EM-SPRINT-NEXTEL-152-130201
41 Manitock Hill Road
Waterford

Alcatel·Lucent

1 Robbins Road
Westford, MA 01886

RECEIVED
JUL 10 2014
CONNECTICUT
SITING COUNCIL

July 9, 2014

State of Connecticut
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notification of Construction Completion on telecommunication facilities

To whom it may concern:

Alcatel Lucent hereby acknowledges that the list of attached sites have completed construction per the approval granted on the specified date. Please advise if further information is needed..

Very truly yours,

Martha Powers

Martha Powers
Lead Development Manager
Alcatel-Lucent
Sprint Vision Project
1 Robbins Road
Westford, MA 01886

Cc: FST, Siterra

EM/TS #	Address	Town	Sprint ID	Decision Date
EM-SPRINT-062-130912	1065 Wintergreen Avenue	Hamden	CT03XC003	10/15/2013
EM-SPRINT-NEXTEL-060-130118	10 Tanner Marsh Road	Guilford	CT03XC022	2/14/2013
EM-SPRINT-004-130822	181 Montevideo Road	Avon	CT03XC053	9/6/2013
EM-SPRINT-NEXTEL-155-130214A	1358 New Britain Ave.	West Hartford	CT03XC057	3/1/2013
EM-SPRINT-NEXTEL-164-130201	440 Hayden Station Road	Windsor	CT03XC065	3/8/2013
EM-SPRINT-NEXTEL-132-130201	59 McGuire Road	South Windsor	CT03XC066	3/1/2013
EM-SPRINT-NEXTEL-054-130201	299 Paxton Way	Glastonbury	CT03XC081	3/1/2013
EM-SPRINT-NEXTEL-094-130214B	36 Prospect Street	Newington	CT03XC084	3/1/2013
EM-SPRINT-110-130725	10 Sparks Street	Plainville	CT03XC086	8/8/2013
EM-SPRINT-007-130314	260 Beckley Road	Kensington	CT03XC088	4/5/2013
EM-SPRINT-NEXTEL-155-130201	570 New Park Avenue	West Hartford	CT03XC091	3/1/2013
EM-SPRINT-NEXTEL-106-130201	430 Middlesex Turnpike	Old Saybrook	CT03XC102	3/1/2013
EM-SPRINT-NEXTEL-105-130201	30 Short Hills Road	Old Lyme	CT03XC104	3/1/2013
EM-SPRINT-NEXTEL-152-130201	41 Manitock Hill Road	Waterford	CT03XC105	3/1/2013
EM-SPRINT-NEXTEL-045-130201	93 Roxbury Road	East Lyme	CT03XC110	3/1/2013
EM-SPRINT-152-130114	45R Fargo Road	Waterford	CT03XC112	2/14/2013
EM-SPRINT-NEXTEL-027-130201	48 Cow Hill Road	Clinton	CT03XC156	3/1/2013
EM-SPRINT-NEXTEL-082-130201	238 Meridan Road	Middlefield	CT03XC160	3/8/2013
EM-SPRINT-047-130109	160 Plantation Road	East Windsor	CT03XC202	2/7/2013
EM-SPRINT-NEXTEL-077-130214	53 Slater Street	Manchester	CT03XC211	3/1/2013
EM-SPRINT-142-130109	497 Old Post Road	Tolland	CT03XC212	2/7/2013
EM-SPRINT-NEXTEL-042-130222	94 East High Street	East Hampton	CT03XC335	3/8/2013
EM-SPRINT-057-121226	Butternut Hollow Road	Greenwich	CT03XC343	1/11/2013
EM-SPRINT-158-130213	515 Boston Post Road	Westport	CT03XC355	3/1/2013
EM-SPRINT-046-130402	206 Everett Road	Easton	CT03XC362	4/19/2013
EM-SPRINT-085-130322	474 MAIN STREET	MONROE	CT03XC365	4/5/2013
EM-SPRINT-086-131011	57 Cook Drive	Montville	CT03XC365	10/25/2013
EM-SPRINT-118-130322	76 EAST RIDGE	RIDGEFIELD	CT03XC370	4/5/2013
EM-SPRINT-097-131230	20 Barnabas Road	Newtown	CT03XC383	1/21/2014
EM-SPRINT-051-130207	3965 Congress Street	Fairfield	CT03XC385	3/1/2013
EM-SPRINT-NEXTEL-094-130214A	123 Costello Road	Newington	CT23XC555	3/1/2013
EM-SPRINT-119-131008	699 Old Main Street	Rocky Hill	CT23XC556	10/25/2013
EM-SPRINT-077-131008	60 Adams Street	Manchester	CT23XC557	10/25/2013
EM-SPRINT-NEXTEL-080-130123	462 West Main Street	Meriden	CT25XC840	2/14/2013
EM-SPRINT-096-130920	18 Hilltop View Lane	New Milford	CT33XC095	10/4/2013
EM-SPRINT-157-130213	237 Godfrey Road	Weston	CT33XC522	3/1/2013
EM-SPRINT-018-131008	20 Vale Road	Brookfield	CT33XC525	10/25/2013
EM-SPRINT-077-130528	595 Keeney Street	Manchester	CT33XC538	6/14/2013
EM-SPRINT-NEXTEL-129-130214	400 Main Street	Somers	CT33XC554	3/1/2013
EM-SPRINT-047-130322	15 CHAMBERLAIN	BROADBROOK	CT33XC565	4/5/2013
EM-SPRINT-004-130502	277 Huckleberry Road	Avon	CT33XC589	5/17/2013

EM-SPRINT-143-130604	218 Wheeler Road	Torrington	CT33XC592	6/28/2013
EM-SPRINT-140-130724	583 Chapel Street	Thomaston	CT33XC603	8/8/2013
EM-SPRINT-103-130920	Charles Marshall Drive	Norwalk	CT33XC802	10/4/2013
EM-SPRINT-NEXTEL-064-130214	439-455 Homestead Ave.	Hartford	CT43XC805	3/1/2013
EM-SPRINT-064-130311	99 Meadow Street	Hartford	CT43XC806	4/5/2013
EM-SPRINT-083-131127	290 Preston Ave.	Middletown	CT43XC816	12/16/2013
EM-SPRINT-128-130920	530 Bushy Hill Road	Simsbury	CT43XC825	10/4/2013
EM-SPRINT-164-130405A	340 Bloomfield Avenue	Windsor	CT43XC826	4/19/2013
EM-SPRINT-077-130109	239 Middle Turnpike	Manchester	CT43XC827	2/13/2013
EM-SPRINT-165-130118	2-4 Volunteer Drive	Windsor Locks	CT43XC828	2/14/2013
EM-SPRINT-NEXTEL-139-130214	44 Fyler Place	Suffield	CT43XC829	3/8/2013
EM-SPRINT-111-130712	171 Town Hill Road	Plymouth	CT54XC712	7/26/2013
EM-SPRINT-009-130322	38 Spring Hill Road	Bethel	CT54XC749	4/5/2013
EM-SPRINT-154-131011	315 Spencer Plains Road	Westbrook	CT54XC758	10/25/2013
EM-SPRINT-023-130405	14 Canton Springs Road	Canton	CT54XC760	4/19/2013
EM-SPRINT-104-130606	153 Old Salem Road	Norwich	CT54XC775	6/28/2013
EM-SPRINT-164-130405B	99 Day Hill Road	Windsor	CT54XC787	4/19/2013
EM-SPRINT-132-130920	300 Governor's Highway	South Windsor	CT60XC014	10/4/2013
EM-SPRINT-094-130108	605 Willard Avenue	Newington	CT60XC018	1/25/2013
EM-SPRINT-146-130506	197 South Street	Vernon	CT60XC935	5/24/2013
EM-SPRINT-146-130311	777 Talcottville Road	Vernon	CT70XC147	4/5/2013
EM-SPRINT-126-130531	62 Birdseye Road	Shelton	CT73XC004	6/21/2013

CROWN CASTLE

500 West Cummings Park, Suite 3600 Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

June 27, 2014

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

RE: Sprint PCS-Exempt Modification - Crown Site BU: 876338
Sprint PCS Site ID: CT03XC105
Located at: 41 Manitock Hill Road, Waterford, Connecticut

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. Pursuant to the Connecticut Siting Council approval of **EM-Sprint-Nextel-152-130201, t**his letter is to satisfy item number three of the approval letter that the CSC will be notified in writing within 45 days after completion of construction.

Please contact me if you have any questions.

Sincerely,

Jeffrey Barbadora
781-970-0053

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

March 1, 2013

Kevin Savage
Crown Castle
3530 Torrington Way, Suite 300
Charlotte, NC 28277

RE: **EM-SPRINT-NEXTEL-152-130201** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 41 Manitock Hill Road, Waterford, Connecticut.

Dear Mr. Savage:

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;
- Within 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 January 29, 2013. 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/cm

c: The Honorable Daniel M. Steward, First Selectman, Town of Waterford
Thomas V. Wagner, Planning Director, Town of Waterford

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

February 19, 2013

The Honorable Daniel M. Steward
First Selectman
Waterford Town Hall
15 Rope Ferry Road
Waterford, CT 06385

RE: **EM-SPRINT-NEXTEL-152-130201** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 41 Manitock Hill Road, Waterford, Connecticut.

Dear First Selectman Steward:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by March 5, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/laf

c: Thomas V. Wagner, Planning Director, Town of Waterford

CSC
CONNECTICUT SITING COUNCIL

Crown Castle
3530 Torrington Way Suite 300
Charlotte NC 28277

Tel 704-405-6560
Fax 724-416-4911
www.crowncastle.com

ORIGINAL

January 29, 2013

RECEIVED
FEB - 1 2013
CONNECTICUT
SITING COUNCIL

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

RE: Sprint Nextel-Exempt Modification Request- Crown Site BU 876338 Sprint Nextel Site CT03XC105 – Located at – 41 Manitock Hill Road Waterford, CT 06385.

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of Sprint Nextel (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their network vision technology. Please accept this letter and attachments as notification, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), of construction that 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 First Selectman Dan Steward, Town of Waterford.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at 41 Manitock Hill Road Waterford, CT 06385. Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprints operations at the site.

The changes to the facility do not constitute a modification 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. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprints replacement antennas and will be located at the same elevation on the existing tower.
2. Although the proposed modifications will involve replacing the ground-mounted equipment the proposed change will not require the extension of the site boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted a safely standard. A cumulative General Power Density table for Sprint modified facility is included behind Tab 2.

Also attached is a Structural Report confirming that the tower and foundation can support Sprints proposed modifications. (See Tab 3).

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

Sincerely,

Kevin Savage

Enclosures
Copy to: Town of Waterford, First Selectman Dan Steward

Sprint

NETWORK VISION MMBTS LAUNCH
NORTHERN CONNECTICUT MARKET

SITE NAME

WATERFORD

SPRINT SITE NUMBER

CT03XC105

CROWN SITE NUMBER

876338

SITE ADDRESS

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

STRUCTURE TYPE

SELF SUPPORT TOWER

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	COMPOUND SITE PLAN & ELEVATION
C3	EQUIPMENT SITE PLANS
C4	EQUIPMENT DETAILS
C5	ANTENNA PLANS
C6	ANTENNA CABLE RISER & GPS DETAILS
C7	EQUIPMENT DETAILS
C8	RF AND CABLE DETAILS
C9	FIBER DISTRIBUTION BOX DETAILS
E1	UTILITY SITE PLAN
E2	DETAILS
E3	GROUNDING PLAN AND DETAILS

DRIVING DIRECTIONS

DEPART FROM SPRINT:
1 INTERNATIONAL BLVD MAHWAH, NJ 07430

1. HEAD NORTH ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD. CONTINUE TO FOLLOW INTERNATIONAL BLVD.
2. TAKE THE 3RD RIGHT ONTO PARK LN.
3. CONTINUE STRAIGHT ONTO LEISURE LN.
4. CONTINUE ONTO NJ-17 N.
5. TAKE THE NEW JERSEY 17 N/INTERSTATE 287 N EXIT TOWARD INTERSTATE 87/NORTH Y. THRUWAY.
6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-287 N/I-87/NJ-17 N/N Y. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N.
ENTERING NEW YORK.
7. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 S. CONTINUE TO FOLLOW I-287 E.
8. TAKE THE EXIT ONTO I-95 N.
ENTERING CONNECTICUT.
9. TAKE EXIT 75 FOR US-1 TOWARD WATERFORD.
10. SLIGHT RIGHT ONTO U.S. 1 N/BOSTON POST RD.
11. TURN LEFT ONTO FOG PLAIN RD.
12. TAKE THE 1ST LEFT ONTO PUT DR.

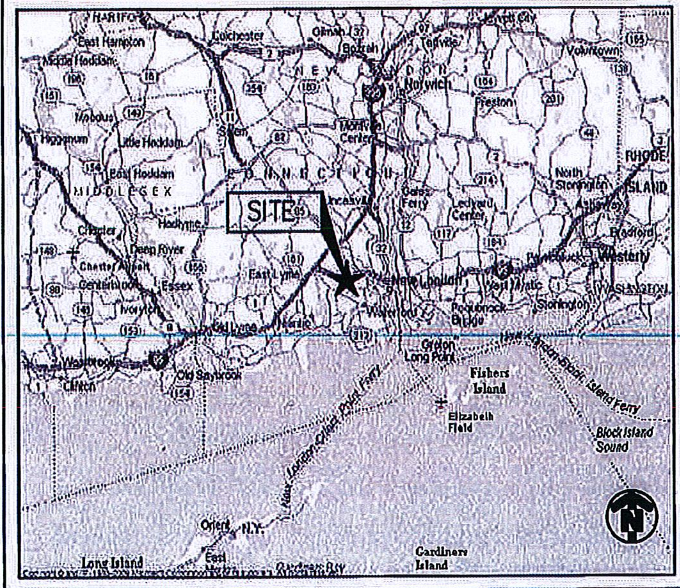
OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
1-800-922-4455
THREE WORKING DAYS BEFORE YOU DIG

PROJECT SUMMARY

SITE NAME:	WATERFORD	
SITE NO.:	CT03XC105	
SITE ADDRESS:	41 MANITOCK HILL ROAD WATERFORD, CT 06385-2000	
COUNTY:	NEW LONDON	
SITE COORDINATES:		
LATITUDE:	41° 21' 16.73" N	(NAD 83)
LONGITUDE:	72° 09' 01.86" W	(NAD 83)
GROUND ELEV.:	±230'	(AMSL)
JURISDICTION:	CONNECTICUT SITING COUNSIL	
ZONING CLASSIFICATION:	TBD	
LANDLORD:	CROWN ATLANTIC COMPANY LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317	
CONTACT:	PROJECT MANAGER:	JOSH MOSTOW (201) 236-9059
	CONSTRUCTION MANAGER:	MIKE CALLAHAN (860) 919-7278
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495	
PROJECT MANAGER:	ALCATEL LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886	
CONTACT:	CAMILLE MULLIGAN – (845) 313-6920	
CONSTRUCTION MANAGER:	TRACEY SWEARINGEN (518) 944-8794 (CELL)	
ENGINEER:	INFINIGY 11 HERBERT DRIVE LATHAM, NY 12110	
CONTACT:	PAUL FANOS – (518) 690-0790	
BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	2005 NATIONAL ELECTRICAL CODE	

VICINITY MAP



PROJECT TEAM

ALCATEL·LUCENT

1 ROBBINS ROAD
WESTFORD, MA 01886

PROJECT MANAGER

INFINIGY Design. Build. Deliver.

11 Herbert Drive
Latham, NY 12110
OFFICE #: (518) 690-0790
FAX #: (518) 690-0793

ENGINEER

SCOPE OF WORK:

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
- FACILITY HAS NO PLUMBING OR REFRIGERANTS
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR
- INSTALL NEW ANTENNAS/RRH'S ON EXISTING TOWER
- INSTALL NEW BTS OR RETROFIT EXISTING BTS IN EXISTING EQUIPMENT AREA
- REMOVE EXISTING CDMA ANTENNAS AND COAX CABLES
- REPLACE EXISTING BATTERY CABINET WITH NEW BATTERY CABINET IF REQUIRED
- REPLACE EXISTING GPS IF REQUIRED

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

LICENSED ENGINEER – STATE OF CONNECTICUT

APPROVALS

SPRINT CONST.		DATE
ALU RF		DATE
ALU LEASING/SITE ACQ.		DATE
IN-MARKET CONSTRUCTION LEAD		DATE
SITE OWNER	NAME/COMPANY: TITLE:	DATE

INFINIGY Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT JOHN S. STEVENS No. 24705 LICENSED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO ANY DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	1/16/13
1	REVISED PER COMMENTS	KMF	12/19/12
0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: AGF Date: 11/1/12

Project Number: 294-051

Project Title:
WATERFORD
CT03XC105
41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For: Sprint VISION

Drawing Scale: AS NOTED
Date: 1/16/13

Drawing Title: **TITLE SHEET**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: SPRINT NEXTEL CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT NEXTEL WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY SPRINT NEXTEL TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR SPRINT NEXTEL PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT NEXTEL OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.

C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.

D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.

F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.

G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ICE, SNOW, ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ICE, SNOW ROOTS, SOD, RUBBISH, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

PROJECT INFORMATION

THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT FACILITY AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC WIRELESS COMMUNICATIONS SERVICE.

NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.

NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.

NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

SPRINT MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
KW	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
#	DENOTES REFERENCE NOTE
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR ⊗	GROUND ROD
OR ⊠	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	PIN AND SLEEVE RECEPTACLE
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	1/16/13
1	REVISED PER COMMENTS	KMF	12/19/12
0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: ADF Date: 11/1/12

Project Number
294-051

Project Title
WATERFORD
CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For
Sprint
VISION

Drawing Scale:
AS NOTED

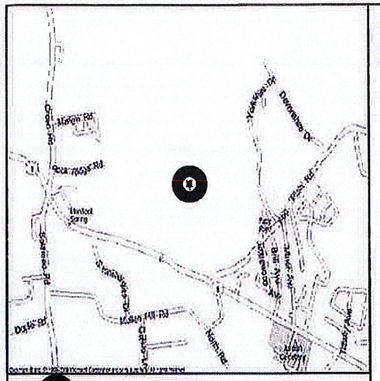
Date:
1/16/13

Drawing Title
GENERAL NOTES

Drawing Number
C1

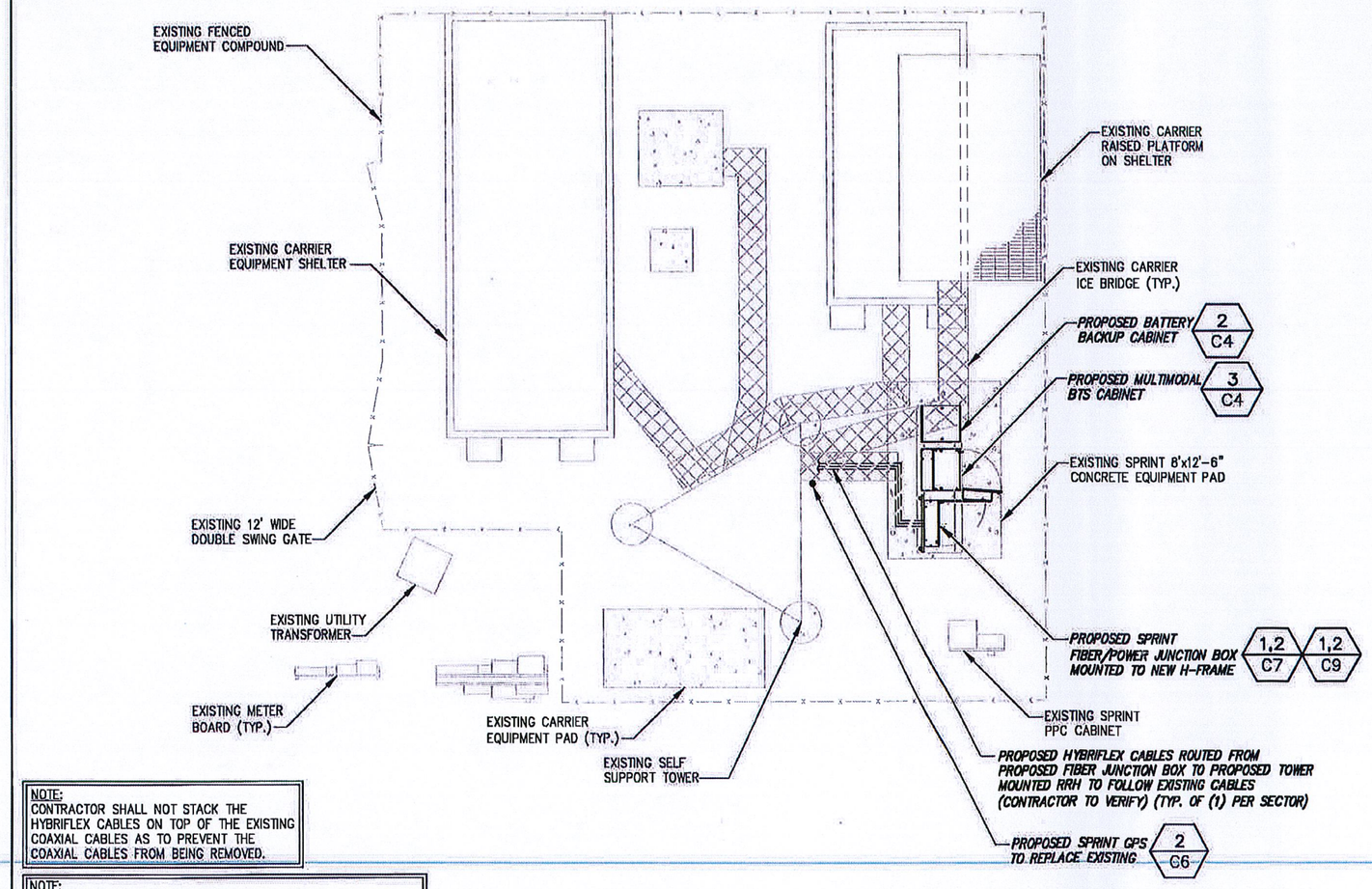
INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY CROWN CASTLE DATED: 10/18/12. THE EXISTING MONOPOLE HAS INSUFFICIENT CAPACITY TO ACCOMMODATE THE PROPOSED EQUIPMENT.



