STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

July 11, 2011

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

RE: **EM-CING-009-110624** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 23 Spring Hill Lane, Bethel, 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 June 23, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Matthew S. Knickerbocker, First Selectman, Town of Bethel
Steve Palmer, Planning & Zoning Official, Town of Bethel
Valley Communications

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@ct.gov
www.ct.gov/csc

June 27, 2011

The Honorable Matthew S. Knickerbocker
First Selectman
Town of Bethel
1 School Street
Bethel Municipal Center
Bethel, CT 06801-2105

RE: **EM-CING-009-110624** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 23 Spring Hill Lane, Bethel, Connecticut.

Dear First Selectman Knickerbocker:

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 July 12, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Steve Palmer, Planning & Zoning Official, Town of Bethel

CSC
CONNECTICUT SITING COUNCIL

EM-CING-009-110624

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

June 23, 2011

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

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 23 Spring Hill Lane Bethel, CT (owner Valley Communications).

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 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.

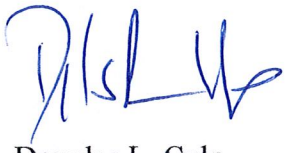
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

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

23 Spring Hill Lane Bethel, CT
Site Number CT2268
Exempt Mod

Tower Owner/Manager: Valley Communications

Equipment configuration: Monopole

Current and/or approved: Six PowerWave P7770 antennas @ 123 ft
Six PowerWave TMA's and Six PowerWave Diplexers @ 123 ft
Twelve runs 1 5/8 inch coax @ 123 ft
Equipment Shelter

Planned Modifications: Retain existing PowerWave P7770 Antenna's and TMA's @ 123 ft
Retain all Coax Cabling
Install two PowerWave P65-16 and one P90-16 antennas or equivalent @ 123 ft
Install six remote radio heads Ericsson RRUS-11 @ 123 ft
Install three PowerWave Twin BP TMA's TT19-08BP111-001 @ 123 ft
Install one Raycap Fiber Power Connector/ Surge Suppressor – DC6-48-60-18-8F @ 123 ft
Install one fiber and two DC power cables @ 123 ft

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 96.6 % 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 98.7 % of the standard.

Existing

Other Users							75.83
AT&T UMTS	122	1900 Band	1	500	0.0121	1.0000	1.21
AT&T UMTS	122	800 Band	1	500	0.0121	0.5867	2.06
AT&T GSM	122	800Band	11	296	0.0787	0.5867	13.41
AT&T GSM	122	1900 Band	4	427	0.0413	1.0000	4.13
Total							**96.6%**

* 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							75.83
AT&T UMTS	123	800 Band	1	500	0.0119	0.5867	2.03
AT&T UMTS	123	1900 Band	1	500	0.0119	1.0000	1.19
AT&T GSM	123	1900 Band	4	427	0.0406	1.0000	4.06
AT&T GSM	123	880 - 894	11	296	0.0774	0.5867	13.19
AT&T LTE	123	740 - 746	1	500	0.0119	0.4933	2.41
Total							**98.7%**

* 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. (Clough Harbour and Associates dated 6-10-11).

NEW CINGULAR WIRELESS PCS, LLC
WIRELESS COMMUNICATIONS FACILITY CT2268
BETHEL - AWS SPRING HILL LANE

23 SPRING HILL LANE
BETHEL, CONNECTICUT

PROJECT SUMMARY

SITE NUMBER:	CT2268
SITE NAME:	BETHEL – AWS SPRING HILL LANE
SITE ADDRESS:	23 SPRING HILL LANE BETHEL, CT 06801
STRUCTURE OWNER:	VALLEY COMMUNICATIONS
APPLICANT:	NEW CINGULAR WIRELESS PCS, LLC 500 ENTERPRISE DRIVE ROCKY HILL, CT 06067
CONTACT:	MICHAEL D. FOLEY (203) 414-1184
COORDINATES:	41° 21' 43.94"N 73° 23' 47.69"W
HORIZONTAL DATUM:	NAD 83
ENGINEER:	CHA, INC. 2139 SILAS DEANE HIGHWAY SUITE 212 ROCKY HILL, CT 06067
CONTACT:	PAUL LUSITANI (860) 257-4557

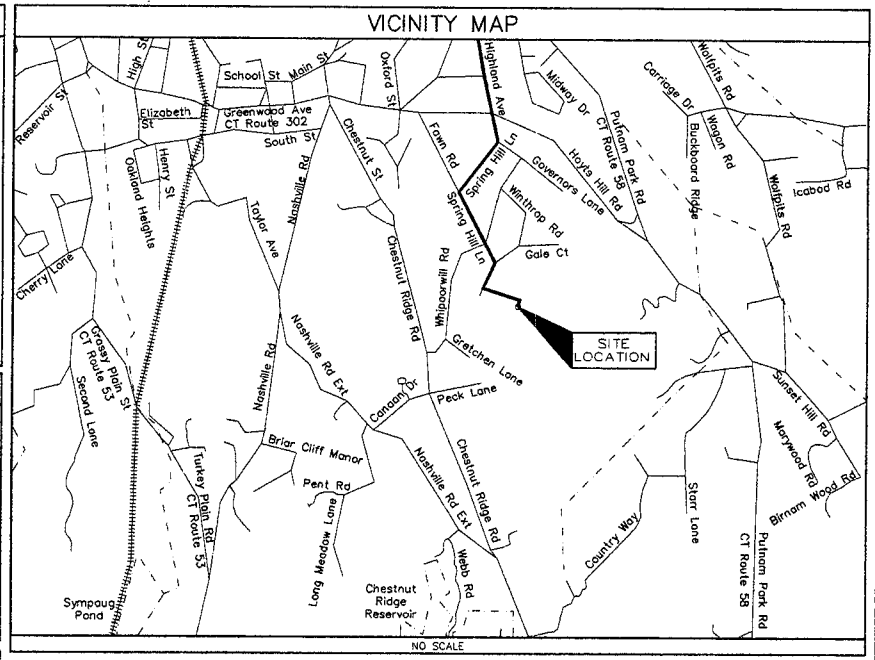
DRIVING DIRECTIONS

FROM HARTFORD:
1. TAKE I-84W.
2. TAKE EXIT 10 FOR US-6W TOWARD NEWTOWN/SANDY HOOK.
3. TURN RIGHT ONTO CT-34W/US-6W/CHURCH HILL ROAD.
4. TURN LEFT ONTO MAIN STREET.
5. TAKE FIRST RIGHT ONTO CT-302W/SUGAR STREET.
6. TURN LEFT ONTO HIGHLAND AVENUE.
7. CONTINUE STRAIGHT ONTO GOVERNORS LANE.
8. TURN RIGHT ONTO SPRING HILL LANE.
9. TURN LEFT ONTO ACCESS ROAD AT 23 SPRING HILL LANE, AND FOLLOW TO TOWER.

PROJECT DESCRIPTION

THIS PROJECT ADDS THREE ANTENNAS, SIX RRH, SURGE ARRESTORS, AND A RADIO CABINET TO AN EXISTING TELECOMMUNICATIONS SITE

VICINITY MAP



NORTH

APRIL 5, 2011

SHEET INDEX

SHEET NO:	SHEET TITLE	REVISION HISTORY NO:	REVISION HISTORY DATE
T01	TITLE SHEET	1	04 / 05 / 11
C01	COMPOUND PLAN	1	04 / 05 / 11
C02	SHELTER PLAN	1	04 / 05 / 11
C03	ELEVATION AND ANTENNA PLAN	1	04 / 05 / 11
C04	STRUCTURAL DETAILS	1	04 / 05 / 11
E01	GROUNDING DETAILS & PLUMBING DIAGRAM	1	04 / 05 / 11
GN01	GENERAL NOTES	1	04 / 05 / 11

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

CHA PROJECT NO:
22702 – 1015 – 43000

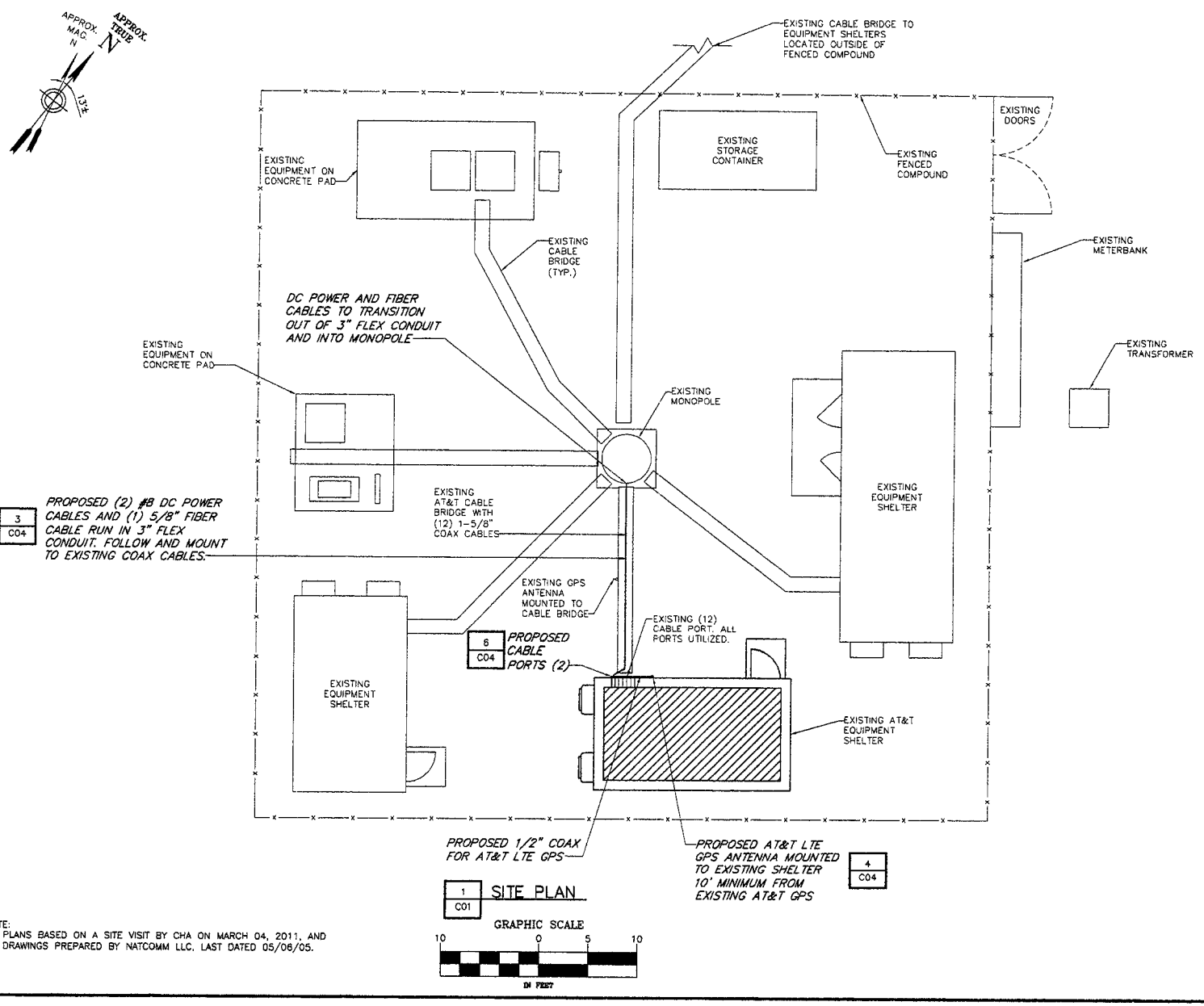
NO.	SUBMITTAL		
0	03/14/11	ISSUED FOR REVIEW	
	BY: JDM	CHK: PAL	APP'D: JPS
1	04/05/11	ISSUED FOR CONSTRUCTION	
	BY: PAL	CHK: PAL	APP'D: JPS

STATE OF CONNECTICUT
JOHN P. SOBIECKI
No. 17827
LICENSED
PROFESSIONAL ENGINEER

SITE ID:
CT2268
SITE NAME:
BETHEL–AWS
SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
BETHEL, CT 06801
FAIRFIELD COUNTY

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T01



NOTE:
1. PLANS BASED ON A SITE VISIT BY CHA ON MARCH 04, 2011, AND DRAWINGS PREPARED BY NATCOMM LLC, LAST DATED 05/06/05.

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NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

CHA

2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Metro: (860) 257-4557 - www.chacompanies.com

CHA PROJECT NO:
22702 - 1015 - 43000

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SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
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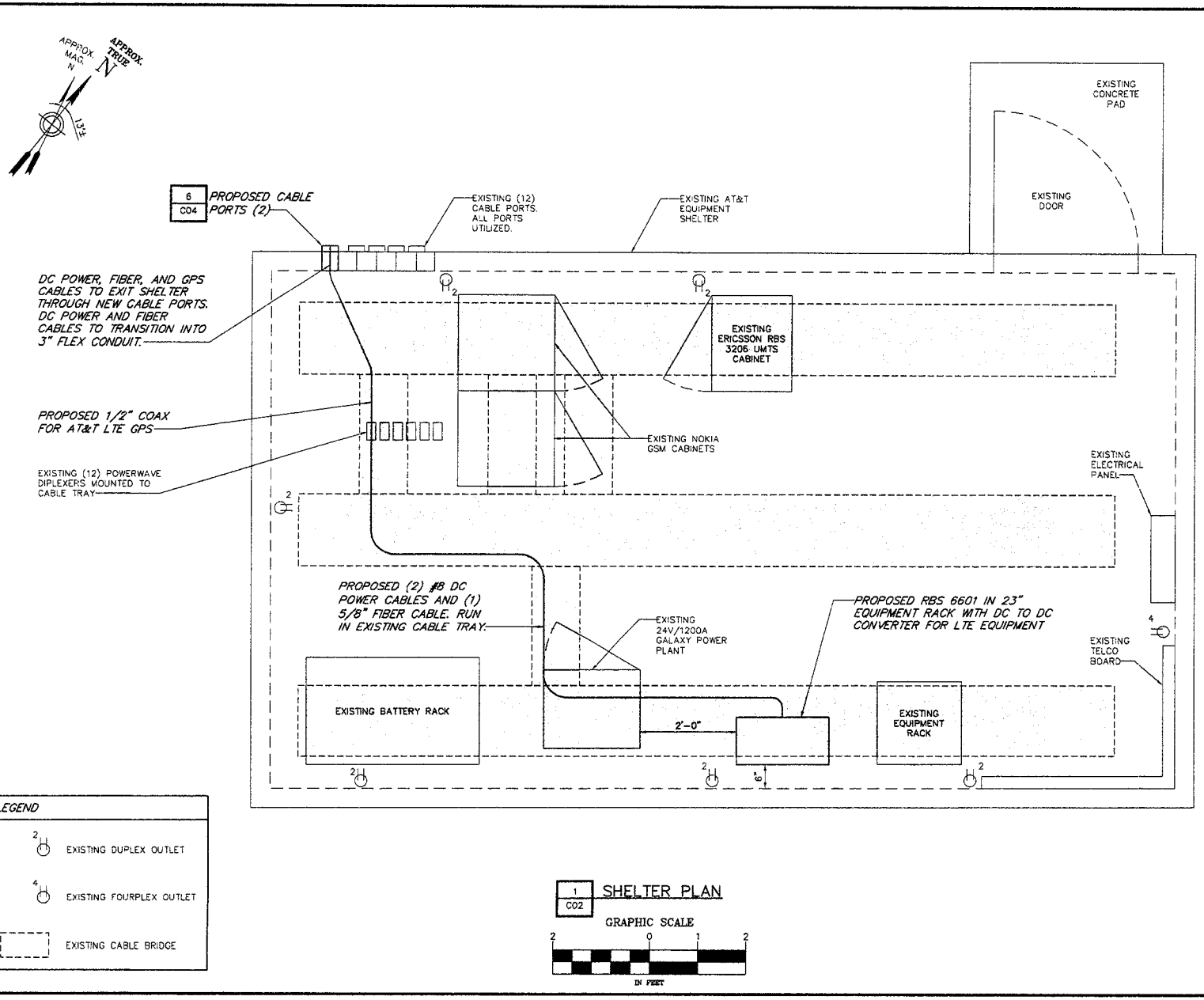
FAIRFIELD COUNTY

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
C01



1 / C02 SHELTER PLAN

GRAPHIC SCALE

2 0 1 2

IN FEET

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500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

CHA

2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2536
Metro: (860) 257-4557 - www.chaconpartner.com

CHA PROJECT NO:
22702 - 1015 - 43000

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	BY: PAL	CHK: PAL	APP'D: JPS

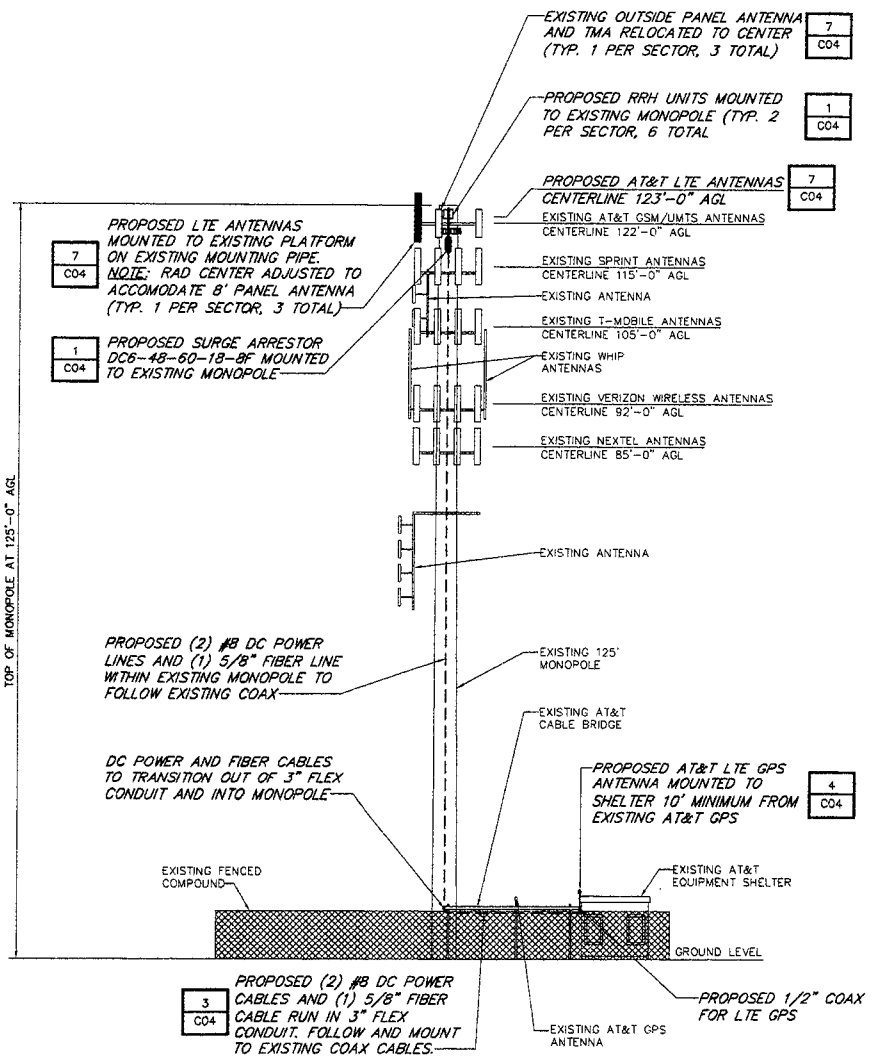
STATE OF CONNECTICUT
JOHN P. SOBIECKI
No. 17827
LICENSED PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE ID:
CT2268
SITE NAME:
BETHEL-AWS
SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
BETHEL, CT 06801
FAIRFIELD COUNTY

