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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

March 21, 2011

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

RE: **EM-CING-014-110225** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 21 Acorn 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 February 24, 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
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

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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Daniel F. Caruso
Chairman

March 7, 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-014-110225** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 21 Acorn 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 March 21, 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-014-110225

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

February 24, 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 21 Acorn Street Branford, CT (owner Town of Branford)

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. It is the last step toward the 4th generation (4G) of radio technologies, 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

21 Acorn Road Branford, CT
Site Number 2014
Exempt Mod 06/05

Tower Owner/Manager: Town of Branford

Equipment configuration: Monopole

Current and/or approved: Six PowerWave antennas @ 105 ft
Six PowerWave TMA's @ 105 ft
Twelve runs 1 5/8 inch coax to 105 ft
Equipment Shelter

Planned Modifications: Retain existing Coax Cabling
Retain all existing antennas, TMA's
Install three LTE KMW14-65 antennas or equivalent @ 105 ft
Install six remote radio heads and one surge arrestors @ 105 ft
Install one fiber and two DC power cables to @ 105 ft
Install one new cabinet and surge suppressor in existing equipment shelter

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 Monopole, of approximately 85.7 % 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 89.0 % 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							42.13
AT&T UMTS	105	1900 Band	13	500	0.2120	1.0000	21.20
AT&T GSM	105	1900 Band	9	427	0.1253	1.0000	12.53
AT&T GSM	105	880 - 894	6	296	0.0579	0.5867	9.87
Total							**85.7%**

* 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							42.13
AT&T UMTS	105	1900 Band	13	500	0.2120	1.0000	21.20
AT&T GSM	105	1900 Band	9	427	0.1253	1.0000	12.53
AT&T GSM	105	880 - 894	6	296	0.0579	0.5867	9.87
AT&T LTE	105	740 - 746	1	500	0.0163	0.4933	3.31
Total							**89.0%**

* 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 Company dated 1-31-11)

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	21 ACORN ROAD BRANFORD, CT 06405
LATITUDE:	41.293056° N 41° 17' 35" N
LONGITUDE:	-72.762884° W -72° 45' 46.38" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

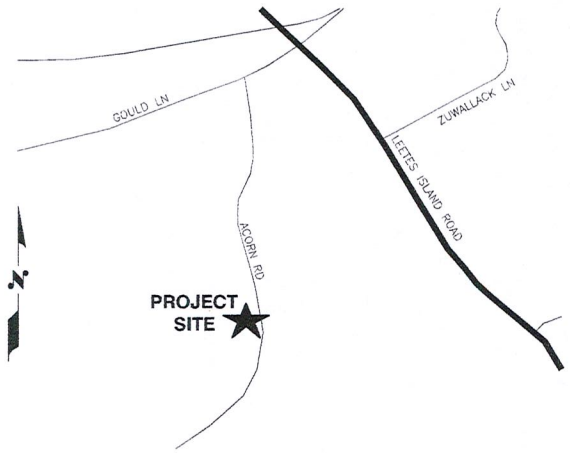
at&t

SITE NUMBER: CT2014
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 8.5 MI, TAKE THE LEETES ISLAND RD EXIT, EXIT 56, TOWARD STONY CREEK 0.3 MI, TURN SHARP RIGHT ONTO GOULD LN. 0.1 MI, TURN LEFT ONTO ACORN RD. 0.2 MI, 21 ACORN RD IS ON THE RIGHT.



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
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: CT2014
SITE NAME: BRANFORD - SPRINT

21 ACORN ROAD
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	01/24/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	HC	DC	DPH

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

DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2014.01	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: CT2014
SITE NAME: BRANFORD - SPRINT

21 ACORN ROAD
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	01/24/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	HC	DC	DPH

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

Daniel P. Hannon No. 24173 REGISTERED PROFESSIONAL ENGINEER STATE OF CONNECTICUT

AT&T

GENERAL NOTES (LTE)

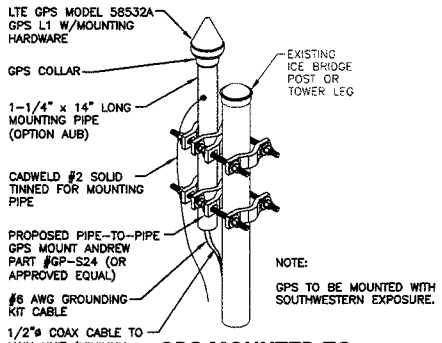
JOB NUMBER	DRAWING NUMBER	REV
2014.01	GN-1	1

NOTE:

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

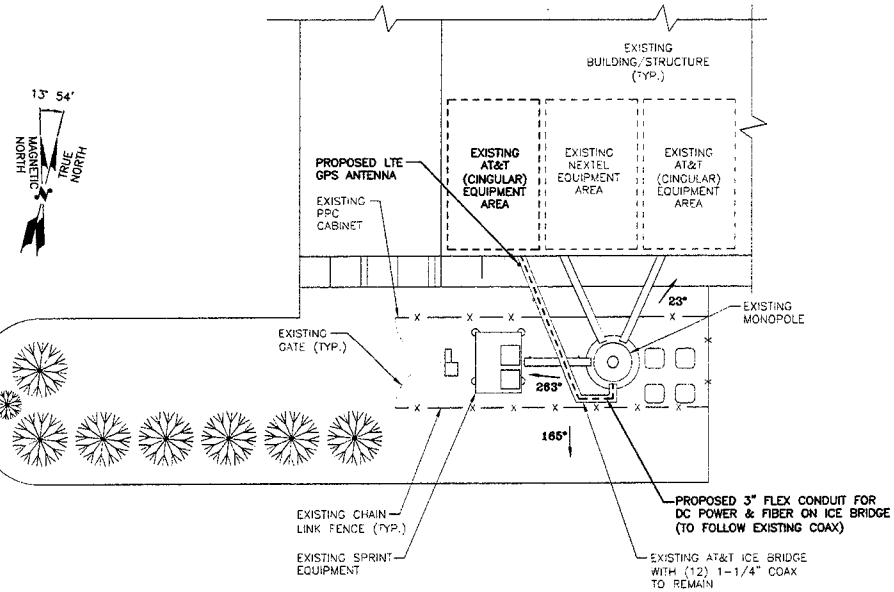
NOTE:

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



GPS MOUNTED TO TOWER LEG/ICE BRIDGE

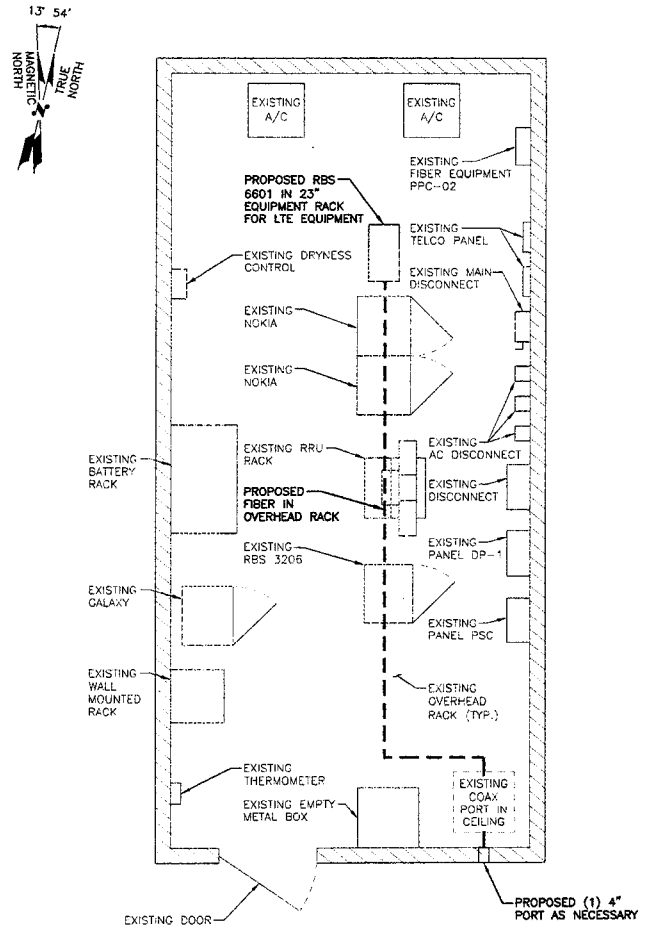
SCALE: N.T.S.



COMPOUND PLAN

SCALE: 1/8"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"



EQUIPMENT PLAN

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

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

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20-NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-0553
FAX: (978) 336-5884

SAI communications

22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2014
SITE NAME: BRANFORD - SPRINT

21 ACORN ROAD
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	01/24/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	HC	DC	DPH

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

Dwake P. Hamm
No. 24,779

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

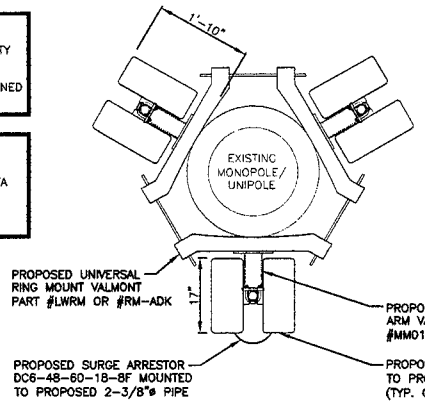
JOB NUMBER	DRAWING NUMBER	REV
2014.01	A-1	1

NOTE:

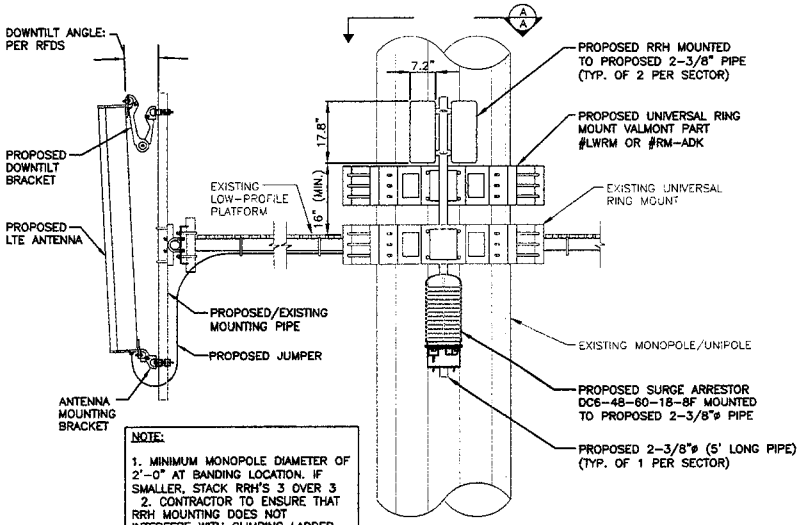
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

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



SECTION A-A



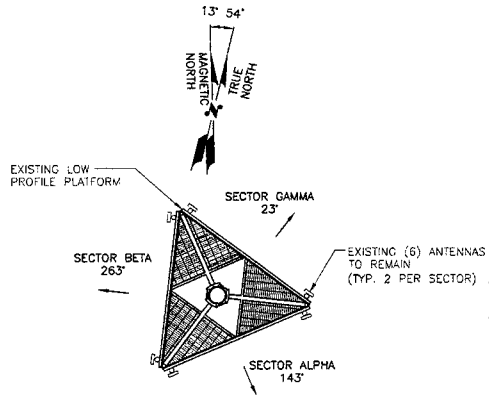
NOTE:

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

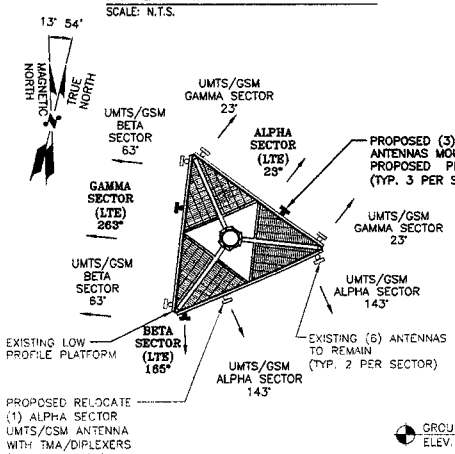
PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.