WORK AREA

LOCATION MAP
N.T.S.



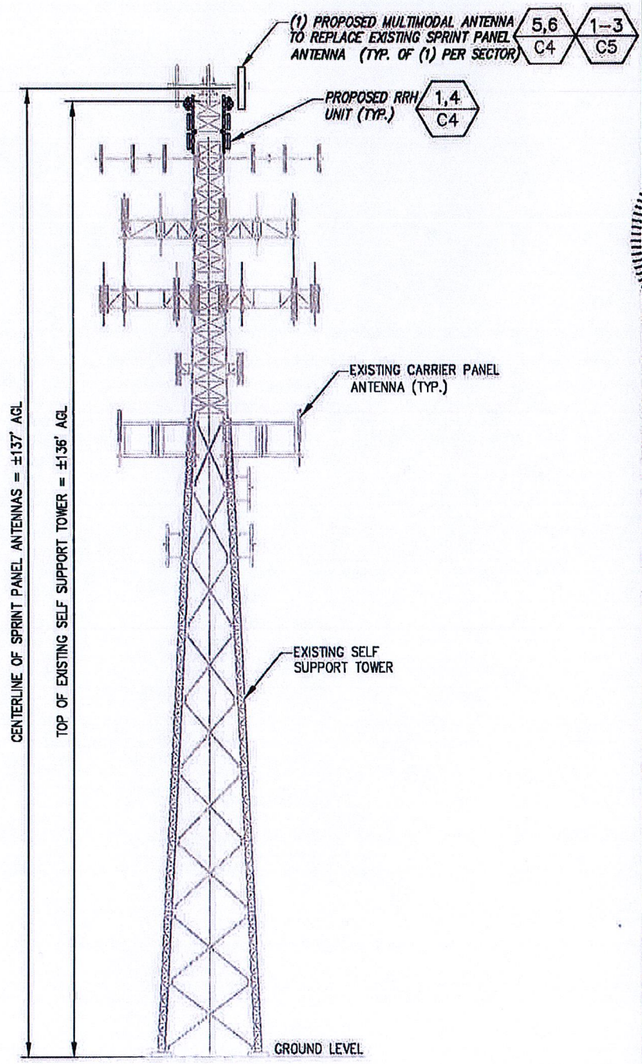
NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A - WTHRPRF - STD CONSTR SPECS._157201110421855429.DOCM"
3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

1 — COMPOUND SITE PLAN
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"



2 — SITE ELEVATION
NOT TO SCALE

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STATE OF CONNECTICUT
JOHN S. STEVENS
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Project Number
294-051

Project Title
WATERFORD
CT03XC105
41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

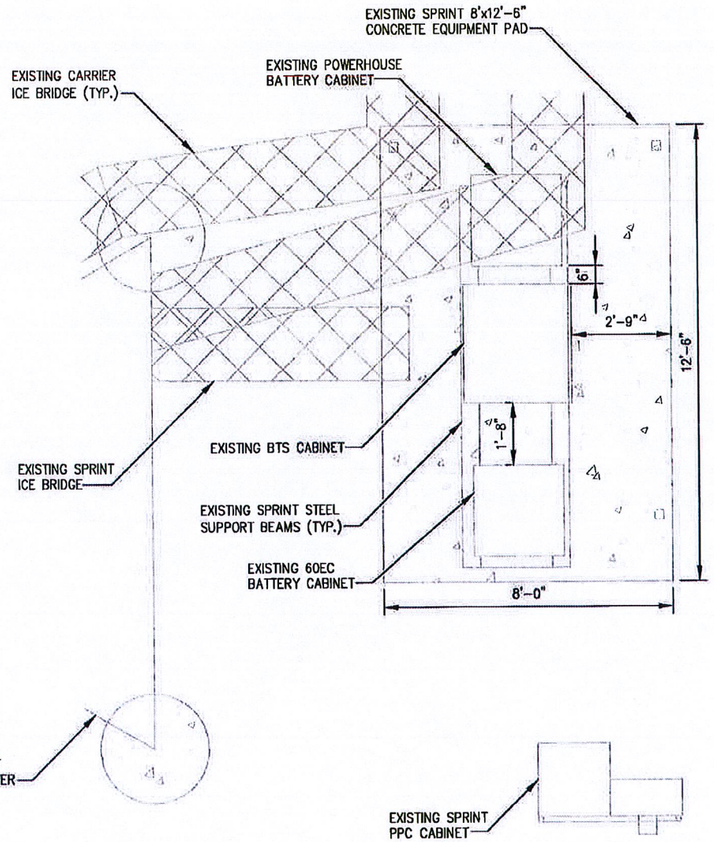
Prepared For
Sprint VISION

Drawing Scale:
AS NOTED

Date:
1/16/13

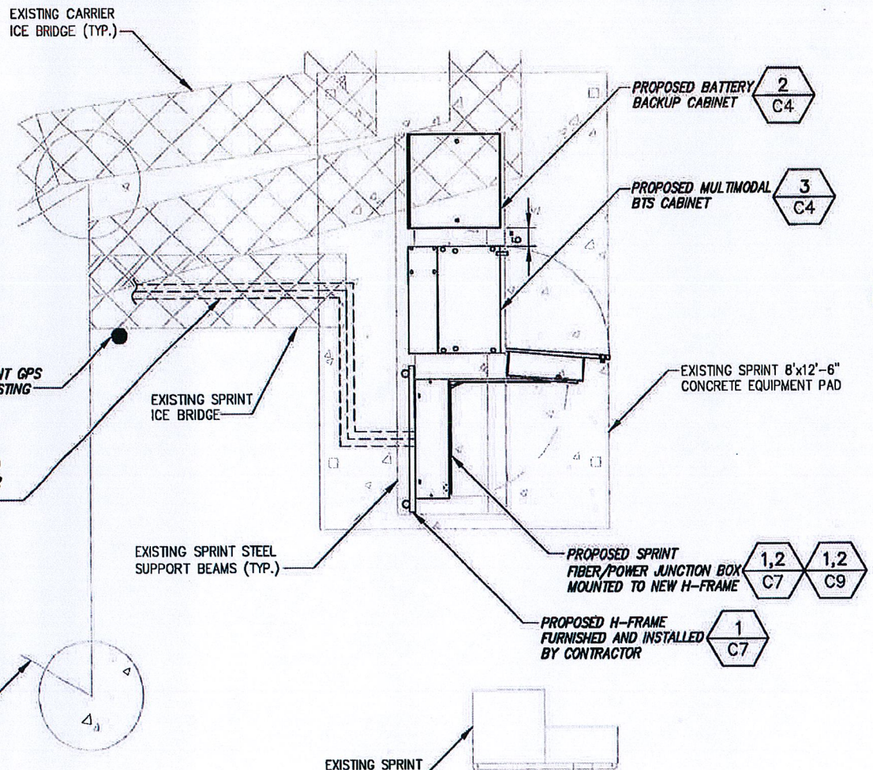
Drawing Title
COMPOUND SITE PLAN & ELEVATION

Drawing Number
C2



1 C6 PROPOSED SPRINT GPS TO REPLACE EXISTING

PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED TOWER MOUNTED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)



1 EQUIPMENT SITE PLAN (EXISTING)
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

2 EQUIPMENT SITE PLAN (FINAL/PERMANENT)
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

NOTE:
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3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

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UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF APPLICABLE STATE AND LOCAL LAWS

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41 MANITOCK HILL ROAD
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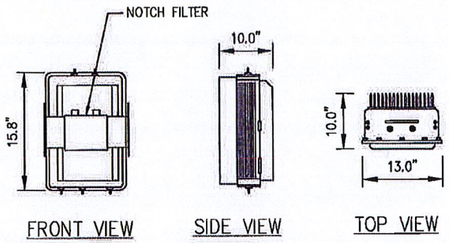
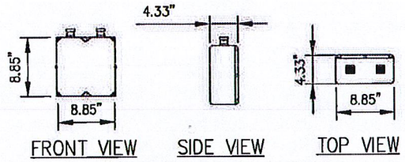
Sprint VISION

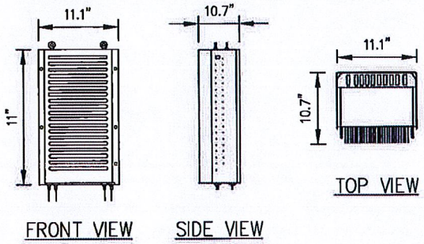
Drawing Scale:
AS NOTED
Date:
1/16/13

Drawing Title
EQUIPMENT SITE PLANS

Drawing Number
C3

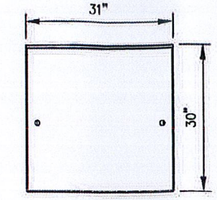


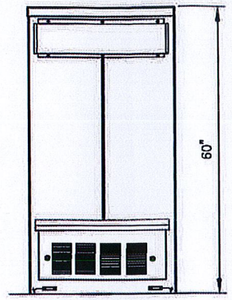




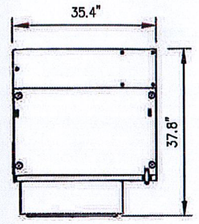
NOTE:
REFER TO R.F. SYSTEM SCHEDULE FOR EXACT RRH SPECIFICATIONS AND QUANTITIES.

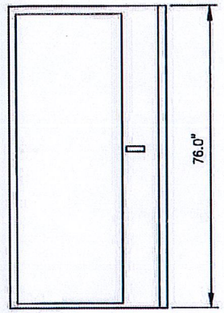
1 RRH EQUIPMENT DETAILS
NOT TO SCALE





2 BATTERY CABINET PROFILE
NOT TO SCALE

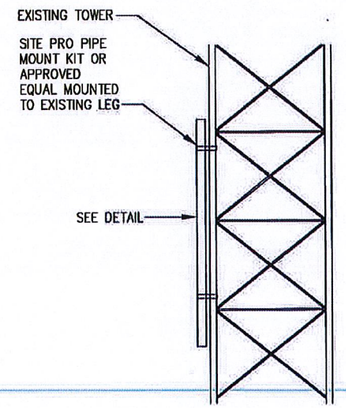


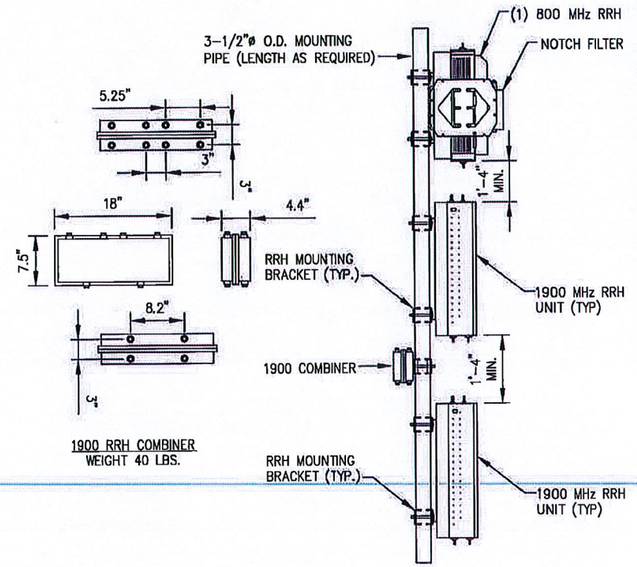


3 BTS CABINET PROFILE
NOT TO SCALE

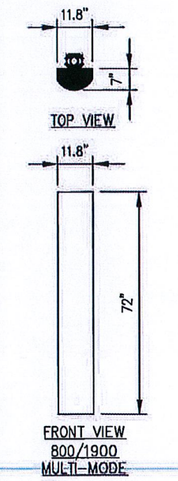
DESIGN CRITERIA:

2009 INTERNATIONAL BUILDING CODE W/ STATE MODIFICATION	
WIND SPEED (ASCE-7-05)	90 MPH
EXPOSURE B	
IMPORTANCE FACTOR	1.0
SEISMIC SITE CLASS	D
Ss=0.152 S1=0.050	
SEISMIC IMPORTANCE FACTOR	1.0
SEISMIC DESIGN CATEGORY	B
CABINET WEIGHT:	
9928 MM BTS CABINET	1074 LBS.
6OEC V2 BATTERY CABINET	2830 LBS.
MATERIAL SPECIFICATIONS	
C-, M-, AND ANGLE SHAPES:	ASTM A36
HIGH-STRENGTH BOLTS:	ASTM A325SC OR (A325N)
STRUCTURAL WF SHAPES:	ASTM A572-GR50
TUBE STEEL & PIPE COLUMNS:	ASTM A500, GRADE B
WELDING ELECTRODES:	E70XX
W - SHAPES:	ASTM A992, GRADE 50
U-BOLTS:	ASTM A36



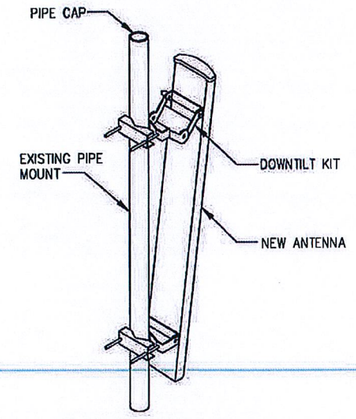


4 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE



RFS ANTENNA
P/N: APXVSPP18-C-A20

5 ANTENNA DETAILS
NOT TO SCALE



6 PANEL ANTENNA MOUNT DETAIL
NOT TO SCALE

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Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED
PROFESSIONAL ENGINEER

No	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	1/16/13
1	REVISED PER COMMENTS	KMF	12/19/12
0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: AGF Date: 11/1/12

Project Number
294-051

Project Title

WATERFORD
CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

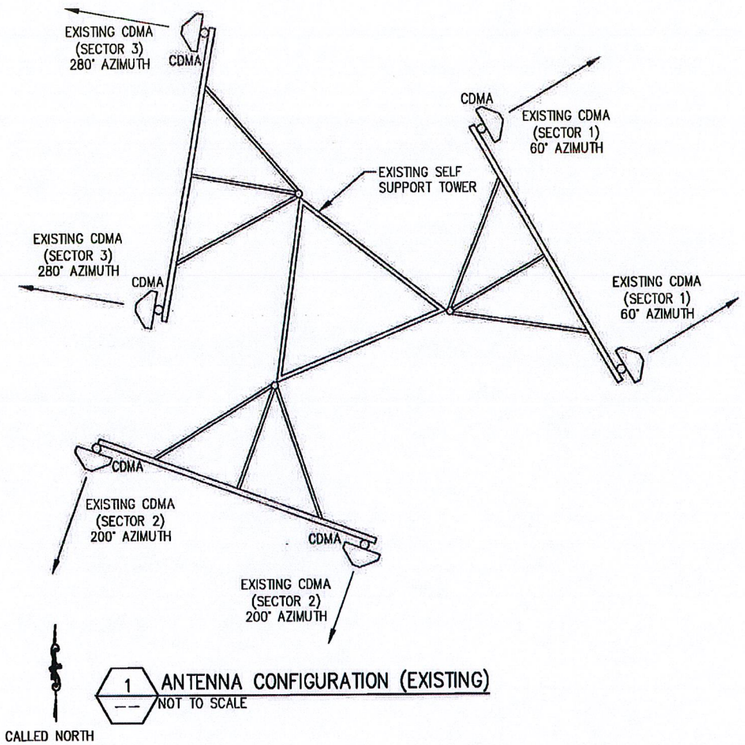
Date:
1/16/13

Drawing Title

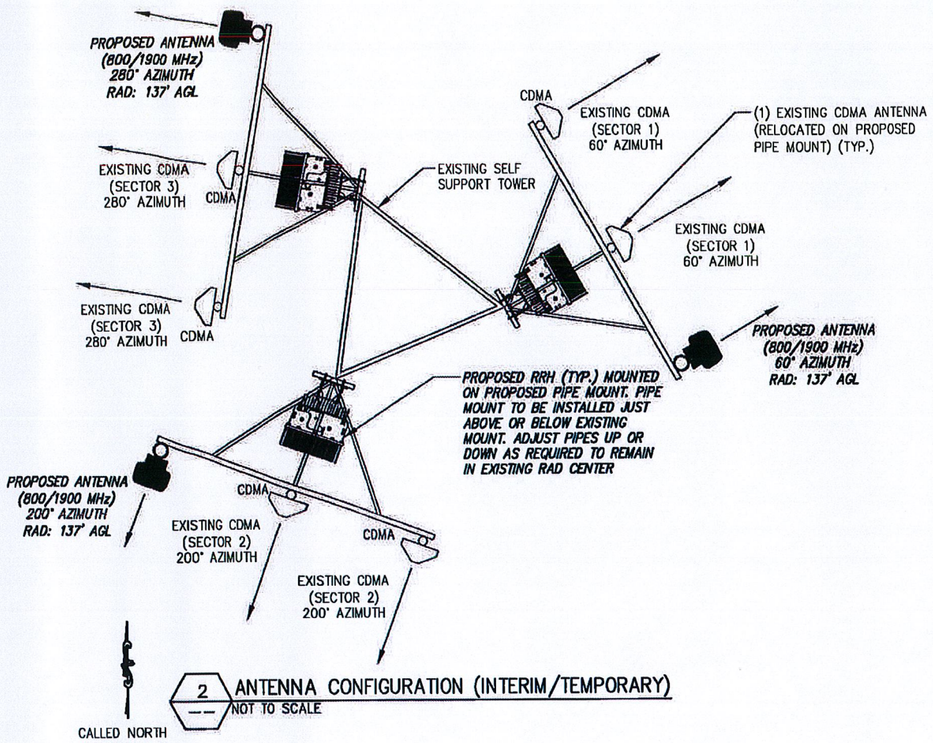
EQUIPMENT DETAILS

Drawing Number

C4

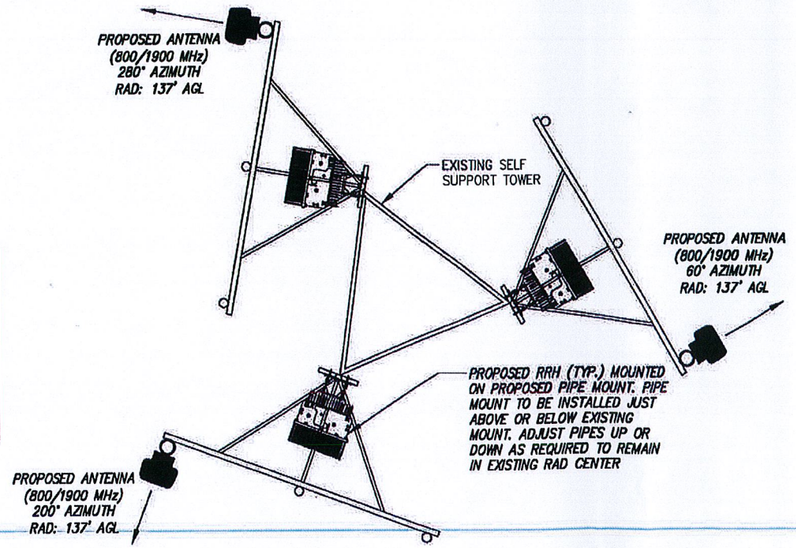


1 ANTENNA CONFIGURATION (EXISTING)
NOT TO SCALE



2 ANTENNA CONFIGURATION (INTERIM/TEMPORARY)
NOT TO SCALE

CONTRACTOR TO VERIFY A PASSING SIGNED AND SEALED ANTENNA MOUNT/ PLATFORM STRUCTUAL ANALYSIS HAS BEEN COMPLETED FOR INTERIM AND FINAL RF CONFIGURATION. NO ANTENNA MOUNT/ PLATFORM MODIFICATIONS SHOULD COMMENCE OR INSTALLATION OF ANTENNAS, RRH OR TOWER MOUNTED EQUIPMENT WITHOUT VERIFYING THE MOUNT/ PLATFORM ANALYSIS HAS BEEN COMPLETED FOR SPECIFIC LOADING. ADDITIONALLY ALL MOUNTS ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH TOWER STRUCTUAL ANALYSIS PROVIDED BY CROWN CASTLE



3 ANTENNA CONFIGURATION (FINAL/PERMANENT)
NOT TO SCALE

NOTE:
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY CROWN CASTLE DATED: 10/18/12. THE EXISTING MONOPOLE HAS INSUFFICIENT CAPACITY TO ACCOMMODATE THE PROPOSED EQUIPMENT.

