberry Engineers Inc.
 600 PARSIPPANY ROAD
 SUITE 301
 PARSIPPANY, NJ 07054
 PHONE: 973.739.9400
 FAX: 973.739.9710



T-MOBILE NORTHEAST LLC

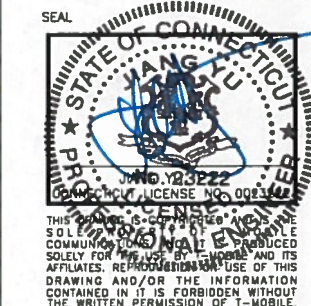
4 SYLVAN WAY
 PARSIPPANY, NJ 07054
 PHONE: (973) 397-4800
 FAX: (973) 292-8893

SOUTH WINDSOR / RT 5

CT11279D

300 GOVERNORS HIGHWAY
 SOUTH WINDSOR, CT 06074
 HARTFORD COUNTY

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.



SCALE
 AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	05/08/15	RA	ISSUED AS FINAL
0	09/18/14	HMP	ISSUED AS FINAL
A	08/02/14	HMP	ISSUED FOR REVIEW

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

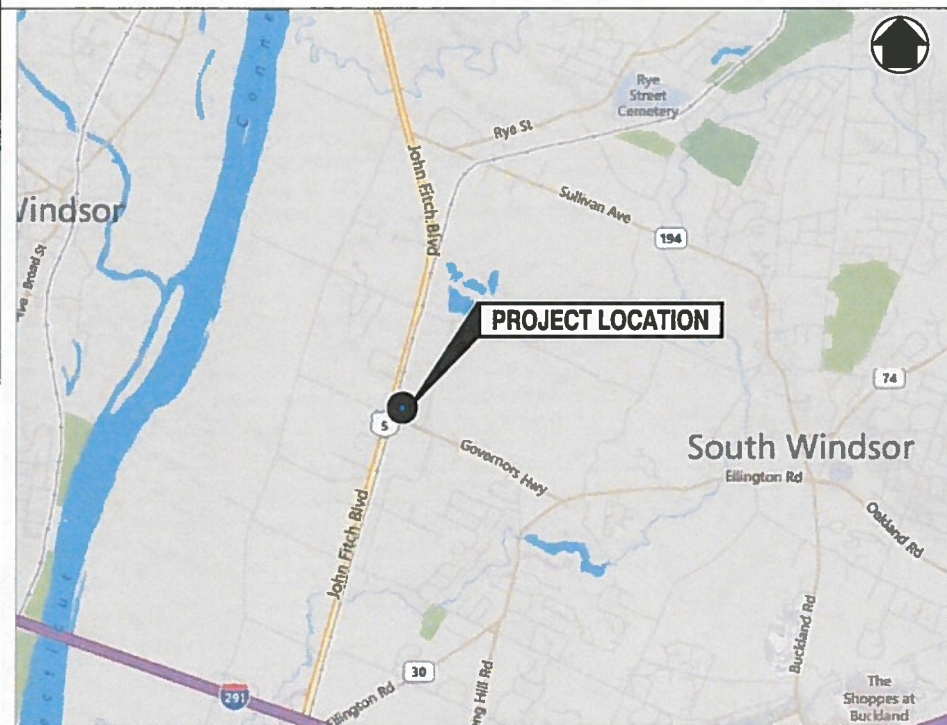
TITLE SHEET

PROJECT NO. 50066258/50072428

T - 1

SHEET NO.

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-687 N VIA THE EXIT ON THE LEFT. MERGE ONTO I-84E VIA EXIT 9E TOWARD DANBURY. KEEP RIGHT TO TAKE I-84 TOWARD HARTFORD. MERGE ONTO CONNECTICUT BLVD / US-44 VIA EXIT 53. TURN LEFT ONTO MAIN ST / US-5N / US-44E. CONTINUE TO FOLLOW US-5N. TURN RIGHT ONTO GOVERNORS HIGHWAY. THE DESTINATION WILL BE ON THE LEFT.

PROJECT INFORMATION

T-MOBILE SITE #: CT11279D
 CROWN CASTLE BU #: 828054
 SITE ADDRESS: 300 GOVERNORS HIGHWAY
 SOUTH WINDSOR, CT 06074
 HARTFORD COUNTY
 LATITUDE: 41°-50'-0.40" N
 LONGITUDE: 72°-36'-11.0" W
 TOWER OWNER: CROWN CASTLE
 3 CORPORATE PARK DRIVE, SUITE 101
 CLIFTON PARK, NY 12065
 CONTACT: PATRICIA PELON
 (518) 373-3507
 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: BRYAN HUFF
 (973) 576-0147
 SCOPE OF WORK: REMOVE AND REPLACE (3) EXISTING
 ANTENNAS WITH (3) NEW ANTENNAS,
 INSTALL (3) NEW RRU'S

CONFIGURATION

702Cc

SHEET INDEX

SHEET NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
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

GENERAL NOTES:

- 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
- 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.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
- 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.
- 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.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- 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.
- 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.
- 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.
- 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.
- 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:

- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
A) FALL PROTECTION
B) CONFINED SPACE
C) ELECTRICAL SAFETY
D) TRENCHING & EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
- 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.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
- 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.
- EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

CONSTRUCTION NOTES:

- FIELD VERIFICATION:
CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
- COORDINATION OF WORK:
CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
- 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.
- 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:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- 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.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- 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.
- 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).
- PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- 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.
- 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.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 8 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GRAD 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.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- 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.
- 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).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- 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.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
- 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.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.



Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 901
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



T-MOBILE NORTHEAST LLC

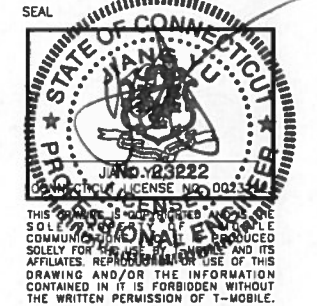
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SOUTH WINDSOR / RT 5

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REVISIONS

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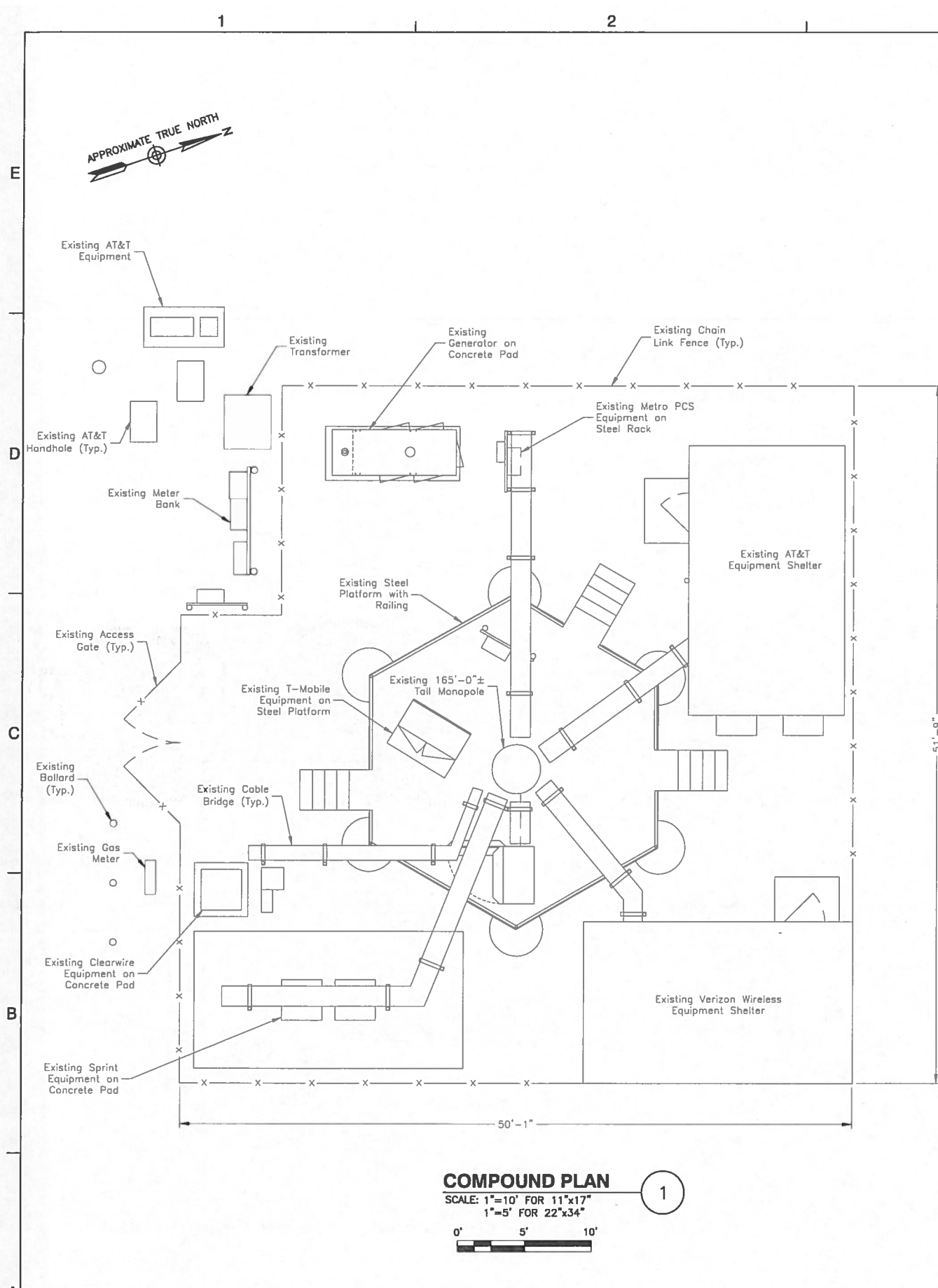
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GENERAL NOTES

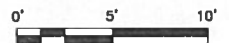
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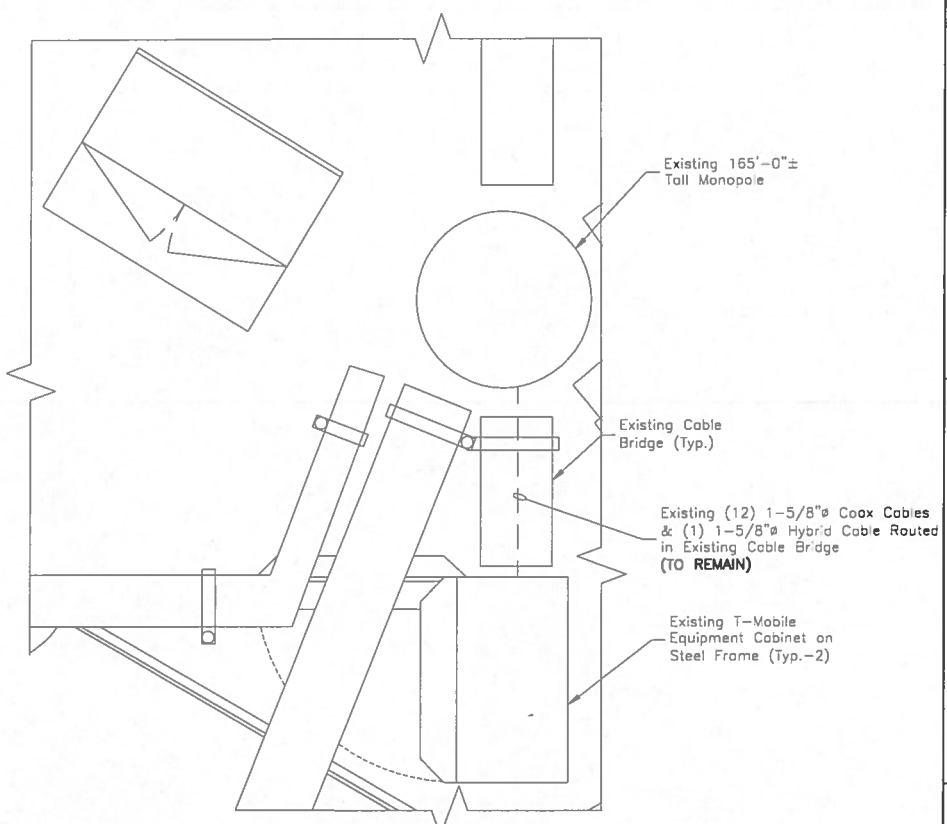
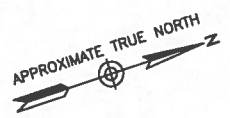
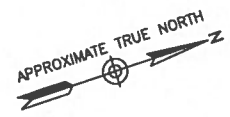
SHEET NO.



