STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

April 11, 2011

Douglas L. Culp, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-014-110325** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 150 North Main Street, Branford, Connecticut.

Dear Mr. Culp:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 23, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts NAB

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Anthony "Unk" DaRos, First Selectman, Town of Branford
Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford
Crown Castle USA, Inc.

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March 28, 2011

The Honorable Anthony "Unk" DaRos
First Selectman
Town of Branford
Town Hall
1019 Main Street
P. O. Box 150
Branford, CT 06405-0150

RE: **EM-CING-014-110325** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 150 North Main Street, Branford, Connecticut.

Dear First Selectman DaRos:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by April 11, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford

EM-CING-014-110325

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

March 23, 2011

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 150 North Main Street Branford, CT (owner Crown Castle)

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications, designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

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

1. The height of the overall structure will be unaffected.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

150 North Main Street Branford, CT
Site Number 2220
TS 09/98; Exempt Mod 08/02, 07/06 and 09/08

Tower Owner/Manager: Crown Castle USA, Inc.

Equipment configuration: Monopole

Current and/or approved: Six PowerWave antennas @ 112 ft
Six PowerWave TMA's and Diplexer's @ 112 ft
Twelve runs 1 1/4 inch coax to 112 ft
Outdoor Shelter

Planned Modifications: Retain existing PowerWave Diplexers and TMA's at 112 ft
Retain existing PowerWave Antennas @ 112 ft
Retain all Coax Cabling
Install three Kathrein 800-10764 antennas or equivalent @ 112 ft
Install six Ericsson RRUS 11 remote radio heads @ 112 ft
Install one RayCap DC6-48-60-18-8F surge protector @ 112 ft
Install one fiber and two DC power cables to 112 ft

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 39.9% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 42.8 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							13.27
AT&T UMTS	112	1900 Band	2	500	0.0287	1.0000	2.87
AT&T UMTS	112	800 Band	1	500	0.0143	0.5867	2.44
AT&T GSM	112	800Band	8	296	0.0679	0.5867	11.57
AT&T GSM	112	1900 Band	8	427	0.0979	1.0000	9.79
Total							**39.9%**

* Data for other users are from Siting Council records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							13.27
AT&T UMTS	112	800 Band	1	500	0.0143	0.5867	2.44
AT&T UMTS	112	1900 Band	2	500	0.0287	1.0000	2.87
AT&T GSM	112	1900 Band	8	427	0.0979	1.0000	9.79
AT&T GSM	112	880 - 894	8	296	0.0679	0.5867	11.57
AT&T LTE	112	740 - 746	1	500	0.0143	0.4933	2.91
Total							**42.8%**

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (Paul J. Ford and Co. dated 3-2-11)

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	150 NORTH MAIN STREET BRANFORD, CT 06405
LATITUDE:	41.288611° N 41° 17' 19" N
LONGITUDE:	-72.813859° W -72° 48' 49.89" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

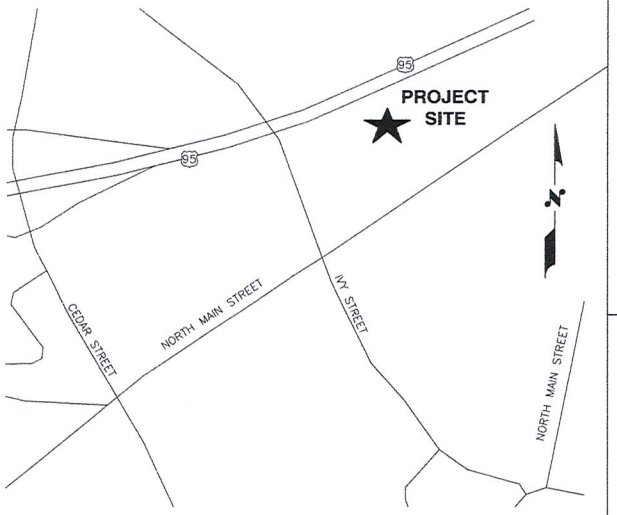
at&t

SITE NUMBER: CT2220
SITE NAME: BRANFORD - SPRINT

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:
START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI TURN LEFT ONTO CAPITOL BLVD. 0.3 MI TURN LEFT ONTO WEST ST. 0.3 MI MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 29.0 MI MERGE ONTO I-95 N/GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD NEW LONDON. 5.6 MI TAKE THE CEDAR ST EXIT, EXIT 54, TOWARD BRANFORD. 0.1 MI TURN RIGHT ONTO CEDAR ST/CT-740. 0.2 MI TAKE THE 1ST LEFT ONTO N MAIN ST/US-1.IF 0.2 MI 150 N MAIN ST IS ON THE LEFT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS

BEFORE YOU DIG

CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2220
SITE NAME: BRANFORD - SPRINT

150 NORTH MAIN STREET
BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/07/11	ISSUED FOR CONSTRUCTION	DB	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: DB

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2220.01	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR 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 CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. 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.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
   ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
   LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

   AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

   AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

   MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

   TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

   ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2220
SITE NAME: BRANFORD - SPRINT

150 NORTH MAIN STREET
BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/07/11	ISSUED FOR CONSTRUCTION	DB	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	DB	DC	DPH

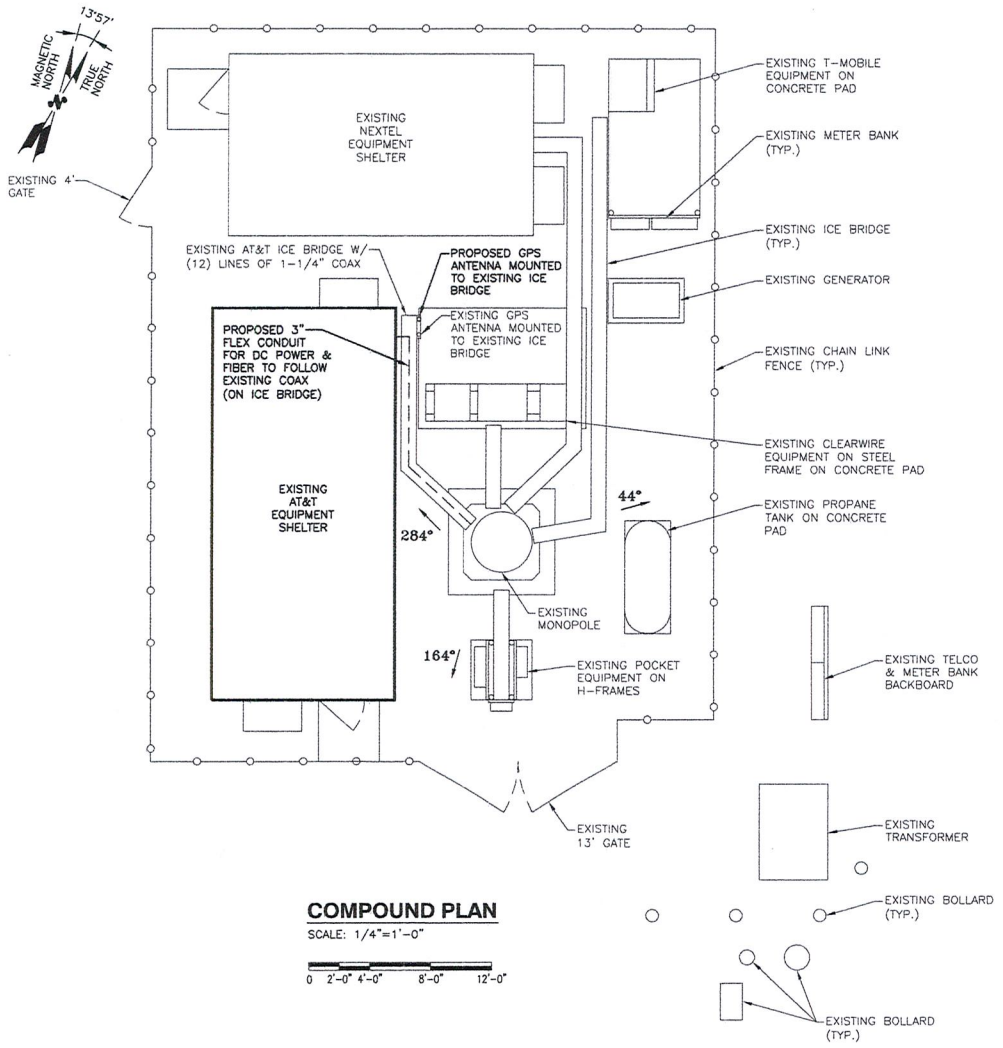
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES (LTE)

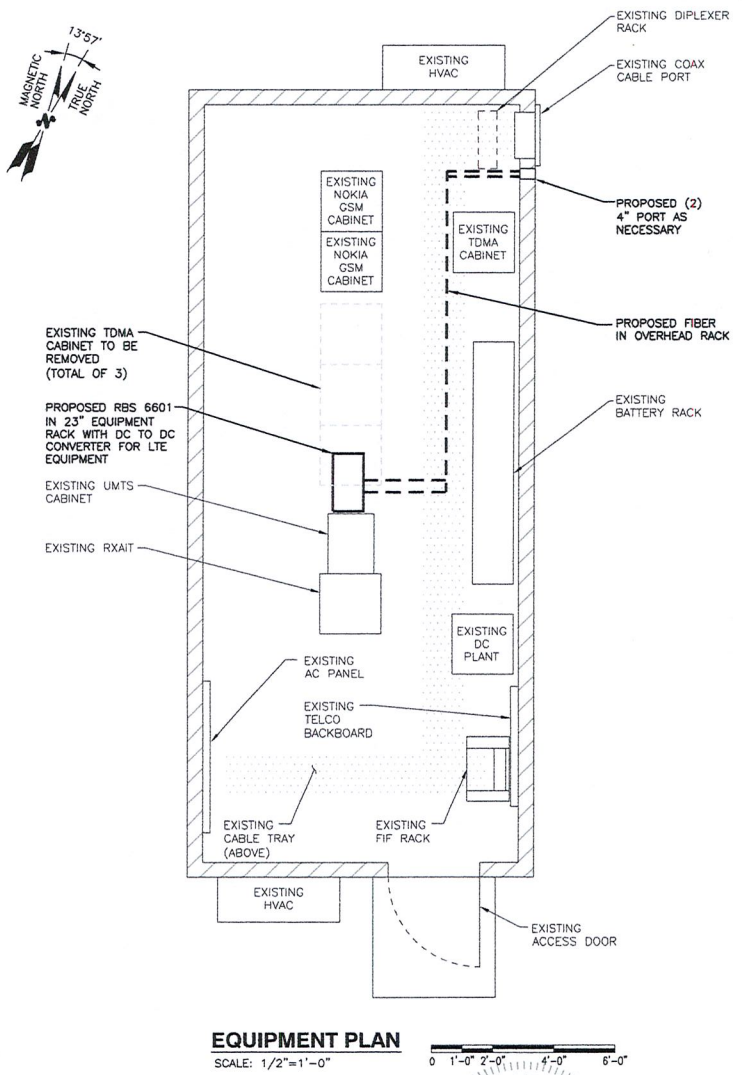
JOB NUMBER	DRAWING NUMBER	REV
2220.01	GN-1	1



COMPOUND PLAN

SCALE: 1/4"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"



EQUIPMENT PLAN

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

Hudson Design Group LLC
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2220
SITE NAME: BRANFORD - SPRINT

150 NORTH MAIN STREET
BRANFORD, CT 06405
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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

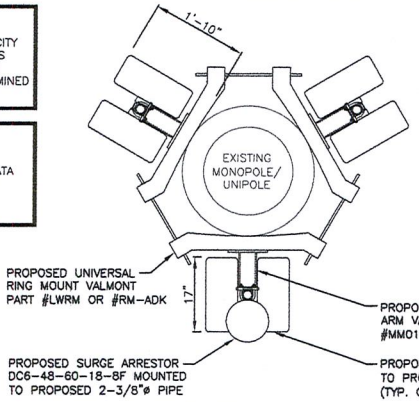
JOB NUMBER	DRAWING NUMBER	REV
2220.01	A-1	1

NOTE:

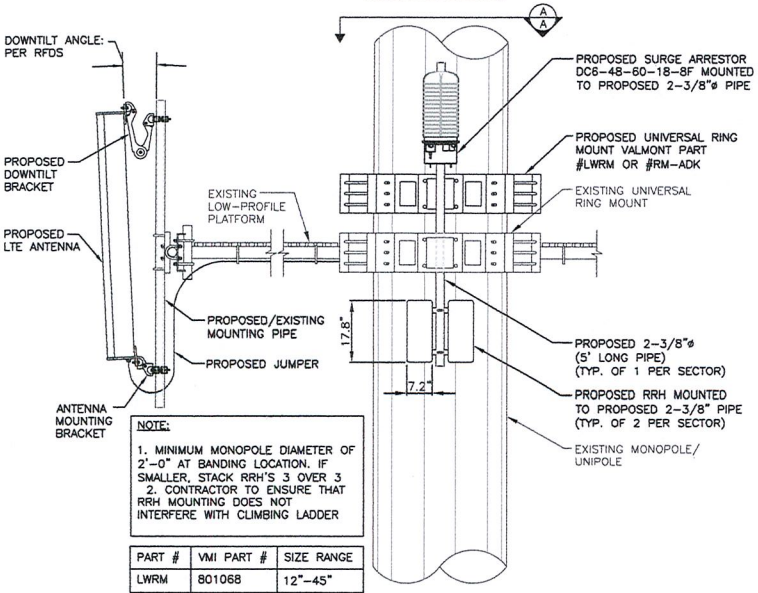
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



SECTION A-A



NOTE:

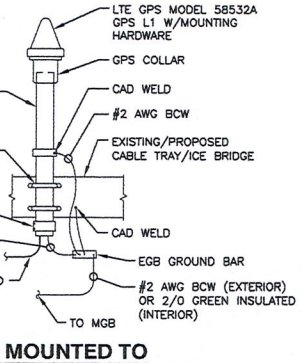
1. MINIMUM MONOPOLE DIAMETER OF 2'-0" AT BANDING LOCATION. IF SMALLER, STACK RRH'S 3 OVER 3
2. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER

PART #	VMI PART #	SIZE RANGE
LWRM	801068	12"-45"
RM-ADK	157286	36"-60" ADAPTER KIT

PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

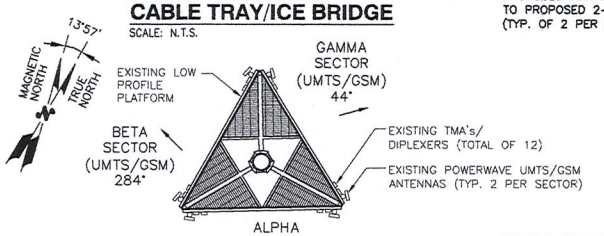
SCALE: N.T.S.