RRH NOTES:

- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).
- REFER TO RF SCHEDULE ON SHEET C8 FOR RRH UNIT SPECS AND QUANTITIES.

GENERAL NOTES:

1. NEW SPRINT PANEL ANTENNAS TO MEET RF DESIGN REQUIREMENTS PER EBTS, PER APPROVED STRUCTURAL ANALYSIS.
2. CONTRACTOR TO PROVIDE EXISTING ANTENNA VERIFICATION AND TO INCLUDE MOUNTING HEIGHT, RAD CENTER, TOP AND BOTTOM OF ANTENNAS.
3. THE CONFIGURATION PLANS ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS.
4. THE ANTENNA INSTALLATION SHALL BE DONE IN ACCORDANCE WITH THE STRUCTURAL ANALYSIS AND ASSOCIATED DETAILS THEREIN. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO WORK ON THE STRUCTURE.
5. CONTRACTOR SHALL VERIFY NEW PARTS BEFORE ORDERING.
6. REFER TO SHEET C4 & C8 FOR ANTENNA SPECS.
7. CONTRACTOR TO USE PROPER TORQUE WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.
8. ALL HYBRID CABLES SHALL BE MARKED WITHIN 24" OF THE END OF EACH CABLE WITH 2" WIDE VINYL TAPE. THIS INCLUDES ALL JUMPERS AND MAIN LINE HYBRID CABLES.
9. CDMA ANTENNAS SHALL NOT BE REMOVED UNTIL ALL NEW MULTI-MODE ANTENNAS ARE INSTALLED AND ON-AIR.

INFINIGY Design. Build. Deliver.
11 Herbert Drive
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UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

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CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

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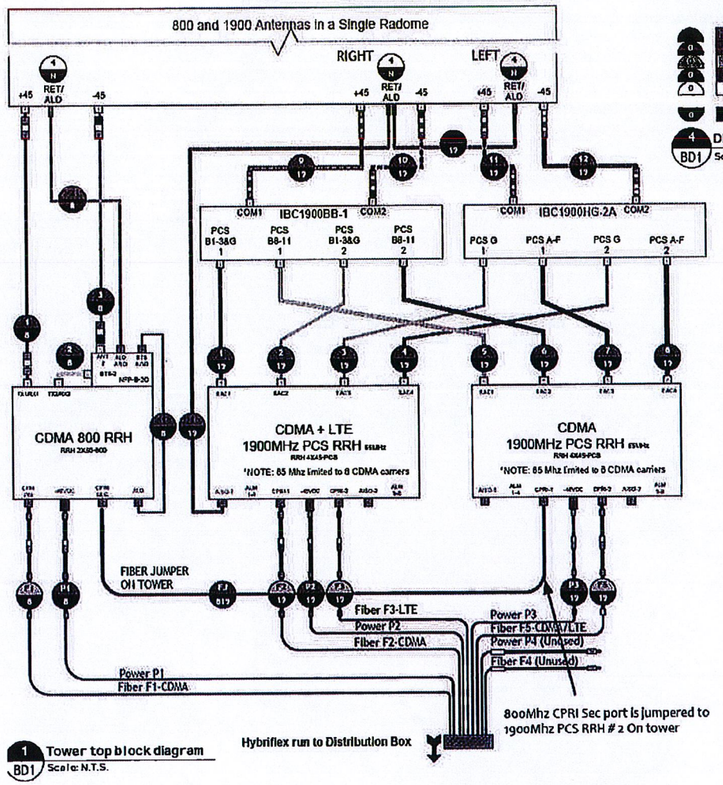
Drawing Scale:
AS NOTED

Date:
1/16/13

Drawing Title
ANTENNA PLANS

Drawing Number
C5



1 Tower top block diagram
BD1 Scale: N.T.S.

COAX
FIBER
POWER
NOTES
FREQ

4 Diagram Legend
BD1 Scale: N.T.S.

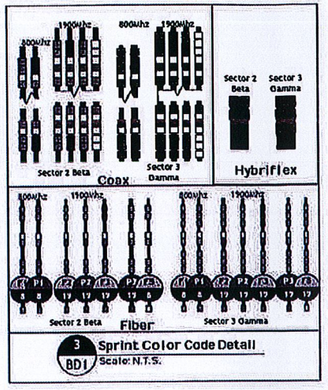
Power Feed Polarity Definition:
IF wires are BLACK AND BLACK/ WHITE STRIPE:
- Black= -48VDC Feed (Battery)
- Black/White Stripe= Return

IF wires are RED AND BLACK:
- Red= -48VDC Feed (Battery)
- Black= Return

NOTE: For power feed use the same Hybriflex OEM color designator as the fiber.

- MM Pair 1= F1= Green= P1(Green)
- MM Pair 2= F2= Blue= P2(Blue)
- MM Pair 3= F3= Red= P3(Red)
- MM Pair 4= F4= Yellow= P4(Yellow)
- MM Pair 5= F5= Orange= (No P5 power feed)

2 Hybriflex OEM Color Code
BD1 Scale: N.T.S.

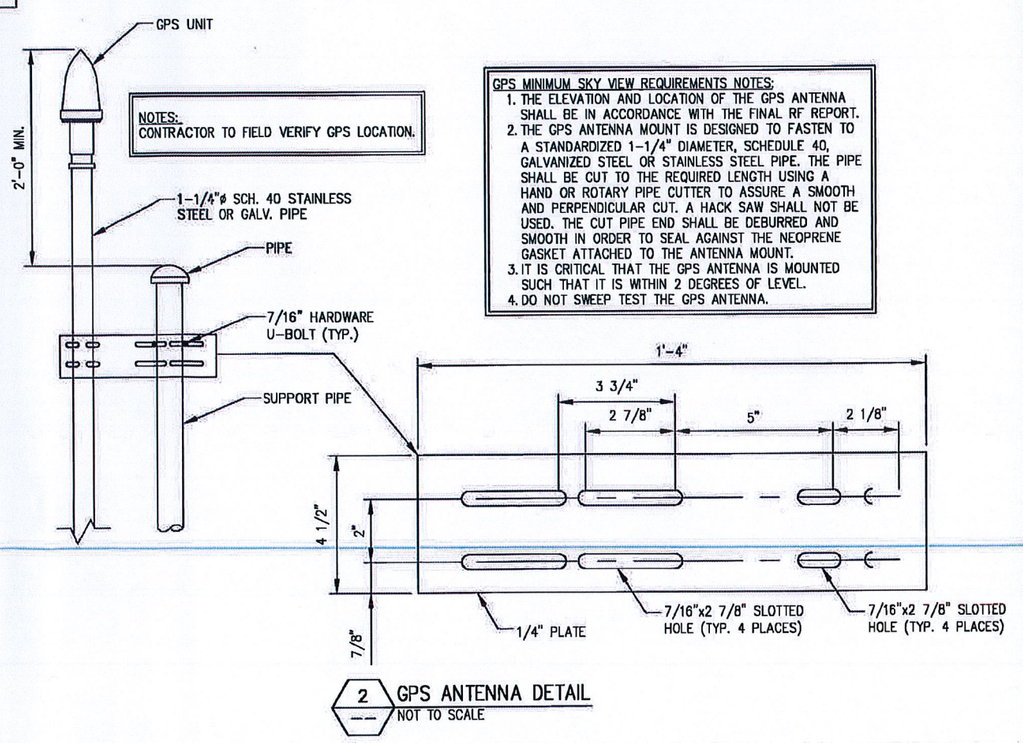


3 Sprint Color Code Detail
BD1 Scale: N.T.S.

SCENARIO 128 v2.0

1 ANTENNA CABLE RISER DIAGRAM
NOT TO SCALE

INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.



NOTES:
CONTRACTOR TO FIELD VERIFY GPS LOCATION.

GPS MINIMUM SKY VIEW REQUIREMENTS NOTES:
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARDIZED 1-1/4" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF LEVEL.
4. DO NOT SWEEP TEST THE GPS ANTENNA.

2 GPS ANTENNA DETAIL
NOT TO SCALE

WEATHERPROOFING CONNECTORS AND GROUND KIT NOTES:
1. ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE, THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR PER THE FOLLOWING INSTRUCTIONS (WHICHEVER IS GREATER).
2. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 IN. WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY ½" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AND DISCUSSED BELOW; OR
3. THE COAXIAL ABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OR ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW OR;
4. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE.

RRH JUMPER NOTES:
1. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS LESS THAN 10'-0" USE A 1/2" JUMPER.
2. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS GREATER THAN 10'-0" USE A 7/8" JUMPER.

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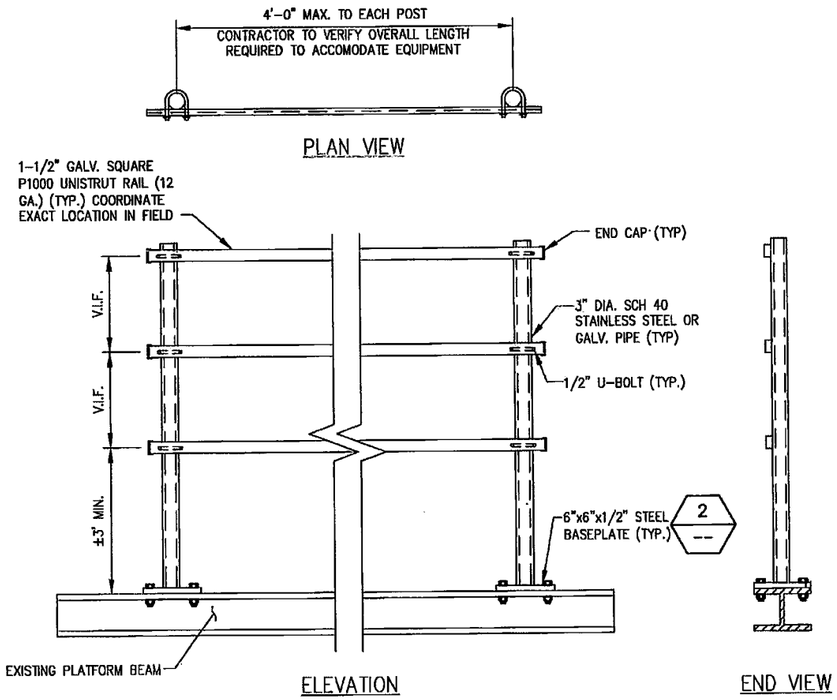
WATERFORD, CT 06385-2000

Prepared For: Sprint VISION

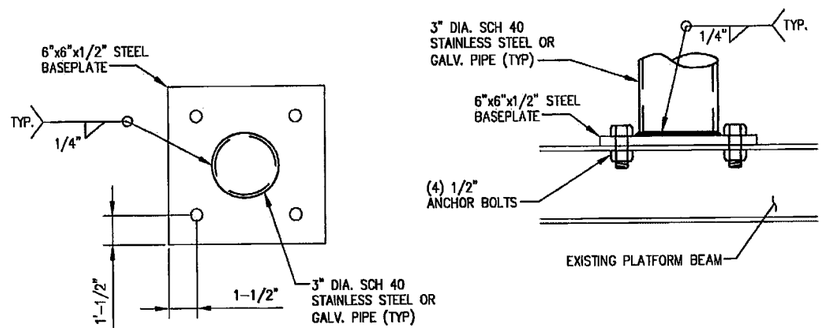
Drawing Scale: AS NOTED
Date: 1/16/13

Drawing Title:
ANTENNA CABLE RISER AND GPS DETAILS

Drawing Number:
C6



1 -- H-FRAME FABRICATION DETAIL
NOT TO SCALE



2 -- SUPPORT POST MOUNTING DETAIL
NOT TO SCALE

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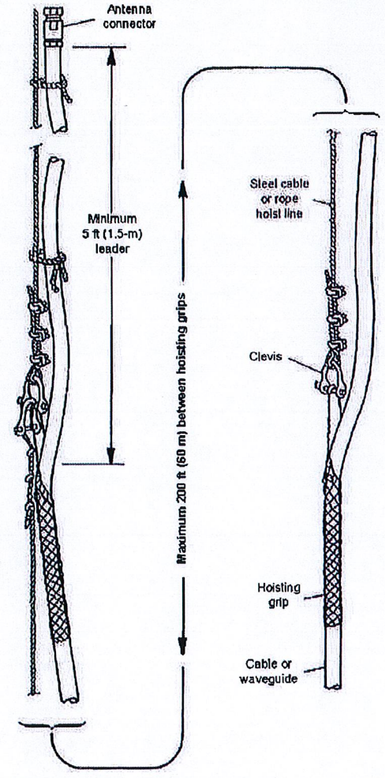
EQUIPMENT DETAILS

Drawing Number
C7

Market	Northern Connecticut		
Cascade ID	CT03XC105		
	SECTOR 1	SECTOR 2	SECTOR 3
Split sector present	No	No	No
1900MHz_Azimuth	60	200	280
1900MHz_No_of_Antennas	1	1	1
1900MHz_RADCenter(ft)	137	137	137
1900MHz_Antenna Make	RFS	RFS	RFS
1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20	APXVSPP18-C-A20
1900MHz_Horizontal_Beamwidth	65	65	65
1900MHz_Vertical_Beamwidth	5.5	5.5	5.5
1900MHz_AntennaHeight (ft)	6	6	6
1900MHz_AntennaGain(dBd)	15.9	15.9	15.9
1900MHz_E_Tilt	-2	-4	-2
1900MHz _M_Tilt	-4	0	0
1900MHz_Carrier_Forecast_Year_2013	5	5	5
1900MHz_RRH Manufacturer	ALU	ALU	ALU
1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
1900MHz_RRH Count	2	2	2
1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
1900MHz Combiner Model	IBC1900BB-1 and IBC1900HG-2A	IBC1900BB-1 and IBC1900HG-2A	IBC1900BB-1 and IBC1900HG-2A
1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to	10	10	10
1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax	LCF12-50J	LCF12-50J	LCF12-50J
1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)	6	6	6
1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)	LCF12-50J	LCF12-50J	LCF12-50J
1900MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
1900MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)	N/A	N/A	N/A
1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)	N/A	N/A	N/A
1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)	N/A	N/A	N/A
1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)	N/A	N/A	N/A
800MHz_Azimuth	60	200	280
800MHz_No_of_Antennas	0	0	0
800MHz_RADCenter(ft)	137	137	137
800MHz_AntennaMake	RFS	RFS	RFS
800MHz_AntennaModel	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)
800MHz_Horizontal_Beamwidth	65	65	65
800MHz_Vertical_Beamwidth	11.5	11.5	11.5
800MHz_AntennaHeight (ft)	6	6	6
800MHz_AntennaGain (dBd)	13.4	13.4	13.4
800MHz_E_Tilt	-1	-8	-1
800MHz_M_Tilt	-4	0	0
800MHz_RRH Manufacturer	ALU	ALU	ALU
800MHz_RRH Model	800 MHz RRH 2x50W	800 MHz RRH 2x50W	800 MHz RRH 2x50W
800MHz_RRH Count	1	1	1
800MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)	10	10	10
800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	LCF12-50J	LCF12-50J	LCF12-50J
800MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
800MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)	N/A	N/A	N/A
800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)	N/A	N/A	N/A
Plumbing Scenario *	128	128	128
* If plumbing scenario does not match the material received, please contact your Construction Manager			
11/9/2012			

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS–SPRINT DOCUMENT: "EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 – 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A – WTHRPRF – STD CONSTR SPECS._15720111042185542 9.DOCM"
3. REFER TO: "COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09–08–11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

1. DO NOT USE ONE HOISTING GRIP FOR HOISTING TWO OR MORE CABLES OR CABLE TRAYS. THIS CAN CAUSE THE HOISTING GRIP TO BREAK OR THE CABLES OR WAVE– GUIDES TO FALL.
2. DO NOT USE THE HOISTING GRIP FOR LOWERING CABLE OR CABLE TRAY. SNAGGING OF THE CABLE OR CABLE TRAY MAY LOOSEN THE GRIP AND POSSIBLY CAUSE THE CABLE TO CABLE TRAY TO SWAY OR FALL.
3. DO NOT REUSE HOISTING GRIPS. USED GRIPS MAY HAVE LOST ELASTICITY, STRETCHED, OR BECOME WEAKENED. REUSING A GRIP CAN CAUSE THE CABLE OR CABLE TRAY TO SLIP, BREAK, OR FALL.
4. USE HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200 FT (60 M).
5. MAKE SURE THAT THE PROPER HOISTING GRIP IS USED FOR THE CABLE OR CABLE TRAY BEING INSTALLED. SLIPPAGE OR INSUFFICIENT GRIPPING STRENGTH WILL RESULT IF YOU ARE USING THE WRONG HOISTING GRIP.



2 HOIST GRIP DETAIL
NOT TO SCALE

1 SPRINT RFDS
NOT TO SCALE

NOTE:
RFDS SHOWN PROVIDED BY SPRINT DATED 11/9/12.

NOTE:
COORDINATE RF ANTENNA INSTALLATION WITH FINAL SPRINT RFDS. COORDINATE RF MW DISH (IF APPLICABLE) INSTALLATION WITH FINAL SPRINT RFDS.

