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-094-130214A** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located 123 Costello Road, Newington, 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 February 8, 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,

L Roberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Stephen Woods, Mayor, Town of Newington
Craig Minor, Town Planner, Town of Newington

EM-SPRINT-NEXTEL-094-130214A

Crown Castle
3530 Torrington Way Suite 300
Charlotte NC 28277

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

February 8, 2013

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

RE: Sprint Nextel-Exempt Modification Request- Crown Site BU 881364 Sprint Nextel Site CT23XC555 – Located at – 123 Costelo Road Newington, CT 06111

Costello

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.C.S.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 Mayor Stephen Woods for the Town of Newington.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at 123 Costelo Road Newington, CT 06111. 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 Sprint's 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 in 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. Sprint's replacement antennas 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.

ORIGINAL

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

Also attached is a Structural Report confirming that the tower and foundation can support Sprint's 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 Newington, Mayor Stephen Woods

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

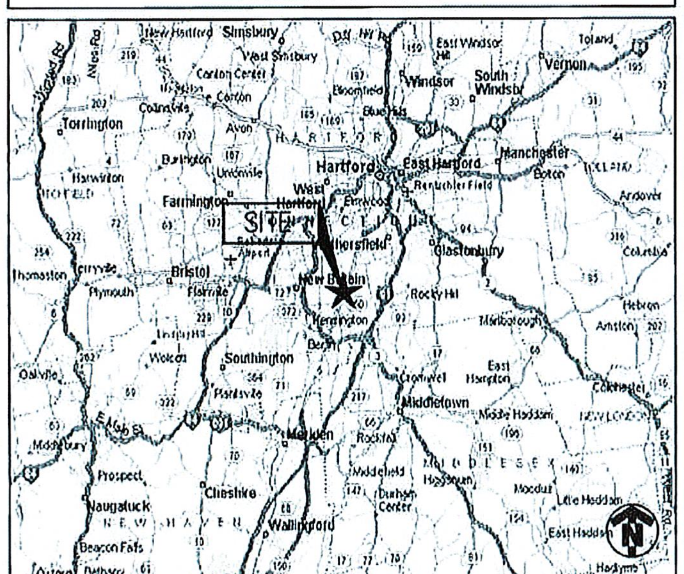
DRIVING DIRECTIONS

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 48 ON THE LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD.
10. TAKE EXIT 17 TO MERGE ONTO CT-15 N TOWARD BERLIN TURNPIKE/I-691/CT-66.
11. TURN RIGHT ONTO COSTELLO RD.
12. TAKE THE 1ST RIGHT.

DESTINATION WILL BE ON THE RIGHT.

VICINITY MAP



Sprint™

NETWORK VISION MMBTS LAUNCH
NORTHERN CONNECTICUT MARKET

SITE NAME

BERLIN / COSTELLO TOWER

SITE NUMBER

CT23XC555

SITE ADDRESS

123 COSTELLO ROAD
NEWINGTON, CT 06111

STRUCTURE TYPE

MONOPOLE

OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AND 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 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

PROJECT SUMMARY

SITE NAME:	BERLIN / COSTELLO TOWER	
SITE NO.:	CT23XC555	
SITE ADDRESS:	123 COSTELLO ROAD NEWINGTON, CT 06111	
COUNTY:	HARTFORD	
SITE COORDINATES:		
LATITUDE:	41° 39' 18.72" N	(NAD 83)
LONGITUDE:	72° 43' 17.19" W	(NAD 83)
GROUND ELEV.:	±136'	(AMSL)
JURISDICTION:	CONNECTICUT SITING COUNCIL	
ZONING CLASSIFICATION:	RESIDENTIAL	
LANDLORD:	CROWN ATLANTIC COMPANY LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317	
CONTACT:	MIKE CALLAHAN (860) 919-7278	
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495	
PROJECT MANAGER:	ALCATEL LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886	
CONTACT:	ISAM ELHALWANI (617) 851-6133	
CONSTRUCTION MANAGER:	MIKE NEGRETE (315) 439-4819	
ENGINEER:	INFINIGY 11 HERBERT DRIVE LATHAM, NY 12110	
CONTACT:	PAUL FANOS (518) 690-0790	
POWER COMPANY:	CONNECTICUT LINE AND POWER (800) 286-2000	
PHONE COMPANY:	VERIZON (800) 837-4966	
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	

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 ... No. 24706 ... LICENSED PROFESSIONAL ENGINEER

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

No	Submittal / Revision	App'd	Date
1	REVISED PER COMMENTS	KMF	1/29/13
0	ISSUED FOR REVIEW	AHS	11/05/12

Drawn: AHS Date: 11/05/12
Designed: AJD Date: 11/05/12
Checked: AGF Date: 11/05/12

Project Number
294-056

Project Title

BERLIN / COSTELLO TOWER
CT23XC555

123 COSTELO ROAD
Newington, CT 06111

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

Date:
1/29/13

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
M	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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JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	App'd	Date
1	REVISED PER COMMENTS	KMF	1/29/13
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Designed: AJD Date: 11/05/12
Checked: AGF Date: 11/05/12

Project Number
284-056

Project Title

BERLIN / COSTELLO TOWER
CT23XC555

123 COSTELO ROAD
Newington, CT 06111

Prepared For

Sprint VISION

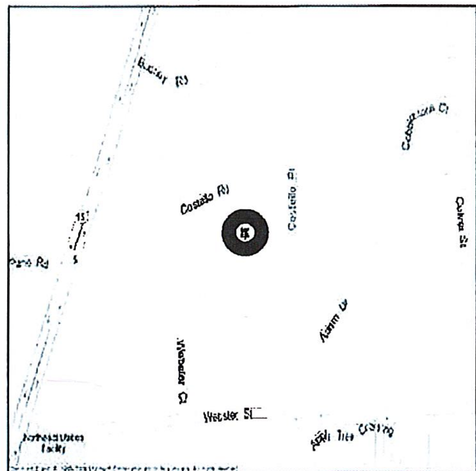
Drawing Scale: AS NOTED
Date: 1/29/13

Drawing Title

GENERAL NOTES

Drawing Number

C1

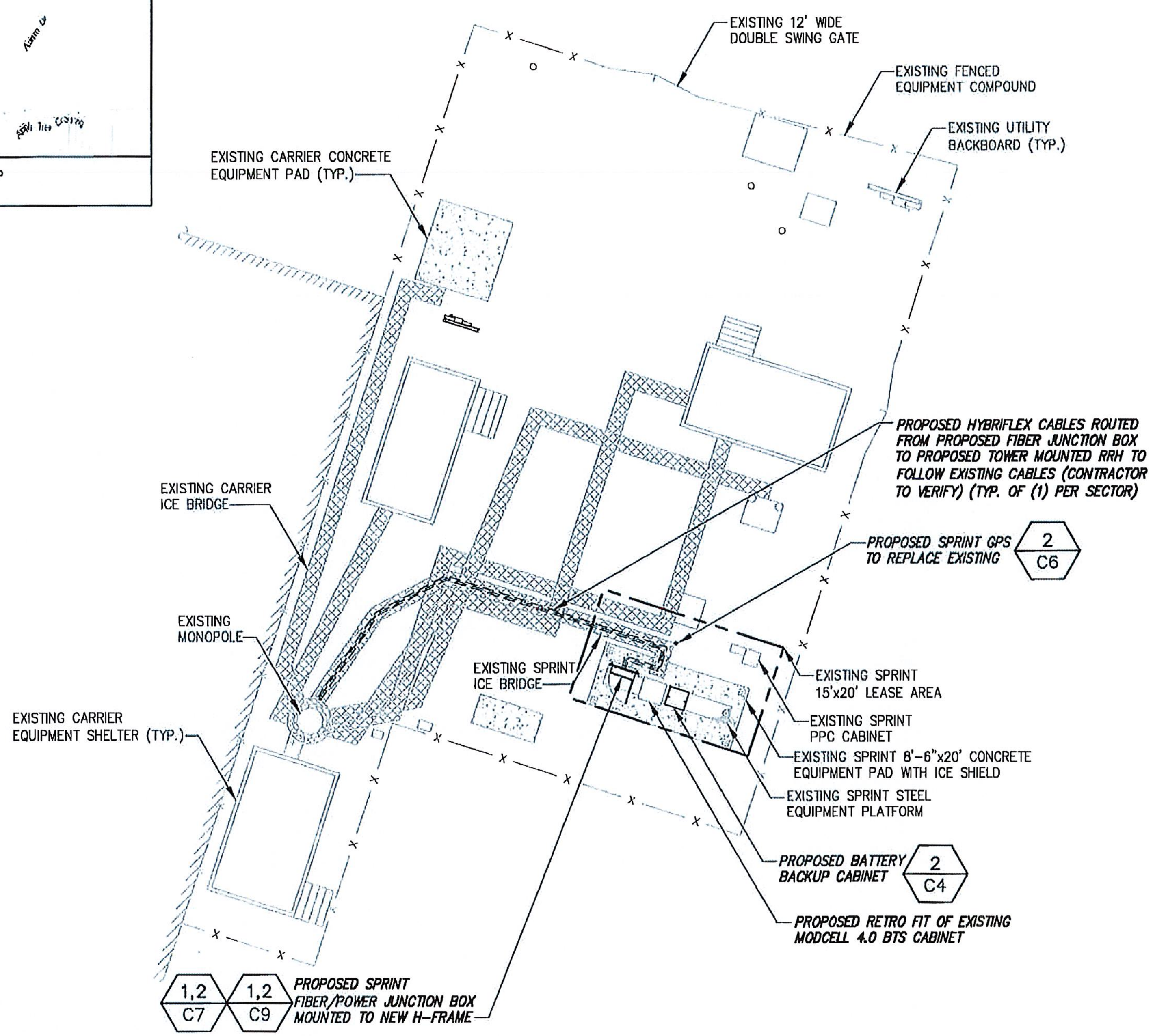


LOCATION MAP
N.T.S.

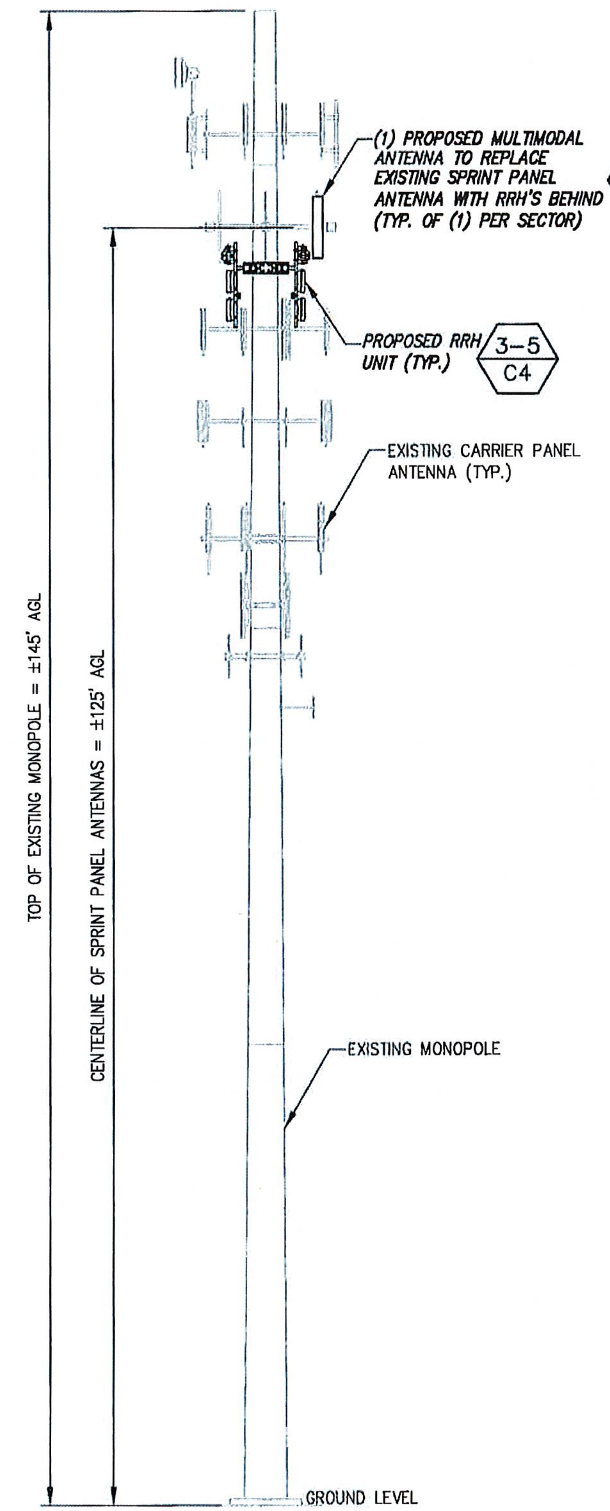
WORK AREA

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

OVERALL VERTICAL SPRINT LEASED AREA OF 8' NOT TO BE EXCEEDED



FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY CROWN CASTLE DATED: 10/19/12



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.

CALLED NORTH

1 — COMPOUND SITE PLAN
SCALE: AS NOTED

GRAPHIC SCALE
20' 10' 0 10' 20'
SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