NOTE:
GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE.



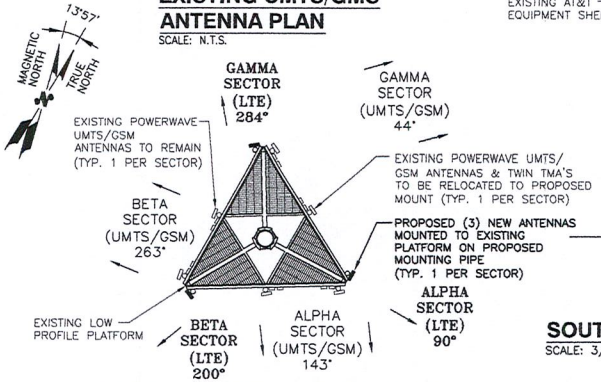
GPS MOUNTED TO CABLE TRAY/ICE BRIDGE

SCALE: N.T.S.



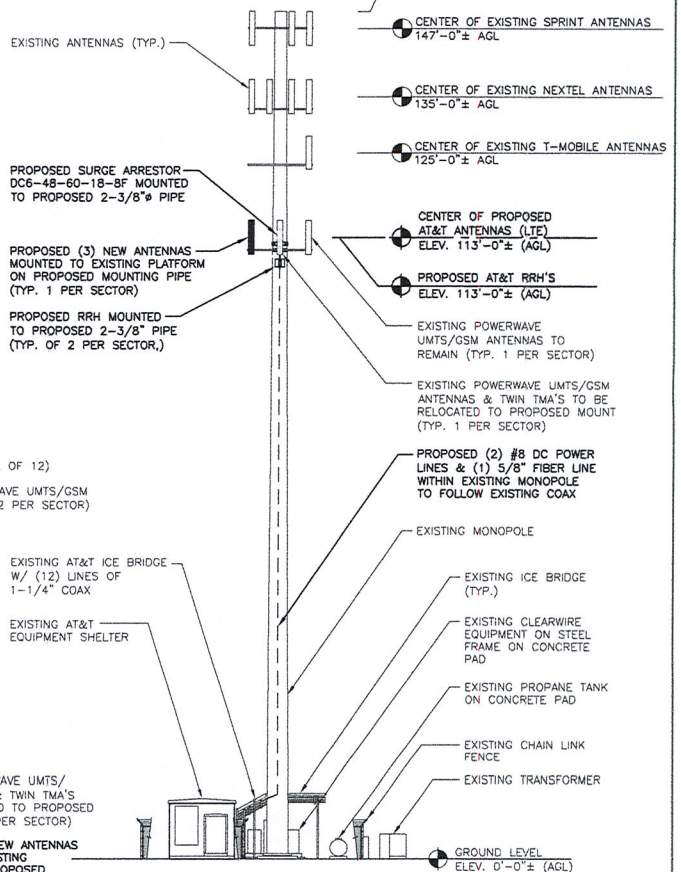
EXISTING UMTS/GMS ANTENNA PLAN

SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



SOUTHEAST ELEVATION

SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Groupllc
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2220
SITE NAME: BRANFORD - SPRINT

150 NORTH MAIN STREET
BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/07/11	ISSUED FOR CONSTRUCTION	DB	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	DB	DC	DPH

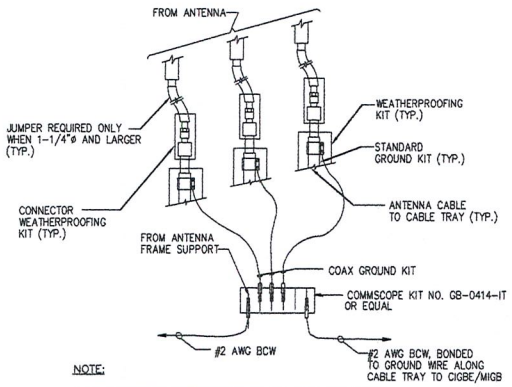
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2220.01	A-2	1

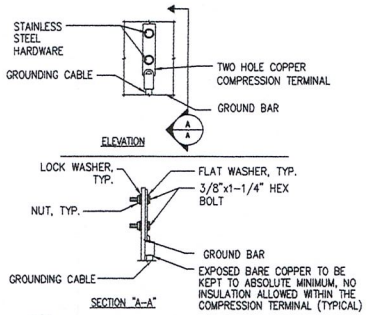


NOTE:

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

1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL

N.T.S.

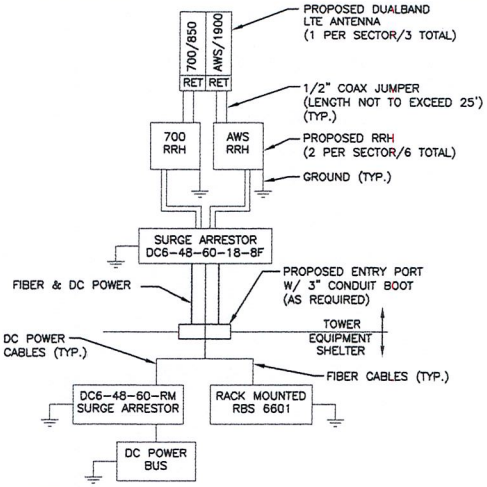


NOTE:

1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

2 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.

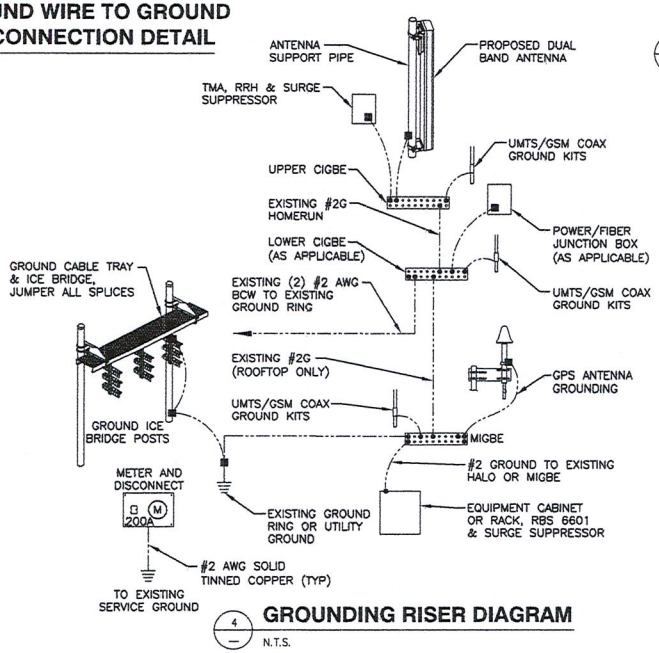


NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

3 PLUMBING DIAGRAM

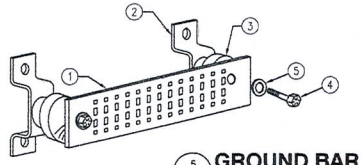
N.T.S.



4 GROUNDING RISER DIAGRAM

N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



5 GROUND BAR - DETAIL

N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

Hudson Design Group LLC
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
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SITE NUMBER: CT2220
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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2220.01	G-1	1

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

Date: **March 2, 2011**

Erica Lee
Crown Castle USA Inc.
5350 North 48th Street, Suite 305
Chandler, AZ 85226

Paul J Ford and Company
250 E. Broad Street. Suite 1500
Columbus, OH 43215
614.221.6679
eswanson@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	2220
	Carrier Site Name:	Branford-North Main Street
Crown Castle Designation:	**Crown Castle BU Number:**	876321
	Crown Castle Site Name:	BRANFORD BANM TOWER
	Crown Castle JDE Job Number:	148745
	Crown Castle Work Order Number:	384166
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37511-0154 Revised
Site Data:	**150 North Main Street, BRANFORD, New Haven County, CT** **Latitude *41° 17' 19"*, Longitude *-72° 48' 49.9"*** **147 Foot - Monopole Tower**	

Dear Erica Lee,

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 402521, in accordance with application 115588, revision 0.

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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:

Ellen T. Swanson, P.E.
Structural Engineer

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

MAR 0 8 2011

RISA Tower Report - version 5.4.2.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 147 ft Monopole tower designed by SUMMIT in March of 1999. The tower was originally designed for a wind speed of 90 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 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110	112	6	Ericsson	RRUS-11	2 (I) 1 (I)	7/8 1/4	1
		3	Kathrein	800 10764 w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			

Notes:
1) Proposed Equipment
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.

Table 2 - Existing 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
147	149	2	Dragonwave	A-ANT-23G-2-C	6* (E) 4 (E) 6 (I)	5/16 1/2 1-5/8	2
	148	2	Decibel	950F65T2ZE-M w/ Pipe			
		2	Decibel	DB950F40T2E-M w/Mount Pipe			
		2	Decibel	DB980H90E-M w/ Pipe			
	147	1	Tower mounts	Platform Mount [LP 403-1]			
	145	3	Argus technologies	LLPX310R W/ PIPE			
		3	Samsung telecom	FDD_R6_RRH			
131	132	12	Decibel	DB844H90E-XY w/ Pipe	12 (I)	1-5/8	2
	131	1	Tower mounts	Platform Mount [LP 403-1]			
119	122	6	Remec	Remec S20057A-1	12 (I) 1 (I)	1-5/8 5/16	2
		3	RFS	RFS APX16DWV-16DWVS-C w/ mount pipe			
	119	1	Tower mounts	T-Arm Mount [TA 601-3]			
110	112	12	Powerwave Tech	LGP2140X	12 (I)	1-1/4	2
		6	Powerwave Tech	7770 w/ Mount Pipe			
	110	1	Tower mounts	Platform Mount [LP 401-1]			
100	100	3	RFS/Celwave	APXV18-206517S-C w/ Mount Pipe	6 (E)	1-5/8	2
		1	Tower mounts	Pipe Mount [PM 602-3]			
49	49	1	Lucent	KS24019-L112A	1 (I)	1/2	2
		1	Tower mounts	Side Arm Mount[SO701-1]			

Notes:
2) Existing Equipment
* Coax installed inside (2) 2-1/2" externally mounted conduits. See coax layout in Appendix B.
(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS		2135657	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 41709-0058 Observation Report, 06/15/09	2448190	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29299-111, 03/15/1999	1613620	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF, 29299-111, 03/15/1999	1614568	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 41709-0058 Record, 06/15/09	2431042	CCISITES

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Monopole was reinforced in conformance with the referenced modification drawings.
6) All reserved and SLA loading was ignored in this analysis per TSA's instructions. See Table 1 and Table 2 for all appurtenances considered.
7) The soil density assumed directly above the pad is assumed to be a disturbed soil density of 105 pcf for the calculation of the footing overturning resistance. The soil density of 125 pcf from the geotechnical report is used in all other foundation calculations.

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	147 - 99.5	Pole	TP30.313x22x0.25	1	-10.14	1135.99	65.3	Pass
L2	99.5 - 68.5	Pole	TP35.2376x29.1567x0.3125	2	-16.53	1827.00	92.7	Pass
L3	68.5 - 59	Pole	TP36.9x35.2376x0.3804	3	-17.54	2272.75	80.1	Pass
L4	59 - 49.5	Pole	TP37.9374x35.3079x0.375	4	-21.29	2357.96	93.8	Pass
L5	49.5 - 29.25	Pole	TP41.481x37.9374x0.4251	5	-25.11	2855.94	90.5	Pass
L6	29.25 - 23	Pole	TP41.8248x39.7122x0.4375	6	-29.10	3031.07	96.0	Pass
L7	23 - 0	Pole	TP45.85x41.8248x0.4708	7	-35.98	3576.08	96.2	Pass
							Summary	
						Pole (L7)	96.2	Pass
						Rating =	96.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	88.3	Pass
	Base Plate	0	71.7	Pass
	Base Foundation	0	98.6	Pass
	Base Foundation Soil Interaction	0	97.3	Pass

Structure Rating (max from all components) =	98.6%

4.1) Recommendations

As summarized in Table 4 and 5 above, our analysis indicates that the existing monopole structure and foundation have sufficient capacity to adequately support the existing, reserved, and proposed loading. Modifications are not required at this time.