CHECK FST FOR LATEST VERSION OF RFDS

INFINIGY
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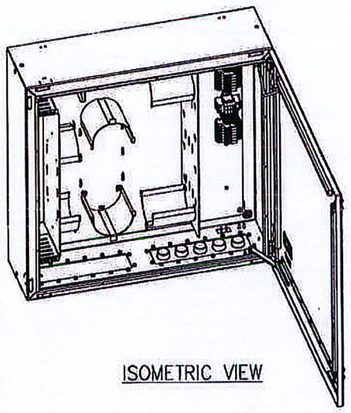
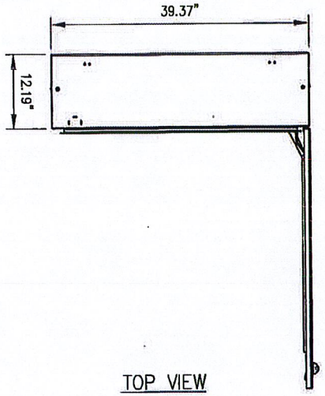
RF AND CABLE DETAILS

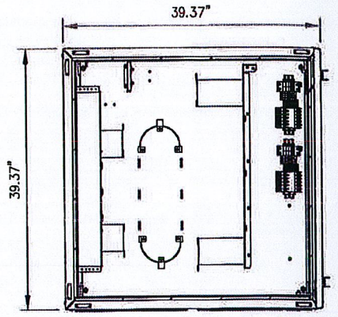
Drawing Number
C8



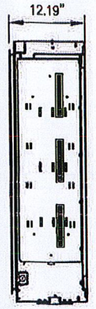
ISOMETRIC VIEW



TOP VIEW

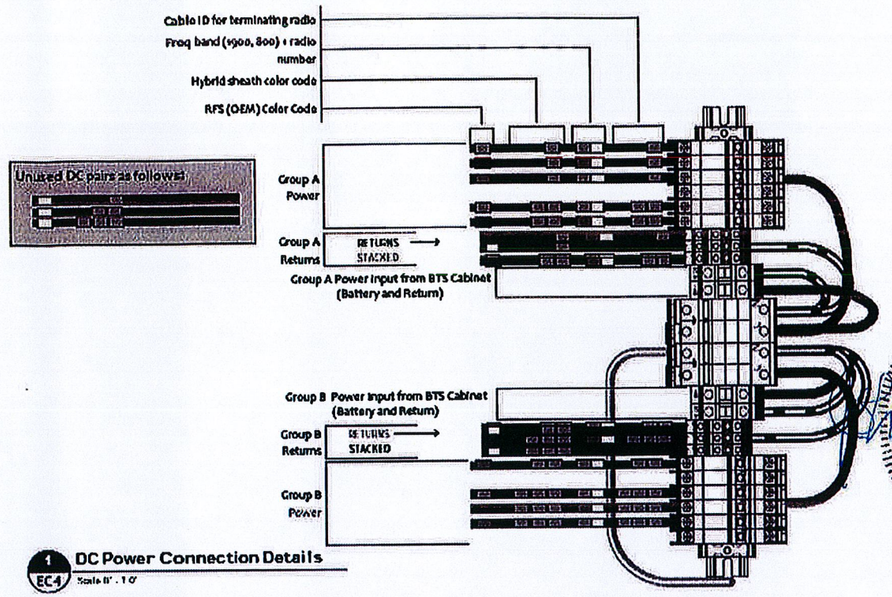


FRONT VIEW

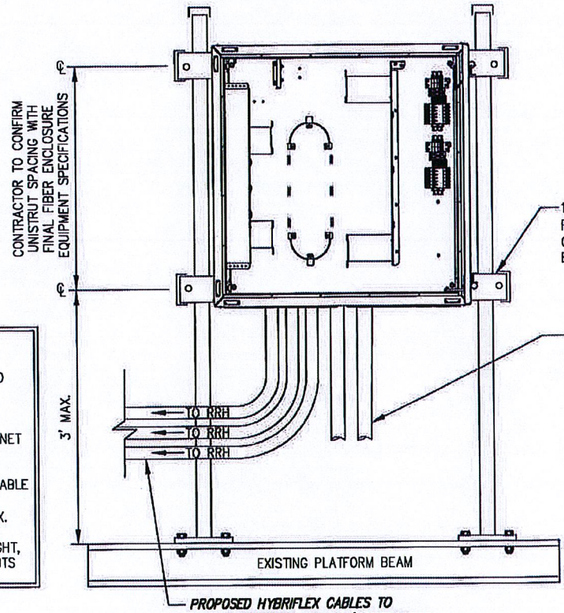


SIDE VIEW

1 — DISTRIBUTION BOX DETAIL
NOT TO SCALE



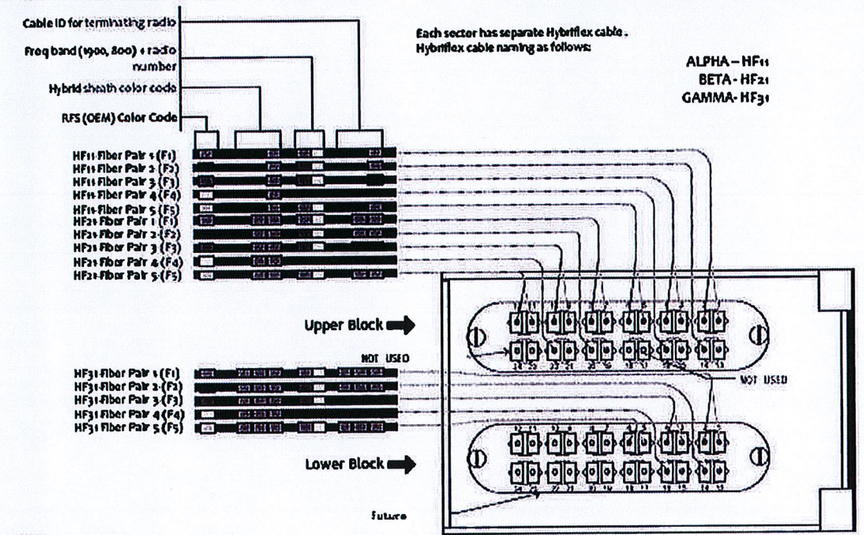
1 EC4 DC Power Connection Details
Scale 8" = 1'-0"



NOTE:
- DISTRIBUTION BOX IS KITTED WITH 50' OF 1-1/2" LIQUID-TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
  * SPLIT IN HALF,
  * TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
  * RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.
- DISTRIBUTION BOX IS KITTED WITH 2 AWG, POWER CABLE 35' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.
- BTS INSTALLATION TEAM WILL TERMINATE LIQUID-TIGHT, RUN THE FIBER JUMPERS AND POWER CABLES FROM BTS CABINET TO DISTRIBUTION BOX.

NOTE:
1. ANCHORS AND UNISTRUT CHANNEL SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
2. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS.

2 — TYPICAL DISTRIBUTION BOX ON H-FRAME DETAIL
NOT TO SCALE



Each sector has separate Hybriflex cable.
Hybriflex cable naming as follows:

ALPHA - HF1
BETA - HF2
GAMMA - HF3

2 EC4 Fiber Connection Details
Scale 8" = 1'-0"

SCENARIO 128 v2.0

3 — FIBER & DC CONNECTION DETAILS
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AS NOTED

Date:
1/16/13

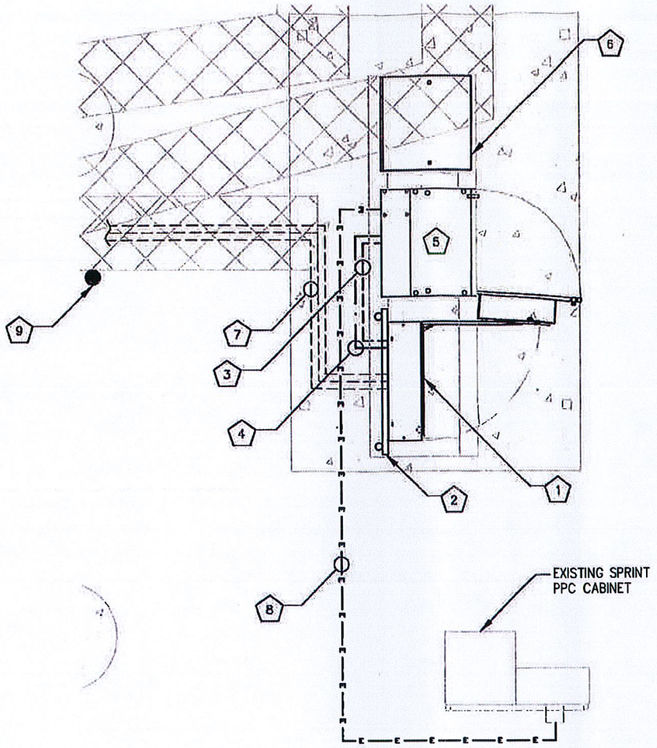
Drawing Title
FIBER DISTRIBUTION BOX DETAILS

Drawing Number
C9

CODED NOTES:

1. *PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME*
2. *PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR*
3. *PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 5'*
4. *PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 5'*
5. *PROPOSED MULTIMODAL BTS CABINET*
6. *PROPOSED BATTERY BACKUP CABINET*
7. *PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED TOWER MOUNTED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)*
8. *PROPOSED 2"ø LIQUID TIGHT CONDUIT ROUTED FROM BTS TO EXISTING PPC CABINET*
9. *PROPOSED SPRINT GPS TO REPLACE EXISTING*

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.



1 UTILITY SITE PLAN
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
2. GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL SPRINT SERVICE DISCONNECTS WITH SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 10 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY SPRINTS REPRESENTATIVE.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO A SPRINT REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY A SPRING REPRESENTATIVE.
16. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
17. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE A SITE "PUNCH LIST" WALK TO SPRINT'S REPRESENTATIVE.

NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
1-800-922-4455
THREE WORKING DAYS BEFORE YOU DIG

NOTES:
CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.

EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBTS EQUIPMENT IS INSTALLED.

REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE COILED (NOT ON WALKING SURFACE).

REMAINING UNUSED CONDUITS FROM EXISTING CABINETS TO BE COVERED WITH WATERPROOF CAPS (NOT DUCT TAPE).

EXISTING PANELBOARD

PANEL RATING: 120/240V, 60 HZ, 1ø, 200A

BUS AMPS L1	BUS AMPS L2	LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD	BUS AMPS L1	BUS AMPS L2
		MM BTS 1	2	--	1	7	--	2	AC SURGE PROTECTION		
					2	8					
		BACK BOARD GFI	1	--	3	9	--	2	TOWER LIGHTS		
					4	10					
		GEN	1	--	5	11	--	1	TELCO GFI		
		FAN	1	--	6	12					

NOTE:
CONTRACTOR IS TO ENSURE THE INSTALLATION INSTRUCTIONS FOR EACH CABINET ARE FOLLOWED AND THAT THE MANUFACTURER'S REQUIREMENTS ARE MET.

2 EXISTING PANELBOARD SCHEDULE
NOT TO SCALE

NOTE:
THERE ARE NO EXISTING DUAL POLE BREAKER POSITIONS AVAILABLE FOR THE MM BTS BREAKER. CONTRACTOR TO VERIFY IF THERE ARE EXISTING SPARE OR UNUSED BREAKERS INSIDE THE PANEL AND REPLACE WITH THE NEW 2P 60A BREAKER FOR THE MM BTS CABINET.

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	1/16/13
1	REVISED PER COMMENTS	KMF	12/19/12
0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: AGF Date: 11/1/12

Project Number
294-051

Project Title
WATERFORD
CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For
Sprint VISION

Drawing Scale:
AS NOTED

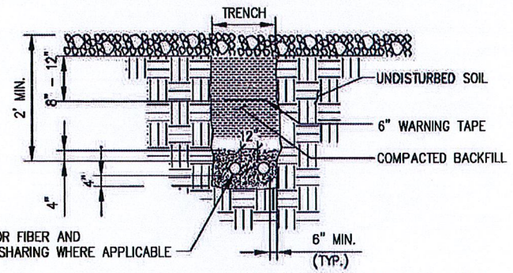
Date:
1/16/13

Drawing Title
UTILITY SITE PLAN

Drawing Number
E1

GROUNDING NOTES:
IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC. CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT.

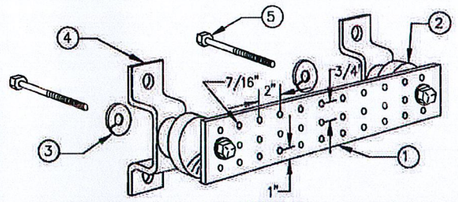
HOME RUN GROUNDS ARE NOT APPROVED IN CROWN CASTLE CONSTRUCTION STANDARDS. A NOTE INDICATING THAT ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS SHOULD BE INCLUDED



– SEPARATION DIMENSIONS MUST BE VERIFIED WITH LOCAL UTILITY CO. REQUIREMENTS.

***HAND DIG INSIDE COMPOUND**

1 UTILITY TRENCH DETAIL
NOT TO SCALE

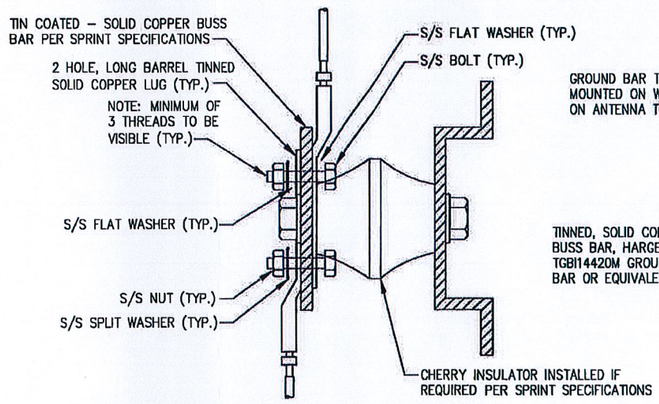


LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO., HARGER TGBI14420M, OR EQUIVALENT. HOLE CENTERS TO MATCH
2. NEMA DOUBLE LUG CONFIGURATION.
3. INSULATORS, NEWTON INSTRUMENT CO. CAT. NO. 3061–4 OR HARGER EQUIVALENT.
4. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8 OR EQUIVALENT.
5. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A–6056 OR HARGER EQUIVALENT.
6. 5/8–11"x1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012–1 OR HARGER EQUIVALENT.

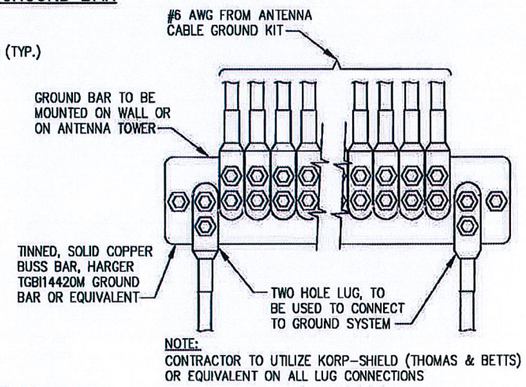
NOTE:
1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
2) ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGBI14420M.

GROUND BAR



NOTE:
1) ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2) COAT WIRE END WITH ANTI–OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3) APPLY ANTI–OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

GROUND LUG



NOTE:
CONTRACTOR TO UTILIZE KORP–SHIELD (THOMAS & BETTS) OR EQUIVALENT ON ALL LUG CONNECTIONS

ANTENNA GROUND BAR

2 GROUND BAR DETAILS
NOT TO SCALE

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	Rep'd	Date
2	REVISED PER COMMENTS	AHS	1/16/13
1	REVISED PER COMMENTS	KMF	12/19/12
0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: AGF Date: 11/1/12

Project Number
294-051

Project Title
WATERFORD
CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For
Sprint VISION

Drawing Scale:
AS NOTED

Date:
1/16/13

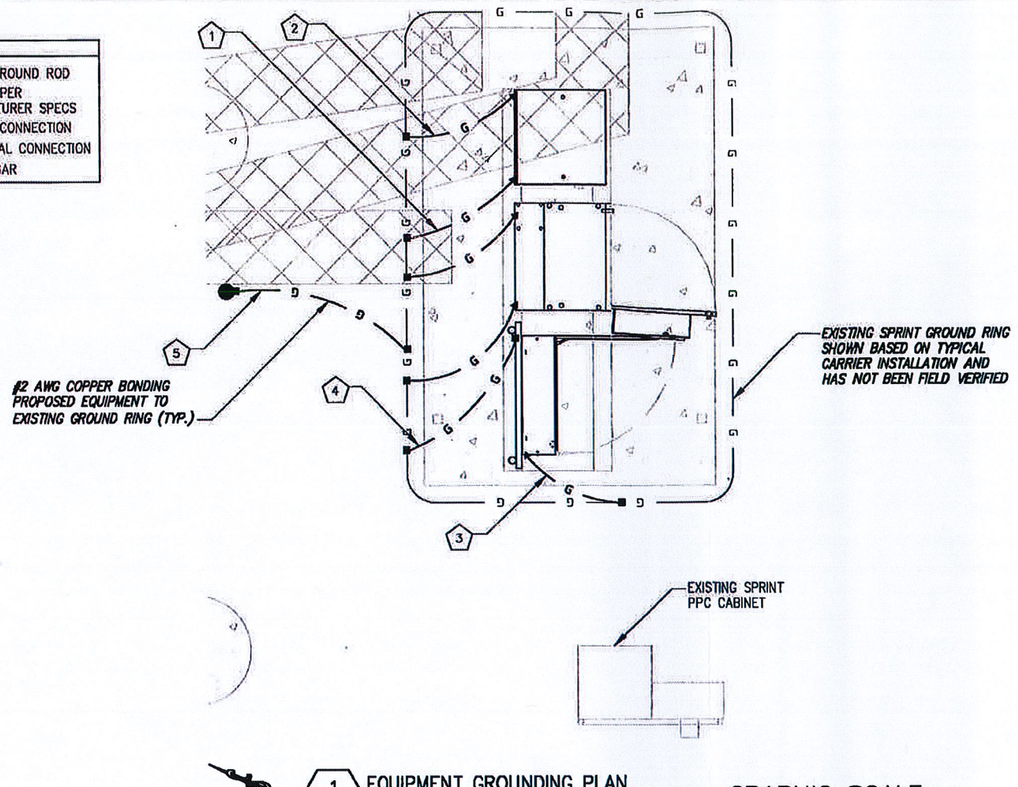
Drawing Title
DETAILS

Drawing Number
E2

CODED NOTES:

1. PROPOSED MULTIMODAL BTS CABINET
2. PROPOSED BATTERY BACKUP CABINET
3. PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME
4. PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR
5. PROPOSED SPRINT GPS TO REPLACE EXISTING

SYMBOL	
⊗	COPPER GROUND ROD
▸	CONNECT PER MANUFACTURER SPECS
■	CADWELD CONNECTION
•	MECHANICAL CONNECTION
▬	GROUND BAR



1 EQUIPMENT GROUNDING PLAN
SCALE: AS NOTED

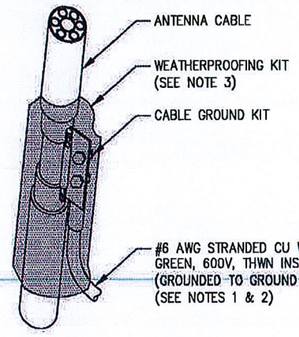
CALLED NORTH

GRAPHIC SCALE

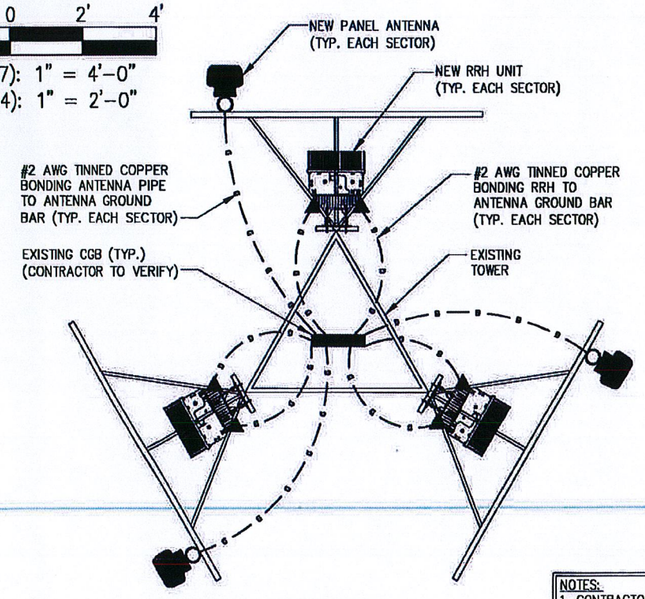
4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

NOTES:
1) DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2) GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3) WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.