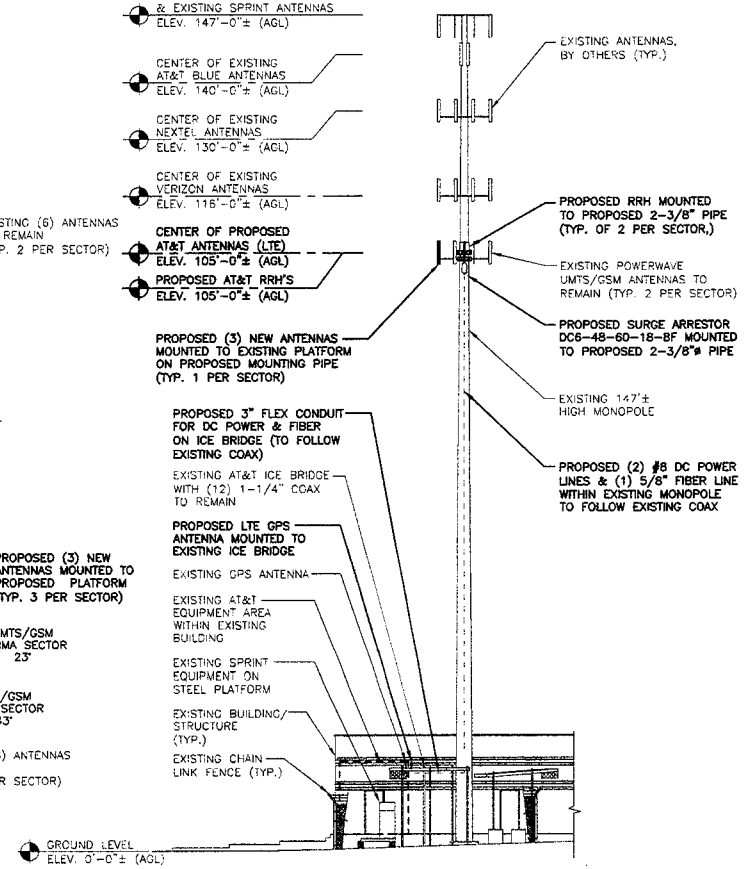
EXISTING ANTENNA PLAN

SCALE: N.T.S.



PROPOSED ANTENNA PLAN

SCALE: N.T.S.



SOUTH ELEVATION

SCALE: 1/16"=1'-0"

0 8'-0" 16'-0" 32'-0" 48'-0"

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: CT2014
SITE NAME: BRANFORD - SPRINT

21 ACORN ROAD
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	01/24/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	01/05/11	ISSUED FOR REVIEW	HC	DC	DPH

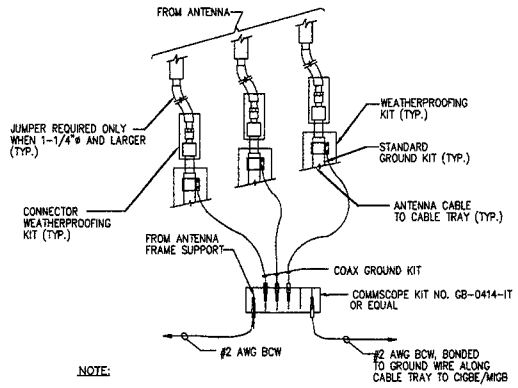
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: HC

Daniel P. Hamm No. 24178

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2014.01	A-2	1

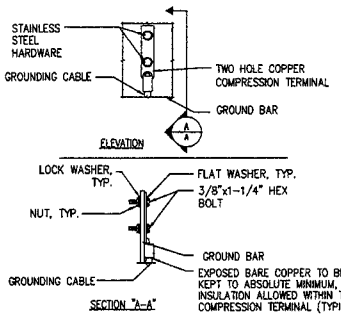


NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

1 — N.T.S.

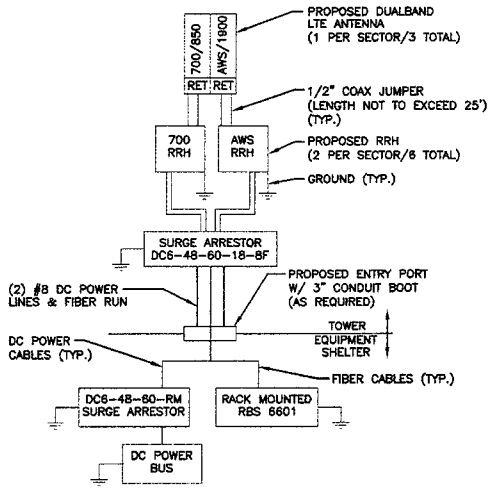


NOTE:

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.

TYPICAL GROUND BAR CONNECTION DETAIL

2 — N.T.S.



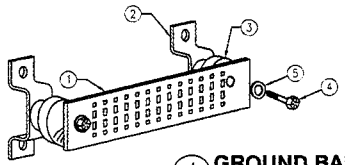
NOTES:

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

PLUMBING DIAGRAM

3 — 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



GROUND BAR - DETAIL

4 — N.T.S.

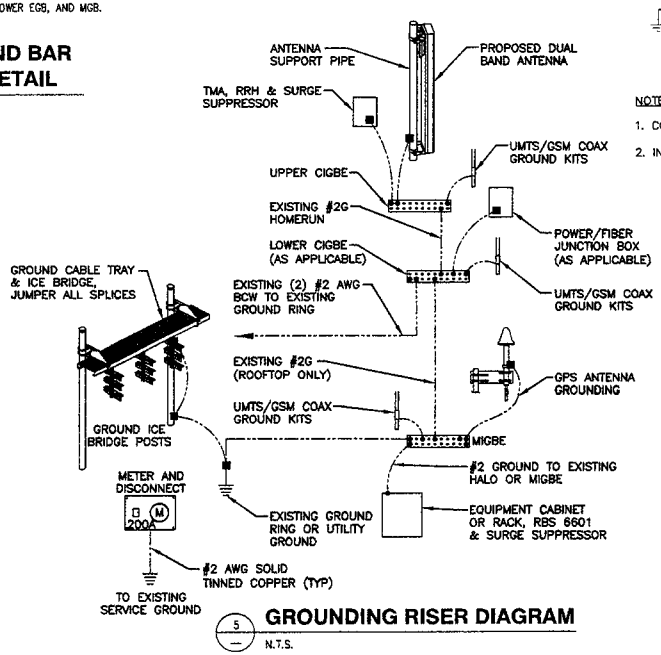
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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)



GROUNDING RISER DIAGRAM

5 — N.T.S.

Hudson Design Groupllc
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
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SITE NUMBER: CT2014
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0	01/05/11	ISSUED FOR REVIEW	HC	DC	DPH

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

AT&T

PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV.
2014.01	G-1	1

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

Date: **January 31, 2011**

Erica Lee
Crown Castle USA Inc.
5350 North 48th Street Suite 305
Chandler, AZ 85226
480-734-2406

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

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	2014
	Carrier Site Name:	Branford-Acorn Road
Crown Castle Designation:	**Crown Castle BU Number:**	876316
	Crown Castle Site Name:	Secondino Property
	Crown Castle JDE Job Number:	148674
	Crown Castle Work Order Number:	384107
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37511-0162
Site Data:	**21 Acorn Road, BRANFORD, New Haven County, CT** **Latitude *41° 17' 35.06"*, Longitude *-72° 45' 46.4"*** **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 402451, in accordance with application 115601, revision 1.

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

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and TIA/EIA-222-F based upon a wind speed of 85 mph fastest mile with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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:

Udaykiran Yerra
Structural Engineer

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

FEB 04 2011

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 147 ft Monopole tower designed by SUMMIT in September of 1997. 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
105	108	3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	1 2	1/4 (I) 7/8 (I)	1
	105	6	ericsson	RRUS-11			
		1	raycap	DC6-48-60-18-8F			

Notes:
1) Proposed Equipment

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147	147	1	tower mounts	Platform Mount [LP 401-1]	-	-	1
	145	9	ems wireless	FV65-14-00NA2 w/Mount Pipe	9	1-5/8 (I)	2
	144	4	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8 (I)	1
		2		DB950F85E-M w/ Mount Pipe			
135	135	3	celwave	Celwave APXV18-206515L-03 w/Mount Pipe	6	1-5/8 (I)	1
		1	tower mounts	Pipe Mount [PM 601-3]			
126	127	12	decibel	844G90VTA-SX w/ Mount Pipe	12	1-1/4 (I)	1
	126	1	tower mounts	Platform Mount [LP 401-1]			
116	116	2	adc	ADC DUAL BAND 800/1900 FULL BAND	12	1-5/8 (I)	1
		6	antel	Antel LPA-185090/8CFx2 w/ mount pipe			
		2	antel	Antel LPA-80063/6CF w/ Mount Pipe			
		4	decibel	DB844H80-XY w/Mount Pipe			
		1	tower mounts	Platform Mount [LP 401-1]			
105	108	6	powerwave	Powerwave Technologies	12	1-5/8 (I)	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
			technologies	7770 w/ Mount Pipe			
	105	12	powerwave technologies	Powerwave Technologies LGP2140X			
		1	tower mounts	Platform Mount [LP 401-1]			
80	81	1	kathreinscala	Kathrein OG-860/1920/GPS-A	3	½ (I)	1
		2	lucent	KS24019-L112A			
	80	1	tower mounts	Side Arm Mount [SO 701-3]			

Notes:
1) Existing Equipment
2) MLA equipment controlling

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Associates, Inc.	1529736	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1632435	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1632399	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF	2251030	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.