APPENDIX A

RISA TOWER 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:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

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	147.00-99.50	47.50	3.75	12	22.0000	30.3130	0.2500	1.0000	A607-60 (60 ksi)
L2	99.50-68.50	34.75	0.00	12	29.1567	35.2376	0.3125	1.2500	A607-65 (65 ksi)
L3	68.50-59.00	9.50	4.75	12	35.2376	36.9000	0.3804	1.5217	65 ksi (w/ Reinf.) (65 ksi)
L4	59.00-49.50	14.25	0.00	12	35.3079	37.9374	0.3750	1.5000	A607-65 (65 ksi)
L5	49.50-29.25	20.25	5.25	12	37.9374	41.4810	0.4251	1.7002	65 ksi (w/ Reinf.) (65 ksi)
L6	29.25-23.00	11.50	0.00	12	39.7122	41.8248	0.4375	1.7500	A607-65 (65 ksi)
L7	23.00-0.00	23.00		12	41.8248	45.8500	0.4708	1.8830	65 ksi (w/ Reinf.) (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	31.3823	24.2007	2791.7645	10.7626	15.7021	177.7952	5656.8718	11.9109	7.4539	29.816
L2	30.8646	29.0245	3082.2498	10.3262	15.1032	204.0796	6245.4738	14.2850	6.9765	22.325
	36.4806	35.1434	5471.4800	12.5032	18.2531	299.7566	11086.701 9	17.2965	8.6062	27.54
L3	36.4806	42.6995	6622.0576	12.4789	18.2531	362.7913	13418.084 0	21.0154	8.4241	22.144
	38.2017	44.7359	7615.4145	13.0740	19.1142	398.4166	15430.894 4	22.0177	8.8696	23.315
L4	37.4609	42.1815	6570.1987	12.5060	18.2895	359.2331	13313.003 8	20.7605	8.4575	22.553
	39.2757	45.3566	8168.3265	13.4473	19.6516	415.6576	16551.244 0	22.3231	9.1622	24.433
L5	39.2757	51.3429	9221.7751	13.4294	19.6516	469.2640	18685.816 6	25.2694	9.0281	21.24
	42.9443	56.1930	12089.826 3	14.6980	21.4872	562.6536	24497.265 7	27.6565	9.9777	23.474
L6	42.1115	55.3282	10893.250 2	14.0603	20.5709	529.5465	22072.678 3	27.2309	9.4704	21.647
	43.3002	58.3044	12747.386 8	14.8167	21.6652	588.3795	25829.661 7	28.6956	10.0365	22.941
L7	43.3002	62.6864	13683.437 3	14.8047	21.6652	631.5847	27726.353 7	30.8523	9.9474	21.131
	47.4674	68.7880	18080.608 0	16.2458	23.7503	761.2791	36636.213 7	33.8554	11.0262	23.422

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 147.00-99.50				1	1	1		
L2 99.50-68.50				1	1	1		
L3 68.50-59.00				1	1	1		
L4 59.00-49.50				1	1	1		
L5 49.50-29.25				1	1	1		
L6 29.25-23.00				1	1	1		
L7 23.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1 5/8" foam)	C	No	Inside Pole	147.00 - 0.00	6	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92
***								
9207 (5/16 FOEM)	A	No	CaAa (Out Of Face)	147.00 - 0.00	6	No Ice	0.00	1.00
						1/2" Ice	0.00	1.32
						1" Ice	0.00	2.26
						2" Ice	0.00	5.96

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	20.69
LDF4-50A (1/2" foam)	A	No	CaAa (Out Of Face)	147.00 - 0.00	4	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
2 1/2" Rigid Conduit	A	No	CaAa (Out Of Face)	147.00 - 0.00	1	No Ice	0.25	0.95
						1/2" Ice	0.35	2.48
						1" Ice	0.45	4.62
						2" Ice	0.65	10.72
						4" Ice	1.05	30.27
2 1/2" Rigid Conduit	A	No	CaAa (Out Of Face)	147.00 - 0.00	1	No Ice	0.00	0.95
						1/2" Ice	0.00	2.48
						1" Ice	0.00	4.62
						2" Ice	0.00	10.72
						4" Ice	0.00	30.27
***								
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	131.00 - 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" foam)	C	No	Inside Pole	119.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92
9207 (5/16 FOEM)	C	No	Inside Pole	119.00 - 0.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
						2" Ice	0.00	1.00
						4" Ice	0.00	1.00
***								
LDF6-50 (1 1/4" foam)	C	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
LDF5-50A (7/8" foam)	C	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LDF1-50 (1/4" foam)	C	No	Inside Pole	110.00 - 0.00	1	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
***								
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	100.00 - 0.00	1	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
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	100.00 - 0.00	5	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
**								
**								
LDF4P-50A (1/2 FOAM)	C	No	Inside Pole	49.00 - 0.00	1	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
**								
Aero MP3-04	C	No	CaAa (Out Of	25.50 - 0.00	1	No Ice	0.27	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.38	0.00
						1" Ice	0.49	0.00
						2" Ice	0.71	0.00
						4" Ice	1.16	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	52.00 - 32.00	1	No Ice	0.27	0.00
						1/2" Ice	0.38	0.00
						1" Ice	0.49	0.00
						2" Ice	0.71	0.00
						4" Ice	1.16	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	71.00 - 61.00	1	No Ice	0.27	0.00
						1/2" Ice	0.38	0.00
						1" Ice	0.49	0.00
						2" Ice	0.71	0.00
						4" Ice	1.16	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.00-99.50	A	0.000	0.000	0.000	11.875	0.40
		B	0.000	0.000	0.000	0.099	0.00
		C	0.000	0.000	0.000	0.000	0.90
L2	99.50-68.50	A	0.000	0.000	0.000	7.750	0.26
		B	0.000	0.000	0.000	6.138	0.15
		C	0.000	0.000	0.000	0.673	1.12
L3	68.50-59.00	A	0.000	0.000	0.000	2.375	0.08
		B	0.000	0.000	0.000	1.881	0.05
		C	0.000	0.000	0.000	2.018	0.34
L4	59.00-49.50	A	0.000	0.000	0.000	2.375	0.08
		B	0.000	0.000	0.000	1.881	0.05
		C	0.000	0.000	0.000	0.673	0.34
L5	49.50-29.25	A	0.000	0.000	0.000	5.062	0.17
		B	0.000	0.000	0.000	4.010	0.10
		C	0.000	0.000	0.000	4.708	0.73
L6	29.25-23.00	A	0.000	0.000	0.000	1.562	0.05
		B	0.000	0.000	0.000	1.238	0.03
		C	0.000	0.000	0.000	0.673	0.23
L7	23.00-0.00	A	0.000	0.000	0.000	5.750	0.20
		B	0.000	0.000	0.000	4.554	0.11
		C	0.000	0.000	0.000	6.188	0.83

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.00-99.50	A	0.878	0.000	0.000	0.000	20.213	1.31
		B		0.000	0.000	0.000	0.187	0.00
		C		0.000	0.000	0.000	0.000	0.90
L2	99.50-68.50	A	0.839	0.000	0.000	0.000	13.192	0.86
		B		0.000	0.000	0.000	11.580	0.25
		C		0.000	0.000	0.000	1.160	1.12
L3	68.50-59.00	A	0.812	0.000	0.000	0.000	3.917	0.24
		B		0.000	0.000	0.000	3.423	0.07
		C		0.000	0.000	0.000	3.370	0.34
L4	59.00-49.50	A	0.796	0.000	0.000	0.000	3.917	0.24
		B		0.000	0.000	0.000	3.423	0.07
		C		0.000	0.000	0.000	1.123	0.34
L5	49.50-29.25	A	0.766	0.000	0.000	0.000	8.164	0.49
		B		0.000	0.000	0.000	7.111	0.15
		C		0.000	0.000	0.000	7.686	0.73
L6	29.25-23.00	A	0.750	0.000	0.000	0.000	2.520	0.15

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		B		0.000	0.000	0.000	2.195	0.05
		C		0.000	0.000	0.000	1.098	0.23
L7	23.00-0.00	A	0.750	0.000	0.000	0.000	9.200	0.55
		B		0.000	0.000	0.000	8.004	0.17
		C		0.000	0.000	0.000	10.021	0.83

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.00-99.50	0.0028	-0.3345	0.0047	-0.5022
L2	99.50-68.50	0.1934	-0.1781	0.3177	-0.2407
L3	68.50-59.00	-0.0142	-0.0557	0.0066	-0.0588
L4	59.00-49.50	0.1401	-0.1477	0.2340	-0.1937
L5	49.50-29.25	-0.0356	-0.0441	-0.0246	-0.0423
L6	29.25-23.00	0.1001	-0.1249	0.1729	-0.1594
L7	23.00-0.00	-0.0771	-0.0207	-0.0839	-0.0090

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
(2) DB980H90E-M w/Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.27 4.86 5.37 6.42 8.86	3.86 4.95 5.75 7.39 10.87	0.03 0.07 0.12 0.23 0.59
(2) DB950F40T2E-M w/Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.89 7.56 8.16 9.39 11.97	6.29 7.40 8.27 10.08 13.92	0.05 0.10 0.17 0.33 0.79
(2) 950F65T2ZE-M w/Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.47 5.06 5.57 6.64 9.11	4.44 5.54 6.35 8.00 11.51	0.04 0.07 0.12 0.25 0.62
Platform Mount [LP 403-1]	C	None		0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.85 24.30 29.75 40.65 62.45	18.85 24.30 29.75 40.65 62.45	1.50 1.80 2.09 2.69 3.87
LLPX310R W/ MOUNT PIPE	A	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.96 5.35 5.75 6.58 8.37	2.85 3.37 3.90 5.08 7.84	0.04 0.08 0.12 0.23 0.53
LLPX310R W/ MOUNT PIPE	B	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice	4.96 5.35 5.75	2.85 3.37 3.90	0.04 0.08 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	6.58	5.08	0.23
							2" Ice	8.37	7.84	0.53
							4" Ice			
LLPX310R W/ MOUNT PIPE	C	From Face	4.00	0.00	0.0000	147.00	No Ice	4.96	2.85	0.04
			0.00				1/2" Ice	5.35	3.37	0.08
			-2.00				1" Ice	5.75	3.90	0.12
							2" Ice	6.58	5.08	0.23
							4" Ice	8.37	7.84	0.53
FDD_R6_RRH	A	From Face	4.00	0.00	0.0000	147.00	No Ice	1.79	0.99	0.04
			0.00				1/2" Ice	1.97	1.24	0.05
			-2.00				1" Ice	2.16	1.50	0.07
							2" Ice	2.57	2.10	0.12
							4" Ice	3.49	3.53	0.27
FDD_R6_RRH	B	From Face	4.00	0.00	0.0000	147.00	No Ice	1.79	0.99	0.04
			0.00				1/2" Ice	1.97	1.24	0.05
			-2.00				1" Ice	2.16	1.50	0.07
							2" Ice	2.57	2.10	0.12
							4" Ice	3.49	3.53	0.27
FDD_R6_RRH	C	From Face	4.00	0.00	0.0000	147.00	No Ice	1.79	0.99	0.04
			0.00				1/2" Ice	1.97	1.24	0.05
			-2.00				1" Ice	2.16	1.50	0.07
							2" Ice	2.57	2.10	0.12
							4" Ice	3.49	3.53	0.27
**										
**										
**										
(4) DB844H90E-XY w/Mount Pipe	A	From Face	4.00	0.00	0.0000	131.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
(4) DB844H90E-XY w/Mount Pipe	B	From Face	4.00	0.00	0.0000	131.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
(4) DB844H90E-XY w/Mount Pipe	C	From Face	4.00	0.00	0.0000	131.00	No Ice	3.58	5.40	0.04
			0.00				1/2" Ice	4.20	6.49	0.08
			1.00				1" Ice	4.73	7.30	0.13
							2" Ice	5.86	8.96	0.25
							4" Ice	8.27	12.49	0.62
Platform Mount [LP 403-1]	C	None			0.0000	131.00	No Ice	18.85	18.85	1.50
							1/2" Ice	24.30	24.30	1.80
							1" Ice	29.75	29.75	2.09
							2" Ice	40.65	40.65	2.69
							4" Ice	62.45	62.45	3.87
***										
RFS APX16DWV-16DWVS-C w/ mount pipe	A	From Face	4.00	0.00	0.0000	119.00	No Ice	7.15	3.34	0.06
			0.00				1/2" Ice	7.62	3.99	0.10
			3.00				1" Ice	8.10	4.64	0.16
							2" Ice	9.09	6.01	0.28
							4" Ice	11.18	9.00	0.65
RFS APX16DWV-16DWVS-C w/ mount pipe	B	From Face	4.00	0.00	0.0000	119.00	No Ice	7.15	3.34	0.06
			0.00				1/2" Ice	7.62	3.99	0.10
			3.00				1" Ice	8.10	4.64	0.16
							2" Ice	9.09	6.01	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	11.18	9.00	0.65
						4" Ice			
RFS APX16DWV-16DWVS-C w/ mount pipe	C	From Face	4.00 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.15 7.62 8.10 9.09 11.18	3.34 3.99 4.64 6.01 9.00	0.06 0.10 0.16 0.28 0.65
(2) Remec S20057A-1	A	From Face	4.00 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.83 0.96 1.10 1.41 2.13	0.39 0.50 0.62 0.89 1.52	0.01 0.01 0.02 0.04 0.11
(2) Remec S20057A-1	B	From Face	4.00 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.83 0.96 1.10 1.41 2.13	0.39 0.50 0.62 0.89 1.52	0.01 0.01 0.02 0.04 0.11
(2) Remec S20057A-1	C	From Face	4.00 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.83 0.96 1.10 1.41 2.13	0.39 0.50 0.62 0.89 1.52	0.01 0.01 0.02 0.04 0.11
T-Arm Mount [TA 601-3]	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.90 14.65 18.40 25.90 40.90	10.90 14.65 18.40 25.90 40.90	0.73 0.93 1.13 1.52 2.32
***									
DC6-48-60-18-8F	A	From Face	4.00 0.00 2.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
800 10764 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.20 6.69 7.18 8.19 10.33	4.29 4.99 5.66 7.10 10.30	0.06 0.11 0.16 0.30 0.67
800 10764 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.20 6.69 7.18 8.19 10.33	4.29 4.99 5.66 7.10 10.30	0.06 0.11 0.16 0.30 0.67
800 10764 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.20 6.69 7.18 8.19 10.33	4.29 4.99 5.66 7.10 10.30	0.06 0.11 0.16 0.30 0.67
(2) RRUS-11	A	From Face	4.00 0.00 2.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	0.06 0.08 0.11 0.18 0.37
(2) RRUS-11	B	From Face	4.00 0.00	0.0000	110.00	No Ice 1/2"	4.42 4.71	1.19 1.35	0.06 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			Ice	5.00	1.53	0.11
						1" Ice	5.61	1.90	0.18
						2" Ice	6.94	2.75	0.37
						4" Ice			
(2) RRUS-11	C	From Face	4.00	0.0000	110.00	No Ice	4.42	1.19	0.06
			0.00			1/2"	4.71	1.35	0.08
			2.00			Ice	5.00	1.53	0.11
						1" Ice	5.61	1.90	0.18
						2" Ice	6.94	2.75	0.37
						4" Ice			
(2) Powerwave 7770 w/ Mount Pipe	A	From Face	4.00	0.0000	110.00	No Ice	5.98	4.12	0.06
			0.00			1/2"	6.44	4.77	0.11
			2.00			Ice	6.91	5.43	0.16
						1" Ice	7.87	6.81	0.29
						2" Ice	9.91	9.98	0.65
						4" Ice			
(2) Powerwave 7770 w/ Mount Pipe	B	From Face	4.00	0.0000	110.00	No Ice	5.98	4.12	0.06
			0.00			1/2"	6.44	4.77	0.11
			2.00			Ice	6.91	5.43	0.16
						1" Ice	7.87	6.81	0.29
						2" Ice	9.91	9.98	0.65
						4" Ice			
(2) Powerwave 7770 w/ Mount Pipe	C	From Face	4.00	0.0000	110.00	No Ice	5.98	4.12	0.06
			0.00			1/2"	6.44	4.77	0.11
			2.00			Ice	6.91	5.43	0.16
						1" Ice	7.87	6.81	0.29
						2" Ice	9.91	9.98	0.65
						4" Ice			
(4) LGP2140X	A	From Face	4.00	0.0000	110.00	No Ice	1.23	0.26	0.00
			0.00			1/2"	1.38	0.34	0.01
			2.00			Ice	1.54	0.44	0.02
						1" Ice	1.89	0.64	0.04
						2" Ice	2.69	1.16	0.12
						4" Ice			
(4) LGP2140X	B	From Face	4.00	0.0000	110.00	No Ice	1.23	0.26	0.00
			0.00			1/2"	1.38	0.34	0.01
			2.00			Ice	1.54	0.44	0.02
						1" Ice	1.89	0.64	0.04
						2" Ice	2.69	1.16	0.12
						4" Ice			
(4) LGP2140X	C	From Face	4.00	0.0000	110.00	No Ice	1.23	0.26	0.00
			0.00			1/2"	1.38	0.34	0.01
			2.00			Ice	1.54	0.44	0.02
						1" Ice	1.89	0.64	0.04
						2" Ice	2.69	1.16	0.12
						4" Ice			
Platform Mount [LP 401-1]	C	None		0.0000	110.00	No Ice	24.33	24.33	1.65
						1/2"	30.22	30.22	2.03
						Ice	36.11	36.11	2.41
						1" Ice	47.89	47.89	3.18
						2" Ice	71.45	71.45	4.72
						4" Ice			
***									
APXV18-206517S-C w/ Mount Pipe	A	From Face	1.00	0.0000	100.00	No Ice	5.40	4.70	0.05
			0.00			1/2"	5.96	5.86	0.09
			0.00			Ice	6.48	6.73	0.15
						1" Ice	7.55	8.51	0.28
						2" Ice	9.92	12.28	0.68
						4" Ice			
APXV18-206517S-C w/ Mount Pipe	B	From Face	1.00	0.0000	100.00	No Ice	5.40	4.70	0.05
			0.00			1/2"	5.96	5.86	0.09
			0.00			Ice	6.48	6.73	0.15
						1" Ice	7.55	8.51	0.28
						2" Ice	9.92	12.28	0.68
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXV18-206517S-C w/ Mount Pipe	C	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.09 0.15 0.28 0.68
Pipe Mount [PM 602-3]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.68 9.50 11.32 14.96 22.24	7.68 9.50 11.32 14.96 22.24	0.28 0.35 0.43 0.58 0.87
**									
Side Arm Mount [SO 701-1]	C	None		0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
KS24019-L112A	C	From Face	2.00 0.00 0.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06