SHEET TITLE
SHELTER PLAN

SHEET NUMBER
C02

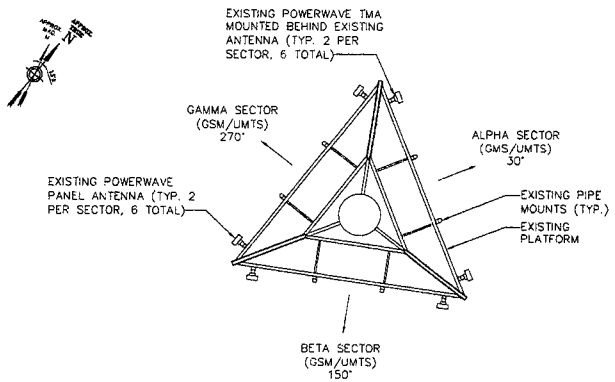


1 C03 **TOWER ELEVATION**

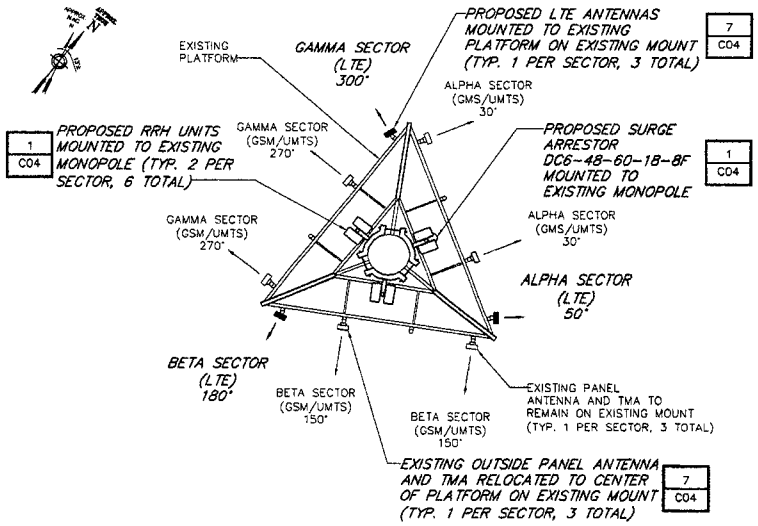
SCALE: 1" = 10' FULL SIZE
1" = 20' 11 X 17

GRAPHIC SCALE
20 0 10 20
IN FEET

NOTE:
A STRUCTURAL ANALYSIS OF THE EXISTING TOWER HAS NOT BEEN PERFORMED. AN ANALYSIS OF THE EXISTING STRUCTURE MUST BE PERFORMED PRIOR TO CONSTRUCTION TO CONFIRM STRUCTURE IS CAPABLE OF SUPPORTING PROPOSED LOADS.



EXISTING



PROPOSED

2 C03 **ANTENNA PLANS**

SCALE: N.T.S.

NOTE:
REFER TO FINAL RFDS FOR FINAL SECTOR CONFIGURATIONS.

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500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

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Main: (860) 257-4857 · www.chacompanies.com

CHA PROJECT NO:
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No. 17827
LICENSED PROFESSIONAL ENGINEER

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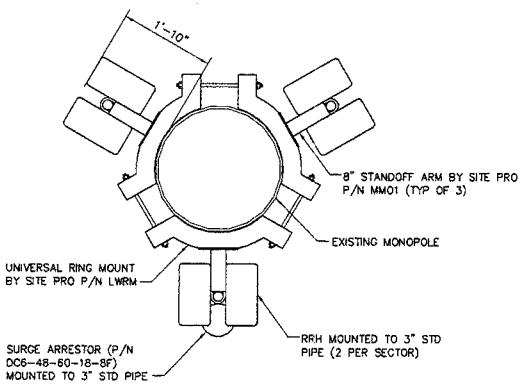
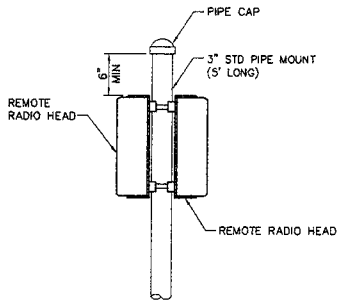
SITE ID:
CT2268
SITE NAME:
BETHEL-AWS
SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
BETHEL, CT 06801
FAIRFIELD COUNTY

SHEET TITLE
ELEVATION AND ANTENNA PLAN

SHEET NUMBER
C03



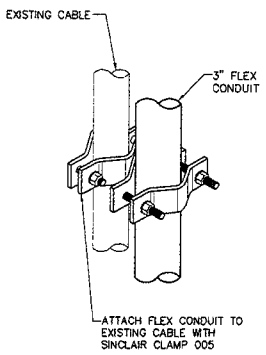
PLAN



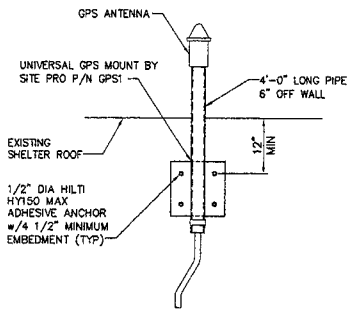
NOTE:

REMOTE RADIO HEAD MOUNTING BRACKET AND HARDWARE TO BE PROVIDED BY MANUFACTURER.

2 C04 RRH MOUNTING DETAIL
SCALE: NTS



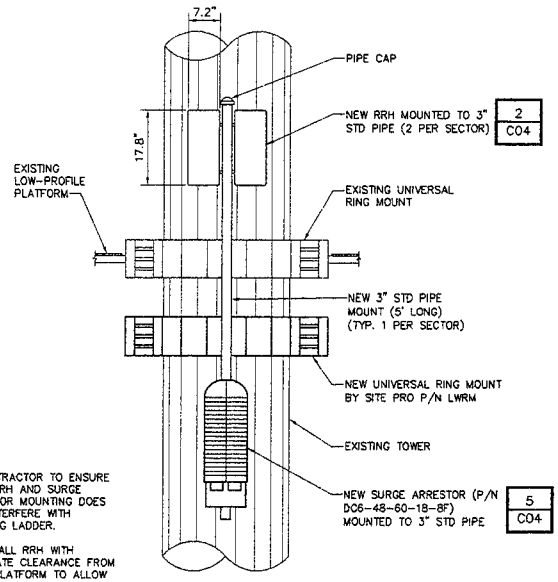
3 C04 FLEX CONDUIT DETAIL
SCALE: NTS



NOTE:

1. THE WEIGHT OF THE ANTENNA MOUNT IS 6.5 LBS.

4 C04 GPS MOUNTING DETAIL
SCALE: NTS

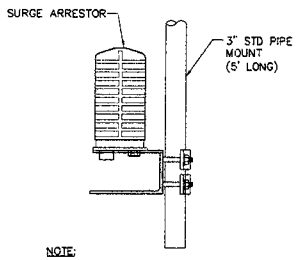


NOTE:
1. CONTRACTOR TO ENSURE THAT RRH AND SURGE ARRESTOR MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER.

2. INSTALL RRH WITH ADEQUATE CLEARANCE FROM AT&T PLATFORM TO ALLOW ROOM FOR ACCESS.

ELEVATION

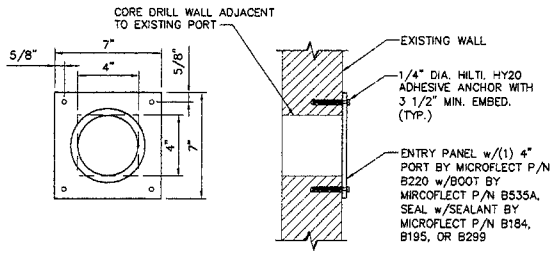
1 C04 RRH/SURGE ARRESTOR MOUNTING DETAIL
SCALE: NTS



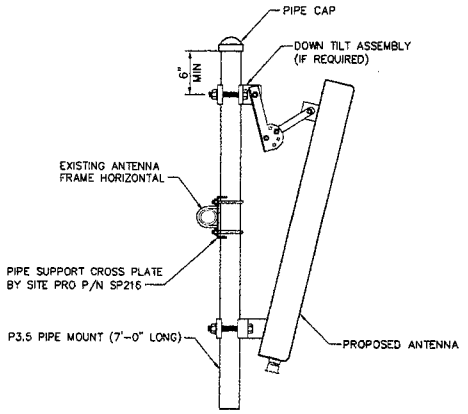
NOTE:

SURGE ARRESTOR MOUNTING BRACKET AND HARDWARE TO BE PROVIDED BY MANUFACTURER.

5 C04 SURGE ARRESTOR MOUNTING DETAIL
SCALE: NTS



6 C04 PORT PANEL DETAIL
SCALE: NTS



NOTE:

1. MOUNT ANTENNA IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED PROCEDURE.

2. USE EXISTING PIPE MOUNT IF AVAILABLE.

7 C04 TYPICAL ANTENNA MOUNTING DETAIL
SCALE: NTS

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NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

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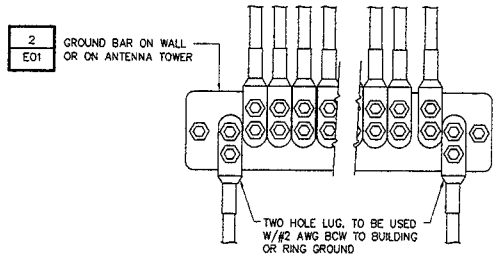
BETHEL, CT 06801
FAIRFIELD COUNTY

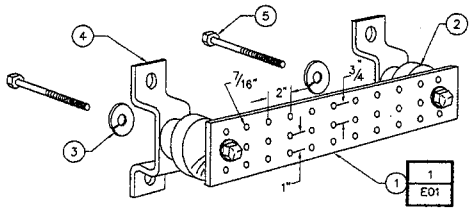
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
C04



1 E01 GROUND WIRE INSTALLATION TO GROUND BAR

NO SCALE

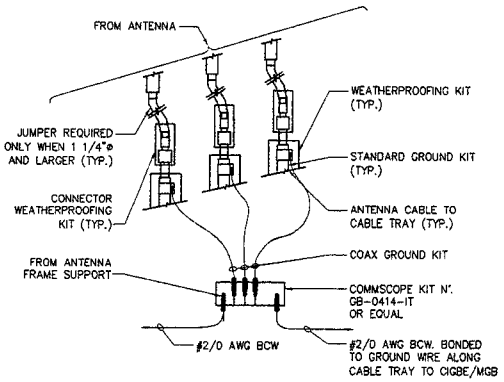


LEGEND

1 – COPPER GROUND BAR. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4. (NOT TO BE USED ON BARS PHYSICALLY ATTACHED TO TOWER.)
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-8056
5 – 5/8-11 X 1" H.H.C.S.BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

2 E01 GROUND BAR

NO SCALE



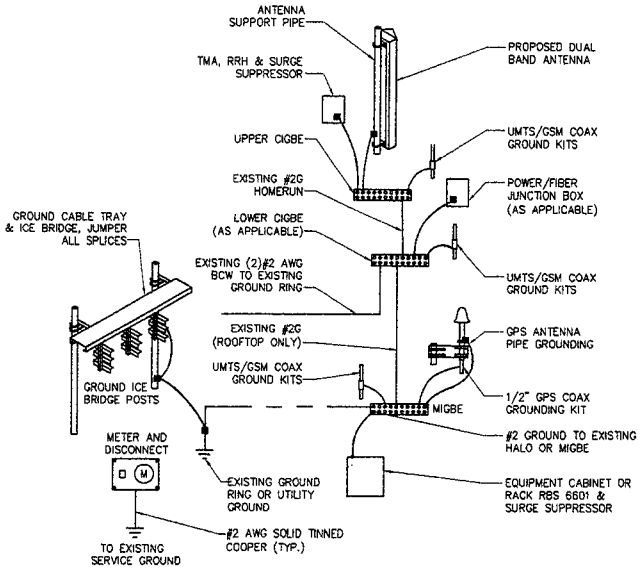
NOTE:

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

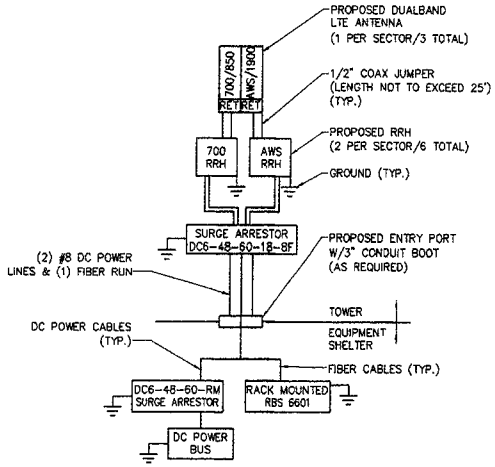
3 E01

NO SCALE



4 E01 GROUNDING RISER DIAGRAM

NO SCALE



NOTES:

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

5 E01 PLUMBING DIAGRAM

NO SCALE

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CHA PROJECT NO:
22702 – 1015 – 43000

NO.	SUBMITTAL		
0	03/14/11	ISSUED FOR REVIEW	
	BY: JDM	CHK: PAL	APP'D: JPS
1	04/05/11	ISSUED FOR CONSTRUCTION	
	BY: PAL	CHK: PAL	APP'D: JPS

STATE OF CONNECTICUT
JOHN P. SOBIESKI
No. 17827
LICENSED PROFESSIONAL ENGINEER

SITE ID:
CT2268
SITE NAME:
BETHEL-AWS
SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
BETHEL, CT 06801
FAIRFIELD COUNTY

SHEET TITLE
GROUNDING DETAILS & PLUMBING DIAGRAM

SHEET NUMBER
E01

GROUNDING SYSTEM NOTES:

1. CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM
   EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER.
   INTER-BUS EXTENSION (FROM IGR TO EGR) – #2 AWG ANNEALED SOLID TINNED BARE COPPER.
   EXTERNAL BOND CONNECTIONS TO EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER.
   TOWER BOND CONNECTION TO EGR – #2 AWG SOLID COPPER.

2. MINIMUM BENDING RADIUS
   EGR #2: 2'-0" NOMINAL AND 8" MINIMUM.
   CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 8" RADIUS.

3. CONNECTIONS (MECHANICAL)
   COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY COPPER, 600V RATED. USE 1/4" DIA. BOLT, 3/4" SPACING LUGS TO BOND OBJECTS PROM IGR.
   CONNECTOR SHALL BE BURNDY "HYLUG SERIES" OR EQUAL.

   EXOTHERMIC WELD LUG CONNECTOR – 2 HOLE OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY COPPER. 600V. USE ½" DIA. BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE "IA". EXOTHERMIC WELD TO LUG AS REQUIRED.

   "C" TAP COMPRESSION CONNECTOR – HIGH CONDUCTIVITY COPPER FOR MAIN-BRANCH TAPPING. CONNECTOR SHALL BE BURNDY "HYTAP" SERIES OR EQUAL.

   USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION. APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED. SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

4. CONNECTIONS BELOW GRADE (EXOTHERMIC)
   PROVIDE CADWELD CONNECTIONS – STYLE AND TYPE AS REQUIRED.

5. WHEN BONDING #2 TO #2
   EXTERIOR OF SHELTER – USE EXOTHERMIC WELD CONNECTION.

6. WHEN BONDING #2 TO FENCE POST
   USE EXOTHERMIC WELD "CADWELD TYPE VS" CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THROUGH. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS.

SECTION 16050 GROUNDING

1.01 ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL SYSTEM AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

1.02 GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL INSPECTOR HAVING JURISDICTION.

1.03 ELECTRICAL AC SERVICE GROUNDED SYSTEM – GROUNDING AT MAIN SERVICE OVERCURRENT PROTECTION DEVICE.

- A. THE GROUNDED CONDUCTOR (NEUTRAL) OF THE INCOMING SERVICE FEEDERS (LINE SIDE OF THE METER SOCKET) SHALL TERMINATE INTO THE MAIN OVERCURRENT DEVICE ENCLOSURE SOLID NEUTRAL BAR WHICH IS INSULATED FROM THE ENCLOSURE.
- B. THE GROUNDING ELECTRODE CONDUCTOR SHALL EXTEND CONTINUOUSLY WITHOUT SPLICES OR JOINTS FROM THE MAIN OVERCURRENT DEVICES SOLID NEUTRAL BAR TO THE MAIN SWITCHBOARD GROUND TERMINAL.
- C. THE MAIN SERVICE OVERCURRENT PROTECTION DEVICE ENCLOSURE'S EQUIPMENT GROUND BAR KIT SHALL BE LUGGED TO THE ENCLOSURE WITH THE SURFACES BETWEEN THEM BARE METAL TO BARE METAL. PROVIDE BONDING JUMPER BETWEEN EQUIPMENT GROUND BAR AND SOLID NEUTRAL. BONDING JUMPER CONDUCTOR SIZE SHALL BE THE SAME AS THE GROUNDING ELECTRODE CONDUCTOR. CONDUITS TERMINATING INTO THE MAIN OVERCURRENT DEVICE ENCLOSURE SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH #10 AWG BARE COPPER WHICH IN TURN IS TERMINATED INTO THE EQUIPMENT GROUND BAR KIT.

1.04 CELLULAR GROUNDING SYSTEM:

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS. INCLUDING BUT NOT LIMITED TO:

-GROUND BARS
-EXTERIOR GROUNDING RING
-ANTENNA GROUND CONNECTIONS AND PLATES

1.05 CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY THE AT&T CONSTRUCTION REPRESENTATIVE AND LOCAL AUTHORITY HAVING JURISDICTION WHO WILL MAKE A VISUAL INSPECTION OF THE GROUNDING GRID, RODS AND CONNECTIONS OF THE EXTERIOR GROUNDING SYSTEMS.