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 - 105	Pole	TP29.141x22x0.25	1	-8.80	1075.85	56.1	Pass
L2	105 - 88	Pole	TP31.5319x28.0034x0.3125	2	-14.73	1485.99	82.9	Pass
L3	88 - 84.5	Pole	TP32.127x31.5319x0.4815	3	-15.47	2320.86	57.9	Pass
L4	84.5 - 73.75	Pole	TP33.955x32.127x0.4415	4	-17.01	2205.08	68.9	Pass
L5	73.75 - 42.75	Pole	TP38.601x32.3493x0.5144	5	-25.17	2918.10	80.2	Pass
L6	42.75 - 8	Pole	TP43.7597x36.7298x0.5547	6	-37.89	3650.33	89.3	Pass
L7	8 - 6.5	Pole	TP44.0148x43.7597x0.568	7	-38.39	3758.77	87.5	Pass
L8	6.5 - 0	Pole	TP45.12x44.0148x0.5643	8	-40.54	3829.59	89.2	Pass
							Summary	
						Pole (L6)	89.3	Pass
						Rating =	89.3	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	89.8	Pass
	Base Plate	0	81.0	Pass
	Base Foundation	0	55.3	Pass
	Base Foundation Soil Interaction	0	87.4	Pass

Structure Rating (max from all components) =	89.8%

Notes:

1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 105% are considered acceptable based on analysis methods used.
3) According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

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.
Temperature drop of 50 °F.
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	147.00-105.00	42.00	3.75	18	22.0000	29.1410	0.2500	1.0000	A607-60 (60 ksi)
L2	105.00-88.00	20.75	0.00	18	28.0034	31.5319	0.3125	1.2500	A607-60 (60 ksi)
L3	88.00-84.50	3.50	0.00	18	31.5319	32.1270	0.4815	1.9260	A607-60 (60 ksi)
L4	84.50-73.75	10.75	4.25	18	32.1270	33.9550	0.4415	1.7660	A607-60 (60 ksi)
L5	73.75-42.75	35.25	4.75	18	32.3493	38.6010	0.5144	2.0576	A607-60 (60 ksi)
L6	42.75-8.00	39.50	0.00	18	36.7298	43.7597	0.5547	2.2188	A607-60 (60 ksi)
L7	8.00-6.50	1.50	0.00	18	43.7597	44.0148	0.5680	2.2720	A607-60 (60 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L8	6.50-0.00	6.50		18	44.0148	45.1200	0.5643	2.2572	A607-60 (60 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/ft
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	29.5905	22.9250	2417.5313	10.2563	14.8036	163.3067	4838.2436	11.4647	4.6888	18.755
L2	29.0829	27.4659	2660.7626	9.8303	14.2257	187.0387	5325.0263	13.7356	4.3786	14.012
	32.0183	30.9657	3813.0109	11.0829	16.0182	238.0423	7631.0391	15.4858	4.9996	15.999
L3	32.0183	47.4537	5780.1920	11.0229	16.0182	360.8514	11567.989 7	23.7314	4.7022	9.766
	32.6226	48.3632	6118.9450	11.2342	16.3205	374.9235	12245.941 5	24.1862	4.8069	9.983
L4	32.6226	44.4016	5631.9239	11.2484	16.3205	345.0825	11271.258 3	22.2050	4.8773	11.047
	34.4788	46.9632	6663.9916	11.8973	17.2491	386.3376	13336.751 8	23.4860	5.1990	11.776
L5	33.6137	51.9770	6655.1199	11.3014	16.4334	404.9741	13318.996 8	25.9935	4.7881	9.308
	39.1965	62.1842	11396.249 5	13.5207	19.6093	581.1653	22807.494 4	31.0980	5.8884	11.447
L6	38.1548	63.6905	10530.058 6	12.8422	18.6587	564.3504	21073.972 9	31.8513	5.4882	9.894
	44.4348	76.0675	17939.261 8	15.3378	22.2299	806.9870	35902.128 5	38.0410	6.7254	12.124
L7	44.4348	77.8674	18352.431 1	15.3331	22.2299	825.5731	36729.010 8	38.9411	6.7020	11.799
	44.6938	78.3273	18679.536 4	15.4236	22.3595	835.4177	37383.651 7	39.1711	6.7469	11.878
L8	44.6938	77.8237	18562.597 9	15.4249	22.3595	830.1877	37149.621 0	38.9192	6.7534	11.968
	45.8160	79.8032	20015.398 3	15.8173	22.9210	873.2356	40057.133 3	39.9092	6.9480	12.313

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 147.00-105.00				1	1	1		
L2 105.00-88.00				1	1	1		
L3 88.00-84.50				1	1	1		
L4 84.50-73.75				1	1	1		
L5 73.75-42.75				1	1	1		
L6 42.75-8.00				1	1	1		
L7 8.00-6.50				1	1	1		
L8 6.50-0.00				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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
**								
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	135.00 - 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)	C	No	CaAa (Out Of Face)	135.00 - 0.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	126.00 - 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
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	116.00 - 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	105.00 - 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
LDF4RN-50A (1/2 FOAM)	C	No	Inside Pole	80.00 - 0.00	3	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 MP3-05	C	No	CaAa (Out Of Face)	90.00 - 0.00	1	No Ice	0.35	0.00
						1/2" Ice	0.40	0.00
						1" Ice	0.66	0.00
						2" Ice	0.88	0.00
						4" Ice	1.32	0.00
**								
LDF1-50A (1/4 FOAM)	C	No	Inside Pole	105.00 - 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
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	105.00 - 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

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	147.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.940	0.73

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
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.819	0.06
L8	6.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.548	0.26

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	147.00-105.00	A	0.880	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.221	1.30
L2	105.00-88.00	A	0.853	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.549	1.00
L3	88.00-84.50	A	0.842	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.296	0.20
L4	84.50-73.75	A	0.833	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.056	0.62
L5	73.75-42.75	A	0.803	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	28.999	1.79
L6	42.75-8.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	31.759	1.98
L7	8.00-6.50	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.314	0.08
L8	6.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.696	0.36

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.00-105.00	-0.1792	0.1034	-0.3022	0.1745
L2	105.00-88.00	-0.2854	0.1648	-0.4700	0.2713
L3	88.00-84.50	-0.5880	0.3395	-0.8688	0.5016
L4	84.50-73.75	-0.5917	0.3416	-0.8741	0.5047
L5	73.75-42.75	-0.5995	0.3461	-0.8938	0.5160
L6	42.75-8.00	-0.6107	0.3526	-0.9069	0.5236
L7	8.00-6.50	-0.6169	0.3562	-0.8937	0.5160
L8	6.50-0.00	-0.6182	0.3569	-0.8966	0.5177

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(3) FV65-14-00NA2 w/Mount Pipe	A	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	0.06 0.12 0.20 0.38 0.89
(3) FV65-14-00NA2 w/Mount Pipe	B	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	0.06 0.12 0.20 0.38 0.89
(3) FV65-14-00NA2 w/Mount Pipe	C	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.95 8.13 9.02 10.84 14.85	0.06 0.12 0.20 0.38 0.89
Platform Mount [LP 401-1]	C	None		0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.33 30.22 36.11 47.89 71.45	24.33 30.22 36.11 47.89 71.45	1.65 2.03 2.41 3.18 4.72
6'x2" Pipe Mount	A	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
6'x2" Pipe Mount	B	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
6'x2" Pipe Mount	C	From Face	3.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
** Pipe Mount [PM 601-3]	C	None		0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
Celwave APXV18-206515L-03 w/Mount Pipe	A	From Face	0.50 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.48 3.90 4.31 5.23 7.27	3.24 3.97 4.64 6.03 9.01	0.04 0.07 0.11 0.21 0.51
Celwave APXV18-206515L-03 w/Mount Pipe	B	From Face	0.50 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.48 3.90 4.31 5.23 7.27	3.24 3.97 4.64 6.03 9.01	0.04 0.07 0.11 0.21 0.51
Celwave APXV18-206515L-03 w/Mount Pipe	C	From Face	0.50 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	3.48 3.90 4.31 5.23	3.24 3.97 4.64 6.03	0.04 0.07 0.11 0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	7.27	9.01	0.51
						4" Ice			
**									
(4) 844G90VTA-SX w/ Mount Pipe	A	From Face	3.00 0.00 1.00	0.0000	126.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
(4) 844G90VTA-SX w/ Mount Pipe	B	From Face	3.00 0.00 1.00	0.0000	126.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
(4) 844G90VTA-SX w/ Mount Pipe	C	From Face	3.00 0.00 1.00	0.0000	126.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
Platform Mount [LP 401-1]	C	None		0.0000	126.00	No Ice	24.33	24.33	1.65
						1/2" Ice	30.22	30.22	2.03
						1" Ice	36.11	36.11	2.41
						2" Ice	47.89	47.89	3.18
						4" Ice	71.45	71.45	4.72
**									
(2) Antel LPA-185090/8CFx2 w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	2.20	3.78	0.02
						1/2" Ice	2.52	4.36	0.05
						1" Ice	2.86	4.97	0.09
						2" Ice	3.55	6.30	0.18
						4" Ice	5.21	9.28	0.45
(2) Antel LPA-185090/8CFx2 w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	2.20	3.78	0.02
						1/2" Ice	2.52	4.36	0.05
						1" Ice	2.86	4.97	0.09
						2" Ice	3.55	6.30	0.18
						4" Ice	5.21	9.28	0.45
(2) DB844H80-XY w/Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	3.58	5.63	0.04
						1/2" Ice	4.20	6.73	0.08
						1" Ice	4.73	7.54	0.13
						2" Ice	5.86	9.21	0.25
						4" Ice	8.27	12.75	0.62
(2) DB844H80-XY w/Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	3.58	5.63	0.04
						1/2" Ice	4.20	6.73	0.08
						1" Ice	4.73	7.54	0.13
						2" Ice	5.86	9.21	0.25
						4" Ice	8.27	12.75	0.62
(2) Antel LPA-80063/6CF w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	10.68	11.41	0.08
						1/2" Ice	11.31	12.38	0.18
						1" Ice	11.95	13.37	0.29
						2" Ice	13.25	15.40	0.54
						4" Ice	15.98	19.68	1.17
(2) Antel LPA-185090/8CFx2 w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	116.00	No Ice	2.20	3.78	0.02
						1/2" Ice	2.52	4.36	0.05
						1" Ice	2.86	4.97	0.09
						2" Ice	3.55	6.30	0.18
						4" Ice	5.21	9.28	0.45
(2) ADC DUAL BAND	B	From Face	3.00	0.0000	116.00	No Ice	0.65	0.81	0.03