Dishes

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-23G-2-C	A	Paraboloid w/o Radome	From Face	4.00 0.00 2.00	0.0000		147.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.01 0.02 0.03 0.04 0.07
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Face	4.00 0.00 2.00	0.0000		147.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.01 0.02 0.03 0.04 0.07

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 147.00-99.50	122.32	1.454	27	103.536	A B C	0.000 0.000 0.000	103.536 103.536 103.536	103.536	100.00 100.00 100.00	0.000 0.000 0.000	11.875 0.099 0.000
L2 99.50-	83.77	1.305	24	84.024	A	0.000	84.024	84.024	100.00	0.000	7.750

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
68.50					B	0.000	84.024		100.00	0.000	6.138
					C	0.000	84.024		100.00	0.000	0.673
L3 68.50-59.00	63.71	1.207	22	28.554	A	0.000	28.554	28.554	100.00	0.000	2.375
					B	0.000	28.554		100.00	0.000	1.881
					C	0.000	28.554		100.00	0.000	2.018
L4 59.00-49.50	54.21	1.152	21	29.340	A	0.000	29.340	29.340	100.00	0.000	2.375
					B	0.000	29.340		100.00	0.000	1.881
					C	0.000	29.340		100.00	0.000	0.673
L5 49.50-29.25	39.22	1.051	19	67.009	A	0.000	67.009	67.009	100.00	0.000	5.062
					B	0.000	67.009		100.00	0.000	4.010
					C	0.000	67.009		100.00	0.000	4.708
L6 29.25-23.00	26.11	1	18	21.485	A	0.000	21.485	21.485	100.00	0.000	1.562
					B	0.000	21.485		100.00	0.000	1.238
					C	0.000	21.485		100.00	0.000	0.673
L7 23.00-0.00	11.32	1	18	84.022	A	0.000	84.022	84.022	100.00	0.000	5.750
					B	0.000	84.022		100.00	0.000	4.554
					C	0.000	84.022		100.00	0.000	6.188

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.00-99.50	122.32	1.454	5	0.8777	110.484	A	0.000	110.484	110.484	100.00	0.000	20.213
						B	0.000	110.484		100.00	0.000	0.187
						C	0.000	110.484		100.00	0.000	0.000
L2 99.50-68.50	83.77	1.305	5	0.8387	88.558	A	0.000	88.558	88.558	100.00	0.000	13.192
						B	0.000	88.558		100.00	0.000	11.580
						C	0.000	88.558		100.00	0.000	1.160
L3 68.50-59.00	63.71	1.207	4	0.8116	29.840	A	0.000	29.840	29.840	100.00	0.000	3.917
						B	0.000	29.840		100.00	0.000	3.423
						C	0.000	29.840		100.00	0.000	3.370
L4 59.00-49.50	54.21	1.152	4	0.7960	30.625	A	0.000	30.625	30.625	100.00	0.000	3.917
						B	0.000	30.625		100.00	0.000	3.423
						C	0.000	30.625		100.00	0.000	1.123
L5 49.50-29.25	39.22	1.051	4	0.7657	69.594	A	0.000	69.594	69.594	100.00	0.000	8.164
						B	0.000	69.594		100.00	0.000	7.111
						C	0.000	69.594		100.00	0.000	7.686
L6 29.25-23.00	26.11	1	4	0.7500	22.282	A	0.000	22.282	22.282	100.00	0.000	2.520
						B	0.000	22.282		100.00	0.000	2.195
						C	0.000	22.282		100.00	0.000	1.098
L7 23.00-0.00	11.32	1	4	0.7500	86.897	A	0.000	86.897	86.897	100.00	0.000	9.200
						B	0.000	86.897		100.00	0.000	8.004
						C	0.000	86.897		100.00	0.000	10.021

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.00-99.50	122.32	1.454	9	103.536	A	0.000	103.536	103.536	100.00	0.000	11.875
					B	0.000	103.536		100.00	0.000	0.099
					C	0.000	103.536		100.00	0.000	0.000
L2 99.50-	83.77	1.305	8	84.024	A	0.000	84.024	84.024	100.00	0.000	7.750

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
68.50					B	0.000	84.024		100.00	0.000	6.138
					C	0.000	84.024		100.00	0.000	0.673
L3 68.50-59.00	63.71	1.207	8	28.554	A	0.000	28.554	28.554	100.00	0.000	2.375
					B	0.000	28.554		100.00	0.000	1.881
					C	0.000	28.554		100.00	0.000	2.018
L4 59.00-49.50	54.21	1.152	7	29.340	A	0.000	29.340	29.340	100.00	0.000	2.375
					B	0.000	29.340		100.00	0.000	1.881
					C	0.000	29.340		100.00	0.000	0.673
L5 49.50-29.25	39.22	1.051	7	67.009	A	0.000	67.009	67.009	100.00	0.000	5.062
					B	0.000	67.009		100.00	0.000	4.010
					C	0.000	67.009		100.00	0.000	4.708
L6 29.25-23.00	26.11	1	6	21.485	A	0.000	21.485	21.485	100.00	0.000	1.562
					B	0.000	21.485		100.00	0.000	1.238
					C	0.000	21.485		100.00	0.000	0.673
L7 23.00-0.00	11.32	1	6	84.022	A	0.000	84.022	84.022	100.00	0.000	5.750
					B	0.000	84.022		100.00	0.000	4.554
					C	0.000	84.022		100.00	0.000	6.188

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
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147 - 99.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.27	-0.12	1.66
			Max. Mx	5	-10.15	-434.19	-6.13
			Max. My	2	-10.14	1.03	436.67
			Max. Vy	5	18.39	-434.19	-6.13
			Max. Vx	2	-18.43	1.03	436.67
			Max. Torque	8			0.87
L2	99.5 - 68.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.90	-0.44	2.90
			Max. Mx	5	-16.54	-1185.00	-10.94
			Max. My	2	-16.53	1.65	1189.20
			Max. Vy	5	23.99	-1185.00	-10.94
			Max. Vx	2	-24.03	1.65	1189.20
			Max. Torque	12			-0.83
L3	68.5 - 59	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.11	-0.49	3.07
			Max. Mx	5	-17.55	-1300.42	-11.59
			Max. My	2	-17.54	1.73	1304.84
			Max. Vy	5	24.62	-1300.42	-11.59
			Max. Vx	2	-24.67	1.73	1304.84
			Max. Torque	12			-0.83
L4	59 - 49.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.65	-0.64	3.56
			Max. Mx	5	-21.29	-1665.36	-13.53
			Max. My	2	-21.29	1.97	1670.47
			Max. Vy	5	26.51	-1665.36	-13.53
			Max. Vx	2	-26.56	1.97	1670.47
			Max. Torque	12			-0.85
L5	49.5 - 29.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.06	-0.80	4.04
			Max. Mx	5	-25.12	-2077.33	-15.55
			Max. My	2	-25.12	2.20	2083.15
			Max. Vy	5	28.37	-2077.33	-15.55
			Max. Vx	2	-28.42	2.20	2083.15
			Max. Torque	12			-0.85
L6	29.25 - 23	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.72	-0.93	4.44
			Max. Mx	5	-29.11	-2412.07	-17.08
			Max. My	2	-29.11	2.38	2418.45
			Max. Vy	5	29.77	-2412.07	-17.08
			Max. Vx	2	-29.81	2.38	2418.45
			Max. Torque	12			-0.85
L7	23 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.38	-1.20	5.28
			Max. Mx	5	-35.98	-3126.78	-20.05
			Max. My	2	-35.98	2.72	3134.24
			Max. Vy	5	32.40	-3126.78	-20.05
			Max. Vx	2	-32.45	2.72	3134.24
			Max. Torque	12			-0.85

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	50.38	0.00	7.70
	Max. H_x	11	36.00	32.30	-0.00
	Max. H_z	2	36.00	0.02	32.43
	Max. M_x	2	3134.24	0.02	32.43
	Max. M_z	5	3126.78	-32.39	-0.14
	Max. Torsion	7	0.71	-16.35	-28.02
	Min. Vert	1	36.00	0.00	0.00
	Min. H_x	5	36.00	-32.39	-0.14
	Min. H_z	8	36.00	-0.23	-32.41
	Min. M_x	8	-3128.95	-0.23	-32.41

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M_z	11	-3112.41	32.30	-0.00
	Min. Torsion	12	-0.84	27.99	16.40