SECTION 16120 CONDUCTORS

1.01 ALL CONDUCTORS SHALL BE THE TYPE THWN (INTERIOR) AND XHHW (EXTERIOR), 75 DEGREES C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING SOLDERLESS PRESSURE CONNECTORS, ACCEPTABLE. #12 AWG SHALL BE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZES. CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

120 / 240 VAC – 1 PHASE, 3 WIRE SYSTEM

PHASE:	COLOR:
A	BLACK
B	RED
N	CONTINUOUS WHITE
G	CONTINUOUS GREEN

1.02 MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130 RACEWAY

1.01 CONDUIT MATERIAL SHALL BE AS FOLLOWS:

(1) GALVANIZED RIGID CONDUIT (GRC) – FEEDERS EXPOSED TO EXTERIOR & UNDERGROUND CONDUIT SWEEPS.

(2) PVC CONDUIT – SERVICE CONDUITS AND WHERE SHOWN ON GROUNDING DETAILS.

GENERAL NOTES:

1. ALL DIMENSIONS TO, OF, AND IN EXISTING STRUCTURES SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
2. DO NOT CHANGE THE SIZE NOR SPACING OF STRUCTURAL ELEMENTS WITHOUT THE APPROVAL OF THE ENGINEER.
3. DETAILS SHOWN ARE TYPICAL APPLY TO SIMILAR CONDITIONS UNLESS NOTED OTHERWISE.
4. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
5. BRACE STRUCTURES AS REQUIRED FOR CONSTRUCTION AND WIND LOADS UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: (LATERAL BRACING MEMBERS, ANCHOR BOLTS, ETC.)
6. THE DESIGN IS BASED ON THE 2005 CONNECTICUT STATE BUILDING CODE (IBC 2003), 2005 CONNECTICUT SUPPLEMENT AND THE 2009 AMENDMENT TO THE 2005 CONNECTICUT SUPPLEMENT AND TIA/EIA-222-F.
7. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND UTILITIES.
8. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER'S APPROVAL.
9. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
10. VERIFY SIZE AND LOCATION OF OPENINGS PRIOR TO BEGINNING WORK. FOR DIMENSIONS NOT SHOWN, SEE CIVIL DRAWINGS.
11. VERIFY SIZE AND LOCATION OF EQUIPMENT PADS WITH MECHANICAL AND/OR ELECTRICAL CONTRACTOR AND EQUIPMENT MANUFACTURER.
12. CONTRACTOR TO FOLLOW ALL STATE, LOCAL AND NATIONAL CODES AS APPLICABLE.

APPURTENANCE SUPPORT BRACKET NOTES:

1. DESIGN RESPONSIBILITY OF APPURTENANCE MOUNTING BRACKETS AND POLES AND ALL COMPONENTS THERE OF AND ATTACHMENT THERE TO SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER. MANUFACTURER SHALL PROVIDE TO THE ENGINEER FOR APPROVAL DRAWINGS DETAILING ALL COMPONENTS OF THE ASSEMBLY, INCLUDING CONNECTIONS, DESIGN LOADS, AND ALL OTHER PERTINENT DATA. ALL SUBMISSIONS SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.
2. BRACKETS SHALL BE DESIGNED TO SUPPORT CURRENT AND FUTURE PANEL ANTENNAS, REMOTE RADIO HEADS, SURGE ARRESTORS, AND COAXIAL CABLES AS SHOWN.

STEEL NOTES:

1. STRUCTURAL STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL.
2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:
   - A. WIDE FLANGE AND CHANNEL SHAPES – A992 GR 50 (50 KSI) UNLESS OTHERWISE NOTED
   - B. ANGLES AND PLATES – ASTM A36 (36 KSI)
   - C. STEEL PIPE – ASTM A53, GRADE B A500 GRADE B (35 KSI)
3. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM SPECIFICATION A123 UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED BY FIELD TOUCHUP PRIOR TO COMPLETION OF THE WORK USING ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL.
4. CONNECTIONS:
   - A. ALL BOLTS, NUTS AND WASHERS USED IN EXTERIOR APPLICATIONS SHALL BE GALVANIZED.

DESIGN LOADS:

THE FOLLOWING DESIGN LOADS WERE USED FOR THIS BUILDING BASED ON THE 2005 CONNECTICUT STATE BUILDING CODE (IBC 2003), 2005 CONNECTICUT SUPPLEMENT AND THE 2009 AMENDMENT TO THE 2005 CONNECTICUT SUPPLEMENT AND TIA/EIA-222-F:

ICE LOAD:
½" RADIAL ON ALL COMPONENTS AND CABLE

WIND DESIGN DATA:
BASIC WIND SPEED (3 SECOND GUST): 105 MPH
WIND IMPORTANCE FACTOR = 1.0
WIND EXPOSURE CATEGORY: B

EARTHQUAKE DESIGN DATA:
SEISMIC IMPORTANCE FACTOR, I: 1.0
MAPPED SPECTRAL RESPONSE ACCELERATIONS: SS=0.286 S1=0.066
SITE CLASS: D
SEISMIC DESIGN CATEGORY: B

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CHA PROJECT NO.
22702 – 1015 – 43000

NO.	SUBMITTAL		
0	03/14/11	ISSUED FOR REVIEW	
	BY: JDM	CHK: PAL	APP'D: JPS
1	04/05/11	ISSUED FOR CONSTRUCTION	
	BY: PAL	CHK: PAL	APP'D: JPS

STATE OF CONNECTICUT
JOHN P. SOBIESKI
No. 17827
LICENSED PROFESSIONAL ENGINEER

SITE ID:
CT2268
SITE NAME:
BETHEL-AWS
SPRING HILL LANE
SITE ADDRESS:
23 SPRING HILL LANE
BETHEL, CT 06801
FAIRFIELD COUNTY

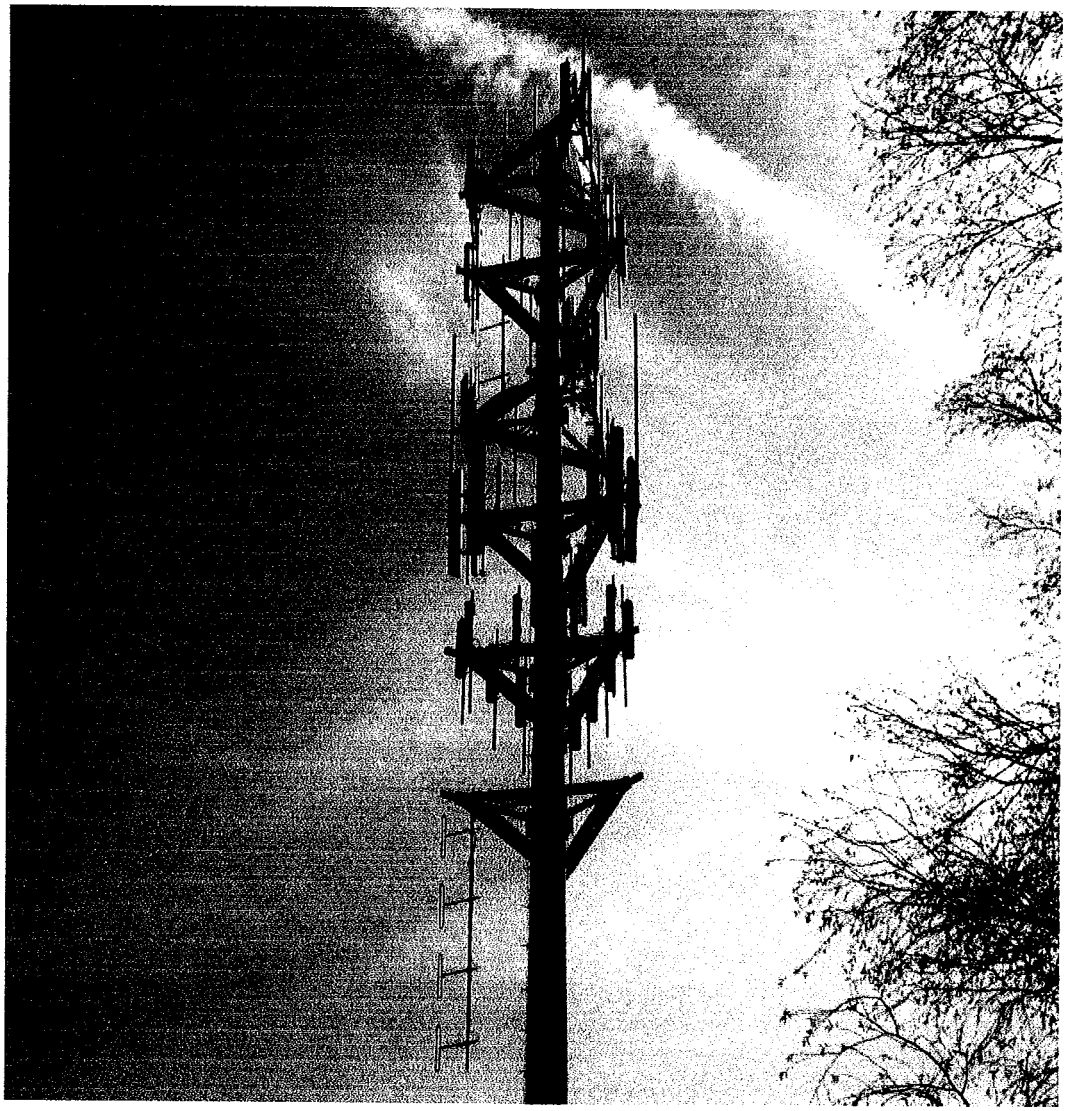
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN01

Bethel-AWS Monopole

CT2268

Fairfield County, Connecticut



Prepared for:

New Cingular Wireless PCS, LLC

500 Enterprise Drive

Rocky Hill, CT 06067

June 10, 2011

CHA

2139 Silas Deane Highway

Suite 212

Rocky Hill, CT 06067-2336

Tel: (860) 257-4557

CHA Project No. 22702.1015.28000 R1

June 10, 2011

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067

RE: Structural Analysis of the Bethel-AWS Monopole
CT2268
Located in Fairfield County, CT
CHA Project No. 22702.1015.28000

To Whom It May Concern:

CHA has performed a structural analysis under the provisions of TIA-EIA-222-F of the referenced monopole for the purpose of evaluating its ability to support the existing equipment loads in addition to the new equipment proposed by New Cingular Wireless PCS, LLC. In summary, our analysis indicates that the tower ***is*** structurally capable of supporting the existing and proposed loads.

Our analysis and design is based on the following information:

- Tower member sizes, configuration and existing appurtenances obtained from a previous structural analysis report by All-Points Technology Corporation, prepared for Sprint-Nextel dated December 15, 2010.
- Proposed equipment information, including antenna models and elevations, provided by New Cingular Wireless PCS, LLC.
- Original structure design and foundation data obtained from design documents by Engineering Endeavors Inc. (EEI), dated March 25, 2005.
- A previous structural analysis performed by CHA, dated December 10, 2008.

Our analysis includes data for the following proposed antennas and cables:

New Cingular Wireless:

- (2) Powerwave P65-16-XLH-RR and (1) P90-16-XLH-RR panel antennas mounted on (3) existing standoff pipes, supported on the existing 13' low-profile platform at an antenna centerline elevation of 123' with (2) #8 DC power cables and (1) 5/8" fiber cable.

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- (6) Remote Radio Units mounted to a proposed 3" Std. pipe, supported by a SitePro LWRM universal ring mount, at an antenna centerline elevation of 123'.
- (1) Raycap DC6-48-60-18-8F surge arrester mounted to a proposed 3" Std. steel pipe, supported by a SitePro LWRM universal ring mount, at an antenna centerline elevation of 123'.
- (3) Allgon TT19-08BP111-001 Twin BP TMA's to replace (6) existing diplexers, mounted on an existing 13' low-profile platform at a centerline elevation of 123'.

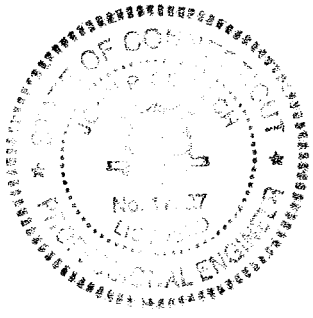
The existing and proposed antenna elevations and coaxial cable sizes have been listed in the attached Executive Summary.

With this information, TIA/EIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures,* and the Connecticut State Building Code the analysis was performed to determine the structural integrity of the tower. Based on the data provided, section properties, member strengths, and projected areas, applicable loads were calculated. Knowing the projected area of the tower and all of its appurtenances, 85 mph wind loads were calculated with and without radial ice loads of 1/2". These wind and ice loads were then reduced to member forces in the tower components through RISA Tower structural analysis software. The member forces were then compared to the maximum allowable stress for each member type.

The analysis indicates that the existing tower ***is*** capable of supporting the existing and proposed loads under TIA/EIA-222-F.

Reactions at the base of the monopole due to the existing and proposed loads are larger than the original EEI design reactions. A foundation analysis was performed by CHA and it has been determined that the proposed tower reactions are acceptable. Based on this information, it can be concluded that the tower foundation **is** adequate for supporting the existing and proposed loads provided that the foundation was built per the design documents and applicable codes.

As requested, we have included a copy of the governing structural analysis calculations referenced above for your review and use. If you have any questions, or if we can be of further assistance, please do not hesitate to call.



Very truly yours,

John P. Sobiech, P.E.
Partner

CHA

EXECUTIVE SUMMARY

Bethel-AWS Monopole
CT2268

June 10, 2011

Tower Information:

Tower Owner:	Unknown
Tower Manufacturer:	Engineering Endeavors Inc.
Tower Height:	124 feet
Tower Type:	Monopole

Proposed Antenna Data:

New Cingular Wireless:

- (2) Powerwave P65-16-XLH-RR and (1) Powerwave P90-16-XLH-RR panel antennas mounted on (3) 12" standoff pipes, supported on an existing 13' low-profile platform at an antenna centerline elevation of 123' with (2) #8 DC power cables and (1) 5/8" fiber cable.
- (6) Ericsson Remote Radio Units mounted to a proposed 3" Std. steel pipe, supported by a SitePro LWRM universal ring mount, at an antenna centerline elevation of 123'.
- (1) Raycap DC6-48-60-18-8F surge arrester mounted to a proposed 3" Std. steel pipe, supported by a SitePro LWRM universal ring mount, at an antenna centerline elevation of 123'.
- (3) Allgon TT19-08BP111-001 Twin BP TMA's to replace (6) existing diplexers, mounted on an existing 13' low-profile platform at a centerline elevation of 123'.

Existing Antenna and Appurtenance Data:

AT&T:

- (6) Powerwave 7770.0 panel antennas pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 122' with (12) 1-5/8" coaxial cables.
- (6) Powerwave LGP21401 TMA's pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 122'.
- *(6) Powerwave LGP21901 diplexers pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 122'.

Note: *(6) existing diplexors @ 122' will be replaced by (3) proposed Twin BP TMA's (TT19-08BP111-001)

Unknown:

- (1) 20' 4-bay inverted dipole mounted to a 13' low-profile platform at an antenna elevation of 124' with (1) 1-5/8" coaxial cable.
- (1) 18' omni directional whip antenna mounted to a 13' low-profile platform at a base elevation of 124' with (1) 1-5/8" coaxial cable.
- (3) Andrew HBX-9014DS, (3) Decibel DB950F85 panel antennas and (1) TMA pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 114' with (12) 1-5/8" coaxial cables.
- (3) RFS APX16DWV-16WVS, (3) RFS APXV16-16PVL panel antennas and (6) Ericsson KRY 112 144/1 TMA's pipe mounted to a 13' low-

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profile platform at an antenna centerline elevation of 104' with (12) 1-5/8" coaxial cables.

- (6) Antel LPA-185080/12, (4) LPA-80080/8 and (2) LPA-80063/8 panel antennas pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 94' with (12) 1-5/8" coaxial cables.
- (2) 18' omnidirectional whip antennas mounted to a 13' low-profile platform at an elevation of 94' with (2) 1-5/8" coaxial cables.
- (12) Decibel DB844H90 panel antennas pipe mounted to a pipe mounted to a 13' low-profile platform at an antenna centerline elevation of 84' with (12) 1-5/8" coaxial cables.
- (1) 20' 4-bay dipole antenna mounted to a 13' low-profile platform at an antenna elevation of 74' with (1) 7/8" coaxial cable.

Code Data:

Applicable Code: - TIA/EIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- Connecticut State Building Code

Load Cases:

(1) Weight of Tower, Antennas, and Appurtenances plus Wind Load without radial ice at a wind speed of 85 mph.
(2) Weight of Tower, Antennas, and Appurtenances plus Wind Load on iced tower plus weight of 1/2" radial ice in conjunction with a wind speed of 74 mph.

Monopole Shaft Members: (A572 Gr. 65 ksi steel)

Tower Section	Length	Base Diameter	Top Diameter	Wall Thickness	Splice Length
1	28.96'	26.90"	18.00"	3/16"	3.92'
2	52.29'	41.28"	25.32"	1/4"	5.67'
3	52.34'	55.00"	39.05"	5/16"	0'

Tower Superstructure:

The tower sections are stressed at the following governing capacities for the load cases 1 & 2:

	Stress Ratio (%)
Section 1	43.6
*Section 2	78.4
Section 3	75.0

*The governing tower member is stressed at 78.4%. The monopole is considered adequate for the proposed and existing loads.