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
800/1900 FULL BAND			0.00				1/2"	0.76	0.94	0.04
			0.00				Ice	0.89	1.09	0.05
							1" Ice	1.16	1.40	0.09
							2" Ice	1.82	2.12	0.19
							4" Ice			
Platform Mount [LP 401-1]	C	None			0.0000	116.00	No Ice	24.33	24.33	1.65
							1/2" Ice	30.22	30.22	2.03
							1" Ice	36.11	36.11	2.41
							2" Ice	47.89	47.89	3.18
							4" Ice	71.45	71.45	4.72
**										
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Face	4.00		0.0000	105.00	No Ice	5.74	4.02	0.03
			0.00				1/2" Ice	6.20	4.63	0.08
			3.00				1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Face	4.00		0.0000	105.00	No Ice	5.74	4.02	0.03
			0.00				1/2" Ice	6.20	4.63	0.08
			3.00				1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Face	4.00		0.0000	105.00	No Ice	5.74	4.02	0.03
			0.00				1/2" Ice	6.20	4.63	0.08
			3.00				1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
(2) RRUS-11	A	From Face	4.00		0.0000	105.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37
(2) RRUS-11	B	From Face	4.00		0.0000	105.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37
(2) RRUS-11	C	From Face	4.00		0.0000	105.00	No Ice	4.42	1.19	0.06
			0.00				1/2" Ice	4.71	1.35	0.08
			0.00				1" Ice	5.00	1.53	0.11
							2" Ice	5.61	1.90	0.18
							4" Ice	6.94	2.75	0.37
DC6-48-60-18-8F	A	From Face	4.00		0.0000	105.00	No Ice	1.27	1.27	0.02
			0.00				1/2" Ice	1.46	1.46	0.04
			0.00				1" Ice	1.66	1.66	0.05
							2" Ice	2.09	2.09	0.10
							4" Ice	3.10	3.10	0.21
(2) Powerwave Technologies 7770 w/ Mount Pipe	A	From Face	3.00		0.0000	105.00	No Ice	6.01	4.42	0.07
			0.00				1/2" Ice	6.46	5.08	0.12
			3.00				1" Ice	6.93	5.74	0.18
							2" Ice	7.89	7.13	0.32
							4" Ice	9.94	10.41	0.70
(2) Powerwave Technologies 7770 w/ Mount Pipe	B	From Face	3.00		0.0000	105.00	No Ice	6.01	4.42	0.07
			0.00				1/2" Ice	6.46	5.08	0.12
			3.00				1" Ice	6.93	5.74	0.18
							2" Ice	7.89	7.13	0.32
							4" Ice	9.94	10.41	0.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) Powerwave Technologies 7770 w/ Mount Pipe	C	From Face	3.00 0.00 3.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.46 6.93 7.89 9.94	4.42 5.08 5.74 7.13 10.41	0.07 0.12 0.18 0.32 0.70
(4) Powerwave Technologies LGP2140X	A	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.37 0.48 0.60 0.87 1.51	0.02 0.02 0.03 0.06 0.14
(4) Powerwave Technologies LGP2140X	B	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.37 0.48 0.60 0.87 1.51	0.02 0.02 0.03 0.06 0.14
(4) Powerwave Technologies LGP2140X	C	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.38 1.54 1.89 2.69	0.37 0.48 0.60 0.87 1.51	0.02 0.02 0.03 0.06 0.14
Platform Mount [LP 401-1]	C	None		0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.33 30.22 36.11 47.89 71.45	24.33 30.22 36.11 47.89 71.45	1.65 2.03 2.41 3.18 4.72
6'x2" Pipe Mount	A	From Face	3.00 0.00 3.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
6'x2" Pipe Mount	B	From Face	3.00 0.00 3.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
6'x2" Pipe Mount	C	From Face	3.00 0.00 3.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.07 0.08 0.09 0.13 0.27
**									
Side Arm Mount [SO 701-3]	C	None		0.0000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.83 3.92 5.01 7.19 11.55	2.83 3.92 5.01 7.19 11.55	0.20 0.24 0.28 0.36 0.53
KS24019-L112A	A	From Face	3.00 0.00 1.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.18 0.26 0.42 0.74	0.10 0.18 0.26 0.42 0.74	0.01 0.01 0.01 0.01 0.02
Kathrein OG-860/1920/GPS-A	B	From Face	3.00 0.00 1.00	0.0000	80.00	No Ice 1/2" Ice	0.14 0.23 0.33	0.14 0.23 0.33	0.00 0.00 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	0.57	0.57	0.02
						2" Ice	1.17	1.17	0.05
						4" Ice			
KS24019-L112A	C	From Face	3.00	0.0000	80.00	No Ice	0.10	0.10	0.01
			0.00			1/2" Ice	0.18	0.18	0.01
			1.00			1" Ice	0.26	0.26	0.01
						2" Ice	0.42	0.42	0.01
						4" Ice	0.74	0.74	0.02

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 147.00-105.00	125.27	1.464	27	89.497	A	0.000	89.497	89.497	100.00	0.000	0.000
					B	0.000	89.497		100.00	0.000	0.000
					C	0.000	89.497		100.00	0.000	5.940
L2 105.00-88.00	96.36	1.358	25	42.623	A	0.000	42.623	42.623	100.00	0.000	0.000
					B	0.000	42.623		100.00	0.000	0.000
					C	0.000	42.623		100.00	0.000	4.062
L3 88.00-84.50	86.24	1.316	24	9.284	A	0.000	9.284	9.284	100.00	0.000	0.000
					B	0.000	9.284		100.00	0.000	0.000
					C	0.000	9.284		100.00	0.000	1.910
L4 84.50-73.75	79.08	1.284	24	29.599	A	0.000	29.599	29.599	100.00	0.000	0.000
					B	0.000	29.599		100.00	0.000	0.000
					C	0.000	29.599		100.00	0.000	5.867
L5 73.75-42.75	58.15	1.176	22	92.618	A	0.000	92.618	92.618	100.00	0.000	0.000
					B	0.000	92.618		100.00	0.000	0.000
					C	0.000	92.618		100.00	0.000	16.920
L6 42.75-8.00	24.97	1	19	117.766	A	0.000	117.766	117.766	100.00	0.000	0.000
					B	0.000	117.766		100.00	0.000	0.000
					C	0.000	117.766		100.00	0.000	18.966
L7 8.00-6.50	7.25	1	18	5.486	A	0.000	5.486	5.486	100.00	0.000	0.000
					B	0.000	5.486		100.00	0.000	0.000
					C	0.000	5.486		100.00	0.000	0.819
L8 6.50-0.00	3.24	1	18	24.141	A	0.000	24.141	24.141	100.00	0.000	0.000
					B	0.000	24.141		100.00	0.000	0.000
					C	0.000	24.141		100.00	0.000	3.548

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	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 147.00-105.00	125.27	1.464	5	0.8802	95.658	A	0.000	95.658	95.658	100.00	0.000	0.000
						B	0.000	95.658		100.00	0.000	0.000
						C	0.000	95.658		100.00	0.000	11.221
L2 105.00-	96.36	1.358	5	0.8529	45.116	A	0.000	45.116	45.116	100.00	0.000	0.000

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
88.00						B	0.000	45.116		100.00	0.000	0.000
						C	0.000	45.116		100.00	0.000	7.549
L3 88.00-84.50	86.24	1.316	5	0.8416	9.775	A	0.000	9.775	9.775	100.00	0.000	0.000
						B	0.000	9.775		100.00	0.000	0.000
						C	0.000	9.775		100.00	0.000	3.296
L4 84.50-73.75	79.08	1.284	5	0.8329	31.092	A	0.000	31.092	31.092	100.00	0.000	0.000
						B	0.000	31.092		100.00	0.000	0.000
						C	0.000	31.092		100.00	0.000	10.056
L5 73.75-42.75	58.15	1.176	4	0.8028	96.921	A	0.000	96.921	96.921	100.00	0.000	0.000
						B	0.000	96.921		100.00	0.000	0.000
						C	0.000	96.921		100.00	0.000	28.999
L6 42.75-8.00	24.97	1	4	0.7500	122.415	A	0.000	122.415	122.415	100.00	0.000	0.000
						B	0.000	122.415		100.00	0.000	0.000
						C	0.000	122.415		100.00	0.000	31.759
L7 8.00-6.50	7.25	1	4	0.7500	5.673	A	0.000	5.673	5.673	100.00	0.000	0.000
						B	0.000	5.673		100.00	0.000	0.000
						C	0.000	5.673		100.00	0.000	1.314
L8 6.50-0.00	3.24	1	4	0.7500	24.953	A	0.000	24.953	24.953	100.00	0.000	0.000
						B	0.000	24.953		100.00	0.000	0.000
						C	0.000	24.953		100.00	0.000	5.696

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 147.00-105.00	125.27	1.464	9	89.497	A	0.000	89.497	89.497	100.00	0.000	0.000
					B	0.000	89.497		100.00	0.000	0.000
					C	0.000	89.497		100.00	0.000	5.940
L2 105.00-88.00	96.36	1.358	9	42.623	A	0.000	42.623	42.623	100.00	0.000	0.000
					B	0.000	42.623		100.00	0.000	0.000
					C	0.000	42.623		100.00	0.000	4.062
L3 88.00-84.50	86.24	1.316	8	9.284	A	0.000	9.284	9.284	100.00	0.000	0.000
					B	0.000	9.284		100.00	0.000	0.000
					C	0.000	9.284		100.00	0.000	1.910
L4 84.50-73.75	79.08	1.284	8	29.599	A	0.000	29.599	29.599	100.00	0.000	0.000
					B	0.000	29.599		100.00	0.000	0.000
					C	0.000	29.599		100.00	0.000	5.867
L5 73.75-42.75	58.15	1.176	7	92.618	A	0.000	92.618	92.618	100.00	0.000	0.000
					B	0.000	92.618		100.00	0.000	0.000
					C	0.000	92.618		100.00	0.000	16.920
L6 42.75-8.00	24.97	1	6	117.766	A	0.000	117.766	117.766	100.00	0.000	0.000
					B	0.000	117.766		100.00	0.000	0.000
					C	0.000	117.766		100.00	0.000	18.966
L7 8.00-6.50	7.25	1	6	5.486	A	0.000	5.486	5.486	100.00	0.000	0.000
					B	0.000	5.486		100.00	0.000	0.000
					C	0.000	5.486		100.00	0.000	0.819
L8 6.50-0.00	3.24	1	6	24.141	A	0.000	24.141	24.141	100.00	0.000	0.000
					B	0.000	24.141		100.00	0.000	0.000
					C	0.000	24.141		100.00	0.000	3.548

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 90 deg - No Ice

Comb. No.	Description
4	Dead+Wind 180 deg - No Ice
5	Dead+Ice+Temp
6	Dead+Wind 0 deg+Ice+Temp
7	Dead+Wind 90 deg+Ice+Temp
8	Dead+Wind 180 deg+Ice+Temp
9	Dead+Wind 0 deg - Service
10	Dead+Wind 90 deg - Service
11	Dead+Wind 180 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 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-17.11	-0.76	0.44
			Max. Mx	3	-8.80	-344.84	0.51
			Max. My	2	-8.81	-0.61	344.27
			Max. Vy	3	15.97	-344.84	0.51
			Max. Vx	2	-15.92	-0.61	344.27
			Max. Torque	2			-2.05
L2	105 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-26.31	-0.04	0.27
			Max. Mx	3	-14.73	-779.19	1.50
			Max. My	2	-14.74	-1.45	777.70
			Max. Vy	3	22.29	-779.19	1.50
			Max. Vx	2	-22.23	-1.45	777.70
			Max. Torque	2			-2.04
L3	88 - 84.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-27.20	0.05	0.22
			Max. Mx	3	-15.47	-857.74	1.65
			Max. My	2	-15.48	-1.60	856.07
			Max. Vy	3	22.62	-857.74	1.65
			Max. Vx	2	-22.57	-1.60	856.07
			Max. Torque	4			1.75
L4	84.5 - 73.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-29.09	0.23	0.12
			Max. Mx	3	-17.01	-1006.93	1.94
			Max. My	2	-17.01	-1.86	1004.93
			Max. Vy	3	23.36	-1006.93	1.94
			Max. Vx	2	-23.31	-1.86	1004.93
			Max. Torque	4			1.73
L5	73.75 - 42.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-38.63	1.11	-0.39
			Max. Mx	3	-25.17	-1761.67	3.28
			Max. My	2	-25.18	-3.13	1758.10
			Max. Vy	3	26.04	-1761.67	3.28
			Max. Vx	4	25.99	3.33	-1757.98
			Max. Torque	4			1.69
L6	42.75 - 8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-52.96	2.35	-1.11
			Max. Mx	3	-37.89	-2846.57	4.95
			Max. My	4	-37.89	5.44	-2841.22
			Max. Vy	3	28.79	-2846.57	4.95
			Max. Vx	4	28.74	5.44	-2841.22
			Max. Torque	4			1.55
L7	8 - 6.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-53.50	2.40	-1.14
			Max. Mx	3	-38.39	-2889.78	5.01
			Max. My	4	-38.39	5.52	-2884.37
			Max. Vy	3	28.89	-2889.78	5.01
			Max. Vx	4	28.83	5.52	-2884.37
			Max. Torque	4			1.39
L8	6.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-55.88	2.62	-1.26
			Max. Mx	3	-40.54	-3078.67	5.27