2 — SITE ELEVATION
NOT TO SCALE

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CT23XC555

123 COSTELO ROAD
Newington, CT 06111

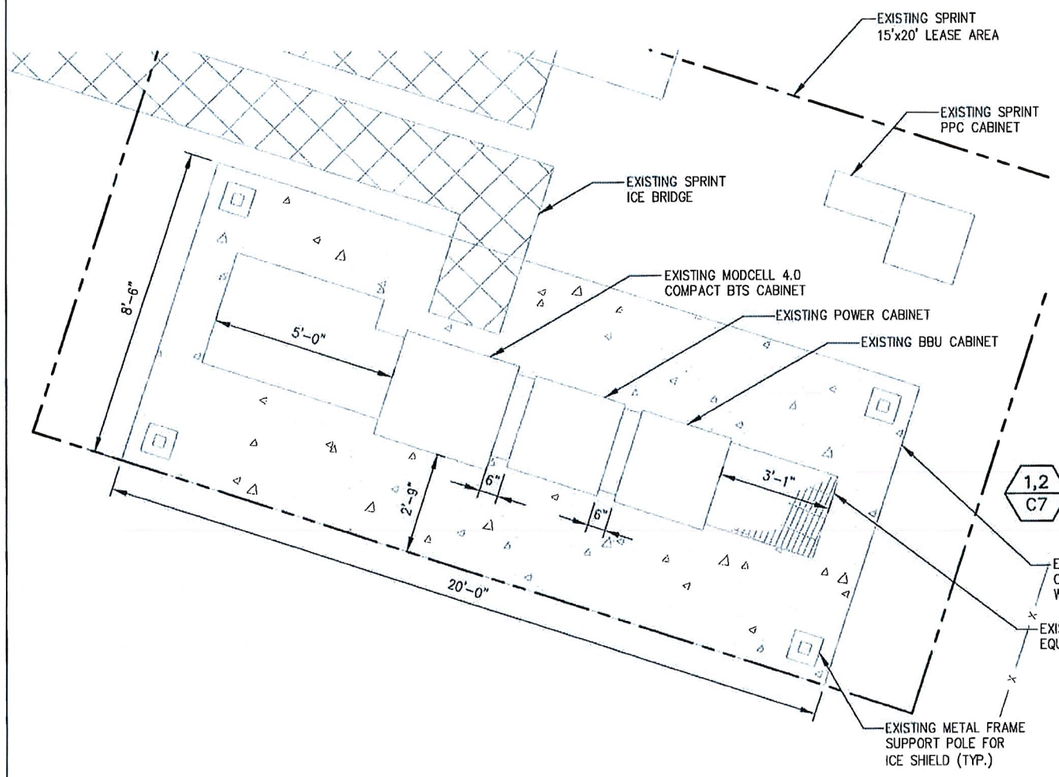
Prepared For
Sprint
VISION

Drawing Scale:
AS NOTED

Date:
1/29/13

Drawing Title
COMPOUND SITE PLAN & ELEVATION

Drawing Number
C2



CALLED NORTH

1 / C-- EQUIPMENT SITE PLAN (EXISTING)
SCALE: AS NOTED

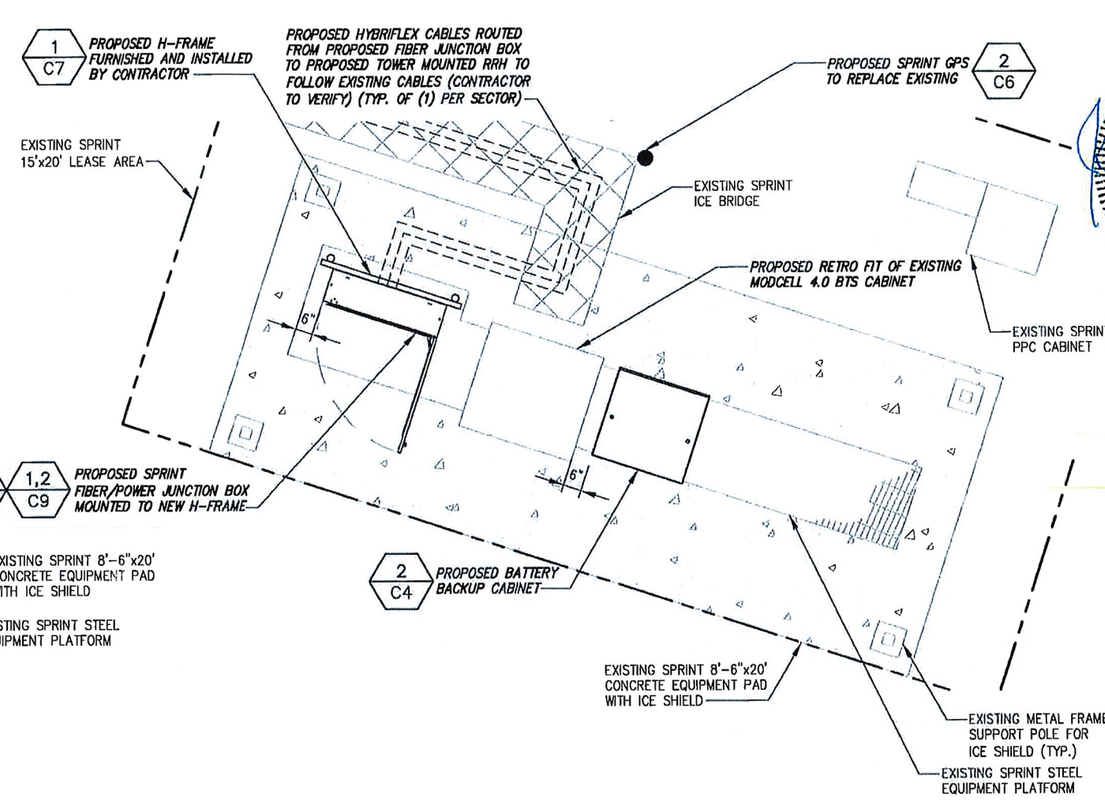
GRAPHIC SCALE

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:
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.



CALLED NORTH

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

GRAPHIC SCALE

4' 2' 0 2' 4'

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

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123 COSTELO ROAD
Newington, CT 06111

Prepared For

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Drawing Scale:
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Date:
1/29/13

Drawing Title

EQUIPMENT SITE PLANS

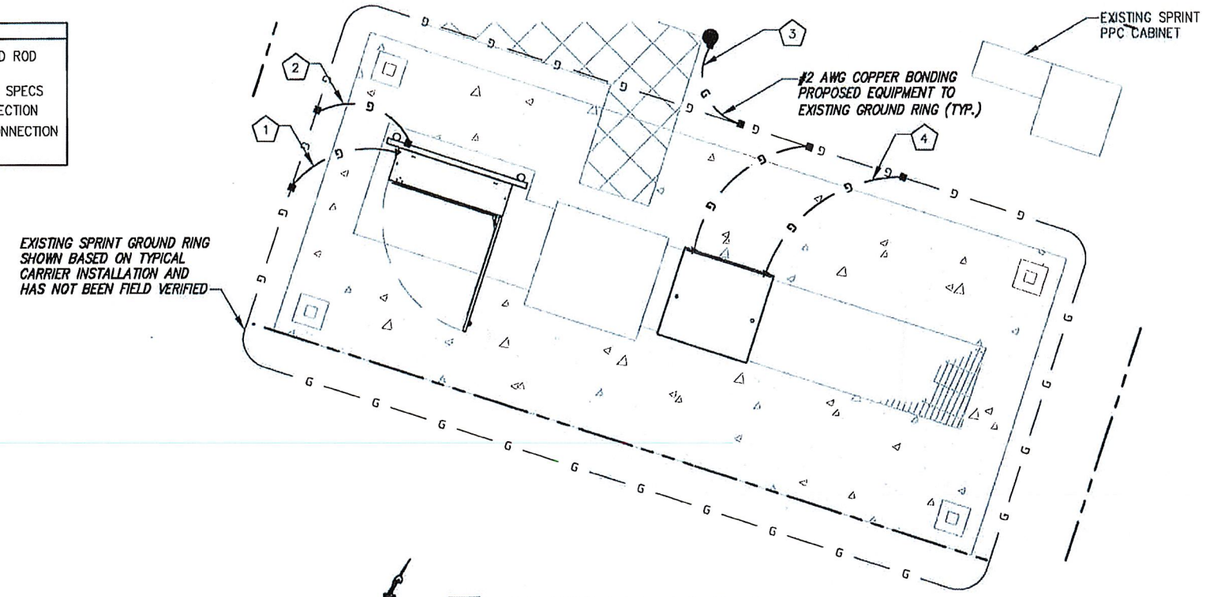
Drawing Number

C3

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 SPRINT GPS TO REPLACE EXISTING*
4. *PROPOSED BATTERY BACKUP CABINET*

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



1 — EQUIPMENT GROUNDING PLAN
SCALE: AS NOTED

GRAPHIC SCALE

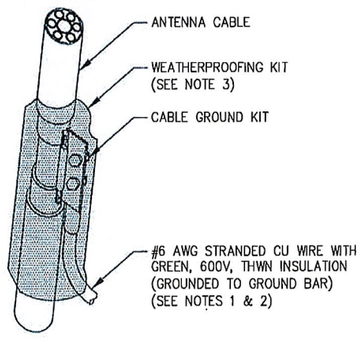
4' 2' 0 2' 4'

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

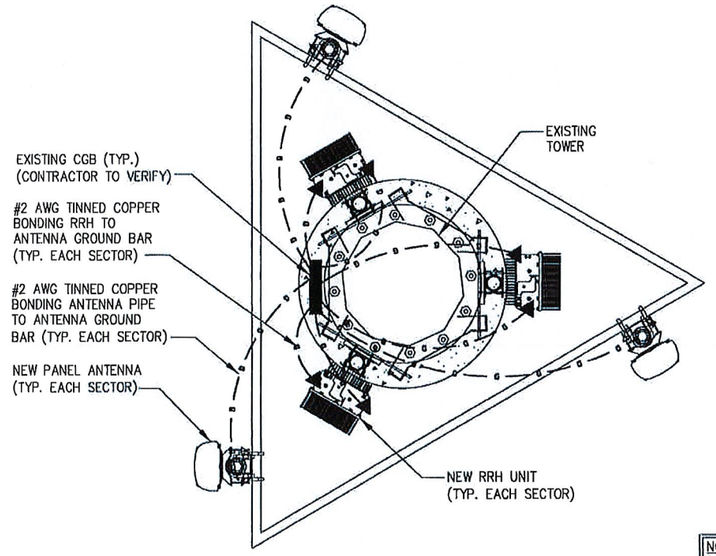
GROUNDING NOTES:

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.

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.

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

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BERLIN / COSTELLO TOWER
CT23XC555

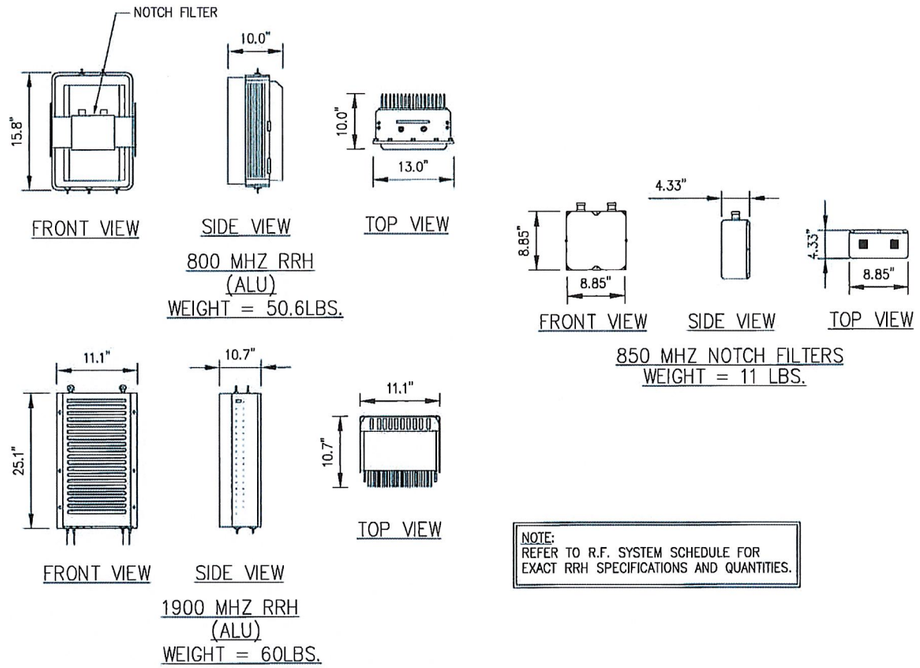
123 COSTELO ROAD
Newington, CT 06111

Prepared For: Sprint VISION

Drawing Scale: AS NOTED
Date: 1/29/13

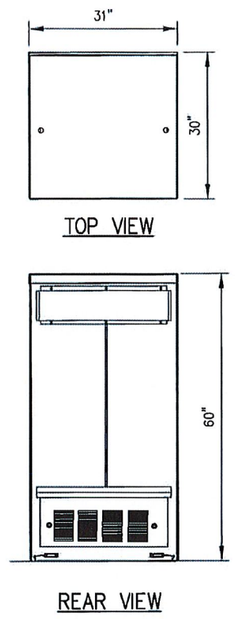
Drawing Title: **GROUNDING PLAN AND DETAILS**

Drawing Number: **E3**



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

1 RRH EQUIPMENT DETAILS
NOT TO SCALE

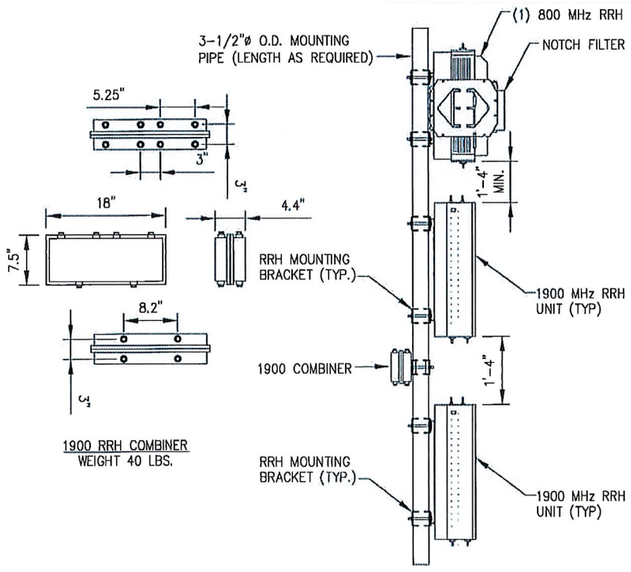


2 BATTERY CABINET PROFILE
NOT TO SCALE

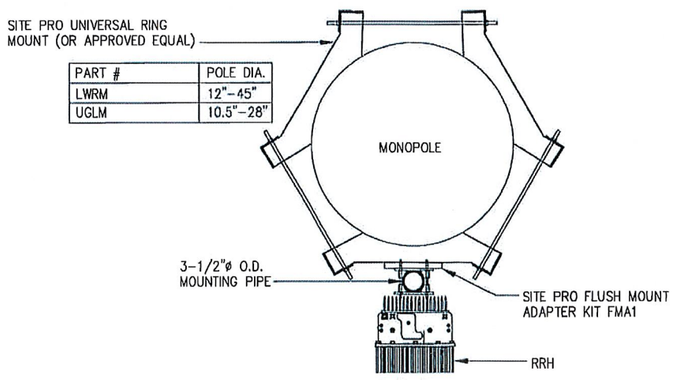
DESIGN CRITERIA:

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.
60EC 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

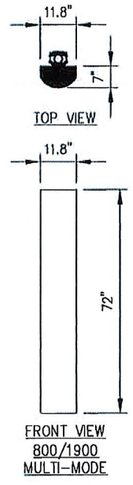
OVERALL VERTICAL SPRINT LEASED AREA OF 8' NOT TO BE EXCEEDED



3 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE

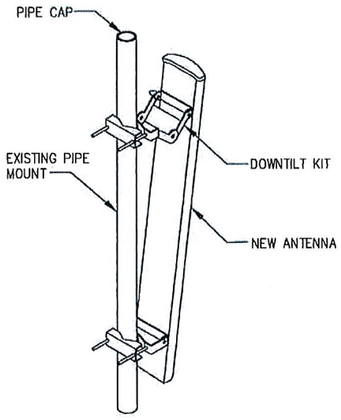


PART #	POLE DIA.
LWRM	12"-45"
UGLM	10.5"-28"



RFS ANTENNA
P/N: APXVSPP18-C-A20

4 ANTENNA DETAILS
NOT TO SCALE



5 PANEL ANTENNA MOUNT DETAIL
NOT TO SCALE

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JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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123 COSTELO ROAD
Newington, CT 06111