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Foundation Reactions: (Existing and Proposed Equipment)

	EEI Original Design	Current Analysis	Percentage
Vertical (Axial) (k)	28.0	37.4	133.6%*
Shear (k)	29.0	24.8	85.5%*
Overturning Moment (k-ft)	2498.0	2161.5	86.5%*

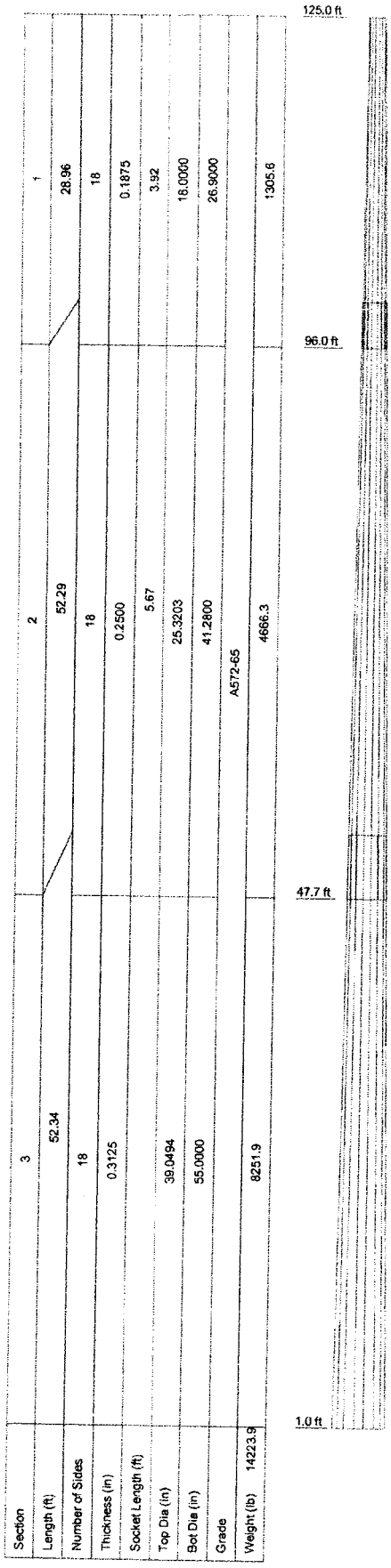
*A foundation analysis was performed. Proposed reactions meet the overturning requirements of 2.0 (see attached calculations) and are acceptable. Capacities are based on a soil bearing pressure of 20 ksf and a minimum factor of safety of 2.0 against overturning.

Conclusion:

The analysis indicates that the existing tower is structurally capable of supporting the existing and proposed loads.

CHA

TOWER ELEVATION



Section	1	2	3
Length (ft)	28.96	52.29	52.34
Number of Sides	18	18	18
Thickness (in)	0.1875	0.2500	0.3125
Socket Length (ft)	3.92	5.67	
Top Dia (in)	18.0000	25.3203	39.0494
Bot Dia (in)	26.9000	41.2800	55.0000
Grade		A572-65	
Weight (lb)	1305.6	4666.3	8251.9

Section Weight (lb) 14223.9

DESIGNED APPURTENANCE LOADING

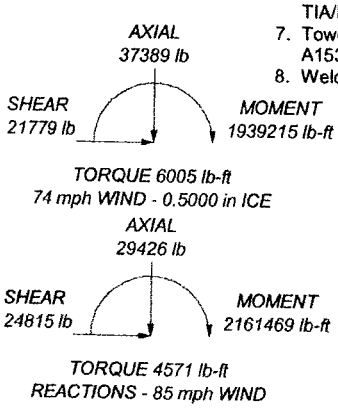
TYPE	ELEVATION	TYPE	ELEVATION
W.Monroe - 20' Quad Dipole	124.9 - 104.9	(4) 8'x2 3/8" Pipe Mount	104.9
(2) 7770.00	124.6	(4) 8'x2 3/8" Pipe Mount	104.9
(2) 7770.00	124.6	APX16PV-16PVL	104.9
(4) 8'x2 3/8" Pipe Mount	124.6	APX16PV-16PVL	104.9
(4) 8'x2 3/8" Pipe Mount	124.6	APX16DWV-16DWV-S-E-ACU	104.9 - 104.69
(4) 8'x2 3/8" Pipe Mount	124.6	APX16DWV-16DWV-S-E-ACU	104.9
PiROD 13' Low Profile Platform (Monopole)	124.6 - 1	APX16DWV-16DWV-S-E-ACU	104.9
18' x 4" omni whip	124.6	(2) KRY 112 144/1	104.9
(2) 7770.00	124.6	(2) KRY 112 144/1	104.9
Twin BP TMA (replacing exist diplexers)	124.6	(2) KRY 112 144/1	104.9
Twin BP TMA (replacing exist diplexers)	124.6	APX16PV-16PVL	104.9
Twin BP TMA (replacing exist diplexers)	124.6	(4) 8'x2 3/8" Pipe Mount	104.9
P90-16-XLH-RR	124	(2) LPA-185080/12	95
P-65-16-XLH-RR	124	(2) LPA-185080/12	95
P-65-16-XLH-RR	124	PiROD 13' Low Profile Platform (Monopole)	95
(2) Remote Radio Heads	124	(2) LPA-185080/12	95
(2) Remote Radio Heads	124	(2) LPA-80080/8CF	95
(2) Remote Radio Heads	124	(2) LPA-80080/8CF	95
DC6-48-60-18	124	(2) LPA-80080/8CF	95
TMA	114.7	(2) 6'x 2 3/8" Pipe Mount	95
DB950F85T2E-M	114.7	(2) 6'x 2 3/8" Pipe Mount	95
DB950F85T2E-M	114.7	(2) 6'x 2 3/8" Pipe Mount	95
DB950F85T2E-M	114.7	(2) 8'x2 3/8" Pipe Mount	95
(4) 8'x2 3/8" Pipe Mount	114.7	(2) 8'x2 3/8" Pipe Mount	95
(4) 8'x2 3/8" Pipe Mount	114.7	(2) 8'x2 3/8" Pipe Mount	95
(4) 8'x2 3/8" Pipe Mount	114.7	(4) DB844H90E-XY	85
PiROD 13' Low Profile Platform (Monopole)	114.7	(4) DB844H90E-XY	85
HBX-9014DS	114.7	(4) 8'x2 3/8" Pipe Mount	85
HBX-9014DS	114.7	(4) 8'x2 3/8" Pipe Mount	85
HBX-9014DS	114.7	(4) 8'x2 3/8" Pipe Mount	85
18' x 4" omni whip	113 - 95	PiROD 13' Low Profile Platform (Monopole)	85
18' x 4" omni whip	113 - 95	(4) DB844H90E-XY	85
PiROD 13' Low Profile Platform (Monopole)	104.9	PiROD 13' Low Profile Platform (Monopole)	75
		W.Monroe - 20' Quad Dipole	75 - 55

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.



CHA Consulting, Inc.
2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067-2336
Phone: (860) 257-4557
FAX:

Job: **Bethel-AWS (CT-2268)**			
Project: **22702-1015**			
Client: SAI	Drawn by: Tony Marruso	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/11	Scale: NTS	
Path: W:\SAI Circuits\22702\Sept1015_2268-Struct\Rev F Analysis\Model.eri		Dwg No. E-1	

FOUNDATION ANALYSIS

AM	06/09/11	CLOUGH HARBOUR & ASSOCIATES LLP	1 OF 1
COMP. BY	DATE		
JJS	05/12/11		
CHK. BY	DATE		
Project Name: New Cingular Wireless			Proj No.: 22702-1015
Acct No.: CT2268	Site Name: Bethel-AWS		Site Loc.: CT
Subject: Foundation Calculations			County.: Fairfield

VARIABLES

4.5 = MAT DEPTH (FT)
25 = MAT WIDTH (FT) (SHORTER OF 2)
25 = MAT LENGTH (FT)

1 = REVEAL (FT)
7 = SQUARE PIER WIDTH (FT) <===One of these has to be Zero
= DIAMETER OF CIRCULAR PIER (FT) <===One of these has to be Zero
1 = TOTAL LENGTH OF PIER (FT) WITH REVEAL
13 = DESIGN WATER TABLE (FT BELOW GROUND LEVEL)
0 = SOIL ANGLE OF INTERNAL FRICTION (DEG)
200 = (ASSUMED) NET HORIZONTAL SOIL PRESSURE
0.4 = COEFFICIENT OF FRICTION

24.8 = SHEAR (KIP)
37.4 = AXIAL (KIP)
10 = AXIAL UPLIFT (KIP)
2161.5 = MOMENT (FT-KIP)

0.09 = ASSUMED UNIT WEIGHT OF SOIL (KCF)
0.15 = UNIT WEIGHT OF CONCRETE (KCF)
20 = BEARING CAPACITY (KSF)

GEOMETRY & WEIGHT

2812.5 = VOL OF MAT (FT^3)
421.875 = WEIGHT OF MAT (KIP)

49.00 = VOL OF SQUARE PIER (FT^3)
7.35 = WEIGHT OF SQUARE PIER (KIP)
0.00 = VOL OF CIRCULAR PIER (FT^3)
0.00 = WEIGHT OF CIRCULAR PIER (KIP)

49.00 = VOL OF PROPOSED PIER (FT^3)
7.35 = WEIGHT OF PROPOSED PIER (KIP)

0 = VOL OF SOIL OVER MAT MINUS VOL OF SQUARE PIER (FT^3)
0 = WEIGHT OF SOIL DIRECTLY ABOVE MAT (KIP)
0.00 = VOL OF SOIL OVER MAT MINUS VOL OF CIRCULAR PIER (FT^3)
0.00 = WEIGHT OF SOIL DIRECTLY ABOVE MAT (KIP)
0.00 = WEIGHT OF FAILURE CONE OF SOIL ABOVE FOOTING (KIP)

0.00 = VOL OF SOIL OVER PROPOSED FOOTING (FT^3)
0.00 = WEIGHT OF SOIL OVER PROPOSED FOOTING (KIP)

OVERTURNING

2297.9 = TOTAL OVERTURNING MOMENT (FT-K)
5832.81 = RESISTING MOMENT (USE DIRT DIRECTLY OVER FTG) (F
2 = MIN SAFETY FACTOR

OK = RESULT

BEARING CAPACITY

1.63 = POSITIVE BEARING (KSF) FOR SQUARE MAT *
-0.14 = NEGETIVE BEARING (KSF) FOR SQUARE MAT *
20 = MIN ALLOWABLE BEARING

OK = RESULT

UPLIFT

10 =TOTAL UPLIFT FORCE ON FOOTING

429.23 =RESISTING FORCE DUE TO FOUNDATION AND SOIL

OK = RESULT
42.9 = SAFETY FACTOR

* CHANGE I (MOMENT OF INERTIA) IF NOT SQUARE

SLIDING

429.23 = TOTAL AXIAL FORCE (K) (NORMAL WEIGHT)
0.40 = COEFFICIENT OF FRICTION
171.69 = FRICTION FORCE (K)
50.63 = PASSIVE FORCE (K)
148.21 = ALLOWABLE FORCE (K)
1.50 = MIN SAFETY FACTOR

OK = RESULT

ANALYSIS SUMMARY
PER TIA/EIA-222-F
(Existing and Proposed Equipment)

RISATower	Job	Page
	Bethel-AWS (CT-2268)	1 of 25
CHA Consulting, Inc. 2139 Silas Deane Highway, Suite 212 Rocky Hill, CT 06067-2336 Phone: (860) 257-4557 FAX:	Project 22702-1015	Date 16:46:40 06/09/11
	Client SAI	Designed by Tony Marruso

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 Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
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	125.00-96.04	28.96	3.92	18	18.0000	26.9000	0.1875	0.7500	A572-65 (65 ksi)
L2	96.04-47.67	52.29	5.67	18	25.3203	41.2800	0.2500	1.0000	A572-65 (65 ksi)
L3	47.67-1.00	52.34		18	39.0494	55.0000	0.3125	1.2500	A572-65

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
									(65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	27.3150	15.8973	1433.1421	9.4829	13.6652	104.8753	2868.1699	7.9501	4.4044	23.49
L2	26.9258	19.8933	1579.6584	8.9000	12.8627	122.8091	3161.3954	9.9485	4.0164	16.065
	41.9168	32.5573	6924.5082	14.5657	20.9702	330.2064	13858.1278	16.2817	6.8253	27.301
L3	41.4064	38.4222	7284.0015	13.7516	19.8371	367.1906	14577.5874	19.2147	6.3227	20.233
	55.8485	54.2432	20495.5041	19.4141	27.9400	733.5542	41017.9768	27.1267	9.1300	29.216

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								
125.00-96.04				1	1	1		
L2 96.04-47.67								
L3 47.67-1.00				1	1	1		
				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	12
Embedment length	60.0000 in
f'_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-60
Base plate thickness	1.7500 in
Bolt circle diameter	63.0000 in
Outer diameter	69.0000 in
Inner diameter	55.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.7500 in
Stiffener height	8.0000 in

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
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	124.60 - 10.00	14	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	114.70 - 10.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	104.90 - 10.00	14	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	95.00 - 10.00	14	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	85.00 - 10.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	75.00 - 10.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
Safety Line 3/8	A	No	CaAa (Out Of Face)	125.00 - 14.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
2" Rigid Conduit	C	No	Inside Pole	124.00 - 10.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80

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 lb
L1	125.00-96.04	A	0.000	0.000	0.000	1.086	6.37
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	599.68
L2	96.04-47.67	A	0.000	0.000	0.000	1.814	10.64
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2403.69
L3	47.67-1.00	A	0.000	0.000	0.000	1.263	7.41
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1971.27

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 lb
L1	125.00-96.04	A	0.500	0.000	0.000	0.000	3.982	21.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	599.68
L2	96.04-47.67	A	0.500	0.000	0.000	0.000	6.651	36.28
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2403.69
L3	47.67-1.00	A	0.500	0.000	0.000	0.000	4.629	25.25
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1971.27

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) 7770.00	A	From Face	4.00	0.00	0.0000	124.60	No Ice	5.88	3.98	51.73
							1/2" Ice	6.31	4.60	94.70
(2) 7770.00	B	From Face	4.00	0.00	0.0000	124.60	No Ice	5.88	3.98	51.73
							1/2" Ice	6.31	4.60	94.70
(2) 7770.00	C	From Face	4.00	0.00	0.0000	124.60	No Ice	5.88	3.98	51.73
							1/2" Ice	6.31	4.60	94.70
(4) 8'x2 3/8" Pipe Mount	A	From Face	4.00	0.00	0.0000	124.60	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
(4) 8'x2 3/8" Pipe Mount	B	From Face	4.00	0.00	0.0000	124.60	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
(4) 8'x2 3/8" Pipe Mount	C	From Face	4.00	0.00	0.0000	124.60	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
PiROD 13' Low Profile Platform (Monopole)	C	None			0.0000	124.60 - 1.00	No Ice	10.70	10.70	1300.00
							1/2" Ice	15.10	15.10	1765.00
18' x 4" omni whip	C	From Face	4.00	0.00	0.0000	124.60	No Ice	7.20	7.20	60.00
							1/2" Ice	9.04	9.04	110.12
TMA	A	From Face	4.00	0.00	0.0000	114.70	No Ice	1.40	0.70	8.00
							1/2" Ice	1.56	0.82	18.34
HBX-9014DS	A	From Face	4.00	0.00	0.0000	114.70	No Ice	3.62	3.51	41.95
							1/2" Ice	4.00	4.13	76.43
HBX-9014DS	B	From Face	4.00	0.00	0.0000	114.70	No Ice	3.62	3.51	41.95
							1/2" Ice	4.00	4.13	76.43
HBX-9014DS	C	From Face	4.00	0.00	0.0000	114.70	No Ice	3.62	3.51	41.95
							1/2" Ice	4.00	4.13	76.43
DB950F85T2E-M	A	From Face	4.00	0.00	0.0000	114.70	No Ice	2.53	4.19	10.50
							1/2" Ice	2.90	4.57	33.82
DB950F85T2E-M	B	From Face	4.00	0.00	0.0000	114.70	No Ice	2.53	4.19	10.50
							1/2" Ice	2.90	4.57	33.82
DB950F85T2E-M	C	From Face	4.00	0.00	0.0000	114.70	No Ice	2.53	4.19	10.50
							1/2" Ice	2.90	4.57	33.82
(4) 8'x2 3/8" Pipe Mount	A	From Face	4.00	0.00	0.0000	114.70	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
(4) 8'x2 3/8" Pipe Mount	B	From Face	4.00	0.00	0.0000	114.70	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
(4) 8'x2 3/8" Pipe Mount	C	From Face	4.00	0.00	0.0000	114.70	No Ice	1.90	1.90	29.20
							1/2" Ice	2.73	2.73	43.57
PiROD 13' Low Profile Platform (Monopole)	C	None			0.0000	114.70	No Ice	10.70	10.70	1300.00
							1/2" Ice	15.10	15.10	1765.00
APX16PV-16PVL	A	From Face	4.00	0.00	0.0000	104.90	No Ice	6.65	1.98	40.00
							1/2" Ice	7.08	2.30	71.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	lb
			0.00						
APX16PV-16PVL	B	From Face	4.00	0.0000	104.90	No Ice	6.65	1.98	40.00
			0.00			1/2" Ice	7.08	2.30	71.05
			0.00						
APX16PV-16PVL	C	From Face	4.00	0.0000	104.90	No Ice	6.65	1.98	40.00
			0.00			1/2" Ice	7.08	2.30	71.05
			0.00						
APX16DWV-16DWV-S-E-A CU	A	From Face	4.00	0.0000	104.69 - 104.90	No Ice	6.70	2.00	39.60
			0.00			1/2" Ice	7.13	2.33	70.94
			0.00						
APX16DWV-16DWV-S-E-A CU	B	From Face	4.00	0.0000	104.90	No Ice	6.70	2.00	39.60
			0.00			1/2" Ice	7.13	2.33	70.94
			0.00						
APX16DWV-16DWV-S-E-A CU	C	From Face	4.00	0.0000	104.90	No Ice	6.70	2.00	39.60
			0.00			1/2" Ice	7.13	2.33	70.94
			0.00						
(2) KRY 112 144/1	A	From Face	4.00	0.0000	104.90	No Ice	0.56	0.25	15.00
			0.00			1/2" Ice	0.66	0.33	19.18
			0.00						
(2) KRY 112 144/1	B	From Face	4.00	0.0000	104.90	No Ice	0.56	0.25	15.00
			0.00			1/2" Ice	0.66	0.33	19.18
			0.00						
(2) KRY 112 144/1	C	From Face	4.00	0.0000	104.90	No Ice	0.56	0.25	15.00
			0.00			1/2" Ice	0.66	0.33	19.18
			0.00						
W.Monroe - 20' Quad Dipole	C	From Face	4.00	0.0000	124.90 - 104.90	No Ice	4.30	4.30	29.87
			0.00			1/2" Ice	11.55	11.55	64.34
			0.00						
(4) 8'x2 3/8" Pipe Mount	A	From Face	4.00	0.0000	104.90	No Ice	1.90	1.90	29.20
			0.00			1/2" Ice	2.73	2.73	43.57
			0.00						
(4) 8'x2 3/8" Pipe Mount	B	From Face	4.00	0.0000	104.90	No Ice	1.90	1.90	29.20
			0.00			1/2" Ice	2.73	2.73	43.57
			0.00						
(4) 8'x2 3/8" Pipe Mount	C	From Face	4.00	0.0000	104.90	No Ice	1.90	1.90	29.20
			0.00			1/2" Ice	2.73	2.73	43.57
			0.00						
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	104.90	No Ice	10.70	10.70	1300.00
						1/2" Ice	15.10	15.10	1765.00
(2) LPA-185080/12	A	From Face	4.00	0.0000	95.00	No Ice	3.47	4.66	15.00
			0.00			1/2" Ice	3.89	5.10	41.86
			0.00						
(2) LPA-185080/12	B	From Face	4.00	0.0000	95.00	No Ice	3.47	4.66	15.00
			0.00			1/2" Ice	3.89	5.10	41.86
			0.00						
(2) LPA-185080/12	C	From Face	4.00	0.0000	95.00	No Ice	3.47	4.66	15.00
			0.00			1/2" Ice	3.89	5.10	41.86
			0.00						
(2) LPA-80080/8CF	A	From Face	4.00	0.0000	95.00	No Ice	6.28	12.17	24.00
			0.00			1/2" Ice	6.85	12.83	87.32
			0.00						
(2) LPA-80080/8CF	B	From Face	4.00	0.0000	95.00	No Ice	6.28	12.17	24.00
			0.00			1/2" Ice	6.85	12.83	87.32
			0.00						
(2) LPA-80080/8CF	C	From Face	4.00	0.0000	95.00	No Ice	6.28	12.17	24.00
			0.00			1/2" Ice	6.85	12.83	87.32
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Azimuth Adjustment ° / Vert ft	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) 6'x 2 3/8" Pipe Mount	A	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.43 1.93	1.43 1.93	10.00 20.85
(2) 6'x 2 3/8" Pipe Mount	B	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.43 1.93	1.43 1.93	10.00 20.85
(2) 6'x 2 3/8" Pipe Mount	C	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.43 1.93	1.43 1.93	10.00 20.85
(2) 8'x2 3/8" Pipe Mount	A	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	25.00 39.37
(2) 8'x2 3/8" Pipe Mount	B	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	25.00 39.37
(2) 8'x2 3/8" Pipe Mount	C	From Face	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	25.00 39.37
18' x 4" omni whip	A	From Face	4.00 0.00 0.00	0.0000	113.00 - 95.00	No Ice 1/2" Ice	7.20 9.04	7.20 9.04	60.00 110.12
18' x 4" omni whip	C	From Face	4.00 0.00 0.00	0.0000	113.00 - 95.00	No Ice 1/2" Ice	7.20 9.04	7.20 9.04	60.00 110.12
PiROD 13' Low Profile Platform (Monopole)	A	None		0.0000	95.00	No Ice 1/2" Ice	10.70 15.10	10.70 15.10	1300.00 1765.00
(4) DB844H90E-XY	A	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	10.00 35.38
(4) DB844H90E-XY	B	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	10.00 35.38
(4) DB844H90E-XY	C	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	10.00 35.38
(4) 8'x2 3/8" Pipe Mount	A	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	29.20 43.57
(4) 8'x2 3/8" Pipe Mount	B	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	29.20 43.57
(4) 8'x2 3/8" Pipe Mount	C	From Face	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	29.20 43.57
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	85.00	No Ice 1/2" Ice	10.70 15.10	10.70 15.10	1300.00 1765.00
W.Monroe - 20' Quad Dipole	C	From Face	4.00 0.00 0.00	0.0000	75.00 - 55.00	No Ice 1/2" Ice	4.30 11.55	4.30 11.55	29.87 64.34
PiROD 13' Low Profile Platform (Monopole) ***SAI***	C	None		0.0000	75.00	No Ice 1/2" Ice	10.70 15.10	10.70 15.10	1300.00 1765.00
P90-16-XLH-RR	A	From Face	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice	11.47 12.08	6.80 7.38	32.00 94.06
P-65-16-XLH-RR	B	From Face	4.00 0.00	0.0000	124.00	No Ice 1/2" Ice	8.40 8.95	5.46 5.91	60.00 110.86