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	4	-40.54	5.87	-3073.00
			Max. Vy	3	29.29	-3078.67	5.27
			Max. Vx	4	29.24	5.87	-3073.00
			Max. Torque	4			1.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	5	55.88	0.00	-0.00
	Max. H_x	4	40.55	0.05	-29.22
	Max. H_z	2	40.55	-0.05	29.22
	Max. M_x	2	3072.72	-0.05	29.22
	Max. M_z	3	3078.67	-29.27	0.05
	Max. Torsion	4	1.35	0.05	-29.22
	Min. Vert	3	40.55	-29.27	0.05
	Min. H_x	3	40.55	-29.27	0.05
	Min. H_z	4	40.55	0.05	-29.22
	Min. M_x	4	-3073.00	0.05	-29.22
	Min. M_z	4	-5.87	0.05	-29.22
	Min. Torsion	2	-1.35	-0.05	29.22

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	40.55	0.00	0.00	0.14	0.43	0.00
Dead+Wind 0 deg - No Ice	40.55	0.05	-29.22	-3072.72	-4.98	1.35
Dead+Wind 90 deg - No Ice	40.55	29.27	-0.05	-5.27	-3078.67	-1.07
Dead+Wind 180 deg - No Ice	40.55	-0.05	29.22	3073.00	5.87	-1.35
Dead+Ice+Temp	55.88	-0.00	0.00	1.26	2.62	0.00
Dead+Wind 0 deg+Ice+Temp	55.88	0.01	-7.07	-768.44	1.59	0.19
Dead+Wind 90 deg+Ice+Temp	55.88	7.08	-0.01	0.17	-768.32	-0.18
Dead+Wind 180 deg+Ice+Temp	55.88	-0.01	7.07	771.04	3.86	-0.19
Dead+Wind 0 deg - Service	40.55	0.02	-10.11	-1064.41	-1.44	0.47
Dead+Wind 90 deg - Service	40.55	10.13	-0.02	-1.74	-1066.28	-0.38
Dead+Wind 180 deg - Service	40.55	-0.02	10.11	1064.69	2.31	-0.47

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-40.55	0.00	0.00	40.55	0.00	0.000%
2	0.05	-40.55	-29.22	-0.05	40.55	29.22	0.002%
3	29.27	-40.55	-0.05	-29.27	40.55	0.05	0.002%
4	-0.05	-40.55	29.22	0.05	40.55	-29.22	0.002%
5	0.00	-55.88	0.00	0.00	55.88	-0.00	0.000%
6	0.01	-55.88	-7.07	-0.01	55.88	7.07	0.000%
7	7.08	-55.88	-0.01	-7.08	55.88	0.01	0.000%
8	-0.01	-55.88	7.07	0.01	55.88	-7.07	0.000%
9	0.02	-40.55	-10.11	-0.02	40.55	10.11	0.002%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
10	10.13	-40.55	-0.02	-10.13	40.55	0.02	0.002%
11	-0.02	-40.55	10.11	0.02	40.55	-10.11	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00002506	0.00010415
3	Yes	15	0.00002505	0.00008391
4	Yes	15	0.00002506	0.00008846
5	Yes	6	0.00000001	0.00000001
6	Yes	16	0.00000001	0.00007035
7	Yes	16	0.00000001	0.00007034
8	Yes	16	0.00000001	0.00007044
9	Yes	14	0.00000001	0.00004975
10	Yes	14	0.00000001	0.00004476
11	Yes	14	0.00000001	0.00004832

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 105	33.701	10	1.9148	0.0039
L2	108.75 - 88	19.043	10	1.6480	0.0030
L3	88 - 84.5	12.492	10	1.3222	0.0017
L4	84.5 - 73.75	11.540	10	1.2747	0.0015
L5	78 - 42.75	9.872	10	1.1739	0.0013
L6	47.5 - 8	3.711	10	0.7217	0.0006
L7	8 - 6.5	0.102	10	0.1218	0.0001
L8	6.5 - 0	0.067	10	0.0991	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	(3) FV65-14-00NA2 w/Mount Pipe	10	33.701	1.9148	0.0039	33798
135.00	Pipe Mount [PM 601-3]	10	28.915	1.8683	0.0038	14082
126.00	(4) 844G90VTA-SX w/ Mount Pipe	10	25.399	1.8188	0.0037	8046
116.00	(2) Antel LPA-185090/8CFx2 w/ mount pipe	10	21.637	1.7351	0.0034	5450
105.00	AM-X-CD-14-65-00T-RET w/ Mount Pipe	10	17.756	1.5927	0.0028	4061
80.00	Side Arm Mount [SO 701-3]	10	10.372	1.2060	0.0014	4136

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 105	97.110	3	5.5193	0.0112
L2	108.75 - 88	54.911	3	4.7516	0.0086
L3	88 - 84.5	36.033	3	3.8140	0.0047
L4	84.5 - 73.75	33.289	3	3.6770	0.0044
L5	78 - 42.75	28.482	3	3.3867	0.0037
L6	47.5 - 8	10.710	3	2.0829	0.0017
L7	8 - 6.5	0.295	3	0.3517	0.0002
L8	6.5 - 0	0.194	3	0.2862	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	(3) FV65-14-00NA2 w/Mount Pipe	3	97.110	5.5193	0.0112	11934
135.00	Pipe Mount [PM 601-3]	3	83.333	5.3854	0.0110	4971
126.00	(4) 844G90VTA-SX w/ Mount Pipe	3	73.212	5.2429	0.0106	2839
116.00	(2) Antel LPA-185090/8CFx2 w/ mount pipe	3	62.380	5.0023	0.0097	1921
105.00	AM-X-CD-14-65-00T-RET w/ Mount Pipe	3	51.203	4.5925	0.0079	1428
80.00	Side Arm Mount [SO 701-3]	3	29.923	3.4791	0.0039	1445

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 - 105 (1)	TP29.141x22x0.25	42.00	0.00	0.0	36.000	22.4191	-8.80	807.09	0.011
L2	105 - 88 (2)	TP31.5319x28.0034x0.3125	20.75	0.00	0.0	36.000	30.9657	-14.73	1114.77	0.013
L3	88 - 84.5 (3)	TP32.127x31.5319x0.4815	3.50	0.00	0.0	36.000	48.3632	-15.47	1741.08	0.009
L4	84.5 - 73.75 (4)	TP33.955x32.127x0.4415	10.75	0.00	0.0	36.000	45.9504	-17.01	1654.22	0.010
L5	73.75 - 42.75 (5)	TP38.601x32.3493x0.5144	35.25	0.00	0.0	36.000	60.8088	-25.17	2189.12	0.011
L6	42.75 - 8 (6)	TP43.7597x36.7298x0.5547	39.50	0.00	0.0	36.000	76.0675	-37.89	2738.43	0.014
L7	8 - 6.5 (7)	TP44.0148x43.7597x0.568	1.50	0.00	0.0	36.000	78.3273	-38.39	2819.78	0.014
L8	6.5 - 0 (8)	TP45.12x44.0148x0.5643	6.50	0.00	0.0	36.000	79.8032	-40.54	2872.91	0.014

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 - 105 (1)	TP29.141x22x0.25	344.84	26.501	36.000	0.736	0.00	0.000	36.000	0.000
L2	105 - 88 (2)	TP31.5319x28.0034x0.3125	779.20	39.280	36.000	1.091	0.00	0.000	36.000	0.000
L3	88 - 84.5 (3)	TP32.127x31.5319x0.481	857.74	27.453	36.000	0.763	0.00	0.000	36.000	0.000

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 $\frac{f_{by}}{F_{by}}$
L4	84.5 - 73.75 (4)	TP33.955x32.127x0.4415 5	1006.93	32.679	36.000	0.908	0.00	0.000	36.000	0.000
L5	73.75 - 42.75 (5)	TP38.601x32.3493x0.5144	1761.68	38.051	36.000	1.057	0.00	0.000	36.000	0.000
L6	42.75 - 8 (6)	TP43.7597x36.7298x0.5547	2846.57	42.329	36.000	1.176	0.00	0.000	36.000	0.000
L7	8 - 6.5 (7)	TP44.0148x43.7597x0.568	2889.78	41.509	36.000	1.153	0.00	0.000	36.000	0.000
L8	6.5 - 0 (8)	TP45.12x44.0148x0.5643	3078.68	42.307	36.000	1.175	0.00	0.000	36.000	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 - 105 (1)	TP29.141x22x0.25	15.97	0.712	24.000	0.059	1.18	0.044	24.000	0.002
L2	105 - 88 (2)	TP31.5319x28.0034x0.3125	22.29	0.720	24.000	0.060	1.31	0.032	24.000	0.001
L3	88 - 84.5 (3)	TP32.127x31.5319x0.4815	22.62	0.468	24.000	0.039	1.30	0.020	24.000	0.001
L4	84.5 - 73.75 (4)	TP33.955x32.127x0.4415	23.36	0.508	24.000	0.042	1.28	0.020	24.000	0.001
L5	73.75 - 42.75 (5)	TP38.601x32.3493x0.5144	26.05	0.428	24.000	0.036	1.20	0.013	24.000	0.001
L6	42.75 - 8 (6)	TP43.7597x36.7298x0.5547	28.79	0.379	24.000	0.032	1.10	0.008	24.000	0.000
L7	8 - 6.5 (7)	TP44.0148x43.7597x0.568	28.89	0.369	24.000	0.031	1.10	0.008	24.000	0.000
L8	6.5 - 0 (8)	TP45.12x44.0148x0.5643	29.29	0.367	24.000	0.031	1.08	0.007	24.000	0.000

Pole Interaction Design Data

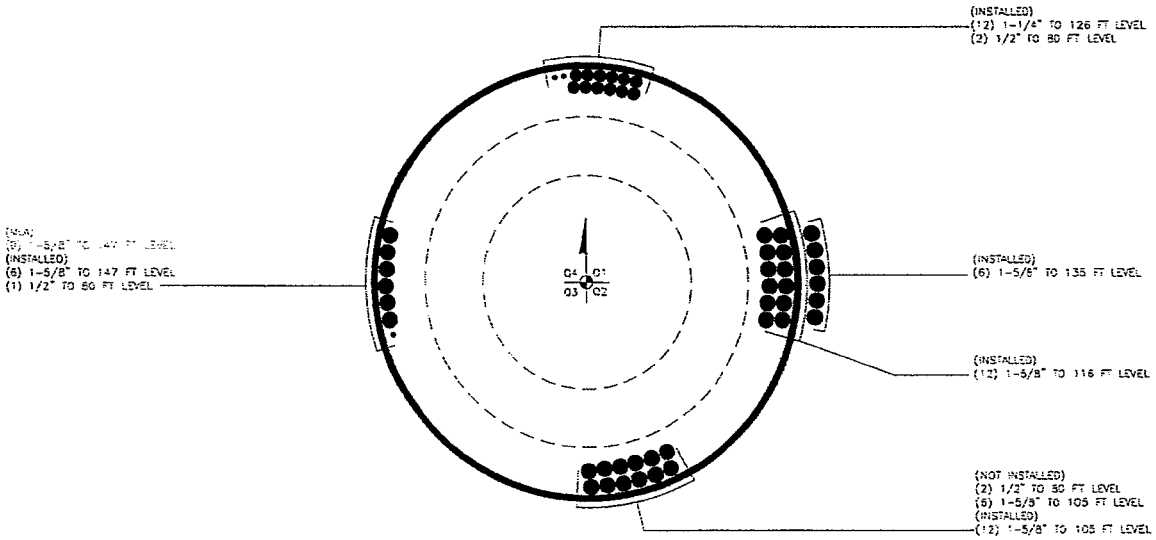
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 105 (1)	0.011	0.736	0.000	0.059	0.002	0.748 ✓	1.333	H1-3+VT ✓
L2	105 - 88 (2)	0.013	1.091	0.000	0.060	0.001	1.105 ✓	1.333	H1-3+VT ✓
L3	88 - 84.5 (3)	0.009	0.763	0.000	0.039	0.001	0.772 ✓	1.333	H1-3+VT ✓
L4	84.5 - 73.75 (4)	0.010	0.908	0.000	0.042	0.001	0.919 ✓	1.333	H1-3+VT ✓
L5	73.75 - 42.75 (5)	0.011	1.057	0.000	0.036	0.001	1.069 ✓	1.333	H1-3+VT ✓
L6	42.75 - 8 (6)	0.014	1.176	0.000	0.032	0.000	1.190 ✓	1.333	H1-3+VT ✓
L7	8 - 6.5 (7)	0.014	1.153	0.000	0.031	0.000	1.167 ✓	1.333	H1-3+VT ✓
L8	6.5 - 0 (8)	0.014	1.175	0.000	0.031	0.000	1.190 ✓	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 - 105	Pole	TP29.141x22x0.25	1	-8.80	1075.85	56.1	Pass
L2	105 - 88	Pole	TP31.5319x28.0034x0.3125	2	-14.73	1485.99	82.9	Pass
L3	88 - 84.5	Pole	TP32.127x31.5319x0.4815	3	-15.47	2320.86	57.9	Pass
L4	84.5 - 73.75	Pole	TP33.955x32.127x0.4415	4	-17.01	2205.08	68.9	Pass
L5	73.75 - 42.75	Pole	TP38.601x32.3493x0.5144	5	-25.17	2918.10	80.2	Pass
L6	42.75 - 8	Pole	TP43.7597x36.7298x0.5547	6	-37.89	3650.33	89.3	Pass
L7	8 - 6.5	Pole	TP44.0148x43.7597x0.568	7	-38.39	3758.77	87.5	Pass
L8	6.5 - 0	Pole	TP45.12x44.0148x0.5643	8	-40.54	3829.59	89.2	Pass
							Summary	
						Pole (L6)	89.3	Pass
						RATING =	**89.3**	**Pass**