2 CONNECTION OF GROUND KIT TO ANTENNA CABLE
NOT TO SCALE



3 TYPICAL ANTENNA GROUNDING PLAN
NOT TO SCALE

NOTES:
1. CONTRACTOR TO VERIFY EXISTING LUG SPACES ARE AVAILABLE ON GROUND BAR. ADD ADDITIONAL BUS BAR IF NO LUG SPACES ARE AVAILABLE.
2. ANTENNA GROUNDING CONNECTIONS SHOWN ARE NOT EXACT TO THIS SITE. FOR EXACT ANTENNA LAYOUT REFER TO ANTENNA CONFIGURATION SHEET.

GROUNDING NOTES:

1. ALL DOWN CONDUCTORS AND GROUND RING AND CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE R FOUNDATION, WHICHEVER IS HIGHER. COLD-GALV AFTER. EXOTHERMICALLY WELD OTHER END TO THE GROUND.
4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
8. UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT'S SSEQ DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
10. RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.
11. REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUND RING.

INFINIGY
Design. Build. Deliver.
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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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2	REVISED PER COMMENTS	AHS	1/16/13
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0	ISSUED FOR REVIEW	AHS	11/1/12

Drawn: AHS Date: 11/1/12
Designed: AJD Date: 11/1/12
Checked: AGF Date: 11/2/12

Project Number: 204-051

Project Title:
WATERFORD CT03XC105

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

Prepared For:
Sprint VISION

Drawing Scale: AS NOTED
Date: 1/16/13

Drawing Title:
GROUNDING PLAN AND DETAILS

Drawing Number:
E3

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC105

Waterford
41 Manitock Hill Road
Waterford, CT 06385

December 27, 2012

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

EBI Consulting
environmental | engineering | due diligence

December 27, 2012

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Emissions Values for Site: **CT03XC105 – Waterford**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 41 Manitock Hill Road, Waterford, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 41 Manitock Hill Road, Waterford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 5 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

6) The antenna mounting height centerline of the proposed antennas is **137 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CT03XC105 - Waterford
Site Address	41 Manitock Hill Road, Waterford, CT, 06385
Site Type	Self Support Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	5	100	15.9	137	131	1/2 "	0.5	0	3467.3685	72.63792	7.26379%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137	131	1/2 "	0.5	0	389.96892	8.169461	1.44082%
														Sector total Power Density Value:		8.705%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	5	100	15.9	137	131	1/2 "	0.5	0	3467.3685	72.63792	7.26379%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137	131	1/2 "	0.5	0	389.96892	8.169461	1.44082%
														Sector total Power Density Value:		8.705%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	5	100	15.9	137	131	1/2 "	0.5	0	3467.3685	72.63792	7.26379%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137	131	1/2 "	0.5	0	389.96892	8.169461	1.44082%
														Sector total Power Density Value:		8.705%	

Site Composite MPE %	
Carrier	MPE %
Sprint	26.114%
Nextel	3.540%
MetroPCS	6.040%
AT&T	21.330%
Verizon Wireless	22.690%
T-Mobile	7.030%
Total Site MPE %	**86.744%**

EBI Consulting
environmental | engineering | due diligence

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **26.114% (8.705% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **86.744%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

Date: **October 18, 2012**

David Grimes
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Dr.
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC105
	Carrier Site Name:	CT03XC105
Crown Castle Designation:	**Crown Castle BU Number:**	876338
	Crown Castle Site Name:	WATERFORD
	Crown Castle JDE Job Number:	190528
	Crown Castle Work Order Number:	539583
	Crown Castle Application Number:	165450 Rev. 2
Engineering Firm Designation:	**Crown Castle Project Number:**	539583
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT** **Latitude *41° 21' 16.42"*, Longitude *-72° 9' 3.38"*** **136 Foot - Self Support Tower**	

Dear David Grimes,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 539583, in accordance with application 165450, revision 2.

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

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

The analysis has been performed in accordance with the TIA/EIA-222-F standard, 2005 CT State Building Code and local code requirements based upon a wind speed of 85 mph fastest mile.

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

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

Structural analysis prepared by: Brad Gruszecki, Engineer I / MFB

Respectfully submitted by:

Aaron C. Poot, P.E.
Manager Engineering

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED
PROFESSIONAL ENGINEER

tnxTower Report - version 6.0.4.0

10/20/12

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Antenna and Cable Information
Table 2 - Existing Antenna and Cable Information
Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE
Table 4 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 5 - Section Capacity (Summary)
Table 6 – Tower Components vs. Capacity
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 136 ft Self Support tower designed by Pirod Manufacturers, Inc. in February of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower was reworked in 2008 by Vertical Structures to accommodate additional loading.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
136.0	137.0	6	alcatel lucent	1900MHz RRH (65MHz)	3	1-1/4	-
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
136.0	137.0	6	decibel	980F90T2E-M w/ Mount Pipe	6	1-5/8	2
	136.0	1	tower mounts	Platform Mount [LP 405-1]	-	-	1
127.0	127.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	1
		1	tower mounts	Sector Mount [SM 411-3]			
117.0	119.0	3	ems wireless	RR90-17-02DP w/ Mount Pipe	14	1-5/8	1
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/Mount Pipe			
		6	rfs celwave	ATMAA1412D-1A20			
	117.0	1	tower mounts	Sector Mount [SM 411-3]			
107.0	107.0	3	antel	BXA-185063/8CF	12	1-5/8	1
		3	antel	BXA-70063/6CF			
		6	antel	LPA-80063/4CF			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Sector Mount [SM 307-3]			
97.0	97.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	6 2 1	1-1/4 5/8 3/8	1
		3	ericsson	RRUS-11			
		2	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 201-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
87.0	89.0	3	kathrein	800 10504 w/ Mount Pipe	6	7/8	1
		3	kathrein	860 10118	1	3/8	
	87.0	1	tower mounts	Sector Mount [SM 104-3]			
80.0	80.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1
		1	unknown	GPS			
72.0	72.0	2	tower mounts	Side Arm Mount [SO 701-1]	2	1/2	1
		2	unknown	GPS			

Notes:
1) Existing Equipment
2) Equipment to be Removed, Not Considered in Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136	136	12	allgon	7184.05	12	1 5/8
127	127	12	swedcom	ALP9212	12	1-5/8
117	117	12	swedcom	ALP9212	12	1 5/8
102	102	2	decibel	DB810	2	1-5/8
80	80	2	generic	GPS Antenna	2	1/2

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	SEA Consultants, Inc.	2035622	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Structures, Inc.	2376132	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod Manufacturers, Inc.	2068030	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod Manufacturers, Inc.	1441523	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Inc.	2125417	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	136 - 130	Leg	1 1/2	2	-5.64	46.64	12.1	Pass
T2	130 - 110	Leg	2	23	32.83	67.69	48.5	Pass
T3	110 - 95	Leg	2 1/4	87	-74.43	128.26	58.0	Pass
T4	95 - 90	Leg	2 1/4	134	-94.09	147.86	63.6	Pass
T5	90 - 80	Leg	Pirod 105244 w/ 1 1/4" Reinforcement	165	-98.61	204.90	59.7	Pass
T6	80 - 60	Leg	Pirod 105217	174	-145.60	184.67	78.8	Pass
T7	60 - 40	Leg	Pirod 105218	189	-185.15	258.24	71.7	Pass
T8	40 - 20	Leg	Pirod 105218	204	-220.03	258.24	85.2	Pass
T9	20 - 0	Leg	Pirod 105219	219	-251.17	343.62	73.1	Pass
T1	136 - 130	Diagonal	3/4	17	-1.28	5.22	24.4	Pass
T2	130 - 110	Diagonal	7/8	35	-3.33	8.17	40.8	Pass
T3	110 - 95	Diagonal	1	94	-4.97	12.27	40.5	Pass
T4	95 - 90	Diagonal	1	144	-6.15	12.15	50.7	Pass
T5	90 - 80	Diagonal	L3x3x3/16	168	-7.47	16.99	44.0 61.6 (b)	Pass
T6	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	176	-7.48	9.20	81.3	Pass
T7	60 - 40	Diagonal	L3x3x3/16	191	-7.07	13.46	52.6 58.9 (b)	Pass
T8	40 - 20	Diagonal	L3x3x3/16	206	-7.10	11.02	64.4	Pass
T9	20 - 0	Diagonal	L3x3x5/16	221	-8.99	14.74	61.0	Pass
T1	136 - 130	Horizontal	3/4	16	-0.08	2.92	2.6	Pass
T2	130 - 110	Horizontal	7/8	45	-0.41	4.58	8.9	Pass
T3	110 - 95	Horizontal	7/8	106	-0.68	3.89	17.5	Pass
T4	95 - 90	Horizontal	7/8	137	-0.87	3.69	23.5	Pass
T4	95 - 90	Secondary Horizontal	1 1/2	152	-1.63	30.81	5.3	Pass
T1	136 - 130	Top Girt	7/8	5	-0.58	5.41	10.6	Pass
T2	130 - 110	Top Girt	1	28	-0.60	9.33	6.4	Pass
T3	110 - 95	Top Girt	1	92	-1.01	7.39	13.6	Pass
T1	136 - 130	Bottom Girt	7/8	7	-0.44	5.41	8.1	Pass
T2	130 - 110	Bottom Girt	1	31	-1.50	7.39	20.3	Pass
T4	95 - 90	Bottom Girt	1	140	-1.78	6.02	29.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
							Summary	
						Leg (T8)	85.2	Pass
						Diagonal (T6)	81.3	Pass
						Horizontal (T4)	23.5	Pass
						Secondary Horizontal (T4)	5.3	Pass
						Top Girt (T3)	13.6	Pass
						Bottom Girt (T4)	29.6	Pass
						Bolt Checks	72.3	Pass
						RATING =	**85.2**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	46.7	Pass
1	Base Foundation Soil Interaction	0	97.2	Pass

Structure Rating (max from all components) =	97.2%

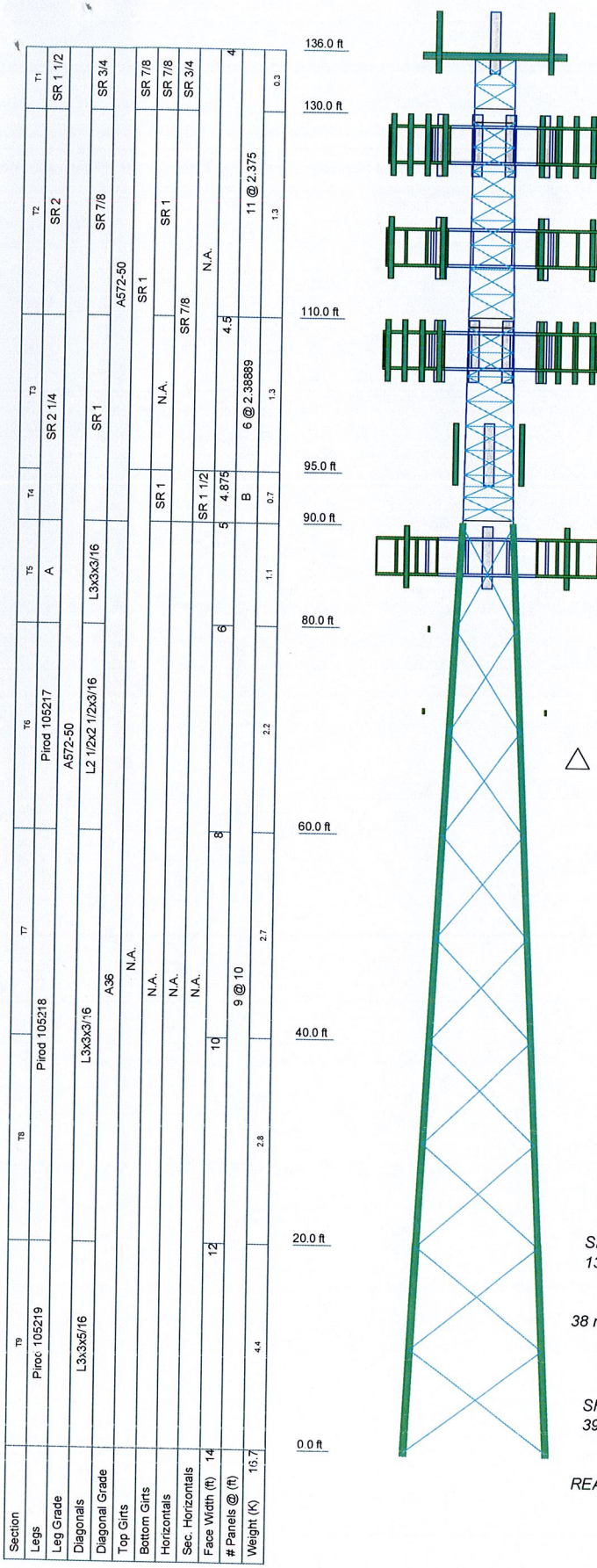
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-70063/6CF	107
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-70063/6CF	107
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-70063/6CF	107
(2) 1900MHz RRH (65MHz)	136	(2) FD9R6004/2C-3L	107
(2) 1900MHz RRH (65MHz)	136	(2) FD9R6004/2C-3L	107
(2) 1900MHz RRH (65MHz)	136	(2) FD9R6004/2C-3L	107
800MHz 2X50W RRH W/FILTER	136	Sector Mount [SM 307-3]	107
800MHz 2X50W RRH W/FILTER	136	AM-X-CD-14-65-00T-RET w/ Mount Pipe	97
800MHz 2X50W RRH W/FILTER	136	AM-X-CD-14-65-00T-RET w/ Mount Pipe	97
IBC1900BB-1	136	SBNH-1D6565C w/ Mount Pipe	97
IBC1900BB-1	136	7770.00 w/Mount Pipe	97
IBC1900BB-1	136	7770.00 w/Mount Pipe	97
IBC1900HG-2A	136	7770.00 w/Mount Pipe	97
IBC1900HG-2A	136	(2) LGP21401	97
IBC1900HG-2A	136	(2) LGP21401	97
Platform Mount [LP 405-1]	136	(2) LGP21401	97
(4) DB844H90E-XY w/ Mount Pipe	127	RRUS-11	97
(4) DB844H90E-XY w/ Mount Pipe	127	RRUS-11	97
(4) DB844H90E-XY w/ Mount Pipe	127	RRUS-11	97
Sector Mount [SM 411-3]	127	DC6-48-60-18-8F	97
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	117	Side Arm Mount [SO 201-3]	97
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	117	800 10504 w/ Mount Pipe	87
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	117	800 10504 w/ Mount Pipe	87
RR90-17-02DP w/ Mount Pipe	117	800 10504 w/ Mount Pipe	87
RR90-17-02DP w/ Mount Pipe	117	860 10118	87
RR90-17-02DP w/ Mount Pipe	117	860 10118	87
(2) ATMAA1412D-1A20	117	860 10118	87
(2) ATMAA1412D-1A20	117	7'x2" Antenna Mount Pipe	87
(2) ATMAA1412D-1A20	117	7'x2" Antenna Mount Pipe	87
Sector Mount [SM 411-3]	117	7'x2" Antenna Mount Pipe	87
(2) LPA-80063/4CF	107	Sector Mount [SM 104-3]	87
(2) LPA-80063/4CF	107	GPS	80
(2) LPA-80063/4CF	107	Side Arm Mount [SO 701-1]	80
BXA-185063/8CF	107	GPS	72
BXA-185063/8CF	107	GPS	72
BXA-185063/8CF	107	Side Arm Mount [SO 701-1]	72
		Side Arm Mount [SO 701-1]	72

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244 w/ 1 1/4" Reinforcement	B	2 @ 2.20833

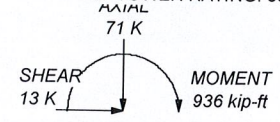
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

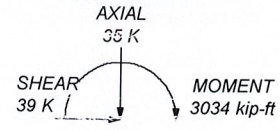
MAX. CORNER REACTIONS AT BASE:
DOWN: 262 K
SHEAR
UPLIFT

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 85.2%



TORQUE 2 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 6 kip-ft
REACTIONS - 85 mph WIND

CROWN CASTLE
We Are Solutions
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Canonsburg, PA
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FAX: (724) 416-4866

Job: BU# 876338			
Project:			
Client: Crown Castle	Drawn by: mbranagan	App'd:	
Code: TIA/EIA-222-F	Date: 10/20/12	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\BGruszecki\876338-\Final\876335.eri		Dwg No. E-1	

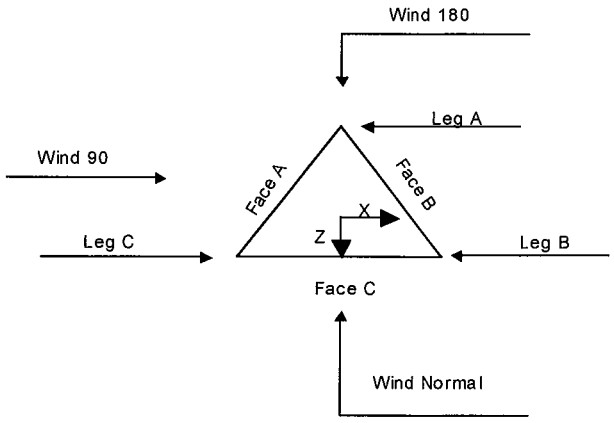
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 4' at the top and 14' at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in New London County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in tower member design is 1.333.
12) 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	136'-130'			4'	1	6'
T2	130'-110'			4'	1	20'
T3	110'-95'			4'6"	1	15'
T4	95'-90'			4'10-9/16"	1	5'
T5	90'-80'			5'	1	10'
T6	80'-60'			6'	1	20'
T7	60'-40'			8'	1	20'
T8	40'-20'			10'	1	20'
T9	20'-0'			12'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	136'-130'	2'4-9/16"	X Brace	No	Steps	8.5000	6.5000
T2	130'-110'	2'4-9/16"	X Brace	No	Steps	9.5000	2.5000
T3	110'-95'	2'4-11/16"	X Brace	No	Steps	8.0000	0.0000
T4	95'-90'	2'2-17/32"	X Brace	No	Yes	0.0000	7.0000
T5	90'-80'	10'	X Brace	No	No	0.0000	0.0000
T6	80'-60'	10'	X Brace	No	No	0.0000	0.0000
T7	60'-40'	10'	X Brace	No	No	0.0000	0.0000
T8	40'-20'	10'	X Brace	No	No	0.0000	0.0000
T9	20'-0'	10'	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136'-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 110'-95'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 95'-90'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 90'-80'	Truss Leg	Pirod 105244 w/ 1 1/4" Reinforcement	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 80'-60'	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 60'-40'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 40'-20'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 20'-0'	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136'-130'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 130'-110'	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 110'-95'	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 95'-90'	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136'-130'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 130'-110'	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 110'-95'	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 95'-90'	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 95'-90'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 136'-130'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T2 130'-110'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T3 110'-95'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T4 95'-90'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T5 90'-80'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T6 80'-60'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T7 60'-40'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T8 40'-20'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T9 20'-0'	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 136'-130'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 130'-110'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 110'-95'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 95'-90'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 90'-80'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 80'-60'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 60'-40'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 40'-20'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 20'-0'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry (cont'd)