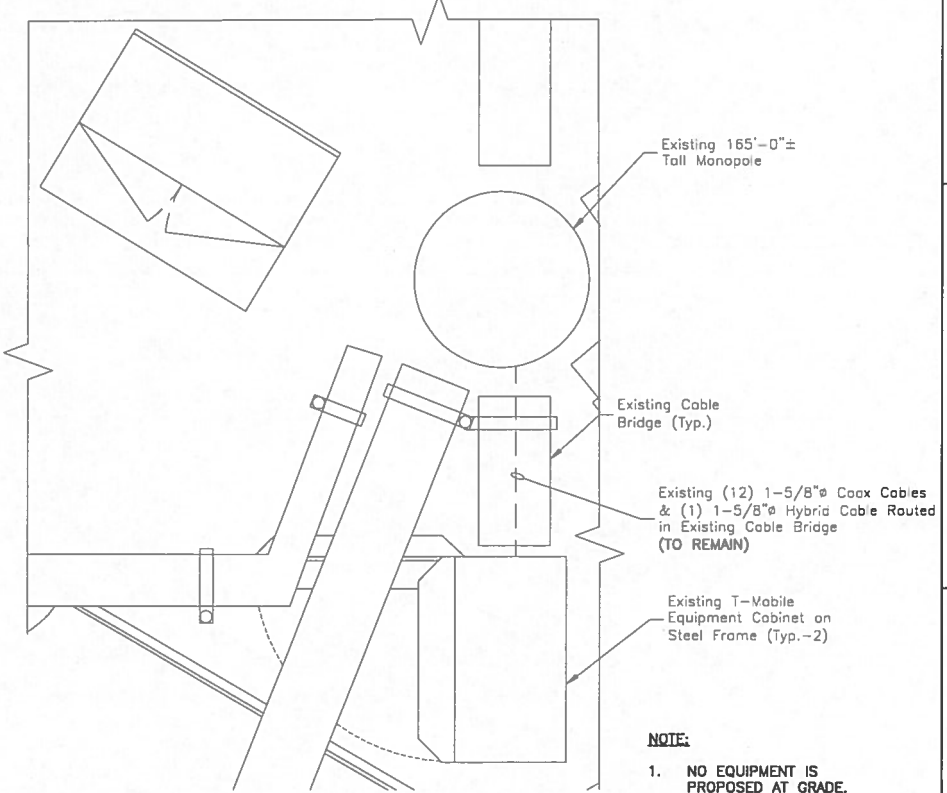
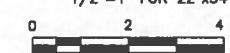
COMPOUND PLAN
 SCALE: 1"=10' FOR 11"x17"
 1"=5' FOR 22"x34"



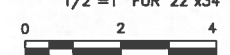
- NOTES:**
1. NORTH SHOWN AS APPROXIMATE.
 2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
 3. MOUNT ALL ANTENNAS, RRU'S, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS.



EXISTING EQUIPMENT PLAN
 SCALE: 1/4"=1' FOR 11"x17"
 1/2"=1' FOR 22"x34"



PROPOSED EQUIPMENT PLAN
 SCALE: 1/4"=1' FOR 11"x17"
 1/2"=1' FOR 22"x34"



NOTE:
 1. NO EQUIPMENT IS PROPOSED AT GRADE.

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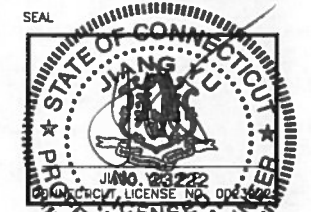
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SOUTH WINDSOR / RT 5

CT11279D

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 HARTFORD COUNTY

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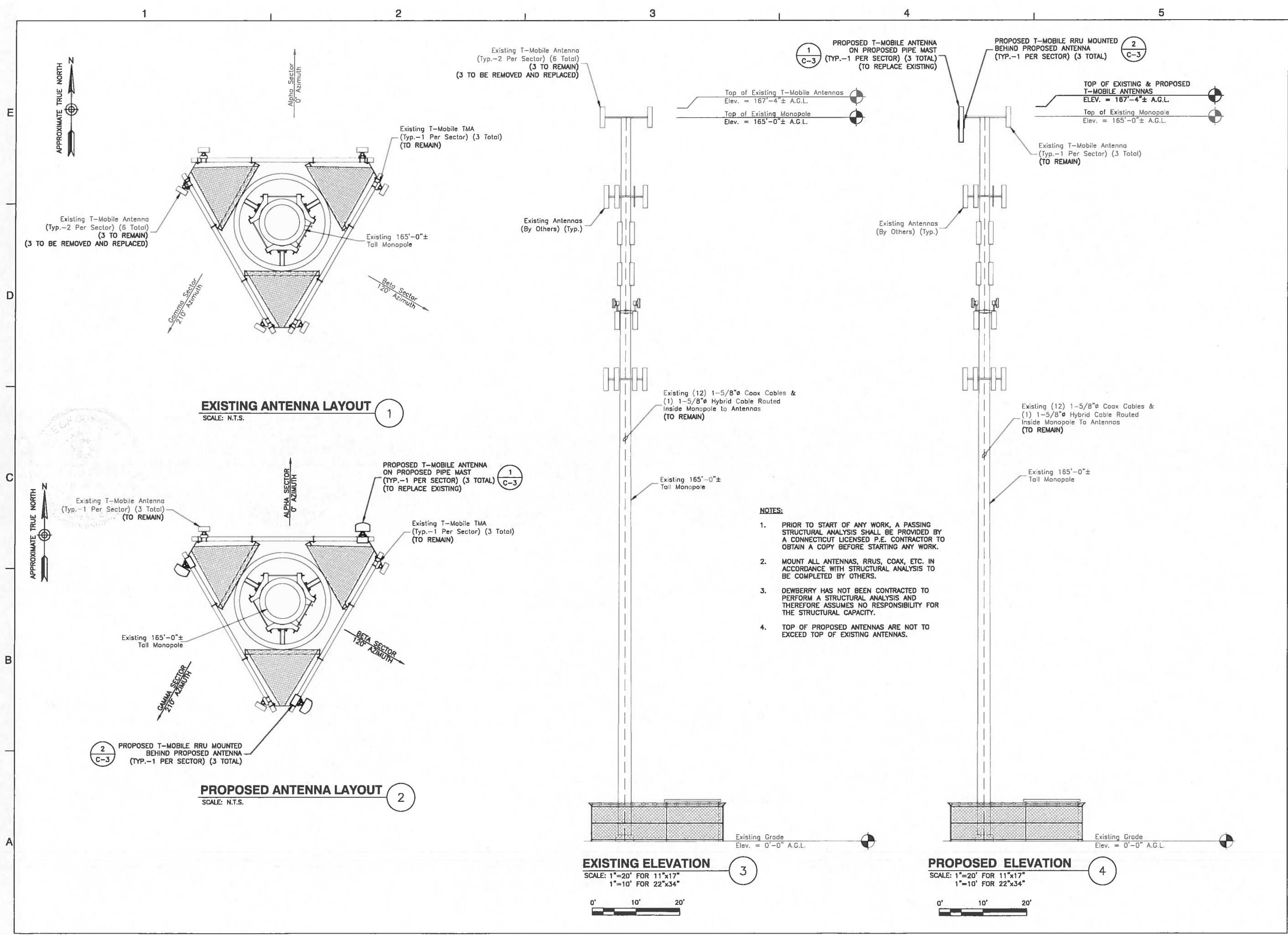
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0	09/16/14	HMP	ISSUED AS FINAL
A	09/02/14	HMP	ISSUED FOR REVIEW

REVISIONS

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

COMPOUND PLAN & EQUIPMENT PLANS

PROJECT NO. 50066258/50072428



EXISTING ANTENNA LAYOUT
SCALE: N.T.S.

PROPOSED ANTENNA LAYOUT
SCALE: N.T.S.

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

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

- 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 TO BE COMPLETED BY OTHERS.
 3. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.
 4. TOP OF PROPOSED ANTENNAS ARE NOT TO EXCEED TOP OF EXISTING ANTENNAS.

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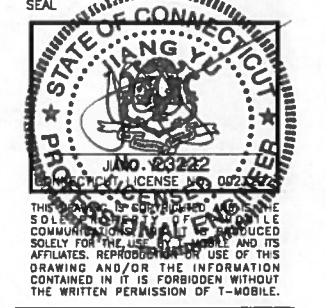
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HARTFORD COUNTY

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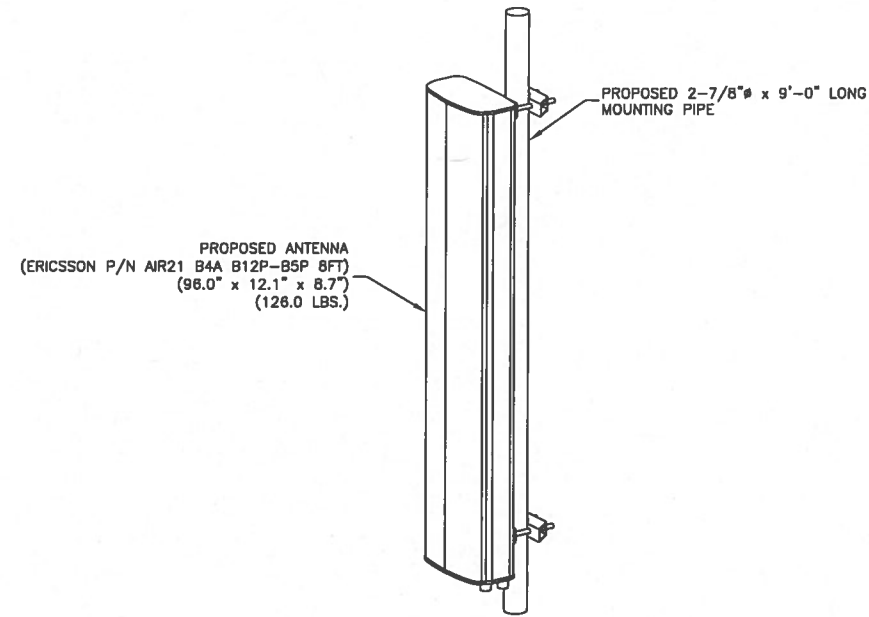
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REVISIONS
DRAWN BY: HMP
CHECKED BY: BSH
APPROVED BY: GHN
DATE: 09/02/14

ANTENNA LAYOUTS & ELEVATIONS

PROJECT NO. 50066258/50072428



PROPOSED ANTENNA
(ERICSSON P/N AIR21 B4A B12P-B5P 8FT)
(96.0" x 12.1" x 8.7")
(126.0 LBS.)

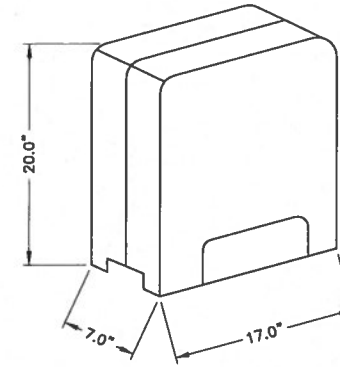
PROPOSED 2-7/8" x 9'-0" LONG
MOUNTING PIPE

NOTES:

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
SCALE: N.T.S.

1



SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

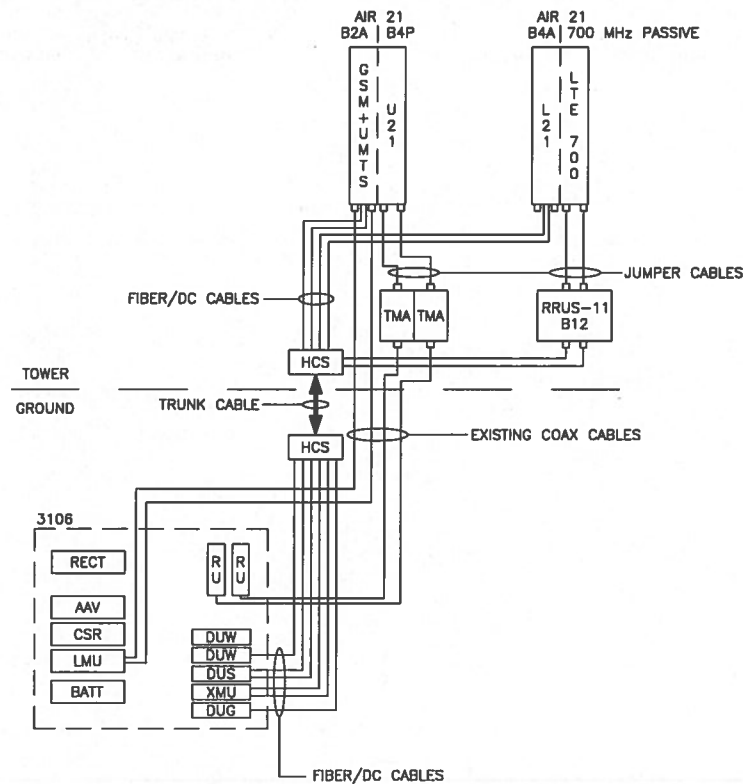
ERICSSON RRUS-11 B12

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
SCALE: N.T.S.

2



SITE CONFIGURATION 702Cc
SCALE: N.T.S.

3

DESIGN CONFIGURATION						
	ANTENNAS		COAX		COAX LENGTH	EXISTING HCS
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"	-	215'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"	-	215'-0"	(1) 1-5/8" ● 215'-0"
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"	-	215'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				

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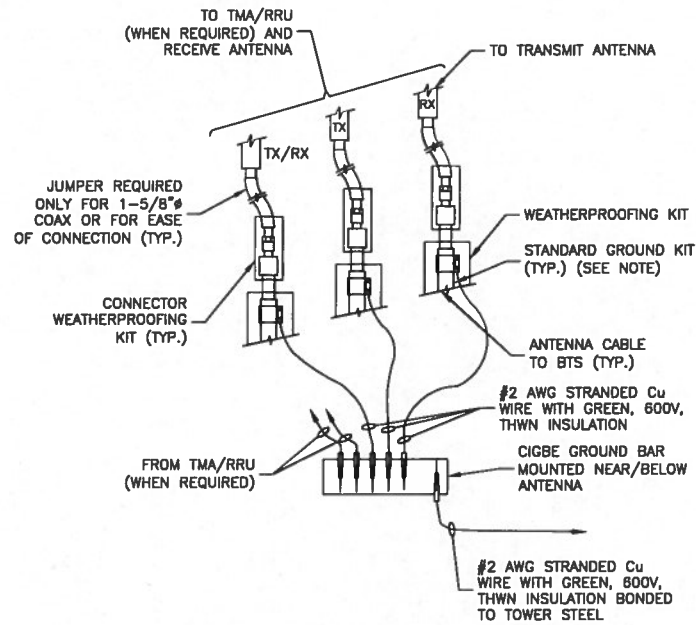
TITLE

CONSTRUCTION DETAILS

PROJECT NO. 50066258/5007242B

GROUNDING NOTES:

- 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) LIGHTNING 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.
- 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.
- 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.
- 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.
- 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.
- METAL CONDUIT AND TRAY SHALL BE GROUNDING AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 8 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
- 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.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- 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.
- EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 8 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.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
- 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.
- EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
- 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.
- ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTIONS. 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.
- 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.
- APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF 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.
- 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.



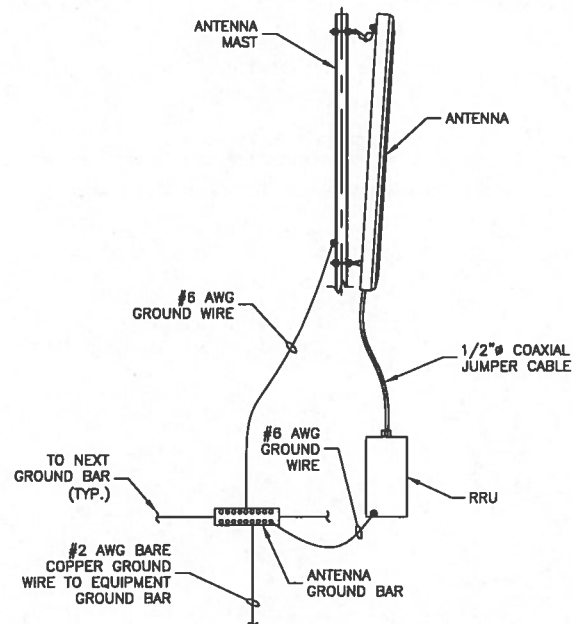
NOTE:

- 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)

SCALE: N.T.S.

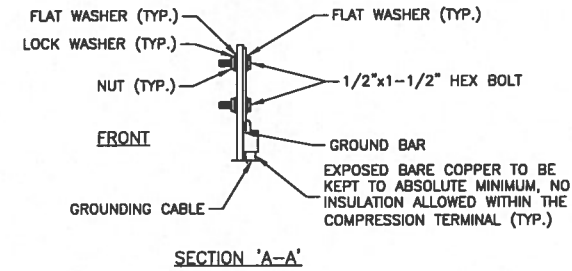
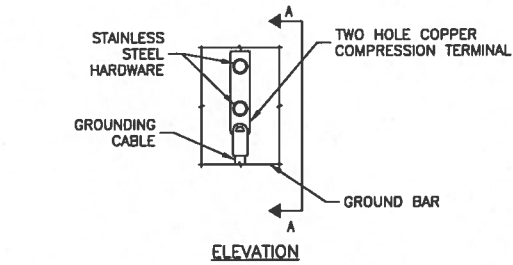
1



TYPICAL ANTENNA GROUNDING DETAIL

SCALE: N.T.S.

3



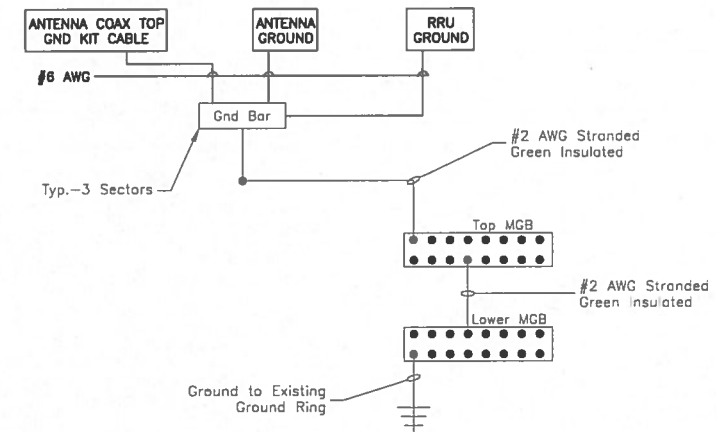
NOTES:

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

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL

SCALE: N.T.S.

2



NOTES:

- BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
- BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
- SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
- VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM

SCALE: N.T.S.

4



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REVISIONS

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

TITLE

GROUNDING NOTES & DETAILS

PROJECT NO. 50066258/5007242B

E - 1

SHEET NO.



Date: May 12, 2015

Adam Winters
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
980.209.8238

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

Subject: Structural Analysis Report

Carrier Designation: T-Mobile Co-Locate
Carrier Site Number: CT11279D
Carrier Site Name: South Windsor/Rt 5

Crown Castle Designation: Crown Castle BU Number: 828054
Crown Castle Site Name: South Windsor/Rt 5
Crown Castle JDE Job Number: 302376
Crown Castle Work Order Number: 1059025
Crown Castle Application Number: 261480 Rev. 3

Engineering Firm Designation: Paul J Ford and Company Project Number: 37515-1767.001.7805

Site Data: 300 Governors Highway, South Windsor, Hartford County, CT
Latitude 41° 50' 0.4", Longitude -72° 36' 11"
169 Foot - Monopole Tower

Dear Adam Winters,

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 785840, in accordance with application 261480, revision 3.

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:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

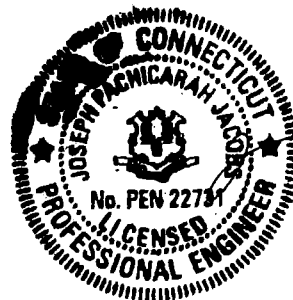
The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

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:


Bob Koors, E.I. *UKK*
Structural Designer



for given

Date: **May 12, 2015**

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Charlotte, NC 28277
980.209.8238

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rkoors@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:

T-Mobile Co-Locate
Carrier Site Number:
Carrier Site Name:

CT11279D
South Windsor/Rt 5

Crown Castle Designation:

Crown Castle BU Number:
Crown Castle Site Name:
Crown Castle JDE Job Number:
Crown Castle Work Order Number:
Crown Castle Application Number:

828054
South Windsor/Rt 5
302376
1059025
261480 Rev. 3

Engineering Firm Designation:

Paul J Ford and Company Project Number: 37515-1767.001.7805

Site Data:

300 Governors Highway, South Windsor, Hartford County, CT
Latitude 41° 50' 0.4", Longitude -72° 36' 11"
169 Foot - Monopole Tower

Dear Adam Winters,

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 785840, in accordance with application 261480, revision 3.

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:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

Sufficient Capacity

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

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Respectfully submitted by:

Bob Koors, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 169 ft Monopole tower designed by EEI in January 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 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
165.0	165.0	3	ericsson	Ericsson Air 21 B4A B12P-B5P 8FT 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
165.0	165.0	3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	1	1-1/4	3
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 712-1]			
156.0	156.0	3	communication components inc.	DTMABP7819VG12A	12	1-5/8	1
		6	css	DUO1417-8686 w/ Mount Pipe			
		3	ericsson	RRUS 11			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			
148.0	148.0	3	andrew	932LG65VTE-B w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
138.0	138.0	3	rfs celwave	APXV18-206517-A	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
128.0	128.0	3	argus technologies	LLPX310R w/ Mount Pipe	3 6 1	1/4 1/2 5/16	1
		3	dragonwave	A-ANT-18G-2-C			
		3	dragonwave	HORIZON DUO			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Side Arm Mount [SO 701-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
111.0	111.0	3	alcatel lucent	RRH2X60-AWS	2	1-5/8	2
		3	alcatel lucent	RRH2X60-PCS			
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe			
		6	andrew	LNK-6514DS-A1M w/ Mount Pipe			
		2	rfs celwave	DB-B1-6C-12AB-0Z			
		1	tower mounts	Platform Mount [LP 303-1]	18	1-5/8	1

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	TEP, 47923.6344, 11/20/2014	5406393	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2012712.97, 06/29/2012	3773024	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 103179, 12/03/2010	3773025	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 6255 REV 1, 03/10/2000	3436661	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI, 99-1371 REV. 1, 01/31/2000	3436681	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-1535.003.7700 R1, 12/09/2014	5431037	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) Monopole was fabricated and installed in accordance with the manufacturer's specifications.
- 2) Monopole has been properly maintained in accordance with manufacturer's specifications.
- 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 modified in conformance with the referenced modification drawings.
- 5) Monopole will be reinforced in conformance with the referenced proposed modification drawings.

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 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	169 - 133.33	Pole	TP22.31x15.5x0.25	1	-5.94	883.79	63.1	Pass
L2	133.33 - 111	Pole	TP26.0013x21.1743x0.3125	2	-9.62	1324.63	85.8	Pass
L3	111 - 101.5	Pole	TP27.7884x26.0013x0.5508	3	-13.66	1962.51	73.4	Pass
L4	101.5 - 101	Pole	TP27.8825x27.7884x0.9838	4	-13.84	2956.35	50.8	Pass
L5	101 - 87.83	Pole	TP30.36x27.8825x0.6941	5	-16.18	2244.03	76.5	Pass
L6	87.83 - 81.8	Pole	TP30.8702x28.1572x0.7414	6	-20.09	2506.80	81.4	Pass
L7	81.8 - 43.33	Pole	TP38.11x30.8702x0.8207	7	-31.83	3894.23	73.2	Pass
L8	43.33 - 37.4	Pole	TP38.4726x35.4655x0.8018	8	-35.51	3787.03	81.0	Pass
L9	37.4 - 9	Pole	TP43.8089x38.4726x0.7411	9	-48.86	4193.84	88.6	Pass
L10	9 - 7	Pole	TP44.1847x43.8089x0.7763	10	-49.72	4435.25	84.7	Pass
L11	7 - 0	Pole	TP45.5x44.1847x0.7254	11	-52.62	4272.57	90.8	Pass
							Summary	
						Pole (L11)	90.8	Pass
						Rating =	90.8	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation	0	80.5	Pass

Structure Rating (max from all components) =	90.8%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

Reinforce monopole in conformance with the referenced proposed modification drawings.

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 Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.0000 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) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|--|
| Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
✓ Use Code Stress Ratios
✓ Use Code Safety Factors - Guys
✓ Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination | Distribute Leg Loads As Uniform
Assume Legs Pinned
✓ Assume Rigid Index Plate
✓ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
✓ Bypass Mast Stability Checks
✓ Use Azimuth Dish Coefficients
✓ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
SR Members Have Cut Ends
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Use TIA-222-G Tension Splice
Capacity Exemption | Treat Feedline Bundles As Cylinder
Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
✓ Consider Feedline Torque
Include Angle Block Shear Check
<div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets |
|--|--|--|

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	169.00-133.33	35.67	3.33	18	15.5000	22.3100	0.2500	1.0000	A572-65 (65 ksi)
L2	133.33-111.00	25.66	0.00	18	21.1743	26.0013	0.3125	1.2500	A572-65 (65 ksi)
L3	111.00-101.50	9.50	0.00	18	26.0013	27.7884	0.5508	2.2032	Reinf 51.53 ksi (52 ksi)
L4	101.50-101.00	0.50	0.00	18	27.7884	27.8825	0.9838	3.9350	Reinf 44.01 ksi (44 ksi)
L5	101.00-87.83	13.17	4.33	18	27.8825	30.3600	0.6941	2.7765	Reinf 44.14 ksi (44 ksi)
L6	87.83-81.80	10.36	0.00	18	28.1572	30.8702	0.7414	2.9654	Reinf 44.21 ksi (44 ksi)
L7	81.80-43.33	38.47	5.33	18	30.8702	38.1100	0.8207	3.2829	Reinf 51.51 ksi (52 ksi)
L8	43.33-37.40	11.26	0.00	18	35.4655	38.4726	0.8018	3.2070	Reinf 51.56 ksi (52 ksi)
L9	37.40-9.00	28.40	0.00	18	38.4726	43.8089	0.7411	2.9644	Reinf 51.76 ksi (52 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L10	9.00-7.00	2.00	0.00	18	43.8089	44.1847	0.7763	3.1050	Reinf 51.85 ksi (52 ksi)
L11	7.00-0.00	7.00		18	44.1847	45.5000	0.7254	2.9016	Reinf 51.82 ksi (52 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	15.7391	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	22.6542	17.5046	1076.2196	7.8313	11.3335	94.9593	2153.8554	8.7540	3.4866	13.946
L2	22.1370	20.6922	1137.7494	7.4059	10.7565	105.7730	2276.9958	10.3481	3.1767	10.165
	26.4024	25.4801	2124.3514	9.1195	13.2087	160.8301	4251.4980	12.7425	4.0262	12.884
L3	26.4024	44.4936	3641.0595	9.0349	13.2087	275.6569	7286.9099	22.2510	3.6068	6.548
	28.2171	47.6179	4463.1990	9.6694	14.1165	316.1684	8932.2708	23.8135	3.9214	7.119
L4	28.2171	83.6955	7597.3301	9.5157	14.1165	538.1871	15204.657	41.8557	3.1594	3.212
	28.3126	83.9892	7677.5902	9.5491	14.1643	542.0379	15365.282	42.0026	3.1759	3.228
L5	28.3126	59.9005	5594.1515	9.6519	14.1643	394.9471	11195.663	29.9560	3.6856	5.31
	30.8284	65.3589	7267.0217	10.5314	15.4229	471.1845	14543.605	32.6857	4.1217	5.938
L6	29.7430	64.5115	6126.0035	9.7326	14.3038	428.2766	12260.067	32.2619	3.6509	4.925
	31.3464	70.8954	8130.5575	10.6957	15.6821	518.4625	16271.813	35.4545	4.1284	5.569
L7	31.3464	78.2788	8930.0666	10.6676	15.6821	569.4449	17871.883	39.1468	3.9887	4.86
	38.6979	97.1384	17064.608	13.2377	19.3599	881.4418	34151.670	48.5784	5.2629	6.412
L8	37.4580	88.2117	13391.015	12.3056	18.0165	743.2659	26799.651	44.1142	4.8308	6.025
	39.0661	95.8643	17187.222	13.3732	19.5441	879.4074	34397.061	47.9413	5.3601	6.685
L9	39.0661	88.7540	15963.732	13.3947	19.5441	816.8059	31948.469	44.3855	5.4668	7.377
	44.4847	101.3063	23739.952	15.2891	22.2549	1066.7278	47511.143	50.6628	6.4060	8.644
L10	44.4847	106.0260	24805.395	15.2766	22.2549	1114.6022	49643.430	53.0231	6.3442	8.173
	44.8663	106.9519	25460.956	15.4100	22.4458	1134.3286	50955.415	53.4861	6.4103	8.258
L11	44.8663	100.0602	23876.189	15.4281	22.4458	1063.7246	47783.795	50.0396	6.4998	8.96
	46.2019	103.0885	26110.270	15.8950	23.1140	1129.6301	52254.897	51.5541	6.7313	9.28

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 169.00-133.33				1	1	1		
L2 133.33-111.00				1	1	1		
L3 111.00-101.50				1	1	1		
L4 101.50-101.00				1	1	1		
L5 101.00-87.83				1	1	1		
L6 87.83-				1	1	1		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
81.80								
L7 81.80-43.33				1	1	1		
L8 43.33-37.40				1	1	1		
L9 37.40-9.00				1	1	1		
L10 9.00-7.00				1	1	1		
L11 7.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weight
				ft			ft ² /ft	plf
LDF7-50A(1-5/8")	C	No	Inside Pole	165.00 - 0.00	4	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	165.00 - 0.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	165.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	165.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	2.37
						1" Ice	0.00	4.28
						2" Ice	0.00	9.93
						4" Ice	0.00	28.56
**								
LDF7-50A(1-5/8")	C	No	Inside Pole	156.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
**								
LDF7-50A(1-5/8")	C	No	Inside Pole	148.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
**								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	138.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
**								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
							ft ² /ft	
LDF1-50A(1/4")	C	No	Inside Pole	128.00 - 0.00	3	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	128.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
LDF4-50A(1/2")	C	No	Inside Pole	128.00 - 0.00	4	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	0.00 - 0.00	2	No Ice	0.24	0.72
						1/2" Ice	0.34	2.48
						1" Ice	0.44	4.84
						2" Ice	0.64	11.41
						4" Ice	1.04	31.87
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	0.00 - 0.00	2	No Ice	0.00	0.72
						1/2" Ice	0.00	2.48
						1" Ice	0.00	4.84
						2" Ice	0.00	11.41
						4" Ice	0.00	31.87
**								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	111.00 - 0.00	16	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	111.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	111.00 - 0.00	1	No Ice	0.20	1.30
						1/2" Ice	0.30	2.81
						1" Ice	0.40	4.94
						2" Ice	0.60	11.02
						4" Ice	1.00	30.52
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	111.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	2.81
						1" Ice	0.00	4.94
						2" Ice	0.00	11.02
						4" Ice	0.00	30.52
**								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	104.00 - 0.00	2	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
						4" Ice	1.10	0.00
**								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	113.50 - 104.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00
**								

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	169.00-133.33	A	0.000	0.000	0.000	0.000	0.00

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.541	0.64
L2	133.33-111.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.259	0.68
L3	111.00-101.50	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	11.613	0.46
L4	101.50-101.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.703	0.02
L5	101.00-87.83	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	18.526	0.63
L6	87.83-81.80	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	8.482	0.29
L7	81.80-43.33	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	54.114	1.85
L8	43.33-37.40	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	8.342	0.29
L9	37.40-9.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	39.949	1.37
L10	9.00-7.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.813	0.10
L11	7.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.847	0.34

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	169.00-133.33	A	1.199	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	27.737	1.99
L2	133.33-111.00	A	1.170	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	20.640	2.29
L3	111.00-101.50	A	1.151	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	25.612	1.98
L4	101.50-101.00	A	1.144	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	1.530	0.10
L5	101.00-87.83	A	1.134	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	40.104	2.69
L6	87.83-81.80	A	1.120	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	18.362	1.23
L7	81.80-43.33	A	1.079	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	114.088	7.41
L8	43.33-37.40	A	1.024	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	17.586	1.14
L9	37.40-9.00	A	1.000	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	80.972	4.99
L10	9.00-7.00	A	1.000	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L11	7.00-0.00	B	1.000	0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.702	0.35
		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	19.958	1.23

Feed Line Center of Pressure

Section	Elevation	CP _X	CP _Z	CP _X Ice	CP _Z Ice
	ft	in	in	in	in
L1	169.00-133.33	-0.3809	0.2199	-0.6359	0.3672
L2	133.33-111.00	-0.4474	0.2583	-0.7706	0.4449
L3	111.00-101.50	-1.0289	0.5940	-1.5322	0.8846
L4	101.50-101.00	-1.1375	0.6567	-1.6551	0.9556
L5	101.00-87.83	-1.1568	0.6679	-1.6958	0.9791
L6	87.83-81.80	-1.1705	0.6758	-1.7272	0.9972
L7	81.80-43.33	-1.2269	0.7083	-1.8394	1.0620
L8	43.33-37.40	-1.2620	0.7286	-1.9246	1.1112
L9	37.40-9.00	-1.2957	0.7481	-1.9698	1.1373
L10	9.00-7.00	-1.3206	0.7625	-2.0316	1.1729
L11	7.00-0.00	-1.3276	0.7665	-2.0490	1.1830

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft	°	ft	ft ²	ft ²	K	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00	0.000	165.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00	0.000	165.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00	0.000	165.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			0.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
KRY 112 144/1	A	From Face	4.00	0.000	165.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			0.00			Ice	0.59	0.35	0.02
						1" Ice	0.81	0.53	0.03
						2" Ice	1.36	1.00	0.08
						4" Ice			
KRY 112 144/1	B	From Face	4.00	0.000	165.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			0.00			Ice	0.59	0.35	0.02
						1" Ice	0.81	0.53	0.03
						2" Ice	1.36	1.00	0.08
						4" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
KRY 112 144/1	C	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	0.41	0.20	0.01
								1/2" Ice	0.50	0.27	0.01
								1" Ice	0.59	0.35	0.02
								2" Ice	0.81	0.53	0.03
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	A	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	11.78	11.04	0.16
								1/2" Ice	12.50	12.56	0.25
								1" Ice	13.23	14.12	0.36
								2" Ice	14.74	16.47	0.61
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	B	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	11.78	11.04	0.16
								1/2" Ice	12.50	12.56	0.25
								1" Ice	13.23	14.12	0.36
								2" Ice	14.74	16.47	0.61
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	C	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	11.78	11.04	0.16
								1/2" Ice	12.50	12.56	0.25
								1" Ice	13.23	14.12	0.36
								2" Ice	14.74	16.47	0.61
RRUS 11 B12	A	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	3.31	1.36	0.05
								1/2" Ice	3.55	1.54	0.07
								1" Ice	3.80	1.73	0.10
								2" Ice	4.33	2.13	0.15
RRUS 11 B12	B	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	3.31	1.36	0.05
								1/2" Ice	3.55	1.54	0.07
								1" Ice	3.80	1.73	0.10
								2" Ice	4.33	2.13	0.15
RRUS 11 B12	C	From Face	4.00	0.00	0.00	0.000	165.00	4" Ice			
								No Ice	3.31	1.36	0.05
								1/2" Ice	3.55	1.54	0.07
								1" Ice	3.80	1.73	0.10
								2" Ice	4.33	2.13	0.15
Platform Mount [LP 712-1]	C	None				0.000	165.00	4" Ice			
								No Ice	24.53	24.53	1.34
								1/2" Ice	29.94	29.94	1.65
								1" Ice	35.35	35.35	1.96
								2" Ice	46.17	46.17	2.58
8-ft Ladder	C	None				0.000	165.00	4" Ice			
								No Ice	5.00	5.00	0.04
								1/2" Ice	6.00	6.00	0.07
								1" Ice	7.00	7.00	0.08
								2" Ice	9.00	9.00	0.11
** (2) DUO1417-8686 w/ Mount Pipe	A	From Face	4.00	0.00	0.00	0.000	156.00	4" Ice			
								No Ice	6.77	5.39	0.04
								1/2" Ice	7.24	6.07	0.09
								1" Ice	7.72	6.76	0.16
								2" Ice	8.70	8.20	0.30
(2) DUO1417-8686 w/ Mount Pipe	B	From Face	4.00	0.00	0.00	0.000	156.00	No Ice	6.77	5.39	0.04
								1/2" Ice	7.24	6.07	0.09
								Ice	7.72	6.76	0.16

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz ft	Lateral ft						Vert ft
(2) DUO1417-8686 w/ Mount Pipe	C	From Face	4.00	0.00	0.000	156.00	1" Ice	8.70	8.20	0.30
							2" Ice	10.81	11.35	0.71
							4" Ice			
							No Ice	6.77	5.39	0.04
							1/2" Ice	7.24	6.07	0.09
							1" Ice	7.72	6.76	0.16
							2" Ice	10.81	11.35	0.71
7770.00 w/ Mount Pipe	A	From Face	4.00	0.00	0.000	156.00	4" Ice			
							No Ice	6.22	4.82	0.09
							1/2" Ice	6.71	5.51	0.14
							1" Ice	7.22	6.21	0.21
							1" Ice	8.26	7.67	0.36
							2" Ice	10.48	11.06	0.76
							4" Ice			
7770.00 w/ Mount Pipe	B	From Face	4.00	0.00	0.000	156.00	No Ice	6.22	4.82	0.09
							1/2" Ice	6.71	5.51	0.14
							1" Ice	7.22	6.21	0.21
							1" Ice	8.26	7.67	0.36
							2" Ice	10.48	11.06	0.76
							4" Ice			
							No Ice	6.22	4.82	0.09
7770.00 w/ Mount Pipe	C	From Face	4.00	0.00	0.000	156.00	1/2" Ice	6.71	5.51	0.14
							1" Ice	7.22	6.21	0.21
							1" Ice	8.26	7.67	0.36
							2" Ice	10.48	11.06	0.76
							4" Ice			
							No Ice	6.22	4.82	0.09
							1/2" Ice	6.71	5.51	0.14
DTMABP7819VG12A	A	From Face	4.00	0.00	0.000	156.00	Ice	1.44	0.59	0.04
							1" Ice	1.77	0.83	0.06
							2" Ice	2.54	1.41	0.14
							4" Ice			
							No Ice	1.14	0.39	0.02
							1/2" Ice	1.28	0.49	0.03
							1" Ice	1.44	0.59	0.04
DTMABP7819VG12A	B	From Face	4.00	0.00	0.000	156.00	Ice	1.44	0.59	0.04
							1" Ice	1.77	0.83	0.06
							2" Ice	2.54	1.41	0.14
							4" Ice			
							No Ice	1.14	0.39	0.02
							1/2" Ice	1.28	0.49	0.03
							1" Ice	1.44	0.59	0.04
DTMABP7819VG12A	C	From Face	4.00	0.00	0.000	156.00	Ice	1.44	0.59	0.04
							1" Ice	1.77	0.83	0.06
							2" Ice	2.54	1.41	0.14
							4" Ice			
							No Ice	1.14	0.39	0.02
							1/2" Ice	1.28	0.49	0.03
							1" Ice	1.44	0.59	0.04
RRUS 11	A	From Face	4.00	0.00	0.000	156.00	Ice	3.75	1.74	0.10
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	3.75	1.74	0.10
RRUS 11	B	From Face	4.00	0.00	0.000	156.00	Ice	3.75	1.74	0.10
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	3.75	1.74	0.10
RRUS 11	C	From Face	4.00	0.00	0.000	156.00	Ice	3.75	1.74	0.10
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	3.75	1.74	0.10
2.375" OD x 6' Mount Pipe	A	From Face	4.00	0.00	0.000	156.00	No Ice	1.43	1.43	0.03
							1/2" Ice	1.92	1.92	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
2.375" OD x 6' Mount Pipe	B	From Face	4.00	0.000	156.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
2.375" OD x 6' Mount Pipe	C	From Face	4.00	0.000	156.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Platform Mount [LP 712-1]	C	None		0.000	156.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						Ice	35.35	35.35	1.96
						1" Ice	46.17	46.17	2.58
						2" Ice	67.81	67.81	3.82
						4" Ice			
**									
932LG65VTE-B w/ Mount Pipe	A	From Face	2.00	0.000	148.00	No Ice	4.49	4.79	0.04
			0.00			1/2"	4.95	5.50	0.08
			0.00			Ice	5.42	6.23	0.13
						1" Ice	6.38	7.72	0.25
						2" Ice	8.42	10.94	0.61
						4" Ice			
932LG65VTE-B w/ Mount Pipe	B	From Face	2.00	0.000	148.00	No Ice	4.49	4.79	0.04
			0.00			1/2"	4.95	5.50	0.08
			0.00			Ice	5.42	6.23	0.13
						1" Ice	6.38	7.72	0.25
						2" Ice	8.42	10.94	0.61
						4" Ice			
932LG65VTE-B w/ Mount Pipe	C	From Face	2.00	0.000	148.00	No Ice	4.49	4.79	0.04
			0.00			1/2"	4.95	5.50	0.08
			0.00			Ice	5.42	6.23	0.13
						1" Ice	6.38	7.72	0.25
						2" Ice	8.42	10.94	0.61
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.000	148.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
						1" Ice	4.92	4.92	0.20
						2" Ice	6.84	6.84	0.32
						4" Ice			
**									
APXV18-206517-A	A	From Face	1.00	0.000	138.00	No Ice	5.17	3.04	0.03
			0.00			1/2"	5.62	3.47	0.05
			0.00			Ice	6.08	3.91	0.09
						1" Ice	7.02	4.81	0.17
						2" Ice	9.12	6.70	0.40
						4" Ice			
APXV18-206517-A	B	From Face	1.00	0.000	138.00	No Ice	5.17	3.04	0.03
			0.00			1/2"	5.62	3.47	0.05
			0.00			Ice	6.08	3.91	0.09
						1" Ice	7.02	4.81	0.17
						2" Ice	9.12	6.70	0.40
						4" Ice			
APXV18-206517-A	C	From Face	1.00	0.000	138.00	No Ice	5.17	3.04	0.03
			0.00			1/2"	5.62	3.47	0.05
			0.00			Ice	6.08	3.91	0.09
						1" Ice	7.02	4.81	0.17
						2" Ice	9.12	6.70	0.40
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Pipe Mount [PM 601-3]	C	None		0.000	138.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 4.39 5.48 6.57 8.75 13.11 13.11	0.20 0.24 0.28 0.36 0.53	
** LLPX310R w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37 8.37	2.85 3.37 3.90 5.08 7.84 7.84	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37 8.37	2.85 3.37 3.90 5.08 7.84 7.84	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37 8.37	2.85 3.37 3.90 5.08 7.84 7.84	0.04 0.08 0.12 0.23 0.53
WIMAX DAP HEAD	A	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51 3.51	0.78 0.92 1.07 1.39 2.14 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	B	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51 3.51	0.78 0.92 1.07 1.39 2.14 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	C	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51 3.51	0.78 0.92 1.07 1.39 2.14 2.14	0.03 0.04 0.06 0.09 0.20
HORIZON DUO	A	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60 1.60	0.34 0.43 0.52 0.73 1.25 1.25	0.01 0.01 0.02 0.04 0.10
HORIZON DUO	B	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60 1.60	0.34 0.43 0.52 0.73 1.25 1.25	0.01 0.01 0.02 0.04 0.10
HORIZON DUO	C	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60 1.60	0.34 0.43 0.52 0.73 1.25 1.25	0.01 0.01 0.02 0.04 0.10
2.375" OD x 6' Mount Pipe	A	From Face	4.00 0.00 0.00	0.000	128.00	No Ice 1/2" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.03 0.04 0.05

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
2.375" OD x 6' Mount Pipe	B	From Face	4.00	0.000	128.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
2.375" OD x 6' Mount Pipe	C	From Face	4.00	0.000	128.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Side Arm Mount [SO 701-3]	C	None		0.000	128.00	No Ice	2.83	2.83	0.20
						1/2"	3.92	3.92	0.24
						Ice	5.01	5.01	0.28
						1" Ice	7.19	7.19	0.36
						2" Ice	11.55	11.55	0.53
						4" Ice			
**									
(3) LNX-6514DS-A1M w/ Mount Pipe	A	From Face	4.00	0.000	111.00	No Ice	8.65	7.08	0.06
			0.00			1/2"	9.31	8.27	0.13
			0.00			Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Face	4.00	0.000	111.00	No Ice	8.65	7.08	0.06
			0.00			1/2"	9.31	8.27	0.13
			0.00			Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	C	From Face	4.00	0.000	111.00	No Ice	8.65	7.08	0.06
			0.00			1/2"	9.31	8.27	0.13
			0.00			Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			
HBXX-6517DS-A2M w/ Mount Pipe	A	From Face	4.00	0.000	111.00	No Ice	8.98	6.96	0.07
			0.00			1/2"	9.65	8.18	0.14
			0.00			Ice	10.29	9.14	0.21
						1" Ice	11.59	11.02	0.40
						2" Ice	14.32	15.03	0.91
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Face	4.00	0.000	111.00	No Ice	8.98	6.96	0.07
			0.00			1/2"	9.65	8.18	0.14
			0.00			Ice	10.29	9.14	0.21
						1" Ice	11.59	11.02	0.40
						2" Ice	14.32	15.03	0.91
						4" Ice			
(3) HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00	0.000	111.00	No Ice	8.98	6.96	0.07
			0.00			1/2"	9.65	8.18	0.14
			0.00			Ice	10.29	9.14	0.21
						1" Ice	11.59	11.02	0.40
						2" Ice	14.32	15.03	0.91
						4" Ice			
RRH2X60-PCS	A	From Face	4.00	0.000	111.00	No Ice	2.57	2.01	0.06
			0.00			1/2"	2.79	2.22	0.08
			0.00			Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
RRH2X60-PCS	B	From Face	4.00	0.000	111.00	No Ice	2.57	2.01	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} _{Front} ft ²	C _{AA} _{Side} ft ²	Weight K	
			0.00			1/2"	2.79	0.08	
			0.00			Ice	3.02	0.10	
						1" Ice	3.52	0.16	
						2" Ice	4.61	0.31	
						4" Ice			
RRH2X60-PCS	C	From Face	4.00	0.000	111.00	No Ice	2.57	0.06	
			0.00			1/2"	2.79	0.08	
			0.00			Ice	3.02	0.10	
						1" Ice	3.52	0.16	
						2" Ice	4.61	0.31	
						4" Ice			
RRH2X60-AWS	A	From Face	4.00	0.000	111.00	No Ice	2.19	0.04	
			0.00			1/2"	2.40	0.06	
			0.00			Ice	2.61	0.08	
						1" Ice	3.07	0.13	
						2" Ice	4.09	0.26	
						4" Ice			
RRH2X60-AWS	B	From Face	4.00	0.000	111.00	No Ice	2.19	0.04	
			0.00			1/2"	2.40	0.06	
			0.00			Ice	2.61	0.08	
						1" Ice	3.07	0.13	
						2" Ice	4.09	0.26	
						4" Ice			
RRH2X60-AWS	C	From Face	4.00	0.000	111.00	No Ice	2.19	0.04	
			0.00			1/2"	2.40	0.06	
			0.00			Ice	2.61	0.08	
						1" Ice	3.07	0.13	
						2" Ice	4.09	0.26	
						4" Ice			
(2) DB-B1-6C-12AB-0Z	C	From Face	4.00	0.000	111.00	No Ice	3.92	0.03	
			0.00			1/2"	4.20	0.06	
			0.00			Ice	4.48	0.09	
						1" Ice	5.07	0.17	
						2" Ice	6.35	0.37	
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.000	111.00	No Ice	14.66	1.25	
						1/2"	18.87	1.48	
						Ice	23.08	1.71	
						1" Ice	31.50	2.18	
						2" Ice	48.34	3.10	
						4" Ice			
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
A-ANT-18G-2-C	A	Paraboloid w/Radome	From Leg	4.00	0.000		128.00	2.17	No Ice	3.72
				0.00					1/2" Ice	4.01
				0.00					1" Ice	4.30
									2" Ice	4.88
									4" Ice	6.04
A-ANT-18G-2-C	B	Paraboloid w/Radome	From Leg	4.00	0.000		128.00	2.17	No Ice	3.72
				0.00					1/2" Ice	4.01
				0.00					1" Ice	4.30
									2" Ice	4.88

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
A-ANT-18G-2-C	C	Paraboloid w/Radome	From Leg	4.00 0.00 0.00	0.000		128.00	2.17	4" Ice 6.04 No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88 4" Ice 6.04	0.11 0.03 0.04 0.05 0.07 0.11
**										

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 169.00-133.33	150.24	1.542	25.25	56.195	A	0.000	56.195	56.195	100.00	0.000	0.000
					B	0.000	56.195	100.00	0.000	0.000	
					C	0.000	56.195	100.00	0.000	12.541	
L2 133.33-111.00	121.84	1.452	23.80	44.476	A	0.000	44.476	44.476	100.00	0.000	0.000
					B	0.000	44.476	100.00	0.000	0.000	
					C	0.000	44.476	100.00	0.000	9.259	
L3 111.00-101.50	106.20	1.396	22.88	21.292	A	0.000	21.292	21.292	100.00	0.000	0.000
					B	0.000	21.292	100.00	0.000	0.000	
					C	0.000	21.292	100.00	0.000	11.613	
L4 101.50-101.00	101.25	1.378	22.57	1.160	A	0.000	1.160	1.160	100.00	0.000	0.000
					B	0.000	1.160	100.00	0.000	0.000	
					C	0.000	1.160	100.00	0.000	0.703	
L5 101.00-87.83	94.32	1.35	22.12	31.961	A	0.000	31.961	31.961	100.00	0.000	0.000
					B	0.000	31.961	100.00	0.000	0.000	
					C	0.000	31.961	100.00	0.000	18.526	
L6 87.83-81.80	84.79	1.309	21.45	15.116	A	0.000	15.116	15.116	100.00	0.000	0.000
					B	0.000	15.116	100.00	0.000	0.000	
					C	0.000	15.116	100.00	0.000	8.482	
L7 81.80-43.33	62.32	1.199	19.56	110.569	A	0.000	110.569	110.569	100.00	0.000	0.000
					B	0.000	110.569	100.00	0.000	0.000	
					C	0.000	110.569	100.00	0.000	54.114	
L8 43.33-37.40	40.34	1.059	17.35	18.621	A	0.000	18.621	18.621	100.00	0.000	0.000
					B	0.000	18.621	100.00	0.000	0.000	
					C	0.000	18.621	100.00	0.000	8.342	
L9 37.40-9.00	22.89	1	16.38	97.367	A	0.000	97.367	97.367	100.00	0.000	0.000
					B	0.000	97.367	100.00	0.000	0.000	
					C	0.000	97.367	100.00	0.000	39.949	
L10 9.00-7.00	8.00	1	16.38	7.333	A	0.000	7.333	7.333	100.00	0.000	0.000
					B	0.000	7.333	100.00	0.000	0.000	
					C	0.000	7.333	100.00	0.000	2.813	
L11 7.00-0.00	3.48	1	16.38	26.158	A	0.000	26.158	26.158	100.00	0.000	0.000
					B	0.000	26.158	100.00	0.000	0.000	
					C	0.000	26.158	100.00	0.000	9.847	

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 169.00-133.33	150.24	1.542	5.58	1.1995	63.326	A	0.000	63.326	63.326	100.00	0.000	0.000
						B	0.000	63.326	100.00	0.000	0.000	

Section Elevation ft	z ft	K _z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L2 133.33-111.00	121.84	1.452	5.26	1.1697	48.940	C	0.000	63.326	48.940	100.00	0.000	27.737
						A	0.000	48.940		100.00	0.000	0.000
						B	0.000	48.940		100.00	0.000	0.000
L3 111.00-101.50	106.20	1.396	5.05	1.1506	23.114	C	0.000	48.940	23.114	100.00	0.000	20.640
						A	0.000	23.114		100.00	0.000	0.000
						B	0.000	23.114		100.00	0.000	0.000
L4 101.50-101.00	101.25	1.378	4.99	1.1440	1.255	C	0.000	1.255	1.255	100.00	0.000	1.530
						A	0.000	1.255		100.00	0.000	0.000
						B	0.000	1.255		100.00	0.000	0.000
L5 101.00-87.83	94.32	1.35	4.89	1.1343	34.450	C	0.000	34.450	34.450	100.00	0.000	40.104
						A	0.000	34.450		100.00	0.000	0.000
						B	0.000	34.450		100.00	0.000	0.000
L6 87.83-81.80	84.79	1.309	4.74	1.1199	16.256	C	0.000	16.256	16.256	100.00	0.000	18.362
						A	0.000	16.256		100.00	0.000	0.000
						B	0.000	16.256		100.00	0.000	0.000
L7 81.80-43.33	62.32	1.199	4.32	1.0793	117.489	C	0.000	117.489	117.489	100.00	0.000	114.088
						A	0.000	117.489		100.00	0.000	0.000
						B	0.000	117.489		100.00	0.000	0.000
L8 43.33-37.40	40.34	1.059	3.83	1.0244	19.687	C	0.000	19.687	19.687	100.00	0.000	17.586
						A	0.000	19.687		100.00	0.000	0.000
						B	0.000	19.687		100.00	0.000	0.000
L9 37.40-9.00	22.89	1	3.62	1.0000	102.100	C	0.000	102.100	102.100	100.00	0.000	80.972
						A	0.000	102.100		100.00	0.000	0.000
						B	0.000	102.100		100.00	0.000	0.000
L10 9.00-7.00	8.00	1	3.62	1.0000	7.666	C	0.000	7.666	7.666	100.00	0.000	5.702
						A	0.000	7.666		100.00	0.000	0.000
						B	0.000	7.666		100.00	0.000	0.000
L11 7.00-0.00	3.48	1	3.62	1.0000	27.325	C	0.000	27.325	27.325	100.00	0.000	19.958
						A	0.000	27.325		100.00	0.000	0.000
						B	0.000	27.325		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 169.00-133.33	150.24	1.542	9.86	56.195	A	0.000	56.195	56.195	100.00	0.000	0.000
					B	0.000	56.195		100.00	0.000	0.000
					C	0.000	56.195		100.00	0.000	12.541
L2 133.33-111.00	121.84	1.452	9.30	44.476	A	0.000	44.476	44.476	100.00	0.000	0.000
					B	0.000	44.476		100.00	0.000	0.000
					C	0.000	44.476		100.00	0.000	9.259
L3 111.00-101.50	106.20	1.396	8.94	21.292	A	0.000	21.292	21.292	100.00	0.000	0.000
					B	0.000	21.292		100.00	0.000	0.000
					C	0.000	21.292		100.00	0.000	11.613
L4 101.50-101.00	101.25	1.378	8.82	1.160	A	0.000	1.160	1.160	100.00	0.000	0.000
					B	0.000	1.160		100.00	0.000	0.000
					C	0.000	1.160		100.00	0.000	0.703
L5 101.00-87.83	94.32	1.35	8.64	31.961	A	0.000	31.961	31.961	100.00	0.000	0.000
					B	0.000	31.961		100.00	0.000	0.000
					C	0.000	31.961		100.00	0.000	18.526
L6 87.83-81.80	84.79	1.309	8.38	15.116	A	0.000	15.116	15.116	100.00	0.000	0.000
					B	0.000	15.116		100.00	0.000	0.000
					C	0.000	15.116		100.00	0.000	8.482
L7 81.80-43.33	62.32	1.199	7.64	110.569	A	0.000	110.569	110.569	100.00	0.000	0.000
					B	0.000	110.569		100.00	0.000	0.000
					C	0.000	110.569		100.00	0.000	54.114
L8 43.33-37.40	40.34	1.059	6.78	18.621	A	0.000	18.621	18.621	100.00	0.000	0.000
					B	0.000	18.621		100.00	0.000	0.000
					C	0.000	18.621		100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L9 37.40-9.00	22.89	1	6.40	97.367	C	0.000	18.621	97.367	100.00	0.000	8.342
					A	0.000	97.367		100.00	0.000	0.000
					B	0.000	97.367		100.00	0.000	0.000
L10 9.00-7.00	8.00	1	6.40	7.333	C	0.000	97.367	7.333	100.00	0.000	39.949
					A	0.000	7.333		100.00	0.000	0.000
					B	0.000	7.333		100.00	0.000	0.000
L11 7.00-0.00	3.48	1	6.40	26.158	C	0.000	7.333	26.158	100.00	0.000	2.813
					A	0.000	26.158		100.00	0.000	0.000
					B	0.000	26.158		100.00	0.000	0.000
					C	0.000	26.158		100.00	0.000	9.847

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+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
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	169 - 133.33	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	14	-14.72	1.25	-0.74
			Max. Mx	11	-5.94	241.71	-0.13

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L2	133.33 - 111	Pole	Max. My	8	-5.94	0.17	-241.66			
			Max. Vy	11	-11.88	241.71	-0.13			
			Max. Vx	8	11.88	0.17	-241.66			
			Max. Torque	13			0.07			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-21.74	3.28	-1.94			
			Max. Mx	11	-9.62	592.01	-0.66			
			Max. My	2	-9.62	0.44	591.67			
			Max. Vy	11	-14.97	592.01	-0.66			
			Max. Vx	2	-14.99	0.44	591.67			
L3	111 - 101.5	Pole	Max. Torque	9			-0.21			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-31.05	5.16	-4.14			
			Max. Mx	11	-13.67	787.94	-1.41			
			Max. My	8	-13.66	0.76	-788.49			
			Max. Vy	11	-21.12	787.94	-1.41			
			Max. Vx	2	-21.27	0.60	788.26			
			Max. Torque	5			-1.26			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-31.32	5.27	-4.21			
L4	101.5 - 101	Pole	Max. Mx	11	-13.85	798.52	-1.44			
			Max. My	8	-13.84	0.78	-799.12			
			Max. Vy	11	-21.18	798.52	-1.44			
			Max. Vx	2	-21.33	0.62	798.90			
			Max. Torque	5			-1.27			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-35.36	7.13	-5.29			
			Max. Mx	11	-16.20	990.47	-1.86			
			Max. My	8	-16.19	1.13	-991.84			
			Max. Vy	11	-22.20	990.47	-1.86			
L5	101 - 87.83	Pole	Max. Vx	2	-22.35	0.83	991.75			
			Max. Torque	5			-1.32			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-41.45	9.38	-6.60			
			Max. Mx	11	-20.10	1227.61	-2.36			
			Max. My	2	-20.09	1.09	1229.94			
			Max. Vy	11	-23.47	1227.61	-2.36			
			Max. Vx	2	-23.62	1.09	1229.94			
			Max. Torque	5			-1.38			
			Max Tension	1	0.00	0.00	0.00			
L6	87.83 - 81.8	Pole	Max. Compression	14	-59.14	17.11	-11.10			
			Max. Mx	11	-31.83	2064.31	-4.04			
			Max. My	2	-31.83	2.08	2069.75			
			Max. Vy	11	-26.95	2064.31	-4.04			
			Max. Vx	2	-27.11	2.08	2069.75			
			Max. Torque	12			1.66			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-67.38	19.83	-12.68			
			Max. Mx	11	-37.77	2375.10	-4.62			
			Max. My	2	-37.77	2.44	2381.55			
L7	81.8 - 43.33	Pole	Max. Vy	11	-28.11	2375.10	-4.62			
			Max. Vx	2	-28.26	2.44	2381.55			
			Max. Torque	12			1.78			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-83.03	26.66	-16.63			
			Max. Mx	11	-48.86	3204.63	-6.15			
			Max. My	2	-48.86	3.48	3213.39			
			Max. Vy	11	-30.27	3204.63	-6.15			
			Max. Vx	2	-30.42	3.48	3213.39			
			Max. Torque	12			2.09			
L8	43.33 - 37.4	Pole	Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-84.21	27.15	-16.92			
			Max. Mx	11	-49.73	3265.37	-6.26			
			Max. My	2	-49.72	3.56	3274.28			
			Max. Vy	11	-30.42	3265.37	-6.26			
			Max. Vx	2	-30.57	3.56	3274.28			
			Max. Torque	12			2.11			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-88.26	28.92	-17.94			
			L9	37.4 - 9	Pole	Max. Mx	11	-49.73	3265.37	-6.26
Max. My	2	-49.72				3.56	3274.28			
Max. Vy	11	-30.42				3265.37	-6.26			
Max. Vx	2	-30.57				3.56	3274.28			
Max. Torque	12						2.11			
Max Tension	1	0.00				0.00	0.00			
Max. Compression	14	-88.26				28.92	-17.94			
L10	9 - 7	Pole				Max. Mx	11	-49.73	3265.37	-6.26
						Max. My	2	-49.72	3.56	3274.28
						Max. Vy	11	-30.42	3265.37	-6.26
			Max. Vx	2	-30.57	3.56	3274.28			
			Max. Torque	12			2.11			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	14	-88.26	28.92	-17.94			
			L11	7 - 0	Pole	Max. Mx	11	-49.73	3265.37	-6.26
						Max. My	2	-49.72	3.56	3274.28
						Max. Vy	11	-30.42	3265.37	-6.26
Max. Vx	2	-30.57				3.56	3274.28			
Max. Torque	12						2.11			
Max Tension	1	0.00				0.00	0.00			
Max. Compression	14	-88.26				28.92	-17.94			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-52.62	3480.28	-6.64
			Max. My	2	-52.62	3.84	3489.71
			Max. Vy	11	-30.93	3480.28	-6.64
			Max. Vx	2	-31.08	3.84	3489.71
			Max. Torque	12			2.19

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	88.26	-0.00	0.00
	Max. H _x	11	52.63	30.91	-0.03
	Max. H _z	2	52.63	-0.01	31.06
	Max. M _x	2	3489.71	-0.01	31.06
	Max. M _z	5	3470.88	-30.91	-0.01
	Max. Torsion	12	2.19	26.74	15.50
	Min. Vert	2	52.63	-0.01	31.06
	Min. H _x	5	52.63	-30.91	-0.01
	Min. H _z	8	52.63	0.01	-31.01
	Min. M _x	8	-3489.40	0.01	-31.01
	Min. M _z	11	-3480.28	30.91	-0.03
	Min. Torsion	6	-2.19	-26.78	-15.53

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	52.63	0.00	-0.00	3.02	4.53	-0.00
Dead+Wind 0 deg - No Ice	52.63	0.01	-31.06	-3489.71	3.84	-1.33
Dead+Wind 30 deg - No Ice	52.63	15.45	-26.90	-3022.10	-1731.74	-0.41
Dead+Wind 60 deg - No Ice	52.63	26.74	-15.51	-1740.94	-3002.01	0.86
Dead+Wind 90 deg - No Ice	52.63	30.91	0.01	4.90	-3470.88	1.90
Dead+Wind 120 deg - No Ice	52.63	26.78	15.53	1749.21	-3007.18	2.19
Dead+Wind 150 deg - No Ice	52.63	15.47	26.87	3024.90	-1734.78	1.90
Dead+Wind 180 deg - No Ice	52.63	-0.01	31.01	3489.40	5.58	1.33
Dead+Wind 210 deg - No Ice	52.63	-15.48	26.88	3025.76	1745.70	0.41
Dead+Wind 240 deg - No Ice	52.63	-26.79	15.54	1750.71	3017.45	-0.86
Dead+Wind 270 deg - No Ice	52.63	-30.91	0.03	6.64	3480.28	-1.90
Dead+Wind 300 deg - No Ice	52.63	-26.74	-15.50	-1739.43	3010.55	-2.19
Dead+Wind 330 deg - No Ice	52.63	-15.43	-26.89	-3021.23	1739.64	-1.90
Dead+Ice+Temp	88.26	0.00	-0.00	17.94	28.92	-0.00
Dead+Wind 0 deg+Ice+Temp	88.26	0.00	-9.61	-1091.83	28.89	-0.66
Dead+Wind 30 deg+Ice+Temp	88.26	4.79	-8.32	-943.02	-523.28	-0.27
Dead+Wind 60 deg+Ice+Temp	88.26	8.29	-4.80	-536.10	-927.43	0.26
Dead+Wind 90 deg+Ice+Temp	88.26	9.58	0.00	18.57	-1076.55	0.72
Dead+Wind 120 deg+Ice+Temp	88.26	8.30	4.81	572.83	-928.94	0.92
Dead+Wind 150 deg+Ice+Temp	88.26	4.79	8.32	978.23	-524.23	0.88
Dead+Wind 180 deg+Ice+Temp	88.26	-0.00	9.60	1125.98	29.24	0.66
Dead+Wind 210 deg+Ice+Temp	88.26	-4.80	8.32	978.41	582.67	0.27
Dead+Wind 240 deg+Ice+Temp	88.26	-8.30	4.81	573.14	987.24	-0.26

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
Dead+Wind 270 deg+Ice+Temp	88.26	-9.58	0.01	18.92	1134.67	-0.72
Dead+Wind 300 deg+Ice+Temp	88.26	-8.29	-4.80	-535.81	985.42	-0.92
Dead+Wind 330 deg+Ice+Temp	88.26	-4.78	-8.32	-942.88	581.12	-0.88
Dead+Wind 0 deg - Service	52.63	0.00	-12.13	-1363.11	4.38	-0.52
Dead+Wind 30 deg - Service	52.63	6.03	-10.51	-1180.14	-674.48	-0.16
Dead+Wind 60 deg - Service	52.63	10.45	-6.06	-679.02	-1171.33	0.34
Dead+Wind 90 deg - Service	52.63	12.07	0.00	3.84	-1354.64	0.75
Dead+Wind 120 deg - Service	52.63	10.46	6.06	686.11	-1173.35	0.86
Dead+Wind 150 deg - Service	52.63	6.04	10.50	1185.09	-675.67	0.74
Dead+Wind 180 deg - Service	52.63	-0.00	12.11	1366.69	5.06	0.52
Dead+Wind 210 deg - Service	52.63	-6.05	10.50	1185.43	685.69	0.16
Dead+Wind 240 deg - Service	52.63	-10.46	6.07	686.70	1183.12	-0.34
Dead+Wind 270 deg - Service	52.63	-12.07	0.01	4.52	1364.07	-0.75
Dead+Wind 300 deg - Service	52.63	-10.44	-6.05	-678.43	1180.42	-0.86
Dead+Wind 330 deg - Service	52.63	-6.03	-10.50	-1179.80	683.32	-0.74

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-52.63	0.00	-0.00	52.63	0.00	0.001%
2	0.01	-52.63	-31.06	-0.01	52.63	31.06	0.009%
3	15.45	-52.63	-26.90	-15.45	52.63	26.90	0.000%
4	26.74	-52.63	-15.51	-26.74	52.63	15.51	0.000%
5	30.91	-52.63	0.01	-30.91	52.63	-0.01	0.005%
6	26.78	-52.63	15.53	-26.78	52.63	-15.53	0.000%
7	15.47	-52.63	26.87	-15.47	52.63	-26.87	0.000%
8	-0.01	-52.63	31.01	0.01	52.63	-31.01	0.005%
9	-15.48	-52.63	26.88	15.48	52.63	-26.88	0.000%
10	-26.79	-52.63	15.54	26.79	52.63	-15.54	0.000%
11	-30.91	-52.63	0.03	30.91	52.63	-0.03	0.005%
12	-26.74	-52.63	-15.50	26.74	52.63	15.50	0.000%
13	-15.43	-52.63	-26.89	15.43	52.63	26.89	0.000%
14	0.00	-88.26	0.00	-0.00	88.26	0.00	0.001%
15	0.00	-88.26	-9.61	-0.00	88.26	9.61	0.001%
16	4.79	-88.26	-8.33	-4.79	88.26	8.32	0.001%
17	8.29	-88.26	-4.80	-8.29	88.26	4.80	0.001%
18	9.58	-88.26	0.00	-9.58	88.26	-0.00	0.001%
19	8.30	-88.26	4.81	-8.30	88.26	-4.81	0.000%
20	4.79	-88.26	8.32	-4.79	88.26	-8.32	0.000%
21	-0.00	-88.26	9.60	0.00	88.26	-9.60	0.001%
22	-4.80	-88.26	8.32	4.80	88.26	-8.32	0.000%
23	-8.30	-88.26	4.81	8.30	88.26	-4.81	0.000%
24	-9.58	-88.26	0.01	9.58	88.26	-0.01	0.001%
25	-8.29	-88.26	-4.80	8.29	88.26	4.80	0.000%
26	-4.78	-88.26	-8.32	4.78	88.26	8.32	0.000%
27	0.00	-52.63	-12.13	-0.00	52.63	12.13	0.004%
28	6.03	-52.63	-10.51	-6.03	52.63	10.51	0.001%
29	10.45	-52.63	-6.06	-10.45	52.63	6.06	0.001%
30	12.08	-52.63	0.00	-12.07	52.63	-0.00	0.004%
31	10.46	-52.63	6.06	-10.46	52.63	-6.06	0.001%
32	6.04	-52.63	10.50	-6.04	52.63	-10.50	0.001%
33	-0.00	-52.63	12.11	0.00	52.63	-12.11	0.004%
34	-6.05	-52.63	10.50	6.05	52.63	-10.50	0.001%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
35	-10.46	-52.63	6.07	10.46	52.63	-6.07	0.001%
36	-12.08	-52.63	0.01	12.07	52.63	-0.01	0.004%
37	-10.44	-52.63	-6.05	10.44	52.63	6.05	0.001%
38	-6.03	-52.63	-10.50	6.03	52.63	10.50	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.00000296
2	Yes	16	0.00010868	0.00014916
3	Yes	22	0.0000001	0.00011845
4	Yes	22	0.0000001	0.00011687
5	Yes	17	0.00005653	0.00014238
6	Yes	22	0.0000001	0.00012160
7	Yes	22	0.0000001	0.00011724
8	Yes	17	0.00005650	0.00008299
9	Yes	22	0.0000001	0.00011982
10	Yes	22	0.0000001	0.00012118
11	Yes	17	0.00005651	0.00014597
12	Yes	22	0.0000001	0.00011626
13	Yes	22	0.0000001	0.00012083
14	Yes	13	0.0000001	0.00006632
15	Yes	19	0.0000001	0.00010275
16	Yes	19	0.0000001	0.00014767
17	Yes	19	0.0000001	0.00014729
18	Yes	19	0.0000001	0.00010162
19	Yes	20	0.0000001	0.00008603
20	Yes	20	0.0000001	0.00008348
21	Yes	19	0.0000001	0.00010586
22	Yes	20	0.0000001	0.00009041
23	Yes	20	0.0000001	0.00009050
24	Yes	19	0.0000001	0.00010663
25	Yes	20	0.0000001	0.00008492
26	Yes	20	0.0000001	0.00008768
27	Yes	16	0.00011504	0.00005406
28	Yes	18	0.0000001	0.00012668
29	Yes	18	0.0000001	0.00012279
30	Yes	16	0.00011508	0.00006726
31	Yes	18	0.0000001	0.00013531
32	Yes	18	0.0000001	0.00012346
33	Yes	16	0.00011504	0.00005440
34	Yes	18	0.0000001	0.00013034
35	Yes	18	0.0000001	0.00013401
36	Yes	16	0.00011505	0.00006799
37	Yes	18	0.0000001	0.00012161
38	Yes	18	0.0000001	0.00013363

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 133.33	48.71	34	2.806	0.003
L2	136.66 - 111	30.56	34	2.386	0.002
L3	111 - 101.5	19.42	34	1.698	0.002
L4	101.5 - 101	16.22	34	1.516	0.002
L5	101 - 87.83	16.06	34	1.511	0.002
L6	92.16 - 81.8	13.40	34	1.366	0.001
L7	81.8 - 43.33	10.56	34	1.225	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	48.66 - 37.4	3.82	34	0.722	0.001
L9	37.4 - 9	2.25	34	0.586	0.001
L10	9 - 7	0.13	34	0.135	0.000
L11	7 - 0	0.08	34	0.106	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
165.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	34	46.35	2.773	0.003	14844
156.00	(2) DUO1417-8686 w/ Mount Pipe	34	41.10	2.688	0.003	5708
148.00	932LG65VTE-B w/ Mount Pipe	34	36.58	2.590	0.002	3533
138.00	APXV18-206517-A	34	31.24	2.415	0.002	2413
128.00	A-ANT-18G-2-C	34	26.39	2.165	0.002	2187
111.00	(3) LNX-6514DS-A1M w/ Mount Pipe	34	19.42	1.698	0.002	2105

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 133.33	123.84	2	7.145	0.007
L2	136.66 - 111	77.78	9	6.076	0.006
L3	111 - 101.5	49.46	9	4.325	0.005
L4	101.5 - 101	41.32	9	3.865	0.004
L5	101 - 87.83	40.92	9	3.850	0.004
L6	92.16 - 81.8	34.14	9	3.482	0.004
L7	81.8 - 43.33	26.92	9	3.122	0.003
L8	48.66 - 37.4	9.74	9	1.841	0.002
L9	37.4 - 9	5.74	9	1.495	0.001
L10	9 - 7	0.33	9	0.343	0.000
L11	7 - 0	0.20	9	0.270	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
165.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	117.86	7.060	0.007	5986
156.00	(2) DUO1417-8686 w/ Mount Pipe	9	104.55	6.845	0.006	2300
148.00	932LG65VTE-B w/ Mount Pipe	9	93.07	6.596	0.006	1422
138.00	APXV18-206517-A	9	79.51	6.150	0.006	968
128.00	A-ANT-18G-2-C	9	67.19	5.516	0.006	874
111.00	(3) LNX-6514DS-A1M w/ Mount Pipe	9	49.46	4.325	0.005	836

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 P/P _a
L1	169 - 133.33 (1)	TP22.31x15.5x0.25	35.67	0.00	0.0	39.00	17.0001	-5.94	663.01	0.009
L2	133.33 - 111 (2)	TP26.0013x21.1743x0.312 5	25.66	0.00	0.0	39.00	25.4801	-9.62	993.72	0.010
L3	111 - 101.5 (3)	TP27.7884x26.0013x0.550 8	9.50	0.00	0.0	30.92	47.6179	-13.66	1472.25	0.009
L4	101.5 - 101 (4)	TP27.8825x27.7884x0.983 8	0.50	0.00	0.0	26.41	83.9892	-13.84	2217.82	0.006
L5	101 - 87.83 (5)	TP30.36x27.8825x0.6941	13.17	0.00	0.0	26.48	63.5643	-16.18	1683.44	0.010
L6	87.83 - 81.8 (6)	TP30.8702x28.1572x0.741 4	10.36	0.00	0.0	26.53	70.8954	-20.09	1880.57	0.011
L7	81.8 - 43.33 (7)	TP38.11x30.8702x0.8207	38.47	0.00	0.0	30.91	94.5254	-31.83	2921.40	0.011
L8	43.33 - 37.4 (8)	TP38.4726x35.4655x0.801 8	11.26	0.00	0.0	30.94	91.8341	-35.51	2840.98	0.013
L9	37.4 - 9 (9)	TP43.8089x38.4726x0.741 1	28.40	0.00	0.0	31.06	101.306 0	-48.86	3146.17	0.016
L10	9 - 7 (10)	TP44.1847x43.8089x0.776 3	2.00	0.00	0.0	31.11	106.952 0	-49.72	3327.27	0.015
L11	7 - 0 (11)	TP45.5x44.1847x0.7254	7.00	0.00	0.0	31.09	103.089 0	-52.62	3205.23	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} /F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} /F _{by}
L1	169 - 133.33 (1)	TP22.31x15.5x0.25	241.78	32.40	39.00	0.831	0.00	0.00	39.00	0.000
L2	133.33 - 111 (2)	TP26.0013x21.1743x0.31 25	592.50	44.21	39.00	1.134	0.00	0.00	39.00	0.000
L3	111 - 101.5 (3)	TP27.7884x26.0013x0.55 08	789.49	29.96	30.92	0.969	0.00	0.00	30.92	0.000
L4	101.5 - 101 (4)	TP27.8825x27.7884x0.98 38	800.14	17.71	26.41	0.671	0.00	0.00	26.41	0.000
L5	101 - 87.83 (5)	TP30.36x27.8825x0.6941	993.07	26.76	26.48	1.010	0.00	0.00	26.48	0.000
L6	87.83 - 81.8 (6)	TP30.8702x28.1572x0.74 14	1231.3 8	28.50	26.53	1.074	0.00	0.00	26.53	0.000
L7	81.8 - 43.33 (7)	TP38.11x30.8702x0.8207 3	2071.8	29.80	30.91	0.964	0.00	0.00	30.91	0.000
L8	43.33 - 37.4 (8)	TP38.4726x35.4655x0.80 18	2217.9 3	33.01	30.94	1.067	0.00	0.00	30.94	0.000
L9	37.4 - 9 (9)	TP43.8089x38.4726x0.74 11	3216.5 9	36.18	31.06	1.165	0.00	0.00	31.06	0.000
L10	9 - 7 (10)	TP44.1847x43.8089x0.77 63	3277.5 5	34.67	31.11	1.115	0.00	0.00	31.11	0.000
L11	7 - 0 (11)	TP45.5x44.1847x0.7254 3	3493.2 3	37.11	31.09	1.194	0.00	0.00	31.09	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v /F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} /F _{vt}
L1	169 - 133.33	TP22.31x15.5x0.25	11.88	0.70	26.00	0.054	0.00	0.00	26.00	0.000

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L2	133.33 - 111 (1)	TP26.0013x21.1743x0.31 25	15.00	0.59	26.00	0.045	0.00	0.00	26.00	0.000
L3	111 - 101.5 (2)	TP27.7884x26.0013x0.55 08	21.23	0.45	20.61	0.043	0.24	0.00	20.61	0.000
L4	101.5 - 101 (3)	TP27.8825x27.7884x0.98 38	21.32	0.25	17.60	0.029	0.23	0.00	17.60	0.000
L5	101 - 87.83 (4)	TP30.36x27.8825x0.6941 14	22.32	0.35	17.66	0.040	0.18	0.00	17.66	0.000
L6	87.83 - 81.8 (5)	TP30.8702x28.1572x0.74 14	23.58	0.33	17.68	0.038	0.12	0.00	17.68	0.000
L7	81.8 - 43.33 (6)	TP38.11x30.8702x0.8207 11	27.07	0.29	20.60	0.028	0.10	0.00	20.60	0.000
L8	43.33 - 37.4 (7)	TP38.4726x35.4655x0.80 18	27.81	0.30	20.62	0.029	0.14	0.00	20.62	0.000
L9	37.4 - 9 (9) (8)	TP43.8089x38.4726x0.74 11	30.38	0.30	20.70	0.029	0.35	0.00	20.70	0.000
L10	9 - 7 (10) (9)	TP44.1847x43.8089x0.77 63	30.53	0.29	20.74	0.028	0.36	0.00	20.74	0.000
L11	7 - 0 (11) (10)	TP45.5x44.1847x0.7254 63	31.04	0.30	20.73	0.029	0.41	0.00	20.73	0.000

Pole Interaction Design Data

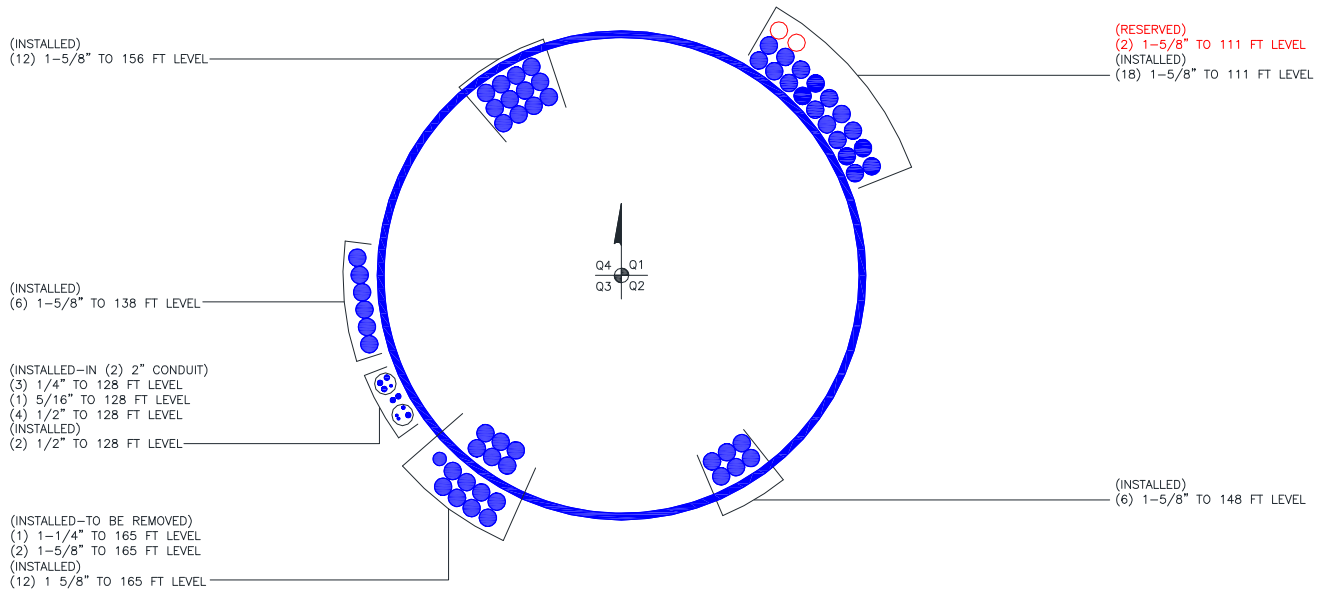
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	169 - 133.33 (1)	0.009	0.831	0.000	0.054	0.000	0.841	1.333	H1-3+VT ✓
L2	133.33 - 111 (2)	0.010	1.134	0.000	0.045	0.000	1.144	1.333	H1-3+VT ✓
L3	111 - 101.5 (3)	0.009	0.969	0.000	0.043	0.000	0.979	1.333	H1-3+VT ✓
L4	101.5 - 101 (4)	0.006	0.671	0.000	0.029	0.000	0.677	1.333	H1-3+VT ✓
L5	101 - 87.83 (5)	0.010	1.010	0.000	0.040	0.000	1.020	1.333	H1-3+VT ✓
L6	87.83 - 81.8 (6)	0.011	1.074	0.000	0.038	0.000	1.085	1.333	H1-3+VT ✓
L7	81.8 - 43.33 (7)	0.011	0.964	0.000	0.028	0.000	0.975	1.333	H1-3+VT ✓
L8	43.33 - 37.4 (8)	0.013	1.067	0.000	0.029	0.000	1.080	1.333	H1-3+VT ✓
L9	37.4 - 9 (9) (9)	0.016	1.165	0.000	0.029	0.000	1.181	1.333	H1-3+VT ✓
L10	9 - 7 (10) (10)	0.015	1.115	0.000	0.028	0.000	1.130	1.333	H1-3+VT ✓
L11	7 - 0 (11) (11)	0.016	1.194	0.000	0.029	0.000	1.210	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	169 - 133.33	Pole	TP22.31x15.5x0.25	1	-5.94	883.79	63.1	Pass

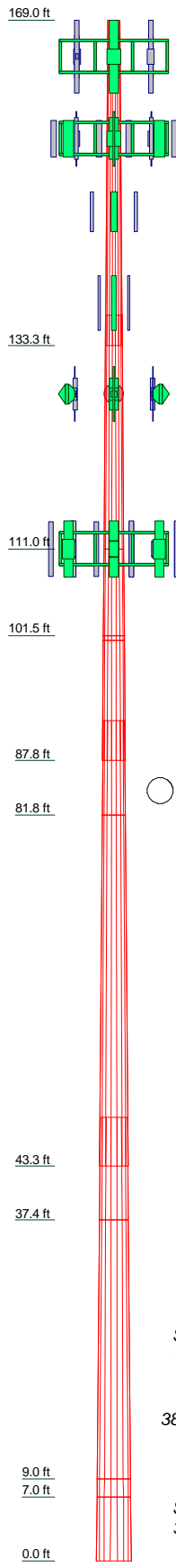
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L2	133.33 - 111	Pole	TP26.0013x21.1743x0.3125	2	-9.62	1324.63	85.8	Pass	
L3	111 - 101.5	Pole	TP27.7884x26.0013x0.5508	3	-13.66	1962.51	73.4	Pass	
L4	101.5 - 101	Pole	TP27.8825x27.7884x0.9838	4	-13.84	2956.35	50.8	Pass	
L5	101 - 87.83	Pole	TP30.36x27.8825x0.6941	5	-16.18	2244.03	76.5	Pass	
L6	87.83 - 81.8	Pole	TP30.8702x28.1572x0.7414	6	-20.09	2506.80	81.4	Pass	
L7	81.8 - 43.33	Pole	TP38.11x30.8702x0.8207	7	-31.83	3894.23	73.2	Pass	
L8	43.33 - 37.4	Pole	TP38.4726x35.4655x0.8018	8	-35.51	3787.03	81.0	Pass	
L9	37.4 - 9	Pole	TP43.8089x38.4726x0.7411	9	-48.86	4193.84	88.6	Pass	
L10	9 - 7	Pole	TP44.1847x43.8089x0.7763	10	-49.72	4435.25	84.7	Pass	
L11	7 - 0	Pole	TP45.5x44.1847x0.7254	11	-52.62	4272.57	90.8	Pass	
							Summary		
							Pole (L11)	90.8	Pass
							RATING =	90.8	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11
Length (ft)	35.67	25.66	9.50	0.50	13.17	10.36	38.47	11.26	28.40	7.00	2.00
Number of Sides	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.5508	0.6941	0.9838	0.7414	0.8207	0.8018	0.7411	0.7254	0.7763
Socket Length (ft)	3.33			4.33			5.33				
Top Dia (in)	15.5000	21.1743	27.78426.0013	27.8825	27.788426.0013	28.1572	30.8702	35.4655	38.4726	44.18473.8089	44.18473.8089
Bot Dia (in)	22.3100	26.0013	27.882527.7884	30.3600	27.882527.7884	30.8702	38.1100	38.4726	43.8089	45.50004.1847	45.50004.1847
Grade	A572-65	A572-65	Reinf 51.53 ksi	Reinf 44.21 ksi	Reinf 44.14 ksi	Reinf 44.21 ksi	Reinf 51.51 ksi	Reinf 51.56 ksi	Reinf 51.76 ksi	Reinf 51.85 ksi	Reinf 51.76 ksi
Weight (K)	1.8	2.0	1.5	0.1	2.8	2.4	11.5	3.5	9.2	2.4	0.7



DESIGNED APPURTENANCE LOADING

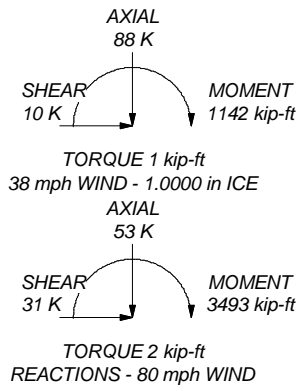
TYPE	ELEVATION	TYPE	ELEVATION
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	932LG65VTE-B w/ Mount Pipe	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	932LG65VTE-B w/ Mount Pipe	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	Side Arm Mount [SO 102-3]	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	APXV18-206517-A	138
KRY 112 144/1	165	APXV18-206517-A	138
KRY 112 144/1	165	APXV18-206517-A	138
KRY 112 144/1	165	Pipe Mount [PM 601-3]	138
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	165	LLPX310R w/ Mount Pipe	128
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	165	LLPX310R w/ Mount Pipe	128
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	165	LLPX310R w/ Mount Pipe	128
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	165	WIMAX DAP HEAD	128
Ericsson Air 21 B4A B12P-B5P 8FT w/ Mount Pipe	165	WIMAX DAP HEAD	128
RRUS 11 B12	165	WIMAX DAP HEAD	128
RRUS 11 B12	165	HORIZON DUO	128
RRUS 11 B12	165	HORIZON DUO	128
RRUS 11 B12	165	HORIZON DUO	128
Platform Mount [LP 712-1]	165	2.375" OD x 6' Mount Pipe	128
8-ft Ladder	165	2.375" OD x 6' Mount Pipe	128
(2) DUO1417-8686 w/ Mount Pipe	156	2.375" OD x 6' Mount Pipe	128
(2) DUO1417-8686 w/ Mount Pipe	156	Side Arm Mount [SO 701-3]	128
(2) DUO1417-8686 w/ Mount Pipe	156	A-ANT-18G-2-C	128
7770.00 w/ Mount Pipe	156	A-ANT-18G-2-C	128
7770.00 w/ Mount Pipe	156	A-ANT-18G-2-C	128
7770.00 w/ Mount Pipe	156	HBXX-6517DS-A2M w/ Mount Pipe	111
7770.00 w/ Mount Pipe	156	(2) HBXX-6517DS-A2M w/ Mount Pipe	111
DTMABP7819VG12A	156	(3) HBXX-6517DS-A2M w/ Mount Pipe	111
DTMABP7819VG12A	156	RRH2X60-PCS	111
RRUS 11	156	RRH2X60-PCS	111
RRUS 11	156	RRH2X60-AWS	111
RRUS 11	156	RRH2X60-AWS	111
2.375" OD x 6' Mount Pipe	156	RRH2X60-AWS	111
2.375" OD x 6' Mount Pipe	156	(2) DB-B1-6C-12AB-0Z	111
2.375" OD x 6' Mount Pipe	156	Platform Mount [LP 303-1]	111
Platform Mount [LP 712-1]	156	(3) LNX-6514DS-A1M w/ Mount Pipe	111
932LG65VTE-B w/ Mount Pipe	148	(2) LNX-6514DS-A1M w/ Mount Pipe	111
		LNX-6514DS-A1M w/ Mount Pipe	111


MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 51.51 ksi	52 ksi	65 ksi
Reinf 51.53 ksi	52 ksi	65 ksi	Reinf 51.56 ksi	52 ksi	65 ksi
Reinf 44.01 ksi	44 ksi	56 ksi	Reinf 51.76 ksi	52 ksi	65 ksi
Reinf 44.14 ksi	44 ksi	56 ksi	Reinf 51.85 ksi	52 ksi	65 ksi
Reinf 44.21 ksi	44 ksi	56 ksi	Reinf 51.82 ksi	52 ksi	65 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 90.8%



 Paul J Ford and Company 250 E. Broad Street Suite 600 Columbus, OH 43215 Phone: 614.221.6679 FAX: 614.448.44105	Job: 165-Ft Monopole / South Windsor/Rt 5		
	Project: PJF 37515-1767 / BU 828054		
	Client: Crown Castle	Drawn by: Robert Koors	App'd:
	Code: TIA/EIA-222-F	Date: 05/12/15	Scale: NTS
	Path:		Dwg No. E-1



Asymmetric Anchor Rod Analysis

Moment = 3493 k-ft
Axial = 53.0 kips
Shear = 31.0 kips
Anchor Qty = 6

TIA Ref. = F
ASIF = 1.3333
Max Ratio = 105.0%

Location = Base Plate
η = N/A for BP, Rev. G Sect. 4.9.9
Threads = N/A for FP, Rev. G

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1					0.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%
2					60.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%
3					120.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%
4					180.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%
5					240.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%
6					300.0	117.50	5.51	5.51	246.65	228.99	246.65	306.30	306.30	80.5%

33.06

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

T-Mobile Existing Facility

Site ID: CT11279D

South Windsor/Rt 5
300 Governors Highway
South Windsor, CT 06074

June 4, 2015

EBI Project Number: 6215000148

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	59.46 %

June 4, 2015

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

Emissions Analysis for Site: **CT11279D – South Windsor/Rt 5**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **300 Governors Highway, South Windsor, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **300 Governors Highway, South Windsor, 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 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Ericsson AIR21 B4A/B12P** for 2100 MHz (AWS) and 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe. The **Ericsson AIR21 B4A/B12P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz and has a maximum gain of **13.6 dBd** at its main lobe at 700 MHz. 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 **165 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.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	165	Height (AGL):	165	Height (AGL):	165
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	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.66	Antenna B1 MPE%	0.66	Antenna C1 MPE%	0.66
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B12P	Make / Model:	Ericsson AIR21 B4A/B12P	Make / Model:	Ericsson AIR21 B4A/B12P
Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd
Height (AGL):	165	Height (AGL):	165	Height (AGL):	165
Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power:	150	Total TX Power:	150	Total TX Power:	150
ERP (W):	5,355.80	ERP (W):	5,355.80	ERP (W):	5,355.80
Antenna A2 MPE%	0.87	Antenna B2 MPE%	0.87	Antenna C2 MPE%	0.87

Site Composite MPE%	
Carrier	MPE%
T-Mobile	4.61
Verizon Wireless	29.15 %
Clearwire	1.07 %
Sprint	8.44 %
AT&T	16.19 %
Site Total MPE %:	59.46 %

T-Mobile Sector 1 Total:	1.54 %
T-Mobile Sector 2 Total:	1.54 %
T-Mobile Sector 3 Total:	1.54 %
Site Total:	59.46

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:	1.54 %
Sector 2:	1.54 %
Sector 3 :	1.54%
T-Mobile Total:	4.61%
Site Total:	59.46 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is 59.46% 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

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 Jerry Feathers
 Crown Castle
 3530 Toringdon Way
 Suite 300
 Charlotte, NC 28277

Origin ID: MEOA



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 CAD: 104924201/NET3810

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Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square

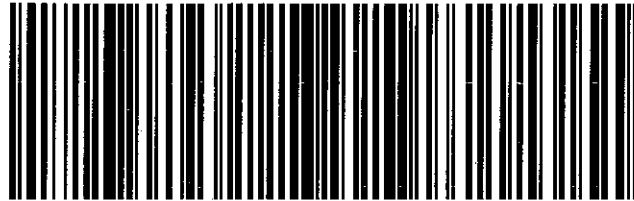
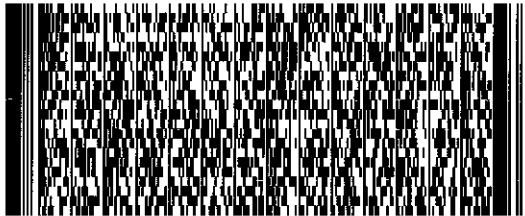
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