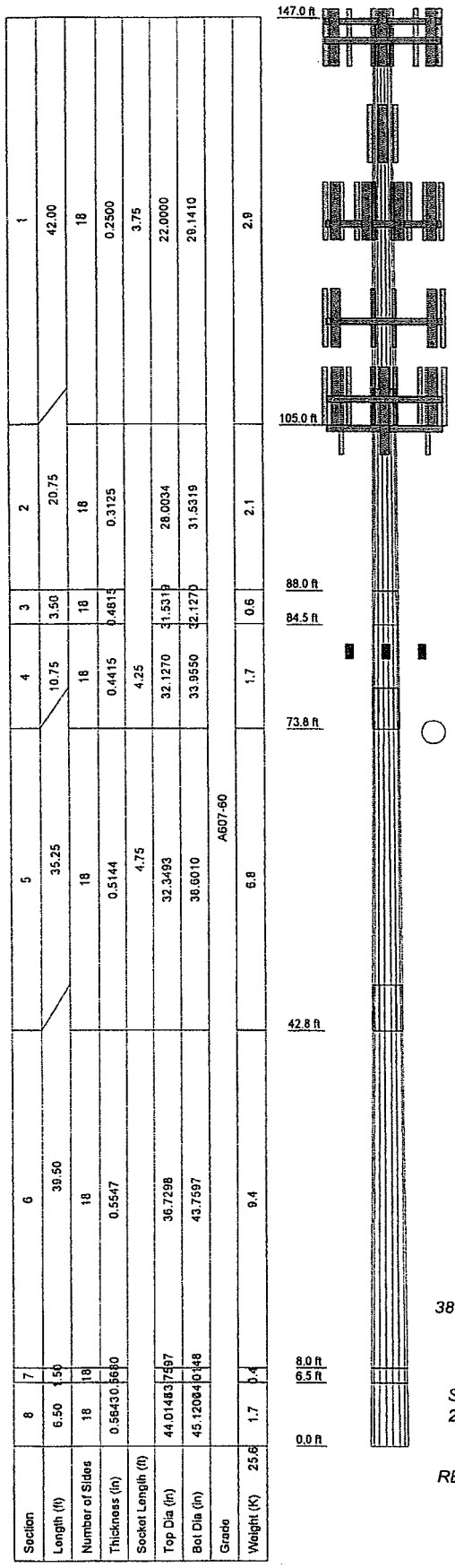
APPENDIX B

BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS



Section	1	2	3	4	5	6	7	8
Length (ft)	42.00	20.75	3.50	10.75	35.25	30.50	1.50	6.50
Number of Sides	18	18	18	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.4815	0.4415	0.5144	0.5547	0.5680	0.5843
Socket Length (ft)	3.75			4.25	4.75			
Top Dia (in)	22.0000	28.0034	31.5319	32.1270	32.3493	36.7298	37.597	44.0148
Bot Dia (in)	28.1410	31.5319	32.1270	33.9550	38.6010	43.7597	44.148	45.1208
Grade	A607-60							
Weight (K)	2.9	2.1	0.6	1.7	6.8	9.4	0.4	1.7

DESIGNED APPURTENANCE LOADING

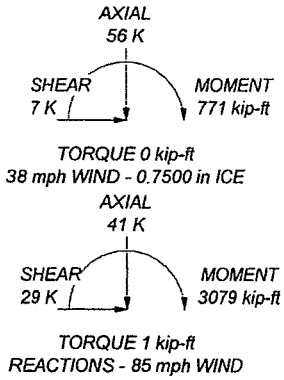
TYPE	ELEVATION	TYPE	ELEVATION
(3) FV65-14-00NA2 w/Mount Pipe	147	AM-X-CD-14-65-00T-RET w/ Mount Pipe	105
(3) FV65-14-00NA2 w/Mount Pipe	147	AM-X-CD-14-65-00T-RET w/ Mount Pipe	105
(3) FV65-14-00NA2 w/Mount Pipe	147	AM-X-CD-14-65-00T-RET w/ Mount Pipe	105
Platform Mount [LP 401-1]	147	(2) RRUS-11	105
6'x2" Pipe Mount	147	(2) RRUS-11	105
6'x2" Pipe Mount	147	(2) RRUS-11	105
6'x2" Pipe Mount	147	DC6-48-60-18-8F	105
Pipe Mount [PM 601-3]	135	(2) Powerwave Technologies 7770 w/ Mount Pipe	105
Celwave APXV18-206515L-03 w/Mount Pipe	135	(2) Powerwave Technologies 7770 w/ Mount Pipe	105
Celwave APXV18-206515L-03 w/Mount Pipe	135	(2) Powerwave Technologies 7770 w/ Mount Pipe	105
Celwave APXV18-206515L-03 w/Mount Pipe	135	(4) Powerwave Technologies LGP2140X	105
(4) 844G90VTA-SX w/ Mount Pipe	126	(4) Powerwave Technologies LGP2140X	105
(4) 844G90VTA-SX w/ Mount Pipe	126	(4) Powerwave Technologies LGP2140X	105
(4) 844G90VTA-SX w/ Mount Pipe	126	Platform Mount [LP 401-1]	105
Platform Mount [LP 401-1]	126	6'x2" Pipe Mount	105
(2) Antel LPA-185090/8CFx2 w/ mount pipe	116	6'x2" Pipe Mount	105
(2) Antel LPA-185090/8CFx2 w/ mount pipe	116	6'x2" Pipe Mount	105
(2) DB844H80-XY w/Mount Pipe	116	Side Arm Mount [SO 701-3]	80
(2) DB844H80-XY w/Mount Pipe	116	KS24019-L112A	80
(2) Antel LPA-80063/6CF w/ Mount Pipe	116	Kathrein OG-860/1920/GPS-A	80
(2) Antel LPA-185090/8CFx2 w/ mount pipe	116	KS24019-L112A	80
(2) ADC DUAL BAND 800/1900 FULL BAND	116		
Platform Mount [LP 401-1]	116		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 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: 89.3%



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

Job: *Ex. 147 ft Monopole, Secondino, Property Branford, CT*		
Project: *PJF #37511-0162/ BU #876316*		
Client: Crown Castle International	Drawn by: Udaykiran Yerra	App'd:
Code: TIA/EIA-222-F	Date: 02/01/11	Scale: NTS
Path: T:\376_Crown_Castle\2011\37511-0162 BU 876316\37511-0162 Rnsf.en		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#:	
Site Name:	
App #:	

Reactions		
Moment:	3079	ft-kips
Axial:	41	kips
Shear:	29	kips

Connection Type:	*Butt*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Bolt Circle:	52	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	53	in
Thick:	3	in
Grade:	50	ksi
B effective	29.83	in

Pole Data		
Diam:	45.12	in
Thick:	0.4375	in
Grade:	60	ksi

Stress Increase Factor		
ASIF:	1.333	

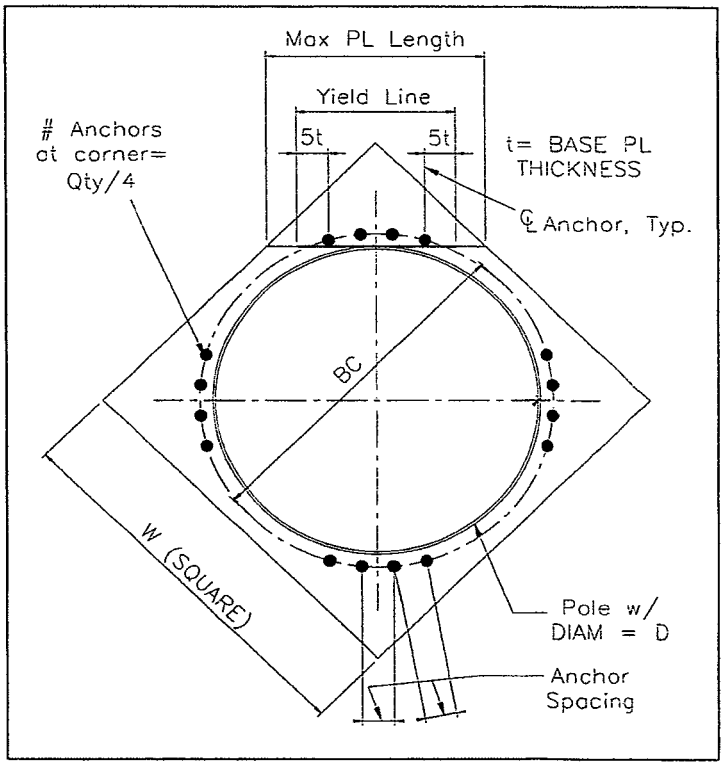
Anchor Rod Results

Maximum Rod Tension:	175.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	89.8% **Pass**

Base Plate Results

Base Plate Stress:	40.5 ksi
Allowable Plate Stress:	50.0 ksi
Base Plate Stress Ratio:	81.0% **Pass**

PL Ref. Data
Yield Line (in):
29.83
Max PL Length:
29.83



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708
Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

Job Number:	37511-0162	**Page:**	1
Site Number:	876316	**By:**	XXX
Site Name:	Site Name	**Date:**	2/4/2011

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	3079.0		k-ft
Shear, V =	29.0		kips
Axial Load, P =	41.0		kips
OTM =	3093.5	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	22.5	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00
+ Effective Soil Wt. - Buoyant Conc. Wt. ≥ Compression
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

Number of Bars =	32	
Rebar Size =	#11	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	4	in

Soil Parameters

Water Table Depth =	5.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Maximum Capacity Ratios