Tower Elevation ft	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T5 90'-80'	1	0.5	0.85	1	0.5	0.85
T6 80'-60'	1	0.5	0.85	1	0.5	0.85
T7 60'-40'	1	0.5	0.85	1	0.5	0.85
T8 40'-20'	1	0.5	0.85	1	0.5	0.85
T9 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136'-130'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 130'-110'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 110'-95'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 95'-90'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 90'-80'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 80'-60'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 60'-40'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 40'-20'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 20'-0'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry (cont'd)

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 136'-130'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 130'-110'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 110'-95'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T4 95'-90'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 90'-80'	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T6 80'-60'	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T7 60'-40'	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T8 40'-20'	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T9 20'-0'	5.0000	12.2500	5.0000	12.2500	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136'-130'	Sleeve DS	0.6250 A325N	5	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T2 130'-110'	Sleeve DS	0.7500 A325N	5	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 110'-95'	Sleeve DS	0.7500 A325N	0	1.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 95'-90'	Flange	1.0000 A325N	6	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 90'-80'	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80'-60'	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 60'-40'	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 40'-20'	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20'-0'	Flange	1.2500 A687	6	1.2500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (Leg)	136' - 0'	0.0000	0.38	3	3	0.5000	1.5400		0.00
T-Brackets (Af) *	B	No	Af (Leg)	136' - 0'	0.0000	0.4	1	1	1.0000	1.0000	4.0000	0.01
LDF6-50A(1-1/4")	A	No	Ar (Leg)	127' - 0'	0.0000	0.4	12	7	0.5000	1.5500		0.00
T-Brackets (Af) *	A	No	Af (Leg)	127' - 0'	0.0000	0.4	1	1	1.0000	1.0000	4.0000	0.01
LDF7-50A(1-5/8")	C	No	Ar (Leg)	117' - 0'	0.0000	0.4	14	7	0.5000	1.9800		0.00
T-Brackets (Af) *	C	No	Af (Leg)	117' - 0'	0.0000	0.4	1	1	1.0000	1.0000	4.0000	0.01
LDF7-50A(1-5/8") *	B	No	Ar (Leg)	107' - 0'	0.0000	0.35	12	7	0.5000	1.9800		0.00
LDF6-50A(1-1/4")	B	No	Ar (Leg)	97' - 0'	0.0000	0.4	6	6	0.5000	1.5500		0.00
FB-L98-002-XXX(3/8)	B	No	Ar (Leg)	97' - 0'	0.0000	0.35	1	1	0.3937	0.3937		0.00
WR-VG82ST-BRDA(5/8") *	B	No	Ar (Leg)	97' - 0'	0.0000	0.36	2	2	0.5000	0.6450		0.00
FSJ2-50(3/8")	C	Yes	Ar (CfAe)	87' - 0'	0.0000	0	1	1	0.4250	0.4250		0.00
FXL 780 PE(7/8)	C	Yes	Ar (CfAe)	87' - 0'	0.0000	-0.1	6	6	0.5000	1.0900		0.00
Feedline Ladder (Af) *	C	Yes	Af (CfAe)	87' - 0'	0.0000	0	1	1	3.0000	3.0000	12.0000	0.01
FLC 12-50J(1/2") *	B	No	Ar (Leg)	80' - 0'	0.0000	0.47	1	1	0.5000	0.6400		0.00
LDF4-	A	No	Ar (Leg)	72' - 0'	0.0000	0.35	2	2	0.5000	0.6300		0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
50A(1/2") *												

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 klf
*							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136'-130'	A	0.000	0.000	0.000	0.000	0.00
		B	2.310	0.500	0.000	0.000	0.07
		C	2.310	0.500	0.000	0.000	0.00
T2	130'-110'	A	23.456	2.000	0.000	0.000	0.28
		B	23.071	3.083	0.000	0.000	0.23
		C	15.785	2.250	0.000	0.000	0.14
T3	110'-95'	A	30.887	2.500	0.000	0.000	0.24
		B	35.028	2.500	0.000	0.000	0.30
		C	38.791	2.500	0.000	0.000	0.30
T4	95'-90'	A	10.296	0.833	0.000	0.000	0.08
		B	16.797	0.833	0.000	0.000	0.13
		C	18.052	0.833	0.000	0.000	0.10
T5	90'-80'	A	20.592	1.667	0.000	0.000	0.16
		B	33.595	1.667	0.000	0.000	0.26
		C	40.166	3.417	0.000	0.000	0.27
T6	80'-60'	A	42.443	3.333	0.000	0.000	0.33
		B	69.516	3.333	0.000	0.000	0.53
		C	84.881	8.333	0.000	0.000	0.60
T7	60'-40'	A	43.283	3.333	0.000	0.000	0.33
		B	70.356	3.333	0.000	0.000	0.53
		C	84.881	8.333	0.000	0.000	0.60
T8	40'-20'	A	43.283	3.333	0.000	0.000	0.33
		B	70.356	3.333	0.000	0.000	0.53
		C	84.881	8.333	0.000	0.000	0.60
T9	20'-0'	A	43.283	3.333	0.000	0.000	0.33
		B	70.356	3.333	0.000	0.000	0.53
		C	84.881	8.333	0.000	0.000	0.60

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136'-130'	A	0.887	0.000	0.000	0.000	0.000	0.00
		B		1.657	3.131	0.000	0.000	0.12
		C		1.657	3.131	0.000	0.000	0.00
T2	130'-110'	A	0.876	6.854	30.440	0.000	0.000	0.65
		B		10.162	30.908	0.000	0.000	0.41
		C		7.662	20.357	0.000	0.000	0.35
T3	110'-95'	A	0.859	8.709	39.339	0.000	0.000	0.57
		B		13.148	42.618	0.000	0.000	0.75
		C		13.686	45.843	0.000	0.000	0.74
T4	95'-90'	A	0.849	2.885	13.101	0.000	0.000	0.19

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		7.435	19.549	0.000	0.000	0.37
		C		7.614	20.624	0.000	0.000	0.24
T5	90'-80'	A	0.840	5.742	26.184	0.000	0.000	0.37
		B		14.784	39.080	0.000	0.000	0.74
		C		17.986	48.271	0.000	0.000	0.66
T6	80'-60'	A	0.821	13.627	53.411	0.000	0.000	0.77
		B		35.255	79.203	0.000	0.000	1.49
		C		41.698	102.447	0.000	0.000	1.46
T7	60'-40'	A	0.788	14.817	54.020	0.000	0.000	0.78
		B		35.904	79.812	0.000	0.000	1.46
		C		40.723	102.231	0.000	0.000	1.43
T8	40'-20'	A	0.750	14.433	53.850	0.000	0.000	0.76
		B		34.881	79.642	0.000	0.000	1.42
		C		39.573	101.975	0.000	0.000	1.40
T9	20'-0'	A	0.750	14.433	53.850	0.000	0.000	0.76
		B		34.881	79.642	0.000	0.000	1.42
		C		39.573	101.975	0.000	0.000	1.40

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	136'-130'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	130'-110'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	110'-95'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	95'-90'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T5	90'-80'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.593	0.602	1.058
T6	80'-60'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	1.388	1.211	2.113
T7	60'-40'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	1.128	1.244	2.146
T8	40'-20'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.956	1.123	1.913
T9	20'-0'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.892	1.048	1.785

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	136'-130'	1.4664	0.8466	0.6750	0.3897
T2	130'-110'	0.0878	-0.6008	0.0327	-0.4379
T3	110'-95'	0.5275	0.5599	0.3132	0.3137
T4	95'-90'	1.1668	0.8671	0.7611	0.5519
T5	90'-80'	1.2623	1.5167	0.8760	1.0876

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T6	80'-60'	1.6766	2.1839	1.1500	1.5735
T7	60'-40'	2.0541	2.6060	1.4233	1.9132
T8	40'-20'	2.4821	3.1507	1.7502	2.3589
T9	20'-0'	2.8553	3.6249	2.0218	2.7310

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
(2) 1900MHz RRH (65MHz)	A	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
(2) 1900MHz RRH (65MHz)	B	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
(2) 1900MHz RRH (65MHz)	C	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
800MHz 2X50W RRH W/FILTER	A	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	4.00 0' 1'	0.0000	136'	No Ice 1/2" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
IBC1900BB-1	A	From Leg	4.00	0' 1'	0.0000	136'	1" Ice	3.30	3.13	0.17
							2" Ice	4.34	4.15	0.34
							4" Ice			
							No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
IBC1900BB-1	B	From Leg	4.00	0' 1'	0.0000	136'	No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
IBC1900BB-1	C	From Leg	4.00	0' 1'	0.0000	136'	No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
IBC1900HG-2A	A	From Leg	4.00	0' 1'	0.0000	136'	No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
IBC1900HG-2A	B	From Leg	4.00	0' 1'	0.0000	136'	No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
IBC1900HG-2A	C	From Leg	4.00	0' 1'	0.0000	136'	No Ice	1.13	0.53	0.02
							1/2" Ice	1.27	0.65	0.03
								1.43	0.77	0.04
							1" Ice	1.76	1.04	0.06
							2" Ice	2.53	1.69	0.15
							4" Ice			
Platform Mount [LP 405-1]	C	None			0.0000	136'	No Ice	20.80	20.80	1.80
							1/2" Ice	28.10	28.10	2.07
								35.40	35.40	2.33
							1" Ice	50.00	50.00	2.86
							2" Ice	79.20	79.20	3.93
							4" Ice			
* (4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00	0' 0'	0.0000	127'	No Ice	3.30	4.92	0.03
							1/2" Ice	3.69	5.60	0.07
								4.12	6.28	0.12
							1" Ice	5.01	7.71	0.23
							2" Ice	6.92	10.83	0.56
							4" Ice			
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00	0' 0'	0.0000	127'	No Ice	3.30	4.92	0.03
							1/2" Ice	3.69	5.60	0.07
								4.12	6.28	0.12
							1" Ice	5.01	7.71	0.23
							2" Ice	6.92	10.83	0.56
							4" Ice			
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00	0' 0'	0.0000	127'	No Ice	3.30	4.92	0.03
							1/2" Ice	3.69	5.60	0.07
								4.12	6.28	0.12
							1" Ice	5.01	7.71	0.23
							2" Ice	6.92	10.83	0.56
							4" Ice			
Sector Mount [SM 411-3]	C	None			0.0000	127'	No Ice	21.88	21.88	1.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	30.68	30.68	1.48
						1" Ice	39.48	39.48	1.90
						2" Ice	57.08	57.08	2.73
						4" Ice	92.28	92.28	4.40
*									
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.73 8.21 9.18 11.23	3.29 3.92 4.57 5.92 8.88	0.06 0.10 0.16 0.28 0.65
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.73 8.21 9.18 11.23	3.29 3.92 4.57 5.92 8.88	0.06 0.10 0.16 0.28 0.65
APX16DWV-16DWV-S-E-A20 w/Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.73 8.21 9.18 11.23	3.29 3.92 4.57 5.92 8.88	0.06 0.10 0.16 0.28 0.65
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
(2) ATMAA1412D-1A20	A	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	B	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
(2) ATMAA1412D-1A20	C	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
Sector Mount [SM 411-3]	C	None		0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	21.88 30.68 39.48 57.08 92.28	21.88 30.68 39.48 57.08 92.28	1.07 1.48 1.90 2.73 4.40

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*						4" Ice			
(2) LPA-80063/4CF	A	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.01 7.42 7.84 8.70 10.54	6.08 6.48 6.89 7.72 9.50	0.02 0.07 0.13 0.26 0.60
(2) LPA-80063/4CF	B	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.01 7.42 7.84 8.70 10.54	6.08 6.48 6.89 7.72 9.50	0.02 0.07 0.13 0.26 0.60
(2) LPA-80063/4CF	C	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.01 7.42 7.84 8.70 10.54	6.08 6.48 6.89 7.72 9.50	0.02 0.07 0.13 0.26 0.60
BXA-185063/8CF	A	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.26 3.60 4.36 5.99	1.79 2.09 2.40 3.04 4.46	0.01 0.03 0.05 0.10 0.27
BXA-185063/8CF	B	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.26 3.60 4.36 5.99	1.79 2.09 2.40 3.04 4.46	0.01 0.03 0.05 0.10 0.27
BXA-185063/8CF	C	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.26 3.60 4.36 5.99	1.79 2.09 2.40 3.04 4.46	0.01 0.03 0.05 0.10 0.27
BXA-70063/6CF	A	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	4.05 4.49 4.93 5.84 7.75	0.01 0.06 0.10 0.22 0.53
BXA-70063/6CF	B	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	4.05 4.49 4.93 5.84 7.75	0.01 0.06 0.10 0.22 0.53
BXA-70063/6CF	C	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	4.05 4.49 4.93 5.84 7.75	0.01 0.06 0.10 0.22 0.53
(2) FD9R6004/2C-3L	A	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0' 0'	0.0000	107'	No Ice 1/2" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	0.75	0.34	0.02
							2" Ice	1.28	0.74	0.06
							4" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00	0'	0.0000	107'	No Ice	0.37	0.08	0.00
							1/2" Ice	0.45	0.14	0.01
							1" Ice	0.54	0.20	0.01
							2" Ice	0.75	0.34	0.02
							4" Ice	1.28	0.74	0.06
Sector Mount [SM 307-3]	C	None			0.0000	107'	No Ice	26.22	26.22	1.62
							1/2" Ice	36.28	36.28	2.15
							1" Ice	46.34	46.34	2.68
							2" Ice	66.46	66.46	3.73
							4" Ice	106.70	106.70	5.85
*										
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	1.00	0'	0.0000	97'	No Ice	5.74	4.02	0.03
							1/2" Ice	6.20	4.63	0.08
							1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	1.00	0'	0.0000	97'	No Ice	5.74	4.02	0.03
							1/2" Ice	6.20	4.63	0.08
							1" Ice	6.66	5.28	0.13
							2" Ice	7.62	6.68	0.25
							4" Ice	9.67	9.74	0.61
SBNH-1D6565C w/ Mount Pipe	C	From Leg	1.00	0'	0.0000	97'	No Ice	11.68	9.84	0.09
							1/2" Ice	12.40	11.37	0.18
							1" Ice	13.14	12.91	0.28
							2" Ice	14.60	15.27	0.52
							4" Ice	17.87	20.14	1.16
7770.00 w/Mount Pipe	A	From Leg	1.00	0'	0.0000	97'	No Ice	5.92	4.04	0.05
							1/2" Ice	6.36	4.67	0.10
							1" Ice	6.81	5.32	0.15
							2" Ice	7.74	6.67	0.27
							4" Ice	9.71	9.81	0.63
7770.00 w/Mount Pipe	B	From Leg	1.00	0'	0.0000	97'	No Ice	5.92	4.04	0.05
							1/2" Ice	6.36	4.67	0.10
							1" Ice	6.81	5.32	0.15
							2" Ice	7.74	6.67	0.27
							4" Ice	9.71	9.81	0.63
7770.00 w/Mount Pipe	C	From Leg	1.00	0'	0.0000	97'	No Ice	5.92	4.04	0.05
							1/2" Ice	6.36	4.67	0.10
							1" Ice	6.81	5.32	0.15
							2" Ice	7.74	6.67	0.27
							4" Ice	9.71	9.81	0.63
(2) LGP21401	A	From Leg	1.00	0'	0.0000	97'	No Ice	1.29	0.23	0.01
							1/2" Ice	1.45	0.31	0.02
							1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Leg	1.00	0'	0.0000	97'	No Ice	1.29	0.23	0.01
							1/2" Ice	1.45	0.31	0.02
							1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21401	C	From Leg	1.00		0.0000	97'	No Ice	1.29	0.23	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'				1/2" Ice	1.45	0.31	0.02
			0'				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
RRUS-11	A	From Leg	1.00		0.0000	97'	No Ice	3.25	1.37	0.05
			0'				1/2" Ice	3.49	1.55	0.07
			0'				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
RRUS-11	B	From Leg	1.00		0.0000	97'	No Ice	3.25	1.37	0.05
			0'				1/2" Ice	3.49	1.55	0.07
			0'				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
RRUS-11	C	From Leg	1.00		0.0000	97'	No Ice	3.25	1.37	0.05
			0'				1/2" Ice	3.49	1.55	0.07
			0'				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
DC6-48-60-18-8F	C	From Leg	1.00		0.0000	97'	No Ice	1.27	1.27	0.02
			0'				1/2" Ice	1.46	1.46	0.04
			0'				1" Ice	1.66	1.66	0.05
							2" Ice	2.09	2.09	0.10
							4" Ice	3.10	3.10	0.21
Side Arm Mount [SO 201-3]	C	None			0.0000	97'	No Ice	5.71	5.71	0.29
							1/2" Ice	7.91	7.91	0.35
							1" Ice	10.11	10.11	0.41
							2" Ice	14.51	14.51	0.54
							4" Ice	23.31	23.31	0.79
*										
800 10504 w/ Mount Pipe	A	From Leg	4.00		0.0000	87'	No Ice	3.59	3.18	0.04
			0'				1/2" Ice	4.01	3.91	0.07
			2'				1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
800 10504 w/ Mount Pipe	B	From Leg	4.00		0.0000	87'	No Ice	3.59	3.18	0.04
			0'				1/2" Ice	4.01	3.91	0.07
			2'				1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
800 10504 w/ Mount Pipe	C	From Leg	4.00		0.0000	87'	No Ice	3.59	3.18	0.04
			0'				1/2" Ice	4.01	3.91	0.07
			2'				1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
860 10118	A	From Leg	4.00		0.0000	87'	No Ice	0.17	0.14	0.00
			0'				1/2" Ice	0.24	0.21	0.00
			2'				1" Ice	0.32	0.28	0.00
							2" Ice	0.50	0.46	0.01
							4" Ice	0.96	0.91	0.05
860 10118	B	From Leg	4.00		0.0000	87'	No Ice	0.17	0.14	0.00
			0'				1/2" Ice	0.24	0.21	0.00
			2'				1" Ice	0.32	0.28	0.00
							2" Ice	0.50	0.46	0.01
							4" Ice	0.96	0.91	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
860 10118	C	From Leg	4.00 0' 2'		0.0000	87'	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.17 0.24 0.32 0.50 0.96	0.14 0.21 0.28 0.46 0.91	0.00 0.00 0.00 0.01 0.05
7'x2" Antenna Mount Pipe	A	From Leg	4.00 0' 0'		0.0000	87'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.66 2.39 2.83 3.71 5.58	1.66 2.39 2.83 3.71 5.58	0.03 0.04 0.06 0.10 0.27
7'x2" Antenna Mount Pipe	B	From Leg	4.00 0' 0'		0.0000	87'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.66 2.39 2.83 3.71 5.58	1.66 2.39 2.83 3.71 5.58	0.03 0.04 0.06 0.10 0.27
7'x2" Antenna Mount Pipe	C	From Leg	4.00 0' 0'		0.0000	87'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.66 2.39 2.83 3.71 5.58	1.66 2.39 2.83 3.71 5.58	0.03 0.04 0.06 0.10 0.27
Sector Mount [SM 104-3]	C	None			0.0000	87'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	30.02 40.48 50.94 71.86 113.70	30.02 40.48 50.94 71.86 113.70	0.95 1.40 1.86 2.76 4.57
* GPS	C	From Leg	3.00 0' 0'		0.0000	80'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.17 0.24 0.31 0.48 0.92	0.17 0.24 0.31 0.48 0.92	0.00 0.00 0.00 0.01 0.05
Side Arm Mount [SO 701-1]	C	None			0.0000	80'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
* GPS	B	From Leg	3.00 0' 0'		0.0000	72'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.17 0.24 0.31 0.48 0.92	0.17 0.24 0.31 0.48 0.92	0.00 0.00 0.00 0.01 0.05
GPS	C	From Leg	3.00 0' 0'		0.0000	72'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.17 0.24 0.31 0.48 0.92	0.17 0.24 0.31 0.48 0.92	0.00 0.00 0.00 0.01 0.05
Side Arm Mount [SO 701-1]	B	None			0.0000	72'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
Side Arm Mount [SO 701-1]	C	None			0.0000	72'	No Ice 1/2"	0.85 1.14	1.67 2.34	0.07 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice	3.17	7.03	0.18
						4" Ice			
*									