Prepared For

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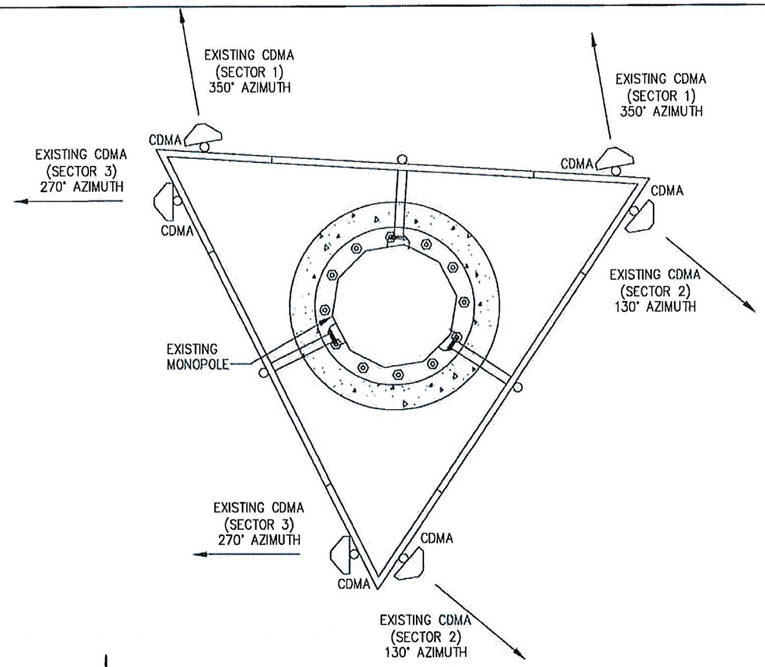
Drawing Title

EQUIPMENT DETAILS

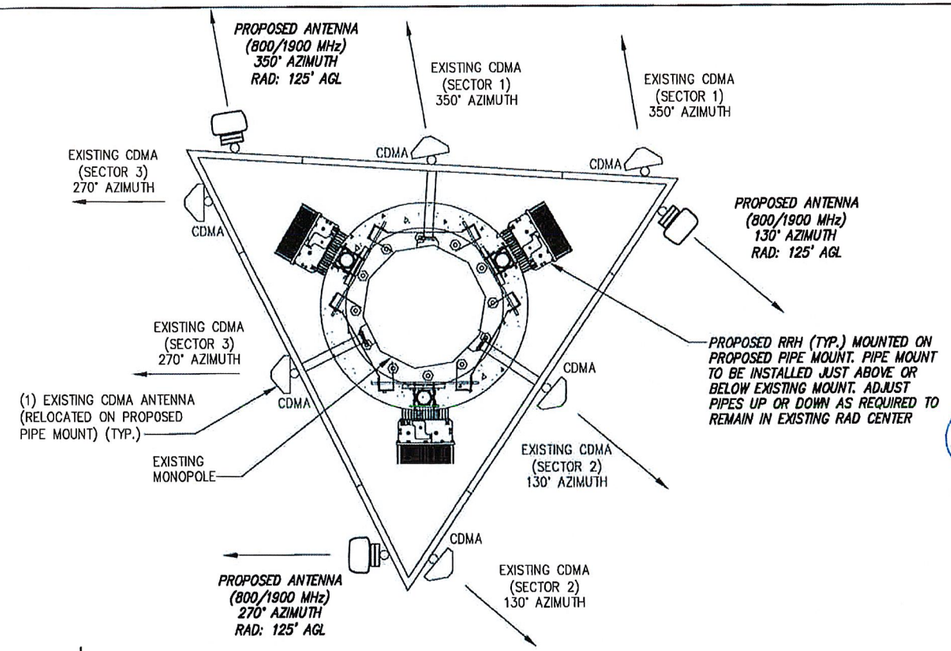
Drawing Number

C4



1 ANTENNA CONFIGURATION (EXISTING)
NOT TO SCALE

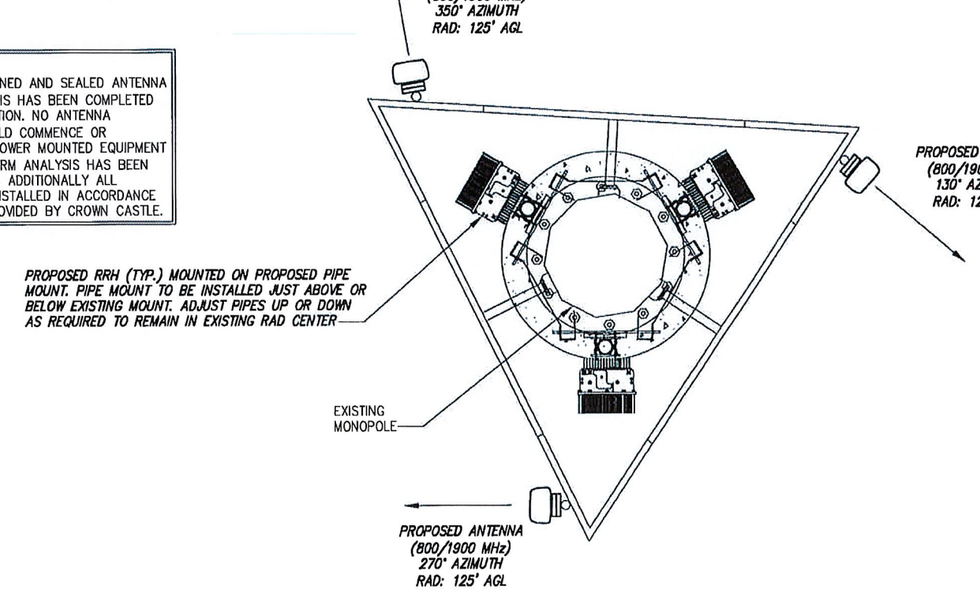
CALLED NORTH



2 ANTENNA CONFIGURATION (INTERIM/TEMPORARY)
NOT TO SCALE

CALLED NORTH

NOTE:
CONTRACTOR TO VERIFY A PASSING SIGNED AND SEALED ANTENNA MOUNT/PLATFORM STRUCTURAL 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 THE SPECIFIC LOADING. ADDITIONALLY ALL MOUNTS, ANTENNA AND COAX TO BE INSTALLED IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.



3 ANTENNA CONFIGURATION (FINAL/PERMANENT)
NOT TO SCALE

CALLED NORTH

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY CROWN CASTLE DATED: 10/19/12

STRUCTURAL ANALYSIS NOT COMPLETED AT TIME OF ISSUANCE OF THESE DRAWINGS. THE STRUCTURAL ANALYSIS MUST BE COMPLETED PRIOR TO CONSTRUCTION.

RRH NOTES:

- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).
- REFER TO RF SCHEDULE ON SHEET C7 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 & C7 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.

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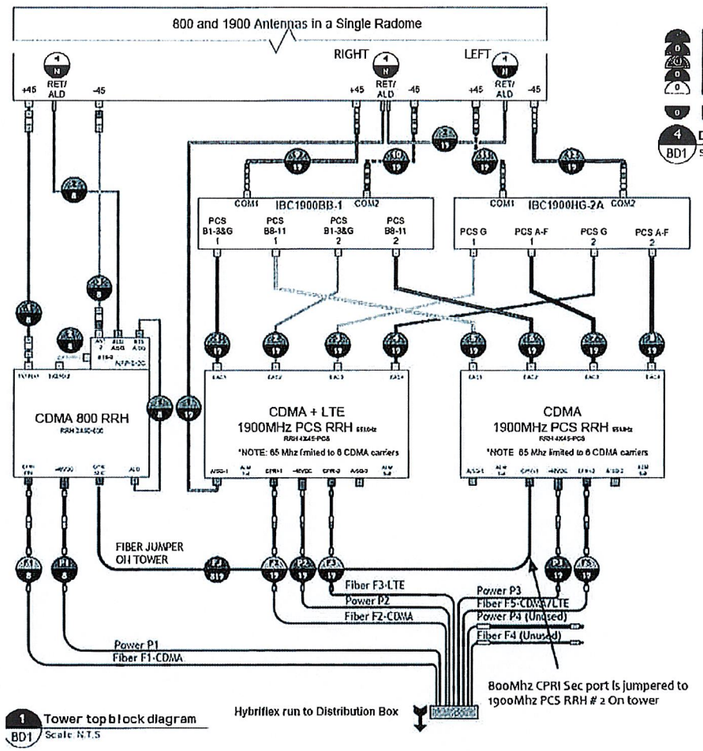
ANTENNA PLANS

Drawing Number

C5



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

4 BD1 Diagram Legend
Scale: N.T.S

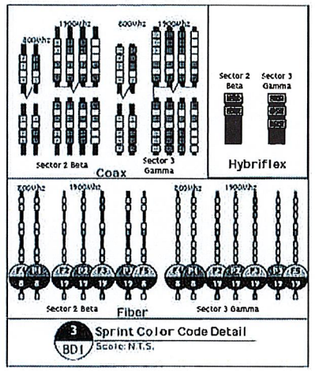
Power Feed Polarity Definition:
IF wires are BLACK AND BLACK/ WHITE STRIPE:
- Black= -48VDC Feed (Battery)
- Black/White Stripe= Return

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



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

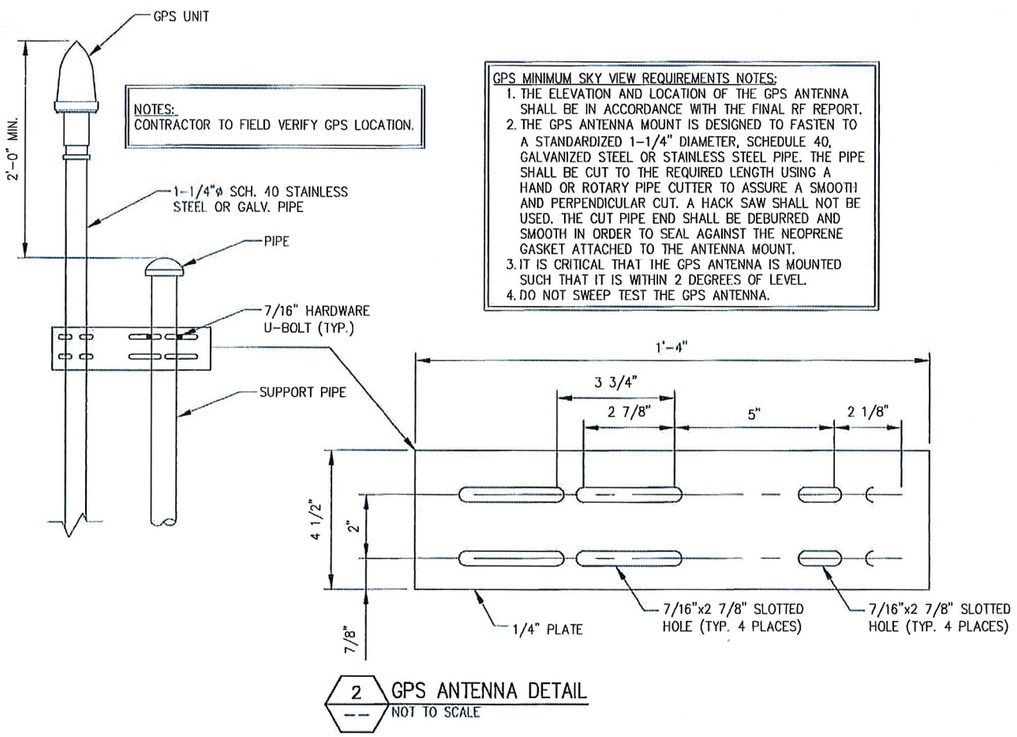
SCENARIO 128 v2.0

1 -- ANTENNA CABLE RISER DIAGRAM
NOT TO SCALE

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

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.



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

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

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Drawn: AHS Date: 11/05/12
Designed: AJD Date: 11/05/12
Checked: AGF Date: 11/05/12

Project Number
294-056

Project Title
BERLIN / COSTELLO TOWER
CT23XC555

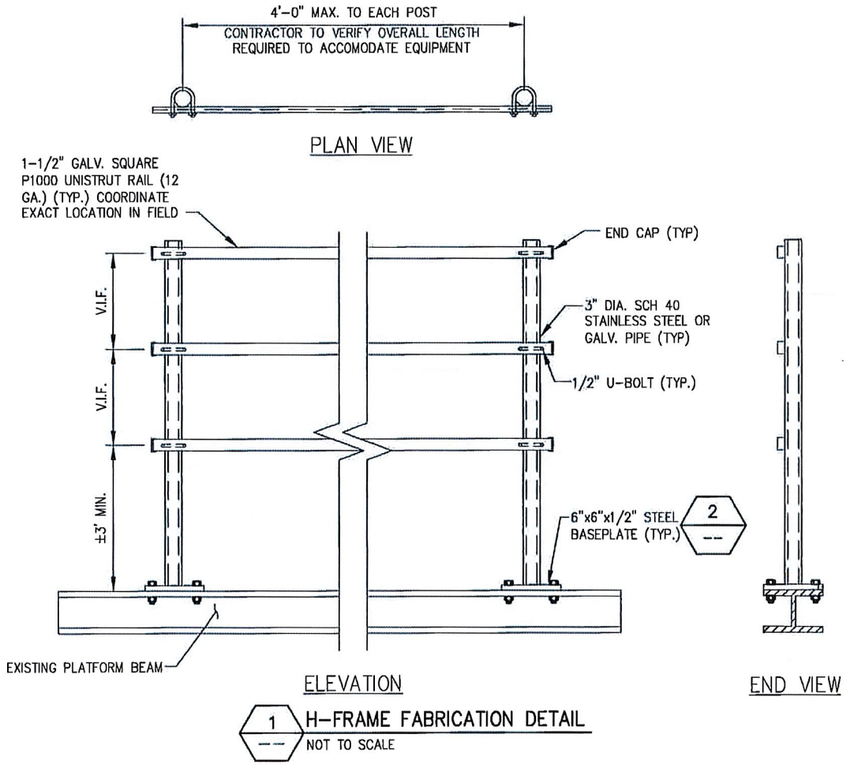
123 COSTELO ROAD
Newington, CT 06111

Prepared For
Sprint VISION

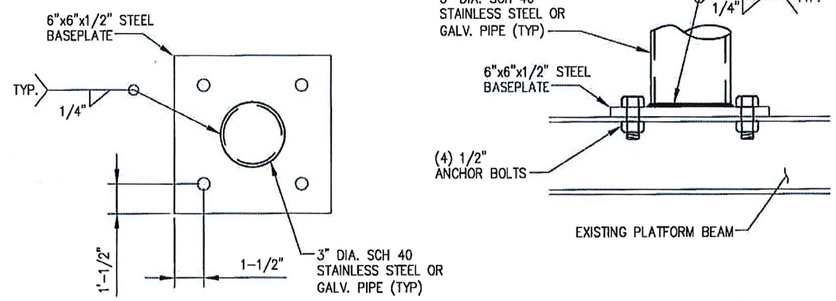
Drawing Scale: AS NOTED
Date: 1/29/13

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

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

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CT23XC555

123 COSTELO ROAD
Newington, CT 06111

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Sprint VISION

Drawing Scale:
AS NOTED

Date:
1/29/13

Drawing Title
EQUIPMENT DETAILS

Drawing Number
C7

		Market	Northern Connecticut		
		Cascade ID	CT23XC555		
			SECTOR 1	SECTOR 2	SECTOR 3
	Split sector present		No	No	No
1900	1900MHz_Azimuth		350	130	270
	1900MHz_No_of_Antennas		1	1	1
	1900MHz_RADCenter(ft)		125	125	125
	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		-1	0	-1
	1900MHz _M_Tilt		0	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
800	800MHz_Azimuth		350	130	270
	800MHz_No_of_Antennas		0	0	0
	800MHz_RADCenter(ft)		125	125	125
	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		-8	-8	-3
	800MHz_M_Tilt		0	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
Comments	* If plumbing scenario does not match the material received, please contact your Construction Manager				
	11/9/2012				

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

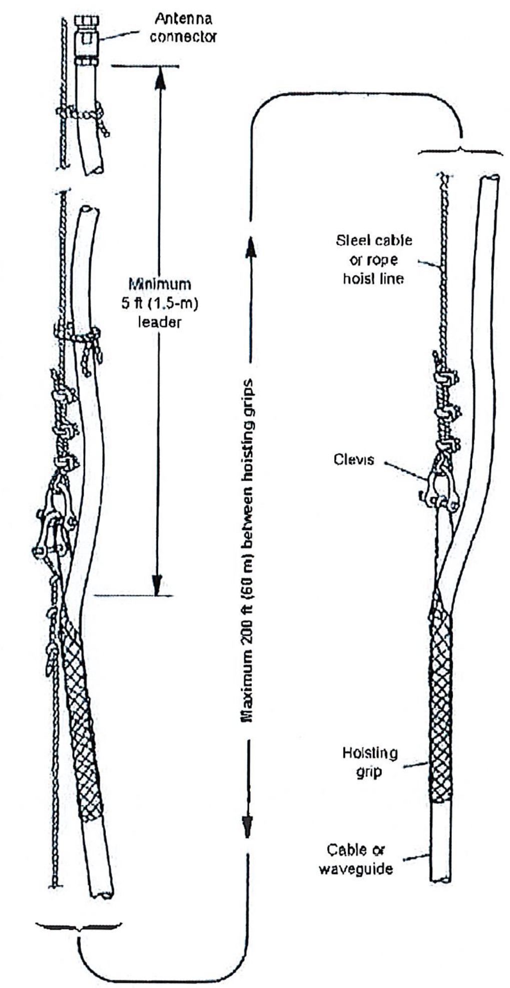
NOTE:
COORDINATE RF ANTENNA INSTALLATION WITH FINAL SPRINT RFDS. COORDINATE RF MW DISH (IF APPLICABLE) INSTALLATION WITH FINAL SPRINT RFDS.