Maximum Soil Ratio =	110.0%
Maximum Steel Ratio =	105.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	5	100		36	Sand				5
2	2.5	135		36	Sand				7.5
3	18.5	135		40	Sand	16000			26
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	16.18	ft, from Grade	Shear, V =	29.00	kips
Bending Moment, M =	3562.78	k-ft, from COR	Resisting Shear, Va =	33.19	kips
Resisting Moment, Ma =	4077.59	k-ft, from COR			

MOMENT RATIO = 87.4% OK **SHEAR RATIO =** 87.4% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	72.60	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	41.00	kips
Allowable Comp. Cap., Ca =	285.27	kips

COMPRESSION RATIO = 14.4% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	27.71	sq in
Actual Steel Area =	49.92	sq in
Allowable Min Axial, Pa =	-2073.60	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6799.77	kips, Where Ma = 0 k-ft
Axial Load, P =	73.59	kips @ 5.25 ft Below Grade
Moment, M =	3223.66	k-ft @ 5.25 ft Below Grade
Allowable Moment, Ma =	5828.13	k-ft

MOMENT RATIO = 55.3% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876316*
Site Name: *Site Name*
App #:

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	3223.66	ft-kips (* Note)
Max. Service Shaft P:	73.59	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Load Factor	Shaft Factored Loads		
1.30	Mu:	4190.758	ft-kips
1.30	Pu:	95.667	kips

Pier Properties

Concrete:

Pier Diameter = 7.0 ft
Concrete Area = 5541.8 in^2

Reinforcement:

Clear Cover to **Tie**= 4.00 in
Horiz. **Tie** Bar Size= 5
Vert. Cage Diameter = 6.11 ft
Vert. Cage Diameter = 73.34 in
Vertical Bar Size = 11
Bar Diameter = 1.41 in
Bar Area = 1.56 in^2
Number of Bars = 32
As Total= 49.92 in^2
A s/ Aconc, Rho: 0.0090 0.90%

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

Seismic Properties

Seismic Design Category = D
Seismic Risk = **High**

Solve (Run) <-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tesnion Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033
IBC 1810.1.2: 0.0050 SDC D, E, or F
Governing: 0.0050 **0.50%**

ACI 10.8 and 10.9
Min As for Columns, Comp. Controlled, Shafts:

Min As: 0.0100 **1.00%**

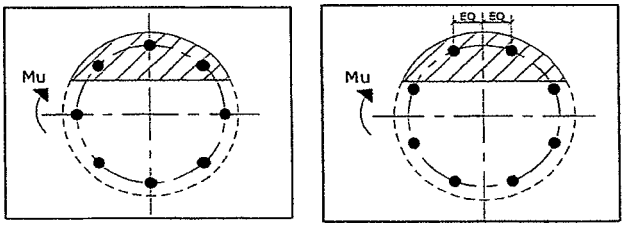
Minimum Rho Check:

Actual Req'd Min. Rho: 0.50% Flexural Member
Provided Rho: 0.90% **OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8839.70	kips
at Mu=(ϕ=0.65)Mn=	5309.39	ft-kips
Max Tu, (φ=0.9) Tn =	2695.68	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Extreme Steel Strain, εt: **0.0108**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Dist. From Edge to Neutral Axis: **17.12** in

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu =	95.67	kips
Drilled Shaft Moment Capacity, φMn:	**7576.56**	ft-kips
Drilled Shaft Superimposed Mu:	**4190.76**	ft-kips

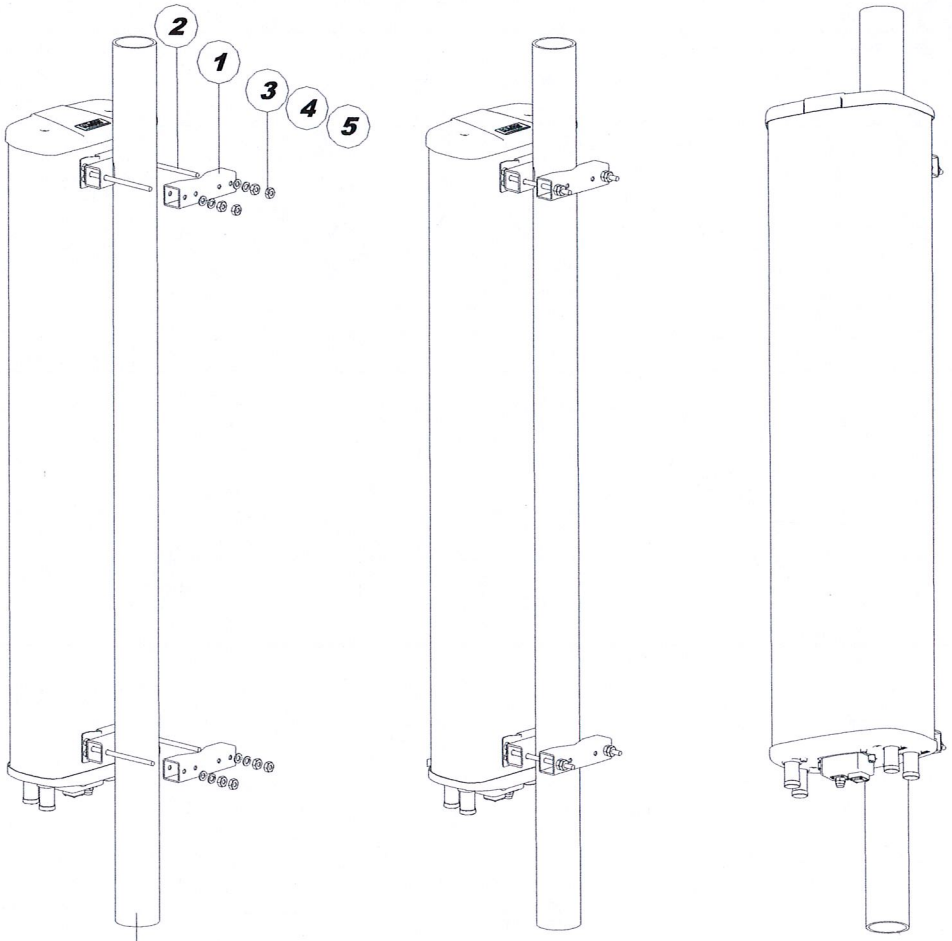
(Mu/φMn, Drilled Shaft Flexure CSR:	55.31%

Simply Intelligent

KMW Communications
Base Station Antennas
For Mobile Communications

AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

Antenna Drawings and Installation Diagram



MOUNT POLE
Ø1.97 ~ 3.15inch OD.
(50 ~ 80mm OD.)

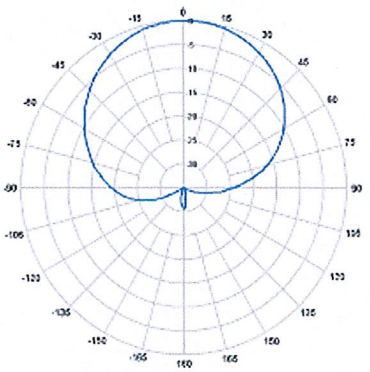
STANDARD MOUNTING KITS

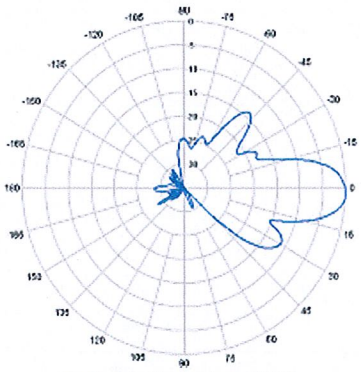
No.	PART NAME	Q'TY	Recommending Torque
1	FIXED CLAMP	4	
2	Hex. Cap Bolt, M10	4	17mm Spanner 208lbf.inch 240kgf.cm
3	Plain Washer, M10	4	
4	Spring Washer, M10	4	
5	Hex. Nut, M10	8	

Simply Intelligent

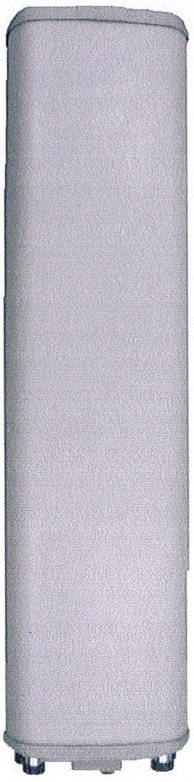
AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

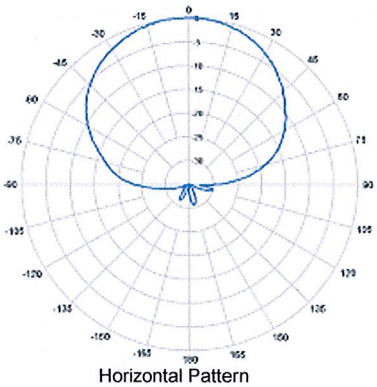
KMW Communications
Base Station Antennas
For Mobile Communications

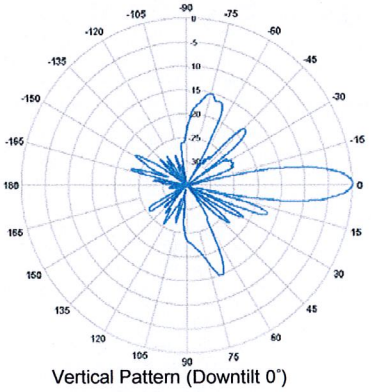

Horizontal Pattern


Vertical Pattern (Downtilt 2°)

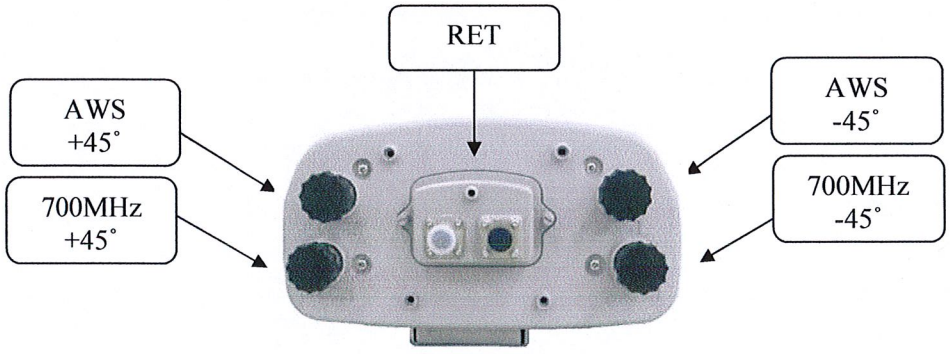
700MHz band Pattern




Horizontal Pattern


Vertical Pattern (Downtilt 0°)

AWS band Pattern



Simply Intelligent

KMW Communications
Base Station Antennas
For Mobile Communications

AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

Dual Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V17.0°
1710 ~ 2170MHz, X-pol., H65° / V8.5°

Electrical Specification

Frequency Range		698~894MHz	1710~2170MHz
Impedance		50Ω	
Polarization		Dual, Slant ±45°	
Gain		14.0dBi / 11.85dBd @ 698-806MHz 14.8dBi / 12.65dBd @ 824-894MHz	16.1dBi / 13.95dBd @1710-1755MHz 16.3dBi / 14.15dBd @1850-1900MHz 16.0dBi / 13.85dBd @2110-2155MHz
Beamwidth	Horizontal	67° @ 698-806MHz 65° @ 824-894MHz	60° @ 1710-1755MHz 61° @ 1850-1900MHz 64° @ 2110-2155MHz
	Vertical	17.5 @ 698-806MHz 16.5° @ 824-894MHz	8.8° @ 1710-1755MHz 8.5° @ 1850-1900MHz 8.0° @ 2110-2155MHz
VSWR		≤1.5:1	
Front-to-Back Ratio		≥28 dB	
Electrical Downtilt Range		2° ~ 16°	0° ~ 10°
Isolation Between Ports		≥30 dB	
Isolation Between Ports of Different Frequency Elements		≥35 dB	
Cross Pole Discrimination		10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression		16dB	
Side Lobe Suppression		> 16dB @ 0-6° Tilt > 18dB @ 7-12° Tilt (Up to 15° from Boresight)	> 16dB @ 0-6° Tilt > 18dB @ 7-10° Tilt (Up to 15° from Boresight)
Passive Intermodulation		≤ -150 dBc @ 2x20w	
Input Maximum CW Power		500 W	300 W
Environmental Compliance		IP65 for Radome IP67 for Connectors	
RET Motor Configuration		Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0		AISG 1.1 and 2.0	

