CROWN CASTLE

500 West Cummings Park, Suite 3600 Woburn, Ma 01801

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

June 27, 2014

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

RE: Sprint PCS-Exempt Modification - Crown Site BU: 876324
Sprint PCS Site ID: CT03XC057
Located at: 1358 New Britain Avenue, West Hartford, Connecticut

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. Pursuant to the Connecticut Siting Council approval of **EM-Sprint-Nextel-155-130214A, t**his letter is to satisfy item number three of the approval letter that the CSC will be notified in writing within 45 days after completion of construction.

.

Please contact me if you have any questions.

Sincerely,

Jeffrey Barbadora
781-970-0053

EM-SPRINT-NEXTEL-155-130214A

1358 New Britain Ave.

West Hartford

Alcatel·Lucent

1 Robbins Road
Westford, MA 01886

July 9, 2014

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

RE: Notification of Construction Completion on telecommunication facilities

To whom it may concern:

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

Very truly yours,

Martha Powers

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

Cc: FST, Siterra

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

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

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-155-130214A** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located 1358 New Britain Avenue, West Hartford, 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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Scott Slifka, Mayor, Town of West Hartford
Mila Limson, Town Planner, Town of West Hartford

EM-SPRINT-NEXTEL-155-130214A

Crown Castle
3530 Torrington Way Suite 300
Charlotte NC 28277

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

February 8, 2013

ORIGINAL

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

RE: Sprint Nextel-Exempt Modification Request- Crown Site BU 876324, Sprint Nextel Site CT03XC057 – Located at 1358 New Britain Avenue, West Hartford, CT 06110

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 the Town Clerk Essie Labrot for the Town of West Hartford.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at1358 New Britain Avenue, West Hartford, CT 06110. 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 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.

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 West Hartford, Town Clerk, Essie Labrot

SHEET INDEX

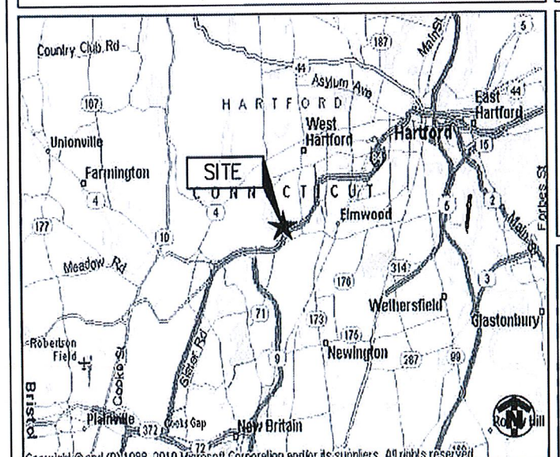
NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	COMPOUND SITE PLAN & ELEVATION
C3	EQUIPMENT SITE PLANS
C4	EQUIPMENT DETAILS
C5	ANTENNA PLANS
C6	ANTENNA CABLE RISER
C7	EQUIPMENT DETAILS
C8	RF AND CABLE DETAILS
C9	FIBER DISTRIBUTION BOX DETAILS
E1	UTILITY SITE PLAN
E2	DETAILS
E3	GROUNDING PLAN AND DETAILS

DRIVING DIRECTIONS

DEPART FROM SPRINT:
1 INTERNATIONAL BLVD MAHWAH, NJ 07430

1. HEAD NORTH ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD.
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/NY. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N.
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.
8. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD.
9. KEEP LEFT AT THE FORK AND MERGE ONTO SAW MILL RIVER PARKWAY N.
10. TAKE THE EXIT TOWARD I-684 N.
11. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-684/BREWSTER AND MERGE ONTO I-684 N.
12. TAKE EXIT 9E FOR INTERSTATE 84 E TOWARD DANBURY.
13. MERGE ONTO I-84 E.
14. SLIGHT RIGHT TO STAY ON I-84 E.
15. SLIGHT RIGHT TO STAY ON I-84 E.
16. TAKE EXIT 41 FOR SOUTH MAIN STREET TOWARD ELMWOOD.
17. TURN RIGHT ONTO S MAIN ST.
18. TAKE THE 1ST RIGHT ONTO NEW BRITAIN AVE.

VICINITY MAP



Sprint™

NETWORK VISION MMBTS LAUNCH
NORTHERN CONNECTICUT MARKET

SITE NAME

WEST HARTFORD UNITED METHODIST CHURCH

SITE NUMBER

CT03XC057

SITE ADDRESS

1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

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 SUMMARY

SITE NAME:	WEST HARTFORD UNITED METHODIST CHURCH	
SITE NO.:	CT03XC057	
SITE ADDRESS:	1358 NEW BRITAIN AVENUE WEST HARTFORD, CT 06110	
COUNTY:	HARTFORD	
SITE COORDINATES:		
LATITUDE:	41° 43' 50.3682" N	(NAD 83)
LONGITUDE:	72° 45' 13.1688" W	(NAD 83)
GROUND ELEV.:	±160'	(AMSL)
JURISDICTION:	CONNECTICUT SITING COUNCIL	
ZONING CLASSIFICATION:	RESIDENTAL	
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	

PROJECT TEAM

ALCATEL·LUCENT

1 ROBBINS ROAD
WESTFORD, MA 01886

PROJECT MANAGER

INFINIGY Design. Build. Deliver.

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

ENGINEER

SCOPE OF WORK:

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

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:

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

LICENSED ENGINEER – STATE OF CONNECTICUT

APPROVALS

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

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

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

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

No	Submittal / Revision	Appd	Date
1	REVISED PER COMMENTS	KMF	1/28/13
0	ISSUED FOR REVIEW	KMF	11/13/12

Drawn: KMF Date: 11/13/12
Designed: AJD Date: 11/13/12
Checked: AGF Date: 11/13/12

Project Number 294-042

Project Title

WEST HARTFORD UNITED METHODIST CHURCH
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For

Sprint VISION

Drawing Scale: AS NOTED
Date: 11/13/12

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
	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

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

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No.	Submittal / Revision	App'd	Date
1	REVISED PER COMMENTS	KMF	1/28/13
0	ISSUED FOR REVIEW	KMF	11/13/12

Drawn: KMF Date: 11/13/12
Designed: AJD Date: 11/13/12
Checked: AGF Date: 11/13/12

Project Number: 294-042

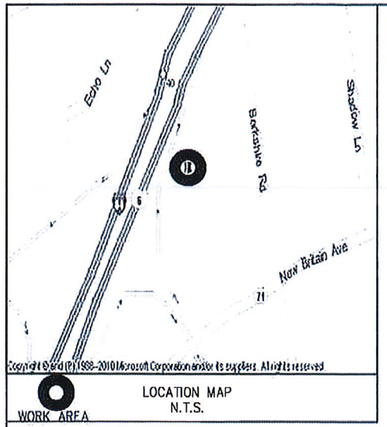
Project Title:
WEST HARTFORD UNITED METHODIST CHURCH
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For: Sprint VISION

Drawing Scale: AS NOTED
Date: 11/13/12

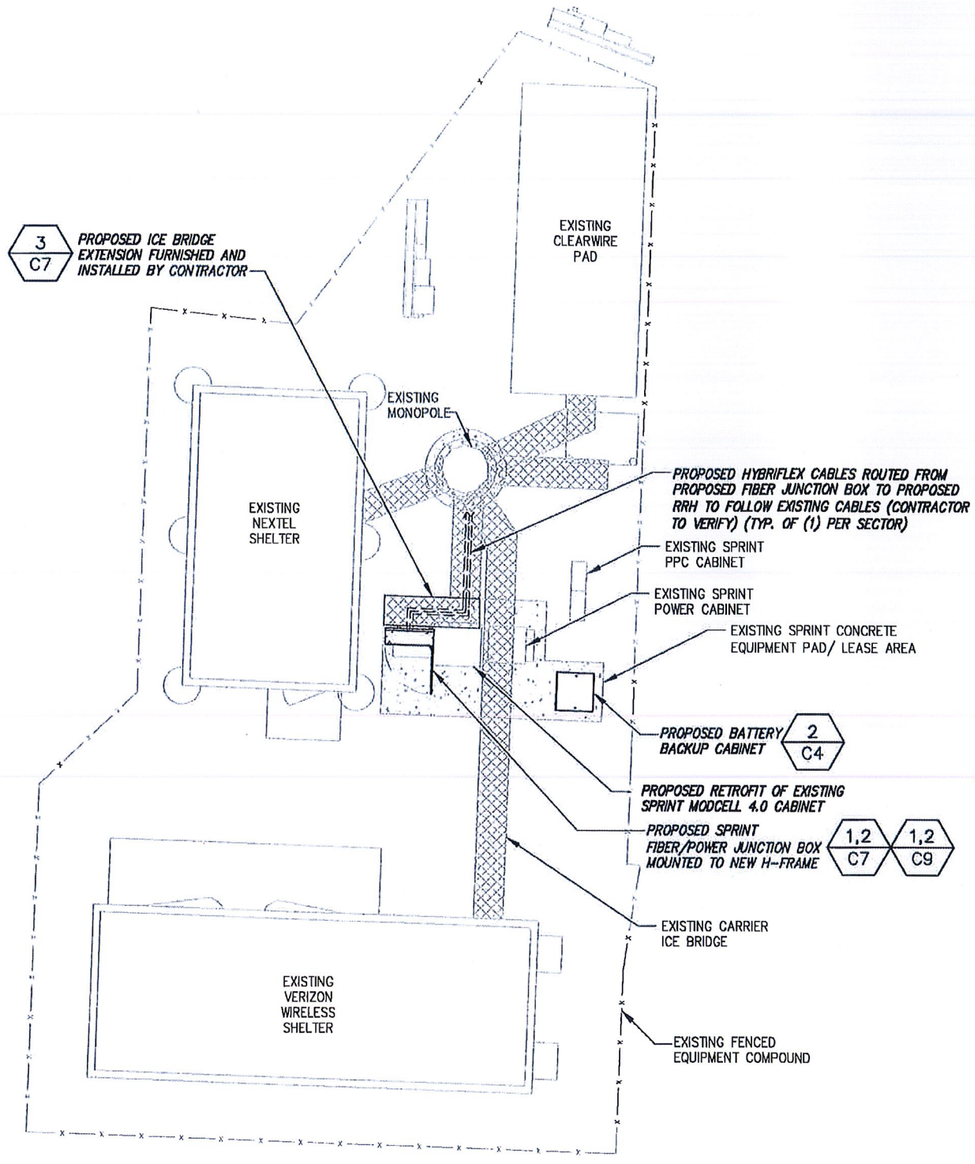
Drawing Title: GENERAL NOTES

Drawing Number: C1



LOCATION MAP
N.T.S.

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.



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

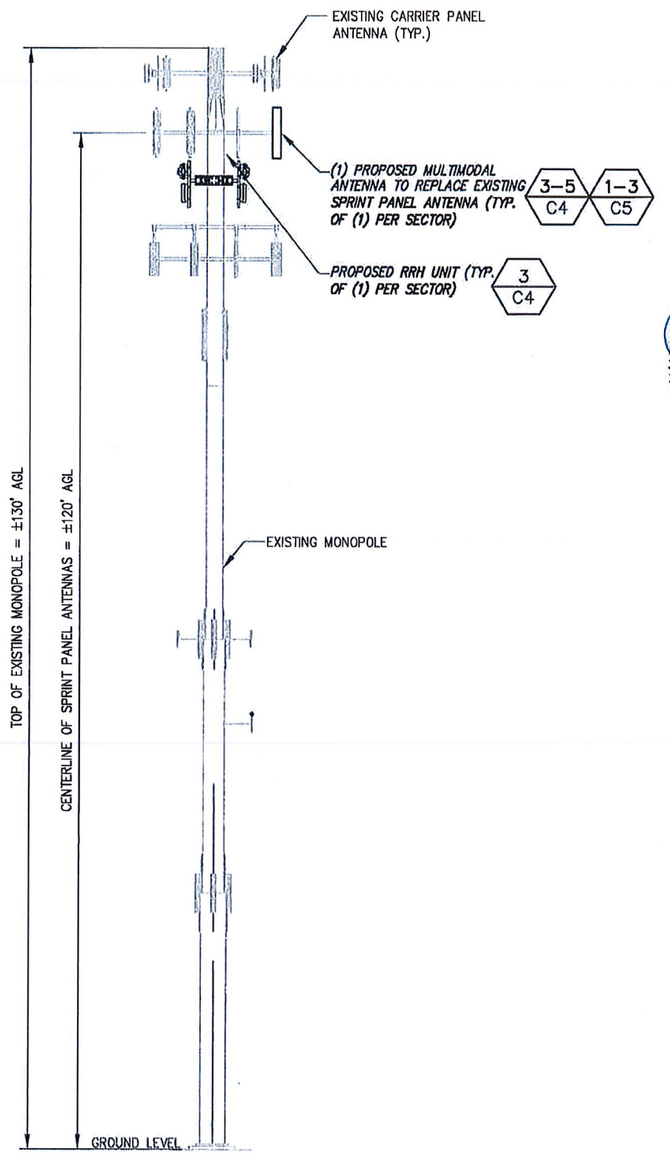
NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 – 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A – WTHRPRF – STD CONSTR SPECS._15720111042185542 9.DOCM"
3. REFER TO: "COLOR CODING-SPRINT NEXTEL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

CALLED NORTH

1 — COMPOUND SITE PLAN
SCALE: AS NOTED

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

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY TOWER ENGINEERING PROFESSIONALS DATED: 10/29/12



2 — SITE ELEVATION
NOT TO SCALE

INFINIGY Design. Build. Deliver.
11 Herbert Drive
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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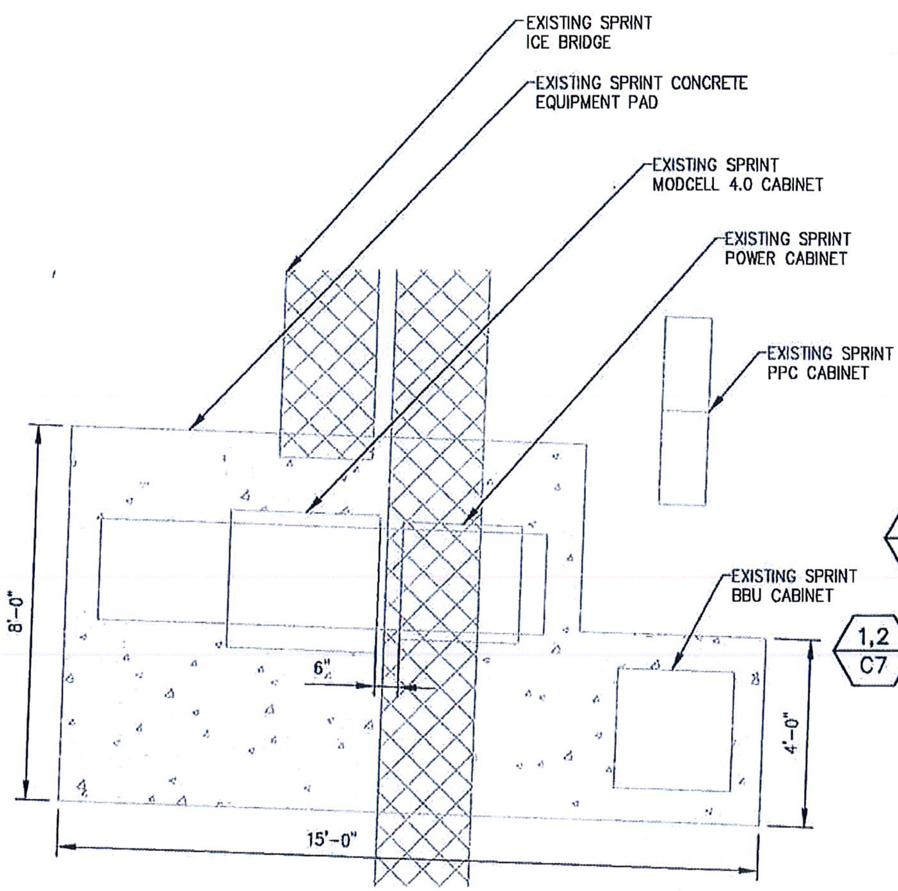
Prepared For
Sprint VISION

Drawing Scale:
AS NOTED
Date:
11/13/12

Drawing Title
COMPOUND SITE PLAN & ELEVATION

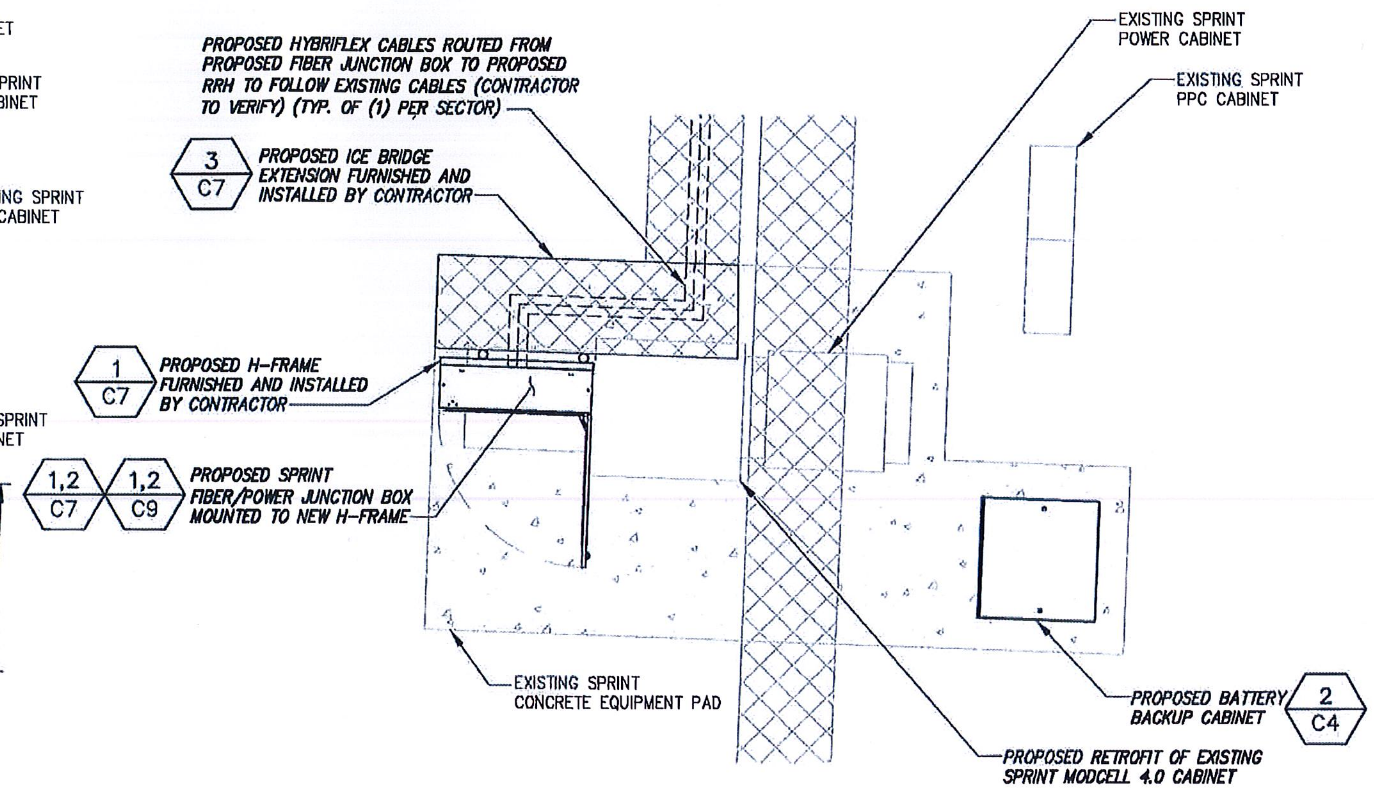
Drawing Number
C2



CALLED NORTH

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

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



CALLED NORTH

2 / -- 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"

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

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

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

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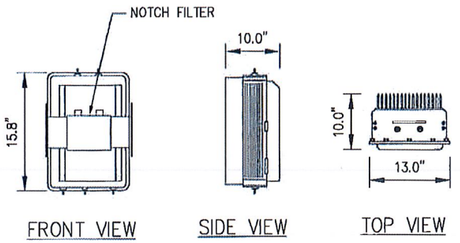
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For: Sprint VISION

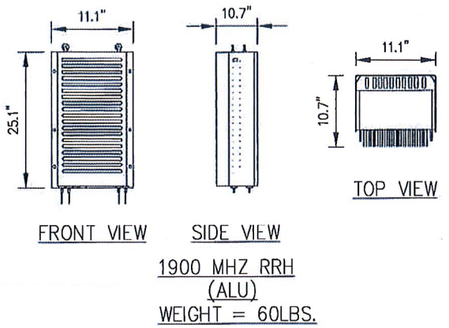
Drawing Scale: AS NOTED
Date: 11/13/12

Drawing Title: EQUIPMENT SITE PLANS

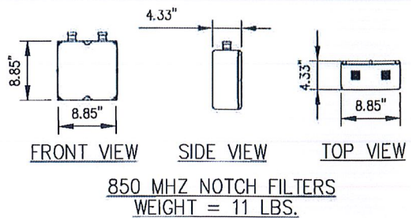
Drawing Number: C3



800 MHZ RRH
(ALU)
WEIGHT = 50.6LBS.



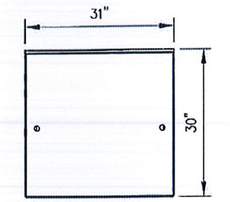
1900 MHZ RRH
(ALU)
WEIGHT = 60LBS.