1 SPRINT RFDS
NOT TO SCALE

CHECK FST FOR LATEST VERSION OF RFDS

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. 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

INFINIGY Design. Build. Deliver.
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Latham, NY 12110
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Fax # (518) 690-0793

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

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294-056

Project Title
BERLIN / COSTELLO TOWER
CT23XC555

123 COSTELO ROAD
Newington, CT 06111

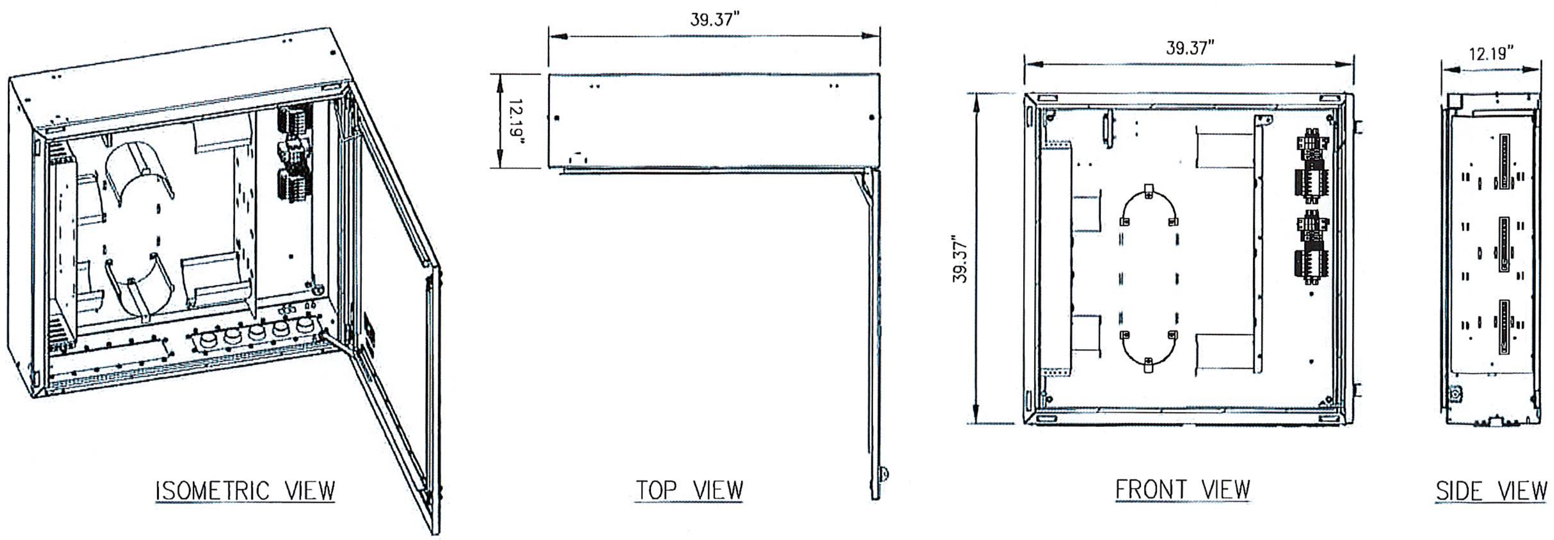
Prepared For
Sprint VISION

Drawing Scale:
AS NOTED

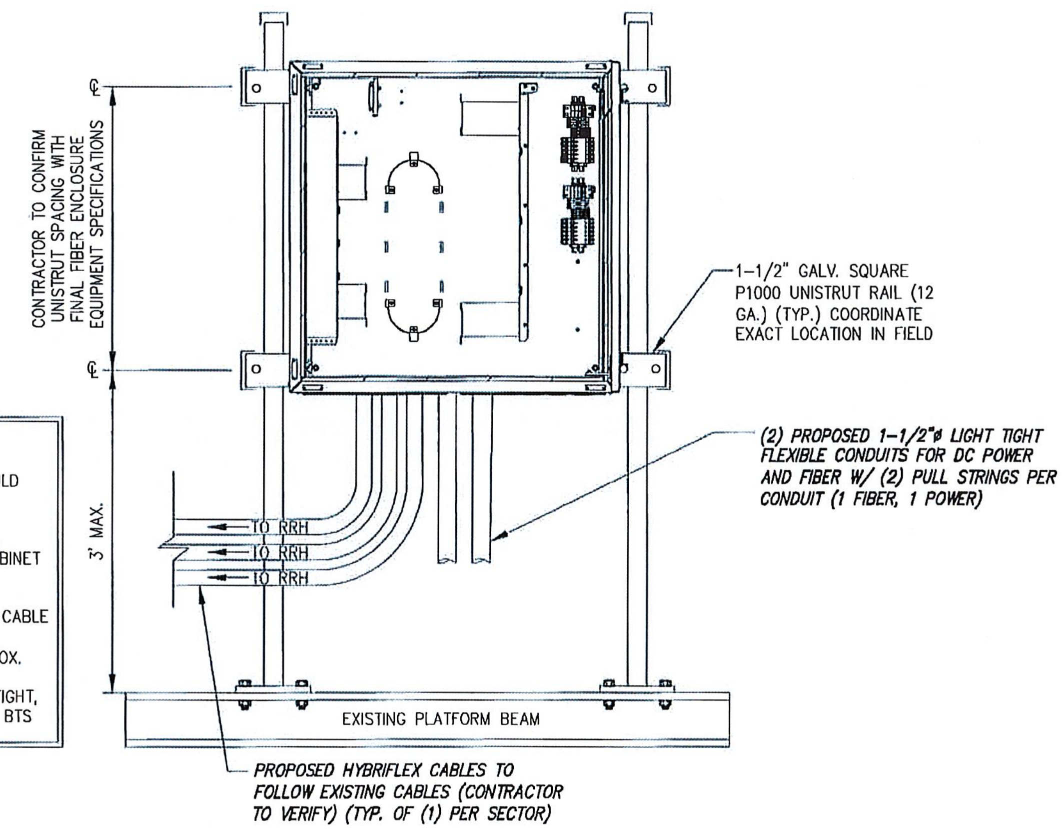
Date:
1/29/13

Drawing Title
RF AND CABLE DETAILS

Drawing Number
C8



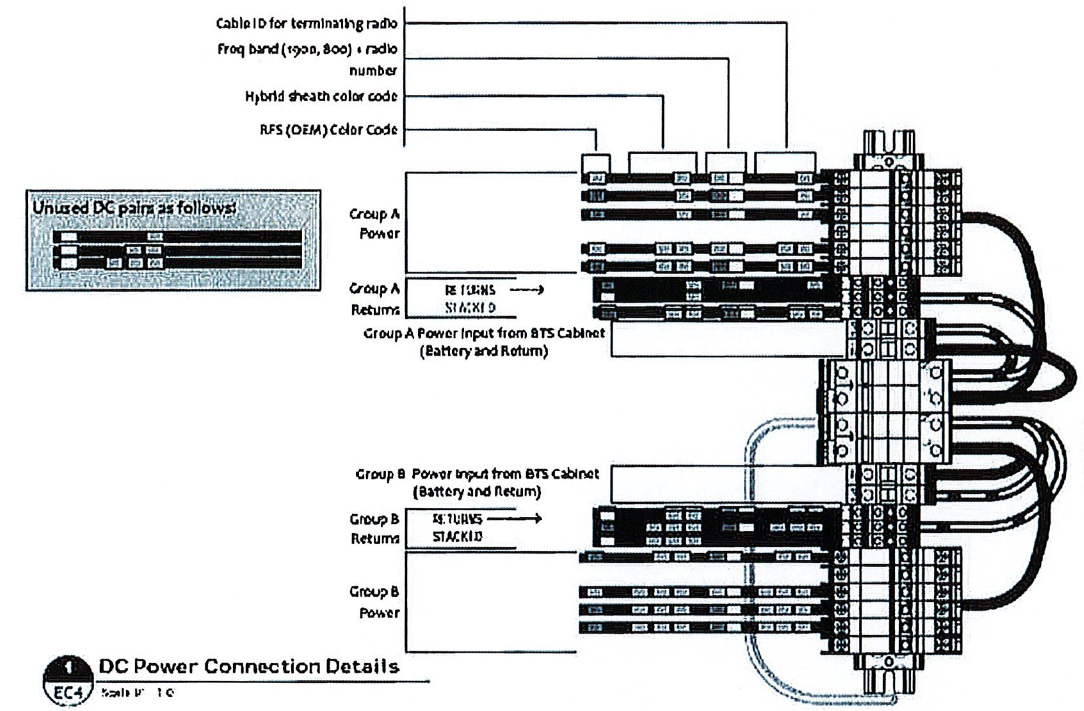
1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



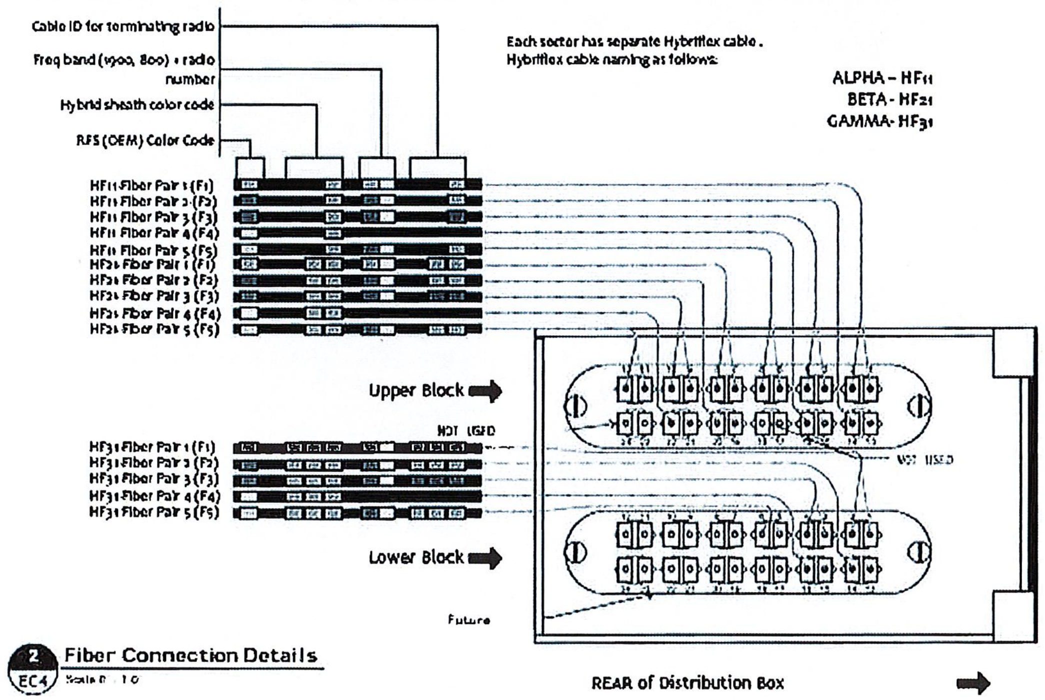
NOTE:
- DISTRIBUTION BOX IS KITTED WITH 50' OF 1-1/2" LIQUID-TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
  - SPLIT IN HALF,
  - TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
  - RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.
- DISTRIBUTION BOX IS KITTED WITH 2 AWG, 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



1 DC Power Connection Details
EC4



2 Fiber Connection Details
EC4

SCENARIO 128 v2.0

3 FIBER & DC CONNECTION DETAILS
NOT TO SCALE

INFINIGY Design. Build. Deliver.
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Latham, NY 12110
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Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
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BERLIN / COSTELLO TOWER
CT23XC555
123 COSTELLO ROAD
Newington, CT 06111

Prepared For: Sprint VISION

Drawing Scale: AS NOTED
Date: 1/29/13

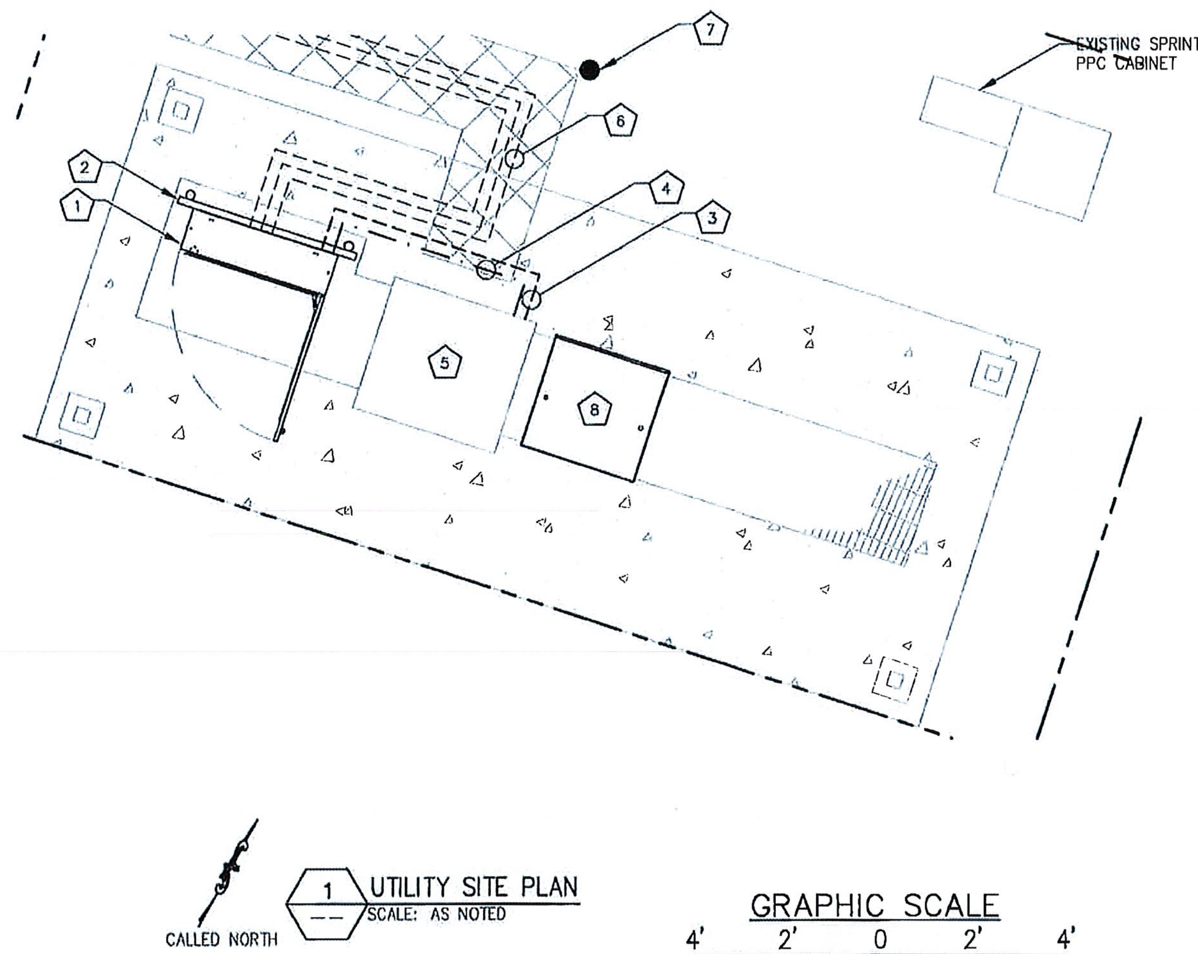
Drawing Title: FIBER DISTRIBUTION BOX DETAILS

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, 7'
4. PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 6'
5. PROPOSED RETRO FIT OF EXISTING MODCELL 4.0 BTS CABINET
6. 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)
7. PROPOSED SPRINT GPS TO REPLACE EXISTING
8. PROPOSED BATTERY BACKUP CABINET

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



1 UTILITY SITE PLAN
SCALE: AS NOTED

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

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).

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 SPRINT 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. PROTECT 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.

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

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CT23XC555
123 COSTELO ROAD
Newington, CT 06111

Prepared For
Sprint VISION

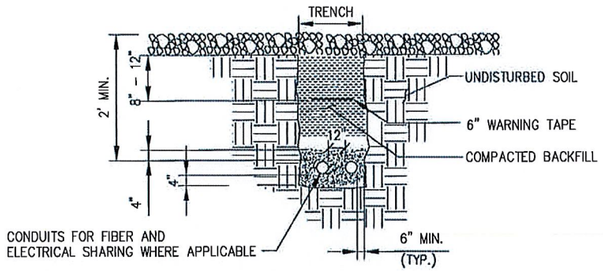
Drawing Scale:
AS NOTED

Date:
1/29/13

Drawing Title
UTILITY SITE PLAN

Drawing Number
E1

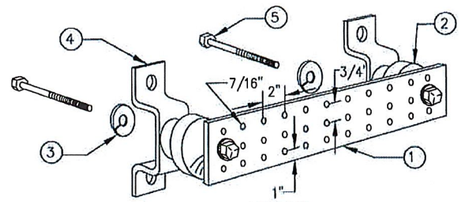
GROUNDING NOTES:
IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC. CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT.



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

*HAND DIG INSIDE COMPOUND

1 UTILITY TRENCH DETAIL
NOT TO SCALE

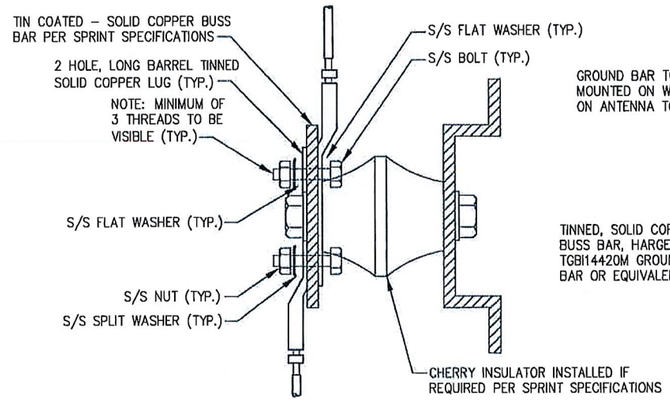


LEGEND

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.

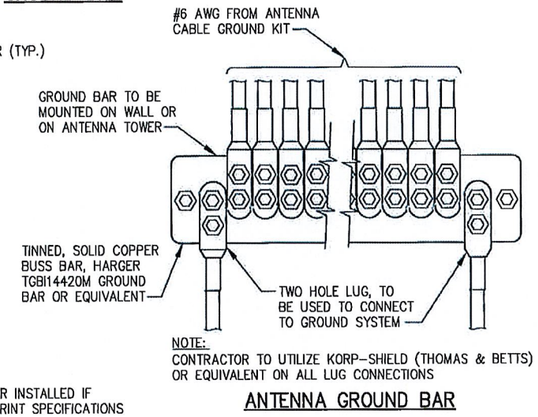
NOTE:
1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
2) ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGBI14420M.

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	App'd	Date
1	REVISED PER COMMENTS	KMF	1/29/13
0	ISSUED FOR REVIEW	AHS	11/05/12

Drawn: AHS Date: 11/05/12
Designed: AJD Date: 11/05/12
Checked: AGF Date: 11/05/12

Project Number
294-056

Project Title

BERLIN / COSTELLO TOWER
CT23XC555

123 COSTELO ROAD
Newington, CT 06111

Prepared For

Sprint VISION

Drawing Scale: AS NOTED
Date: 1/29/13

Drawing Title

DETAILS

Drawing Number

E2

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: CT23XC555

Berlin / Costello Tower
123 Costello Road
Newington, CT 06111

January 2, 2013

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

EBI Consulting
environmental | engineering | due diligence

January 2, 2013

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

Re: Emissions Values for Site: **CT23XC555 – Berlin / Costello Tower**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 123 Costello Road, Newington, 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.

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 123 Costello Road, Newington, 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 **124 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	CT23XC555 - Berlin / Costello Tower
Site Addresss	123 Costello Road, Newington, CT, 06111
Site Type	Monopole

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	124	118	1/2 "	0.5	0	3467.3685	89.52451	8.95245%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	124	118	1/2 "	0.5	0	389.96892	10.06867	1.77578%
														Sector total Power Density Value:		10.728%	

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	124	118	1/2 "	0.5	0	3467.3685	89.52451	8.95245%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	124	118	1/2 "	0.5	0	389.96892	10.06867	1.77578%
														Sector total Power Density Value:		10.728%	

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	124	118	1/2 "	0.5	0	3467.3685	89.52451	8.95245%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	124	118	1/2 "	0.5	0	389.96892	10.06867	1.77578%
														Sector total Power Density Value:		10.728%	

Site Composite MPE %

Carrier	MPE %
Sprint	32.185%
Verizon Wireless	22.400%
Metro PCS	8.990%
Clearwire	1.050%
Nextel	3.130%
AT&T	30.790%
T-Mobile	0.380%
Total Site MPE %	**98.925%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **32.185% (10.728%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 **98.925%** 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 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 19, 2012**

Marianne Dunst
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416 2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT23XC555
	Carrier Site Name:	CT23XC555
Crown Castle Designation:	**Crown Castle BU Number:**	881364
	Crown Castle Site Name:	Newington
	Crown Castle JDE Job Number:	190498
	Crown Castle Work Order Number:	540910
	Crown Castle Application Number:	165639 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	540910
Site Data:	**123 Costelo Road, Newington, Hartford County, CT** **Latitude *41° 39' 18.72"*, Longitude *-72° 43' 17.19"*** **145 Foot - Monopole Tower**	

Dear Marianne Dunst,

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 540910, in accordance with application 165639, revision 1.

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

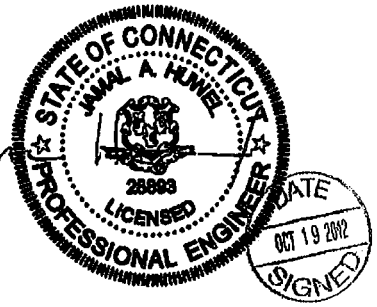
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 80 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: Drew Stephens / RJ
Respectfully submitted by:



Jamal A. Huwel, P.E.
Manager Engineering

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 145 ft Monopole tower designed by SUMMIT in August of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
124.0	124.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	-
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
122.0	122.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		6	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
133.0	139.0	2	andrew	VHLP2.5-11	3 6 9	1/2 5/16 1-1/4	1
		2	dragonwave	HORIZON COMPACT			
		3	kathrein	840 10054 w/ Mount Pipe			
	135.0	1	motorola	TIMING 2000			
		3	samsung telecommunications	WIMAX DAP HEAD			
	134.0	9	decibel	DB844H90E-XY w/ Mount Pipe			
	133.0	1	tower mounts	Platform Mount [LP 712-1]			
124.0	124.0	6	dapa	49000 w/ Mount Pipe	6	1-5/8	2
		1	tower mounts	Platform Mount [LP 712-1]	-	-	1
114.0	116.0	1	lucent	KS24019-L112A	1 12	1/2 1-5/8	1
	114.0	3	andrew	LNX-6514DS-T4M w/ Mount Pipe			
		3	antel	BXA-185063/8CF w/ Mount Pipe			
		6	decibel	DB844H65E-XY w/ Mount Pipe			
		6	rfs/celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
105.0	105.0	6	ericsson	RRUS-11	1 2 12	3/8 3/4 1-5/8	1
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave tech	LGP2140X			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 712-1]			
94.0	95.0	3	rfs celwave	ATMAA1412D-1A20	18	1-5/8	1
		3	rfs celwave	ATMPP1412D-1CWA			
		6	ems wireless	RR90-17-02DP w/ Mount Pipe			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	94.0	1	tower mounts	Platform Mount [LP 712-1]			
87.0	87.0	3	kathrein	742 213 w/ Mount Pipe	6	1-5/8	1
77.0	77.0	1	symmetricom	58532A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Existing equipment to be removed

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)
150	150	6	Generic	10' Whip	-	-
147	147	12	DAPA	58210	-	-
135	135	12	DAPA	58210	-	-
125	125	12	DAPA	58210	-	-
115	115	12	DAPA	58210	-	-
105	105	12	DAPA	58210	-	-
95	95	12	DAPA	58210	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E.	1425352	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SUMMIT	1425473	CCISITES
4-TOWER MANUFACTURER DRAWINGS	SUMMIT	1425417	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
L1	145 - 130	Pole	TP26.77x24x0.1875	1	-2.345	822.430	6.0	Pass
L2	130 - 84.75	Pole	TP35.27x26.77x0.25	2	-14.152	1409.767	60.4	Pass
L3	84.75 - 44.25	Pole	TP42.26x33.9247x0.3125	3	-22.259	2112.858	89.3	Pass
L4	44.25 - 0	Pole	TP49.83x40.6625x0.375	4	-35.595	3060.155	96.7	Pass
							Summary	
						Pole (L4)	96.7	Pass
						Rating =	96.7	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.1	Pass
1	Base Plate	0	78.9	Pass
1	Base Foundation Soil Interaction	0	69.0	Pass
1	Flange Plate & Bolts	130	2.8 & 8.3	Pass
Structure Rating (max from all components) =				**96.7%**

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

4.1) Recommendations

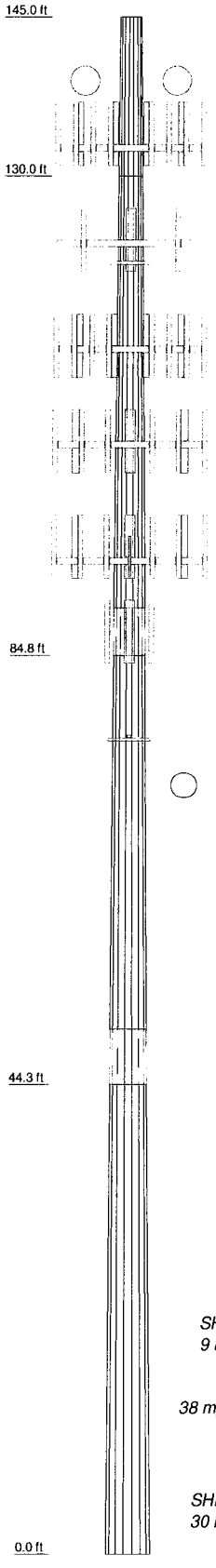
The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

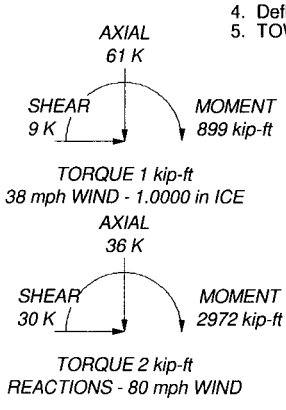
APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	15.000	45.250	45.000	49.500
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.2500	0.3125	0.3750
Socket Length (ft)		4.500	5.250	
Top Dia (in)	24.0000	26.7700	33.9247	40.6625
Bot Dia (in)	26.7700	35.2700	42.2600	49.8300
Grade	A607-65			
Weight (K)	0.8	3.8	5.7	9.0

Total Weight (K) 19.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
840 10054 w/ Mount Pipe	133	LNX-6514DS-T4M w/ Mount Pipe	114
840 10054 w/ Mount Pipe	133	LNX-6514DS-T4M w/ Mount Pipe	114
840 10054 w/ Mount Pipe	133	(2) 7770.00 w/ Mount Pipe	105
HORIZON COMPACT	133	AM-X-CD-16-65-00T-RET w/ Mount Pipe	105
HORIZON COMPACT	133		
TIMING 2000	133	AM-X-CD-16-65-00T-RET w/ Mount Pipe	105
WIMAX DAP HEAD	133		
WIMAX DAP HEAD	133	AM-X-CD-16-65-00T-RET w/ Mount Pipe	105
WIMAX DAP HEAD	133		
(3) DB844H90E-XY w/ Mount Pipe	133	(2) RRUS-11	105
(3) DB844H90E-XY w/ Mount Pipe	133	(2) RRUS-11	105
(3) DB844H90E-XY w/ Mount Pipe	133	(2) RRUS-11	105
Platform Mount [LP 712-1]	133	DC6-48-60-18-8F	105
VHLP2.5-11	133	(2) LGP2140X	105
VHLP2.5-11	133	(2) LGP2140X	105
APXVSPP18-C-A20 w/ Mount Pipe	124	(2) LGP2140X	105
IBC1900BB-1	124	Platform Mount [LP 712-1]	105
IBC1900BB-1	124	(2) 7770.00 w/ Mount Pipe	105
IBC1900BB-1	124	(2) 7770.00 w/ Mount Pipe	105
IBC1900HG-2A	124	(2) RR90-17-02DP w/ Mount Pipe	94
IBC1900HG-2A	124	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	94
IBC1900HG-2A	124	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	94
Platform Mount [LP 712-1]	124		
APXVSPP18-C-A20 w/ Mount Pipe	124	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	94
APXVSPP18-C-A20 w/ Mount Pipe	124		
800MHz 2X50W RRH W/FILTER	122	ATMAA1412D-1A20	94
(2) PCS 1900MHz 4x45W-65MHz	122	ATMAA1412D-1A20	94
(2) PCS 1900MHz 4x45W-65MHz	122	ATMAA1412D-1A20	94
(2) PCS 1900MHz 4x45W-65MHz	122	ATMPP1412D-1CWA	94
Side Arm Mount [SO 102-3]	122	ATMPP1412D-1CWA	94
800MHz 2X50W RRH W/FILTER	122	ATMPP1412D-1CWA	94
800MHz 2X50W RRH W/FILTER	122	6'x2" Pipe Mount	94
LNX-6514DS-T4M w/ Mount Pipe	114	6'x2" Pipe Mount	94
BXA-185063/8CF w/ Mount Pipe	114	6'x2" Pipe Mount	94
BXA-185063/8CF w/ Mount Pipe	114	Platform Mount [LP 712-1]	94
BXA-185063/8CF w/ Mount Pipe	114	(2) RR90-17-02DP w/ Mount Pipe	94
(2) DB844H65E-XY w/ Mount Pipe	114	(2) RR90-17-02DP w/ Mount Pipe	94
(2) DB844H65E-XY w/ Mount Pipe	114	742 213 w/ Mount Pipe	87
(2) DB844H65E-XY w/ Mount Pipe	114	742 213 w/ Mount Pipe	87
(2) FD9R6004/2C-3L	114	742 213 w/ Mount Pipe	87
(2) FD9R6004/2C-3L	114	58532A	77
(2) FD9R6004/2C-3L	114	Side Arm Mount [SO 701-1]	77
KS24019-L112A	114		
Platform Mount [LP 712-1]	114		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.7%

CROWN CASTLE
We Are Solutions

Crown Castle
2000 Corporate Drive
Canonsburgh, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-2254

Job: **BU# 881364**			
Project:			
Client: Crown Castle	Drawn by: RJenabzadeh		App'd:
Code: TIA/EIA-222-F	Date: 10/19/12		Scale: NTS
Path: R:\SA Models - Letters\Work Area\DStephens\881364 - WO 540910 2 final 881364.er			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 1.0000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.000 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50.000 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	145.000-130.000	15.000	0.000	18	24.0000	26.7700	0.1875	0.7500	A607-65 (65 ksi)
L2	130.000-84.750	45.250	4.500	18	26.7700	35.2700	0.2500	1.0000	A607-65 (65 ksi)
L3	84.750-44.250	45.000	5.250	18	33.9247	42.2600	0.3125	1.2500	A607-65 (65 ksi)
L4	44.250-0.000	49.500		18	40.6625	49.8300	0.3750	1.5000	A607-65 (65 ksi)

Tapered Pole Properties

Section	*Tip Dia.*	*Area*	*I*	*r*	*C*	*I/C*	*J*	*It/Q*	*w*	*w/t*
	in	*in²*	*in⁴*	*in*	*in*	*in³*	*in⁴*	*in²*	*in*	
L1	24.3702	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	27.1830	15.8199	1412.3200	9.4368	13.5992	103.8535	2826.4984	7.9115	4.3815	23.368
L2	27.1830	21.0436	1869.8421	9.4146	13.5992	137.4969	3742.1446	10.5238	4.2715	17.086
	35.8141	27.7884	4305.5913	12.4321	17.9172	240.3055	8616.8481	13.8968	5.7675	23.07
L3	35.2944	33.3391	4758.6642	11.9323	17.2337	276.1248	9523.5900	16.6727	5.4207	17.346
	42.9119	41.6067	9249.3804	14.8914	21.4681	430.8434	18510.9314	20.8073	6.8878	22.041
L4	42.2771	47.9523	9833.0477	14.3021	20.6566	476.0251	19679.0339	23.9807	6.4966	17.324
	50.5987	58.8638	18188.8926	17.5565	25.3136	718.5412	36401.7186	29.4375	8.1101	21.627

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 145.000-130.000				1	1	1		
L2 130.000-84.750				1	1	1		
L3 84.750-44.250				1	1	1		
L4 44.250-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
ATCB-B01-005(5/16)	B	No	Inside Pole	133.000 - 0.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
2" Conduit	B	No	Inside Pole	133.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FSJ4-50B(1/2")	B	No	Inside Pole	133.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
*								
LDF6-50A(1-1/4")	A	No	Inside Pole	133.000 - 0.000	9	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	124.000 - 0.000	2	No Ice	0.154	0.001
						1/2" Ice	0.254	0.002
						1" Ice	0.354	0.004
						2" Ice	0.554	0.010
						4" Ice	0.954	0.028
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	124.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.028
***								
LDF4-50A(1/2")	B	No	Inside Pole	114.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF7-50A(1-5/8")	B	No	Inside Pole	114.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
LCF158-50A(1-5/8")	C	No	Inside Pole	105.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-002-75000(3/8")	C	No	Inside Pole	105.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	105.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	94.000 - 0.000	2	No Ice	0.196	0.001
						1/2" Ice	0.296	0.002
						1" Ice	0.396	0.004
						2" Ice	0.596	0.010
						4" Ice	0.996	0.030
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	94.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
HJ7-50A(1-5/8")	C	No	Inside Pole	94.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
AVA7-50(1-5/8)	B	No	CaAa (Out Of Face)	87.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
***								
LDF4-50A(1/2")	C	No	Inside Pole	77.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	145.000-130.000	A	0.000	0.000	0.000	0.000	0.018
		B	0.000	0.000	0.000	0.000	0.008
		C	0.000	0.000	0.000	0.000	0.000
L2	130.000-84.750	A	0.000	0.000	0.000	12.089	0.396
		B	0.000	0.000	0.000	0.000	0.427
		C	0.000	0.000	0.000	3.626	0.364
L3	84.750-44.250	A	0.000	0.000	0.000	12.474	0.372
		B	0.000	0.000	0.000	0.000	0.687
		C	0.000	0.000	0.000	15.876	1.076

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
L4	44.250-0.000	A	0.000	0.000	0.000	13.629	0.406
		B	0.000	0.000	0.000	0.000	0.750
		C	0.000	0.000	0.000	17.346	1.177

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	145.000-130.000	A	1.187	0.000	0.000	0.000	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.008
		C		0.000	0.000	0.000	0.000	0.000
L2	130.000-84.750	A	1.151	0.000	0.000	0.000	30.163	0.860
		B		0.000	0.000	0.000	0.000	0.489
		C		0.000	0.000	0.000	7.885	0.615
L3	84.750-44.250	A	1.083	0.000	0.000	0.000	31.123	0.851
		B		0.000	0.000	0.000	0.000	1.805
		C		0.000	0.000	0.000	34.525	2.177
L4	44.250-0.000	A	1.000	0.000	0.000	0.000	32.804	0.880
		B		0.000	0.000	0.000	0.000	1.862
		C		0.000	0.000	0.000	36.521	2.271

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	145.000-130.000	0.0000	0.0000	0.0000	0.0000
L2	130.000-84.750	-0.1018	-0.3009	-0.1794	-0.6239
L3	84.750-44.250	-0.4180	-0.1379	-0.7077	-0.3280
L4	44.250-0.000	-0.4302	-0.1419	-0.7351	-0.3380

Discrete Tower Loads

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
840 10054 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.086 0.128 0.230 0.533
840 10054 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.086 0.128 0.230 0.533
840 10054 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.086 0.128 0.230 0.533

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			
HORIZON COMPACT	A	From Leg	4.000 0.000 6.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122
HORIZON COMPACT	B	From Leg	4.000 0.000 6.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122
TIMING 2000	A	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.126 0.177 0.237 0.383 0.778	0.126 0.177 0.237 0.383 0.778	0.001 0.002 0.005 0.014 0.052
WIMAX DAP HEAD	A	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD	B	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD	C	From Leg	4.000 0.000 2.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
*									
(3) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.070 0.116 0.228 0.557
(3) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.070 0.116 0.228 0.557
(3) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.070 0.116 0.228 0.557
Platform Mount [LP 712-1]	C	None		0.000	133.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	124.000	No Ice 1/2"	8.498 9.149	6.946 8.127	0.083 0.148

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
			0.000			Ice	9.767	9.021	0.225
						1" Ice	11.031	10.844	0.406
						2" Ice	13.679	14.851	0.909
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.148 0.225 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.148 0.225 0.406 0.909
IBC1900BB-1	A	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900BB-1	B	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900BB-1	C	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900HG-2A	A	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900HG-2A	B	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900HG-2A	C	From Leg	4.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
Platform Mount [LP 712-1]	C	None		0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
***									
800MHz 2X50W RRH W/FILTER	A	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338

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
800MHz 2X50W RRH W/FILTER	B	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
800MHz 2X50W RRH W/FILTER	C	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
(2) PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
(2) PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
(2) PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
Side Arm Mount [SO 102-3]	C	None		0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.480 3.960 4.920 6.840	3.000 3.480 3.960 4.920 6.840	0.081 0.111 0.141 0.201 0.321
***									
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.058 0.124 0.202 0.384 0.889
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.058 0.124 0.202 0.384 0.889
LNX-6514DS-T4M w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.058 0.124 0.202 0.384 0.889
BXA-185063/8CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.181 3.559 3.963 4.855 6.773	2.997 3.614 4.236 5.529 8.423	0.028 0.057 0.094 0.186 0.473
BXA-185063/8CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice 1/2" Ice 1" Ice	3.181 3.559 3.963 4.855	2.997 3.614 4.236 5.529	0.028 0.057 0.094 0.186

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	6.773	8.423	0.473
						4" Ice			
BXA-185063/8CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	3.181	2.997	0.028
						1/2" Ice	3.559	3.614	0.057
						1" Ice	3.963	4.236	0.094
						2" Ice	4.855	5.529	0.186
						4" Ice	6.773	8.423	0.473
(2) DB844H65E-XY w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	9.804	5.388	0.038
						1/2" Ice	10.314	6.069	0.104
						1" Ice	10.833	6.763	0.179
						2" Ice	11.903	8.205	0.352
						4" Ice	14.179	11.352	0.815
(2) DB844H65E-XY w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	9.804	5.388	0.038
						1/2" Ice	10.314	6.069	0.104
						1" Ice	10.833	6.763	0.179
						2" Ice	11.903	8.205	0.352
						4" Ice	14.179	11.352	0.815
(2) DB844H65E-XY w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	9.804	5.388	0.038
						1/2" Ice	10.314	6.069	0.104
						1" Ice	10.833	6.763	0.179
						2" Ice	11.903	8.205	0.352
						4" Ice	14.179	11.352	0.815
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	0.000	0.085	0.003
						1/2" Ice	0.000	0.136	0.005
						1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	0.000	0.085	0.003
						1/2" Ice	0.000	0.136	0.005
						1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 0.000	0.000	114.000	No Ice	0.000	0.085	0.003
						1/2" Ice	0.000	0.136	0.005
						1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
KS24019-L112A	A	From Leg	4.000 0.000 2.000	0.000	114.000	No Ice	0.100	0.100	0.005
						1/2" Ice	0.180	0.180	0.006
						1" Ice	0.260	0.260	0.008
						2" Ice	0.420	0.420	0.011
						4" Ice	0.740	0.740	0.017
Platform Mount [LP 712-1]	C	None		0.000	114.000	No Ice	24.530	24.530	1.335
						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.101
						1" Ice	7.128	5.711	0.155
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	105.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.101

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
			0.000			Ice	7.128	5.711	0.155
						1" Ice	8.164	7.155	0.287
						2" Ice	10.360	10.412	0.665
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	105.000	No Ice	6.119	4.254	0.055
			0.000			1/2"	6.626	5.014	0.101
			0.000			Ice	7.128	5.711	0.155
						1" Ice	8.164	7.155	0.287
						2" Ice	10.360	10.412	0.665
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	0.000	105.000	No Ice	8.498	6.304	0.074
			0.000			1/2"	9.149	7.479	0.136
			0.000			Ice	9.767	8.368	0.210
						1" Ice	11.031	10.179	0.385
						2" Ice	13.679	14.024	0.874
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000	0.000	105.000	No Ice	8.498	6.304	0.074
			0.000			1/2"	9.149	7.479	0.136
			0.000			Ice	9.767	8.368	0.210
						1" Ice	11.031	10.179	0.385
						2" Ice	13.679	14.024	0.874
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	105.000	No Ice	8.498	6.304	0.074
			0.000			1/2"	9.149	7.479	0.136
			0.000			Ice	9.767	8.368	0.210
						1" Ice	11.031	10.179	0.385
						2" Ice	13.679	14.024	0.874
						4" Ice			
(2) RRUS-11	A	From Leg	4.000	0.000	105.000	No Ice	3.249	1.373	0.048
			0.000			1/2"	3.491	1.551	0.068
			0.000			Ice	3.741	1.738	0.092
						1" Ice	4.268	2.138	0.150
						2" Ice	5.426	3.042	0.310
						4" Ice			
(2) RRUS-11	B	From Leg	4.000	0.000	105.000	No Ice	3.249	1.373	0.048
			0.000			1/2"	3.491	1.551	0.068
			0.000			Ice	3.741	1.738	0.092
						1" Ice	4.268	2.138	0.150
						2" Ice	5.426	3.042	0.310
						4" Ice			
(2) RRUS-11	C	From Leg	4.000	0.000	105.000	No Ice	3.249	1.373	0.048
			0.000			1/2"	3.491	1.551	0.068
			0.000			Ice	3.741	1.738	0.092
						1" Ice	4.268	2.138	0.150
						2" Ice	5.426	3.042	0.310
						4" Ice			
DC6-48-60-18-8F	A	From Leg	4.000	0.000	105.000	No Ice	1.266	1.266	0.020
			0.000			1/2"	1.456	1.456	0.035
			0.000			Ice	1.658	1.658	0.053
						1" Ice	2.093	2.093	0.095
						2" Ice	3.098	3.098	0.215
						4" Ice			
(2) LGP2140X	A	From Leg	4.000	0.000	105.000	No Ice	0.000	0.378	0.019
			0.000			1/2"	0.000	0.493	0.026
			0.000			Ice	0.000	0.617	0.035
						1" Ice	0.000	0.890	0.060
						2" Ice	0.000	1.541	0.140
						4" Ice			
(2) LGP2140X	B	From Leg	4.000	0.000	105.000	No Ice	0.000	0.378	0.019
			0.000			1/2"	0.000	0.493	0.026
			0.000			Ice	0.000	0.617	0.035
						1" Ice	0.000	0.890	0.060
						2" Ice	0.000	1.541	0.140
						4" Ice			
(2) LGP2140X	C	From Leg	4.000	0.000	105.000	No Ice	0.000	0.378	0.019

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
			0.000 0.000			1/2" Ice	0.000	0.493	0.026
						1" Ice	0.000	0.617	0.035
						2" Ice	0.000	0.890	0.060
						4" Ice	0.000	1.541	0.140
Platform Mount [LP 712-1]	C	None		0.000	105.000	No Ice	24.530	24.530	1.335
						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
***									
(2) RR90-17-02DP w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	4.593	3.319	0.034
						1/2" Ice	5.088	4.089	0.069
						1" Ice	5.578	4.784	0.114
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
(2) RR90-17-02DP w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	4.593	3.319	0.034
						1/2" Ice	5.088	4.089	0.069
						1" Ice	5.578	4.784	0.114
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
(2) RR90-17-02DP w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	4.593	3.319	0.034
						1/2" Ice	5.088	4.089	0.069
						1" Ice	5.578	4.784	0.114
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	6.936	3.289	0.059
						1/2" Ice	7.439	3.995	0.103
						1" Ice	7.942	4.661	0.156
						2" Ice	8.978	6.044	0.283
						4" Ice	11.175	9.023	0.650
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	6.936	3.289	0.059
						1/2" Ice	7.439	3.995	0.103
						1" Ice	7.942	4.661	0.156
						2" Ice	8.978	6.044	0.283
						4" Ice	11.175	9.023	0.650
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	6.936	3.289	0.059
						1/2" Ice	7.439	3.995	0.103
						1" Ice	7.942	4.661	0.156
						2" Ice	8.978	6.044	0.283
						4" Ice	11.175	9.023	0.650
ATMAA1412D-1A20	A	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	0.000	1.167	0.013
						1/2" Ice	0.000	1.314	0.021
						1" Ice	0.000	1.469	0.030
						2" Ice	0.000	1.806	0.056
						4" Ice	0.000	2.584	0.137
ATMAA1412D-1A20	B	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	0.000	1.167	0.013
						1/2" Ice	0.000	1.314	0.021
						1" Ice	0.000	1.469	0.030
						2" Ice	0.000	1.806	0.056
						4" Ice	0.000	2.584	0.137
ATMAA1412D-1A20	C	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice	0.000	1.167	0.013
						1/2" Ice	0.000	1.314	0.021
						1" Ice	0.000	1.469	0.030
						2" Ice	0.000	1.806	0.056
						4" Ice	0.000	2.584	0.137

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			
ATMPP1412D-1CWA	A	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.416 0.530 0.652 0.923 1.569	0.013 0.020 0.028 0.052 0.131
ATMPP1412D-1CWA	B	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.416 0.530 0.652 0.923 1.569	0.013 0.020 0.028 0.052 0.131
ATMPP1412D-1CWA	C	From Leg	4.000 0.000 1.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.416 0.530 0.652 0.923 1.569	0.013 0.020 0.028 0.052 0.131
6'x2" Pipe Mount	A	From Face	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.802 2.170 2.932 4.568	1.200 1.802 2.170 2.932 4.568	0.072 0.081 0.095 0.134 0.268
6'x2" Pipe Mount	B	From Face	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.802 2.170 2.932 4.568	1.200 1.802 2.170 2.932 4.568	0.072 0.081 0.095 0.134 0.268
6'x2" Pipe Mount	C	From Face	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.802 2.170 2.932 4.568	1.200 1.802 2.170 2.932 4.568	0.072 0.081 0.095 0.134 0.268
Platform Mount [LP 712-1]	C	None		0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
***									
742 213 w/ Mount Pipe	A	From Leg	1.000 0.000 0.000	0.000	87.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.091 0.144 0.277 0.682
742 213 w/ Mount Pipe	B	From Leg	1.000 0.000 0.000	0.000	87.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.091 0.144 0.277 0.682
742 213 w/ Mount Pipe	C	From Leg	1.000 0.000 0.000	0.000	87.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.091 0.144 0.277 0.682
***									
58532A	A	From Leg	2.000 0.000	0.000	77.000	No Ice 1/2"	0.221 0.290	0.221 0.290	0.000 0.003

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				0.000			Ice	0.367	0.367	0.006
							1" Ice	0.548	0.548	0.017
							2" Ice	1.014	1.014	0.060
							4" Ice			
Side Arm Mount [SO 701-1]	A	From Leg	1.000	0.000	0.000	77.000	No Ice	0.850	1.670	0.065
			0.000				1/2" Ice	1.140	2.340	0.079
			0.000				1" Ice	1.430	3.010	0.093
							2" Ice	2.010	4.350	0.121
							4" Ice	3.170	7.030	0.177

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Face	4.000	0.000	13.000		133.000	2.917	No Ice	6.680	0.030
					6.000					1/2" Ice	7.070	0.040
										1" Ice	7.460	0.050
										2" Ice	8.230	0.070
										4" Ice	9.780	0.110
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Face	4.000	0.000	37.000		133.000	2.917	No Ice	6.680	0.030
					6.000					1/2" Ice	7.070	0.040
										1" Ice	7.460	0.050
										2" Ice	8.230	0.070
										4" Ice	9.780	0.110

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

Comb. No.	Description
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 130	Pole	Max Tension	2	0.000	-0.000	-0.000
			Max. Compression	14	-5.480	-0.133	0.383
			Max. Mx	11	-2.349	25.317	1.475
			Max. My	8	-2.364	-2.125	-24.024
			Max. Vy	11	-4.897	25.317	1.475
			Max. Vx	8	4.767	-2.125	-24.024
			Max. Torque	10			-1.456
L2	130 - 84.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-29.697	0.099	1.213
			Max. Mx	11	-14.158	585.541	8.279
			Max. My	8	-14.180	-11.961	-578.521
			Max. Vy	11	-22.350	585.541	8.279
			Max. Vx	8	22.214	-11.961	-578.521
			Max. Torque	10			-1.773
L3	84.75 - 44.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-42.418	0.051	0.626
			Max. Mx	11	-22.262	1567.115	14.907
			Max. My	8	-22.276	-21.767	-1553.783
			Max. Vy	11	-26.469	1567.115	14.907
			Max. Vx	8	26.305	-21.767	-1553.783
			Max. Torque	10			-2.025
L4	44.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-60.921	-0.068	-0.744
			Max. Mx	11	-35.595	2967.205	22.653
			Max. My	8	-35.595	-33.651	-2946.013
			Max. Vy	11	-30.002	2967.205	22.653
			Max. Vx	8	29.844	-33.651	-2946.013
			Max. Torque	10			-2.144

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	19	60.921	-7.640	-4.401
	Max. H_x	11	35.623	29.968	0.153
	Max. H_z	2	35.623	0.156	29.758
	Max. M_x	2	2939.617	0.156	29.758
	Max. M_z	5	2964.674	-29.948	-0.180
	Max. Torsion	4	1.776	-25.919	14.700
	Min. Vert	1	35.623	0.000	0.000

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_x	5	35.623	-29.948	-0.180
	Min. H_z	8	35.623	-0.232	-29.811
	Min. M_x	8	-2946.013	-0.232	-29.811
	Min. M_z	11	-2967.205	29.968	0.153
	Min. Torsion	10	-2.144	25.979	-14.730

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	35.623	0.000	0.000	-0.559	-0.169	0.000
Dead+Wind 0 deg - No Ice	35.623	-0.156	-29.758	-2939.617	22.401	-0.097
Dead+Wind 30 deg - No Ice	35.623	14.894	-25.739	-2541.109	-1470.837	-1.404
Dead+Wind 60 deg - No Ice	35.623	25.919	-14.700	-1444.251	-2565.122	-1.776
Dead+Wind 90 deg - No Ice	35.623	29.948	0.180	25.385	-2964.674	-1.472
Dead+Wind 120 deg - No Ice	35.623	25.992	14.978	1483.200	-2575.552	-1.280
Dead+Wind 150 deg - No Ice	35.623	15.138	25.826	2552.489	-1506.095	-0.751
Dead+Wind 180 deg - No Ice	35.623	0.232	29.811	2946.013	-33.651	-0.054
Dead+Wind 210 deg - No Ice	35.623	-14.933	25.709	2535.616	1476.168	1.586
Dead+Wind 240 deg - No Ice	35.623	-25.979	14.730	1447.335	2573.377	2.144
Dead+Wind 270 deg - No Ice	35.623	-29.968	-0.153	-22.653	2967.205	1.845
Dead+Wind 300 deg - No Ice	35.623	-26.009	-14.948	-1480.009	2577.685	1.602
Dead+Wind 330 deg - No Ice	35.623	-15.150	-25.770	-2545.651	1507.506	0.875
Dead+Ice+Temp	60.921	0.000	0.000	0.744	-0.068	0.000
Dead+Wind 0 deg+Ice+Temp	60.921	-0.039	-8.753	-889.224	5.840	-0.090
Dead+Wind 30 deg+Ice+Temp	60.921	4.383	-7.572	-768.750	-445.531	-0.480
Dead+Wind 60 deg+Ice+Temp	60.921	7.622	-4.331	-437.510	-776.267	-0.599
Dead+Wind 90 deg+Ice+Temp	60.921	8.806	0.045	7.479	-897.087	-0.508
Dead+Wind 120 deg+Ice+Temp	60.921	7.640	4.401	449.388	-779.018	-0.409
Dead+Wind 150 deg+Ice+Temp	60.921	4.444	7.594	773.428	-454.765	-0.202
Dead+Wind 180 deg+Ice+Temp	60.921	0.058	8.766	892.579	-8.816	0.052
Dead+Wind 210 deg+Ice+Temp	60.921	-4.393	7.564	768.994	446.886	0.528
Dead+Wind 240 deg+Ice+Temp	60.921	-7.637	4.339	439.999	778.392	0.695
Dead+Wind 270 deg+Ice+Temp	60.921	-8.811	-0.038	-5.085	897.711	0.603
Dead+Wind 300 deg+Ice+Temp	60.921	-7.645	-4.394	-446.874	779.537	0.490
Dead+Wind 330 deg+Ice+Temp	60.921	-4.447	-7.580	-769.958	455.093	0.231
Dead+Wind 0 deg - Service	35.623	-0.061	-11.624	-1149.822	8.656	-0.038
Dead+Wind 30 deg - Service	35.623	5.818	-10.054	-993.993	-575.235	-0.551
Dead+Wind 60 deg - Service	35.623	10.125	-5.742	-565.099	-1003.134	-0.697
Dead+Wind 90 deg - Service	35.623	11.699	0.070	9.566	-1159.391	-0.579
Dead+Wind 120 deg - Service	35.623	10.153	5.851	579.621	-1007.241	-0.505
Dead+Wind 150 deg - Service	35.623	5.913	10.088	997.743	-589.044	-0.297
Dead+Wind 180 deg - Service	35.623	0.090	11.645	1151.603	-13.270	-0.022
Dead+Wind 210 deg - Service	35.623	-5.833	10.042	991.116	577.110	0.625
Dead+Wind 240 deg - Service	35.623	-10.148	5.754	565.580	1006.161	0.845
Dead+Wind 270 deg - Service	35.623	-11.706	-0.060	-9.227	1160.169	0.726

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	35.623	-10.160	-5.839	-579.101	1007.861	0.630
Dead+Wind 330 deg - Service	35.623	-5.918	-10.067	-995.790	589.378	0.343

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-35.623	0.000	0.000	35.623	0.000	0.000%
2	-0.156	-35.623	-29.758	0.156	35.623	29.758	0.000%
3	14.894	-35.623	-25.739	-14.894	35.623	25.739	0.000%
4	25.919	-35.623	-14.700	-25.919	35.623	14.700	0.000%
5	29.948	-35.623	0.180	-29.948	35.623	-0.180	0.000%
6	25.992	-35.623	14.978	-25.992	35.623	-14.978	0.000%
7	15.138	-35.623	25.826	-15.138	35.623	-25.826	0.000%
8	0.232	-35.623	29.811	-0.232	35.623	-29.811	0.000%
9	-14.933	-35.623	25.709	14.933	35.623	-25.709	0.000%
10	-25.979	-35.623	14.730	25.979	35.623	-14.730	0.000%
11	-29.968	-35.623	-0.153	29.968	35.623	0.153	0.000%
12	-26.009	-35.623	-14.948	26.009	35.623	14.948	0.000%
13	-15.150	-35.623	-25.770	15.150	35.623	25.770	0.000%
14	0.000	-60.921	0.000	0.000	60.921	0.000	0.000%
15	-0.039	-60.921	-8.753	0.039	60.921	8.753	0.000%
16	4.383	-60.921	-7.572	-4.383	60.921	7.572	0.000%
17	7.622	-60.921	-4.331	-7.622	60.921	4.331	0.000%
18	8.806	-60.921	0.045	-8.806	60.921	-0.045	0.000%
19	7.640	-60.921	4.401	-7.640	60.921	-4.401	0.000%
20	4.444	-60.921	7.594	-4.444	60.921	-7.594	0.000%
21	0.058	-60.921	8.766	-0.058	60.921	-8.766	0.000%
22	-4.393	-60.921	7.564	4.393	60.921	-7.564	0.000%
23	-7.637	-60.921	4.339	7.637	60.921	-4.339	0.000%
24	-8.811	-60.921	-0.038	8.811	60.921	0.038	0.000%
25	-7.645	-60.921	-4.394	7.645	60.921	4.394	0.000%
26	-4.447	-60.921	-7.580	4.447	60.921	7.580	0.000%
27	-0.061	-35.623	-11.624	0.061	35.623	11.624	0.000%
28	5.818	-35.623	-10.054	-5.818	35.623	10.054	0.000%
29	10.125	-35.623	-5.742	-10.125	35.623	5.742	0.000%
30	11.699	-35.623	0.070	-11.699	35.623	-0.070	0.000%
31	10.153	-35.623	5.851	-10.153	35.623	-5.851	0.000%
32	5.913	-35.623	10.088	-5.913	35.623	-10.088	0.000%
33	0.090	-35.623	11.645	-0.090	35.623	-11.645	0.000%
34	-5.833	-35.623	10.042	5.833	35.623	-10.042	0.000%
35	-10.148	-35.623	5.754	10.148	35.623	-5.754	0.000%
36	-11.706	-35.623	-0.060	11.706	35.623	0.060	0.000%
37	-10.160	-35.623	-5.839	10.160	35.623	5.839	0.000%
38	-5.918	-35.623	-10.067	5.918	35.623	10.067	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00033154
3	Yes	5	0.00000001	0.00075647
4	Yes	5	0.00000001	0.00081827
5	Yes	4	0.00000001	0.00087505
6	Yes	5	0.00000001	0.00077834
7	Yes	5	0.00000001	0.00082817
8	Yes	5	0.00000001	0.00004153
9	Yes	5	0.00000001	0.00081470

10	Yes	5	0.00000001	0.00073932
11	Yes	5	0.00000001	0.00009072
12	Yes	5	0.00000001	0.00084629
13	Yes	5	0.00000001	0.00078434
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00022628
16	Yes	5	0.00000001	0.00034342
17	Yes	5	0.00000001	0.00035486
18	Yes	5	0.00000001	0.00022948
19	Yes	5	0.00000001	0.00034893
20	Yes	5	0.00000001	0.00035866
21	Yes	5	0.00000001	0.00022648
22	Yes	5	0.00000001	0.00035302
23	Yes	5	0.00000001	0.00034005
24	Yes	5	0.00000001	0.00023178
25	Yes	5	0.00000001	0.00036404
26	Yes	5	0.00000001	0.00035192
27	Yes	4	0.00000001	0.00006075
28	Yes	5	0.00000001	0.00007637
29	Yes	5	0.00000001	0.00009020
30	Yes	4	0.00000001	0.00027295
31	Yes	5	0.00000001	0.00007919
32	Yes	5	0.00000001	0.00008972
33	Yes	4	0.00000001	0.00015449
34	Yes	5	0.00000001	0.00008883
35	Yes	5	0.00000001	0.00007302
36	Yes	4	0.00000001	0.00046321
37	Yes	5	0.00000001	0.00009444
38	Yes	5	0.00000001	0.00008063

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	145 - 130	35.951	37	1.892	0.007
L2	130 - 84.75	30.014	37	1.885	0.006
L3	89.25 - 44.25	14.959	37	1.539	0.003
L4	49.5 - 0	4.682	37	0.861	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
139.000	VHLP2.5-11	37	33.572	1.893	0.007	78814
133.000	840 10054 w/ Mount Pipe	37	31.198	1.890	0.006	39169
124.000	APXVSPP18-C-A20 w/ Mount Pipe	37	27.660	1.865	0.005	16194
122.000	800MHz 2X50W RRH W/FILTER	37	26.881	1.856	0.005	13935
114.000	LNX-6514DS-T4M w/ Mount Pipe	37	23.802	1.808	0.004	8944
105.000	(2) 7770.00 w/ Mount Pipe	37	20.443	1.730	0.004	6374
94.000	(2) RR90-17-02DP w/ Mount Pipe	37	16.550	1.604	0.003	4717
87.000	742 213 w/ Mount Pipe	37	14.227	1.507	0.002	4076
77.000	58532A	37	11.164	1.350	0.002	3468

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	145 - 130	91.748	12	4.832	0.018
L2	130 - 84.75	76.610	12	4.814	0.014
L3	89.25 - 44.25	38.209	12	3.933	0.006
L4	49.5 - 0	11.968	12	2.202	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
139.000	VHLP2.5-11	12	85.681	4.836	0.016	31450
133.000	840 10054 w/ Mount Pipe	12	79.627	4.827	0.015	15628
124.000	APXVSPP18-C-A20 w/ Mount Pipe	12	70.607	4.765	0.013	6443
122.000	800MHz 2X50W RRH W/FILTER	12	68.620	4.742	0.012	5541
114.000	LNX-6514DS-T4M w/ Mount Pipe	12	60.769	4.618	0.011	3552
105.000	(2) 7770.00 w/ Mount Pipe	12	52.201	4.419	0.009	2529
94.000	(2) RR90-17-02DP w/ Mount Pipe	12	42.268	4.097	0.007	1869
87.000	742 213 w/ Mount Pipe	12	36.342	3.850	0.006	1613
77.000	58532A	12	28.523	3.451	0.005	1368

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	145 - 130 (1)	TP26.77x24x0.1875	15.000	0.000	0.0	39.000	15.8199	-2.345	616.977	0.004
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	45.250	0.000	0.0	39.000	27.1176	-14.152	1057.590	0.013
L3	84.75 - 44.25 (3)	TP42.26x33.9247x0.3125	45.000	0.000	0.0	39.000	40.6421	-22.259	1585.040	0.014
L4	44.25 - 0 (4)	TP49.83x40.6625x0.375	49.500	0.000	0.0	39.000	58.8638	-35.595	2295.690	0.016

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	145 - 130 (1)	TP26.77x24x0.1875	25.757	2.976	39.000	0.076	0.000	0.000	39.000	0.000
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	587.694	30.823	39.000	0.790	0.000	0.000	39.000	0.000
L3	84.75 - 44.25 (3)	TP42.26x33.9247x0.3125	1570.725	45.858	39.000	1.176	0.000	0.000	39.000	0.000
L4	44.25 - 0 (4)	TP49.83x40.6625x0.375	2972.358	49.640	39.000	1.273	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	145 - 130 (1)	TP26.77x24x0.1875	4.937	0.312	26.000	0.024	1.212	0.068	26.000	0.003
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	22.390	0.826	26.000	0.064	1.503	0.038	26.000	0.001
L3	84.75 - 44.25 (3)	TP42.26x33.9247x0.3125	26.501	0.652	26.000	0.050	1.640	0.023	26.000	0.001
L4	44.25 - 0 (4)	TP49.83x40.6625x0.375	30.032	0.510	26.000	0.039	1.604	0.013	26.000	0.001

Pole Interaction Design Data

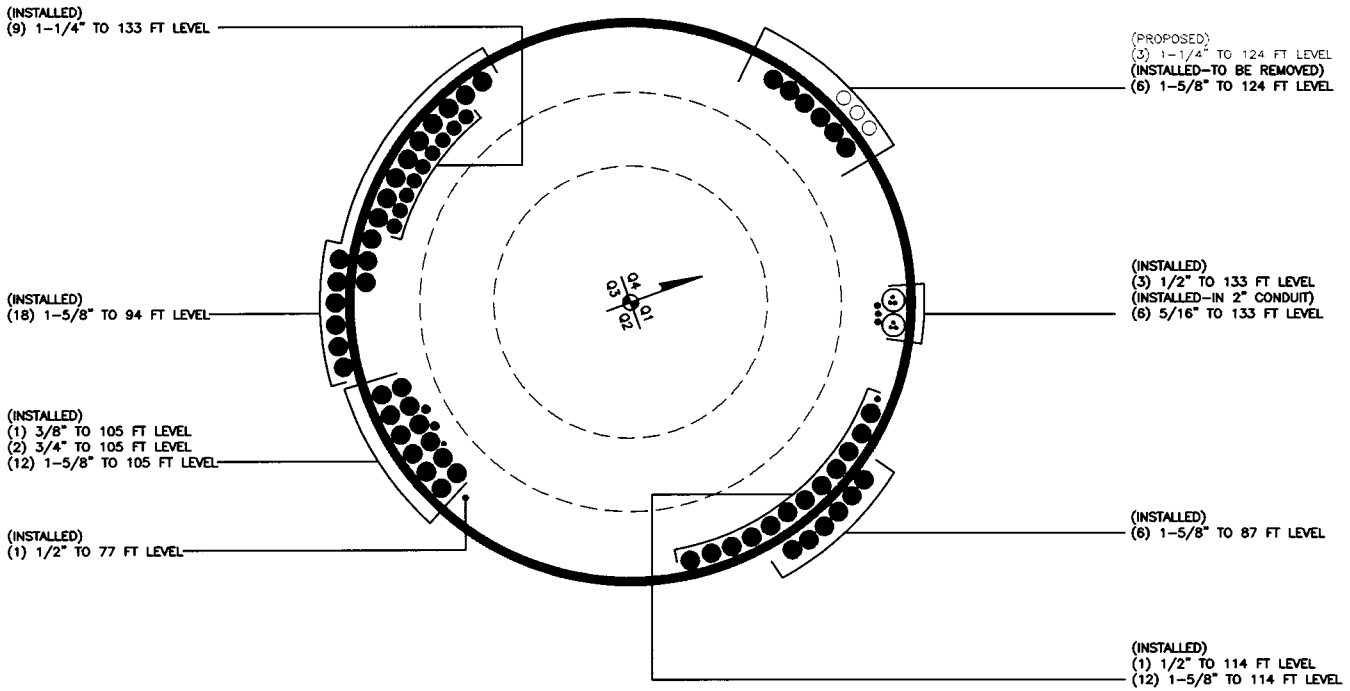
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	145 - 130 (1)	0.004	0.076	0.000	0.024	0.003	0.080 ✓	1.333	H1-3+VT ✓
L2	130 - 84.75 (2)	0.013	0.790	0.000	0.064	0.001	0.805 ✓	1.333	H1-3+VT ✓
L3	84.75 - 44.25 (3)	0.014	1.176	0.000	0.050	0.001	1.191 ✓	1.333	H1-3+VT ✓
L4	44.25 - 0 (4)	0.016	1.273	0.000	0.039	0.001	1.289 ✓	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	145 - 130	Pole	TP26.77x24x0.1875	1	-2.345	822.430	6.0	Pass
L2	130 - 84.75	Pole	TP35.27x26.77x0.25	2	-14.152	1409.767	60.4	Pass
L3	84.75 - 44.25	Pole	TP42.26x33.9247x0.3125	3	-22.259	2112.858	89.3	Pass
L4	44.25 - 0	Pole	TP49.83x40.6625x0.375	4	-35.595	3060.155	96.7	Pass
							Summary	
						Pole (L4)	96.7	Pass
						RATING =	**96.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881364 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *881364*
Site Name: *Newington*
App #: *165639 - Rev 1*

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	3240.082	ft-kips (* Note)
Max. Service Shaft P:	36	kips
Max Axial Force Type:	Comp.	

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

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	4212.106	ft-kips
1.30	Pu:	46.8	kips

Pier Properties		
Concrete:		
Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2
Reinforcement:		
Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	28	
As Total=	43.68	in^2
A s/ Aconc, Rho:	0.0079	0.79%

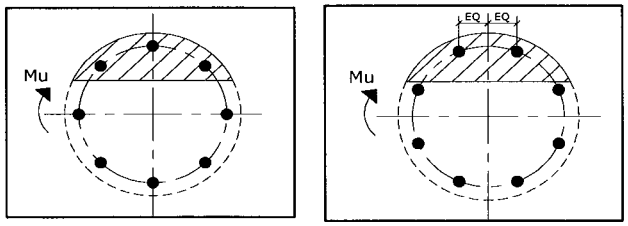
Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2002	
Seismic Properties		
Seismic Design Category =	B	
Seismic Risk =	**Low**	

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

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **15.89** in
Extreme Steel Strain, εt: **0.0118**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Minimum Rho Check:
Actual Req'd Min. Rho: 0.33% Flexural
Provided Rho: 0.79% OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8653.28	kips
at Mu=(ϕ=0.65)Mn=	5213.79	ft-kips
Max Tu, (φ=0.9) Tn =	2358.72	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	46.80	kips
Drilled Shaft Moment Capacity, φMn:	**6642.28**	ft-kips
Drilled Shaft Superimposed Mu:	**4212.11**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**63.4%**

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *881364*
Site Name: *Newington*
App #: *165639 - Rev 1*

Pole Manufacturer:	Other

Bolt Data			
Qty:	18		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	30		

Plate Data		
Diam:	34	in
Thick, t:	1.5	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	4.72	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	26.77	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	25.757	ft-kips
Axial:	2.345	kips
Shear:	4.937	kips
Elevation:	130	feet

If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiffened Cases

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	25.91	kips	Service, ASD
Max Bolt directly applied T:	2.16	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	0.909	in	
Min PL "treq" for actual **T w/ Pry**:	0.194	in	
Min PL "t1" for actual **T w/o Pry**:	0.262	in	
T allowable w/o Prying:	25.91	kips	α'<0 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	2.16	kips	
Non-Prying Bolt Stress Ratio, T/B:	8.3%	Pass	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	1.4	ksi	Service ASD
Allowable Plate Stress:	50.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	2.8%	Pass	Comp. Y.L. Length:
No Prying			13.54
Tension Side Stress Ratio, (treq/t)^2:	1.7%	Pass	

n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: 881364
Site Name: *Newington*
App Number: *165639 - Rev 1*

ACI 318 Version:	2002

Design Reactions		
Shear, **S**:	30.00	kips
Moment, **Mt**:	2972.00	ft-kips
Tower Weight, **Wt**:	36.00	kips
Tower Height, **H**:	145	ft
Base Diameter, **BD**:	49.8	in

Foundation Dimensions		
Caisson Diameter, **CD**:	7.0	ft
Ext. Above Grade, **E**:	0.5	ft
Depth Below Grade, **L**:	25.0	ft
Neglected Depth, **N**:	3.5	ft
Rebar Size, **Sp**:	11	
Rebar Quantity, **mp**:	28	
Tie Size, **tp**:	5	

Material Properties		
Rebar Tensile, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	88	pcf
Clear Cover, **cc**:	4	in

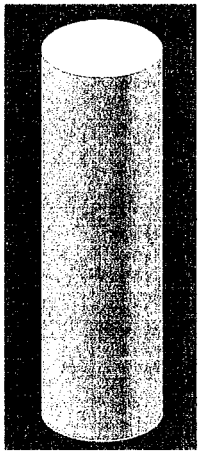
Soil Properties		
Soil Unit Weight, **γ**:	65	pcf
Allowable Bearing, **Bc**:	6.000	ksf
Seismic Design Cat, **z**:	B	

Caisson Analysis		
Depth to Zero Shear:	6.0	ft
Max Factored Moment:	4212.11	ft-kips
Overturning FOS:	2.9	

Depth		Shear		Moment	
2.55	ft	30.3	kips	3147.1	ft-kips
5.1	ft	16	kips	3216.8	ft-kips
7.65	ft	-31.9	kips	3201	ft-kips

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Minimum Req'd Dia. 1 (ft):	7.00	2.76	**OK**
Minimum Req'd Dia. 2 (ft):	7.00	5.65	**OK**
Bearing (ksf):	6.00	0.94	**OK**
Rebar Area (in²):	43.68	18.47	**OK**
Pier moment capacity (k-ft):	6642.28	4212.11	**OK**
Rebar spacing (in):	7.12	2 < Bs <18	**OK**
Development Length (in):	224.58	12.00	**OK**
Soil moment capacity (FOS):	2.90	2.00	**OK**

☐ **Assume 0.33% Minimum Steel?**



Bearing: 15.6%

Steel: 63.4%

Soil: 69.0%

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

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *881364*
Site Name: *Newington*
App #: *165639 - Rev 1*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	57	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	56	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	10	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	49.83	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2972	ft-kips
Unfactored Axial, P:	36	kips
Unfactored Shear, V:	30	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	154.2 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	79.1% Pass

Base Plate Results Flexural Check

Base Plate Stress:	39.4 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	78.9% Pass

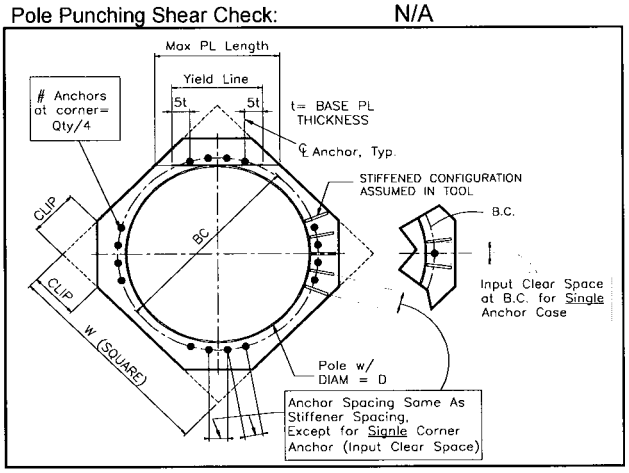
PL Ref. Data
Yield Line (in): 29.37
Max PL Length: 29.37

N/A - Unstiffened
Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



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Crown Castle USA

Project Title: BU# 881364
Project Notes:

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	0.50	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.50	0.00	125.0			
2	Sand	6.50	3.50	125.0		3.537	34.00
3	Sand	2.00	10.00	65.0		3.537	34.00
4	Sand	13.00	12.00	65.0		3.000	30.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
2972.0	36.0	30.00	2.90

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
25.500	147.203	935.4

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	3.50	125.0			0.00	2.25
Sand	4.00	6.50	125.0		3.537	407.36	7.77
Sand	10.50	2.00	65.0		3.537	195.35	11.52
Sand	12.50	4.95	65.0		3.000	480.69	15.06
Sand	17.45	8.05	65.0		3.000	-995.56	21.65

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	87.8	8902.6	30.3	3069.9
2.55	87.8	9126.6	30.3	3147.1
5.10	46.5	9328.9	16.0	3216.8
7.65	-92.6	9282.9	-31.9	3201.0
10.20	-292.1	8805.2	-100.7	3036.3
12.75	-536.7	7750.9	-185.1	2672.7
15.30	-774.4	6084.9	-267.0	2098.2
17.85	-952.5	3796.1	-328.5	1309.0
20.40	-661.6	1732.4	-228.2	597.4
22.95	-344.1	444.4	-118.7	153.3
25.50	0.0	-0.0	0.0	-0.0