Mechanical Specification

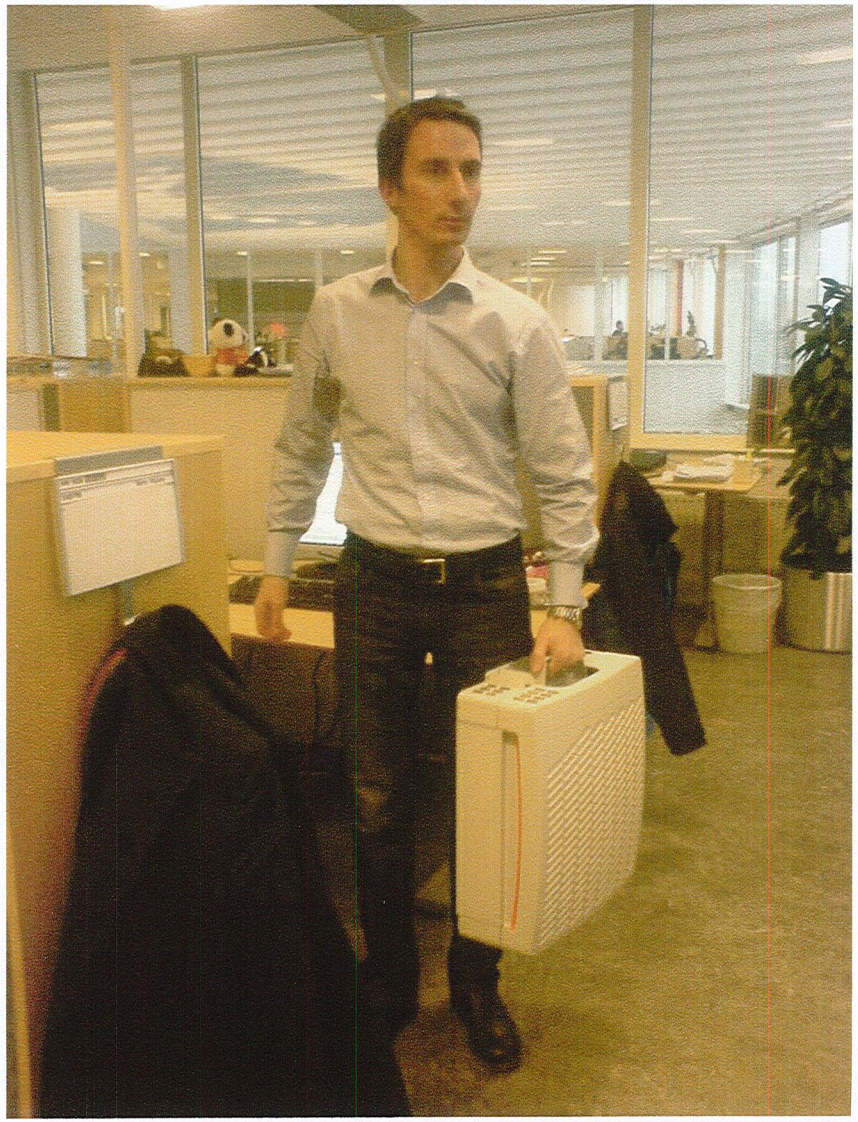
Dimension (W×D×H)	11.8×5.9×48 inches (300×150×1219mm)
Weight (Without clamp)	16.5 kg (36.4 lbs)
Connector	4 x 7/16 DIN(F), Long Neck
Max Wind Speed	150mph
Wind Load (@150 mph)	1260 N

RRUS 11 – Dual PA RRU.

Technical Data

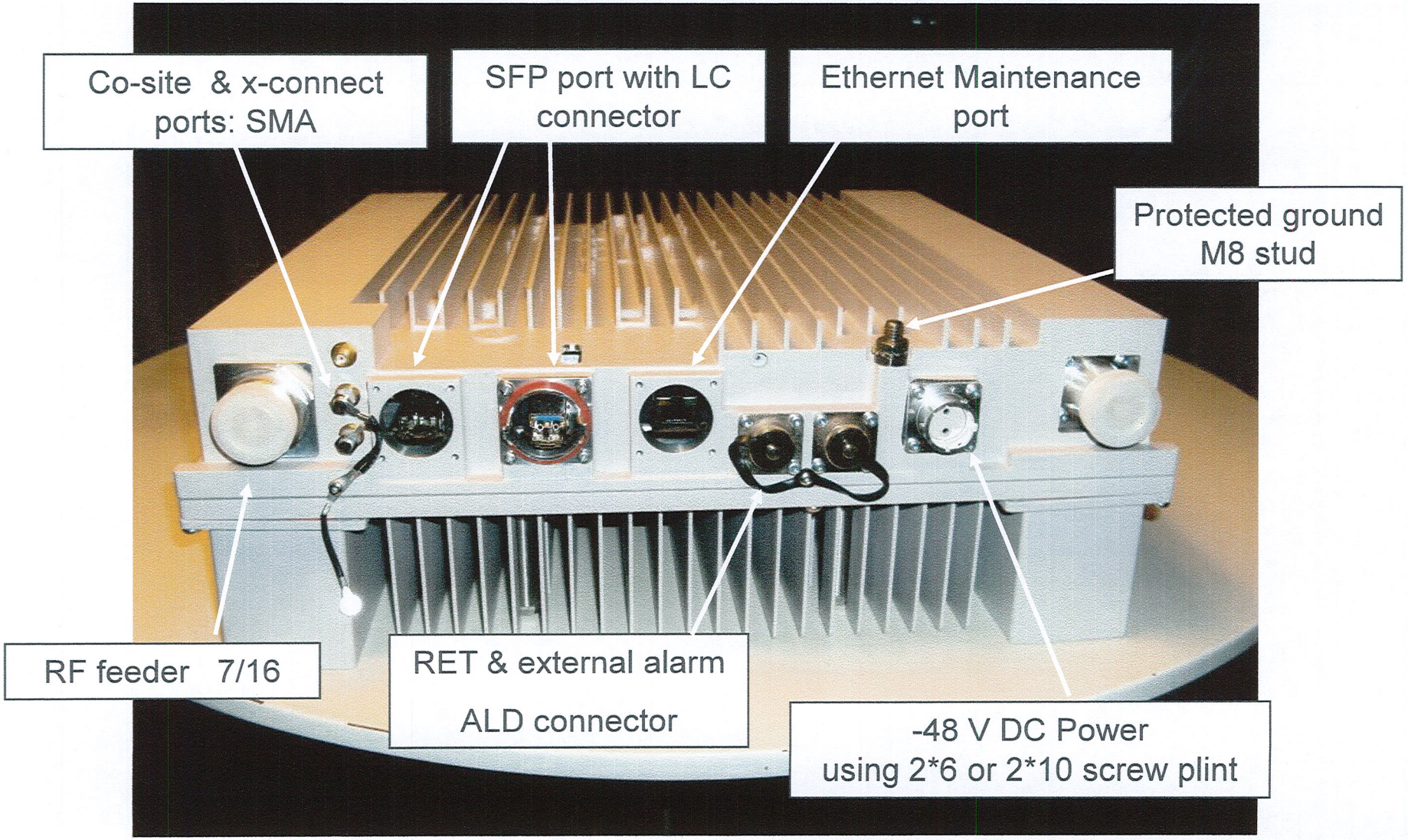
RBS6000

- 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



POWER

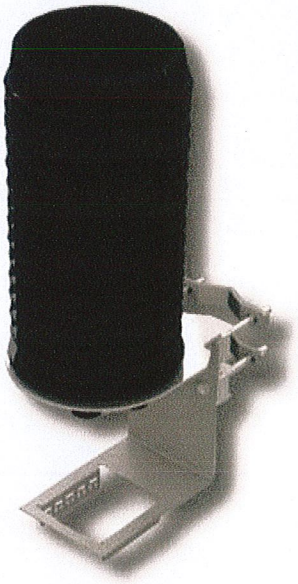
DC6-48-60-18-8F

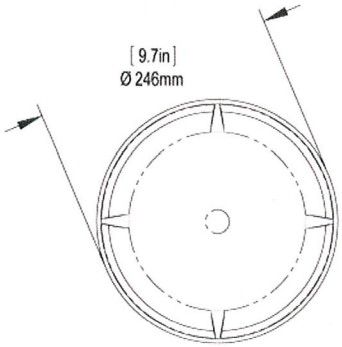
DC Surge Suppression Solution

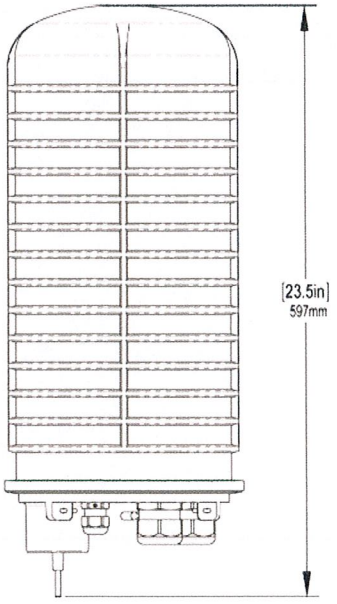
The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

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.

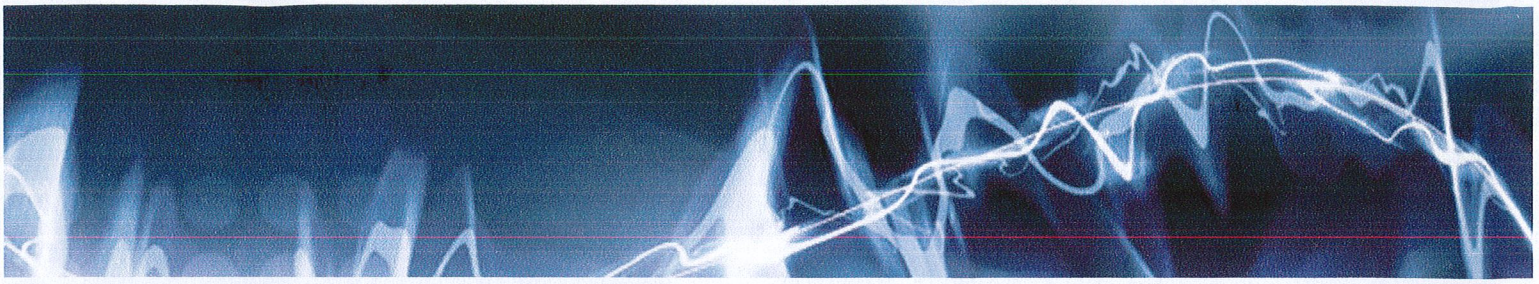






Raycap

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

G02-00-068 REV 050610

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Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

February 24, 2011

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

Re: Telecommunications Facility – 21 Acorn 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