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	36.00	0.00	0.00	-1.40	-0.71	0.00
Dead+Wind 0 deg - No Ice	36.00	-0.02	-32.43	-3134.24	2.72	0.34
Dead+Wind 30 deg - No Ice	36.00	16.07	-28.08	-2714.47	-1545.14	-0.06
Dead+Wind 60 deg - No Ice	36.00	28.11	-16.21	-1567.39	-2718.01	-0.18
Dead+Wind 90 deg - No Ice	36.00	32.39	0.14	20.05	-3126.78	-0.26
Dead+Wind 120 deg - No Ice	36.00	28.11	16.23	1567.92	-2717.06	-0.53
Dead+Wind 150 deg - No Ice	36.00	16.35	28.02	2701.00	-1588.17	-0.71
Dead+Wind 180 deg - No Ice	36.00	0.23	32.41	3128.95	-35.88	-0.66
Dead+Wind 210 deg - No Ice	36.00	-16.15	27.94	2689.54	1556.02	-0.38
Dead+Wind 240 deg - No Ice	36.00	-27.99	16.14	1553.14	2696.90	0.19
Dead+Wind 270 deg - No Ice	36.00	-32.30	0.00	-1.27	3112.41	0.71
Dead+Wind 300 deg - No Ice	36.00	-27.99	-16.40	-1597.08	2697.67	0.84
Dead+Wind 330 deg - No Ice	36.00	-16.12	-28.15	-2724.94	1550.27	0.71
Dead+Ice	50.38	0.00	-0.00	-5.28	-1.20	0.00
Dead+Wind 0 deg+Ice	50.38	-0.00	-7.70	-782.40	-0.50	0.07
Dead+Wind 30 deg+Ice	50.38	3.82	-6.66	-678.33	-384.71	-0.03
Dead+Wind 60 deg+Ice	50.38	6.67	-3.85	-393.85	-675.11	-0.07
Dead+Wind 90 deg+Ice	50.38	7.68	0.03	-0.50	-776.63	-0.08
Dead+Wind 120 deg+Ice	50.38	6.67	3.85	383.77	-674.83	-0.13
Dead+Wind 150 deg+Ice	50.38	3.88	6.65	665.09	-394.49	-0.16
Dead+Wind 180 deg+Ice	50.38	0.05	7.69	771.09	-9.24	-0.13
Dead+Wind 210 deg+Ice	50.38	-3.83	6.63	662.50	385.09	-0.07
Dead+Wind 240 deg+Ice	50.38	-6.64	3.83	380.47	668.12	0.07
Dead+Wind 270 deg+Ice	50.38	-7.67	0.00	-5.27	771.20	0.18
Dead+Wind 300 deg+Ice	50.38	-6.64	-3.89	-400.56	668.25	0.20
Dead+Wind 330 deg+Ice	50.38	-3.82	-6.68	-680.68	383.67	0.16
Dead+Wind 0 deg - Service	36.00	-0.01	-11.22	-1087.10	0.46	0.12
Dead+Wind 30 deg - Service	36.00	5.56	-9.72	-941.62	-535.92	-0.02
Dead+Wind 60 deg - Service	36.00	9.73	-5.61	-544.12	-942.39	-0.06
Dead+Wind 90 deg - Service	36.00	11.21	0.05	6.00	-1084.02	-0.10
Dead+Wind 120 deg - Service	36.00	9.73	5.62	542.40	-942.06	-0.18
Dead+Wind 150 deg - Service	36.00	5.66	9.69	935.05	-550.85	-0.24
Dead+Wind 180 deg - Service	36.00	0.08	11.22	1083.34	-12.93	-0.22
Dead+Wind 210 deg - Service	36.00	-5.59	9.67	931.05	538.72	-0.14
Dead+Wind 240 deg - Service	36.00	-9.68	5.58	537.25	934.08	0.06
Dead+Wind 270 deg - Service	36.00	-11.18	0.00	-1.40	1078.06	0.25
Dead+Wind 300 deg - Service	36.00	-9.69	-5.68	-554.42	934.37	0.29
Dead+Wind 330 deg - Service	36.00	-5.58	-9.74	-945.26	536.75	0.24

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-36.00	0.00	0.00	36.00	0.00	0.000%
2	-0.02	-36.00	-32.43	0.02	36.00	32.43	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
3	16.07	-36.00	-28.08	-16.07	36.00	28.08	0.000%
4	28.11	-36.00	-16.21	-28.11	36.00	16.21	0.000%
5	32.39	-36.00	0.14	-32.39	36.00	-0.14	0.000%
6	28.11	-36.00	16.23	-28.11	36.00	-16.23	0.000%
7	16.35	-36.00	28.02	-16.35	36.00	-28.02	0.000%
8	0.23	-36.00	32.41	-0.23	36.00	-32.41	0.000%
9	-16.15	-36.00	27.94	16.15	36.00	-27.94	0.000%
10	-27.99	-36.00	16.14	27.99	36.00	-16.14	0.000%
11	-32.30	-36.00	0.00	32.30	36.00	-0.00	0.000%
12	-27.99	-36.00	-16.40	27.99	36.00	16.40	0.000%
13	-16.12	-36.00	-28.15	16.12	36.00	28.15	0.000%
14	0.00	-50.38	0.00	-0.00	50.38	0.00	0.000%
15	-0.00	-50.38	-7.70	0.00	50.38	7.70	0.000%
16	3.82	-50.38	-6.66	-3.82	50.38	6.66	0.000%
17	6.67	-50.38	-3.85	-6.67	50.38	3.85	0.000%
18	7.68	-50.38	0.03	-7.68	50.38	-0.03	0.000%
19	6.67	-50.38	3.85	-6.67	50.38	-3.85	0.000%
20	3.88	-50.38	6.65	-3.88	50.38	-6.65	0.000%
21	0.05	-50.38	7.69	-0.05	50.38	-7.69	0.000%
22	-3.83	-50.38	6.63	3.83	50.38	-6.63	0.000%
23	-6.64	-50.38	3.83	6.64	50.38	-3.83	0.000%
24	-7.67	-50.38	0.00	7.67	50.38	-0.00	0.000%
25	-6.64	-50.38	-3.89	6.64	50.38	3.89	0.000%
26	-3.82	-50.38	-6.68	3.82	50.38	6.68	0.000%
27	-0.01	-36.00	-11.22	0.01	36.00	11.22	0.000%
28	5.56	-36.00	-9.72	-5.56	36.00	9.72	0.000%
29	9.73	-36.00	-5.61	-9.73	36.00	5.61	0.000%
30	11.21	-36.00	0.05	-11.21	36.00	-0.05	0.000%
31	9.73	-36.00	5.62	-9.73	36.00	-5.62	0.000%
32	5.66	-36.00	9.69	-5.66	36.00	-9.69	0.000%
33	0.08	-36.00	11.22	-0.08	36.00	-11.22	0.000%
34	-5.59	-36.00	9.67	5.59	36.00	-9.67	0.000%
35	-9.68	-36.00	5.58	9.68	36.00	-5.58	0.000%
36	-11.18	-36.00	0.00	11.18	36.00	-0.00	0.000%
37	-9.69	-36.00	-5.68	9.69	36.00	5.68	0.000%
38	-5.58	-36.00	-9.74	5.58	36.00	9.74	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00045320
3	Yes	6	0.00000001	0.00004238
4	Yes	6	0.00000001	0.00004302
5	Yes	4	0.00000001	0.00049913
6	Yes	6	0.00000001	0.00004250
7	Yes	6	0.00000001	0.00004362
8	Yes	5	0.00000001	0.00005827
9	Yes	6	0.00000001	0.00004190
10	Yes	6	0.00000001	0.00004216
11	Yes	4	0.00000001	0.00066430
12	Yes	6	0.00000001	0.00004383
13	Yes	6	0.00000001	0.00004209
14	Yes	4	0.00000001	0.00000994
15	Yes	4	0.00000001	0.00038656
16	Yes	5	0.00000001	0.00010808
17	Yes	5	0.00000001	0.00011187
18	Yes	4	0.00000001	0.00038284
19	Yes	5	0.00000001	0.00010517
20	Yes	5	0.00000001	0.00011061
21	Yes	4	0.00000001	0.00039123
22	Yes	5	0.00000001	0.00010307
23	Yes	5	0.00000001	0.00010319
24	Yes	4	0.00000001	0.00039226

25	Yes	5	0.00000001	0.00011453
26	Yes	5	0.00000001	0.00010651
27	Yes	4	0.00000001	0.00020573
28	Yes	5	0.00000001	0.00008604
29	Yes	5	0.00000001	0.00008853
30	Yes	4	0.00000001	0.00019968
31	Yes	5	0.00000001	0.00008611
32	Yes	5	0.00000001	0.00009039
33	Yes	4	0.00000001	0.00024655
34	Yes	5	0.00000001	0.00008362
35	Yes	5	0.00000001	0.00008463
36	Yes	4	0.00000001	0.00022102
37	Yes	5	0.00000001	0.00009143
38	Yes	5	0.00000001	0.00008489

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	37.626	29	2.1145	0.0033
L2	103.25 - 68.5	19.263	29	1.7743	0.0013
L3	68.5 - 59	8.358	29	1.1576	0.0006
L4	63.75 - 49.5	7.249	29	1.0722	0.0005
L5	49.5 - 29.25	4.351	29	0.8362	0.0004
L6	34.5 - 23	2.149	29	0.5646	0.0002
L7	23 - 0	0.956	29	0.3984	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	A-ANT-23G-2-C	29	37.626	2.1145	0.0035	34779
147.00	(2) DB980H90E-M w/Mount Pipe	29	37.626	2.1145	0.0035	34779
131.00	(4) DB844H90E-XY w/Mount Pipe	29	30.605	2.0318	0.0024	10868
119.00	RFS APX16DWV-16DWVS-C w/ mount pipe	29	25.509	1.9466	0.0018	6209
110.00	DC6-48-60-18-8F	29	21.864	1.8585	0.0015	4698
100.00	APXV18-206517S-C w/ Mount Pipe	29	18.059	1.7274	0.0012	3787
49.00	Side Arm Mount [SO 701-1]	29	4.263	0.8274	0.0004	2776

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	108.160	4	6.0853	0.0087
L2	103.25 - 68.5	55.438	4	5.1093	0.0033
L3	68.5 - 59	24.078	4	3.3352	0.0016
L4	63.75 - 49.5	20.884	4	3.0894	0.0015
L5	49.5 - 29.25	12.538	4	2.4098	0.0010
L6	34.5 - 23	6.195	4	1.6275	0.0006
L7	23 - 0	2.757	4	1.1485	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	A-ANT-23G-2-C	4	108.160	6.0853	0.0089	12361
147.00	(2) DB980H90E-M w/Mount Pipe	4	108.160	6.0853	0.0089	12361
131.00	(4) DB844H90E-XY w/Mount Pipe	4	88.007	5.8486	0.0063	3861
119.00	RFS APX16DWV-16DWVS-C w/ mount pipe	4	73.378	5.6040	0.0046	2203
110.00	DC6-48-60-18-8F	4	62.910	5.3513	0.0038	1665
100.00	APXV18-206517S-C w/ Mount Pipe	4	51.977	4.9745	0.0031	1339
49.00	Side Arm Mount [SO 701-1]	4	12.286	2.3843	0.0010	967

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	147 - 99.5 (1)	TP30.313x22x0.25	47.50	0.00	0.0	36.000	23.6724	-10.14	852.21	0.012
L2	99.5 - 68.5 (2)	TP35.2376x29.1567x0.3125	34.75	0.00	0.0	39.000	35.1434	-16.53	1370.59	0.012
L3	68.5 - 59 (3)	TP36.9x35.2376x0.3804	9.50	0.00	0.0	39.000	43.7177	-17.54	1704.99	0.010
L4	59 - 49.5 (4)	TP37.9374x35.3079x0.375	14.25	0.00	0.0	39.000	45.3566	-21.29	1768.91	0.012
L5	49.5 - 29.25 (5)	TP41.481x37.9374x0.4251	20.25	0.00	0.0	39.000	54.9356	-25.11	2142.49	0.012
L6	29.25 - 23 (6)	TP41.8248x39.7122x0.4375	11.50	0.00	0.0	39.000	58.3044	-29.10	2273.87	0.013
L7	23 - 0 (7)	TP45.85x41.8248x0.4708	23.00	0.00	0.0	39.000	68.7880	-35.98	2682.73	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	147 - 99.5 (1)	TP30.313x22x0.25	437.50	30.867	36.000	0.857	0.00	0.000	36.000	0.000
L2	99.5 - 68.5 (2)	TP35.2376x29.1567x0.3125	1190.86	47.673	39.000	1.222	0.00	0.000	39.000	0.000
L3	68.5 - 59 (3)	TP36.9x35.2376x0.3804	1306.63	41.219	39.000	1.057	0.00	0.000	39.000	0.000
L4	59 - 49.5 (4)	TP37.9374x35.3079x0.375	1672.65	48.288	39.000	1.238	0.00	0.000	39.000	0.000
L5	49.5 - 29.25 (5)	TP41.481x37.9374x0.4251	2085.60	46.552	39.000	1.194	0.00	0.000	39.000	0.000
L6	29.25 - 23 (6)	TP41.8248x39.7122x0.4375	2421.22	49.381	39.000	1.266	0.00	0.000	39.000	0.000
L7	23 - 0 (7)	TP45.85x41.8248x0.4708	3137.57	49.457	39.000	1.268	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	147 - 99.5 (1)	TP30.313x22x0.25	18.46	0.780	24.000	0.066	0.13	0.004	24.000	0.000
L2	99.5 - 68.5 (2)	TP35.2376x29.1567x0.31 25	24.05	0.684	26.000	0.053	0.16	0.003	26.000	0.000
L3	68.5 - 59 (3)	TP36.9x35.2376x0.3804	24.69	0.565	26.000	0.044	0.16	0.002	26.000	0.000
L4	59 - 49.5 (4)	TP37.9374x35.3079x0.37 5	26.58	0.586	26.000	0.046	0.17	0.002	26.000	0.000
L5	49.5 - 29.25 (5)	TP41.481x37.9374x0.425 1	28.44	0.518	26.000	0.040	0.16	0.002	26.000	0.000
L6	29.25 - 23 (6)	TP41.8248x39.7122x0.43 75	29.84	0.512	26.000	0.040	0.17	0.002	26.000	0.000
L7	23 - 0 (7)	TP45.85x41.8248x0.4708	32.47	0.472	26.000	0.037	0.18	0.001	26.000	0.000