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244 w/ 1 1/4" Reinforcement	2261.8218	4388.8287	0.60	0.79	7.8535	15.2390	5.8293
Pirod 105217	2296.2363	4895.6001	0.59	0.88	7.9730	16.9986	5.3014
Pirod 105218	2441.6826	5107.8359	0.73	0.87	8.4781	17.7355	7.2158
Pirod 105218	2441.6826	4911.6957	0.73	0.81	8.4781	17.0545	7.2158
Pirod 105219	2597.9095	5128.1841	1.09	0.84	9.0205	17.8062	9.4248

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

Comb. No.	Description
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	136 - 130	Leg	Max Tension	8	3.65	0.00	0.31
			Max. Compression	6	-5.64	-0.17	-0.10
			Max. Mx	5	-1.29	-0.57	0.00
			Max. My	2	-1.35	0.00	0.57
			Max. Vy	5	0.91	-0.19	-0.01
			Max. Vx	2	-0.93	0.00	0.19
		Diagonal	Max Tension	13	1.24	0.00	0.00
			Max. Compression	11	-1.28	0.00	0.00
			Max. Mx	15	0.29	-0.00	-0.00
			Max. My	10	-1.18	-0.00	-0.00
			Max. Vy	19	0.00	-0.00	-0.00
			Max. Vx	10	-0.00	-0.00	-0.00
		Horizontal	Max Tension	8	0.19	0.00	0.00
			Max. Compression	2	-0.08	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	10	0.12	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.56	0.00	0.00
			Max. Compression	4	-0.58	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. My	5	0.03	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	0.48	0.00	0.00
			Max. Compression	2	-0.44	0.00	0.00
			Max. Mx	14	0.00	0.01	0.00
			Max. My	4	-0.18	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T2	130 - 110	Leg	Max Tension	4	32.83	0.93	-0.01
			Max. Compression	6	-38.08	-0.37	0.00
			Max. Mx	2	-38.04	-0.96	0.00
			Max. My	9	-1.02	-0.00	0.84
			Max. Vy	2	-2.80	-0.37	0.00
			Max. Vx	9	-2.22	0.01	-0.30
		Diagonal	Max Tension	7	3.33	0.00	0.00
			Max. Compression	13	-3.33	0.00	0.00
			Max. Mx	20	1.00	-0.00	0.00
			Max. My	11	-2.69	-0.00	-0.00
			Max. Vy	20	0.01	-0.00	0.00
			Max. Vx	11	0.00	-0.00	-0.00
		Horizontal	Max Tension	8	0.56	0.00	0.00
			Max. Compression	2	0.41	0.00	0.00
			Max. Mx	14	0.16	0.01	0.00
			Max. My	5	0.07	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Top Girt	Max Tension	10	0.61	0.00	0.00
			Max. Compression	12	-0.60	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. My	5	-0.00	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bottom Girt	Max Tension	8	1.52	0.00	0.00
			Max. Compression	6	-1.50	0.00	0.00
			Max. Mx	14	0.04	0.01	0.00
			Max. My	4	-0.64	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T3	110 - 95	Leg	Max Tension	8	66.33	-0.14	-0.01
			Max. Compression	10	-74.43	-0.04	-0.01
			Max. Mx	2	-38.05	1.49	-0.00
			Max. My	9	-2.60	-0.03	1.18
			Max. Vy	2	-2.80	1.49	-0.00
			Max. Vx	9	-2.23	-0.03	1.18
		Diagonal	Max Tension	3	4.87	0.00	0.00
			Max. Compression	5	-4.97	0.00	0.00
			Max. Mx	2	4.11	-0.01	0.00
			Max. My	5	-3.68	-0.00	0.00
			Max. Vy	15	0.01	-0.01	-0.00
			Max. Vx	5	-0.00	-0.00	0.00
		Horizontal	Max Tension	8	0.85	0.00	0.00
			Max. Compression	2	-0.68	0.00	0.00
			Max. Mx	14	0.18	0.01	0.00
			Max. My	5	0.08	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Top Girt	Max Tension	10	1.07	0.00	0.00
			Max. Compression	12	-1.01	0.00	0.00
			Max. Mx	14	0.02	0.01	0.00
			Max. My	5	-0.06	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T4	95 - 90	Leg	Max Tension	8	84.88	1.64	0.01
			Max. Compression	10	-94.09	1.91	0.02
			Max. Mx	2	-93.94	1.91	0.02
			Max. My	7	-4.51	-0.02	1.11
			Max. Vy	2	-6.24	1.91	0.02
			Max. Vx	7	3.57	0.03	-0.97
		Diagonal	Max Tension	5	6.05	0.00	0.00
			Max. Compression	5	-6.15	0.00	0.00
			Max. Mx	13	3.51	-0.01	0.00
			Max. My	5	-6.12	0.00	0.00
			Max. Vy	23	0.01	-0.01	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Horizontal	Max Tension	8	1.03	0.00	0.00
			Max. Compression	2	-0.87	0.00	0.00
			Max. Mx	14	0.12	0.01	0.00
			Max. My	4	-0.35	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	10	1.63	0.00	0.00
			Max. Compression	10	-1.63	0.00	0.00
			Max. Mx	14	0.14	0.03	0.00
			Max. My	5	1.42	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1.72	0.00	0.00
			Max. Compression	2	-1.78	0.00	0.00
			Max. Mx	14	0.37	0.01	0.00
			Max. My	4	-0.74	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
T5	90 - 80	Leg	Max. Vx	4	0.00	0.00	0.00
			Max Tension	8	89.19	0.93	0.02
			Max. Compression	10	-98.61	14.47	0.07
			Max. Mx	4	88.57	-14.53	-0.09
			Max. My	7	-5.03	0.04	-10.88
			Max. Vy	12	1.80	-14.53	0.11
			Max. Vx	9	-1.73	0.04	10.84
		Diagonal	Max Tension	12	6.92	0.11	0.02
			Max. Compression	6	-7.47	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	6.71	0.11	0.02
			Max. My	11	-5.64	-0.08	0.04
			Max. Vy	8	0.02	0.11	0.02
			Max. Vx	11	-0.01	0.00	0.00
T6	80 - 60	Leg	Max Tension	8	132.92	-1.22	-0.02
			Max. Compression	6	-145.60	12.67	-0.10
			Max. Mx	4	111.78	-13.33	-0.13
			Max. My	9	-6.19	-0.01	10.16
			Max. Vy	2	-1.47	13.29	-0.02
			Max. Vx	3	0.31	0.07	-7.95
		Diagonal	Max Tension	11	7.01	0.07	0.00
			Max. Compression	11	-7.88	0.00	0.00
			Max. Mx	10	5.37	0.10	0.01
			Max. My	9	-7.04	-0.07	0.02
			Max. Vy	10	-0.03	0.10	0.01
			Max. Vx	9	-0.00	-0.07	0.02
T7	60 - 40	Leg	Max Tension	8	168.67	-2.58	-0.03
			Max. Compression	6	-185.15	10.49	-0.06
			Max. Mx	10	-166.27	11.40	0.12
			Max. My	9	-7.48	0.01	7.84
			Max. Vy	2	-1.02	11.40	-0.05
			Max. Vx	3	0.44	0.01	-7.83
		Diagonal	Max Tension	11	6.62	0.09	-0.00
			Max. Compression	11	-7.14	0.00	0.00
			Max. Mx	6	5.39	0.12	-0.01
			Max. My	9	-6.64	-0.08	0.01
			Max. Vy	6	-0.03	0.12	-0.01
			Max. Vx	9	-0.00	-0.08	0.01
T8	40 - 20	Leg	Max Tension	8	199.92	-2.62	-0.03
			Max. Compression	6	-220.03	10.50	-0.08
			Max. Mx	10	-219.89	10.50	0.17
			Max. My	9	-8.99	-0.16	7.95
			Max. Vy	2	-0.89	10.50	-0.09
			Max. Vx	3	0.37	-0.15	-7.94
		Diagonal	Max Tension	11	6.57	0.00	0.00
			Max. Compression	11	-7.10	0.00	0.00
			Max. Mx	6	5.40	0.11	-0.00
			Max. My	17	2.35	0.05	-0.01
			Max. Vy	19	-0.03	0.07	-0.01
			Max. Vx	17	0.00	0.00	0.00
T9	20 - 0	Leg	Max Tension	8	226.61	-2.99	-0.04
			Max. Compression	6	-251.17	4.74	-0.05
			Max. Mx	12	214.06	-8.50	0.06
			Max. My	9	-10.79	-0.40	12.15
			Max. Vy	15	-0.78	6.81	0.00
			Max. Vx	9	-0.95	-0.40	12.15
		Diagonal	Max Tension	4	8.13	0.00	0.00
			Max. Compression	10	-8.99	0.00	0.00
			Max. Mx	6	4.60	0.15	-0.01
			Max. My	9	-7.53	-0.04	0.02
			Max. Vy	19	-0.04	0.10	0.01
			Max. Vx	9	-0.00	-0.04	0.02

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	261.58	23.24	-13.11
	Max. H_x	10	261.58	23.24	-13.11
	Max. H_z	4	-234.87	-21.17	11.94
	Min. Vert	4	-234.87	-21.17	11.94
	Min. H_x	4	-234.87	-21.17	11.94
	Min. H_z	10	261.58	23.24	-13.11
Leg B	Max. Vert	6	261.75	-23.17	-13.23

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Max. H_x	12	-234.66	21.10	12.05
	Max. H_z	12	-234.66	21.10	12.05
	Min. Vert	12	-234.66	21.10	12.05
	Min. H_x	6	261.75	-23.17	-13.23
	Min. H_z	6	261.75	-23.17	-13.23
	Max. Vert	2	261.15	0.14	26.67
	Max. H_x	3	225.42	0.14	22.91
	Max. H_z	2	261.15	0.14	26.67
	Min. Vert	8	-235.27	-0.13	-24.32
	Min. H_x	8	-235.27	-0.13	-24.32
	Min. H_z	8	-235.27	-0.13	-24.32

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	34.62	-0.00	-0.00	4.06	-1.29	0.00
Dead+Wind 0 deg - No Ice	34.62	0.00	-38.95	-3026.34	-1.45	3.30
Dead+Wind 30 deg - No Ice	34.62	19.17	-33.20	-2593.15	-1500.82	5.39
Dead+Wind 60 deg - No Ice	34.62	33.03	-19.07	-1490.12	-2589.43	6.02
Dead+Wind 90 deg - No Ice	34.62	38.34	0.00	4.16	-3000.37	5.13
Dead+Wind 120 deg - No Ice	34.62	33.74	19.48	1519.23	-2625.82	2.94
Dead+Wind 150 deg - No Ice	34.62	19.17	33.20	2601.09	-1500.86	-0.14
Dead+Wind 180 deg - No Ice	34.62	-0.00	38.13	2992.38	-1.18	-3.16
Dead+Wind 210 deg - No Ice	34.62	-19.17	33.20	2601.23	1498.47	-5.39
Dead+Wind 240 deg - No Ice	34.62	-33.74	19.48	1519.47	2623.34	-6.24
Dead+Wind 270 deg - No Ice	34.62	-38.34	0.00	4.43	2997.75	-5.13
Dead+Wind 300 deg - No Ice	34.62	-33.02	-19.06	-1489.89	2586.68	-2.86
Dead+Wind 330 deg - No Ice	34.62	-19.17	-33.20	-2593.02	1497.96	0.14
Dead+Ice+Temp	71.23	-0.00	-0.00	10.64	-5.17	-0.00
Dead+Wind 0 deg+Ice+Temp	71.23	-0.00	-12.64	-914.83	-5.02	0.83
Dead+Wind 30 deg+Ice+Temp	71.23	6.16	-10.67	-780.28	-461.64	1.36
Dead+Wind 60 deg+Ice+Temp	71.23	10.57	-6.10	-443.47	-792.12	1.54
Dead+Wind 90 deg+Ice+Temp	71.23	12.32	0.00	11.14	-918.56	1.36
Dead+Wind 120 deg+Ice+Temp	71.23	10.95	6.32	473.86	-806.77	0.81
Dead+Wind 150 deg+Ice+Temp	71.23	6.16	10.68	802.09	-462.18	-0.00
Dead+Wind 180 deg+Ice+Temp	71.23	0.00	12.21	919.82	-5.48	-0.77
Dead+Wind 210 deg+Ice+Temp	71.23	-6.16	10.67	801.86	451.28	-1.36
Dead+Wind 240 deg+Ice+Temp	71.23	-10.94	6.32	473.46	796.05	-1.64
Dead+Wind 270 deg+Ice+Temp	71.23	-12.32	-0.00	10.68	908.07	-1.36
Dead+Wind 300 deg+Ice+Temp	71.23	-10.57	-6.11	-443.87	781.85	-0.77
Dead+Wind 330 deg+Ice+Temp	71.23	-6.16	-10.68	-780.52	451.55	0.00
Dead+Wind 0 deg - Service	34.62	0.00	-13.48	-1044.48	-1.36	1.14
Dead+Wind 30 deg - Service	34.62	6.63	-11.49	-894.61	-520.22	1.85
Dead+Wind 60 deg - Service	34.62	11.43	-6.60	-512.96	-896.92	2.08
Dead+Wind 90 deg - Service	34.62	13.27	-0.00	4.09	-1039.09	1.79
Dead+Wind 120 deg - Service	34.62	11.67	6.74	528.38	-909.45	1.02
Dead+Wind 150 deg - Service	34.62	6.63	11.49	902.78	-520.18	-0.06
Dead+Wind 180 deg - Service	34.62	-0.00	13.19	1038.20	-1.26	-1.09

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service	34.62	-6.63	11.49	902.82	517.64	-1.85
Dead+Wind 240 deg - Service	34.62	-11.67	6.74	528.46	906.88	-2.16
Dead+Wind 270 deg - Service	34.62	-13.27	0.00	4.19	1036.47	-1.79
Dead+Wind 300 deg - Service	34.62	-11.43	-6.60	-512.88	894.26	-0.99
Dead+Wind 330 deg - Service	34.62	-6.63	-11.49	-894.57	517.52	0.06

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-34.62	0.00	0.00	34.62	0.00	0.001%
2	0.00	-34.62	-38.99	-0.00	34.62	38.95	0.066%
3	19.19	-34.62	-33.23	-19.17	34.62	33.20	0.070%
4	33.06	-34.62	-19.09	-33.03	34.62	19.07	0.073%
5	38.38	-34.62	-0.00	-38.34	34.62	-0.00	0.070%
6	33.77	-34.62	19.49	-33.74	34.62	-19.48	0.066%
7	19.19	-34.62	33.23	-19.17	34.62	-33.20	0.070%
8	-0.00	-34.62	38.17	0.00	34.62	-38.13	0.073%
9	-19.19	-34.62	33.23	19.17	34.62	-33.20	0.070%
10	-33.77	-34.62	19.50	33.74	34.62	-19.48	0.066%
11	-38.38	-34.62	0.00	38.34	34.62	-0.00	0.070%
12	-33.06	-34.62	-19.08	33.02	34.62	19.06	0.073%
13	-19.19	-34.62	-33.23	19.17	34.62	33.20	0.070%
14	0.00	-71.23	0.00	0.00	71.23	0.00	0.002%
15	-0.00	-71.23	-12.65	0.00	71.23	12.64	0.017%
16	6.17	-71.23	-10.68	-6.16	71.23	10.67	0.017%
17	10.58	-71.23	-6.11	-10.57	71.23	6.10	0.018%
18	12.34	-71.23	0.00	-12.32	71.23	-0.00	0.018%
19	10.96	-71.23	6.33	-10.95	71.23	-6.32	0.018%
20	6.17	-71.23	10.69	-6.16	71.23	-10.68	0.018%
21	0.00	-71.23	12.22	-0.00	71.23	-12.21	0.018%
22	-6.17	-71.23	10.68	6.16	71.23	-10.67	0.018%
23	-10.96	-71.23	6.33	10.94	71.23	-6.32	0.017%
24	-12.34	-71.23	-0.00	12.32	71.23	0.00	0.017%
25	-10.58	-71.23	-6.11	10.57	71.23	6.11	0.017%
26	-6.17	-71.23	-10.69	6.16	71.23	10.68	0.017%
27	0.00	-34.62	-13.49	-0.00	34.62	13.48	0.033%
28	6.64	-34.62	-11.50	-6.63	34.62	11.49	0.033%
29	11.44	-34.62	-6.60	-11.43	34.62	6.60	0.034%
30	13.28	-34.62	-0.00	-13.27	34.62	0.00	0.034%
31	11.68	-34.62	6.75	-11.67	34.62	-6.74	0.033%
32	6.64	-34.62	11.50	-6.63	34.62	-11.49	0.034%
33	-0.00	-34.62	13.21	0.00	34.62	-13.19	0.034%
34	-6.64	-34.62	11.50	6.63	34.62	-11.49	0.034%
35	-11.68	-34.62	6.75	11.67	34.62	-6.74	0.033%
36	-13.28	-34.62	0.00	13.27	34.62	-0.00	0.034%
37	-11.44	-34.62	-6.60	11.43	34.62	6.60	0.034%
38	-6.64	-34.62	-11.50	6.63	34.62	11.49	0.033%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00043120
2	Yes	10	0.00051238	0.00074646
3	Yes	10	0.00053755	0.00078273

4	Yes	10	0.00056120	0.00081508
5	Yes	10	0.00053761	0.00078273
6	Yes	10	0.00051271	0.00074872
7	Yes	10	0.00053791	0.00078287
8	Yes	10	0.00056155	0.00081516
9	Yes	10	0.00053793	0.00078291
10	Yes	10	0.00051269	0.00074870
11	Yes	10	0.00053758	0.00078269
12	Yes	10	0.00056118	0.00081505
13	Yes	10	0.00053750	0.00078266
14	Yes	4	0.00000001	0.00063204
15	Yes	10	0.00062519	0.00083205
16	Yes	10	0.00063319	0.00084114
17	Yes	10	0.00064079	0.00085091
18	Yes	10	0.00063365	0.00084329
19	Yes	10	0.00062639	0.00083618
20	Yes	10	0.00063432	0.00084497
21	Yes	10	0.00064159	0.00085348
22	Yes	10	0.00063415	0.00084410
23	Yes	10	0.00062591	0.00083456
24	Yes	10	0.00063312	0.00084149
25	Yes	10	0.00064034	0.00084942
26	Yes	10	0.00063291	0.00084022
27	Yes	10	0.00052766	0.00075669
28	Yes	10	0.00053627	0.00076817
29	Yes	10	0.00054463	0.00077942
30	Yes	10	0.00053636	0.00076840
31	Yes	10	0.00052798	0.00075727
32	Yes	10	0.00053657	0.00076864
33	Yes	10	0.00054487	0.00077973
34	Yes	10	0.00053656	0.00076862
35	Yes	10	0.00052793	0.00075717
36	Yes	10	0.00053630	0.00076828
37	Yes	10	0.00054457	0.00077932
38	Yes	10	0.00053621	0.00076807

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 130	6.071	31	0.3490	0.0092
T2	130 - 110	5.581	31	0.3465	0.0090
T3	110 - 95	4.128	31	0.3165	0.0090
T4	95 - 90	3.162	31	0.2670	0.0089
T5	90 - 80	2.870	31	0.2428	0.0084
T6	80 - 60	2.182	31	0.2241	0.0077
T7	60 - 40	1.140	31	0.1582	0.0051
T8	40 - 20	0.482	31	0.1025	0.0030
T9	20 - 0	0.116	31	0.0443	0.0011

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSPP18-C-A20 w/ Mount Pipe	31	6.071	0.3490	0.0092	16811
127'	(4) DB844H90E-XY w/ Mount Pipe	31	5.347	0.3441	0.0089	14469
117'	APX16DWV-16DWV-S-E-A20 w/Mount Pipe	31	4.613	0.3306	0.0089	27000
107'	(2) LPA-80063/4CF	31	3.924	0.3094	0.0090	31074
97'	AM-X-CD-14-65-00T-RET w/	31	3.280	0.2763	0.0090	12973