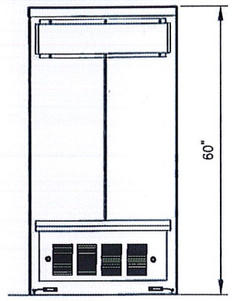


850 MHZ NOTCH FILTERS
WEIGHT = 11 LBS.

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

1 RRH EQUIPMENT DETAILS
NOT TO SCALE

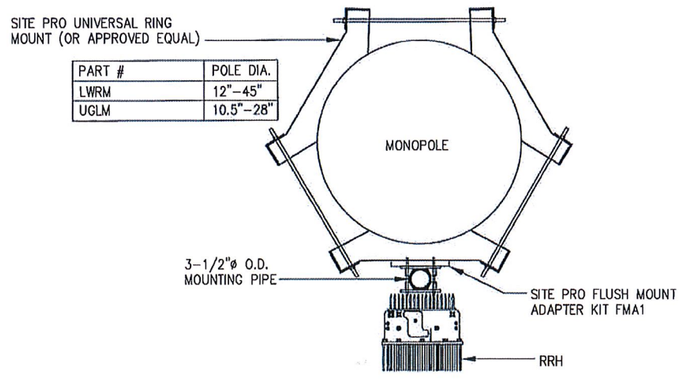




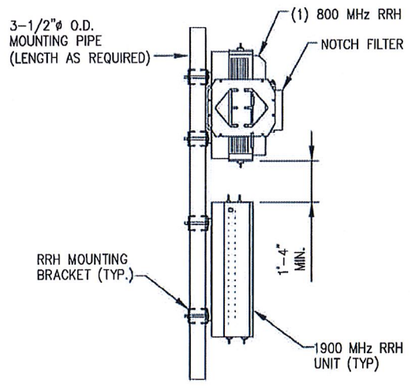
2 BATTERY CABINET PROFILE
NOT TO SCALE

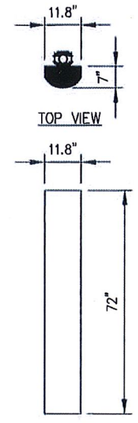
DESIGN CRITERIA:

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



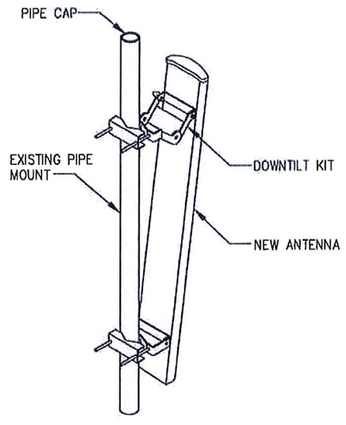
3 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE





RFS ANTENNA
P/N: APXVSPP18-C-A20

4 ANTENNA DETAILS
NOT TO SCALE



5 PANEL ANTENNA
MOUNT DETAIL
NOT TO SCALE

INFINIGY
Design. Build. Deliver.
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Fax # (518) 690-0793

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JOHN S. STEVENS
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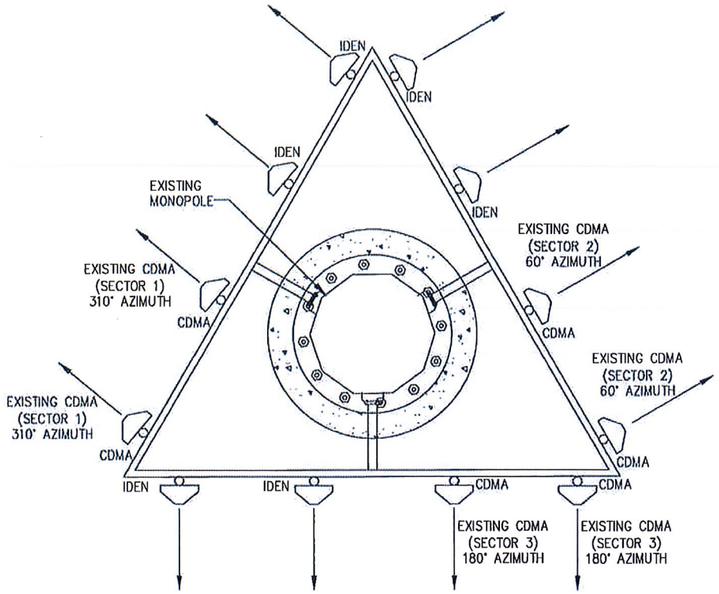
UNITED
METHODIST CHURCH
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For
Sprint VISION

Drawing Scale: AS NOTED
Date: 11/13/12

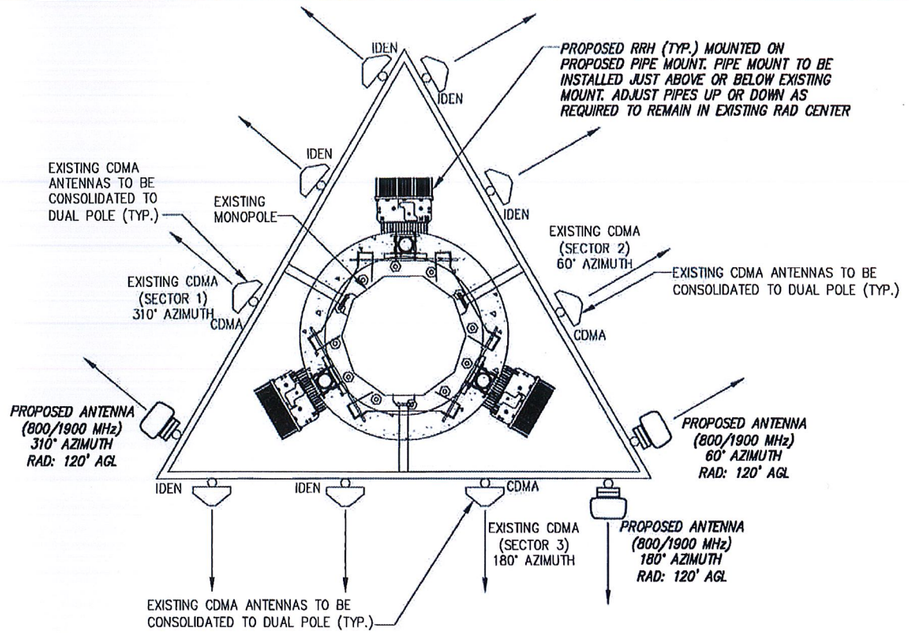
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C4



1 ANTENNA CONFIGURATION (EXISTING)
NOT TO SCALE

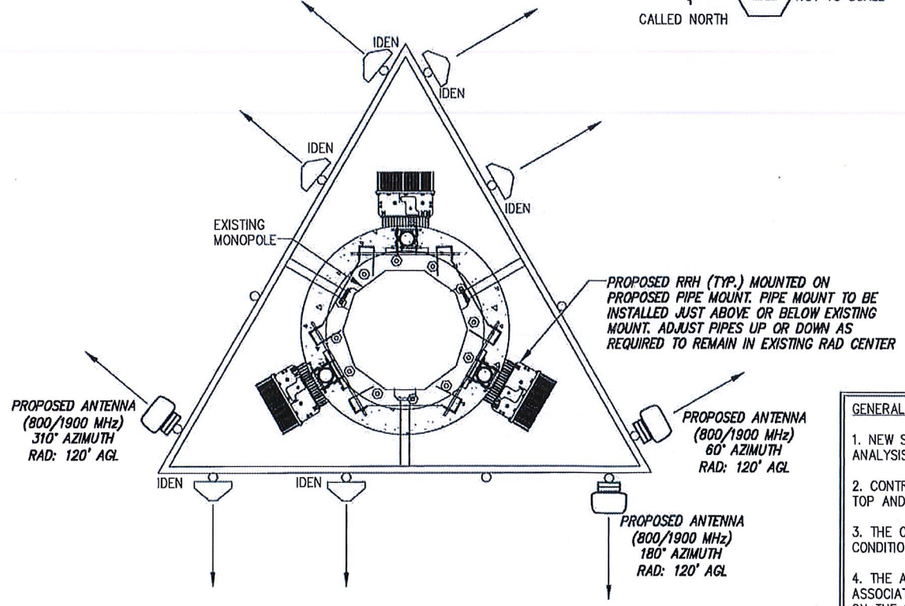
CALLED NORTH



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

NOTE:
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY TOWER ENGINEERING PROFESSIONALS DATED: 10/29/12

RRH NOTES:

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

GENERAL NOTES:

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

INFINIGY Design. Build. Deliver.
11 Herbert Drive
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	1/28/13
0	ISSUED FOR REVIEW	KMF	11/13/12

Drawn: KMF Date: 11/13/12
Designed: AJD Date: 11/13/12
Checked: AGF Date: 11/13/12

Project Number
294-042

Project Title

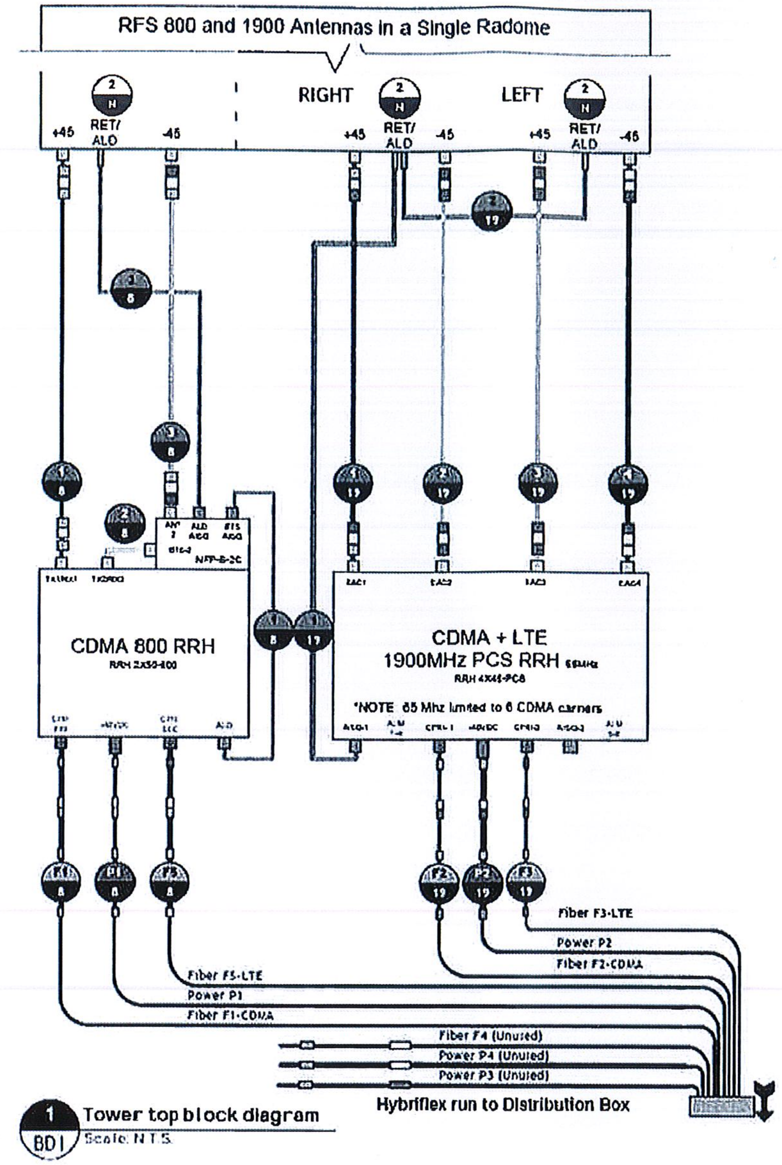
WEST HARTFORD UNITED METHODIST CHURCH
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For
Sprint VISION

Drawing Scale:
AS NOTED
Date:
11/13/12

Drawing Title
ANTENNA PLANS

Drawing Number
C5



SCENARIO 124 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.

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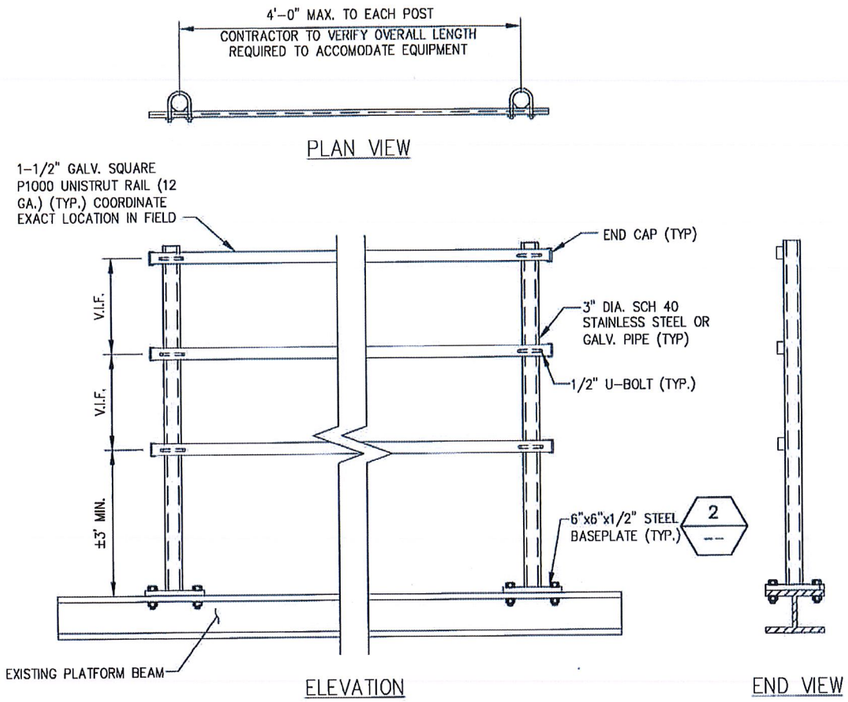
Prepared For: Sprint VISION

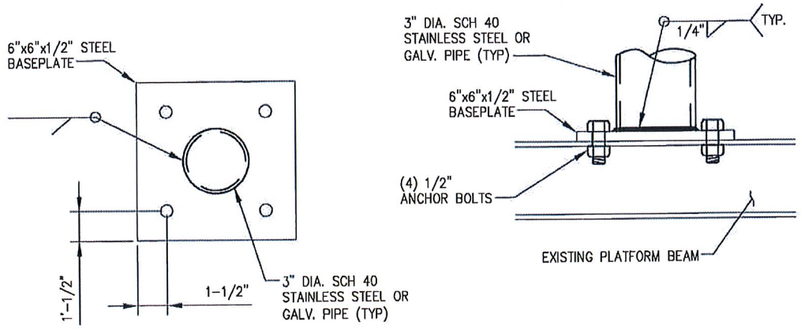
Drawing Scale: AS NOTED
Date: 11/13/12

Drawing Title: **ANTENNA CABLE RISER DETAILS**

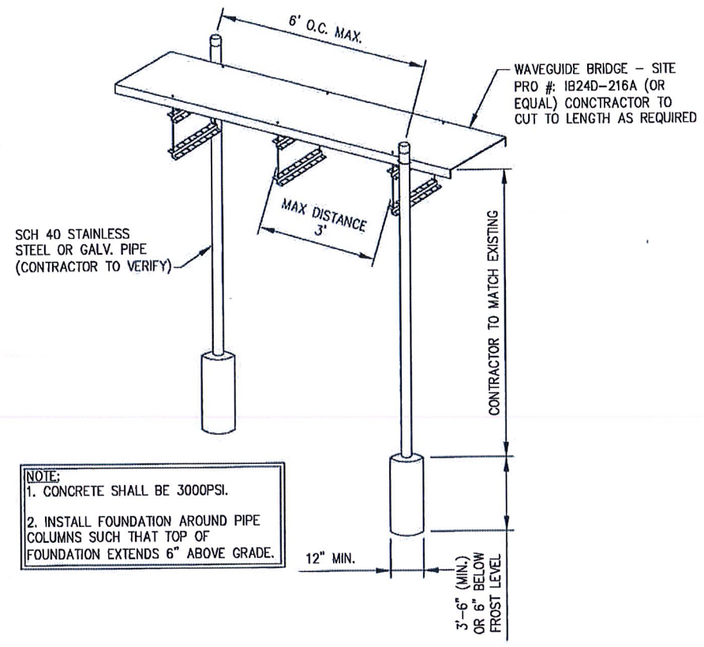
Drawing Number: **C6**



1 H-FRAME FABRICATION DETAIL
NOT TO SCALE



2 SUPPORT POST MOUNTING DETAIL
NOT TO SCALE



NOTE;
1. CONCRETE SHALL BE 3000PSI.

2. INSTALL FOUNDATION AROUND PIPE COLUMNS SUCH THAT TOP OF FOUNDATION EXTENDS 6" ABOVE GRADE.

3 TYPICAL ICE BRIDGE DETAIL
NOT TO SCALE

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Drawing Scale:
AS NOTED

Date:
11/13/12

Drawing Title
EQUIPMENT DETAILS

Drawing Number
C7

	Market	Northern Connecticut		
	Cascade ID	CT03XC057		
		SECTOR 1	SECTOR 2	SECTOR 3
	Split sector present	No	No	No
1900	1900MHz_Azimuth	310	60	180
	1900MHz_No_of_Antennas	1	1	1
	1900MHz_RADCenter(ft)	120	120	120
	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	0	-1	-1
	1900MHz _M_Tilt	0	0	0
	1900MHz_Carrier_Forecast_Year_2013	3	3	3
	1900MHz_RRH Manufacturer	ALU	ALU	ALU
	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count	1	1	1
	1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
	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)	N/A	N/A	N/A
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)	N/A	N/A	N/A
	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	310	60	180
	800MHz_No_of_Antennas	0	0	0
	800MHz_RADCenter(ft)	120	120	120
	800MHz_AntennaMake	RFS	RFS	RFS
	800MHz_AntennaModel	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth	65	65	65
	800MHz_Vertical_Beamwidth	11.5	11.5	11.5
	800MHz_AntennaHeight (ft)	6	6	6
	800MHz_AntennaGain (dBd)	13.4	13.4	13.4
	800MHz_E_Tilt	-1	-8	-8
	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 *	124	124	124
Comments	* If plumbing scenario does not match the material received, please contact your Construction Manager			
	11/9/2012			

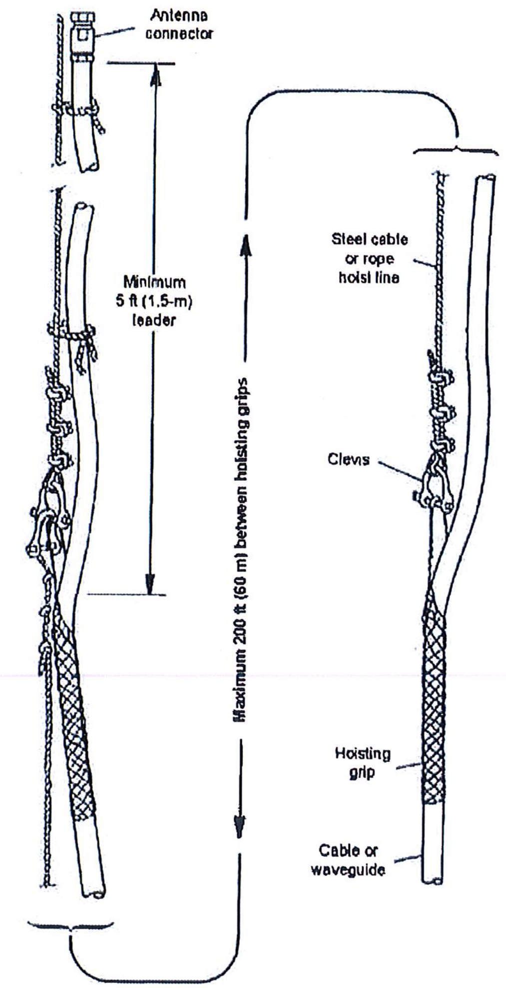
1 SPRINT RFDS
NOT TO SCALE

CHECK FST FOR LATEST VERSION OF RFDS

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. 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

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._1572011104218554 29.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.

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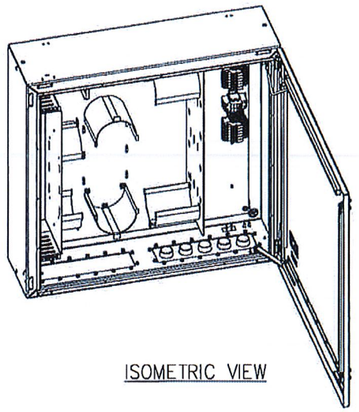
Prepared For
Sprint
VISION

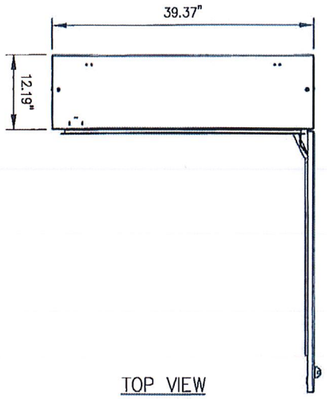
Drawing Scale: AS NOTED
Date: 11/13/12

Drawing Title
RF AND CABLE DETAILS

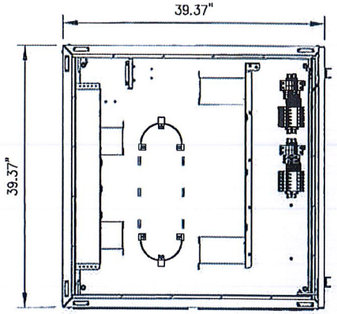
Drawing Number
C8



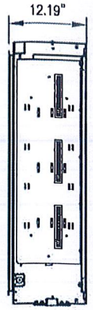
ISOMETRIC VIEW



TOP VIEW

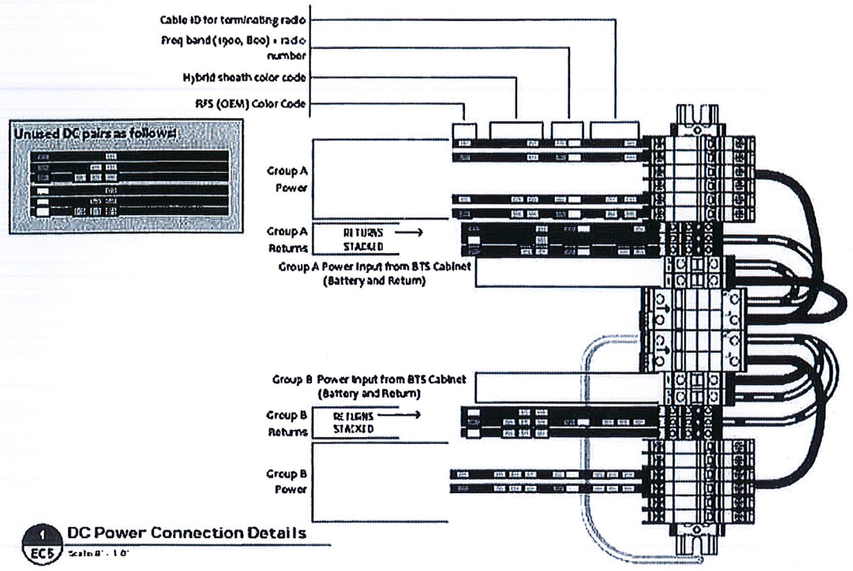


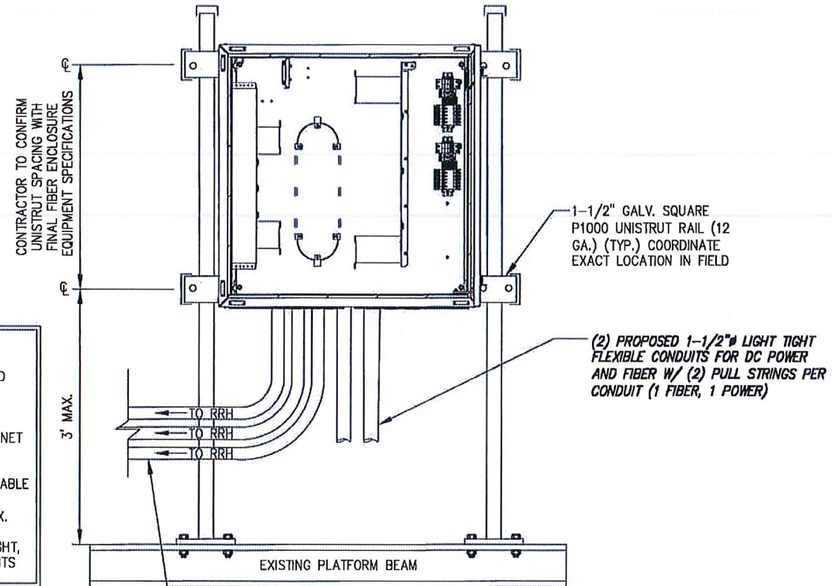
FRONT VIEW



SIDE VIEW

1 EC5 **DC Power Connection Details**
Scale: 1" = 1'-0"





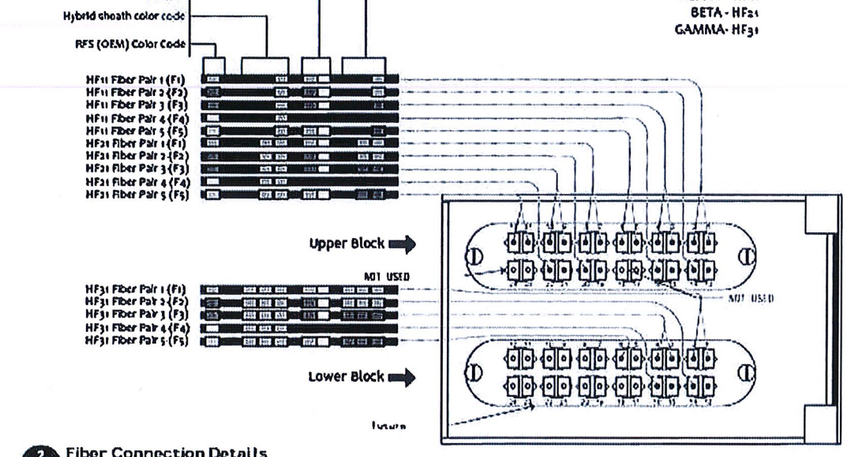
NOTE:
– DISTRIBUTION BOX IS KITTED WITH 50' OF 1–1/2" LIQUID–TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
* SPLIT IN HALF,
* TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
* RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.

– DISTRIBUTION BOX IS KITTED WITH 2 AWG, POWER CABLE 35' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.

– BTS INSTALLATION TEAM WILL TERMINATE LIQUID–TIGHT, RUN THE FIBER JUMPERS AND POWER CABLES FROM BTS CABINET TO DISTRIBUTION BOX.

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

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



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

ALPHA – HF11
BETA - HF21
GAMMA- HF31

2 EC5 **Fiber Connection Details**
Scale: 1" = 1'-0"

SCENARIO 124 v2.0

3 -- FIBER & DC CONNECTION DETAILS
NOT TO SCALE

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Drawing Scale:
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Date:
11/13/12

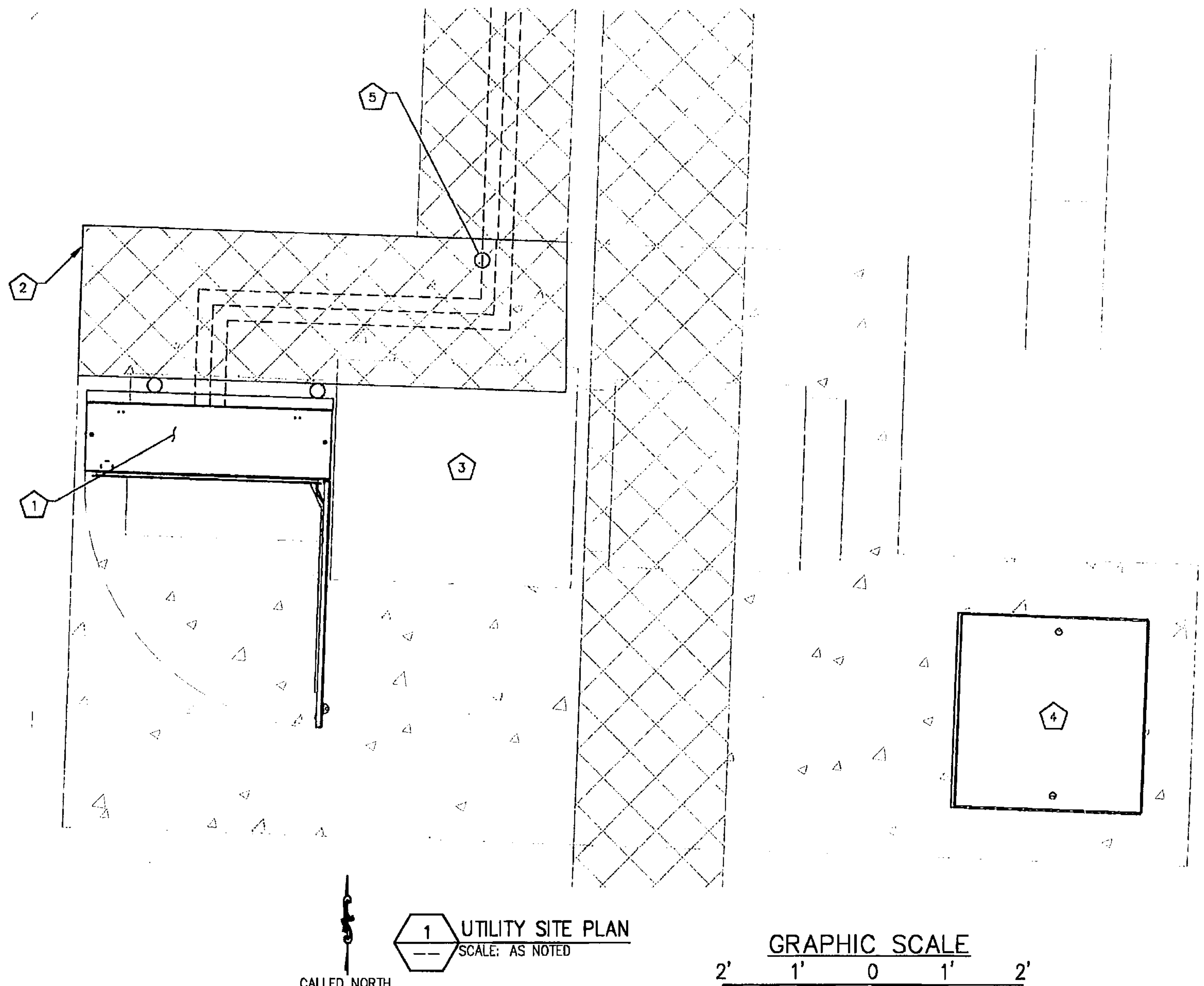
Drawing Title
FIBER DISTRIBUTION BOX DETAILS

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 RETROFIT OF EXISTING SPRINT MODCELL 4.0 CABINET
4. PROPOSED BATTERY BACKUP CABINET
5. PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)

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



1 UTILITY SITE PLAN
SCALE: AS NOTED

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

ELECTRICAL NOTES:

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

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

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

NOTES:

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

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

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

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

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

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

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

No	Submittal / Revision	App'd	Date
1	REVISED PER COMMENTS	KMF	1/28/13
0	ISSUED FOR REVIEW	KMF	11/13/12

Drawn: KMF Date: 11/13/12
Designed: AJD Date: 11/13/12
Checked: AGF Date: 11/13/12

Project Number 294-042

Project Title
WEST HARTFORD UNITED METHODIST CHURCH
CT03XC057
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

Prepared For
Sprint VISION

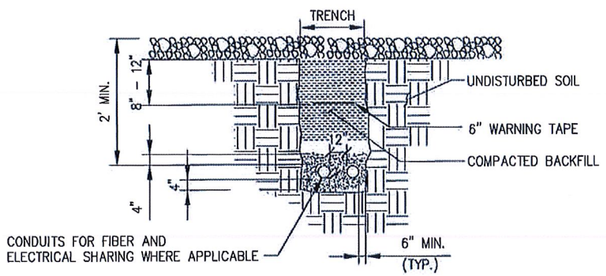
Drawing Scale: AS NOTED

Date: 11/13/12

Drawing Title
UTILITY SITE PLAN

Drawing Number
E1

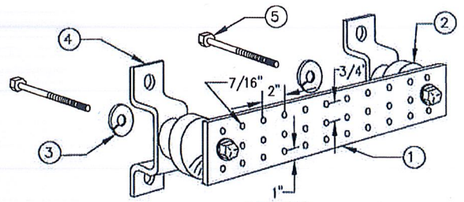
GROUNDING NOTES:
IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC. CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT.



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

***HAND DIG INSIDE COMPOUND**

1 — UTILITY TRENCH DETAIL
NOT TO SCALE

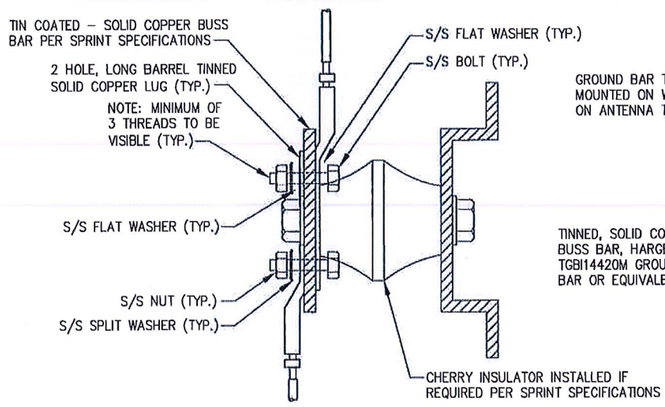


LEGEND

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.

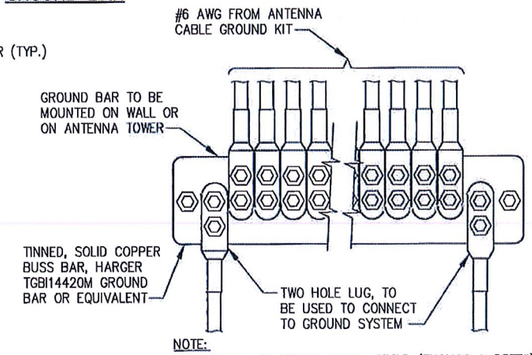
NOTE:
1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
2) ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGBI14420M.

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

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STATE OF CONNECTICUT
JOHN S. STEVENS
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Prepared For

Sprint VISION

Drawing Scale: AS NOTED
Date: 11/13/12

Drawing Title

DETAILS

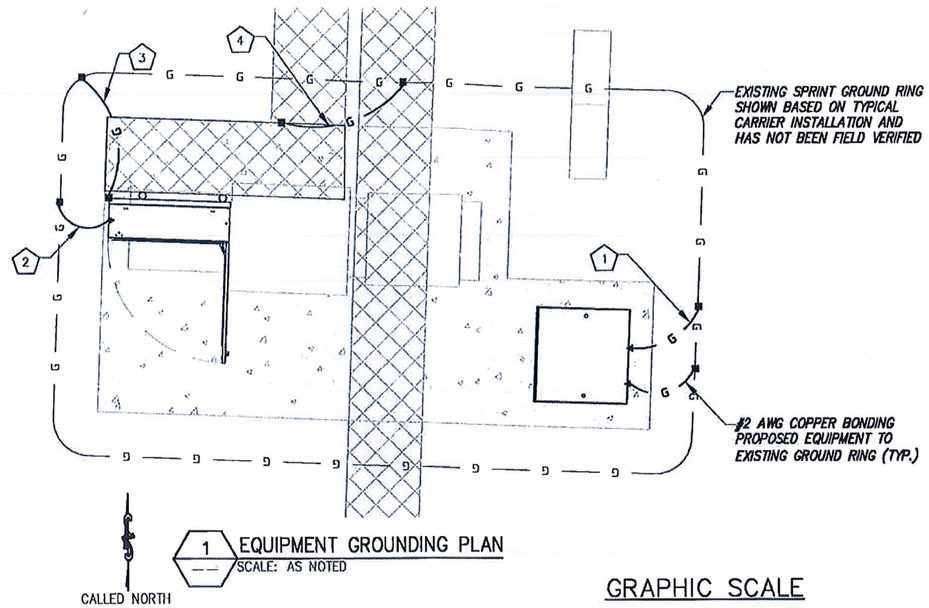
Drawing Number

E2

CODED NOTES:

1. PROPOSED BATTERY BACKUP CABINET
2. PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME
3. PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR
4. PROPOSED ICE BRIDGE EXTENSION FURNISHED AND INSTALLED BY CONTRACTOR

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



1 EQUIPMENT GROUNDING PLAN
SCALE: AS NOTED

GRAPHIC SCALE

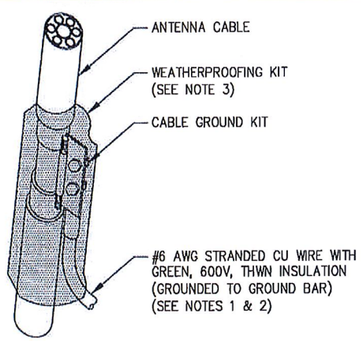
4' 2' 0 2' 4'

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

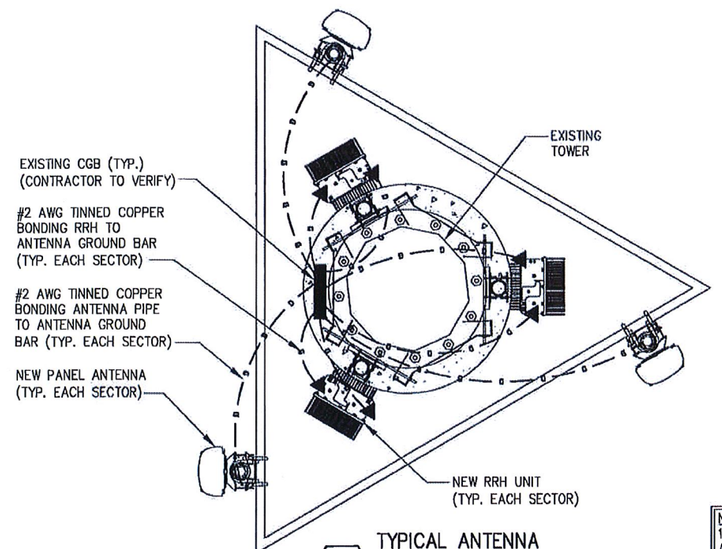
GROUNDING NOTES:

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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Sprint VISION

Drawing Scale: AS NOTED
Date: 11/13/12

Drawing Title

GROUNDING PLAN AND DETAILS

Drawing Number

E3

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC057

West Hartford United Methodist Church
1358 New Britain Avenue
West Hartford, CT 06110

December 9, 2012

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

EBI Consulting
environmental | engineering | due diligence

December 9, 2012

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

Re: Emissions Values for Site: **CT03XC057 – West Hartford United Methodist Church**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 1358 New Britain Avenue, West Hartford, 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 1358 New Britain Avenue, West Hartford, 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) 3 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 **116 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	CT03XC057 - West Hartford United Methodist Church
Site Addresss	1358 New Britain Avenue, West Hartford, CT, 06110
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	3	60	15.9	116	110	1/2 "	0.5	0	2080.4211	61.81187	6.18119%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	116	110	1/2 "	0.5	0	389.96892	11.58646	2.04347%
														Sector total Power Density Value:		8.225%	

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	3	60	15.9	116	110	1/2 "	0.5	0	2080.4211	61.81187	6.18119%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	116	110	1/2 "	0.5	0	389.96892	11.58646	2.04347%
														Sector total Power Density Value:		8.225%	

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	3	60	15.9	116	110	1/2 "	0.5	0	2080.4211	61.81187	6.18119%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	116	110	1/2 "	0.5	0	389.96892	11.58646	2.04347%
														Sector total Power Density Value:		8.225%	

Site Composite MPE %	
Carrier	MPE %
Sprint	24.674%
Nextel	3.480%
Clearwire	1.190%
AT&T	4.380%
Verizon Wireless	23.250%
Pocket	7.390%
T-Mobile	5.730%
Total Site MPE %	70.094%

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **24.674% (8.225% 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 **70.094%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

Date: **October 29, 2012**

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3703 Junction Blvd.
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crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate *SNV* Final**	
	Carrier Site Number:	CT03XC057
	Carrier Site Name:	CT03XC057
Crown Castle Designation:	**Crown Castle BU Number:**	876324
	Crown Castle Site Name:	West Hartford United Methodist
	Crown Castle JDE Job Number:	190519
	Crown Castle Work Order Number:	540588
	Crown Castle Application Number:	165356 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	128057
Site Data:	**1358 New Britain Avenue, West Hartford, Hartford County, CT 06110** **Latitude *41° 43' 50.37"*, Longitude *-72° 45' 13.17"*** **130 Foot - Monopole Tower**	

Dear Molly Carder,

Tower Engineering Professionals 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 496326, in accordance with application 165356, 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 (Final Configuration) **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures and the 2005 Connecticut State Building Code (2003 International 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 appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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: Augusta A. Carroll, P.E. / MDF

Respectfully submitted by:

Andrew T. Haldane, P.E.

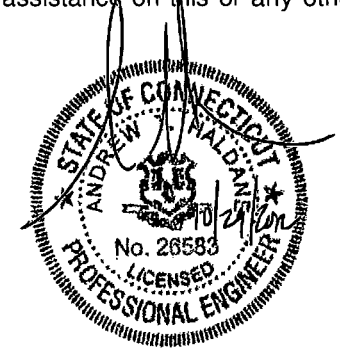


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 130-ft monopole tower. The tower was originally designed as a 120-ft tower by Rohn in January of 1997 for a wind speed of 85 mph per ANSI/EIA-222-E for the appurtenances listed in Table 3. A 10-ft extension was added to bring the tower to a height of 130-ft per modification drawings prepared by TEP in October of 2010. The tower has been modified multiple times in the past to accommodate additional loading. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch escalating 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
116.0	116.0	3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		3	Alcatel Lucent	800MHz 2X50W RRH w/ Filter			
114.0	114.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
		1	Tower Mounts	Side Arm Mount [SO 102-3]			

Notes:
1) See "Appendix B – Base Level Drawing" for assumed feed line configuration.

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
127.0	127.0	3	Argus Technologies	LLPX310R w/ Mount Pipe	3 3 3	1/2 1/4 5/16	1
		3	Dragonwave	A-ANT-18G-2-C			
		3	Dragonwave	Horizon Compact			
		3	Samsung Telecommunications	Wimax Dap Head			
		1	Tower Mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
116.0	116.0	4	Decibel	950F65T2E-M w/ Mount Pipe	6 12 3	1-1/4 7/8 7/8	2
		2	Decibel	950F85T2E-M w/ Mount Pipe			
		1	EMS Wireless	RR65-12-00DBL w/ Mount Pipe			
		2	EMS Wireless	RR90-11-00DBL w/ Mount Pipe			
		1	EMS Wireless	RR65-12-00DBL w/ Mount Pipe			
		2	EMS Wireless	RR90-11-00DBL w/ Mount Pipe			
		1	Tower Mounts	Platform Mount [LP 502-1]	-	-	1
105.0	105.0	3	Antel	BXA-70063/4CF w/ Mount Pipe	12	7/8	1
		6	Antel	LPA-80063/4CF w/ Mount Pipe			
		6	RFS Celwave	FD9R6004/2C-3L			
		3	Rymsa Wireless	MG D3-800Tx w/ Mount Pipe			
		1	Tower Mounts	Platform Mount [LP 502-1]			
96.0	96.0	3	RFS Celwave	APX18-206517-CT2 w/ Mount Pipe	6	1-5/8	1
		1	Tower Mounts	Pipe Mount [PM 602-3]			
60.0	60.0	2	Kathrein	OG-860/1920/GPS-A	2	1/2	1
		2	Tower Mounts	Side Arm Mount [SO 701-1]			
50.0	50.0	1	Lucent	KS24019-L112A	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)
120.0	120.0	12	Swedcom	ALP 9212	12	1-5/8
		1	Tower Mount	Cellular Platform		
100.0	100.0	12	Swedcom	ALP 9212	12	1-5/8
		1	Tower Mount	Cellular Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	SEA Consultants, Inc.	1529734	CCISites
Post-Modification Inspection	Tower Engineering Professionals, Inc.	2745780	CCISites
Post-Modification Inspection	Vertical Solutions	2364340	CCISites
Tower Foundation Drawings	Rohn	1615437	CCISites
Tower Manufacturer Drawings	Rohn	1771422	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals, Inc.	2745779	CCISites
Previous Structural Analysis	Tower Engineering Professionals, Inc.	2745778	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.

For analysis of monopole shaft reinforcements, the plates are modeled as linear appurtenances along the exterior of the pole. The loads calculated from tnxTower are then exported to a proprietary calculation sheet created by Tower Engineering Professionals, Inc. that analyzes each reinforcing element along each critical axis and presents percent capacities for each element and the pole shaft along each critical axis. The actual percent capacity of the tower structure including the reinforcing elements is reported in Table 4 - Section Capacity (Summary).

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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	130 - 120	Pole	Pipe 16" O.D. x 0.1875"	1	-0.69	304.91	13.1	Pass
L2	120 - 90	Pole	P24x0.25	2	-6.00	589.19	93.5	Pass
L3-L4	90 - 60	Pole	P24x0.375	Note 1	Note 1	Note 1	97.6	Pass
L5-L6	60 - 30	Pole	P30x0.375	Note 1	Note 1	Note 1	95.6	Pass
L7-L8	30 - 0	Pole	P36x0.375	Note 1	Note 1	Note 1	99.9	Pass
M1	75 – 60	Shaft Reinforcement	(3) PL1x4.5	Note 1	Note 1	Note 1	89.6	Pass
M2	60 – 30	Shaft Reinforcement	(3) PL1x4.5	Note 1	Note 1	Note 1	87.3	Pass
M3	43 – 30.33	Shaft Reinforcement	(3) PL1.25x3.25	Note 1	Note 1	Note 1	97.0	Pass
M4	30 – 0	Shaft Reinforcement	(3) PL1x6	Note 1	Note 1	Note 1	77.7	Pass
M5	22 – 0	Shaft Reinforcement	(3) PL1.25x3.375	Note 1	Note 1	Note 1	97.5	Pass
							Summary	
						Pole (L7-L8)	99.9	Pass
						Shaft Reinforcement (M5)	97.5	Pass
						RATING =	**99.9**	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Anchor Rods and Base Plate	-	84.4	Pass
1	Reinforcing Anchor Rods	-	70.6	Pass
1, 2, 3	Flange Connection	30.0	67.4	Pass
1, 2, 3	Flange Connection	60.0	60.8	Pass
1, 2, 3	Flange Connection	90.0	48.7	Pass
1	Flange Connection	120.0	9.8	Pass
1	Base Foundation Soil Interaction	-	44.7	Pass
1	Base Foundation Structural	-	97.9	Pass

Structure Rating (max from all components) =	**99.9%**

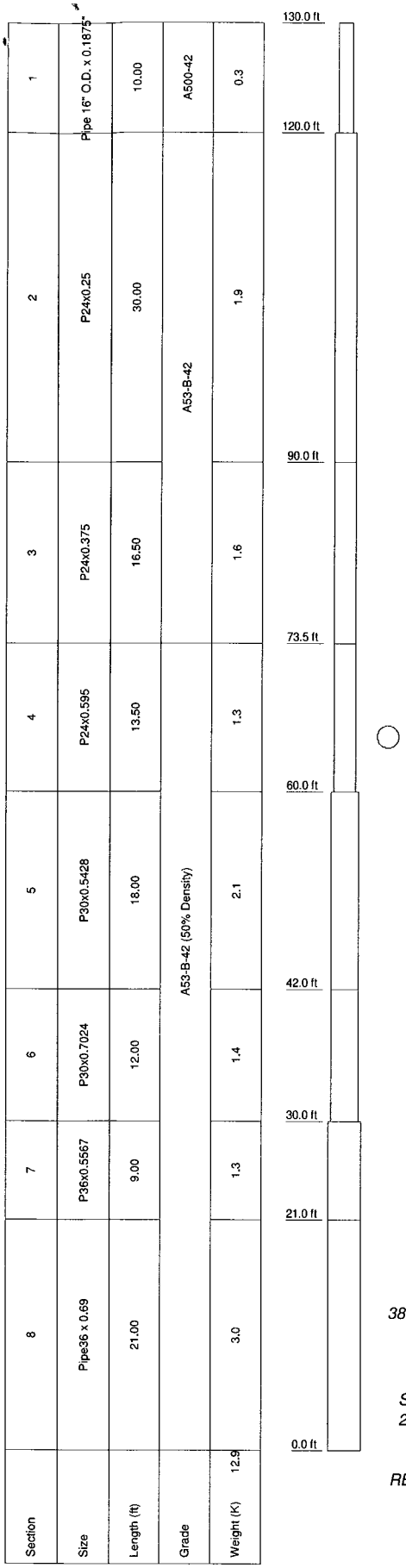
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.
3) Flange plates have the same capacity as their respective splice bolts.

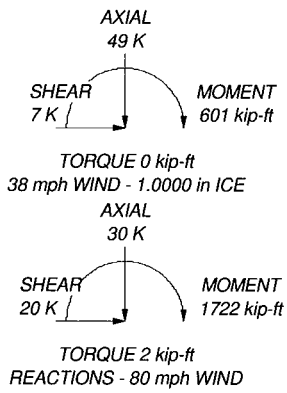
4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	127	(2) FD9R6004/2C-3L	105
LLPX310R w/ Mount Pipe	127	MG D3-800Tx w/ Mount Pipe	105
LLPX310R w/ Mount Pipe	127	MG D3-800Tx w/ Mount Pipe	105
WIMAX DAP HEAD	127	MG D3-800Tx w/ Mount Pipe	105
WIMAX DAP HEAD	127	BXA-70063/4CF w/ Mount Pipe	105
WIMAX DAP HEAD	127	BXA-70063/4CF w/ Mount Pipe	105
HORIZON COMPACT	127	BXA-70063/4CF w/ Mount Pipe	105
HORIZON COMPACT	127	Platform Mount [LP 502-1]	105
HORIZON COMPACT	127	(2) LPA-80063/4CF w/ Mount Pipe	105
2.4" Dia. x 6' Mount Pipe	127	(2) LPA-80063/4CF w/ Mount Pipe	105
2.4" Dia. x 6' Mount Pipe	127	(2) LPA-80063/4CF w/ Mount Pipe	105
2.4" Dia. x 6' Mount Pipe	127	Pipe Mount [PM 602-3]	96
Side Arm Mount [SO 102-3]	127	APX18-206517-CT2 w/ Mount Pipe	96
A-ANT-18G-2-C	127	APX18-206517-CT2 w/ Mount Pipe	96
A-ANT-18G-2-C	127	APX18-206517-CT2 w/ Mount Pipe	96
A-ANT-18G-2-C	127	1.9" x 2-ft Pipe	60
(3) 2.4" Dia. x 6' Mount Pipe	116	Side Arm Mount [SO 701-1]	60
(3) 2.4" Dia. x 6' Mount Pipe	116	Side Arm Mount [SO 701-1]	60
(3) 2.4" Dia. x 6' Mount Pipe	116	Bridge Stiffner 8'x11.5"x5"	60
Platform Mount [LP 502-1]	116	Bridge Stiffner 8'x11.5"x5"	60
APXVSPP18-C-A20 w/ Mount Pipe	116	Bridge Stiffner 8'x11.5"x5"	60
APXVSPP18-C-A20 w/ Mount Pipe	116	Bridge Stiffner (4) C6x13	60
APXVSPP18-C-A20 w/ Mount Pipe	116	Bridge Stiffner (4) C6x13	60
PCS 1900MHz 4x45W-65MHz	114	Bridge Stiffner (4) C6x13	60
PCS 1900MHz 4x45W-65MHz	114	OG-860/1920/GPS-A	60
PCS 1900MHz 4x45W-65MHz	114	OG-860/1920/GPS-A	60
(2) 2.4" Dia. x 6' Mount Pipe	114	1.9" x 2-ft Pipe	60
(2) 2.4" Dia. x 6' Mount Pipe	114	KS24019-L112A	50
(2) 2.4" Dia. x 6' Mount Pipe	114	Side Arm Mount [SO 701-1]	50
Side Arm Mount [SO 102-3]	114	Bridge Stiffner (4) C8x18.75	30
800MHz 2X50W RRH W/FILTER	114	Bridge Stiffner (4) C8x18.75	30
800MHz 2X50W RRH W/FILTER	114	Bridge Stiffner (4) C8x18.75	30
800MHz 2X50W RRH W/FILTER	114	Bridge Stiffner 10'x11.5"x6.5"	30
(2) FD9R6004/2C-3L	105	Bridge Stiffner 10'x11.5"x6.5"	30
(2) FD9R6004/2C-3L	105	Bridge Stiffner 10'x11.5"x6.5"	30

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi	A53-B-42 (50% Density)	42 ksi	63 ksi
A53-B-42	42 ksi	63 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.

Tower Engineering Professionals
3703 Junction Blvd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job:	West Hartford United Methodist (BU 876324)		
Project:	TEP No. 128057		
Client: Crown Castle	Drawn by: mfoster	App'd:	
Code: TIA/EIA-222-F	Date: 10/26/12	Scale: NTS	
Path:		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:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	130.00-120.00	10.00	Pipe 16" O.D. x 0.1875"	A500-42 (42 ksi)	
L2	120.00-90.00	30.00	P24x0.25	A53-B-42 (42 ksi)	
L3	90.00-73.50	16.50	P24x0.375	A53-B-42 (42 ksi)	
L4	73.50-60.00	13.50	P24x0.595	A53-B-42 (50% Density) (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L5	60.00-42.00	18.00	P30x0.5428	A53-B-42 (50% Density) (42 ksi)	
L6	42.00-30.00	12.00	P30x0.7024	A53-B-42 (50% Density) (42 ksi)	
L7	30.00-21.00	9.00	P36x0.5567	A53-B-42 (50% Density) (42 ksi)	
L8	21.00-0.00	21.00	Pipe36 x 0.69	A53-B-42 (50% Density) (42 ksi)	

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 130.00-120.00				1	1	1		
L2 120.00-90.00				1	1	1		
L3 90.00-73.50				1	1	1		
L4 73.50-60.00				1	1	1.273		
L5 60.00-42.00				1	1	1.39		
L6 42.00-30.00				1	1	1.08		
L7 30.00-21.00				1	1	1.355		
L8 21.00-0.00				1	1	1.097		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
9207(5/16")	B	No	CaAa (Out Of Face)	127.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	1.11
						1" Ice	0.00	2.22
						2" Ice	0.00	6.29
						4" Ice	0.00	21.76
FSJ1-50A(1/4")	B	No	CaAa (Out Of Face)	127.00 - 0.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.53
						1" Ice	0.00	1.62
						2" Ice	0.00	5.64
						4" Ice	0.00	21.01
FSJ4-50B(1/2")	B	No	CaAa (Out Of Face)	127.00 - 0.00	3	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
2" Rigid Conduit	B	No	CaAa (Out Of Face)	127.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	4.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	6.47
						2" Ice	0.00	12.57
						4" Ice	0.00	32.12
2" Rigid Conduit	B	No	CaAa (Out Of Face)	127.00 - 0.00	1	No Ice	0.20	2.80
						1/2" Ice	0.30	4.33
						1" Ice	0.40	6.47
						2" Ice	0.60	12.57
						4" Ice	1.00	32.12
*****								
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	116.00 - 0.00	1	No Ice	0.15	1.08
						1/2" Ice	0.25	2.33
						1" Ice	0.35	4.18
						2" Ice	0.55	9.73
						4" Ice	0.95	28.15
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	116.00 - 0.00	2	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
						2" Ice	0.00	9.73
						4" Ice	0.00	28.15
****								
LCF78-50A(7/8")	C	No	Inside Pole	105.00 - 0.00	12	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
						2" Ice	0.00	0.34
						4" Ice	0.00	0.34
****								
AVA7-50(1-5/8)	B	No	Inside Pole	96.00 - 0.00	6	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70
***								
LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	60.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
****								
LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
****								
Step Pegs (5/8" SR) 7-in. w/30" step	B	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.03	0.49
						1/2" Ice	0.13	0.97
						1" Ice	0.23	2.07
						2" Ice	0.43	6.09
						4" Ice	0.83	21.46
Safety Line 3/8	B	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
*** Reinforcement 0-30 ***								
PL 1x6	C	No	CaAa (Out Of Face)	29.80 - 22.00	1	No Ice	0.17	20.45
						1/2" Ice	0.28	21.40
						1" Ice	0.39	22.70
						2" Ice	0.61	26.33
						4" Ice	1.06	37.73

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
PL 1x6	C	No	CaAa (Out Of Face)	25.00 - 5.00	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL 1x6	C	No	CaAa (Out Of Face)	22.00 - 19.80	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL 1x6	B	No	CaAa (Out Of Face)	25.00 - 5.00	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL 1x6	B	No	CaAa (Out Of Face)	29.80 - 19.80	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL 1x6	A	No	CaAa (Out Of Face)	25.00 - 5.00	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL 1x6	A	No	CaAa (Out Of Face)	29.80 - 19.80	1	No Ice	0.00	20.45
						1/2" Ice	0.00	21.40
						1" Ice	0.00	22.70
						2" Ice	0.00	26.33
						4" Ice	0.00	37.73
PL1.25x3.375	C	No	CaAa (Out Of Face)	22.00 - 0.00	1	No Ice	0.21	14.38
						1/2" Ice	0.32	15.26
						1" Ice	0.43	16.48
						2" Ice	0.65	19.96
						4" Ice	1.10	31.08
PL1.25x3.375	B	No	CaAa (Out Of Face)	22.00 - 0.00	1	No Ice	0.00	14.38
						1/2" Ice	0.00	15.26
						1" Ice	0.00	16.48
						2" Ice	0.00	19.96
						4" Ice	0.00	31.08
PL1.25x3.375	A	No	CaAa (Out Of Face)	22.00 - 0.00	1	No Ice	0.00	14.38
						1/2" Ice	0.00	15.26
						1" Ice	0.00	16.48
						2" Ice	0.00	19.96
						4" Ice	0.00	31.08
*** Reinforcement 30-60 ***								
PL 1x4.5	C	No	CaAa (Out Of Face)	59.80 - 43.00	1	No Ice	0.17	15.34
						1/2" Ice	0.28	16.19
						1" Ice	0.39	17.39
						2" Ice	0.61	20.83
						4" Ice	1.06	31.85
PL 1x4.5	C	No	CaAa (Out Of Face)	43.00 - 30.20	1	No Ice	0.00	15.34
						1/2" Ice	0.00	16.19
						1" Ice	0.00	17.39
						2" Ice	0.00	20.83
						4" Ice	0.00	31.85
PL 1x4.5	B	No	CaAa (Out Of Face)	59.80 - 30.20	1	No Ice	0.00	15.34
						1/2" Ice	0.00	16.19
						1" Ice	0.00	17.39
						2" Ice	0.00	20.83

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	31.85
PL 1x4.5	A	No	CaAa (Out Of Face)	59.80 - 30.20	1	No Ice	0.00	15.34
						1/2" Ice	0.00	16.19
						1" Ice	0.00	17.39
						2" Ice	0.00	20.83
						4" Ice	0.00	31.85
PL 1.25x3.25	C	No	CaAa (Out Of Face)	43.00 - 30.33	1	No Ice	0.21	13.82
						1/2" Ice	0.32	14.69
						1" Ice	0.43	15.91
						2" Ice	0.65	19.38
						4" Ice	1.10	30.46
PL 1.25x3.25	B	No	CaAa (Out Of Face)	43.00 - 30.33	1	No Ice	0.00	13.82
						1/2" Ice	0.00	14.69
						1" Ice	0.00	15.91
						2" Ice	0.00	19.38
						4" Ice	0.00	30.46
PL 1.25x3.25	A	No	CaAa (Out Of Face)	43.00 - 30.33	1	No Ice	0.00	13.82
						1/2" Ice	0.00	14.69
						1" Ice	0.00	15.91
						2" Ice	0.00	19.38
						4" Ice	0.00	30.46
*** Reinforcement 60-75 ***								
PL 1x4.5	C	No	CaAa (Out Of Face)	75.20 - 60.20	1	No Ice	0.17	15.34
						1/2" Ice	0.28	16.19
						1" Ice	0.39	17.39
						2" Ice	0.61	20.83
						4" Ice	1.06	31.85
PL 1x4.5	B	No	CaAa (Out Of Face)	75.20 - 60.20	1	No Ice	0.00	15.34
						1/2" Ice	0.00	16.19
						1" Ice	0.00	17.39
						2" Ice	0.00	20.83
						4" Ice	0.00	31.85
PL 1x4.5	A	No	CaAa (Out Of Face)	75.20 - 60.20	1	No Ice	0.00	15.34
						1/2" Ice	0.00	16.19
						1" Ice	0.00	17.39
						2" Ice	0.00	20.83
						4" Ice	0.00	31.85

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	130.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	2.067	0.06
		C	0.000	0.000	0.000	0.000	0.00
L2	120.00-90.00	A	0.000	0.000	0.000	4.004	0.08
		B	0.000	0.000	0.000	8.001	0.29
		C	0.000	0.000	0.000	0.000	0.06
L3	90.00-73.50	A	0.000	0.000	0.000	2.541	0.08
		B	0.000	0.000	0.000	4.401	0.24
		C	0.000	0.000	0.000	0.283	0.09
L4	73.50-60.00	A	0.000	0.000	0.000	2.079	0.25
		B	0.000	0.000	0.000	3.601	0.38
		C	0.000	0.000	0.000	2.217	0.26
L5	60.00-42.00	A	0.000	0.000	0.000	2.772	0.35
		B	0.000	0.000	0.000	4.801	0.52

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
		C	0.000	0.000	0.000	3.008	0.36
L6	42.00-30.00	A	0.000	0.000	0.000	1.848	0.39
		B	0.000	0.000	0.000	3.200	0.50
		C	0.000	0.000	0.000	2.431	0.39
L7	30.00-21.00	A	0.000	0.000	0.000	1.386	0.31
		B	0.000	0.000	0.000	2.400	0.39
		C	0.000	0.000	0.000	1.508	0.31
L8	21.00-0.00	A	0.000	0.000	0.000	3.234	0.73
		B	0.000	0.000	0.000	5.601	0.92
		C	0.000	0.000	0.000	4.375	0.74

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	130.00-120.00	A	1.173	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	8.403	0.32
		C		0.000	0.000	0.000	0.000	0.00
L2	120.00-90.00	A	1.149	0.000	0.000	0.000	9.979	0.39
		B		0.000	0.000	0.000	28.683	1.28
		C		0.000	0.000	0.000	0.000	0.06
L3	90.00-73.50	A	1.115	0.000	0.000	0.000	6.221	0.27
		B		0.000	0.000	0.000	15.439	0.76
		C		0.000	0.000	0.000	0.705	0.10
L4	73.50-60.00	A	1.088	0.000	0.000	0.000	5.017	0.42
		B		0.000	0.000	0.000	12.415	0.81
		C		0.000	0.000	0.000	5.433	0.29
L5	60.00-42.00	A	1.054	0.000	0.000	0.000	6.565	0.68
		B		0.000	0.000	0.000	16.180	1.07
		C		0.000	0.000	0.000	7.176	0.40
L6	42.00-30.00	A	1.010	0.000	0.000	0.000	4.273	0.62
		B		0.000	0.000	0.000	10.476	0.85
		C		0.000	0.000	0.000	5.052	0.44
L7	30.00-21.00	A	1.000	0.000	0.000	0.000	3.186	0.48
		B		0.000	0.000	0.000	7.800	0.65
		C		0.000	0.000	0.000	3.464	0.34
L8	21.00-0.00	A	1.000	0.000	0.000	0.000	7.434	1.13
		B		0.000	0.000	0.000	18.201	1.53
		C		0.000	0.000	0.000	9.042	0.82

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-120.00	0.2325	0.1342	0.6143	0.3547
L2	120.00-90.00	0.2887	-0.0001	0.7138	0.1254
L3	90.00-73.50	0.2659	-0.0148	0.6552	0.0951
L4	73.50-60.00	0.1030	0.0713	0.3468	0.2240
L5	60.00-42.00	0.1047	0.0764	0.3745	0.2456
L6	42.00-30.00	0.0667	0.0968	0.3399	0.2526
L7	30.00-21.00	0.1076	0.0792	0.3935	0.2563
L8	21.00-0.00	0.0627	0.1036	0.3528	0.2752

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
LLPX310R w/ Mount Pipe	A	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.98 5.38 5.78 6.62 8.44	2.87 3.40 3.94 5.12 7.89	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	B	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.98 5.38 5.78 6.62 8.44	2.87 3.40 3.94 5.12 7.89	0.04 0.08 0.12 0.23 0.53
LLPX310R w/ Mount Pipe	C	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.98 5.38 5.78 6.62 8.44	2.87 3.40 3.94 5.12 7.89	0.04 0.08 0.12 0.23 0.53
WIMAX DAP HEAD	A	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	B	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	C	From Leg	2.00 -1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
HORIZON COMPACT	A	From Leg	2.00 1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.53 0.63 0.87 1.44	0.01 0.02 0.03 0.05 0.12
HORIZON COMPACT	B	From Leg	2.00 1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.53 0.63 0.87 1.44	0.01 0.02 0.03 0.05 0.12
HORIZON COMPACT	C	From Leg	2.00 1.00 0.00	30.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.53 0.63 0.87 1.44	0.01 0.02 0.03 0.05 0.12
2.4" Dia. x 6' Mount Pipe	A	From Face	2.00 1.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25

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
2.4" Dia. x 6' Mount Pipe	B	From Face	2.00 1.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
2.4" Dia. x 6' Mount Pipe	C	From Face	2.00 1.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
Side Arm Mount [SO 102-3)	C	None		0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
*** ***									
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Face	4.00 2.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Face	4.00 2.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Face	4.00 -6.00 0.00	10.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
(3) 2.4" Dia. x 6' Mount Pipe	B	From Centroid-Face	4.00 -0.67 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
(3) 2.4" Dia. x 6' Mount Pipe	C	From Centroid-Face	4.00 -0.67 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
(3) 2.4" Dia. x 6' Mount Pipe	A	From Centroid-Face	4.00 2.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
Platform Mount [LP 502-1]	C	None		0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.35 45.67 58.99 85.63 138.91	32.35 45.67 58.99 85.63 138.91	0.93 1.19 1.46 2.00 3.07
***									
800MHz 2X50W RRH W/FILTER	A	From Face	2.00 -1.00 0.00	10.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.40 2.61 2.83 3.30	2.25 2.46 2.68 3.13	0.06 0.09 0.11 0.17

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	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Face	2.00 1.00 0.00	60.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Face	2.00 -1.00 0.00	60.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	A	From Face	2.00 1.00 0.00	10.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	B	From Face	2.00 -1.00 0.00	60.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Face	2.00 1.00 0.00	60.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
(2) 2.4" Dia. x 6' Mount Pipe	A	From Face	1.50 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
(2) 2.4" Dia. x 6' Mount Pipe	B	From Face	1.50 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
(2) 2.4" Dia. x 6' Mount Pipe	C	From Face	1.50 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.05 0.10 0.25
Side Arm Mount [SO 102-3]	C	None		0.0000	114.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
***									
(2) LPA-80063/4CF w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.26 7.73 8.22 9.22 11.36	7.27 7.98 8.69 10.18 13.42	0.04 0.10 0.18 0.34 0.80
(2) LPA-80063/4CF w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.26 7.73 8.22 9.22 11.36	7.27 7.98 8.69 10.18 13.42	0.04 0.10 0.18 0.34 0.80

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPA-80063/4CF w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.26 7.73 8.22 9.22 11.36	7.27 7.98 8.69 10.18 13.42	0.04 0.10 0.18 0.34 0.80
(2) FD9R6004/2C-3L	B	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	A	From Centroid-Face	4.00 0.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
MG D3-800Tx w/ Mount Pipe	B	From Centroid-Face	4.00 -2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.73 4.13 4.56 5.51 7.52	3.60 4.29 4.95 6.33 9.39	0.03 0.07 0.11 0.21 0.53
MG D3-800Tx w/ Mount Pipe	C	From Centroid-Face	4.00 -2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.73 4.13 4.56 5.51 7.52	3.60 4.29 4.95 6.33 9.39	0.03 0.07 0.11 0.21 0.53
MG D3-800Tx w/ Mount Pipe	A	From Centroid-Face	4.00 2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.73 4.13 4.56 5.51 7.52	3.60 4.29 4.95 6.33 9.39	0.03 0.07 0.11 0.21 0.53
BXA-70063/4CF w/ Mount Pipe	B	From Centroid-Face	4.00 2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.70 6.13 7.02 8.91	3.46 4.04 4.63 5.91 8.87	0.03 0.07 0.11 0.23 0.56
BXA-70063/4CF w/ Mount Pipe	C	From Centroid-Face	4.00 2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.70 6.13 7.02 8.91	3.46 4.04 4.63 5.91 8.87	0.03 0.07 0.11 0.23 0.56
BXA-70063/4CF w/ Mount Pipe	A	From Centroid-Face	4.00 2.00 0.00	-30.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.70 6.13 7.02 8.91	3.46 4.04 4.63 5.91 8.87	0.03 0.07 0.11 0.23 0.56
Platform Mount [LP 502-1]	C	None		0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.35 45.67 58.99 85.63 138.91	32.35 45.67 58.99 85.63 138.91	0.93 1.19 1.46 2.00 3.07
***									
APX18-206517-CT2 w/	A	From Face	1.00	0.0000	96.00	No Ice	5.36	4.73	0.05

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
Mount Pipe			0.00			1/2" Ice	5.91	5.90	0.09
			0.00			1" Ice	6.44	6.79	0.15
						2" Ice	7.51	8.58	0.28
						4" Ice	9.86	12.36	0.68
APX18-206517-CT2 w/ Mount Pipe	B	From Face	1.00	0.0000	96.00	No Ice	5.36	4.73	0.05
			0.00			1/2" Ice	5.91	5.90	0.09
			0.00			1" Ice	6.44	6.79	0.15
						2" Ice	7.51	8.58	0.28
						4" Ice	9.86	12.36	0.68
APX18-206517-CT2 w/ Mount Pipe	C	From Face	1.00	0.0000	96.00	No Ice	5.36	4.73	0.05
			0.00			1/2" Ice	5.91	5.90	0.09
			0.00			1" Ice	6.44	6.79	0.15
						2" Ice	7.51	8.58	0.28
						4" Ice	9.86	12.36	0.68
Pipe Mount [PM 602-3]	C	None		0.0000	96.00	No Ice	7.68	7.68	0.28
						1/2" Ice	9.50	9.50	0.35
						1" Ice	11.32	11.32	0.43
						2" Ice	14.96	14.96	0.58
						4" Ice	22.24	22.24	0.87
***									
OG-860/1920/GPS-A	A	From Face	3.00	0.0000	60.00	No Ice	0.14	0.14	0.00
			0.00			1/2" Ice	0.23	0.23	0.00
			0.00			1" Ice	0.33	0.33	0.01
						2" Ice	0.57	0.57	0.02
						4" Ice	1.17	1.17	0.05
OG-860/1920/GPS-A	B	From Face	3.00	0.0000	60.00	No Ice	0.14	0.14	0.00
			0.00			1/2" Ice	0.23	0.23	0.00
			0.00			1" Ice	0.33	0.33	0.01
						2" Ice	0.57	0.57	0.02
						4" Ice	1.17	1.17	0.05
1.9" x 2-ft Pipe	A	From Face	3.00	0.0000	60.00	No Ice	0.29	0.29	0.01
			0.00			1/2" Ice	0.42	0.42	0.01
			0.00			1" Ice	0.56	0.56	0.01
						2" Ice	0.92	0.92	0.03
						4" Ice	1.76	1.76	0.08
1.9" x 2-ft Pipe	B	From Face	3.00	0.0000	60.00	No Ice	0.29	0.29	0.01
			0.00			1/2" Ice	0.42	0.42	0.01
			0.00			1" Ice	0.56	0.56	0.01
						2" Ice	0.92	0.92	0.03
						4" Ice	1.76	1.76	0.08
Side Arm Mount [SO 701-1]	A	From Face	1.50	0.0000	60.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
Side Arm Mount [SO 701-1]	B	From Face	1.50	0.0000	60.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
***									
KS24019-L112A	C	From Face	3.00	0.0000	50.00	No Ice	0.09	0.09	0.01
			0.00			1/2" Ice	0.15	0.15	0.01
			0.00			1" Ice	0.22	0.22	0.01
						2" Ice	0.40	0.40	0.02
						4" Ice	0.89	0.89	0.04
Side Arm Mount [SO 701-1]	C	From Face	1.50	0.0000	50.00	No Ice	0.85	1.67	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
***									
Bridge Stiffner 8'x11.5"x5"	A	From Leg	0.50	0.0000	60.00	No Ice	4.00	10.50	0.42
			0.00			1/2" Ice	5.84	11.91	0.55
			0.00			1" Ice	6.68	12.32	0.68
						2" Ice	8.36	13.14	0.93
						4" Ice	11.72	14.78	1.43
Bridge Stiffner 8'x11.5"x5"	B	From Leg	0.50	0.0000	60.00	No Ice	4.00	10.50	0.42
			0.00			1/2" Ice	5.84	11.91	0.55
			0.00			1" Ice	6.68	12.32	0.68
						2" Ice	8.36	13.14	0.93
						4" Ice	11.72	14.78	1.43
Bridge Stiffner 8'x11.5"x5"	C	From Leg	0.50	0.0000	60.00	No Ice	4.00	10.50	0.42
			0.00			1/2" Ice	5.84	11.91	0.55
			0.00			1" Ice	6.68	12.32	0.68
						2" Ice	8.36	13.14	0.93
						4" Ice	11.72	14.78	1.43
Bridge Stiffner (4) C6x13	A	From Leg	0.50	0.0000	60.00	No Ice	0.00	0.00	0.19
			0.00			1/2" Ice	0.00	0.00	0.25
			0.00			1" Ice	0.00	0.00	0.31
						2" Ice	0.00	0.00	0.42
						4" Ice	0.00	0.00	0.65
Bridge Stiffner (4) C6x13	B	From Leg	0.50	0.0000	60.00	No Ice	0.00	0.00	0.19
			0.00			1/2" Ice	0.00	0.00	0.25
			0.00			1" Ice	0.00	0.00	0.31
						2" Ice	0.00	0.00	0.42
						4" Ice	0.00	0.00	0.65
Bridge Stiffner (4) C6x13	C	From Leg	0.50	0.0000	60.00	No Ice	0.00	0.00	0.19
			0.00			1/2" Ice	0.00	0.00	0.25
			0.00			1" Ice	0.00	0.00	0.31
						2" Ice	0.00	0.00	0.42
						4" Ice	0.00	0.00	0.65
***									
Bridge Stiffner 10'x11.5"x6.5"	A	From Leg	0.50	0.0000	30.00	No Ice	7.00	12.00	0.58
			0.00			1/2" Ice	8.63	13.10	0.75
			0.00			1" Ice	9.68	13.70	0.92
						2" Ice	11.78	14.90	1.27
						4" Ice	15.98	17.30	1.97
Bridge Stiffner 10'x11.5"x6.5"	B	From Leg	0.50	0.0000	30.00	No Ice	7.00	12.00	0.58
			0.00			1/2" Ice	8.63	13.10	0.75
			0.00			1" Ice	9.68	13.70	0.92
						2" Ice	11.78	14.90	1.27
						4" Ice	15.98	17.30	1.97
Bridge Stiffner 10'x11.5"x6.5"	C	From Leg	0.50	0.0000	30.00	No Ice	7.00	12.00	0.58
			0.00			1/2" Ice	8.63	13.10	0.75
			0.00			1" Ice	9.68	13.70	0.92
						2" Ice	11.78	14.90	1.27
						4" Ice	15.98	17.30	1.97
Bridge Stiffner (4) C8x18.75	A	From Leg	0.50	0.0000	30.00	No Ice	0.00	0.00	0.35
			0.00			1/2" Ice	0.00	0.00	0.46
			0.00			1" Ice	0.00	0.00	0.56
						2" Ice	0.00	0.00	0.77
						4" Ice	0.00	0.00	1.19
Bridge Stiffner (4) C8x18.75	B	From Leg	0.50	0.0000	30.00	No Ice	0.00	0.00	0.35

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
			0.00			1/2" Ice	0.00	0.00	0.46
			0.00			1" Ice	0.00	0.00	0.56
						2" Ice	0.00	0.00	0.77
						4" Ice	0.00	0.00	1.19
Bridge Stiffner (4) C8x18.75	C	From Leg	0.50	0.0000	30.00	No Ice	0.00	0.00	0.35
			0.00			1/2" Ice	0.00	0.00	0.46
			0.00			1" Ice	0.00	0.00	0.56
						2" Ice	0.00	0.00	0.77
						4" Ice	0.00	0.00	1.19

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-18G-2-C	A	Paraboloid w/o Radome	From Leg	2.00	30.0000		127.00	2.17	No Ice	3.72	0.03
				1.00					1/2" Ice	4.01	0.05
				0.00					1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.19
A-ANT-18G-2-C	B	Paraboloid w/o Radome	From Leg	2.00	30.0000		127.00	2.17	No Ice	3.72	0.03
				1.00					1/2" Ice	4.01	0.05
				0.00					1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.19
A-ANT-18G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	2.00	30.0000		127.00	2.17	No Ice	3.72	0.03
				1.00					1/2" Ice	4.01	0.05
				0.00					1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.19

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 120	Pole	Max Tension	36	0.00	-0.00	0.00
			Max. Compression	14	-2.15	-0.19	-0.11
			Max. Mx	11	-0.69	12.71	-0.04
			Max. My	8	-0.70	0.88	-12.49
			Max. Vy	11	-1.94	12.71	-0.04
			Max. Vx	8	1.90	0.88	-12.49
			Max. Torque	7			-0.19
L2	120 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.47	-0.82	-1.31
			Max. Mx	11	-6.00	265.15	-0.12
			Max. My	8	-6.01	4.64	-264.37
			Max. Vy	11	-12.68	265.15	-0.12
			Max. Vx	8	12.65	4.64	-264.37
			Max. Torque	6			-2.38
L3	90 - 73.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.72	-1.44	-1.44
			Max. Mx	11	-8.12	482.33	-0.02
			Max. My	8	-8.12	6.65	-481.17
			Max. Vy	11	-13.65	482.33	-0.02
			Max. Vx	8	13.62	6.65	-481.17
			Max. Torque	6			-1.76
L4	73.5 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.98	-1.93	-1.53
			Max. Mx	11	-10.42	671.85	0.07
			Max. My	8	-10.43	8.27	-670.38
			Max. Vy	11	-14.44	671.85	0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	14.41	8.27	-670.38
			Max. Torque	6			-1.74
L5	60 - 42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.34	-2.68	-1.49
			Max. Mx	11	-15.98	958.09	0.19
			Max. My	8	-15.98	10.41	-956.51
			Max. Vy	11	-16.48	958.09	0.19
			Max. Vx	8	16.45	10.41	-956.51
			Max. Torque	6			-1.74
L6	42 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.14	-3.12	-1.46
			Max. Mx	11	-18.82	1159.48	0.28
			Max. My	8	-18.82	11.82	-1157.67
			Max. Vy	11	-17.10	1159.48	0.28
			Max. Vx	8	17.07	11.82	-1157.67
			Max. Torque	6			-1.71
L7	30 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.76	-3.52	-1.43
			Max. Mx	11	-23.98	1323.07	0.35
			Max. My	8	-23.98	12.85	-1321.10
			Max. Vy	11	-18.44	1323.07	0.35
			Max. Vx	8	18.41	12.85	-1321.10
			Max. Torque	6			-1.71
L8	21 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.20	-4.44	-1.37
			Max. Mx	11	-29.62	1721.62	0.51
			Max. My	8	-29.62	15.22	-1719.27
			Max. Vy	11	-19.52	1721.62	0.51
			Max. Vx	8	19.49	15.22	-1719.27
			Max. Torque	6			-1.72

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	18	49.20	-6.51	-0.00
	Max. H_x	11	29.62	19.51	0.01
	Max. H_z	2	29.62	0.14	19.48
	Max. M_x	2	1718.28	0.14	19.48
	Max. M_z	5	1712.17	-19.42	-0.01
	Max. Torsion	12	1.43	16.80	9.79
	Min. Vert	1	29.62	0.00	0.00
	Min. H_x	5	29.62	-19.42	-0.01
	Min. H_z	8	29.62	0.12	-19.48
	Min. M_x	8	-1719.27	0.12	-19.48
	Min. M_z	11	-1721.62	19.51	0.01
	Min. Torsion	6	-1.72	-16.83	-9.66

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	29.62	0.00	0.00	0.47	-0.93	0.00
Dead+Wind 0 deg - No Ice	29.62	-0.14	-19.48	-1718.28	17.22	-0.86
Dead+Wind 30 deg - No Ice	29.62	9.64	-16.92	-1495.18	-847.81	0.04
Dead+Wind 60 deg - No Ice	29.62	16.82	-9.65	-847.33	-1483.71	0.74
Dead+Wind 90 deg - No Ice	29.62	19.42	0.01	1.48	-1712.17	1.41
Dead+Wind 120 deg - No Ice	29.62	16.83	9.66	850.03	-1484.71	1.72
Dead+Wind 150 deg - No Ice	29.62	9.66	16.93	1497.15	-849.54	1.56
Dead+Wind 180 deg - No Ice	29.62	-0.12	19.48	1719.27	15.22	0.96
Dead+Wind 210 deg - No Ice	29.62	-9.76	16.86	1487.74	861.69	-0.00
Dead+Wind 240 deg - No Ice	29.62	-16.79	9.78	865.16	1477.04	-0.88
Dead+Wind 270 deg - No Ice	29.62	-19.51	-0.01	-0.51	1721.62	-1.22
Dead+Wind 300 deg - No Ice	29.62	-16.80	-9.79	-865.91	1478.03	-1.43
Dead+Wind 330 deg - No Ice	29.62	-9.78	-16.87	-1487.75	863.41	-1.33
Dead+Ice+Temp	49.20	0.00	0.00	1.37	-4.44	-0.00
Dead+Wind 0 deg+Ice+Temp	49.20	-0.04	-6.52	-595.74	0.32	-0.07
Dead+Wind 30 deg+Ice+Temp	49.20	3.24	-5.66	-517.73	-299.92	0.12
Dead+Wind 60 deg+Ice+Temp	49.20	5.64	-3.24	-294.11	-520.40	0.23
Dead+Wind 90 deg+Ice+Temp	49.20	6.51	0.00	1.57	-599.91	0.32
Dead+Wind 120 deg+Ice+Temp	49.20	5.64	3.24	297.21	-520.58	0.33
Dead+Wind 150 deg+Ice+Temp	49.20	3.24	5.66	520.70	-300.23	0.25
Dead+Wind 180 deg+Ice+Temp	49.20	-0.03	6.52	598.53	-0.04	0.10
Dead+Wind 210 deg+Ice+Temp	49.20	-3.27	5.65	518.23	295.17	-0.11
Dead+Wind 240 deg+Ice+Temp	49.20	-5.63	3.27	301.47	510.08	-0.27
Dead+Wind 270 deg+Ice+Temp	49.20	-6.53	-0.00	1.22	593.97	-0.27
Dead+Wind 300 deg+Ice+Temp	49.20	-5.63	-3.27	-299.00	510.26	-0.26
Dead+Wind 330 deg+Ice+Temp	49.20	-3.27	-5.65	-515.62	295.48	-0.19
Dead+Wind 0 deg - Service	29.62	-0.05	-7.61	-671.48	6.16	-0.34
Dead+Wind 30 deg - Service	29.62	3.77	-6.61	-584.25	-332.04	0.02
Dead+Wind 60 deg - Service	29.62	6.57	-3.77	-330.96	-580.64	0.29
Dead+Wind 90 deg - Service	29.62	7.59	0.00	0.89	-669.96	0.55
Dead+Wind 120 deg - Service	29.62	6.58	3.78	332.63	-581.03	0.68
Dead+Wind 150 deg - Service	29.62	3.77	6.61	585.64	-332.71	0.61
Dead+Wind 180 deg - Service	29.62	-0.05	7.61	672.47	5.38	0.38
Dead+Wind 210 deg - Service	29.62	-3.81	6.59	581.95	336.31	-0.00
Dead+Wind 240 deg - Service	29.62	-6.56	3.82	338.55	576.88	-0.35
Dead+Wind 270 deg - Service	29.62	-7.62	-0.00	0.11	672.51	-0.48
Dead+Wind 300 deg - Service	29.62	-6.56	-3.83	-338.23	577.27	-0.56
Dead+Wind 330 deg - Service	29.62	-3.82	-6.59	-581.35	336.99	-0.52

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-29.62	0.00	0.00	29.62	0.00	0.000%
2	-0.14	-29.62	-19.48	0.14	29.62	19.48	0.000%
3	9.64	-29.62	-16.92	-9.64	29.62	16.92	0.000%
4	16.82	-29.62	-9.65	-16.82	29.62	9.65	0.000%
5	19.42	-29.62	0.01	-19.42	29.62	-0.01	0.000%
6	16.83	-29.62	9.66	-16.83	29.62	-9.66	0.000%
7	9.66	-29.62	16.93	-9.66	29.62	-16.93	0.000%
8	-0.12	-29.62	19.48	0.12	29.62	-19.48	0.000%
9	-9.76	-29.62	16.86	9.76	29.62	-16.86	0.000%
10	-16.79	-29.62	9.78	16.79	29.62	-9.78	0.000%
11	-19.51	-29.62	-0.01	19.51	29.62	0.01	0.000%
12	-16.80	-29.62	-9.79	16.80	29.62	9.79	0.000%
13	-9.78	-29.62	-16.87	9.78	29.62	16.87	0.000%
14	0.00	-49.20	0.00	-0.00	49.20	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
15	-0.04	-49.20	-6.52	0.04	49.20	6.52	0.000%
16	3.24	-49.20	-5.66	-3.24	49.20	5.66	0.000%
17	5.64	-49.20	-3.24	-5.64	49.20	3.24	0.000%
18	6.51	-49.20	0.00	-6.51	49.20	-0.00	0.000%
19	5.64	-49.20	3.24	-5.64	49.20	-3.24	0.000%
20	3.24	-49.20	5.66	-3.24	49.20	-5.66	0.000%
21	-0.03	-49.20	6.52	0.03	49.20	-6.52	0.000%
22	-3.27	-49.20	5.65	3.27	49.20	-5.65	0.000%
23	-5.63	-49.20	3.27	5.63	49.20	-3.27	0.000%
24	-6.53	-49.20	-0.00	6.53	49.20	0.00	0.000%
25	-5.63	-49.20	-3.27	5.63	49.20	3.27	0.000%
26	-3.27	-49.20	-5.65	3.27	49.20	5.65	0.000%
27	-0.05	-29.62	-7.61	0.05	29.62	7.61	0.000%
28	3.77	-29.62	-6.61	-3.77	29.62	6.61	0.000%
29	6.57	-29.62	-3.77	-6.57	29.62	3.77	0.000%
30	7.59	-29.62	0.00	-7.59	29.62	-0.00	0.000%
31	6.58	-29.62	3.78	-6.58	29.62	-3.78	0.000%
32	3.77	-29.62	6.61	-3.77	29.62	-6.61	0.000%
33	-0.05	-29.62	7.61	0.05	29.62	-7.61	0.000%
34	-3.81	-29.62	6.59	3.81	29.62	-6.59	0.000%
35	-6.56	-29.62	3.82	6.56	29.62	-3.82	0.000%
36	-7.62	-29.62	-0.00	7.62	29.62	0.00	0.000%
37	-6.56	-29.62	-3.83	6.56	29.62	3.83	0.000%
38	-3.82	-29.62	-6.59	3.82	29.62	6.59	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	5	0.00000001	0.00003682
3	Yes	5	0.00000001	0.00036978
4	Yes	5	0.00000001	0.00035475
5	Yes	5	0.00000001	0.00004093
6	Yes	5	0.00000001	0.00039730
7	Yes	5	0.00000001	0.00034830
8	Yes	5	0.00000001	0.00003837
9	Yes	5	0.00000001	0.00037408
10	Yes	5	0.00000001	0.00038505
11	Yes	5	0.00000001	0.00003441
12	Yes	5	0.00000001	0.00035237
13	Yes	5	0.00000001	0.00039671
14	Yes	4	0.00000001	0.00006034
15	Yes	5	0.00000001	0.00039048
16	Yes	5	0.00000001	0.00049880
17	Yes	5	0.00000001	0.00049225
18	Yes	5	0.00000001	0.00039510
19	Yes	5	0.00000001	0.00050526
20	Yes	5	0.00000001	0.00050130
21	Yes	5	0.00000001	0.00039482
22	Yes	5	0.00000001	0.00049659
23	Yes	5	0.00000001	0.00049852
24	Yes	5	0.00000001	0.00039117
25	Yes	5	0.00000001	0.00048801
26	Yes	5	0.00000001	0.00049494
27	Yes	4	0.00000001	0.00021329

28	Yes	5	0.00000001	0.00003792
29	Yes	5	0.00000001	0.00003514
30	Yes	4	0.00000001	0.00028448
31	Yes	5	0.00000001	0.00004454
32	Yes	5	0.00000001	0.00003424
33	Yes	4	0.00000001	0.00022907
34	Yes	5	0.00000001	0.00003857
35	Yes	5	0.00000001	0.00004115
36	Yes	4	0.00000001	0.00024690
37	Yes	5	0.00000001	0.00003463
38	Yes	5	0.00000001	0.00004351

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	130 - 129	Pipe 16" O.D. x 0.1875"	10.00	0.00	0.0	24.558	9.3143	-0.09	228.74	0.000*
	129 - 128					24.558	9.3143	-0.17	228.74	0.001
	128 - 127					24.558	9.3143	-0.10	228.74	0.000
	127 - 126					24.558	9.3143	-0.49	228.74	0.002
	126 - 125					24.558	9.3143	-0.52	228.74	0.002
	125 - 124					24.558	9.3143	-0.55	228.74	0.002
	124 - 123					24.558	9.3143	-0.59	228.74	0.003
	123 - 122					24.558	9.3143	-0.62	228.74	0.003
	122 - 121					24.558	9.3143	-0.66	228.74	0.003
	121 - 120					24.558	9.3143	-0.69	228.74	0.003
L2	120 - 118.5	P24x0.25	30.00	0.00	0.0	23.696	18.6532	-0.80	442.00	0.002
	118.5 - 117					23.696	18.6532	-0.91	442.00	0.002
	117 - 115.5					23.696	18.6532	-2.14	442.00	0.005
	115.5 - 114					23.696	18.6532	-2.25	442.00	0.005
	114 - 112.5					23.696	18.6532	-2.83	442.00	0.006
	112.5 - 111					23.696	18.6532	-2.94	442.00	0.007
	111 - 109.5					23.696	18.6532	-3.05	442.00	0.007
	109.5 - 108					23.696	18.6532	-3.16	442.00	0.007
	108 - 106.5					23.696	18.6532	-3.28	442.00	0.007
	106.5 - 105					23.696	18.6532	-3.39	442.00	0.008
	105 - 103.5					23.696	18.6532	-4.55	442.00	0.010
	103.5 - 102					23.696	18.6532	-4.66	442.00	0.011
	102 - 100.5					23.696	18.6532	-4.78	442.00	0.011
	100.5 - 99					23.696	18.6532	-4.90	442.00	0.011
	99 - 97.5					23.696	18.6532	-5.02	442.00	0.011
	97.5 - 96					23.696	18.6532	-5.14	442.00	0.012
	96 - 94.5					23.696	18.6532	-5.63	442.00	0.013
	94.5 - 93					23.696	18.6532	-5.75	442.00	0.013
	93 - 91.5					23.696	18.6532	-5.88	442.00	0.013
	91.5 - 90					23.696	18.6532	-6.00	442.00	0.014
L3	90 - 88.9688	P24x0.375	16.50	0.00	0.0	25.200	27.8325	-6.14	701.38	0.009
	88.9688 - 87.9375					25.200	27.8325	-6.26	701.38	0.009
	87.9375 - 86.9063					25.200	27.8325	-6.39	701.38	0.009
	86.9063 - 85.875					25.200	27.8325	-6.52	701.38	0.009
	85.875 -					25.200	27.8325	-6.65	701.38	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	84.8438									
	84.8438 - 83.8125					25.200	27.8325	-6.78	701.38	0.010
	83.8125 - 82.7813					25.200	27.8325	-6.91	701.38	0.010
	82.7813 - 81.75					25.200	27.8325	-7.05	701.38	0.010
	81.75 - 80.7188					25.200	27.8325	-7.18	701.38	0.010
	80.7188 - 79.6875					25.200	27.8325	-7.31	701.38	0.010
	79.6875 - 78.6563					25.200	27.8325	-7.44	701.38	0.011
	78.6563 - 77.625					25.200	27.8325	-7.58	701.38	0.011
	77.625 - 76.5938					25.200	27.8325	-7.71	701.38	0.011
	76.5938 - 75.5625					25.200	27.8325	-7.85	701.38	0.011
	75.5625 - 74.5313					25.200	27.8325	-7.98	701.38	0.011
	74.5313 - 73.5					25.200	27.8325	-8.12	701.38	0.012
L4	73.5 - 72.4615	P24x0.595	13.50	0.00	0.0	25.200	43.7497	-8.30	1102.49	0.008
	72.4615 - 71.4231					25.200	43.7497	-8.47	1102.49	0.008
	71.4231 - 70.3846					25.200	43.7497	-8.65	1102.49	0.008
	70.3846 - 69.3462					25.200	43.7497	-8.82	1102.49	0.008
	69.3462 - 68.3077					25.200	43.7497	-9.00	1102.49	0.008
	68.3077 - 67.2692					25.200	43.7497	-9.18	1102.49	0.008
	67.2692 - 66.2308					25.200	43.7497	-9.35	1102.49	0.008
	66.2308 - 65.1923					25.200	43.7497	-9.53	1102.49	0.009
	65.1923 - 64.1538					25.200	43.7497	-9.71	1102.49	0.009
	64.1538 - 63.1154					25.200	43.7497	-9.89	1102.49	0.009
	63.1154 - 62.0769					25.200	43.7497	-10.07	1102.49	0.009
	62.0769 - 61.0385					25.200	43.7497	-10.24	1102.49	0.009
	61.0385 - 60					25.200	43.7497	-10.42	1102.49	0.009
L5	60 - 59	P30x0.5428	18.00	0.00	0.0	25.200	50.2321	-12.57	1265.85	0.010
	59 - 58					25.200	50.2321	-12.76	1265.85	0.010
	58 - 57					25.200	50.2321	-12.96	1265.85	0.010
	57 - 56					25.200	50.2321	-13.15	1265.85	0.010
	56 - 55					25.200	50.2321	-13.35	1265.85	0.011
	55 - 54					25.200	50.2321	-13.54	1265.85	0.011
	54 - 53					25.200	50.2321	-13.74	1265.85	0.011
	53 - 52					25.200	50.2321	-13.93	1265.85	0.011
	52 - 51					25.200	50.2321	-14.13	1265.85	0.011
	51 - 50					25.200	50.2321	-14.33	1265.85	0.011
	50 - 49					25.200	50.2321	-14.59	1265.85	0.012
	49 - 48					25.200	50.2321	-14.79	1265.85	0.012
	48 - 47					25.200	50.2321	-14.99	1265.85	0.012
	47 - 46					25.200	50.2321	-15.19	1265.85	0.012
	46 - 45					25.200	50.2321	-15.38	1265.85	0.012
	45 - 44					25.200	50.2321	-15.58	1265.85	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	44 - 43					25.200	50.2321	-15.78	1265.85	0.012
	43 - 42					25.200	50.2321	-15.98	1265.85	0.013
L6	42 - 41	P30x0.7024	12.00	0.00	0.0	25.200	64.6497	-16.22	1629.17	0.010
	41 - 40					25.200	64.6497	-16.45	1629.17	0.010
	40 - 39					25.200	64.6497	-16.69	1629.17	0.010
	39 - 38					25.200	64.6497	-16.92	1629.17	0.010
	38 - 37					25.200	64.6497	-17.16	1629.17	0.011
	37 - 36					25.200	64.6497	-17.39	1629.17	0.011
	36 - 35					25.200	64.6497	-17.63	1629.17	0.011
	35 - 34					25.200	64.6497	-17.87	1629.17	0.011
	34 - 33					25.200	64.6497	-18.10	1629.17	0.011
	33 - 32					25.200	64.6497	-18.34	1629.17	0.011
	32 - 31					25.200	64.6497	-18.58	1629.17	0.011
	31 - 30					25.200	64.6497	-18.82	1629.17	0.012
L7	30 - 29	P36x0.5567	9.00	0.00	0.0	25.200	61.9877	-21.85	1562.09	0.014
	29 - 28					25.200	61.9877	-22.12	1562.09	0.014
	28 - 27					25.200	61.9877	-22.38	1562.09	0.014
	27 - 26					25.200	61.9877	-22.65	1562.09	0.014
	26 - 25					25.200	61.9877	-22.91	1562.09	0.015
	25 - 24					25.200	61.9877	-23.18	1562.09	0.015
	24 - 23					25.200	61.9877	-23.45	1562.09	0.015
	23 - 22					25.200	61.9877	-23.71	1562.09	0.015
	22 - 21					25.200	61.9877	-23.98	1562.09	0.015
L8	21 - 19.95	Pipe36 x 0.69	21.00	0.00	0.0	25.200	76.5415	-24.26	1928.84	0.013
	19.95 - 18.9					25.200	76.5415	-24.54	1928.84	0.013
	18.9 - 17.85					25.200	76.5415	-24.82	1928.84	0.013
	17.85 - 16.8					25.200	76.5415	-25.10	1928.84	0.013
	16.8 - 15.75					25.200	76.5415	-25.38	1928.84	0.013
	15.75 - 14.7					25.200	76.5415	-25.66	1928.84	0.013
	14.7 - 13.65					25.200	76.5415	-25.94	1928.84	0.013
	13.65 - 12.6					25.200	76.5415	-26.22	1928.84	0.014
	12.6 - 11.55					25.200	76.5415	-26.50	1928.84	0.014
	11.55 - 10.5					25.200	76.5415	-26.79	1928.84	0.014
	10.5 - 9.45					25.200	76.5415	-27.07	1928.84	0.014
	9.45 - 8.4					25.200	76.5415	-27.35	1928.84	0.014
	8.4 - 7.35					25.200	76.5415	-27.63	1928.84	0.014
	7.35 - 6.3					25.200	76.5415	-27.91	1928.84	0.014
	6.3 - 5.25					25.200	76.5415	-28.20	1928.84	0.015
	5.25 - 4.2					25.200	76.5415	-28.48	1928.84	0.015
	4.2 - 3.15					25.200	76.5415	-28.76	1928.84	0.015
	3.15 - 2.1					25.200	76.5415	-29.05	1928.84	0.015
	2.1 - 1.05					25.200	76.5415	-29.33	1928.84	0.015
	1.05 - 0					25.200	76.5415	-29.62	1928.84	0.015

* DL controls

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	130 - 129	Pipe 16" O.D. x 0.1875"	0.02	0.007	24.558	0.000	0.00	0.000	24.558	0.000
	129 - 128		0.08	0.026	24.558	0.001	0.00	0.000	24.558	0.000
	128 - 127		0.21	0.068	24.558	0.003	0.00	0.000	24.558	0.000
	127 - 126		1.84	0.608	24.558	0.025	0.00	0.000	24.558	0.000
	126 - 125		3.55	1.169	24.558	0.048	0.00	0.000	24.558	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	125 - 124		5.29	1.745	24.558	0.071	0.00	0.000	24.558	0.000
	124 - 123		7.08	2.335	24.558	0.095	0.00	0.000	24.558	0.000
	123 - 122		8.91	2.939	24.558	0.120	0.00	0.000	24.558	0.000
	122 - 121		10.79	3.558	24.558	0.145	0.00	0.000	24.558	0.000
	121 - 120		12.71	4.190	24.558	0.171	0.00	0.000	24.558	0.000
L2	120 - 118.5	P24x0.25	15.69	1.718	23.696	0.072	0.00	0.000	23.696	0.000
	118.5 - 117		18.82	2.060	23.696	0.087	0.00	0.000	23.696	0.000
	117 - 115.5		23.74	2.599	23.696	0.110	0.00	0.000	23.696	0.000
	115.5 - 114		31.38	3.435	23.696	0.145	0.00	0.000	23.696	0.000
	114 - 112.5		40.80	4.467	23.696	0.189	0.00	0.000	23.696	0.000
	112.5 - 111		50.38	5.515	23.696	0.233	0.00	0.000	23.696	0.000
	111 - 109.5		60.10	6.580	23.696	0.278	0.00	0.000	23.696	0.000
	109.5 - 108		69.98	7.661	23.696	0.323	0.00	0.000	23.696	0.000
	108 - 106.5		80.00	8.758	23.696	0.370	0.00	0.000	23.696	0.000
	106.5 - 105		90.17	9.871	23.696	0.417	0.00	0.000	23.696	0.000
	105 - 103.5		106.43	11.652	23.696	0.492	0.00	0.000	23.696	0.000
	103.5 - 102		122.91	13.455	23.696	0.568	0.00	0.000	23.696	0.000
	102 - 100.5		139.52	15.275	23.696	0.645	0.00	0.000	23.696	0.000
	100.5 - 99		156.29	17.110	23.696	0.722	0.00	0.000	23.696	0.000
	99 - 97.5		173.19	18.961	23.696	0.800	0.00	0.000	23.696	0.000
	97.5 - 96		190.24	20.827	23.696	0.879	0.00	0.000	23.696	0.000
	96 - 94.5		208.76	22.854	23.696	0.964	0.00	0.000	23.696	0.000
	94.5 - 93		227.42	24.897	23.696	1.051	0.00	0.000	23.696	0.000
	93 - 91.5		246.22	26.955	23.696	1.138	0.00	0.000	23.696	0.000
	91.5 - 90		265.15	29.028	23.696	1.225	0.00	0.000	23.696	0.000
L3	90 - 88.9688	P24x0.375	278.25	20.629	27.720	0.744	0.00	0.000	27.720	0.000
	88.9688 - 87.9375		291.41	21.605	27.720	0.779	0.00	0.000	27.720	0.000
	87.9375 - 86.9063		304.64	22.586	27.720	0.815	0.00	0.000	27.720	0.000
	86.9063 - 85.875		317.93	23.571	27.720	0.850	0.00	0.000	27.720	0.000
	85.875 - 84.8438		331.29	24.561	27.720	0.886	0.00	0.000	27.720	0.000
	84.8438 - 83.8125		344.71	25.556	27.720	0.922	0.00	0.000	27.720	0.000
	83.8125 - 82.7813		358.19	26.556	27.720	0.958	0.00	0.000	27.720	0.000
	82.7813 - 81.75		371.74	27.561	27.720	0.994	0.00	0.000	27.720	0.000
	81.75 - 80.7188		385.35	28.570	27.720	1.031	0.00	0.000	27.720	0.000
	80.7188 - 79.6875		399.03	29.583	27.720	1.067	0.00	0.000	27.720	0.000
	79.6875 - 78.6563		412.76	30.602	27.720	1.104	0.00	0.000	27.720	0.000
	78.6563 - 77.625		426.56	31.624	27.720	1.141	0.00	0.000	27.720	0.000
	77.625 - 76.5938		440.41	32.651	27.720	1.178	0.00	0.000	27.720	0.000
	76.5938 - 75.5625		454.32	33.683	27.720	1.215	0.00	0.000	27.720	0.000
	75.5625 - 74.5313		468.30	34.719	27.720	1.253	0.00	0.000	27.720	0.000
	74.5313 - 73.5		482.33	35.760	27.720	1.290	0.00	0.000	27.720	0.000
L4	73.5 - 72.4615	P24x0.595	496.53	23.852	27.720	0.860	0.00	0.000	27.720	0.000
	72.4615 - 71.4231		510.79	24.537	27.720	0.885	0.00	0.000	27.720	0.000
	71.4231 - 70.3846		525.11	25.225	27.720	0.910	0.00	0.000	27.720	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	70.3846 - 69.3462		539.50	25.916	27.720	0.935	0.00	0.000	27.720	0.000
	69.3462 - 68.3077		553.96	26.611	27.720	0.960	0.00	0.000	27.720	0.000
	68.3077 - 67.2692		568.48	27.308	27.720	0.985	0.00	0.000	27.720	0.000
	67.2692 - 66.2308		583.06	28.009	27.720	1.010	0.00	0.000	27.720	0.000
	66.2308 - 65.1923		597.70	28.712	27.720	1.036	0.00	0.000	27.720	0.000
	65.1923 - 64.1538		612.41	29.419	27.720	1.061	0.00	0.000	27.720	0.000
	64.1538 - 63.1154		627.18	30.128	27.720	1.087	0.00	0.000	27.720	0.000
	63.1154 - 62.0769		642.01	30.840	27.720	1.113	0.00	0.000	27.720	0.000
	62.0769 - 61.0385		656.90	31.556	27.720	1.138	0.00	0.000	27.720	0.000
	61.0385 - 60		671.85	32.274	27.720	1.164	0.00	0.000	27.720	0.000
L5	60 - 59	P30x0.5428	687.20	22.695	27.720	0.819	0.00	0.000	27.720	0.000
	59 - 58		702.62	23.204	27.720	0.837	0.00	0.000	27.720	0.000
	58 - 57		718.10	23.715	27.720	0.856	0.00	0.000	27.720	0.000
	57 - 56		733.64	24.229	27.720	0.874	0.00	0.000	27.720	0.000
	56 - 55		749.24	24.744	27.720	0.893	0.00	0.000	27.720	0.000
	55 - 54		764.91	25.262	27.720	0.911	0.00	0.000	27.720	0.000
	54 - 53		780.64	25.781	27.720	0.930	0.00	0.000	27.720	0.000
	53 - 52		796.43	26.303	27.720	0.949	0.00	0.000	27.720	0.000
	52 - 51		812.28	26.826	27.720	0.968	0.00	0.000	27.720	0.000
	51 - 50		828.20	27.352	27.720	0.987	0.00	0.000	27.720	0.000
	50 - 49		844.23	27.881	27.720	1.006	0.00	0.000	27.720	0.000
	49 - 48		860.32	28.413	27.720	1.025	0.00	0.000	27.720	0.000
	48 - 47		876.47	28.946	27.720	1.044	0.00	0.000	27.720	0.000
	47 - 46		892.67	29.481	27.720	1.064	0.00	0.000	27.720	0.000
	46 - 45		908.94	30.018	27.720	1.083	0.00	0.000	27.720	0.000
	45 - 44		925.27	30.558	27.720	1.102	0.00	0.000	27.720	0.000
	44 - 43		941.65	31.099	27.720	1.122	0.00	0.000	27.720	0.000
	43 - 42		958.08	31.641	27.720	1.141	0.00	0.000	27.720	0.000
L6	42 - 41	P30x0.7024	974.58	25.276	27.720	0.912	0.00	0.000	27.720	0.000
	41 - 40		991.13	25.705	27.720	0.927	0.00	0.000	27.720	0.000
	40 - 39		1007.73	26.135	27.720	0.943	0.00	0.000	27.720	0.000
	39 - 38		1024.38	26.567	27.720	0.958	0.00	0.000	27.720	0.000
	38 - 37		1041.09	27.000	27.720	0.974	0.00	0.000	27.720	0.000
	37 - 36		1057.85	27.435	27.720	0.990	0.00	0.000	27.720	0.000
	36 - 35		1074.67	27.871	27.720	1.005	0.00	0.000	27.720	0.000
	35 - 34		1091.53	28.308	27.720	1.021	0.00	0.000	27.720	0.000
	34 - 33		1108.44	28.747	27.720	1.037	0.00	0.000	27.720	0.000
	33 - 32		1125.41	29.187	27.720	1.053	0.00	0.000	27.720	0.000
	32 - 31		1142.42	29.628	27.720	1.069	0.00	0.000	27.720	0.000
	31 - 30		1159.48	30.071	27.720	1.085	0.00	0.000	27.720	0.000
L7	30 - 29	P36x0.5567	1177.43	26.122	27.720	0.942	0.00	0.000	27.720	0.000
	29 - 28		1195.45	26.521	27.720	0.957	0.00	0.000	27.720	0.000
	28 - 27		1213.52	26.922	27.720	0.971	0.00	0.000	27.720	0.000
	27 - 26		1231.64	27.324	27.720	0.986	0.00	0.000	27.720	0.000
	26 - 25		1249.82	27.727	27.720	1.000	0.00	0.000	27.720	0.000
	25 - 24		1268.05	28.132	27.720	1.015	0.00	0.000	27.720	0.000
	24 - 23		1286.34	28.538	27.720	1.030	0.00	0.000	27.720	0.000
	23 - 22		1304.68	28.945	27.720	1.044	0.00	0.000	27.720	0.000
	22 - 21		1323.08	29.353	27.720	1.059	0.00	0.000	27.720	0.000
L8	21 - 19.95	Pipe36 x 0.69	1342.45	24.299	27.720	0.877	0.00	0.000	27.720	0.000
	19.95 - 18.9		1361.88	24.651	27.720	0.889	0.00	0.000	27.720	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	18.9 - 17.85		1381.38	25.003	27.720	0.902	0.00	0.000	27.720	0.000
	17.85 - 16.8		1400.93	25.357	27.720	0.915	0.00	0.000	27.720	0.000
	16.8 - 15.75		1420.55	25.712	27.720	0.928	0.00	0.000	27.720	0.000
	15.75 - 14.7		1440.23	26.069	27.720	0.940	0.00	0.000	27.720	0.000
	14.7 - 13.65		1459.97	26.426	27.720	0.953	0.00	0.000	27.720	0.000
	13.65 - 12.6		1479.76	26.784	27.720	0.966	0.00	0.000	27.720	0.000
	12.6 - 11.55		1499.62	27.143	27.720	0.979	0.00	0.000	27.720	0.000
	11.55 - 10.5		1519.53	27.504	27.720	0.992	0.00	0.000	27.720	0.000
	10.5 - 9.45		1539.49	27.865	27.720	1.005	0.00	0.000	27.720	0.000
	9.45 - 8.4		1559.51	28.228	27.720	1.018	0.00	0.000	27.720	0.000
	8.4 - 7.35		1579.58	28.591	27.720	1.031	0.00	0.000	27.720	0.000
	7.35 - 6.3		1599.72	28.955	27.720	1.045	0.00	0.000	27.720	0.000
	6.3 - 5.25		1619.90	29.321	27.720	1.058	0.00	0.000	27.720	0.000
	5.25 - 4.2		1640.14	29.687	27.720	1.071	0.00	0.000	27.720	0.000
	4.2 - 3.15		1660.43	30.054	27.720	1.084	0.00	0.000	27.720	0.000
	3.15 - 2.1		1680.78	30.423	27.720	1.097	0.00	0.000	27.720	0.000
	2.1 - 1.05		1701.18	30.792	27.720	1.111	0.00	0.000	27.720	0.000
	1.05 - 0		1721.62	31.162	27.720	1.124	0.00	0.000	27.720	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	130 - 129	Pipe 16" O.D. x 0.1875"	0.00	0.000	16.800	0.000	0.00	0.000	14.201	0.000
	129 - 128		0.04	0.008	16.800	0.000	0.00	0.000	14.201	0.000
	128 - 127		0.13	0.028	16.800	0.002	0.00	0.000	14.201	0.000
	127 - 126		1.66	0.356	16.800	0.021	0.19	0.031	14.201	0.002
	126 - 125		1.73	0.371	16.800	0.022	0.16	0.026	14.201	0.002
	125 - 124		1.77	0.380	16.800	0.023	0.16	0.026	14.201	0.002
	124 - 123		1.81	0.390	16.800	0.023	0.16	0.026	14.201	0.002
	123 - 122		1.86	0.399	16.800	0.024	0.16	0.026	14.201	0.002
	122 - 121		1.90	0.408	16.800	0.024	0.16	0.026	14.201	0.002
	121 - 120		1.94	0.417	16.800	0.025	0.16	0.026	14.201	0.002
L2	120 - 118.5	P24x0.25	2.04	0.219	16.800	0.013	0.16	0.009	11.901	0.001
	118.5 - 117		2.15	0.230	16.800	0.014	0.16	0.009	11.901	0.001
	117 - 115.5		5.05	0.541	16.800	0.032	1.76	0.096	11.901	0.008
	115.5 - 114		5.15	0.552	16.800	0.033	1.76	0.096	11.901	0.008
	114 - 112.5		6.34	0.680	16.800	0.040	1.74	0.095	11.901	0.008
	112.5 - 111		6.44	0.691	16.800	0.041	1.74	0.095	11.901	0.008
	111 - 109.5		6.54	0.701	16.800	0.042	1.74	0.095	11.901	0.008
	109.5 - 108		6.64	0.712	16.800	0.042	1.74	0.095	11.901	0.008
	108 - 106.5		6.74	0.723	16.800	0.043	1.74	0.095	11.901	0.008
	106.5 - 105		6.84	0.733	16.800	0.044	1.74	0.095	11.901	0.008
	105 - 103.5		10.94	1.173	16.800	0.070	1.24	0.068	11.901	0.006
	103.5 - 102		11.04	1.184	16.800	0.070	1.24	0.068	11.901	0.006
	102 - 100.5		11.14	1.194	16.800	0.071	1.24	0.068	11.901	0.006
	100.5 - 99		11.23	1.204	16.800	0.072	1.24	0.068	11.901	0.006
	99 - 97.5		11.33	1.215	16.800	0.072	1.24	0.068	11.901	0.006
	97.5 - 96		11.42	1.225	16.800	0.073	1.24	0.068	11.901	0.006
	96 - 94.5		12.40	1.330	16.800	0.079	1.24	0.068	11.901	0.006
	94.5 - 93		12.50	1.340	16.800	0.080	1.24	0.068	11.901	0.006
	93 - 91.5		12.59	1.350	16.800	0.080	1.24	0.068	11.901	0.006
	91.5 - 90		12.68	1.360	16.800	0.081	1.24	0.068	11.901	0.006
L3	90 - 88.9688	P24x0.375	12.74	0.916	16.800	0.055	1.24	0.046	16.800	0.003
	88.9688 -		12.81	0.920	16.800	0.055	1.24	0.046	16.800	0.003

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 $\frac{f_{vt}}{F_{vt}}$
	87.9375									
	87.9375 - 86.9063		12.87	0.925	16.800	0.055	1.24	0.046	16.800	0.003
	86.9063 - 85.875		12.93	0.929	16.800	0.055	1.24	0.046	16.800	0.003
	85.875 - 84.8438		12.99	0.934	16.800	0.056	1.24	0.046	16.800	0.003
	84.8438 - 83.8125		13.06	0.938	16.800	0.056	1.24	0.046	16.800	0.003
	83.8125 - 82.7813		13.12	0.943	16.800	0.056	1.24	0.046	16.800	0.003
	82.7813 - 81.75		13.18	0.947	16.800	0.056	1.24	0.046	16.800	0.003
	81.75 - 80.7188		13.24	0.951	16.800	0.057	1.24	0.046	16.800	0.003
	80.7188 - 79.6875		13.30	0.956	16.800	0.057	1.24	0.046	16.800	0.003
	79.6875 - 78.6563		13.36	0.960	16.800	0.057	1.24	0.046	16.800	0.003
	78.6563 - 77.625		13.42	0.964	16.800	0.057	1.23	0.046	16.800	0.003
	77.625 - 76.5938		13.48	0.968	16.800	0.058	1.23	0.046	16.800	0.003
	76.5938 - 75.5625		13.53	0.973	16.800	0.058	1.23	0.046	16.800	0.003
	75.5625 - 74.5313		13.59	0.977	16.800	0.058	1.23	0.046	16.800	0.003
	74.5313 - 73.5		13.65	0.981	16.800	0.058	1.23	0.046	16.800	0.003
L4	73.5 - 72.4615	P24x0.595	13.71	0.627	16.800	0.037	1.23	0.030	16.800	0.002
	72.4615 - 71.4231		13.77	0.630	16.800	0.037	1.23	0.030	16.800	0.002
	71.4231 - 70.3846		13.84	0.633	16.800	0.038	1.23	0.030	16.800	0.002
	70.3846 - 69.3462		13.90	0.635	16.800	0.038	1.23	0.030	16.800	0.002
	69.3462 - 68.3077		13.96	0.638	16.800	0.038	1.24	0.030	16.800	0.002
	68.3077 - 67.2692		14.02	0.641	16.800	0.038	1.24	0.030	16.800	0.002
	67.2692 - 66.2308		14.09	0.644	16.800	0.038	1.24	0.030	16.800	0.002
	66.2308 - 65.1923		14.15	0.647	16.800	0.038	1.24	0.030	16.800	0.002
	65.1923 - 64.1538		14.21	0.649	16.800	0.039	1.24	0.030	16.800	0.002
	64.1538 - 63.1154		14.26	0.652	16.800	0.039	1.24	0.030	16.800	0.002
	63.1154 - 62.0769		14.32	0.655	16.800	0.039	1.24	0.030	16.800	0.002
	62.0769 - 61.0385		14.38	0.657	16.800	0.039	1.24	0.030	16.800	0.002
	61.0385 - 60		14.44	0.660	16.800	0.039	1.24	0.030	16.800	0.002
L5	60 - 59	P30x0.5428	15.40	0.613	16.800	0.036	1.24	0.020	16.800	0.001
	59 - 58		15.46	0.616	16.800	0.037	1.04	0.017	16.800	0.001
	58 - 57		15.52	0.618	16.800	0.037	1.04	0.017	16.800	0.001
	57 - 56		15.59	0.621	16.800	0.037	1.04	0.017	16.800	0.001
	56 - 55		15.65	0.623	16.800	0.037	1.04	0.017	16.800	0.001
	55 - 54		15.71	0.626	16.800	0.037	1.04	0.017	16.800	0.001
	54 - 53		15.77	0.628	16.800	0.037	1.04	0.017	16.800	0.001
	53 - 52		15.84	0.631	16.800	0.038	1.04	0.017	16.800	0.001

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 $\frac{f_{vt}}{F_{vt}}$
	52 - 51		15.90	0.633	16.800	0.038	1.04	0.017	16.800	0.001
	51 - 50		15.96	0.635	16.800	0.038	1.04	0.017	16.800	0.001
	50 - 49		16.08	0.640	16.800	0.038	1.20	0.020	16.800	0.001
	49 - 48		16.14	0.642	16.800	0.038	1.20	0.020	16.800	0.001
	48 - 47		16.19	0.645	16.800	0.038	1.20	0.020	16.800	0.001
	47 - 46		16.25	0.647	16.800	0.039	1.20	0.020	16.800	0.001
	46 - 45		16.31	0.649	16.800	0.039	1.20	0.020	16.800	0.001
	45 - 44		16.37	0.652	16.800	0.039	1.20	0.020	16.800	0.001
	44 - 43		16.43	0.654	16.800	0.039	1.20	0.020	16.800	0.001
	43 - 42		16.48	0.656	16.800	0.039	1.20	0.020	16.800	0.001
L6	42 - 41	P30x0.7024	16.54	0.512	16.800	0.030	1.20	0.016	16.800	0.001
	41 - 40		16.59	0.513	16.800	0.031	1.20	0.016	16.800	0.001
	40 - 39		16.64	0.515	16.800	0.031	1.20	0.016	16.800	0.001
	39 - 38		16.70	0.517	16.800	0.031	1.20	0.016	16.800	0.001
	38 - 37		16.75	0.518	16.800	0.031	1.21	0.016	16.800	0.001
	37 - 36		16.80	0.520	16.800	0.031	1.21	0.016	16.800	0.001
	36 - 35		16.85	0.521	16.800	0.031	1.21	0.016	16.800	0.001
	35 - 34		16.90	0.523	16.800	0.031	1.21	0.016	16.800	0.001
	34 - 33		16.96	0.525	16.800	0.031	1.21	0.016	16.800	0.001
	33 - 32		17.01	0.526	16.800	0.031	1.21	0.016	16.800	0.001
	32 - 31		17.05	0.528	16.800	0.031	1.21	0.016	16.800	0.001
	31 - 30		17.10	0.529	16.800	0.031	1.21	0.016	16.800	0.001
L7	30 - 29	P36x0.5567	18.00	0.581	16.800	0.035	1.21	0.013	16.800	0.001
	29 - 28		18.06	0.583	16.800	0.035	1.21	0.013	16.800	0.001
	28 - 27		18.11	0.584	16.800	0.035	1.21	0.013	16.800	0.001
	27 - 26		18.17	0.586	16.800	0.035	1.21	0.013	16.800	0.001
	26 - 25		18.22	0.588	16.800	0.035	1.21	0.013	16.800	0.001
	25 - 24		18.28	0.590	16.800	0.035	1.21	0.013	16.800	0.001
	24 - 23		18.33	0.592	16.800	0.035	1.21	0.013	16.800	0.001
	23 - 22		18.39	0.593	16.800	0.035	1.21	0.013	16.800	0.001
	22 - 21		18.44	0.595	16.800	0.035	1.21	0.013	16.800	0.001
L8	21 - 19.95	Pipe36 x 0.69	18.50	0.483	16.800	0.029	1.21	0.011	16.800	0.001
	19.95 - 18.9		18.56	0.485	16.800	0.029	1.21	0.011	16.800	0.001
	18.9 - 17.85		18.62	0.486	16.800	0.029	1.21	0.011	16.800	0.001
	17.85 - 16.8		18.67	0.488	16.800	0.029	1.21	0.011	16.800	0.001
	16.8 - 15.75		18.73	0.489	16.800	0.029	1.21	0.011	16.800	0.001
	15.75 - 14.7		18.79	0.491	16.800	0.029	1.22	0.011	16.800	0.001
	14.7 - 13.65		18.84	0.492	16.800	0.029	1.22	0.011	16.800	0.001
	13.65 - 12.6		18.90	0.494	16.800	0.029	1.22	0.011	16.800	0.001
	12.6 - 11.55		18.95	0.495	16.800	0.029	1.22	0.011	16.800	0.001
	11.55 - 10.5		19.01	0.497	16.800	0.030	1.22	0.011	16.800	0.001
	10.5 - 9.45		19.06	0.498	16.800	0.030	1.22	0.011	16.800	0.001
	9.45 - 8.4		19.12	0.499	16.800	0.030	1.22	0.011	16.800	0.001
	8.4 - 7.35		19.17	0.501	16.800	0.030	1.22	0.011	16.800	0.001
	7.35 - 6.3		19.22	0.502	16.800	0.030	1.22	0.011	16.800	0.001
	6.3 - 5.25		19.27	0.504	16.800	0.030	1.22	0.011	16.800	0.001
	5.25 - 4.2		19.32	0.505	16.800	0.030	1.22	0.011	16.800	0.001
	4.2 - 3.15		19.37	0.506	16.800	0.030	1.22	0.011	16.800	0.001
	3.15 - 2.1		19.42	0.507	16.800	0.030	1.22	0.011	16.800	0.001
	2.1 - 1.05		19.47	0.509	16.800	0.030	1.22	0.011	16.800	0.001
	1.05 - 0		19.52	0.510	16.800	0.030	1.22	0.011	16.800	0.001

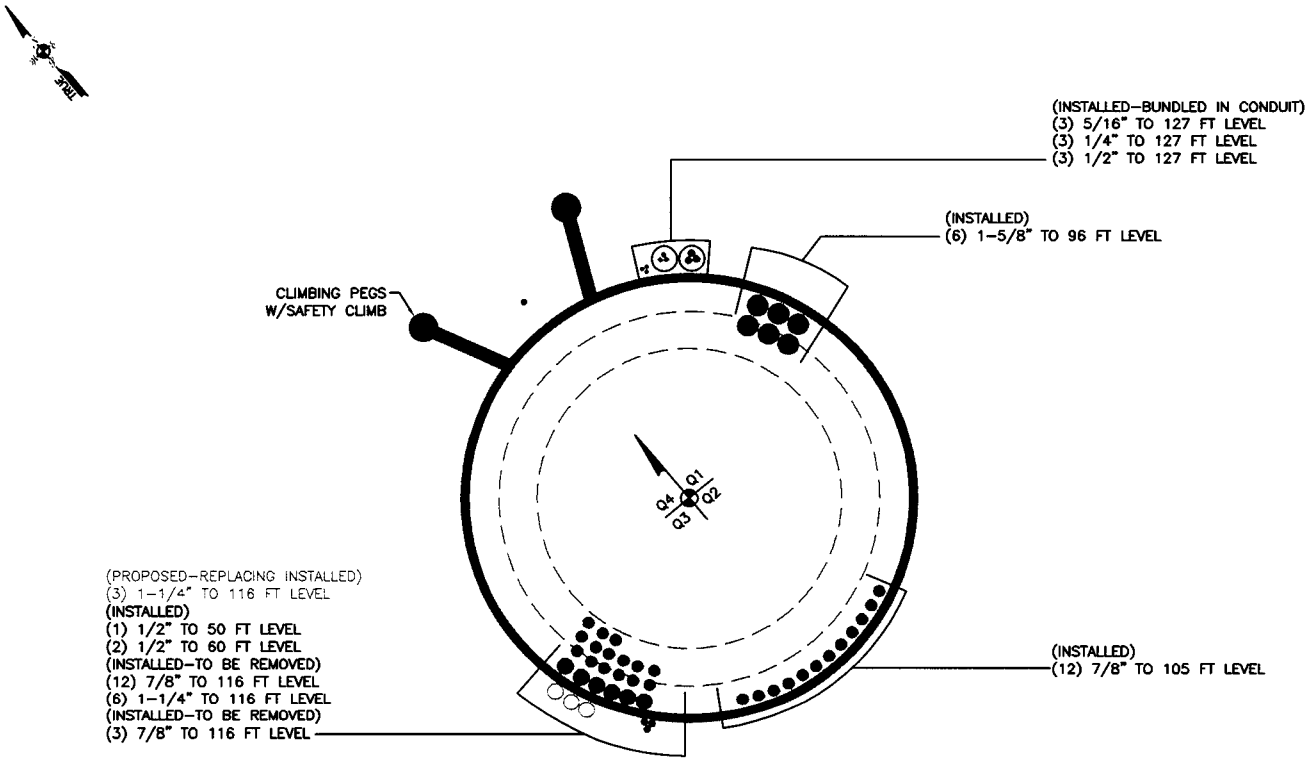
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	130 - 120	Pole	Pipe 16" O.D. x 0.1875"	1	-0.69	304.91	13.1	Pass
L2	120 - 90	Pole	P24x0.25	2	-6.00	589.19	93.5	Pass
L3-L4	90 - 60	Pole	P24x0.375	Note 1	Note 1	Note 1	97.6	Pass
L5-L6	60 - 30	Pole	P30x0.375	Note 1	Note 1	Note 1	95.6	Pass
L7-L8	30 - 0	Pole	P36x0.375	Note 1	Note 1	Note 1	99.9	Pass
M1	75 – 60	Shaft Reinforcement	(3) PL1x4.5	Note 1	Note 1	Note 1	89.6	Pass
M2	60 – 30	Shaft Reinforcement	(3) PL1x4.5	Note 1	Note 1	Note 1	87.3	Pass
M3	43 – 30.33	Shaft Reinforcement	(3) PL1.25x3.25	Note 1	Note 1	Note 1	97.0	Pass
M4	30 – 0	Shaft Reinforcement	(3) PL1x6	Note 1	Note 1	Note 1	77.7	Pass
M5	22 – 0	Shaft Reinforcement	(3) PL1.25x3.375	Note 1	Note 1	Note 1	97.5	Pass
							Summary	
						Pole (L7-L8)	99.9	Pass
						Shaft Reinforcement (M5)	97.5	Pass
						RATING =	**99.9**	Pass

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876324 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 73.5

73.5 Feet Above Base of Pole

Quick Check: PASS 97.62%

Pole % of Allowable w/o Mods: 97.62%

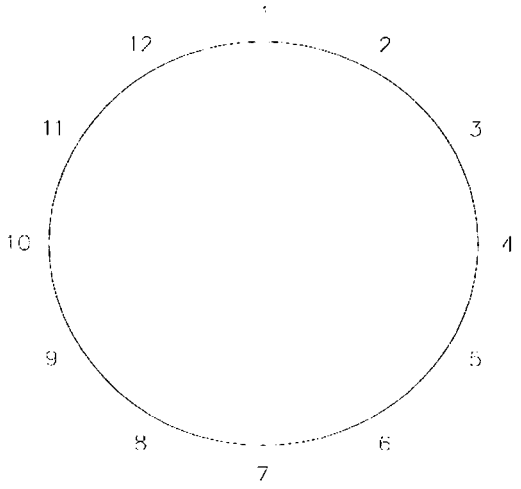
Pole % of Allowable w/ Mods: 97.62%

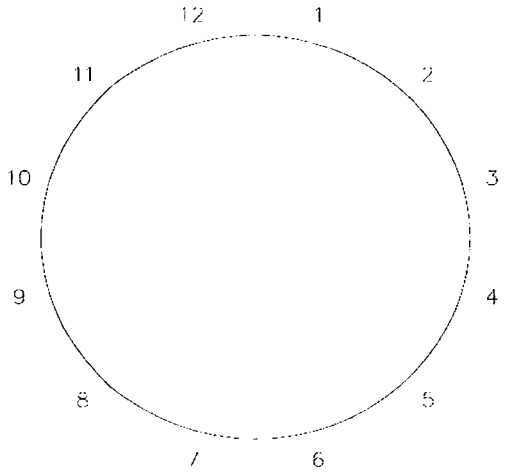
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	24.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	1942.30 in⁴
Area:	27.83 in²
J:	3884.60 in⁴
C Flats:	12.00 in
C Points:	12.00000 in
W / T =	0.00
D / T =	64.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.66
Composite I_y:	1942.30 in⁴
Modifications I_y:	0.00 in⁴
Flange Jump Check:	No

Modifications:

Modification 1:		on	Flats			Area:	in²
Plate Fy:	65 ksi		c:		in	Plate Thickness:	in
Drill Hole:	1.22 in		c_offset:		in	$r_{m's}$:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:		in	Net Area of Plate:	in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:	
Modification 2:		on	Flats			Area:	in²
Plate Fy:	65 ksi		c:		in	Plate Thickness:	in
Drill Hole:	1.22 in		c_offset:		in	$r_{m's}$:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:		in	Net Area of Plate:	in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:	
Modification 3:		on	Flats			Area:	in²
Plate Fy:	65 ksi		c:		in	Plate Thickness:	in
Drill Hole:	0.00 in		c_offset:	10.500	in	$r_{m's}$:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:		in	Net Area of Plate:	in²
			Stitch Bolt Spacing (overide):	0	in	Mod % of Allowable:	
Modification 4:		on	Flats			Area:	in²
Plate Fy:	ksi		c:		in	Plate Thickness:	in
Drill Hole:	in		c_offset:		in	$r_{m's}$:	in
Stitch Bolt Capacity:	kips		Stitch Bolt Spacing:		in	Net Area of Plate:	in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:	





Flats

Loads:

"x" axis			"y" axis	
Axial:	8.120	K		
Moment:	482.330	(K-FT)	Moment:	0.000 (K-FT)
Shear:	13.650	K		
Torque:	NA	K		

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	33.60	ksi
Flexure:	36.96	ksi

Stresses with Reinforcement:

Allowable Stress on the Plates	Compression (ksi)	Tension (ksi)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Allowable Load on the Plates	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable	Compression	Tension
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Points

Loads:

Resultant		
Axial:	8.12	K
Moment:	482.33	(K-FT)
Shear:	13.65	K
Torque:	NA	(K-FT)

Stresses without Reinforcement:

Stress on Pole		
Pole, P/A:	0.29	ksi
Pole, M/S:	35.76	ksi
Total:	36.05	ksi
Pole % of Allowable:	97.62%	%

Stresses with Reinforcement:

Stress on Pole		
Pole, P/A:	0.29	ksi
Pole, M/S:	35.76	ksi
Total:	36.05	ksi
Pole % of Allowable:	97.62%	%

Load Distribution	
8.12	K
482.33	K-FT
13.65	K
0.98	K

Stress on Plates	Compression (kips)	Tension (kips)
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Stitch Bolt Connection
0.00%

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 60 / 60 Feet Above Base of Pole

Quick Check: PASS 89.56%

Pole % of Allowable w/o Mods: 135.88%

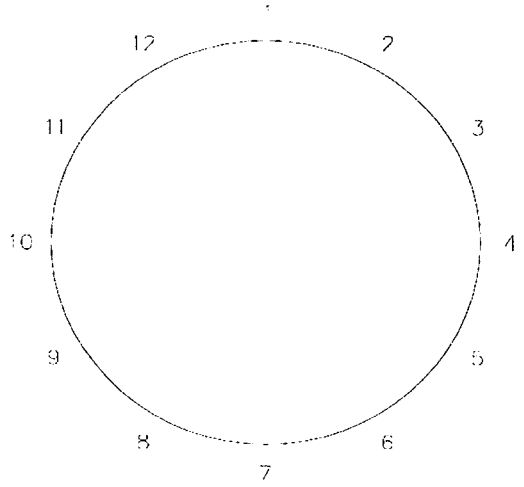
Pole % of Allowable w/ Mods: 88.06%

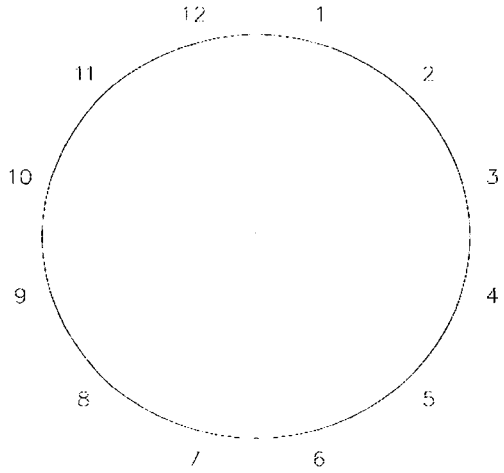
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	24.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	1942.30 in^4
Area:	27.83 in^2
J:	3884.60 in^4
C Flats:	12.00 in
C Points:	12.00000 in
W / T =	0.00
D / T =	64.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.66
Composite I_g:	2998.11 in^4
Modifications I_g:	1055.81 in^4
Flange Jump Check:	No

Modifications:

Modification 1:	Sabre_MS 450	on	Flats	3 7 11	Area:	4.50	in^2
Plate Fy:	65 ksi		c:	0.5 in	Plate Thickness:	1.00	in
Drill Hole:	1.22 in		c_offset:	in	r_{m1}:	0.289	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	20.625 in	Net Area of Plate:	3.22	in^2
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:	89.56%	
Modification 2:		on	Flats		Area:		in^2
Plate Fy:	65 ksi		c:	in	Plate Thickness:		in
Drill Hole:	1.22 in		c_offset:	in	r_{m1}:		in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in	Net Area of Plate:		in^2
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:		
Modification 3:		on	Flats		Area:		in^2
Plate Fy:	65 ksi		c:	in	Plate Thickness:		in
Drill Hole:	0.00 in		c_offset:	10.500 in	r_{m1}:		in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in	Net Area of Plate:		in^2
			Stitch Bolt Spacing (overide):	0 in	Mod % of Allowable:		
Modification 4:		on	Flats		Area:		in^2
Plate Fy:	ksi		c:	in	Plate Thickness:		in
Drill Hole:	in		c_offset:	in	r_{m1}:		in
Stitch Bolt Capacity:	kips		Stitch Bolt Spacing:	in	Net Area of Plate:		in^2
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:		





Flats

Points

Loads:

"x" axis			"y" axis	
Axial:	10.420	K		
Moment:	671.850	(K-FT)	Moment:	0.000 (K-FT)
Shear:	14.440	K		
Torque:	NA	K		

Resultant		
Axial:	10.42	K
Moment:	671.85	(K-FT)
Shear:	14.44	K
Torque:	NA	(K-FT)

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	33.60	ksi
Flexure:	36.96	ksi

Stress on Pole		
Pole, P/A:	0.37	ksi
Pole, M/S:	49.81	ksi
Total:	50.18	ksi
Pole % of Allowable:	135.88%	%

Stresses with Reinforcement:

Allowable Stress on the Plates	Compression (ksi)	Tension (ksi)
Total:	37.81	52.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Pole		
Pole, P/A:	0.25	ksi
Pole, M/S:	32.27	ksi
Total:	32.52	ksi
Pole % of Allowable:	88.06%	%

Load Distribution	
7.02	K
435.25	K-FT
9.72	K
0.59	K

Allowable Load on the Plates	Compression (kips)	Tension (kips)
Total:	170.16	171.60
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Plates	Compression (kips)	Tension (kips)
Plate, P/A:	0.25	0.00
Plate, M/S:	33.61	33.61
Total:	33.87	33.61
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates	Compression (kips)	Tension (kips)
Total:	152.40	151.26
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable	Compression	Tension
Total:	89.56%	88.15%
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Stitch Bolt Connection
18.63%

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 42

42 Feet Above Base of Pole

Quick Check: PASS 95.59%

Pole % of Allowable w/o Mods: 136.07%

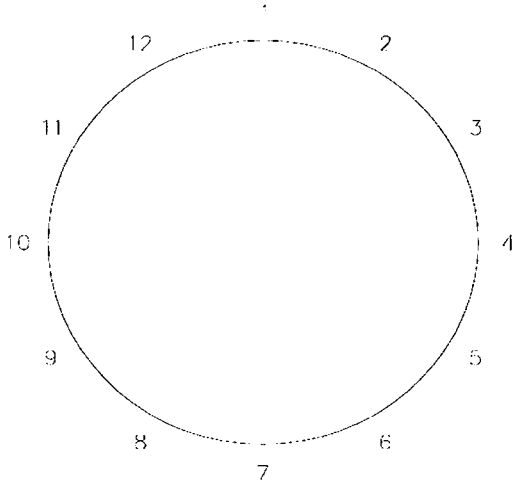
Pole % of Allowable w/ Mods: 95.59%

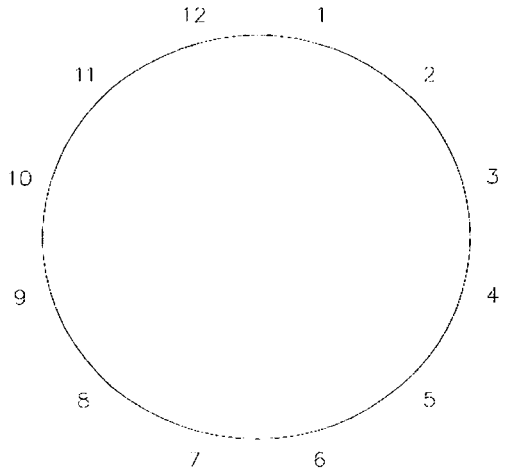
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	30.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	3829.44 in^4
Area:	34.90 in^2
J:	7658.89 in^4
C Flats:	15.00 in
C Points:	15.00000 in
W / T =	0.00
D / T =	80.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.60
Composite I_g:	5452.26 in^4
Modifications I_g:	1622.81 in^4
Flange Jump Check:	No

Modifications:

Modification 1:	Sabre_MS-450	on	Flats	3 7 11		Area:	4.50 in^2
Plate Fy:	65 ksi		c:	0.5 in		Plate Thickness:	1.00 in
Drill Hole:	1.22 in		c_offset:	in		r_{mx}:	0.289 in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	20.625 in		Net Area of Plate:	3.22 in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	87.31%
Modification 2:		on	Flats			Area:	in^2
Plate Fy:	65 ksi		c:	in		Plate Thickness:	in
Drill Hole:	1.22 in		c_offset:	in		r_{mx}:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in		Net Area of Plate:	in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	
Modification 3:		on	Flats			Area:	in^2
Plate Fy:	65 ksi		c:	in		Plate Thickness:	in
Drill Hole:	0.00 in		c_offset:	10.500 in		r_{mx}:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in		Net Area of Plate:	in^2
			Stitch Bolt Spacing (overide):	0 in		Mod % of Allowable:	
Modification 4:		on	Flats			Area:	in^2
Plate Fy:	ksi		c:	in		Plate Thickness:	in
Drill Hole:	in		c_offset:	in		r_{mx}:	in
Stitch Bolt Capacity:	kips		Stitch Bolt Spacing:	in		Net Area of Plate:	in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	





Flats

Points

Loads:

"x" axis			"y" axis		Resultant		
Axial:	15.980	K			Axial:	15.98	K
Moment:	958.080	(K-FT)	Moment:	0.000 (K-FT)	Moment:	958.08	(K-FT)
Shear:	16.480	K			Shear:	16.48	K
Torque:	NA	K			Torque:	NA	(K-FT)

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	33.43	ksi
Flexure:	33.43	ksi

Stress on Pole		
Pole, P/A:	0.46	ksi
Pole, M/S:	45.03	ksi
Total:	45.49	ksi
Pole % of Allowable:	136.07%	%

Stresses with Reinforcement:

Allowable Stress on the Plates		
	Compression (ksi)	Tension (ksi)
Total:	37.81	52.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Allowable Load on the Plates		
	Compression (kips)	Tension (kips)
Total:	170.16	171.60
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates		
	Compression (kips)	Tension (kips)
Total:	148.56	147.08
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable		
	Compression	Tension
Total:	87.31%	85.71%
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Stress on Pole		
Pole, P/A:	0.33	ksi
Pole, M/S:	31.63	ksi
Total:	31.96	ksi
Pole % of Allowable:	95.59%	%

Stress on Plates		
	Compression (kips)	Tension (kips)
Plate, P/A:	0.33	0.00
Plate, M/S:	32.68	32.68
Total:	33.01	32.68
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Load Distribution	
11.52	K
672.92	K-FT
11.88	K
0.69	K

Stitch Bolt Connection
14.49%

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 30

30 Feet Above Base of Pole

Quick Check: PASS 97.00%

Pole % of Allowable w/o Mods: 164.63%

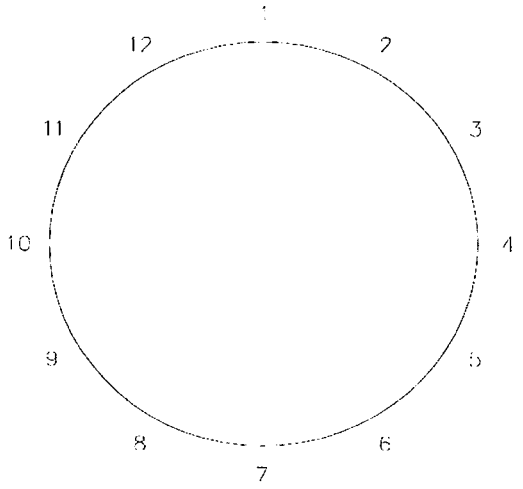
Pole % of Allowable w/ Mods: 90.86%

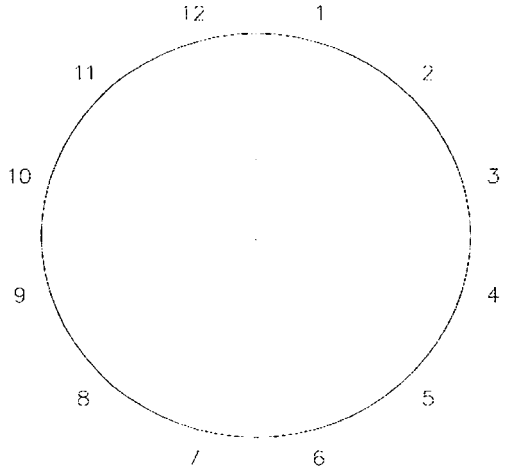
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	30.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	3829.44 in^4
Area:	34.90 in^2
J:	7658.89 in^4
C Flats:	15.00 in
C Points:	15.00000 in
W / T =	0.00
D / T =	80.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.60
Composite I_p:	6941.58 in^4
Modifications I_p:	3112.13 in^4
Flange Jump Check:	No

Modifications:

Modification 1:	Sabre_MS-450	on	Flats	3 7 11		Area:	4.50 in^2
Plate Fy:	65 ksi		c:	0.5 in		Plate Thickness:	1.00 in
Drill Hole:	1.22 in		c_offset:	in		r_{mv}:	0.289 in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	20.625 in		Net Area of Plate:	3.22 in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	82.98%
Modification 2:	PL1.25x3.25	on	Flats	1 5 9		Area:	4.0625 in^2
Plate Fy:	65 ksi		c:	0.625 in		Plate Thickness:	1.25 in
Drill Hole:	1.22 in		c_offset:	in		r_{mv}:	0.361 in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	24.000 in		Net Area of Plate:	2.46 in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	97.00%
Modification 3:		on	Flats			Area:	in^2
Plate Fy:	65 ksi		c:	in		Plate Thickness:	in
Drill Hole:	0.00 in		c_offset:	10.500 in		r_{mv}:	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in		Net Area of Plate:	in^2
			Stitch Bolt Spacing (overide):	0 in		Mod % of Allowable:	
Modification 4:		on	Flats			Area:	in^2
Plate Fy:	ksi		c:	in		Plate Thickness:	in
Drill Hole:	in		c_offset:	in		r_{mv}:	in
Stitch Bolt Capacity:	kips		Stitch Bolt Spacing:	in		Net Area of Plate:	in^2
			Stitch Bolt Spacing (overide):	in		Mod % of Allowable:	





Flats

Points

Loads:

	"x" axis		"y" axis	
Axial:	18.820	K		
Moment:	1159.480	(K-FT)	Moment: 0.000	(K-FT)
Shear:	17.100	K		
Torque:	NA	K		

Resultant		
Axial:	18.82	K
Moment:	1159.48	(K-FT)
Shear:	17.10	K
Torque:	NA	(K-FT)

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	33.43	ksi
Flexure:	33.43	ksi

Stress on Pole		
Pole, P/A:	0.54	ksi
Pole, M/S:	54.50	ksi
Total:	55.04	ksi
Pole % of Allowable:	164.63%	%

Stresses with Reinforcement:

Allowable Stress on the Plates	Compression (ksi)	Tension (ksi)
Total:	37.81	52.00
Total:	39.18	52.00
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Pole		
Pole, P/A:	0.31	ksi
Pole, M/S:	30.07	ksi
Total:	30.38	ksi
Pole % of Allowable:	90.86%	%

Load Distribution	
10.84	K
639.65	K-FT
9.85	K
0.52	K

Allowable Load on the Plates	Compression (kips)	Tension (kips)
Total:	170.16	171.60
Total:	159.16	131.17
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Plates	Compression (kips)	Tension (kips)
Plate, P/A:	0.31	0.00
Plate, M/S:	31.07	31.07
Total:	31.38	31.07
Plate, P/A:	0.31	0.00
Plate, M/S:	31.32	31.32
Total:	31.63	31.32
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates	Compression (kips)	Tension (kips)
Total:	141.21	139.81
Total:	128.49	127.23
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable	Compression	Tension
Total:	82.98%	81.47%
Total:	80.73%	97.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Stitch Bolt Connection
12.51%

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 21 / 21 Feet Above Base of Pole

Quick Check: PASS 94.13%

Pole % of Allowable w/o Mods: 137.65%

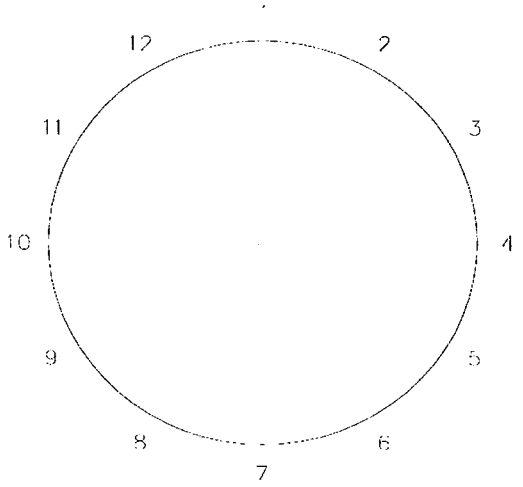
Pole % of Allowable w/ Mods: 94.13%

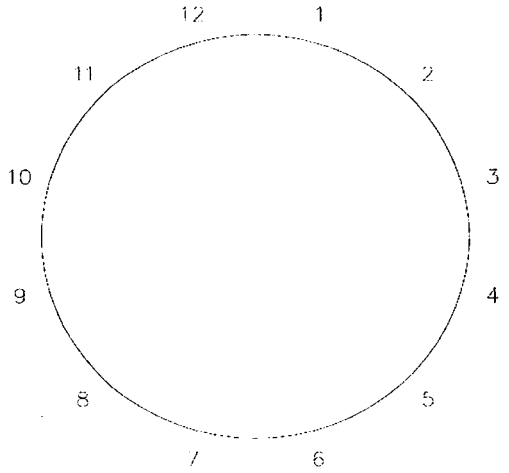
Section Properties:

Pole Type:	Round	
No. of Sides Used:	12	
Diameter Across Flats:	36.00	in
Thickness:	0.375	in
Inside Bend Radius:	1.50	in
Yield Stress:	42.00	ksi
Moment of Inertia:	6658.92	in⁴
Area:	41.97	in²
J:	13317.84	in⁴
C Flats:	18.00	in
C Points:	18.00000	in
W / T =	0.00	
D / T =	96.00	
Width of Flat:	NA	in
Allow. Stress Increase:	1.33	
Allow. Stress Factor Axial:	0.56	TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.56	
Composite I_y:	9740.67	in⁴
Modifications I_y:	3081.75	in⁴
Flange Jump Check:	No	

Modifications:

Modification 1:	Sabre_MS-600	on	Flats	3 7 11		Area:	6.00	in²
Plate Fy:	65	ksi	c:	0.5	in	Plate Thickness:	1.00	in
Drill Hole:	1.22	in	c_offset:		in	r_{mx}:	0.289	in
Stitch Bolt Capacity:	30	kips	Stitch Bolt Spacing:	16.375	in	Net Area of Plate:	4.72	in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:	73.21%	
Modification 2:		on	Flats			Area:		in²
Plate Fy:	65	ksi	c:		in	Plate Thickness:		in
Drill Hole:	1.22	in	c_offset:		in	r_{mx}:		in
Stitch Bolt Capacity:	30	kips	Stitch Bolt Spacing:		in	Net Area of Plate:		in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:		
Modification 3:		on	Flats			Area:		in²
Plate Fy:	65	ksi	c:		in	Plate Thickness:		in
Drill Hole:	0.00	in	c_offset:	10.500	in	r_{mx}:		in
Stitch Bolt Capacity:	30	kips	Stitch Bolt Spacing:		in	Net Area of Plate:		in²
			Stitch Bolt Spacing (overide):	0	in	Mod % of Allowable:		
Modification 4:		on	Flats			Area:		in²
Plate Fy:		ksi	c:		in	Plate Thickness:		in
Drill Hole:		in	c_offset:		in	r_{mx}:		in
Stitch Bolt Capacity:		kips	Stitch Bolt Spacing:		in	Net Area of Plate:		in²
			Stitch Bolt Spacing (overide):		in	Mod % of Allowable:		





Flats

Points

Loads:

	"x" axis		"y" axis	
Axial:	23.980	K		
Moment:	1323.080	(K-FT)	Moment: 0.000	(K-FT)
Shear:	18.440	K		
Torque:	NA	K		

Resultant		
Axial:	23.98	K
Moment:	1323.08	(K-FT)
Shear:	18.44	K
Torque:	NA	(K-FT)

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	31.59	ksi
Flexure:	31.59	ksi

Stress on Pole		
Pole, P/A:	0.57	ksi
Pole, M/S:	42.92	ksi
Total:	43.49	ksi
Pole % of Allowable:	137.65%	%

Stresses with Reinforcement:

Allowable Stress on the Plates	Compression (ksi)	Tension (ksi)
Total:	41.73	52.00
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Pole		
Pole, P/A:	0.40	ksi
Pole, M/S:	29.34	ksi
Total:	29.74	ksi
Pole % of Allowable:	94.13%	%

Load Distribution	
16.78	K
904.48	K-FT
12.91	K
0.66	K

Allowable Load on the Plates	Compression (kips)	Tension (kips)
Total:	250.40	251.60
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Stress on Plates	Compression (kips)	Tension (kips)
Plate, P/A:	0.40	0.00
Plate, M/S:	30.15	30.15
Total:	30.55	30.15
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates	Compression (kips)	Tension (kips)
Total:	183.33	180.93
Total:	0.00	0.00
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable	Compression	Tension
Total:	73.21%	71.91%
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Stitch Bolt Connection
11.47%

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 0 — 0 Feet Above Base of Pole

Quick Check: PASS 99.89%

Pole % of Allowable w/o Mods: 178.99%

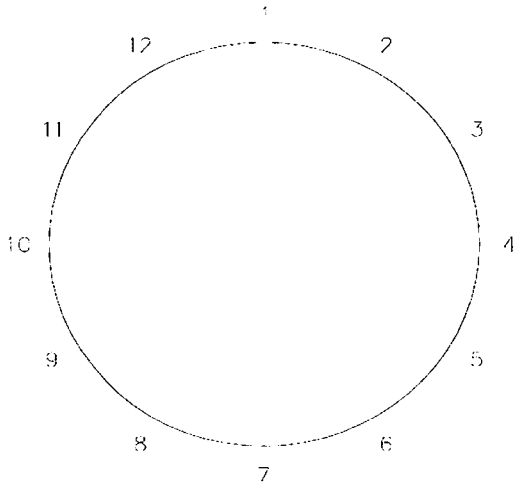
Pole % of Allowable w/ Mods: 99.89%

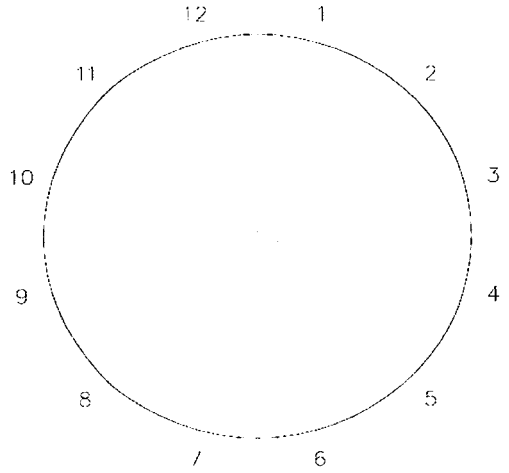
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	36.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	6658.92 in⁴
Area:	41.97 in²
J:	13317.84 in⁴
C Flats:	18.00 in
C Points:	18.00000 in
W / T =	0.00
D / T =	96.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.56 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.56
Composite I_y:	11937.49 in⁴
Modifications I_y:	5278.57 in⁴
Flange Jump Check:	No

Modifications:

Modification 1:	Sabre_MS-600	on	Flats	3 7 11	Area:	6.00	in²
Plate Fy:	65 ksi		c:	0.5 in	Plate Thickness:	1.00	in
Drill Hole:	1.22 in		c_offset:	in	r_{ay}:	0.289	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	16.375 in	Net Area of Plate:	4.72	in²
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:	77.69%	
Modification 2:	PL1.25x3.375	on	Flats	1 5 9	Area:	4.21875	in²
Plate Fy:	65 ksi		c:	0.625 in	Plate Thickness:	1.25	in
Drill Hole:	1.22 in		c_offset:	in	r_{ay}:	0.361	in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	24.000 in	Net Area of Plate:	2.62	in²
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:	97.48%	
Modification 3:		on	Flats		Area:		in²
Plate Fy:	65 ksi		c:	in	Plate Thickness:		in
Drill Hole:	0.00 in		c_offset:	10.500 in	r_{ay}:		in
Stitch Bolt Capacity:	30 kips		Stitch Bolt Spacing:	in	Net Area of Plate:		in²
			Stitch Bolt Spacing (overide):	0 in	Mod % of Allowable:		
Modification 4:		on	Flats		Area:		in²
Plate Fy:	ksi		c:	in	Plate Thickness:		in
Drill Hole:	in		c_offset:	in	r_{ay}:		in
Stitch Bolt Capacity:	kips		Stitch Bolt Spacing:	in	Net Area of Plate:		in²
			Stitch Bolt Spacing (overide):	in	Mod % of Allowable:		





Flats

Loads:

"x" axis			"y" axis	
Axial:	29.620	K		
Moment:	1721.620	(K-FT)	Moment:	0.000 (K-FT)
Shear:	19.520	K		
Torque:	NA	K		

Stresses without Reinforcement:

Allowable Stress on the Pole		
Axial:	31.59	ksi
Flexure:	31.59	ksi

Stresses with Reinforcement:

Allowable Stress on the Plates	Compression (ksi)	Tension (ksi)
Total:	41.73	52.00
Total:	39.18	52.00
Total:	0.00	0.00
Total:	0.00	0.00

Allowable Load on the Plates	Compression (kips)	Tension (kips)
Total:	250.40	251.60
Total:	165.29	139.50
Total:	0.00	0.00
Total:	0.00	0.00

Actual Load on the Plates	Compression (kips)	Tension (kips)
Total:	194.55	192.10
Total:	137.70	135.98
Total:	0.00	0.00
Total:	0.00	0.00

Plate % of Allowable	Compression	Tension
Total:	77.69%	76.35%
Total:	83.31%	97.48%
Total:	0.00%	0.00%
Total:	0.00%	0.00%

Points

Resultant

Axial:	29.62	K
Moment:	1721.62	(K-FT)
Shear:	19.52	K
Torque:	NA	(K-FT)

Stress on Pole		
Pole, P/A:	0.71	ksi
Pole, M/S:	55.85	ksi
Total:	56.55	ksi
Pole % of Allowable:	178.99%	%

Stress on Pole		
Pole, P/A:	0.41	ksi
Pole, M/S:	31.15	ksi
Total:	31.56	ksi
Pole % of Allowable:	99.89%	%

Load Distribution	
17.12	K
960.35	K-FT
11.28	K
0.58	K

Stress on Plates	Compression (kips)	Tension (kips)
Plate, P/A:	0.41	0.00
Plate, M/S:	32.02	32.02
Total:	32.42	32.02
Plate, P/A:	0.41	0.00
Plate, M/S:	32.23	32.23
Total:	32.64	32.23
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Stitch Bolt Connection
10.28%

Anchor Rod Reinforcement

Project Name: West Hartford United Methodist
Project Number: 128057
Designed By: AAC

Code: F
Modification: (3) 1.75" 150 ksi Williams Form

Existing Loading

Moment:	1722	k-ft
Axial:	30	k
Shear:	20	k

Modified Load to Existing Anchor Rods

$M = I_{ext.}/y_{ext.} \times (P/A_{r/f} + T_{r/f})$

(A or S) = (A or S) x A_{ratio}

Moment:	1154.18	k-ft
Axial:	22.29	k
Shear:	14.86	k
A_{ratio}:	0.74	

Existing Anchor Rod Properties

Type of Bar:	A354 BC	
No. Existing:	16	
D_{ext}:	1.50	in
Bolt Circle:	41.50	in
A_{net_ext}:	1.41	in^2
A_{g_ext}:	1.77	in^2
$Fy_{\_ext}$:	105	ksi
$Fu_{\_ext}$:	125	ksi
A_{ext}:	22.6	in^2
I_{ext}:	4859.28	in^4
Y_{ext}:	20.75	in

Reinforcing Anchor Rod Properties

Type of Bar:	150 ksi Williams Form	
No. R/F:	3	
$D_{r/f}$:	1.75	in
Bolt Circle:	49.50	in
$A_{net\_r/f}$:	2.60	in^2
$A_{g\_r/f}$:	2.41	in^2
$F_{y\_r/f}$:	320	kips
$F_{u\_r/f}$:	400	kips
$A_{r/f}$:	30.4	in^2
$I_{r/f}$:	7249.88	in^4
$Y_{r/f}$:	24.75	in

Foundation Properties

f'_c:	3500	psi
f_y:	60000	psi
d_b:	1.128	in
Top Cover:	3	in
G:	3.75	in
T_u:	320.00	kips
Epoxy Strength:	1.8	ksi
Hole Dia:	2.5	in
c_b:	2.5	

Existing Anchor Bolts Stresses

$\sigma = P/A_{r/f} \pm My/I_{r/f}$

Compression:	60.13	ksi
Tension:	-58.15	ksi

Reinforcing Anchor Bolts Stresses

$\sigma = P/A_{r/f} \pm My/I_{r/f}$

Compression:	71.53	ksi
Tension:	-69.56	ksi

Embedment Depth

ld:	39.82	in
Edev:	67.91	in
Embedment Depth:	5.66	ft

Capacity of Existing Anchor Rods

Ext_{design}:	97.19	k
Ext_{actual}:	82.00	k
% Capacity:	84.4%	

Capacity of Reinforcing Anchor Rods

R/F_{design}:	256.00	k
R/F_{actual}:	180.84	k
% Capacity:	70.6%	

Proof Load

	487.50	kips

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *876324*
Site Name: *West Hartford United Methodist*
App #: *165356 Rev. 1*

Pole Manufacturer:	*Rohn*

Reactions		
Moment:	1154.18	ft-kips
Axial:	22.29	kips
Shear:	14.86	kips

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi
Bolt Circle:	41.5	in

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	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:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Rigid
Maximum Rod Tension:	82.0 Kips	Service, ASD
Allowable Tension:	97.2 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	84.4% Pass	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 20.65

n/a

Stiffener Results N/A for Rohn / Pirod

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

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 30 / 30 Feet Above Base of Pole

Quick Check: PASS 67.42%

Pole % of Allowable w/o Mods: 164.63%

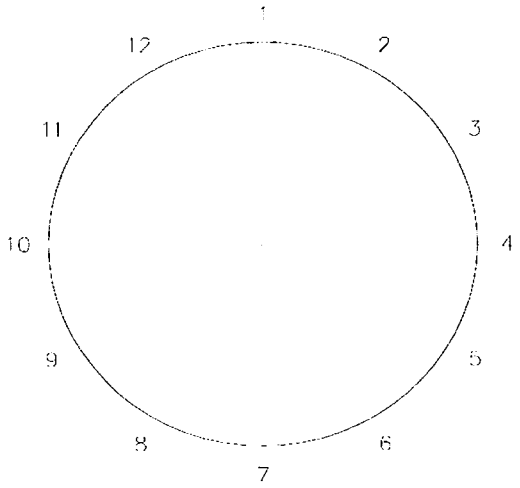
Pole % of Allowable w/ Mods: 60.93%

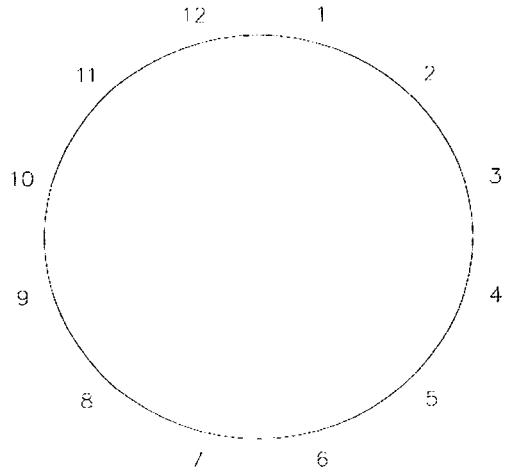
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	30.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	3829.44 in^4
Area:	34.90 in^2
J:	7658.89 in^4
C Flats:	15.00 in
C Points:	15.00000 in
W / T =	0.00
D / T =	80.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.60
Composite I_y:	10422.07 in^4
Modifications I_y:	6592.63 in^4
Flange Jump Check:	No

Modifications:

	Modification 1:	Modification 2:	Modification 3:	Modification 4:
			PL 1 x 6.5	
Plate Fy:	65 ksi	65 ksi	65 ksi	ksi
Drill Hole:	1.22 in	1.22 in	0.00 in	in
Stitch Bolt Capacity:	30 kips	30 kips	30 kips	kips
on Flats			2 6 10	
c:	in	in	11 in	in
c_offset:	in	in	10.500 in	in
Stitch Bolt Spacing:	in	in	12.000 in	in
Stitch Bolt Spacing (overide):	in	in	0 in	in
Area:	in^2	in^2	6.5 in^2	in^2
Plate Thickness:	in	in	1.00 in	in
r_{xx}:	in	in	0.289 in	in
Net Area of Plate:	in^2	in^2	6.50 in^2	in^2
Mod % of Allowable:			67.42%	





Flats

Loads:

	"x" axis		"y" axis	
Axial:	18.820	K		
Moment:	1159.480	(K-FT)	Moment: 0.000	(K-FT)
Shear:	17.100	K		
Torque:	NA	K		

Stresses without Reinforcement:

Allowable Stress on the Pole

Axial:	33.43	ksi
Flexure:	33.43	ksi

Stresses with Reinforcement:

Allowable Stress on the Plates

	Compression (ksi)	Tension (ksi)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	52.00	52.00
Total:	0.00	0.00

Allowable Load on the Plates

	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	338.00	338.00
Total:	0.00	0.00

Actual Load on the Plates

	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	227.87	225.62
Total:	0.00	0.00

Plate % of Allowable

	Compression	Tension
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	67.42%	66.75%
Total:	0.00%	0.00%

Points

Resultant

Axial:	18.82	K
Moment:	1159.48	(K-FT)
Shear:	17.10	K
Torque:	NA	(K-FT)

Stress on Pole

Pole, P/A:	0.54	ksi
Pole, M/S:	54.50	ksi
Total:	55.04	ksi
Pole % of Allowable:	164.63%	%

Stress on Pole

Pole, P/A:	0.35	ksi
Pole, M/S:	20.03	ksi
Total:	20.37	ksi
Pole % of Allowable:	60.93%	%

Load Distribution

12.07	K
426.03	K-FT
10.97	K
0.39	K

Stress on Plates

	Compression (kips)	Tension (kips)
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.35	0.00
Plate, M/S:	34.71	34.71
Total:	35.06	34.71
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Stitch Bolt Connection

0.00%

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

Site Data

BU#: *876324*
Site Name: *West Hartford United*
App #: *165356 Rev. 1*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	16		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	41.5		

Plate Data		
Diam:	47	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.89	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:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	426.03	ft-kips
Axial:	12.07	kips
Shear:	10.97	kips
Elevation:	30	feet

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

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	30.04 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.830 in	
Min PL "treq" for actual **T w/ Pry**:	1.565 in	
Min PL "t1" for actual **T w/o Pry**:	2.062 in	
T allowable with Prying:	49.04 kips	α'>1 case
Prying Force, Q:	2.54 kips	
Total Bolt Tension=T+Q:	32.58 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	31.4% Pass	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length: 28.67
Prying Occurs, PL Check:		
Tension Side Stress Ratio, (treq/t)^2:	61.3% Pass	

n/a

Stiffener Results	N/A for Rohn / Pirod
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

Round Monopole Plate Modification: **TIA Code Revision:** F

Job #: 128057

Section Elevation: 60 — 60 Feet Above Base of Pole

Quick Check: PASS 60.80%

Pole % of Allowable w/o Mods: 135.88%

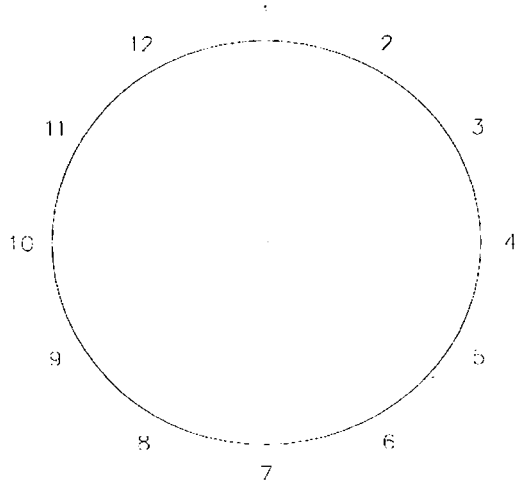
Pole % of Allowable w/ Mods: 45.01%

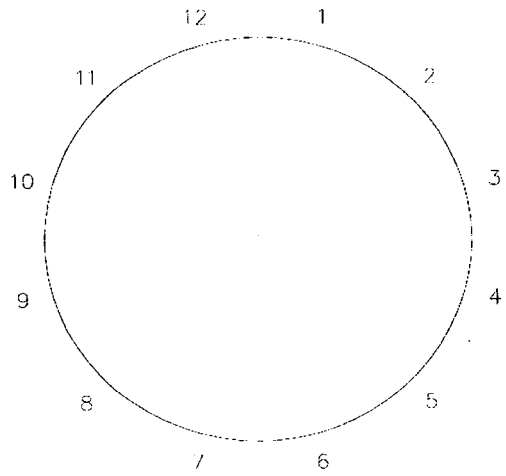
Section Properties:

Pole Type:	Round
No. of Sides Used:	12
Diameter Across Flats:	24.00 in
Thickness:	0.375 in
Inside Bend Radius:	1.50 in
Yield Stress:	42.00 ksi
Moment of Inertia:	1942.30 in⁴
Area:	27.83 in²
J:	3884.60 in⁴
C Flats:	12.00 in
C Points:	12.00000 in
W / T =	0.00
D / T =	64.00
Width of Flat:	NA in
Allow. Stress Increase:	1.33
Allow. Stress Factor Axial:	0.60 TIA - F (Table 5)
Allow. Stress Factor Flexure:	0.66
Composite I_y:	5911.05 in⁴
Modifications I_y:	3968.75 in⁴
Flange Jump Check:	No

Modifications:

	Mod 1:	Mod 2:	Mod 3:	Mod 4:
			PL 1 x 5	
Plate Fy:	65 ksi	65 ksi	65 ksi	ksi
Drill Hole:	1.22 in	1.22 in	0.00 in	in
Stitch Bolt Capacity:	30 kips	30 kips	30 kips	kips
on Flats			2 6 10	
c:	in	in	11 in	in
c_offset:	in	in	10.500 in	in
Stitch Bolt Spacing:	in	in	12.000 in	in
Stitch Bolt Spacing (overide):	in	in	0 in	in
Area:	in²	in²	5 in²	in²
Plate Thickness:	in	in	1.00 in	in
r_{min}:	in	in	0.289 in	in
Net Area of Plate:	in²	in²	5.00 in²	in²
Mod % of Allowable:			60.80%	





Flats

Loads:

	"x" axis		"y" axis	
Axial:	10.420	K		
Moment:	671.850	(K-FT)	0.000	(K-FT)
Shear:	14.440	K		
Torque:	NA	K		

Stresses without Reinforcement:

Allowable Stress on the Pole

Axial:	33.60	ksi
Flexure:	36.96	ksi

Stresses with Reinforcement:

Allowable Stress on the Plates

	Compression (ksi)	Tension (ksi)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	52.00	52.00
Total:	0.00	0.00

Allowable Load on the Plates

	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	260.00	260.00
Total:	0.00	0.00

Actual Load on the Plates

	Compression (kips)	Tension (kips)
Total:	0.00	0.00
Total:	0.00	0.00
Total:	158.07	156.85
Total:	0.00	0.00

Plate % of Allowable

	Compression	Tension
Total:	0.00%	0.00%
Total:	0.00%	0.00%
Total:	60.80%	60.33%
Total:	0.00%	0.00%

Points

Resultant

Axial:	10.42	K
Moment:	671.85	(K-FT)
Shear:	14.44	K
Torque:	NA	(K-FT)

Stress on Pole

Pole, P/A:	0.37	ksi
Pole, M/S:	49.81	ksi
Total:	50.18	ksi
Pole % of Allowable:	135.88%	%

Stress on Pole

Pole, P/A:	0.24	ksi
Pole, M/S:	16.37	ksi
Total:	16.61	ksi
Pole % of Allowable:	45.01%	%

Load Distribution

6.77	K
220.76	K-FT
9.38	K
0.29	K

Stress on Plates

	Compression (kips)	Tension (kips)
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00
Plate, P/A:	0.24	0.00
Plate, M/S:	31.37	31.37
Total:	31.61	31.37
Plate, P/A:	0.00	0.00
Plate, M/S:	0.00	0.00
Total:	0.00	0.00

Stitch Bolt Connection

0.00%

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

Site Data

BU#: *876324*
Site Name: *West Hartford United*
App #: *165356 Rev. 1*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	35.5		

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.28	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:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	220.76	ft-kips
Axial:	6.77	kips
Shear:	9.38	kips
Elevation:	60	feet

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

Flange Bolt Results — Rigid: Service, ASD; Fty*ASIF

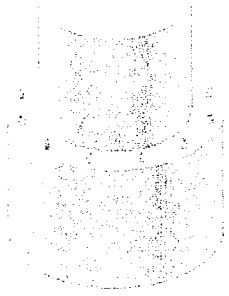
Bolt Tension Capacity, **B**:	103.65 kips	
Max Bolt directly applied T:	24.31 Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	3.708 in	
Min PL "treq" for actual **T w/ Pry**:	1.357 in	
Min PL "t1" for actual **T w/o Pry**:	1.796 in	
T allowable with Prying:	52.81 kips	α'>1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	24.31 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	23.5% Pass	

Exterior Flange Plate Results — Flexural Check — Rigid: Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 26.16

Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	46.0% Pass

n/a

Stiffener Results	N/A for Rohn / Pirod
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

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

Site Data

BU#: *876324*
Site Name: *West Hartford United*
App #: *165356 Rev. 1*

Pole Manufacturer:	Rohn

Reactions		
Moment:	265.15	ft-kips
Axial:	6	kips
Shear:	12.68	kips
Elevation:	90	feet

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

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	28		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	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:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	22.43	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.748	in	
Min PL "treq" for actual **T w/ Pry:**	0.930	in	
Min PL "t1" for actual **T w/o Pry:**	1.220	in	
T allowable with Prying:	41.51	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	22.43	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	48.7%	Pass	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
No Prying		14.42
Tension Side Stress Ratio, (treq/t)^2:	38.5% Pass	

n/a

Stiffener Results	N/A for Rohn / Pirod
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

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

Site Data

BU#: *876324*
Site Name: *West Hartford United*
App #: *165356 Rev. 1*

Pole Manufacturer:	Other

Reactions		
Moment:	12.71	ft-kips
Axial:	0.69	kips
Shear:	1.94	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	9		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	26		

Plate Data		
Diam:	28	in
Thick, t:	1.5	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	5.59	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:	16	in
Thick:	0.1875	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results | Non-Rigid | Service, ASD | Fty*ASIF

Bolt Tension Capacity, **B**:	25.91 kips	
Max Bolt directly applied T:	2.53 Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.605 in	
Min PL "treq" for actual **T w/ Pry**:	0.368 in	
Min PL "t1" for actual **T w/o Pry**:	0.502 in	
T allowable with Prying:	23.39 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	2.53 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	9.8% Pass	

Exterior Flange Plate Results Flexural Check | Non-Rigid | Service ASD | 0.75*Fy*ASIF | Comp. Y.L. Length: 20.49

Compression Side Plate Stress:	2.8 ksi	
Allowable Plate Stress:	50.0 ksi	
Compression Plate Stress Ratio:	5.6% Pass	
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	6.0% 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

TOWER ENGINEERING PROFESSIONALS

		PASS	PASS
	Results Summary:	LC1	LC2
	Soil Interaction:	44.7%	15.6%
Drilled Caisson Tool - Input	Foundation Structural:	97.9%	33.5%

West Hartford United Methodist (BU 876324)

TEP #:	128057 - Rev. 1	
Analysis:	AAC	10/29/2012
Check:	MDF	10/29/2012

Code Revisions: TIA-222-F ACI 318-05

Tower Type: Monopole

	LC1	LC2	
Moment:	1,722.00	601.00	kip-ft
Axial (download):	30.00	49.00	kip
Shear:	20.00	7.00	kip
Axial (uplift):	0.00	0.00	kip

Shaft Information

Diameter:	5.50	ft
Projection:	0.50	ft
Caisson Length:	24.50	ft
f'c:	3.500	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement

Tie Bar Size:	5	*(fy = 60.0 ksi)*
Clear Cover to Tie:	3.25	in
Tie Bar Spacing:	10.00	in
Vertical Bar Size:	9	
Vertical Bar Quantity:	20	*(ρ =0.585%)*
fy:	60.0	ksi
E:	29,000	ksi

Design Parameters

Soil Layer	Soil Type	Depth (ft)		Eff. Unit Weight (pcf)	Cohesion (psf)	Friction Angle ϕ (°)	All. Skin Friction (psf)	
		from	to				Download	Uplift
1	Clay	0.00	7.00	125.0	0			
2	Clay	7.00	8.25	62.6	0			
3	Clay	8.25	24.00	62.6	3375			

Notes: 1) Neglect lateral soil strength to a depth of:

i) ~~1/2 Pier Ø = 5.50ft / 2 = 2.75ft~~

ii) ~~Frost Depth = 40.0in / (12in/ft) = 3.33ft~~

iii) **Geotech Recommendation = 8.25ft**

2) Groundwater = 7.00ft