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 lb
P-65-16-XLH-RR	C	From Face	0.00 4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice	8.40 8.95	5.46 5.91	60.00 110.86
(2) Remote Radio Heads	A	None		0.0000	124.00	No Ice 1/2" Ice	1.79 1.97	0.86 1.00	33.00 44.97
(2) Remote Radio Heads	B	None		0.0000	124.00	No Ice 1/2" Ice	1.79 1.97	0.86 1.00	33.00 44.97
(2) Remote Radio Heads	C	None		0.0000	124.00	No Ice 1/2" Ice	1.79 1.97	0.86 1.00	33.00 44.97
DC6-48-60-18	C	None		0.0000	124.00	No Ice 1/2" Ice	2.59 2.81	1.08 1.24	20.00 36.69
Twin BP TMA (replacing exist diplexers)	A	From Face	4.00 0.00 0.00	0.0000	124.60	No Ice 1/2" Ice	0.27 0.36	0.12 0.20	17.60 19.50
Twin BP TMA (replacing exist diplexers)	B	From Face	4.00 0.00 0.00	0.0000	124.60	No Ice 1/2" Ice	0.27 0.36	0.12 0.20	17.60 19.50
Twin BP TMA (replacing exist diplexers)	C	From Face	4.00 0.00 0.00	0.0000	124.60	No Ice 1/2" Ice	0.27 0.36	0.12 0.20	17.60 19.50

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 125.00-96.04	109.56	1.409	26	54.179	A	0.000	54.179	54.179	100.00	0.000	1.086
					B	0.000	54.179		100.00	0.000	0.000
					C	0.000	54.179		100.00	0.000	0.000
L2 96.04-47.67	70.68	1.243	23	136.639	A	0.000	136.639	136.639	100.00	0.000	1.814
					B	0.000	136.639		100.00	0.000	0.000
					C	0.000	136.639		100.00	0.000	0.000
L3 47.67-1.00	23.31	1	19	186.247	A	0.000	186.247	186.247	100.00	0.000	1.263
					B	0.000	186.247		100.00	0.000	0.000
					C	0.000	186.247		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 125.00-96.04	109.56	1.409	20	0.5000	56.593	A	0.000	56.593	56.593	100.00	0.000	3.982
						B	0.000	56.593		100.00	0.000	0.000
						C	0.000	56.593		100.00	0.000	0.000
L2 96.04-47.67	70.68	1.243	17	0.5000	140.670	A	0.000	140.670	140.670	100.00	0.000	6.651
						B	0.000	140.670		100.00	0.000	0.000
						C	0.000	140.670		100.00	0.000	0.000
L3 47.67-1.00	23.31	1	14	0.5000	190.136	A	0.000	190.136	190.136	100.00	0.000	4.629
						B	0.000	190.136		100.00	0.000	0.000
						C	0.000	190.136		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 125.00-96.04	109.56	1.409	13	54.179	A	0.000	54.179	54.179	100.00	0.000	1.086
					B	0.000	54.179		100.00	0.000	0.000
					C	0.000	54.179		100.00	0.000	0.000
L2 96.04-47.67	70.68	1.243	11	136.639	A	0.000	136.639	136.639	100.00	0.000	1.814
					B	0.000	136.639		100.00	0.000	0.000
					C	0.000	136.639		100.00	0.000	0.000
L3 47.67-1.00	23.31	1	9	186.247	A	0.000	186.247	186.247	100.00	0.000	1.263
					B	0.000	186.247		100.00	0.000	0.000
					C	0.000	186.247		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	1598.83	55.21	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	3502.97	72.42	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	3863.69	82.79	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	503862.91 lb-ft	8965.49		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	1598.83	55.21	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	3502.97	72.42	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	3863.69	82.79	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	503862.91 lb-ft	8965.49		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	1598.83	55.21	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	3502.97	72.42	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	3863.69	82.79	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	503862.91 lb-ft	8965.49		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	621.40	1715.81	A	1	0.65	1	1	1	56.593	1346.59	46.50	C
			B	1	0.65	1	1	1	56.593			
			C	1	0.65	1	1	1	56.593			
L2 96.04-47.67	2439.96	5693.19	A	1	0.65	1	1	1	140.670	2843.39	58.78	C
			B	1	0.65	1	1	1	140.670			
			C	1	0.65	1	1	1	140.670			
L3 47.67-1.00	1996.52	9645.70	A	1	0.65	1	1	1	190.136	3037.42	65.08	C
			B	1	0.65	1	1	1	190.136			
			C	1	0.65	1	1	1	190.136			
Sum Weight:	5057.88	17054.69						OTM	412085.54 lb-ft	7227.40		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	621.40	1715.81	A	1	0.65	1	1	1	56.593	1346.59	46.50	C
			B	1	0.65	1	1	1	56.593			
			C	1	0.65	1	1	1	56.593			
L2 96.04-47.67	2439.96	5693.19	A	1	0.65	1	1	1	140.670	2843.39	58.78	C
			B	1	0.65	1	1	1	140.670			
			C	1	0.65	1	1	1	140.670			
L3 47.67-1.00	1996.52	9645.70	A	1	0.65	1	1	1	190.136	3037.42	65.08	C
			B	1	0.65	1	1	1	190.136			
			C	1	0.65	1	1	1	190.136			
Sum Weight:	5057.88	17054.69						OTM	412085.54 lb-ft	7227.40		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	621.40	1715.81	A	1	0.65	1	1	1	56.593	1346.59	46.50	C
			B	1	0.65	1	1	1	56.593			
			C	1	0.65	1	1	1	56.593			
L2 96.04-47.67	2439.96	5693.19	A	1	0.65	1	1	1	140.670	2843.39	58.78	C
			B	1	0.65	1	1	1	140.670			
			C	1	0.65	1	1	1	140.670			
L3 47.67-1.00	1996.52	9645.70	A	1	0.65	1	1	1	190.136	3037.42	65.08	C
			B	1	0.65	1	1	1	190.136			
			C	1	0.65	1	1	1	190.136			
Sum Weight:	5057.88	17054.69						OTM	412085.54 lb-ft	7227.40		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	796.65	27.51	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	1745.42	36.08	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	1925.16	41.25	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	251059.72 lb-ft	4467.23		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	796.65	27.51	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	1745.42	36.08	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	1925.16	41.25	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	251059.72 lb-ft	4467.23		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-96.04	606.05	1305.62	A	1	0.65	1	1	1	54.179	796.65	27.51	C
			B	1	0.65	1	1	1	54.179			
			C	1	0.65	1	1	1	54.179			
L2 96.04-47.67	2414.33	4666.32	A	1	0.65	1	1	1	136.639	1745.42	36.08	C
			B	1	0.65	1	1	1	136.639			
			C	1	0.65	1	1	1	136.639			
L3 47.67-1.00	1978.68	8251.95	A	1	0.65	1	1	1	186.247	1925.16	41.25	C
			B	1	0.65	1	1	1	186.247			
			C	1	0.65	1	1	1	186.247			
Sum Weight:	4999.05	14223.89						OTM	251059.72 lb-ft	4467.23		

Discrete Appurtenance Pressures - No Ice $G_H = 1.690$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
7770.00	300.0000	103.46	-4.12	-2.38	124.60	1.462	27	11.76	7.96
7770.00	60.0000	103.46	4.12	-2.38	124.60	1.462	27	11.76	7.96
7770.00	180.0000	103.46	0.00	4.76	124.60	1.462	27	11.76	7.96
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.12	-2.38	124.60	1.462	27	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.12	-2.38	124.60	1.462	27	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	4.76	124.60	1.462	27	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	62.80	1.202	22	10.70	10.70
18' x 4" omni whip	180.0000	60.00	0.00	4.76	124.60	1.462	27	7.20	7.20
TMA	300.0000	8.00	-4.23	-2.44	114.70	1.428	26	1.40	0.70
HBX-9014DS	300.0000	41.95	-4.23	-2.44	114.70	1.428	26	3.62	3.51

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
HBX-9014DS	60.0000	41.95	4.23	-2.44	114.70	1.428	26	3.62	3.51
HBX-9014DS	180.0000	41.95	0.00	4.88	114.70	1.428	26	3.62	3.51
DB950F85T2E-M	300.0000	10.50	-4.23	-2.44	114.70	1.428	26	2.53	4.19
DB950F85T2E-M	60.0000	10.50	4.23	-2.44	114.70	1.428	26	2.53	4.19
DB950F85T2E-M	180.0000	10.50	0.00	4.88	114.70	1.428	26	2.53	4.19
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.23	-2.44	114.70	1.428	26	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.23	-2.44	114.70	1.428	26	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	4.88	114.70	1.428	26	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	114.70	1.428	26	10.70	10.70
APX16PV-16PVL	300.0000	40.00	-4.34	-2.50	104.90	1.392	26	6.65	1.98
APX16PV-16PVL	60.0000	40.00	4.34	-2.50	104.90	1.392	26	6.65	1.98
APX16PV-16PVL	180.0000	40.00	0.00	5.01	104.90	1.392	26	6.65	1.98
APX16DWV-16DWV-S-E-ACU	300.0000	39.60	-4.34	-2.50	104.80	1.391	26	6.70	2.00
APX16DWV-16DWV-S-E-ACU	60.0000	39.60	4.34	-2.50	104.90	1.392	26	6.70	2.00
APX16DWV-16DWV-S-E-ACU	180.0000	39.60	0.00	5.01	104.90	1.392	26	6.70	2.00
KRY 112 144/1	300.0000	30.00	-4.34	-2.50	104.90	1.392	26	1.12	0.50
KRY 112 144/1	60.0000	30.00	4.34	-2.50	104.90	1.392	26	1.12	0.50
KRY 112 144/1	180.0000	30.00	0.00	5.01	104.90	1.392	26	1.12	0.50
W.Monroe - 20' Quad Dipole	180.0000	29.87	0.00	4.88	114.90	1.428	26	4.30	4.30
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.34	-2.50	104.90	1.392	26	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.34	-2.50	104.90	1.392	26	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	5.01	104.90	1.392	26	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	104.90	1.392	26	10.70	10.70
LPA-185080/12	300.0000	30.00	-4.43	-2.56	95.00	1.353	25	6.93	9.32
LPA-185080/12	60.0000	30.00	4.43	-2.56	95.00	1.353	25	6.93	9.32
LPA-185080/12	180.0000	30.00	0.00	5.12	95.00	1.353	25	6.93	9.32
LPA-80080/8CF	300.0000	48.00	-4.43	-2.56	95.00	1.353	25	12.56	24.35
LPA-80080/8CF	60.0000	48.00	4.43	-2.56	95.00	1.353	25	12.56	24.35
LPA-80080/8CF	180.0000	48.00	0.00	5.12	95.00	1.353	25	12.56	24.35
(2) 6'x 2 3/8" Pipe Mount	300.0000	10.00	-4.43	-2.56	95.00	1.353	25	1.43	1.43
(2) 6'x 2 3/8" Pipe Mount	60.0000	10.00	4.43	-2.56	95.00	1.353	25	1.43	1.43
(2) 6'x 2 3/8" Pipe Mount	180.0000	10.00	0.00	5.12	95.00	1.353	25	1.43	1.43
(2) 8'x2 3/8" Pipe Mount	300.0000	25.00	-4.43	-2.56	95.00	1.353	25	1.90	1.90
(2) 8'x2 3/8" Pipe Mount	60.0000	25.00	4.43	-2.56	95.00	1.353	25	1.90	1.90
(2) 8'x2 3/8" Pipe Mount	180.0000	25.00	0.00	5.12	95.00	1.353	25	1.90	1.90
18' x 4" omni whip	300.0000	60.00	-4.34	-2.51	104.00	1.388	26	7.20	7.20
18' x 4" omni whip	180.0000	60.00	0.00	5.01	104.00	1.388	26	7.20	7.20
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	95.00	1.353	25	10.70	10.70
DB844H90E-XY	300.0000	40.00	-4.54	-2.62	85.00	1.310	24	11.47	14.93
DB844H90E-XY	60.0000	40.00	4.54	-2.62	85.00	1.310	24	11.47	14.93
DB844H90E-XY	180.0000	40.00	0.00	5.25	85.00	1.310	24	11.47	14.93
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.54	-2.62	85.00	1.310	24	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.54	-2.62	85.00	1.310	24	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	5.25	85.00	1.310	24	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	85.00	1.310	24	10.70	10.70
W.Monroe - 20' Quad Dipole	180.0000	29.87	0.00	5.50	65.00	1.214	22	4.30	4.30
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	75.00	1.264	23	10.70	10.70
P90-16-XLH-RR	300.0000	32.00	-4.12	-2.38	124.00	1.460	27	11.47	6.80
P-65-16-XLH-RR	60.0000	60.00	4.12	-2.38	124.00	1.460	27	8.40	5.46
P-65-16-XLH-RR	180.0000	60.00	0.00	4.76	124.00	1.460	27	8.40	5.46
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	27	3.58	1.71

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	27	3.58	1.71
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	27	3.58	1.71
DC6-48-60-18	0.0000	20.00	0.00	0.00	124.00	1.460	27	2.59	1.08
Twin BP TMA	300.0000	17.60	-4.12	-2.38	124.60	1.462	27	0.27	0.12
Twin BP TMA	60.0000	17.60	4.12	-2.38	124.60	1.462	27	0.27	0.12
Twin BP TMA	180.0000	17.60	0.00	4.76	124.60	1.462	27	0.27	0.12
	Sum Weight:	10076.47							

Discrete Appurtenance Pressures - With Ice $G_H = 1.690$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
7770.00	300.0000	189.40	-4.12	-2.38	124.60	1.462	20	12.63	9.21	0.5000
7770.00	60.0000	189.40	4.12	-2.38	124.60	1.462	20	12.63	9.21	0.5000
7770.00	180.0000	189.40	0.00	4.76	124.60	1.462	20	12.63	9.21	0.5000
(4) 8'x2 3/8" Pipe Mount	300.0000	43.57	-4.12	-2.38	124.60	1.462	20	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	60.0000	43.57	4.12	-2.38	124.60	1.462	20	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	180.0000	43.57	0.00	4.76	124.60	1.462	20	2.73	2.73	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	62.80	1.202	17	15.10	15.10	0.5000
18' x 4" omni whip	180.0000	110.12	0.00	4.76	124.60	1.462	20	9.04	9.04	0.5000
TMA	300.0000	18.34	-4.23	-2.44	114.70	1.428	20	1.56	0.82	0.5000
HBX-9014DS	300.0000	76.43	-4.23	-2.44	114.70	1.428	20	4.00	4.13	0.5000
HBX-9014DS	60.0000	76.43	4.23	-2.44	114.70	1.428	20	4.00	4.13	0.5000
HBX-9014DS	180.0000	76.43	0.00	4.88	114.70	1.428	20	4.00	4.13	0.5000
DB950F85T2E-M	300.0000	33.82	-4.23	-2.44	114.70	1.428	20	2.90	4.57	0.5000
DB950F85T2E-M	60.0000	33.82	4.23	-2.44	114.70	1.428	20	2.90	4.57	0.5000
DB950F85T2E-M	180.0000	33.82	0.00	4.88	114.70	1.428	20	2.90	4.57	0.5000
(4) 8'x2 3/8" Pipe Mount	300.0000	43.57	-4.23	-2.44	114.70	1.428	20	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	60.0000	43.57	4.23	-2.44	114.70	1.428	20	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	180.0000	43.57	0.00	4.88	114.70	1.428	20	2.73	2.73	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	114.70	1.428	20	15.10	15.10	0.5000
APX16PV-16PVL	300.0000	71.05	-4.34	-2.50	104.90	1.392	19	7.08	2.30	0.5000
APX16PV-16PVL	60.0000	71.05	4.34	-2.50	104.90	1.392	19	7.08	2.30	0.5000
APX16PV-16PVL	180.0000	71.05	0.00	5.01	104.90	1.392	19	7.08	2.30	0.5000
APX16DWV-16DWV-S-E-ACU	300.0000	70.94	-4.34	-2.50	104.80	1.391	19	7.13	2.33	0.5000
APX16DWV-16DWV-S-E-ACU	60.0000	70.94	4.34	-2.50	104.90	1.392	19	7.13	2.33	0.5000
APX16DWV-16DWV-S-E-ACU	180.0000	70.94	0.00	5.01	104.90	1.392	19	7.13	2.33	0.5000
KRY 112 144/1	300.0000	38.36	-4.34	-2.50	104.90	1.392	19	1.33	0.65	0.5000
KRY 112 144/1	60.0000	38.36	4.34	-2.50	104.90	1.392	19	1.33	0.65	0.5000
KRY 112 144/1	180.0000	38.36	0.00	5.01	104.90	1.392	19	1.33	0.65	0.5000
W.Monroe - 20' Quad Dipole	180.0000	64.34	0.00	4.88	114.90	1.428	20	11.55	11.55	0.5000
(4) 8'x2 3/8" Pipe Mount	300.0000	43.57	-4.34	-2.50	104.90	1.392	19	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	60.0000	43.57	4.34	-2.50	104.90	1.392	19	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	180.0000	43.57	0.00	5.01	104.90	1.392	19	2.73	2.73	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	104.90	1.392	19	15.10	15.10	0.5000
LPA-185080/12	300.0000	83.72	-4.43	-2.56	95.00	1.353	19	7.78	10.19	0.5000
LPA-185080/12	60.0000	83.72	4.43	-2.56	95.00	1.353	19	7.78	10.19	0.5000
LPA-185080/12	180.0000	83.72	0.00	5.12	95.00	1.353	19	7.78	10.19	0.5000
LPA-80080/8CF	300.0000	174.64	-4.43	-2.56	95.00	1.353	19	13.70	25.66	0.5000

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
LPA-80080/8CF	60.0000	174.64	4.43	-2.56	95.00	1.353	19	13.70	25.66	0.5000
LPA-80080/8CF	180.0000	174.64	0.00	5.12	95.00	1.353	19	13.70	25.66	0.5000
(2) 6'x 2 3/8" Pipe Mount	300.0000	20.85	-4.43	-2.56	95.00	1.353	19	1.93	1.93	0.5000
(2) 6'x 2 3/8" Pipe Mount	60.0000	20.85	4.43	-2.56	95.00	1.353	19	1.93	1.93	0.5000
(2) 6'x 2 3/8" Pipe Mount	180.0000	20.85	0.00	5.12	95.00	1.353	19	1.93	1.93	0.5000
(2) 8'x2 3/8" Pipe Mount	300.0000	39.37	-4.43	-2.56	95.00	1.353	19	2.73	2.73	0.5000
(2) 8'x2 3/8" Pipe Mount	60.0000	39.37	4.43	-2.56	95.00	1.353	19	2.73	2.73	0.5000
(2) 8'x2 3/8" Pipe Mount	180.0000	39.37	0.00	5.12	95.00	1.353	19	2.73	2.73	0.5000
18' x 4" omni whip	300.0000	110.12	-4.34	-2.51	104.00	1.388	19	9.04	9.04	0.5000
18' x 4" omni whip	180.0000	110.12	0.00	5.01	104.00	1.388	19	9.04	9.04	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	95.00	1.353	19	15.10	15.10	0.5000
DB844H90E-XY	300.0000	141.50	-4.54	-2.62	85.00	1.310	18	12.71	16.40	0.5000
DB844H90E-XY	60.0000	141.50	4.54	-2.62	85.00	1.310	18	12.71	16.40	0.5000
DB844H90E-XY	180.0000	141.50	0.00	5.25	85.00	1.310	18	12.71	16.40	0.5000
(4) 8'x2 3/8" Pipe Mount	300.0000	43.57	-4.54	-2.62	85.00	1.310	18	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	60.0000	43.57	4.54	-2.62	85.00	1.310	18	2.73	2.73	0.5000
(4) 8'x2 3/8" Pipe Mount	180.0000	43.57	0.00	5.25	85.00	1.310	18	2.73	2.73	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	85.00	1.310	18	15.10	15.10	0.5000
W.Monroe - 20' Quad Dipole	180.0000	64.34	0.00	5.50	65.00	1.214	17	11.55	11.55	0.5000
PiROD 13' Low Profile Platform (Monopole)	0.0000	1765.00	0.00	0.00	75.00	1.264	18	15.10	15.10	0.5000
P90-16-XLH-RR	300.0000	94.06	-4.12	-2.38	124.00	1.460	20	12.08	7.38	0.5000
P-65-16-XLH-RR	60.0000	110.86	4.12	-2.38	124.00	1.460	20	8.95	5.91	0.5000
P-65-16-XLH-RR	180.0000	110.86	0.00	4.76	124.00	1.460	20	8.95	5.91	0.5000
Remote Radio Heads	0.0000	89.93	0.00	0.00	124.00	1.460	20	3.94	2.00	0.5000
Remote Radio Heads	0.0000	89.93	0.00	0.00	124.00	1.460	20	3.94	2.00	0.5000
Remote Radio Heads	0.0000	89.93	0.00	0.00	124.00	1.460	20	3.94	2.00	0.5000
DC6-48-60-18	0.0000	36.69	0.00	0.00	124.00	1.460	20	2.81	1.24	0.5000
Twin BP TMA	300.0000	19.50	-4.12	-2.38	124.60	1.462	20	0.36	0.20	0.5000
Twin BP TMA	60.0000	19.50	4.12	-2.38	124.60	1.462	20	0.36	0.20	0.5000
Twin BP TMA	180.0000	19.50	0.00	4.76	124.60	1.462	20	0.36	0.20	0.5000
	Sum Weight:	15091.12								

Discrete Appurtenance Pressures - Service $G_H = 1.690$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
7770.00	300.0000	103.46	-4.12	-2.38	124.60	1.462	13	11.76	7.96
7770.00	60.0000	103.46	4.12	-2.38	124.60	1.462	13	11.76	7.96
7770.00	180.0000	103.46	0.00	4.76	124.60	1.462	13	11.76	7.96
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.12	-2.38	124.60	1.462	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.12	-2.38	124.60	1.462	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	4.76	124.60	1.462	13	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	62.80	1.202	11	10.70	10.70
18' x 4" omni whip	180.0000	60.00	0.00	4.76	124.60	1.462	13	7.20	7.20
TMA	300.0000	8.00	-4.23	-2.44	114.70	1.428	13	1.40	0.70
HBX-9014DS	300.0000	41.95	-4.23	-2.44	114.70	1.428	13	3.62	3.51
HBX-9014DS	60.0000	41.95	4.23	-2.44	114.70	1.428	13	3.62	3.51
HBX-9014DS	180.0000	41.95	0.00	4.88	114.70	1.428	13	3.62	3.51
DB950F85T2E-M	300.0000	10.50	-4.23	-2.44	114.70	1.428	13	2.53	4.19
DB950F85T2E-M	60.0000	10.50	4.23	-2.44	114.70	1.428	13	2.53	4.19
DB950F85T2E-M	180.0000	10.50	0.00	4.88	114.70	1.428	13	2.53	4.19

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.23	-2.44	114.70	1.428	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.23	-2.44	114.70	1.428	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	4.88	114.70	1.428	13	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	114.70	1.428	13	10.70	10.70
APX16PV-16PVL	300.0000	40.00	-4.34	-2.50	104.90	1.392	13	6.65	1.98
APX16PV-16PVL	60.0000	40.00	4.34	-2.50	104.90	1.392	13	6.65	1.98
APX16PV-16PVL	180.0000	40.00	0.00	5.01	104.90	1.392	13	6.65	1.98
APX16DWV-16DWV-S-E-ACU	300.0000	39.60	-4.34	-2.50	104.80	1.391	13	6.70	2.00
APX16DWV-16DWV-S-E-ACU	60.0000	39.60	4.34	-2.50	104.90	1.392	13	6.70	2.00
APX16DWV-16DWV-S-E-ACU	180.0000	39.60	0.00	5.01	104.90	1.392	13	6.70	2.00
KRY 112 144/1	300.0000	30.00	-4.34	-2.50	104.90	1.392	13	1.12	0.50
KRY 112 144/1	60.0000	30.00	4.34	-2.50	104.90	1.392	13	1.12	0.50
KRY 112 144/1	180.0000	30.00	0.00	5.01	104.90	1.392	13	1.12	0.50
W.Monroe - 20' Quad Dipole	180.0000	29.87	0.00	4.88	114.90	1.428	13	4.30	4.30
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.34	-2.50	104.90	1.392	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.34	-2.50	104.90	1.392	13	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	5.01	104.90	1.392	13	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	104.90	1.392	13	10.70	10.70
LPA-185080/12	300.0000	30.00	-4.43	-2.56	95.00	1.353	12	6.93	9.32
LPA-185080/12	60.0000	30.00	4.43	-2.56	95.00	1.353	12	6.93	9.32
LPA-185080/12	180.0000	30.00	0.00	5.12	95.00	1.353	12	6.93	9.32
LPA-80080/8CF	300.0000	48.00	-4.43	-2.56	95.00	1.353	12	12.56	24.35
LPA-80080/8CF	60.0000	48.00	4.43	-2.56	95.00	1.353	12	12.56	24.35
LPA-80080/8CF	180.0000	48.00	0.00	5.12	95.00	1.353	12	12.56	24.35
(2) 6'x 2 3/8" Pipe Mount	300.0000	10.00	-4.43	-2.56	95.00	1.353	12	1.43	1.43
(2) 6'x 2 3/8" Pipe Mount	60.0000	10.00	4.43	-2.56	95.00	1.353	12	1.43	1.43
(2) 6'x 2 3/8" Pipe Mount	180.0000	10.00	0.00	5.12	95.00	1.353	12	1.43	1.43
(2) 8'x2 3/8" Pipe Mount	300.0000	25.00	-4.43	-2.56	95.00	1.353	12	1.90	1.90
(2) 8'x2 3/8" Pipe Mount	60.0000	25.00	4.43	-2.56	95.00	1.353	12	1.90	1.90
(2) 8'x2 3/8" Pipe Mount	180.0000	25.00	0.00	5.12	95.00	1.353	12	1.90	1.90
18' x 4" omni whip	300.0000	60.00	-4.34	-2.51	104.00	1.388	13	7.20	7.20
18' x 4" omni whip	180.0000	60.00	0.00	5.01	104.00	1.388	13	7.20	7.20
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	95.00	1.353	12	10.70	10.70
DB844H90E-XY	300.0000	40.00	-4.54	-2.62	85.00	1.310	12	11.47	14.93
DB844H90E-XY	60.0000	40.00	4.54	-2.62	85.00	1.310	12	11.47	14.93
DB844H90E-XY	180.0000	40.00	0.00	5.25	85.00	1.310	12	11.47	14.93
(4) 8'x2 3/8" Pipe Mount	300.0000	29.20	-4.54	-2.62	85.00	1.310	12	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	60.0000	29.20	4.54	-2.62	85.00	1.310	12	1.90	1.90
(4) 8'x2 3/8" Pipe Mount	180.0000	29.20	0.00	5.25	85.00	1.310	12	1.90	1.90
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	85.00	1.310	12	10.70	10.70
W.Monroe - 20' Quad Dipole	180.0000	29.87	0.00	5.50	65.00	1.214	11	4.30	4.30
PiROD 13' Low Profile Platform (Monopole)	0.0000	1300.00	0.00	0.00	75.00	1.264	12	10.70	10.70
P90-16-XLH-RR	300.0000	32.00	-4.12	-2.38	124.00	1.460	13	11.47	6.80
P-65-16-XLH-RR	60.0000	60.00	4.12	-2.38	124.00	1.460	13	8.40	5.46
P-65-16-XLH-RR	180.0000	60.00	0.00	4.76	124.00	1.460	13	8.40	5.46
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	13	3.58	1.71
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	13	3.58	1.71
Remote Radio Heads	0.0000	66.00	0.00	0.00	124.00	1.460	13	3.58	1.71
DC6-48-60-18	0.0000	20.00	0.00	0.00	124.00	1.460	13	2.59	1.08
Twin BP TMA	300.0000	17.60	-4.12	-2.38	124.60	1.462	13	0.27	0.12
Twin BP TMA	60.0000	17.60	4.12	-2.38	124.60	1.462	13	0.27	0.12

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Twin BP TMA	180.0000	17.60	0.00	4.76	124.60	1.462	13	0.27	0.12
	Sum Weight:	10076.47							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	14223.89					
Bracing Weight	0.00					
Total Member Self-Weight	14223.89			826.26	236.72	
Total Weight	29299.41			826.26	236.72	
Wind 0 deg - No Ice		-47.58	-24732.60	-2104076.12	5954.61	-2042.11
Wind 30 deg - No Ice		12352.57	-21395.27	-1819213.73	-1050563.86	297.59
Wind 60 deg - No Ice		21442.85	-12325.09	-1046673.09	-1825521.16	2557.56
Wind 90 deg - No Ice		24787.54	47.58	6544.15	-2111268.12	4132.23
Wind 120 deg - No Ice		21490.43	12407.51	1058229.29	-1831239.06	4599.67
Wind 150 deg - No Ice		12434.98	21442.85	1826584.14	-1060467.54	3834.64
Wind 180 deg - No Ice		47.58	24732.60	2105728.63	-5481.18	2042.11
Wind 210 deg - No Ice		-12352.57	21395.27	1820866.24	1051037.29	-297.59
Wind 240 deg - No Ice		-21442.85	12325.09	1048325.60	1825994.59	-2557.56
Wind 270 deg - No Ice		-24787.54	-47.58	-4891.64	2111741.55	-4132.23
Wind 300 deg - No Ice		-21490.43	-12407.51	-1056576.77	1831712.49	-4599.67
Wind 330 deg - No Ice		-12434.98	-21442.85	-1824931.62	1060940.98	-3834.64
Member Ice	2830.81					
Total Weight Ice	37203.69			1523.92	592.54	
Wind 0 deg - Ice		-35.33	-21717.38	-1871738.52	4831.63	-1885.04
Wind 30 deg - Ice		10848.49	-18790.14	-1618649.39	-934814.96	1308.86
Wind 60 deg - Ice		18825.46	-10828.09	-931436.14	-1623819.86	4152.06
Wind 90 deg - Ice		21758.17	35.33	5763.01	-1877564.77	5882.72
Wind 120 deg - Ice		18860.79	10889.28	941826.29	-1628058.94	6037.10
Wind 150 deg - Ice		10909.68	18825.46	1625936.32	-942157.27	4573.85
Wind 180 deg - Ice		35.33	21717.38	1874786.35	-3646.54	1885.04
Wind 210 deg - Ice		-10848.49	18790.14	1621697.23	936000.04	-1308.86
Wind 240 deg - Ice		-18825.46	10828.09	934483.98	1625004.94	-4152.06
Wind 270 deg - Ice		-21758.17	-35.33	-2715.17	1878749.85	-5882.72
Wind 300 deg - Ice		-18860.79	-10889.28	-938778.46	1629244.03	-6037.10
Wind 330 deg - Ice		-10909.68	-18825.46	-1622888.48	943342.36	-4573.85
Total Weight	29299.41			826.26	236.72	
Wind 0 deg - Service		-23.71	-12323.51	-1047983.23	3085.77	-1017.52
Wind 30 deg - Service		6154.91	-10660.62	-906044.88	-523345.58	148.28
Wind 60 deg - Service		10684.33	-6141.22	-521111.13	-909483.47	1274.36
Wind 90 deg - Service		12350.89	23.71	3675.31	-1051862.58	2058.97
Wind 120 deg - Service		10708.04	6182.29	527698.36	-912332.53	2291.88
Wind 150 deg - Service		6195.98	10684.33	910546.45	-528280.29	1910.68
Wind 180 deg - Service		23.71	12323.51	1049635.75	-2612.34	1017.52
Wind 210 deg - Service		-6154.91	10660.62	907697.39	523819.01	-148.28
Wind 240 deg - Service		-10684.33	6141.22	522763.65	909956.90	-1274.36
Wind 270 deg - Service		-12350.89	-23.71	-2022.80	1052336.01	-2058.97
Wind 300 deg - Service		-10708.04	-6182.29	-526045.84	912805.96	-2291.88
Wind 330 deg - Service		-6195.98	-10684.33	-908893.93	528753.72	-1910.68

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	125 - 96.04	Pole	Max Tension	27	0.46	-4.00	-0.03
			Max. Compression	14	-8728.01	360.52	-1048.30
			Max. Mx	11	-5557.12	151130.71	545.56
			Max. My	8	-5562.78	-960.03	-150408.43
			Max. Vy	11	-9741.53	151130.71	545.56
			Max. Vx	8	9684.34	-960.03	-150408.43
			Max. Torque	25			3819.41
L2	96.04 - 47.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23873.90	600.49	-1543.09
			Max. Mx	11	-17063.16	965824.76	2507.17
			Max. My	8	-17066.96	-3098.21	-962471.38
			Max. Vy	11	-20799.94	965824.76	2507.17

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L3	47.67 - 1	Pole	Max. Vx	8	20741.55	-3098.21	-962471.38
			Max. Torque	25			6009.63
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37388.60	595.26	-1530.33
			Max. Mx	11	-29410.29	2158066.48	5021.83
			Max. My	8	-29410.29	-5627.71	-2151663.42
			Max. Vy	11	-24806.15	2158066.48	5021.83
			Max. Vx	8	24748.93	-5627.71	-2151663.42
			Max. Torque	25			6008.60

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	37388.60	-0.09	0.23
	Max. H_x	11	29426.39	24787.05	47.57
	Max. H_z	2	29426.30	47.59	24729.89
	Max. M_x	2	2149948.05	47.59	24729.89
	Max. M_z	5	2157574.63	-24787.05	-47.59
	Max. Torsion	25	6004.74	18860.75	10889.26
	Min. Vert	36	29426.29	12344.83	23.67
	Min. H_x	5	29426.39	-24787.05	-47.59
	Min. H_z	8	29426.30	-47.56	-24729.89
	Min. M_x	8	-2151663.42	-47.56	-24729.89
	Min. M_z	11	-2158066.48	24787.05	47.57
	Min. Torsion	19	-6004.71	-18860.75	-10889.26

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	29426.41	0.00	-0.02	826.56	236.77	0.02
Dead+Wind 0 deg - No Ice	29426.30	-47.59	-24729.89	-2149948.05	6109.73	-2030.71
Dead+Wind 30 deg - No Ice	29426.41	12352.53	-21395.21	-1859121.51	-1073613.86	295.29
Dead+Wind 60 deg - No Ice	29426.41	21442.79	-12325.06	-1069615.65	-1865595.35	2541.94
Dead+Wind 90 deg - No Ice	29426.39	24787.05	47.59	6716.75	-2157574.63	4106.92
Dead+Wind 120 deg - No Ice	29426.41	21490.37	12407.47	1081472.97	-1871460.30	4570.85
Dead+Wind 150 deg - No Ice	29426.41	12434.94	21442.79	1866686.93	-1083782.10	3810.25
Dead+Wind 180 deg - No Ice	29426.30	47.56	24729.89	2151663.42	-5628.11	2029.38
Dead+Wind 210 deg - No Ice	29426.41	-12352.53	21395.21	1860837.48	1074105.71	-295.25
Dead+Wind 240 deg - No Ice	29426.41	-21442.79	12325.06	1071320.32	1866093.72	-2540.67
Dead+Wind 270 deg - No Ice	29426.39	-24787.05	-47.57	-5022.64	2158066.48	-4105.63
Dead+Wind 300 deg - No Ice	29426.41	-21490.37	-12407.47	-1079779.93	1871939.14	-4570.87
Dead+Wind 330 deg - No Ice	29426.41	-12434.94	-21442.79	-1864982.59	1084254.41	-3811.65
Dead+Ice+Temp	37388.60	0.09	-0.23	1530.33	595.26	-0.01
Dead+Wind 0 deg+Ice+Temp	37388.58	-35.33	-21716.97	-1929665.64	5018.60	-1874.63
Dead+Wind 30 deg+Ice+Temp	37388.60	10848.47	-18790.09	-1668790.33	-963773.80	1303.01
Dead+Wind 60 deg+Ice+Temp	37388.60	18825.42	-10828.07	-960266.47	-1674158.56	4131.37
Dead+Wind 90 deg+Ice+Temp	37388.58	21757.76	35.33	5987.65	-1935719.14	5852.34

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 120 deg+Ice+Temp	37388.60	18860.75	10889.26	971067.52	-1678565.38	6004.71
Dead+Wind 150 deg+Ice+Temp	37388.60	10909.66	18825.42	1676388.52	-971404.12	4548.36
Dead+Wind 180 deg+Ice+Temp	37388.58	35.33	21716.96	1932884.84	-3777.27	1873.69
Dead+Wind 210 deg+Ice+Temp	37388.60	-10848.47	18790.09	1672005.75	965036.01	-1302.91
Dead+Wind 240 deg+Ice+Temp	37388.60	-18825.42	10828.07	963461.30	1675427.79	-4130.40
Dead+Wind 270 deg+Ice+Temp	37388.58	-21757.76	-35.32	-2808.17	1936974.00	-5851.40
Dead+Wind 300 deg+Ice+Temp	37388.60	-18860.75	-10889.26	-967885.30	1679799.01	-6004.74
Dead+Wind 330 deg+Ice+Temp	37388.60	-10909.66	-18825.42	-1673185.70	972630.73	-4549.39
Dead+Wind 0 deg - Service	29426.29	-23.70	-12317.49	-1070828.65	3170.97	-1015.81
Dead+Wind 30 deg - Service	29426.38	6154.23	-10659.43	-926225.87	-535007.47	147.51
Dead+Wind 60 deg - Service	29426.29	10679.12	-6138.24	-532453.41	-929326.60	1271.23
Dead+Wind 90 deg - Service	29426.29	12344.84	23.71	3784.74	-1074817.83	2054.28
Dead+Wind 120 deg - Service	29426.38	10706.83	6181.60	539490.68	-932691.47	2286.66
Dead+Wind 150 deg - Service	29426.29	6192.93	10679.11	930432.09	-539820.42	1906.44
Dead+Wind 180 deg - Service	29426.29	23.68	12317.47	1072548.97	-2678.10	1015.50
Dead+Wind 210 deg - Service	29426.38	-6154.23	10659.43	927947.97	535501.02	-147.47
Dead+Wind 240 deg - Service	29426.38	-10683.13	6140.54	534424.42	930259.99	-1270.94
Dead+Wind 270 deg - Service	29426.29	-12344.83	-23.67	-2064.32	1075310.95	-2053.99
Dead+Wind 300 deg - Service	29426.29	-10702.81	-6179.26	-537517.97	932742.44	-2286.70
Dead+Wind 330 deg - Service	29426.38	-6195.29	-10683.13	-929151.47	540566.58	-1906.74

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-29426.41	0.00	-0.00	29426.41	0.02	0.000%
2	-47.58	-29426.41	-24732.60	47.59	29426.30	24729.89	0.007%
3	12352.57	-29426.41	-21395.27	-12352.53	29426.41	21395.21	0.000%
4	21442.85	-29426.41	-12325.09	-21442.79	29426.41	12325.06	0.000%
5	24787.54	-29426.41	47.58	-24787.05	29426.39	-47.59	0.001%
6	21490.43	-29426.41	12407.51	-21490.37	29426.41	-12407.47	0.000%
7	12434.98	-29426.41	21442.85	-12434.94	29426.41	-21442.79	0.000%
8	47.58	-29426.41	24732.60	-47.56	29426.30	-24729.89	0.007%
9	-12352.57	-29426.41	21395.27	12352.53	29426.41	-21395.21	0.000%
10	-21442.85	-29426.41	12325.09	21442.79	29426.41	-12325.06	0.000%
11	-24787.54	-29426.41	-47.58	24787.05	29426.39	47.57	0.001%
12	-21490.43	-29426.41	-12407.51	21490.37	29426.41	12407.47	0.000%
13	-12434.98	-29426.41	-21442.85	12434.94	29426.41	21442.79	0.000%
14	0.00	-37388.60	0.00	-0.09	37388.60	0.23	0.001%
15	-35.33	-37388.60	-21717.38	35.33	37388.58	21716.97	0.001%
16	10848.49	-37388.60	-18790.14	-10848.47	37388.60	18790.09	0.000%
17	18825.46	-37388.60	-10828.09	-18825.42	37388.60	10828.07	0.000%
18	21758.17	-37388.60	35.33	-21757.76	37388.58	-35.33	0.001%
19	18860.79	-37388.60	10889.28	-18860.75	37388.60	-10889.26	0.000%
20	10909.68	-37388.60	18825.46	-10909.66	37388.60	-18825.42	0.000%
21	35.33	-37388.60	21717.38	-35.33	37388.58	-21716.96	0.001%
22	-10848.49	-37388.60	18790.14	10848.47	37388.60	-18790.09	0.000%
23	-18825.46	-37388.60	10828.09	18825.42	37388.60	-10828.07	0.000%
24	-21758.17	-37388.60	-35.33	21757.76	37388.58	35.32	0.001%
25	-18860.79	-37388.60	-10889.28	18860.75	37388.60	10889.26	0.000%
26	-10909.68	-37388.60	-18825.46	10909.66	37388.60	18825.42	0.000%
27	-23.71	-29426.41	-12323.51	23.70	29426.29	12317.49	0.019%
28	6154.91	-29426.41	-10660.62	-6154.23	29426.38	10659.43	0.004%
29	10684.33	-29426.41	-6141.22	-10679.12	29426.29	6138.24	0.019%
30	12350.89	-29426.41	23.71	-12344.84	29426.29	-23.71	0.019%
31	10708.04	-29426.41	6182.29	-10706.83	29426.38	-6181.60	0.004%
32	6195.98	-29426.41	10684.33	-6192.93	29426.29	-10679.11	0.019%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
33	23.71	-29426.41	12323.51	-23.68	29426.29	-12317.47	0.019%
34	-6154.91	-29426.41	10660.62	6154.23	29426.38	-10659.43	0.004%
35	-10684.33	-29426.41	6141.22	10683.13	29426.38	-6140.54	0.004%
36	-12350.89	-29426.41	-23.71	12344.83	29426.29	23.67	0.019%
37	-10708.04	-29426.41	-6182.29	10702.81	29426.29	6179.26	0.019%
38	-6195.98	-29426.41	-10684.33	6195.29	29426.38	10683.13	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00012631	0.00070663
3	Yes	12	0.00000001	0.00037886
4	Yes	12	0.00000001	0.00034528
5	Yes	11	0.00000001	0.00045523
6	Yes	12	0.00000001	0.00046821
7	Yes	12	0.00000001	0.00034415
8	Yes	10	0.00012628	0.00065211
9	Yes	12	0.00000001	0.00037449
10	Yes	12	0.00000001	0.00042034
11	Yes	11	0.00000001	0.00043319
12	Yes	12	0.00000001	0.00033855
13	Yes	12	0.00000001	0.00045044
14	Yes	6	0.00000001	0.00000765
15	Yes	11	0.00000001	0.00044533
16	Yes	12	0.00000001	0.00048728
17	Yes	12	0.00000001	0.00043505
18	Yes	11	0.00000001	0.00079055
19	Yes	12	0.00000001	0.00059500
20	Yes	12	0.00000001	0.00044388
21	Yes	11	0.00000001	0.00043683
22	Yes	12	0.00000001	0.00046295
23	Yes	12	0.00000001	0.00054574
24	Yes	11	0.00000001	0.00077569
25	Yes	12	0.00000001	0.00044007
26	Yes	12	0.00000001	0.00056126
27	Yes	9	0.00051596	0.00073235
28	Yes	10	0.00012919	0.00058854
29	Yes	9	0.00051421	0.00090721
30	Yes	9	0.00051594	0.00098240
31	Yes	10	0.00012916	0.00091540
32	Yes	9	0.00051413	0.00093170
33	Yes	9	0.00051595	0.00072506
34	Yes	10	0.00012918	0.00057263
35	Yes	10	0.00012918	0.00074503
36	Yes	9	0.00051595	0.00096885
37	Yes	9	0.00051415	0.00094502
38	Yes	10	0.00012917	0.00084847

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	125 - 96.04	27.869	31	1.9979	0.0257
L2	99.96 - 47.67	17.832	31	1.7599	0.0136
L3	53.34 - 1	4.668	31	0.8435	0.0034

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
124.90	W.Monroe - 20' Quad Dipole	31	27.828	1.9972	0.0256	18188
124.60	(2) 7770.00	31	27.704	1.9949	0.0254	18188
124.00	P90-16-XLH-RR	31	27.455	1.9905	0.0251	18188
119.90	W.Monroe - 20' Quad Dipole	31	25.757	1.9596	0.0230	17832
119.45	PiROD 13' Low Profile Platform (Monopole)	31	25.572	1.9561	0.0228	16386
114.90	W.Monroe - 20' Quad Dipole	31	23.704	1.9195	0.0204	9004
114.70	TMA	31	23.622	1.9178	0.0203	8829
114.30	PiROD 13' Low Profile Platform (Monopole)	31	23.459	1.9144	0.0201	8499
113.00	18' x 4" omni whip	31	22.931	1.9030	0.0195	7578
109.90	W.Monroe - 20' Quad Dipole	31	21.684	1.8743	0.0180	6022
109.15	PiROD 13' Low Profile Platform (Monopole)	31	21.384	1.8670	0.0176	5737
107.00	18' x 4" omni whip	31	20.534	1.8449	0.0166	5051
104.90	APX16PV-16PVL	31	19.713	1.8217	0.0157	4523
104.80	APX16DWV-16DWV-S-E-ACU	31	19.672	1.8205	0.0157	4500
104.69	APX16DWV-16DWV-S-E-ACU	31	19.632	1.8193	0.0156	4477
104.00	PiROD 13' Low Profile Platform (Monopole)	31	19.365	1.8112	0.0153	4330
101.00	18' x 4" omni whip	31	18.221	1.7738	0.0141	3835
98.85	PiROD 13' Low Profile Platform (Monopole)	31	17.419	1.7444	0.0132	3625
95.00	(2) LPA-185080/12	31	16.022	1.6863	0.0118	3435
93.70	PiROD 13' Low Profile Platform (Monopole)	31	15.561	1.6652	0.0114	3387
88.55	PiROD 13' Low Profile Platform (Monopole)	31	13.798	1.5754	0.0097	3210
85.00	(4) DB844H90E-XY	31	12.639	1.5084	0.0088	3099
83.40	PiROD 13' Low Profile Platform (Monopole)	31	12.133	1.4771	0.0083	3051
78.25	PiROD 13' Low Profile Platform (Monopole)	31	10.573	1.3723	0.0072	2906
75.00	W.Monroe - 20' Quad Dipole	31	9.645	1.3039	0.0065	2822
73.10	PiROD 13' Low Profile Platform (Monopole)	31	9.123	1.2633	0.0061	2775
70.00	W.Monroe - 20' Quad Dipole	31	8.304	1.1965	0.0056	2701
67.95	PiROD 13' Low Profile Platform (Monopole)	31	7.787	1.1521	0.0052	2655
65.00	W.Monroe - 20' Quad Dipole	31	7.075	1.0883	0.0048	2591
62.80	PiROD 13' Low Profile Platform (Monopole)	31	6.571	1.0409	0.0045	2545
60.00	W.Monroe - 20' Quad Dipole	31	5.962	0.9811	0.0041	2489
57.65	PiROD 13' Low Profile Platform (Monopole)	31	5.481	0.9317	0.0039	2443
55.00	W.Monroe - 20' Quad Dipole	31	4.970	0.8770	0.0036	2410
52.50	PiROD 13' Low Profile Platform (Monopole)	31	4.520	0.8267	0.0033	2435

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
47.35	PiROD 13' Low Profile Platform (Monopole)	31	3.691	0.7273	0.0028	2670
42.20	PiROD 13' Low Profile Platform (Monopole)	31	2.980	0.6332	0.0023	3003
37.05	PiROD 13' Low Profile Platform (Monopole)	31	2.376	0.5438	0.0019	3432
31.90	PiROD 13' Low Profile Platform (Monopole)	31	1.864	0.4585	0.0016	4004
26.75	PiROD 13' Low Profile Platform (Monopole)	31	1.432	0.3767	0.0013	4805
21.60	PiROD 13' Low Profile Platform (Monopole)	31	1.066	0.2978	0.0010	6006
16.45	PiROD 13' Low Profile Platform (Monopole)	31	0.753	0.2213	0.0008	8008
11.30	PiROD 13' Low Profile Platform (Monopole)	31	0.480	0.1466	0.0005	12012
6.15	PiROD 13' Low Profile Platform (Monopole)	31	0.233	0.0730	0.0002	24023
1.00	PiROD 13' Low Profile Platform (Monopole)	0	0.000	0.0000	0.0000	24744

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 96.04	55.833	6	4.0020	0.0615
L2	99.96 - 47.67	35.738	6	3.5278	0.0334
L3	53.34 - 1	9.360	6	1.6914	0.0089

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.90	W.Monroe - 20' Quad Dipole	6	55.750	4.0005	0.0613	9170
124.60	(2) 7770.00	6	55.501	3.9961	0.0610	9170
124.00	P90-16-XLH-RR	6	55.003	3.9872	0.0603	9170
119.90	W.Monroe - 20' Quad Dipole	6	51.605	3.9258	0.0553	8990
119.45	PiROD 13' Low Profile Platform (Monopole)	6	51.233	3.9189	0.0547	8261
114.90	W.Monroe - 20' Quad Dipole	6	47.494	3.8461	0.0493	4539
114.70	TMA	6	47.331	3.8427	0.0491	4451
114.30	PiROD 13' Low Profile Platform (Monopole)	6	47.005	3.8359	0.0486	4284
113.00	18' x 4" omni whip	6	45.948	3.8134	0.0471	3820
109.90	W.Monroe - 20' Quad Dipole	6	43.450	3.7562	0.0436	3035
109.15	PiROD 13' Low Profile Platform (Monopole)	6	42.851	3.7416	0.0428	2891
107.00	18' x 4" omni whip	6	41.148	3.6975	0.0405	2546
104.90	APX16PV-16PVL	6	39.505	3.6512	0.0383	2279
104.80	APX16DWV-16DWV-S-E-ACU	6	39.424	3.6488	0.0382	2267

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.69	APX16DWV-16DWV-S-E-ACU	6	39.342	3.6464	0.0381	2256
104.00	PiROD 13' Low Profile Platform (Monopole)	6	38.808	3.6303	0.0374	2182
101.00	18' x 4" omni whip	6	36.518	3.5556	0.0344	1932
98.85	PiROD 13' Low Profile Platform (Monopole)	6	34.912	3.4968	0.0324	1825
95.00	(2) LPA-185080/12	6	32.113	3.3806	0.0291	1728
93.70	PiROD 13' Low Profile Platform (Monopole)	6	31.191	3.3384	0.0281	1704
88.55	PiROD 13' Low Profile Platform (Monopole)	6	27.658	3.1586	0.0243	1613
85.00	(4) DB844H90E-XY	6	25.337	3.0244	0.0219	1555
83.40	PiROD 13' Low Profile Platform (Monopole)	6	24.323	2.9616	0.0210	1531
78.25	PiROD 13' Low Profile Platform (Monopole)	6	21.197	2.7517	0.0181	1457
75.00	W.Monroe - 20' Quad Dipole	6	19.336	2.6146	0.0165	1414
73.10	PiROD 13' Low Profile Platform (Monopole)	6	18.290	2.5332	0.0156	1390
70.00	W.Monroe - 20' Quad Dipole	6	16.651	2.3993	0.0143	1352
67.95	PiROD 13' Low Profile Platform (Monopole)	6	15.613	2.3103	0.0135	1329
65.00	W.Monroe - 20' Quad Dipole	6	14.187	2.1823	0.0124	1296
62.80	PiROD 13' Low Profile Platform (Monopole)	6	13.176	2.0873	0.0117	1272
60.00	W.Monroe - 20' Quad Dipole	6	11.956	1.9675	0.0108	1244
57.65	PiROD 13' Low Profile Platform (Monopole)	6	10.990	1.8683	0.0101	1221
55.00	W.Monroe - 20' Quad Dipole	6	9.966	1.7587	0.0093	1204
52.50	PiROD 13' Low Profile Platform (Monopole)	6	9.064	1.6578	0.0086	1216
47.35	PiROD 13' Low Profile Platform (Monopole)	6	7.401	1.4585	0.0074	1333
42.20	PiROD 13' Low Profile Platform (Monopole)	6	5.977	1.2698	0.0063	1499
37.05	PiROD 13' Low Profile Platform (Monopole)	6	4.765	1.0905	0.0054	1713
31.90	PiROD 13' Low Profile Platform (Monopole)	6	3.739	0.9194	0.0045	1998
26.75	PiROD 13' Low Profile Platform (Monopole)	6	2.872	0.7554	0.0037	2397
21.60	PiROD 13' Low Profile Platform (Monopole)	6	2.139	0.5973	0.0029	2996
16.45	PiROD 13' Low Profile Platform (Monopole)	6	1.511	0.4438	0.0021	3995
11.30	PiROD 13' Low Profile Platform (Monopole)	6	0.963	0.2939	0.0014	5993
6.15	PiROD 13' Low Profile Platform (Monopole)	6	0.468	0.1464	0.0007	11985
1.00	PiROD 13' Low Profile Platform (Monopole)	0	0.000	0.0000	0.0000	12344

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.7500	12	2.2500	134785.26 131210.58 1.03	139686.97 217809.56 0.64	46.608 45.000 1.04	28.948 45.000 0.64	Plate	1.04 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	125 - 96.04 (1)	TP26.9x18x0.1875	28.96	124.00	164.3	5.530	15.1803	-5554.13	83951.70	0.066
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	52.29	124.00	106.7	13.127	31.1841	-17061.20	409362.00	0.042
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	52.34	124.00	76.6	22.743	54.2432	-29410.30	1233630.00	0.024

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	125 - 96.04 (1)	TP26.9x18x0.1875	151823.33	-19.058	39.000	0.489	0.00	0.000	39.000	0.000
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	967741.67	-38.344	38.202	1.004	0.00	0.000	38.202	0.000
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	2161466.67	-35.359	36.209	0.977	0.00	0.000	36.209	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 96.04 (1)	TP26.9x18x0.1875	0.066	0.489	0.000	0.555 ✓	1.333	H1-3 ✓
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	0.042	1.004	0.000	1.045 ✓	1.333	H1-3 ✓
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	0.024	0.977	0.000	1.000 ✓	1.333	H1-3 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	125 - 96.04	Pole	TP26.9x18x0.1875	1	-5554.13	111907.62	41.6	Pass
L2	96.04 - 47.67	Pole	TP41.28x25.3203x0.25	2	-17061.20	545679.52	78.4	Pass
L3	47.67 - 1	Pole	TP55x39.0494x0.3125	3	-29410.30	1644428.72	75.0	Pass
							Summary	
						Pole (L2)	78.4	Pass
						Base Plate	77.7	Pass
						RATING =	**78.4**	**Pass**

P65-16-XLH-RR : Dual Broadband Antennas

POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 65, 65
GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
TILT: 1-12, 0-8
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

	698-894		1710-2170		
Frequency range (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Frequency band (MHz)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Gain (dBi/dBd)	Dual Linear +/- 45			Dual Linear +/- 45	
Polarization	50			50	
Nominal Impedance (Ω)	< 1.5:1			< 1.5:1	
VSWR	66	65	60	63	63
Horizontal beam width, -3 dB (°)	14.7	12.5	6.8	6.4	5.7
Vertical beam width, -3 dB (°)	1 to 12			0 to 8	
Electrical down tilt (°)	> 16	>16	> 16		
Side lobe suppression, vertical 1st upper (dB)	>16	>16			
	> 30	> 30	> 30	> 30	
Isolation between inputs (dB)	> 40			> 40	
Inter band Isolation (dB)	< 2		< 2	< 2	< 2
Tracking, horizontal plane ±60° (dB)			>-20	>-20	>-20
First null fill (dB)	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Vertical beam squint (°)	>24	>24	> 30	>30	>28
Front to back ratio (dB) 180°±30° copolar					
Front to back ratio (dB) 180°±30° total power	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) 0° (dB)	> 10	> 10	> 10	> 10	> 10
Cross polar discrimination (XPD) ±60° (dB)					
Far field coupling	<-153			<-153	
IM3, 2xTx@43dBm (dBc)					
IM7, 2xTx@43dBm (dBc)	500			250	
Power handling, average per input (W)	1000			500	
Power handling, average total (W)					

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00A

*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

P90-16-XLH-RR ⋮ Dual Broadband Antennas

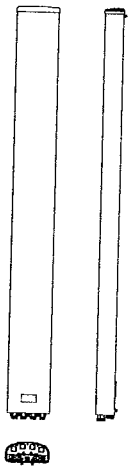
POLARIZATION: Dual Linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 90, 90
GAIN (dBi/dBd): 16.1/14.0 16.3/14.2
TILT: 0-7, 0-8
LENGTH: 96"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	698-894			1710-2170		
Frequency band (MHz)	698-806		806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	15.4/13.3		16.1/14.0	15.7/13.6	16.0/13.9	16.3/14.2
Polarization	Dual Linear +/- 45				Dual Linear +/- 45	
Nominal Impedance (Ω)	50				50	
VSWR	< 1.5:1				< 1.5:1	
Horizontal beam width, -3 dB (°)	83		84	87	84	83
Vertical beam width, -3 dB (°)	9		8.7	6	6.6	6
Electrical down tilt (°)	0-7				0-8	
Side lobe suppression, vertical 1st upper (dB)	> 16		>16	>16	>16	>16
Isolation between inputs (dB)	> 30		> 30	> 30	> 30	> 30
Inter band Isolation (dB)	> 40				> 40	
Tracking, horizontal plane ±60° (dB)	< 2		< 2	< 2	< 2	< 2
First null fill (dB)						
Vertical beam squint (°)	< 0.8		< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) 180°±30° copolar	25		25	>21	>24	>27
Front to back ratio (dB) 180°±30° total power	22		22	> 22	> 22	> 22
Cross polar discrimination (XPD) 0° (dB)	> 15		> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) ±60° (dB)	10		10	10	10	10
Far field coupling						
IM3, 2xTx@43dBm (dBc)	<-153				<-153	
IM7, 2xTx@43dBm (dBc)						
Power handling, average per input (W)	500				300	
Power handling, average total (W)	1000				600	

MECHANICAL SPECIFICATIONS*

Connector	4 x 7/16 DIN Female, Extended Shank
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	2448 x 280 x 186 (96"x11"x7")
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	32 (70)
Weight, without brackets, kg (lbs)	27 (59)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	822 / 384 / 988
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40 to +70C
Radome material	PVC
Packet size, HxWxD, mm (ft)	2725 X 400 X 255 (107" X 16" X 10")
Radome colour	Light Grey
Shipping weight, kg (lbs)	(37) 81
RET	iRET AISGv1.1, MET and AISGv2.0 Available
Brackets	7256.00, 7454.00A



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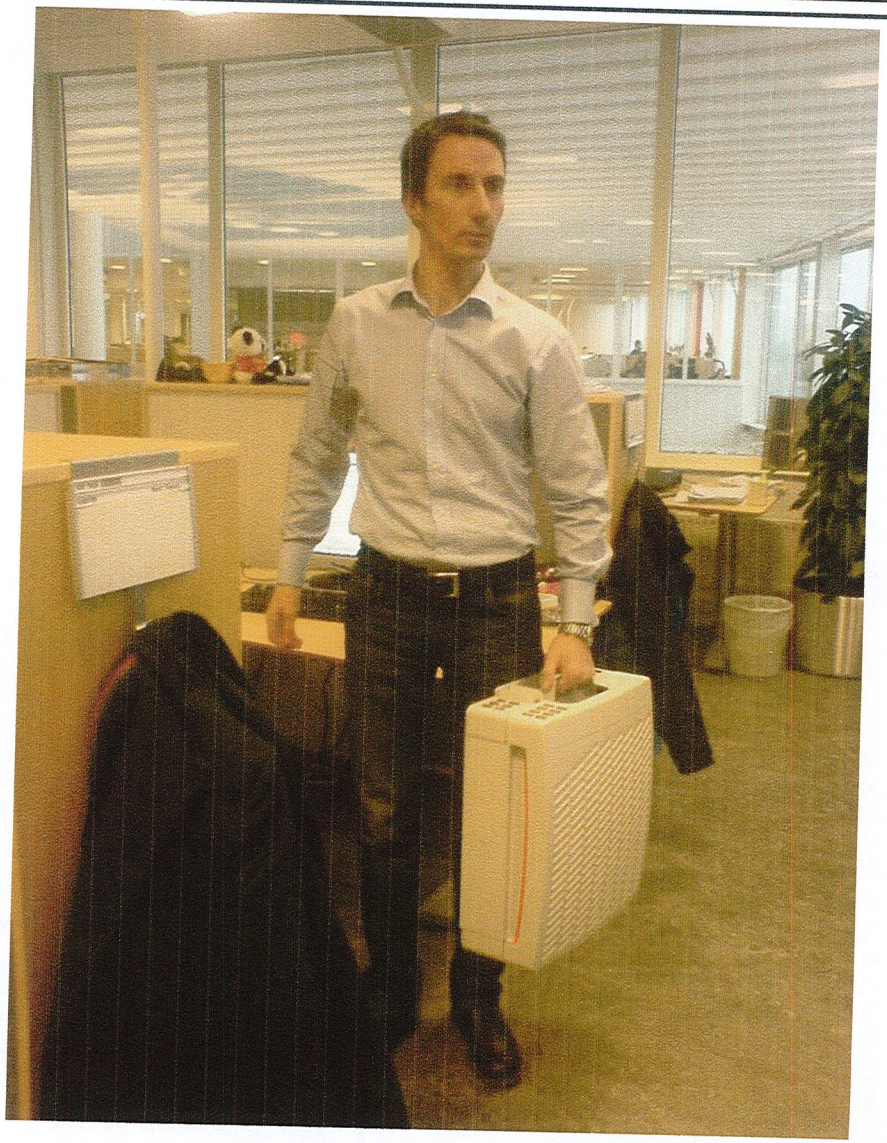
ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

RRUS 11 – Dual PA RRU.
Technical Data

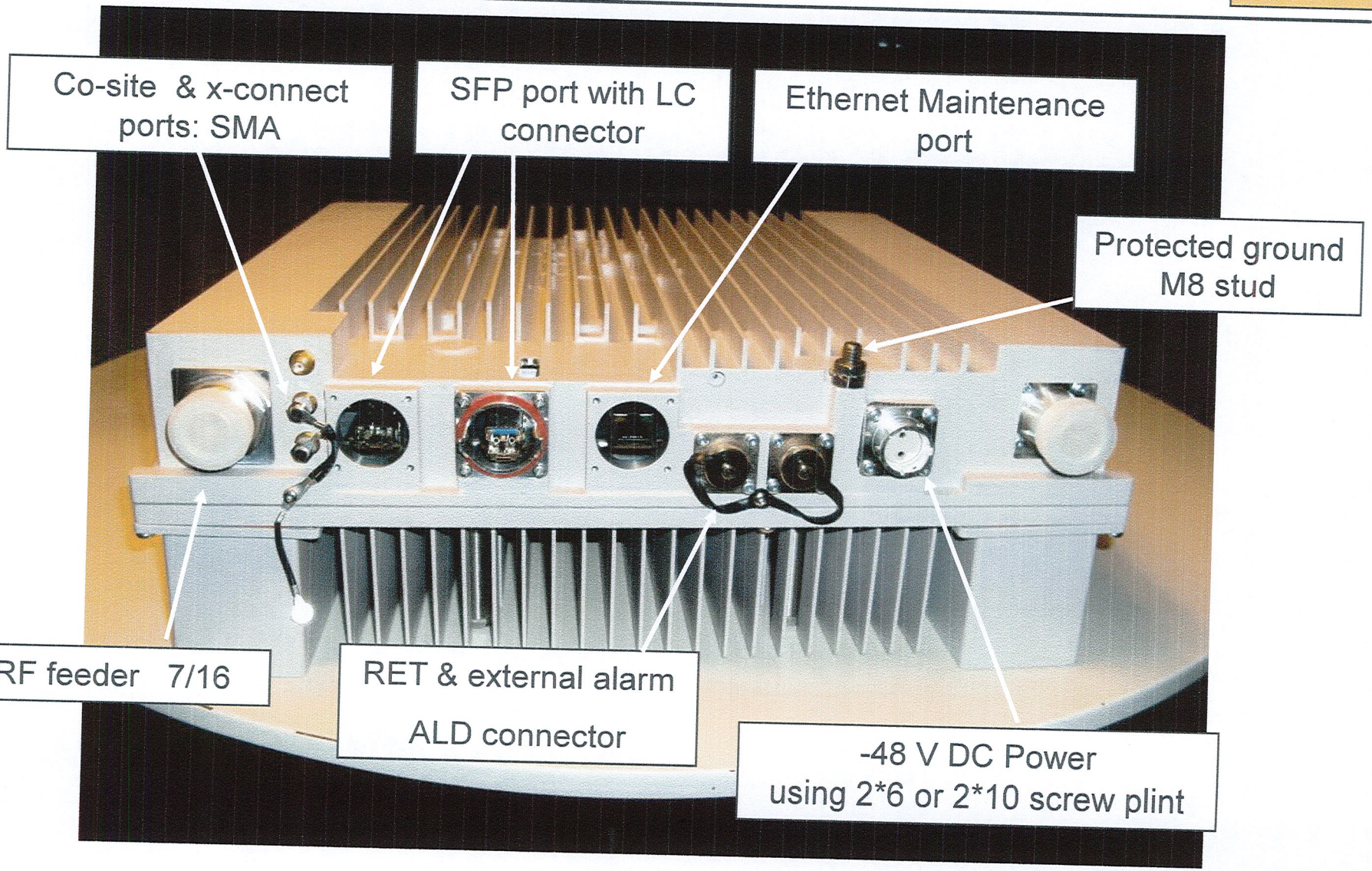
RBS6000

- 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



TT19-08BP111-001 | TMA Twin 1900 with 850 Bypass 12 dB AISG 1.1

ELECTRICAL SPECIFICATIONS

UL Frequency Range (MHz)	1850-1910 with 824-894 bypass
UL Rejection	>77 dB
UL Gain(dB)	12
UL Return Loss	>18
UL Noise Figure	<1.7 dB, Typical
UL Output 3rd Order Intercept Point(dBm)	>+23
UL Bypass Loss(dB)	2.5, Typical
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	1930-1990 with 824-894 bypass
DL Return Loss	>18
DL Insertion Loss (dB)	850 MHz, <0.3; 1900 MHz, <0.5
Intermodulation	@ 2 x +43 dBm TX carriers, in receive band, <160 dBc, reffered to antenna port
Input Voltage (V)	AISG Mode: 10-30; Current alarm mode: 8 -17
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.1W @12V
Power Handling, RMS	850: >57 dBm; 1900: >55 dBm
AISG Compatibility	AISG 1.1 fully upgreadable to AISG 2.0 (AISG version only dependent on loaded SW version) TT19-08BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS

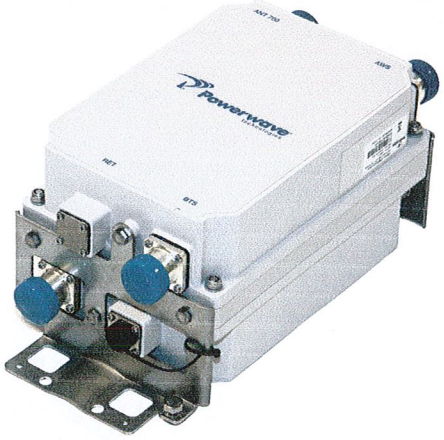
Dimension HxWxD mm(ft)	250x169x137 mm (9.9"x6.7"x5.4")
Weight(lbs)	<16
Colors	Off white (NCS 1502-R)
RF Connectors	DIN 7/16 female, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-40° C to +65° C (-40° F to +149° F)
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	3 kA 10/350 µs; 20 kA (Shield)
Housing	Aluminum
MTBF	>1 million hours per TMA
Ingress Protection	IP65 and IP68

APPROVAL AND TESTS

Safety	EN60950
EMC	3GPP: TS 25.113



*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.

POWER

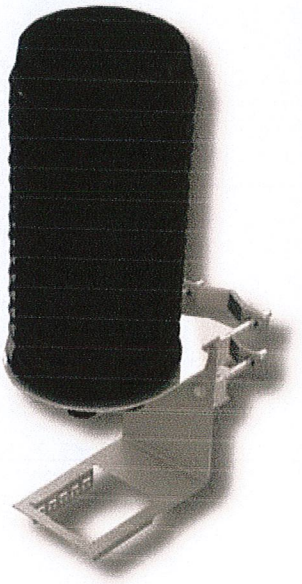
DC6-48-60-18-8F

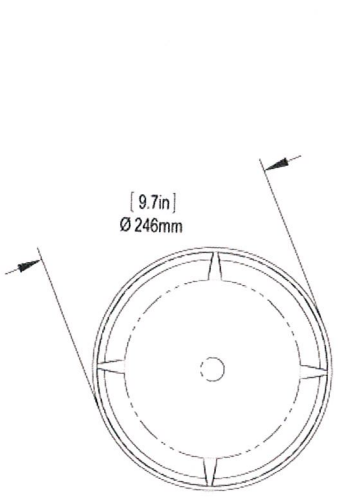
DC Surge Suppression Solution

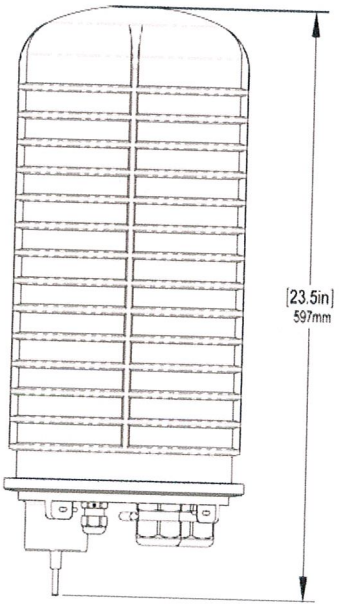
The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

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

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

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

Douglas L. Culp
Real Estate Consultant

June 23, 2011

Honorable Matt Knickerbocker
First Selectman Bethel
Bethel Town Hall
1 School Street
Bethel, CT 06801

Re: Telecommunications Facility – 23 Spring Hill Lane Bethel, CT

Dear First Selectman Knickerbocker:

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