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Mount Pipe					
87'	800 10504 w/ Mount Pipe	31	2.673	0.2341	0.0082	8426
80'	GPS	31	2.182	0.2241	0.0077	8250
72'	GPS	31	1.699	0.2028	0.0068	8240

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 130	17.498	6	1.0062	0.0266
T2	130 - 110	16.088	6	0.9988	0.0259
T3	110 - 95	11.898	6	0.9124	0.0258
T4	95 - 90	9.112	6	0.7694	0.0257
T5	90 - 80	8.272	6	0.6994	0.0242
T6	80 - 60	6.290	6	0.6458	0.0223
T7	60 - 40	3.287	6	0.4560	0.0148
T8	40 - 20	1.390	6	0.2954	0.0087
T9	20 - 0	0.334	6	0.1276	0.0032

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSPP18-C-A20 w/ Mount Pipe	6	17.498	1.0062	0.0266	5826
127'	(4) DB844H90E-XY w/ Mount Pipe	6	15.411	0.9921	0.0257	5015
117'	APX16DWV-16DWV-S-E-A20 w/Mount Pipe	6	13.296	0.9529	0.0255	9360
107'	(2) LPA-80063/4CF	6	11.310	0.8920	0.0261	10780
97'	AM-X-CD-14-65-00T-RET w/ Mount Pipe	6	9.452	0.7964	0.0261	4497
87'	800 10504 w/ Mount Pipe	6	7.703	0.6745	0.0238	2924
80'	GPS	6	6.290	0.6458	0.0223	2846
72'	GPS	6	4.898	0.5845	0.0196	2847

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	136	Leg	A325N	0.6250	5	1.13	12.89	0.087 ✔	1.333	Bolt DS
T2	130	Leg	A325N	0.7500	5	7.02	16.56	0.410 ✔	1.333	Bolt DS
T4	95	Leg	A325N	1.0000	6	14.15	34.49	0.410 ✔	1.333	Bolt Tension
T5	90	Leg	A325N	1.0000	6	14.87	34.55	0.430 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.92	8.43	0.821 ✔	1.333	Member Block Shear
T6	80	Leg	A325N	1.0000	6	22.15	34.55	0.641 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.01	7.75	0.904 ✔	1.333	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T7	60	Leg	A325N	1.0000	6	28.11	34.56	0.813 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.62	8.43	0.786 ✔	1.333	Member Block Shear
T8	40	Leg	A325N	1.0000	6	33.32	34.56	0.964 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.57	8.43	0.780 ✔	1.333	Member Block Shear
T9	20	Leg	A687	1.2500	6	37.77	60.75	0.622 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	8.13	14.95	0.544 ✔	1.333	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	136 - 130	1 1/2	6'	2'4-9/16"	76.0 K=1.00	19.800	1.7672	-5.64	34.99	0.161 ✔
T2	130 - 110	2	20'	2'4-9/16"	57.0 K=1.00	23.222	3.1416	-38.08	72.95	0.522 ✔
T3	110 - 95	2 1/4	15'	2'4-11/16"	51.0 K=1.00	24.199	3.9761	-74.43	96.22	0.774 ✔
T4	95 - 90	2 1/4	5'	1'1-5/16"	23.7 K=1.00	27.898	3.9761	-94.09	110.92	0.848 ✔
T5	90 - 80	Pirod 105244 w/ 1 1/4" Reinforcement	10'1/4"	10'1/4"	36.1 K=1.00	26.370	5.8293	-98.61	153.72	0.642 ✔
T6	80 - 60	Pirod 105217	20'3/8"	10'1/4"	37.8 K=1.00	26.132	5.3014	-145.60	138.54	1.051 ✔
T7	60 - 40	Pirod 105218	20'3/8"	10'1/4"	32.4 K=1.00	26.848	7.2158	-185.15	193.73	0.956 ✔
T8	40 - 20	Pirod 105218	20'3/8"	10'1/4"	32.4 K=1.00	26.848	7.2158	-220.03	193.73	1.136 ✔
T9	20 - 0	Pirod 105219	20'3/8"	10'1/4"	28.4 K=1.00	27.351	9.4248	-251.17	257.78	0.974 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T5	90 - 80	0.5	1'5-5/8"	119.7	10.321	0.1963	1.81	2.27	0.796 ✔
T6	80 - 60	0.5	1'5-5/8"	120.0	10.279	0.1963	1.47	2.26	0.650 ✔
T7	60 - 40	0.5	1'5-17/32"	119.0	10.423	0.1963	1.02	2.29	0.444 ✔
T8	40 - 20	0.5	1'5-17/32"	119.0	10.423	0.1963	0.89	2.29	0.387 ✔
T9	20 - 0	0.625	1'5-13/32"	94.4	13.671	0.3068	0.96	4.69	0.204 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	3/4	4'7-13/16"	2'3"	129.8 K=0.90	8.865	0.4418	-1.28	3.92	0.326 ✔
T2	130 - 110	7/8	5'23/32"	2'5-13/32"	121.0 K=0.90	10.197	0.6013	-3.33	6.13	0.544 ✔
T3	110 - 95	1	5'4-13/16"	2'7-5/16"	112.9 K=0.90	11.718	0.7854	-4.97	9.20	0.540 ✔
T4	95 - 90	1	5'5-5/32"	2'7-9/16"	113.5 K=0.90	11.602	0.7854	-6.15	9.11	0.675 ✔
T5	90 - 80	L3x3x3/16	9'10-11/16"	5'4-13/16"	108.6 K=1.00	11.691	1.0900	-7.47	12.74	0.587 ✔
T6	80 - 60	L2 1/2x2 1/2x3/16	10'9-19/32"	5'9-1/8"	139.7 K=1.00	7.655	0.9020	-7.48	6.91	1.083 ✔
T7	60 - 40	L3x3x3/16	11'11-3/4"	6'3-23/32"	127.0 K=1.00	9.262	1.0900	-7.07	10.10	0.701 ✔
T8	40 - 20	L3x3x3/16	13'4-3/16"	6'11-5/8"	140.3 K=1.00	7.587	1.0900	-7.10	8.27	0.859 ✔
T9	20 - 0	L3x3x5/16	14'8-5/32"	7'7-5/16"	155.0 K=1.00	6.212	1.7800	-8.99	11.06	0.813 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	3/4	4'	3'10-9/16"	173.6 K=0.70	4.955	0.4418	-0.08	2.19	0.035 ✔
T2	130 - 110	7/8	4'4-9/16"	4'2-17/32"	161.6 K=0.70	5.715	0.6013	-0.41	3.44	0.119 ✔
T3	110 - 95	7/8	4'9-1/8"	4'6-27/32"	175.4 K=0.70	4.853	0.6013	-0.68	2.92	0.233 ✔
T4	95 - 90	7/8	4'10-9/16"	4'8-9/32"	180.0 K=0.70	4.609	0.6013	-0.87	2.77	0.313 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	95 - 90	1 1/2	4'11-17/32"	4'9-1/4"	106.9 K=0.70	13.079	1.7672	-1.63	23.11	0.071 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	7/8	4'	3'10-9/16"	148.8 K=0.70	6.744	0.6013	-0.58	4.06	0.142 ✔
T2	130 - 110	1	4'1/4"	3'10-3/16"	129.5 K=0.70	8.909	0.7854	-0.60	7.00	0.085 ✔
T3	110 - 95	1	4'6-1/4"	4'3-31/32"	145.5 K=0.70	7.058	0.7854	-1.01	5.54	0.182 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	7/8	4'	3'10-9/16"	148.8 K=0.70	6.744	0.6013	-0.44	4.06	0.107 ✔
T2	130 - 110	1	4'5-7/8"	4'3-31/32"	145.4 K=0.70	7.061	0.7854	-1.50	5.55	0.271 ✔
T4	95 - 90	1	4'11-7/8"	4'9-19/32"	161.2 K=0.70	5.746	0.7854	-1.78	4.51	0.395 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	1 1/2	6'	2'4-9/16"	76.0	32.500	0.7732	3.65	25.13	0.145 ✔
T2	130 - 110	2	20'	2'4-9/16"	57.0	32.500	1.5625	32.83	50.78	0.646 ✔
T3	110 - 95	2 1/4	15'	2'4-11/16"	51.0	30.000	3.9761	66.33	119.28	0.556 ✔
T4	95 - 90	2 1/4	5'	1'1-5/16"	23.7	30.000	3.9761	84.88	119.28	0.712 ✔
T5	90 - 80	Pirod 105244 w/ 1 1/4" Reinforcement	10'1/4"	10'1/4"	36.1	30.000	5.8293	89.19	174.88	0.510 ✔
T6	80 - 60	Pirod 105217	20'3/8"	10'1/4"	37.8	30.000	5.3014	132.92	159.04	0.836 ✔
T7	60 - 40	Pirod 105218	20'3/8"	10'1/4"	32.4	30.000	7.2158	168.67	216.47	0.779 ✔
T8	40 - 20	Pirod 105218	20'3/8"	10'1/4"	32.4	30.000	7.2158	199.92	216.47	0.924 ✔
T9	20 - 0	Pirod 105219	20'3/8"	10'1/4"	28.4	30.000	9.4248	226.60	282.74	0.801 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T5	90 - 80	0.5	1'5-5/8"	119.7	10.321	0.1963	1.81	2.27	0.796 ✓
T6	80 - 60	0.5	1'5-5/8"	120.0	10.279	0.1963	1.47	2.26	0.650 ✓
T7	60 - 40	0.5	1'5-17/32"	119.0	10.423	0.1963	1.02	2.29	0.444 ✓
T8	40 - 20	0.5	1'5-17/32"	119.0	10.423	0.1963	0.89	2.29	0.387 ✓
T9	20 - 0	0.625	1'5-13/32"	94.4	13.671	0.3068	0.96	4.69	0.204 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	3/4	4'7-13/16"	2'3"	144.2	30.000	0.4418	1.24	13.25	0.094 ✓
T2	130 - 110	7/8	5'23/32"	2'5-13/32"	134.5	30.000	0.6013	3.33	18.04	0.184 ✓
T3	110 - 95	1	5'4-13/16"	2'7-5/16"	125.4	30.000	0.7854	4.87	23.56	0.207 ✓
T4	95 - 90	1	5'5-5/32"	2'7-9/16"	126.1	30.000	0.7854	6.05	23.56	0.257 ✓
T5	90 - 80	L3x3x3/16	9'10-11/16"	5'4-13/16"	69.0	29.000	0.6593	6.92	19.12	0.362 ✓
T6	80 - 60	L2 1/2x2 1/2x3/16	10'3-23/32"	5'6-19/32"	85.6	29.000	0.5183	7.01	15.03	0.466 ✓
T7	60 - 40	L3x3x3/16	11'4-5/16"	6'1/4"	76.9	29.000	0.6593	6.62	19.12	0.346 ✓
T8	40 - 20	L3x3x3/16	12'7-13/16"	6'7-7/16"	84.7	29.000	0.6593	6.57	19.12	0.344 ✓
T9	20 - 0	L3x3x5/16	14'8-5/32"	7'7-5/16"	99.0	29.000	1.0127	8.13	29.37	0.277 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	3/4	4'	3'10-9/16"	248.0	30.000	0.4418	0.19	13.25	0.015 ✓
T2	130 - 110	7/8	4'4-9/16"	4'2-17/32"	230.9	30.000	0.6013	0.56	18.04	0.031 ✓
T3	110 - 95	7/8	4'9-1/8"	4'6-27/32"	250.6	30.000	0.6013	0.85	18.04	0.047 ✓
T4	95 - 90	7/8	4'10-9/16"	4'8-9/32"	257.1	30.000	0.6013	1.03	18.04	0.057 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	95 - 90	1 1/2	4'11-17/32"	4'9-1/4"	152.6	30.000	1.7672	1.63	53.01	0.031 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	7/8	4'	3'10-9/16"	212.6	30.000	0.6013	0.56	18.04	0.031 ✔
T2	130 - 110	1	4'1/4"	3'10-3/16"	184.9	30.000	0.7854	0.61	23.56	0.026 ✔
T3	110 - 95	1	4'6-1/4"	4'3-31/32"	207.8	30.000	0.7854	1.07	23.56	0.046 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 130	7/8	4'	3'10-9/16"	212.6	30.000	0.6013	0.48	18.04	0.026 ✔
T2	130 - 110	1	4'5-7/8"	4'3-31/32"	207.8	30.000	0.7854	1.52	23.56	0.064 ✔
T4	95 - 90	1	4'11-7/8"	4'9-19/32"	230.3	30.000	0.7854	1.72	23.56	0.073 ✔

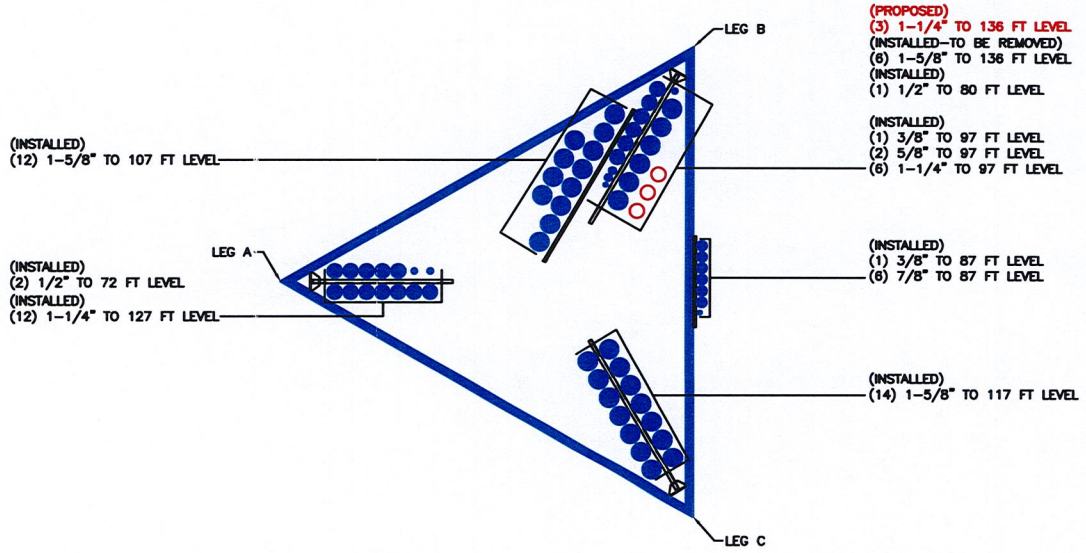
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	136 - 130	Leg	1 1/2	2	-5.64	46.64	12.1	Pass
T2	130 - 110	Leg	2	23	32.83	67.69	48.5	Pass
T3	110 - 95	Leg	2 1/4	87	-74.43	128.26	58.0	Pass
T4	95 - 90	Leg	2 1/4	134	-94.09	147.86	63.6	Pass
T5	90 - 80	Leg	Pirod 105244 w/ 1 1/4" Reinforcement	165	-98.61	204.90	59.7	Pass
T6	80 - 60	Leg	Pirod 105217	174	-145.60	184.67	78.8	Pass
T7	60 - 40	Leg	Pirod 105218	189	-185.15	258.24	71.7	Pass
T8	40 - 20	Leg	Pirod 105218	204	-220.03	258.24	85.2	Pass
T9	20 - 0	Leg	Pirod 105219	219	-251.17	343.62	73.1	Pass
T1	136 - 130	Diagonal	3/4	17	-1.28	5.22	24.4	Pass
T2	130 - 110	Diagonal	7/8	35	-3.33	8.17	40.8	Pass
T3	110 - 95	Diagonal	1	94	-4.97	12.27	40.5	Pass
T4	95 - 90	Diagonal	1	144	-6.15	12.15	50.7	Pass
T5	90 - 80	Diagonal	L3x3x3/16	168	-7.47	16.99	44.0 61.6 (b)	Pass
T6	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	176	-7.48	9.20	81.3	Pass
T7	60 - 40	Diagonal	L3x3x3/16	191	-7.07	13.46	52.6 58.9 (b)	Pass
T8	40 - 20	Diagonal	L3x3x3/16	206	-7.10	11.02	64.4	Pass
T9	20 - 0	Diagonal	L3x3x5/16	221	-8.99	14.74	61.0	Pass
T1	136 - 130	Horizontal	3/4	16	-0.08	2.92	2.6	Pass
T2	130 - 110	Horizontal	7/8	45	-0.41	4.58	8.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T3	110 - 95	Horizontal	7/8	106	-0.68	3.89	17.5	Pass
T4	95 - 90	Horizontal	7/8	137	-0.87	3.69	23.5	Pass
T4	95 - 90	Secondary Horizontal	1 1/2	152	-1.63	30.81	5.3	Pass
T1	136 - 130	Top Girt	7/8	5	-0.58	5.41	10.6	Pass
T2	130 - 110	Top Girt	1	28	-0.60	9.33	6.4	Pass
T3	110 - 95	Top Girt	1	92	-1.01	7.39	13.6	Pass
T1	136 - 130	Bottom Girt	7/8	7	-0.44	5.41	8.1	Pass
T2	130 - 110	Bottom Girt	1	31	-1.50	7.39	20.3	Pass
T4	95 - 90	Bottom Girt	1	140	-1.78	6.02	29.6	Pass
							Summary	
						Leg (T8)	85.2	Pass
						Diagonal (T6)	81.3	Pass
						Horizontal (T4)	23.5	Pass
						Secondary Horizontal (T4)	5.3	Pass
						Top Girt (T3)	13.6	Pass
						Bottom Girt (T4)	29.6	Pass
						Bolt Checks	72.3	Pass
						RATING =	**85.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



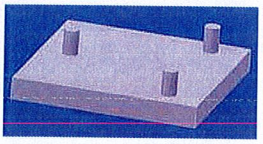
BUSINESS UNIT: 876338 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Unit Base Foundation

Checks capacity of square mat foundation with raised piers for a self-supporting tower



CROWN CASTLE

BU#: 876338
Site Name: WATERFORD
App Number: 165450, Rev. 2
TIA-222 Revision: F

Design Reactions		
Shear, **S**:	39.00	kips
Moment, **M**:	3034.00	ft-kips
Compression/leg, **Ca**:	262.00	kips
Uplift/leg, **Ua**:	235.00	kips
Tower Weight, **Wt**:	35.00	kips
Tower Height, **H**:	136	ft
Base Face Width, **w'**:	14	ft

Pad Properties		
Depth, **D**:	6.0	ft
Pad Width, **W**:	23.0	ft
Pad Thickness, **T**:	3.3	ft
Ext. Above Grade, **E**:	0.5	ft
Neglected Depth, **N**:	2.0	ft
Pad Rebar Size, **Sp**:	9	
Pad Rebar Quantity, **mp**:	46	

Pier Properties		
Pier Shape:	Circular	
Pier Width, di:	3.0	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	15	
Pier Tie Size, **St**:	4	
Tie Quantity, **mt**:	7	

Material Properties		
Rebar Tensile, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, δc:	150	pcf
Clear Cover, **cc**:	3	in

Soil Properties		
Soil Unit Weight, γ:	120	pcf
Ultimate Bearing: **Bc**:	8.000	ksf
Cohesion, **Co**:	0.000	ksf
Friction Angle, φ:	36	degrees
Base Sliding, μ:	0.3	

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Base Sliding (kips):	134.57	39.00	**29.0%**
Overturning (k-ft):	3119.81	3034.00	**97.2%**
Bearing (ksf):	6.00	3.89	**64.8%**
1-way Shear (kips):	777.96	15.98	**2.1%**
2-way Shear (kips):	1245.18	340.60	**27.4%**
Pier concrete stress (ksf):	1587.89	340.60	**21.4%**
Pier moment capacity (k-ft):	304.69	63.38	**20.8%**
Pad moment capacity(k-ft):	6695.87	792.67	**11.8%**

☑ Tower centroid is offset from foundation centroid