Pole Interaction Design Data

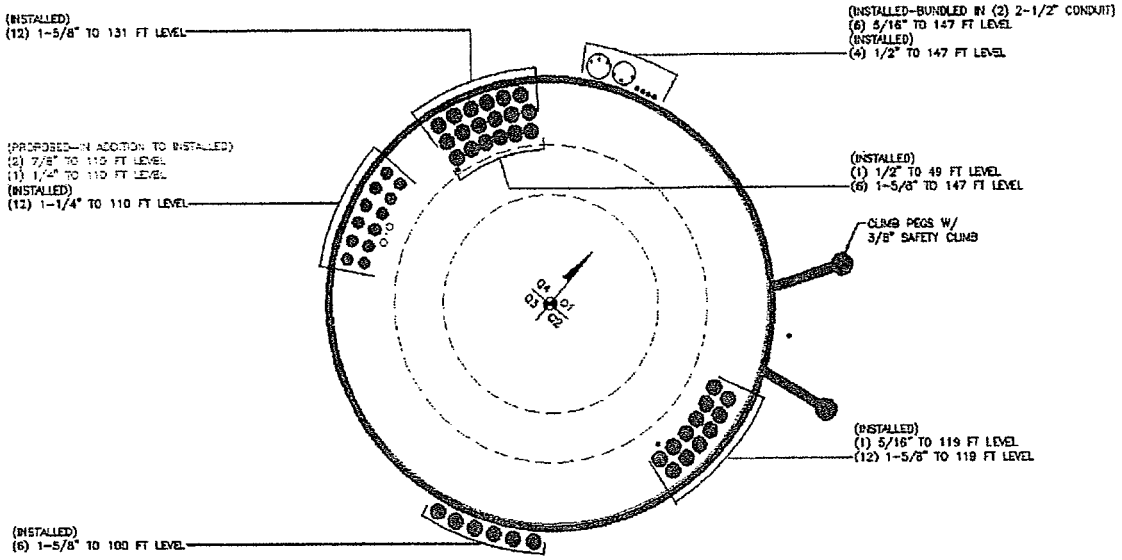
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 99.5 (1)	0.012	0.857	0.000	0.066	0.000	0.870 ✓	1.333	H1-3+VT ✓
L2	99.5 - 68.5 (2)	0.012	1.222	0.000	0.053	0.000	1.235 ✓	1.333	H1-3+VT ✓
L3	68.5 - 59 (3)	0.010	1.057	0.000	0.044	0.000	1.068 ✓	1.333	H1-3+VT ✓
L4	59 - 49.5 (4)	0.012	1.238	0.000	0.046	0.000	1.251 ✓	1.333	H1-3+VT ✓
L5	49.5 - 29.25 (5)	0.012	1.194	0.000	0.040	0.000	1.206 ✓	1.333	H1-3+VT ✓
L6	29.25 - 23 (6)	0.013	1.266	0.000	0.040	0.000	1.279 ✓	1.333	H1-3+VT ✓
L7	23 - 0 (7)	0.013	1.268	0.000	0.037	0.000	1.282 ✓	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	147 - 99.5	Pole	TP30.313x22x0.25	1	-10.14	1135.99	65.3	Pass
L2	99.5 - 68.5	Pole	TP35.2376x29.1567x0.3125	2	-16.53	1827.00	92.7	Pass
L3	68.5 - 59	Pole	TP36.9x35.2376x0.3804	3	-17.54	2272.75	80.1	Pass
L4	59 - 49.5	Pole	TP37.9374x35.3079x0.375	4	-21.29	2357.96	93.8	Pass
L5	49.5 - 29.25	Pole	TP41.481x37.9374x0.4251	5	-25.11	2855.94	90.5	Pass
L6	29.25 - 23	Pole	TP41.8248x39.7122x0.4375	6	-29.10	3031.07	96.0	Pass
L7	23 - 0	Pole	TP45.85x41.8248x0.4708	7	-35.98	3576.08	96.2	Pass
							Summary	
							Pole (L7) 96.2	Pass
							RATING = **96.2**	**Pass**

APPENDIX B

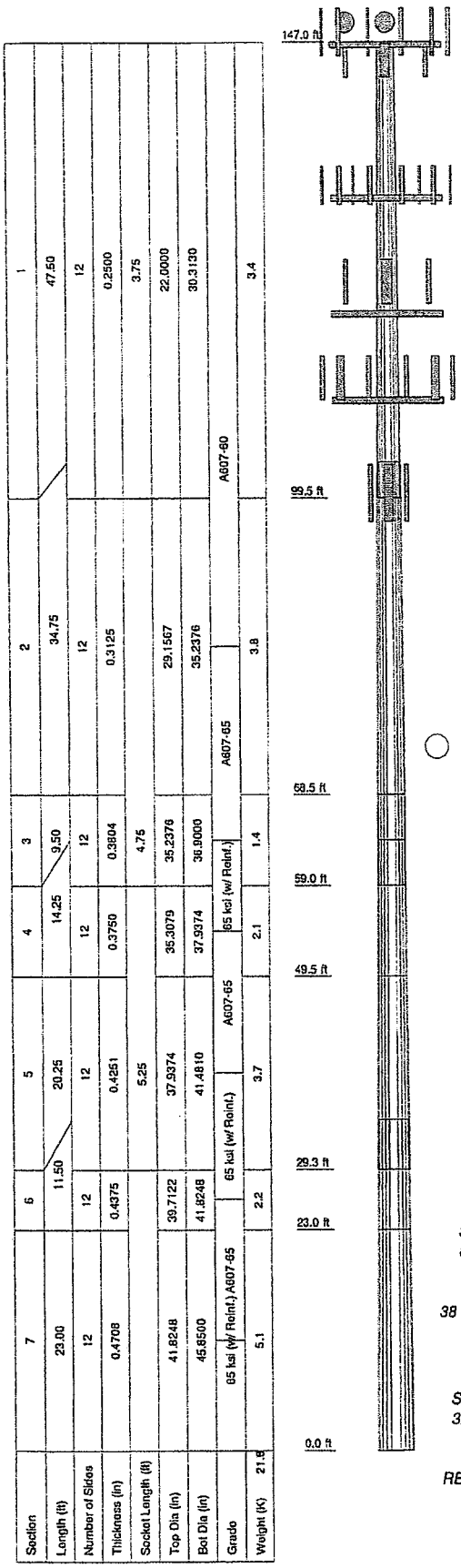
BASE LEVEL DRAWING

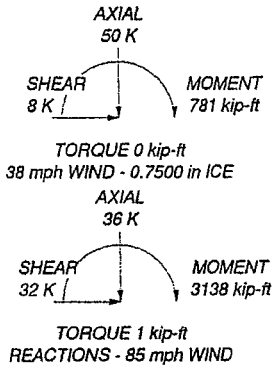


APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 5.4.2.0 - 6/17/2010 File:G:/TOWER/375_CROWN_CASTLE/2011/37511-0154 BU 876321/REVISED/37511-0154-Revised.eri





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/Mount Pipe	147	RFS APX16DWV-16DWVS-C w/ mount pipe	119
(2) DB950F40T2E-M w/Mount Pipe	147		
(2) 950F65T2ZE-M w/Mount Pipe	147	800 10764 w/ Mount Pipe	110
Platform Mount [LP 403-1]	147	800 10764 w/ Mount Pipe	110
LLPX310R W/ MOUNT PIPE	147	(2) RRUS-11	110
LLPX310R W/ MOUNT PIPE	147	(2) RRUS-11	110
LLPX310R W/ MOUNT PIPE	147	(2) RRUS-11	110
FDD_R6_RRH	147	(2) Powerwave 7770 w/ Mount Pipe	110
FDD_R6_RRH	147	(2) Powerwave 7770 w/ Mount Pipe	110
FDD_R6_RRH	147	(2) Powerwave 7770 w/ Mount Pipe	110
A-ANT-23G-2-C	147	(4) LGP2140X	110
A-ANT-23G-2-C	147	(4) LGP2140X	110
(4) DB844H90E-XY w/Mount Pipe	131	(4) LGP2140X	110
Platform Mount [LP 403-1]	131	Platform Mount [LP 401-1]	110
(4) DB844H90E-XY w/Mount Pipe	131	DC6-48-60-18-8F	110
(4) DB844H90E-XY w/Mount Pipe	131	800 10764 w/ Mount Pipe	110
RFS APX16DWV-16DWVS-C w/ mount pipe	119	APXV18-206517S-C w/ Mount Pipe	100
		Pipe Mount [PM 602-3]	100
(2) Remec S20057A-1	119	APXV18-206517S-C w/ Mount Pipe	100
(2) Remec S20057A-1	119	APXV18-206517S-C w/ Mount Pipe	100
(2) Remec S20057A-1	119	Side Arm Mount [SO 701-1]	49
T-Arm Mount [TA 601-3]	119	KS24019-L112A	49
RFS APX16DWV-16DWVS-C w/ mount pipe	119		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	65 ksi (w/ Reinf.)	65 ksi	80 ksi
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.2%

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: *147' MP; BRANFORD, CT*			
Project: *BU 876321 (PJF 37511-0154)*			
Client: Crown Castle	Drawn by: Ellen Swanson	App'd:	
Code: TIA/EIA-222-F	Date: 01/31/11	Scale: NTS	
Path: G:\TOWER\275 CROWN CASTLE\2011\37511-0154 BU 876321\37511-0154.eri		Dwg No. E-1	

Square, Unstiffened Base Plate, Any Rod Material - Rev. F

Assumptions: Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48.
Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)

Site Data	
BU#:	*876321*
Site Name:	
App #:	

Reactions		
Moment:	3138	ft-kips
Axial:	36	kips
Shear:	82	kips

Connection Type:	*Butt*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Bolt Circle:	54	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	54	in
Thick:	3.5	in
Grade:	50	ksi
B effective	30.52	in

Pole Data		
Diam:	45.85	in
Thick:	0.4375	in
Grade:	65	ksi

Stress Increase Factor	
ASIF:	1.333

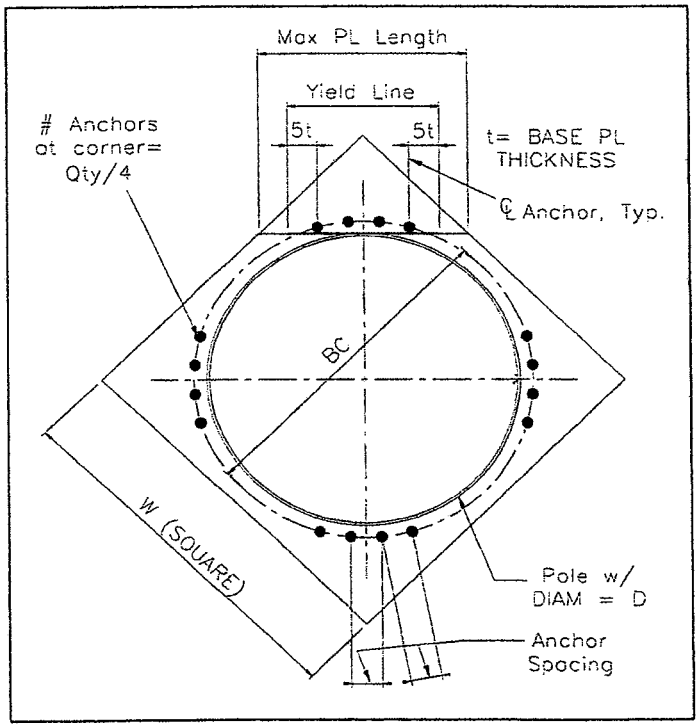
Anchor Rod Results

Maximum Rod Tension:	172.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	88.3% Pass

Base Plate Results

Base Plate Stress:	35.9 ksi	
Allowable Plate Stress:	50.0 ksi	
Base Plate Stress Ratio:	71.7% Pass	

PL Ref. Data
Yield Line (in):
30.52
Max PL Length:
30.52



PJF job no. **37511-0154** Project name **BU 876321**

Foundation Loads:

Tower leg compression =	36	(kips)
Horizontal load at top of pier =	32	(kips)
Overturning moment at top of pier=	3138	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	

Soil Properties:

Soil density =	125	(pcf)
Disturbed Soil density =	105	(pcf)
Allowable soil bearing =	4	(ksf)
Depth to water table =	3	(ft)
Soil cone of uplift =	30	degrees

Dimensions:

Pier shape (round or square)	S	("R" or "S")
Pier width =	7	(ft)
Pier height above grade =	0.5	(ft)
depth to bottom of footing =	11	(ft)
Footing thickness =	3	(ft)
Footing width =	20.5	(ft)
Footing length =	20.5	(ft)

Concrete:

Concrete strength =	3	(ksi)
Rebar strength =	60	(ksi)
ultimate load factor =	1.3	

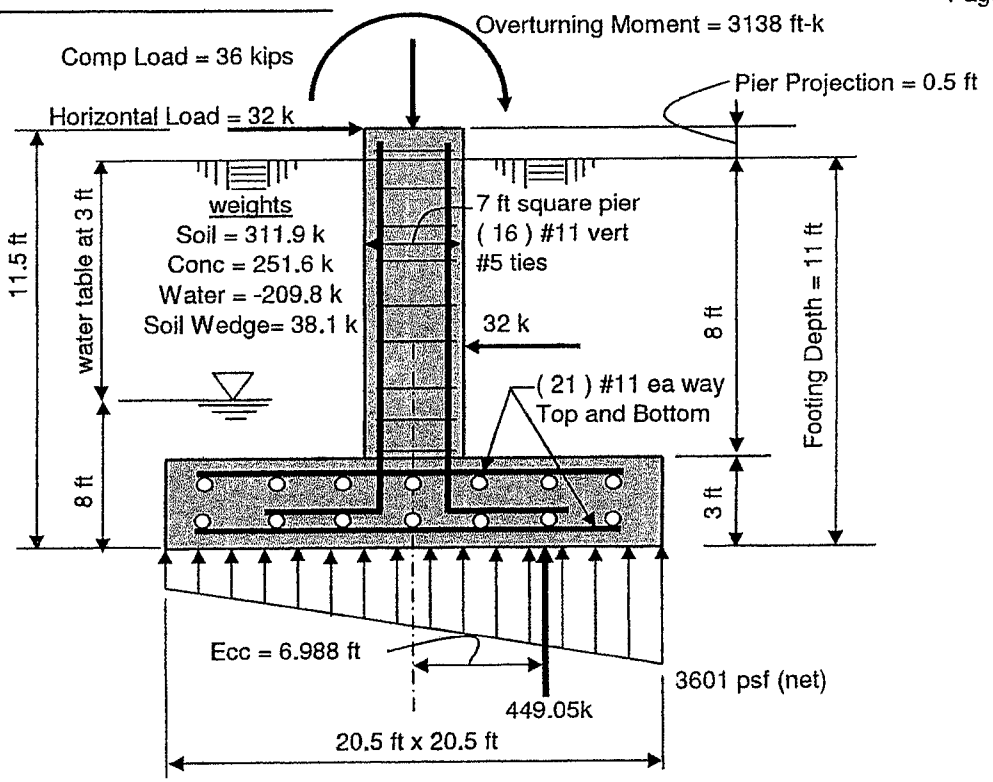
Reinforcing Steel:

	Pad	
minimum cover over rebar =	3	inches
size of pad rebar =	#11	bar
quantity of pad rebar =	21	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	#11	bar
vertical rebar quantity =	16	
size of pier ties =	#5	bar
minimum cover over rebar =	3	inches

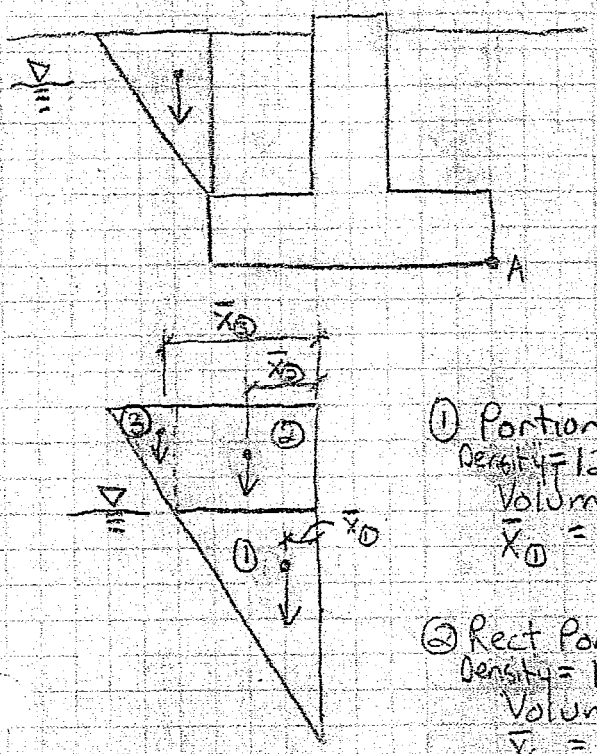
Total volume of concrete = 62.1 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.601 ksf Allowable Net Soil Bearing = 4 ksf **Soil Bearing Stress Ratio = 0.9 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 51 psi **Bending Shear Stress Ratio = 0.47 Okay**
Ftg Overturning Resistance = 4838 ft-kips Overturning Moment = 3138 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.542 **Ratio = 0.973 Okay**	Pad Bending Moment Capacity= 4330 ft-k Pad Bending Moment = 1516 ft-k **Bending Moment Stress Ratio = 0.35 OK**

PJF 37511-0154
BU 876321

Foundation Calculations Cont.



See previous page for dimensions

Undisturbed soil density assumed for wedge wt

Disturbed soil density assumed for soil directly above pad

Pull out angle = 30° from geotech

① Portion of wedge below water table
Density = 125 pcf − 62.4 pcf = 62.4 pcf
Volume = 5' × 20.5' × (5 tan 30°)/2 = 147.94 ft³
$\bar{x}_1 = \frac{1}{3}(5 \tan 30°) = 0.9622$ ft

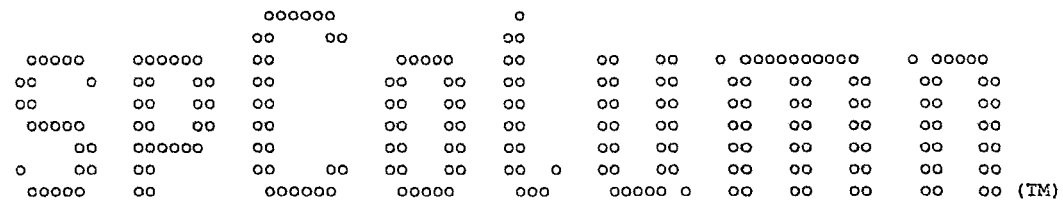
② Rect Portion of wedge above water table
Density = 125 pcf
Volume = 3' × 20.5' × (5 tan 30°) = 177.54 ft³
$\bar{x}_2 = \frac{1}{2}(5 \tan 30°) = 1.443$ ft

③ Triangular Portion of wedge above water table
Density = 125 pcf
Volume = 3' × 20.5' × (3 tan 30°)/2 = 53.26 ft³
$\bar{x}_3 = (5 \tan 30°) + \frac{1}{3}(3 \tan 30°) = 3.464$ ft

Additional overturning resistance from soil wedge calculations:

Wt of wedge: $wt_1 = 62.4\text{ pcf} \times 147.94\text{ ft}^3 = 9.231^K$
$wt_2 = 125\text{ pcf} \times 177.54\text{ ft}^3 = 22.192^K$
$wt_3 = 125\text{ pcf} \times 53.26\text{ ft}^3 = 6.658^K$

Wedge OT Resistance = $[9.231^K \times (0.962\text{ft} + 20.5\text{ft})] + [22.193^K \times (1.443 + 20.5\text{ ft})]$
$+ [6.658^K \times (3.464\text{ ft} + 20.5\text{ft})]$
$= 844.6$ k-ft



spColumn v4.60 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:

File Name: G:\TOWER\375_Crown_Castle\2011\37511-0154 BU 876321\37511-0154-foundationpier.col
Project: 37511-0154
Column: Pier — Engineer: ETS
Code: ACI 318-02 — Units: English

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

Material Properties:

f'c = 3 ksi — fy = 60 ksi
Ec = 3122.02 ksi — Es = 29000 ksi
Ultimate strain = 0.003 in/in
Betal = 0.85

Section:

Rectangular: Width = 84 in — Depth = 84 in

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

Reinforcement:

Bar Set: ASTM A615

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

Confinement: Tied; #5 ties with #10 bars, #5 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Rectangular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 24.96 in^2 at rho = 0.35% (Note: rho < 0.50%)
Minimum clear spacing = 17.42 in

16 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	36.00	4433.00	4494.46	1.014	5.30	79.67	0.04209	0.900

*** End of output ***

98.6%

Multi-band Panel

	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	65°	65°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–16°	0°–10°

KATHREIN
Antennen · Electronic

AISG Antenna Interface Standards Group

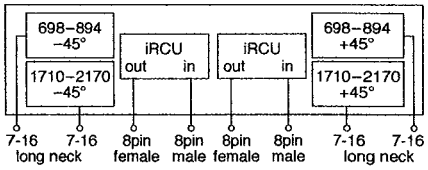
3GPP A GLOBAL INITIATIVE

XXPol Panel iRCU 698–894/1710–2170 65°/65° 15/17.5dBi 0°–16°/0°–10°T

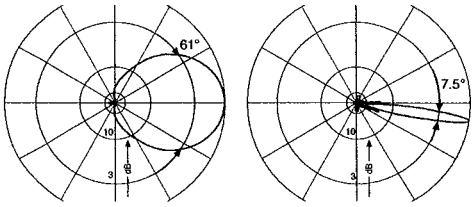
Type No.	80010764			
A) Antenna specifications				
Frequency range	698–894		1710–2170	
	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	12.15 dBd / 14.3 dBi	12.65 dBd / 14.8 dBi	17.3 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	61°	60°
Front-to-back ratio	Copolar: > 30 dB Average: 32 dB	Copolar: > 27 dB Average: 30 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB, Avg. 15 dB	Typically: 25 dB > 8 dB, Avg. 14 dB	Typically: 25 dB > 8 dB, Avg. 14 dB	Typically: 25 dB > 10 dB, Avg. 16 dB
Tracking, Avg.	1.5 dB	1.5 dB	2.0 dB	1.0 dB
Squint	±2.5°	±4.0°	±4.0°	±1.5°
Vertical Pattern:				
Half-power beam width	15°	13.5°	7.5°	7.5°
Electrical tilt	0°–16°, continuously adjustable		0°–10°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam: Average:	0° ... 8° ... 16° T 17 ... 16 ... 16 dB 19 ... 19 ... 18 dB	0° ... 8° ... 16° T 18 ... 16 ... 16 dB 22 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB 20 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB 20 ... 20 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	

B) iRCU specifications (86010145)*

Field replaceable without dismantling the antenna	
Logical interface ex factory[1]	AISG 1.1
Protocols	Compliant to AISG 1.1 and 3GPP/AISG 2.0
Hardware interface[2]	2 x 8pin connector acc. IEC 60130-9; according to AISG: – iRCU in (male): Control / Daisy chain in – iRCU out (female): Daisy chain out
Power supply	10 ... 30 V
Power consumption	< 1 W (stand by) < 8.5 W (motor activated)
Adjustment time (full range)	40 sec.
Adjustment cycles	> 50,000
Certification	CE, FC[3]

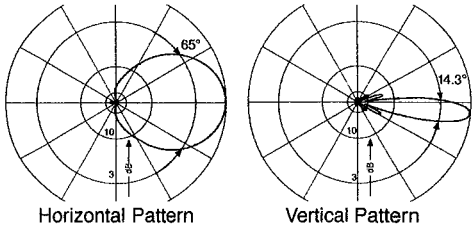


1710 – 2170 MHz: +45°/–45° Polarization



Horizontal Pattern | Vertical Pattern 0°–10° electrical downtilt

698 – 894 MHz: +45°/–45° Polarization



Horizontal Pattern | Vertical Pattern 0°–16° electrical downtilt

* See mounting instructions and warnings.

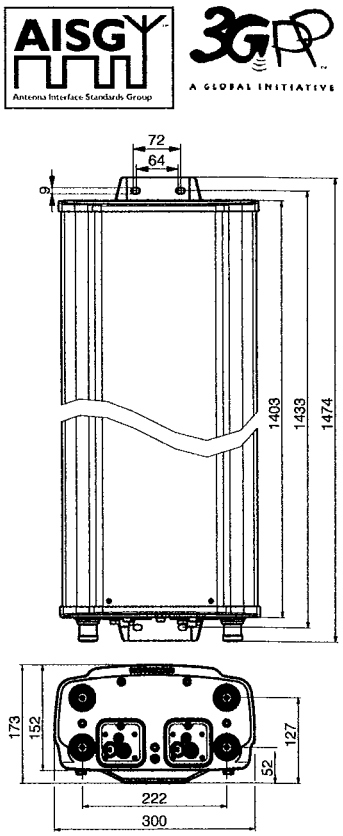
[1] The protocol of the logical interface can be switched from AISG 1.1 to 3GPP/AISG 2.0 and vice versa with a vendor specific command. **Please note:** If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the iRCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

[2] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!!

[3] Tested to comply with FCC Standards. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

KATHREIN-Werke KG · Anton-Kathrein-Straße 1 – 3 · P.O. Box 10 04 44 · 83004 Rosenheim · Germany · Phone +49 8031 184-0 · Fax +49 8031 184-973

C) Mechanical specifications	
Input	4 x 7-16 female (long neck) iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female
Connector position	Bottom
Wind load	Frontal: 690 N (at 150 km/h) 1710 N (at 150 mph) Lateral: 260 N (at 150 km/h) 640 N (at 150 mph) Rearside: 710 N (at 150 km/h) 1770 N (at 150 mph)
Max. wind velocity	241 km/h (150 mph)
Height/width/depth	1403 / 300 / 152 mm (55.2 / 11.8 / 6 inches)
Category of mounting hardware	M (Medium)
Weight	18.5 kg (40.8 lbs) / 20.5 kg (45.2 lbs) (clamps incl.)
Packing size	1646 x 322 x 190 mm (64.8 x 12.7 x 7.5 inches)
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter



Bottom view
Dimensions refer to radome.

All dimensions in mm.

Material: **Reflector screen:** Aluminum. **Radiator:** Tin-plated zinc.
iRCU housing: Coated aluminum.
Fiberglass radome: The grey fiberglass radomes of these antennas are very stable and extraordinarily stiff. They are resistant to ultraviolet radiation and can also be painted to match their surroundings.
All screws and nuts: Stainless steel.

Grounding: The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.

Environmental conditions: Kathrein cellular antennas are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E.
The antennas exceed this standard with regard to the following items:
– Low temperature: –55 °C
– High temperature (dry): +60 °C

Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

Environmental tests: Kathrein antennas have passed environmental tests as recommended in ETS 300 019-2-4. The homogenous design of Kathrein's antenna families use identical modules and materials. Extensive tests have been performed on typical samples and modules.

iRCU additionally fulfil the standards:
EN 60950-1 (Safety), EN 55022 (Emission) and EN 55024 (Immunity)

Accessories

Type No.	Description	Remarks	Weight approx. kg	Weight approx. lbs	Units per antenna
738546	**1 clamp**	**Mast: 42 – 115 mm diameter**	**1.1**	**2.4**	**2 (included in the scope of supply)**
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8	1.8	2 (order separately if required)
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7	6.0	2 (order separately if required)
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8	10.6	2 (order separately if required)
737978	1 downtilt kit	Downtilt angle: 0° – 15°	2.3	5.1	1 (order separately if required)

Wall mounting: No additional mounting kit needed.

Please note:

As a result of more stringent legal regulations and judgements regarding product liability, we are obliged to point out certain risks that may arise when products are used under extraordinary operating conditions.

The mechanical design is based on the environmental conditions as stipulated in ETS 300 019-1-4 and thereby respects the static mechanical load imposed on an antenna by wind at maximum velocity. Wind loads are calculated according to DIN 1055-4. Extraordinary operating conditions, such as heavy icing or exceptional dynamic stress (e.g. strain caused by oscillating support structures), may result in the breakage of an antenna or even cause it to fall to the ground. These facts must be considered during the site planning process.

The installation team must be properly qualified and also be familiar with the relevant national safety regulations.
Commissioning or electrical operation of the antenna without inserted iRCU's is not permitted.
The details given in our data sheets have to be followed carefully when installing the antennas and accessories.
The limits for the coupling torque of RF-connectors, recommended by the connector manufacturers must be obeyed.

Any previous datasheet issues have now become invalid.
Valid subject to change.

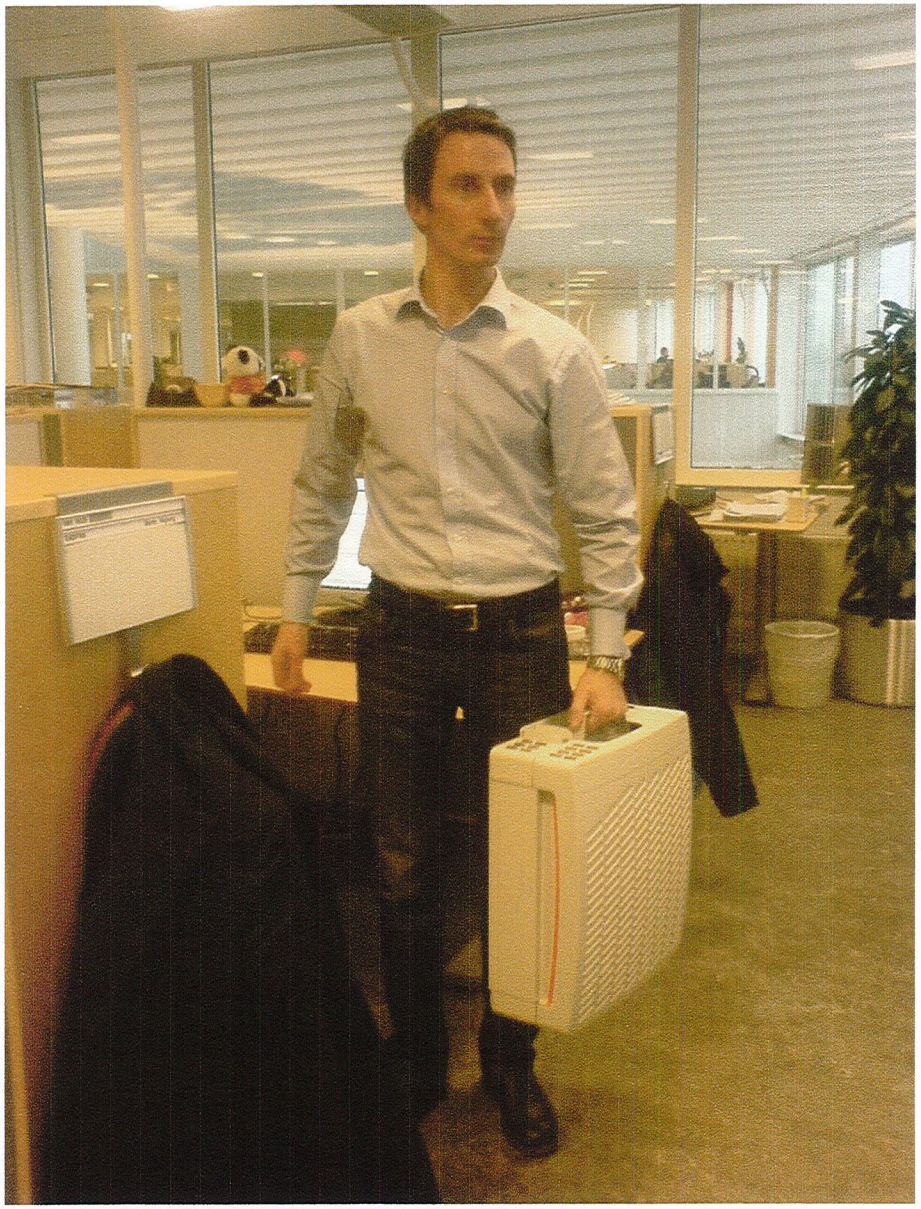
936.3931/a Subject to alteration.

RRUS 11 – Dual PA RRU.

Technical Data

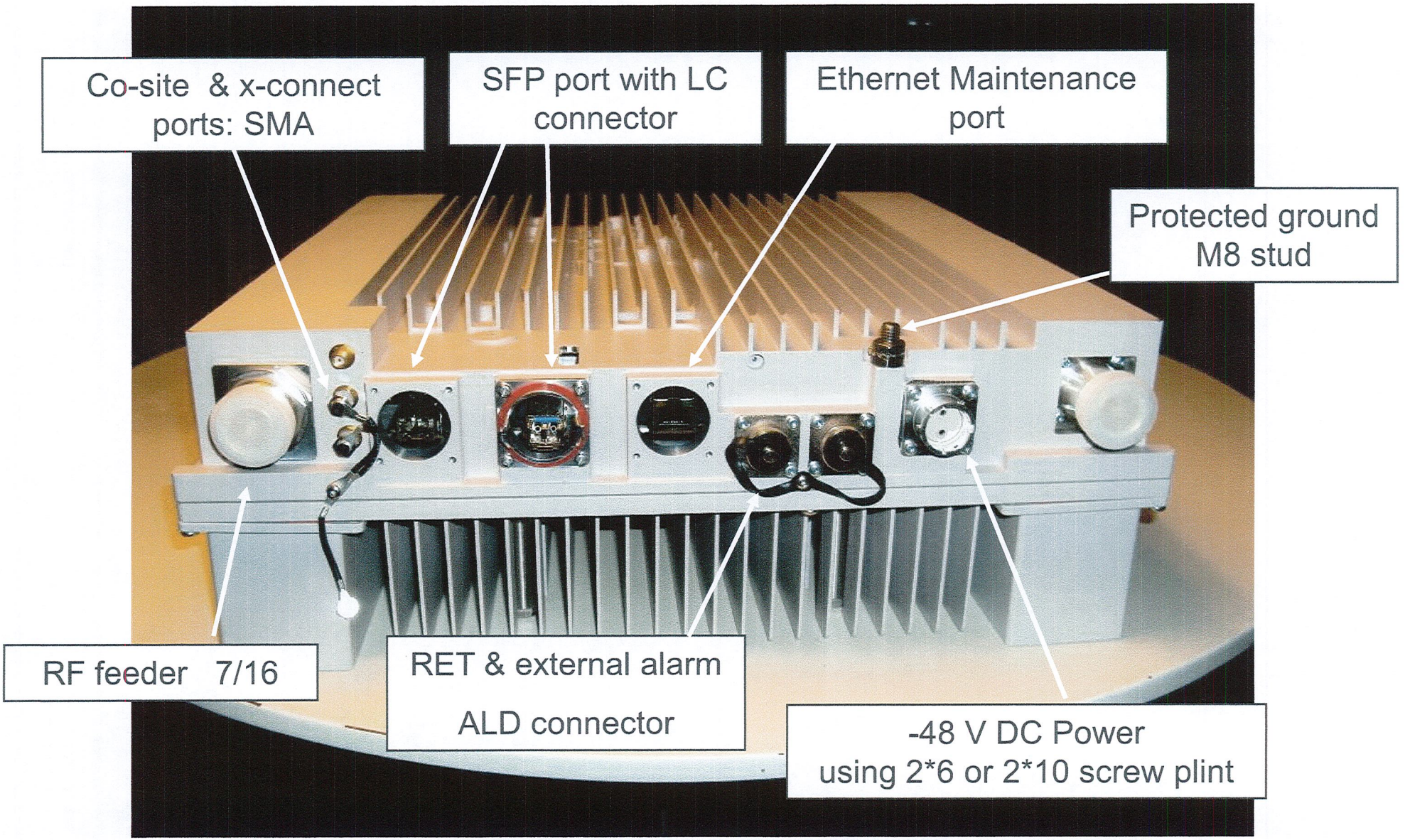
RBS6000

- Multi standard
- RF: 2x30 Watts
- Carrier BW: 1.4 – 20 MHz
- Alarms: 2
- Dimensions (with sunshield):
  - Width: 17.0 in
  - Height: 17.8 in
  - Depth: 7.2 in
  - Weight: 55 lbs (Band 12)
  - Weight: 50 lbs (Band 4)
- Temperature: -40 to +131 F
- Cooling: Self convection
- Power: -48 VDC
- Rec. fuse size 20 Amp
  - Rec. DC cable:
    - 6 mm^2 up to 60 meters
    - 10 mm^2 over 60 meters
    - Shielded
- Power Cons: 200 Watts typ.



RRUS-11 I/F

RBS6000



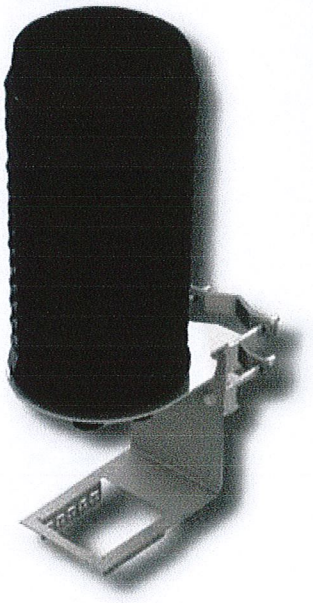
DC6-48-60-18-8F

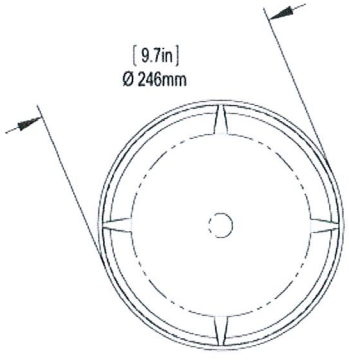
DC Surge Suppression Solution

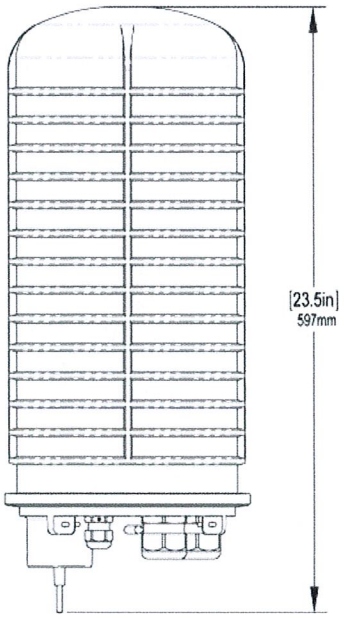
The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.

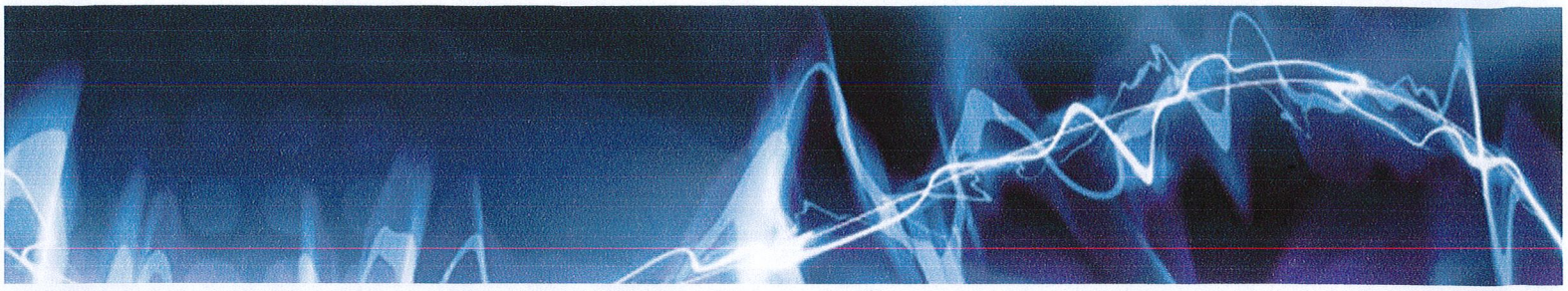






Raycap

Phone 208.777.1166 Toll Free 800.890.2569 Fax 208.777.4466 www.raycapsurgeprotection.com



DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 µs
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 – 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)

GS-07F-0435V

Certified to ISO 9001:2000

TÜV Rheinland of North America

Raycap

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

March 23, 2011

Honorable Anthony DaRos
1st Selectman, Town of Branford
Branford Town Hall
1019 Main Street
Branford, CT 06405

Re: Telecommunications Facility – 150 North Main Street Branford, CT

Dear Mr. DaRos:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure