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

September 26, 2012

The Honorable Patricia E. Llodra
First Selectman
Town of Newtown Town Hall
3 Primrose Street
Newtown, CT 06470-5307

RE: **EM-SPRINT-097-120925** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 352 South Main Street, Newtown, Connecticut.

Dear First Selectman Llodra:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by October 10, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/laf

Enclosure: Notice of Intent

c: Gary Frenette, Ms. Cathy Mockton, Zoning Enforcement Officers, Town of Newtown

CSC
CONNECTICUT SITING COUNCIL

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

October 15, 2012

Jennifer Palumbo
Real Estate Consultant
Sprint
48 Spruce Street
Oakland, NJ 07436

RE: **EM-SPRINT-097-120925** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 352 South Main Street, Newtown, Connecticut.

Dear Ms. Palumbo:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 19, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Patricia E. Llodra, First Selectman, Town of Newtown
Gary Frenette, Ms. Cathy Mockton, Zoning Enforcement Officers, Town of Newtown
Crown Castle USA, Inc.

S:\EM & TS\SPRINT SPECTRUM\Newtown\dc101512SoMainSt.docx

Sprint

Together with Nextel

EM-SPRINT-097-120925

~ORIGINAL~

48 Spruce Street
Oakland, NJ 07436
Phone: (845) 499-4712
Jennifer Palumbo

September 19, 2012

Hand Delivered

RECEIVED
SEP 25 2012
CONNECTICUT
SITING COUNCIL

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

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 352 South Main Street, Newton, CT 06470. Known to Sprint Spectrum L.P. as site CT03XC340.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Code Division Multiple Access ("CDMA") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, Sprint Spectrum L.P. plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

CDMA employs Spread-Spectrum technology and special coding scheme to allow multiple users to be multiplexed over the same physical channel. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

As part of the project the new multi-mode 800/1900 antenna will replace existing antennas. These antennas will provide more flexibility for optimization by allowing fast and easy electrical tilt adjustment from remote location and will enable the transmission of multiple technologies from a single antenna. As Sprint Nextel's network evolves to meet the demands of its customers, it is essential for Sprint Nextel to install modern equipment and antennas in order to provide reliable wireless voice and data services. The

proposed equipment will include multi-mode radios that will allow Sprint Nextel to transmit at different frequencies using different technologies, including LTE technology. Likewise, the proposed antennas are quad-pole multi-band high gain antennas that will allow Sprint to operate using its multiple frequency bands and technologies, including LTE technology. The proposed equipment and antennas will improve the reliability, coverage and capacity of Sprint Nextel's voice and data networks across Sprint Nextel's various FCC licensed frequency bands and significantly increase the data speeds of Sprint Nextel's network by utilizing the latest LTE technology. Without the proposed modifications Sprint Nextel will be unable to provide reliable wireless voice and data service using the latest technologies.

Sprint Spectrum L.P. will have an interim (testing) period during the modification/installation prior to the final configuration. This antenna configuration is shown on the attached drawings of the planned modifications. Also included is the power density calculation reflecting the change in Sprint's operations at the site and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more CDMA transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons Sprint Spectrum L.P. respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (845)-499-4712 or email JPalumbo@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Jennifer Palumbo
Real Estate Consultant

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: CT03XC340

352 South Main Street
352 South Main Street
Newtown, CT 06470

August 26, 2012

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

EBI Consulting
environmental | engineering | due diligence

August 26, 2012

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

Re: Emissions Values for Site **CT03XC340 – 352 South Main Street**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 352 South Main Street, Newtown, 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 352 South Main Street, Newtown, 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) 2 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 RFS 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 **150.4 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	CT03XC340 - 352 South Main Street
Site Addresss	352 South Main Street, Newtown, CT 06470
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	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
															Sector total Power Density Value:		3.577%

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	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
															Sector total Power Density Value:		3.577%

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	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
															Sector total Power Density Value:		3.577%

Site Composite MPE %	
Carrier	MPE %
Sprint	10.731%
T-Mobile	1.100%
Total Site MPE %	**11.831%**

EBI Consulting
environmental | engineering | due diligence

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **10.731% (3.577% 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 **11.831%** 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

Know what's **below.**
Call before you dig.

APPROVALS		APPROVED	APPROVED AS NOTED	DISAPPROVED REVISE
SPRINT REPRESENTATIVES	DATE	☐	☐	☐
SPRINT RF ENGINEER	DATE	☐	☐	☐
SITE OWNER	DATE	☐	☐	☐
	DATE	☐	☐	☐

Sprint®

SITE ID: CT03XC340
SITE NAME: 352 S.MAIN ST, NEW TOWN, CT

THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE AND/OR FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT DEPICTED WITHIN THESE SIGNED AND SEALED DRAWINGS. FURTHERMORE KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PHYSICALLY CONFIRM THE EXISTING MOUNT CONFIGURATION AND PERFORM A STRUCTURAL ANALYSIS TO VERIFY THAT THE EXISTING, INTERIM AND PROPOSED ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT CAN BE SAFELY SUPPORTED. SIGNED AND SEALED DRAWINGS REVISED TO STATE "ISSUED FOR CONSTRUCTION" SHALL BE PROVIDED TO THE PROFESSIONAL ENGINEERS RESPONSIBLE FOR THE STRUCTURAL ANALYSIS OF THE TOWER/POLE, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT. KMB DESIGN GROUP, LLC SHALL BE NOTIFIED SHOULD THE STRUCTURAL ANALYSIS RESULT IN SOME ELEMENTS NOT BEING STRUCTURALLY CAPABLE OF SUPPORTING THE PROPOSED DESIGN DEPICTED. THE CONTRACTOR SHALL NOT COMMENCE CONSTRUCTION WITHOUT OBTAINING (A) A SIGNED AND SEALED COPY OF THE PLANS "ISSUED FOR CONSTRUCTION"; (B) STRUCTURAL ANALYSIS REPORT STATING THAT THE TOWER/POLE/FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED LOADING REFERENCING THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC; (C) SPRINT PLATFORM ANALYSIS STATING THAT THE SPRINT PLATFORM IS CAPABLE OF SUPPORTING THE PROPOSED DESIGN AS REFERENCED WITHIN THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC.

NETWORK VISION CONSTRUCTION DRAWINGS

AERIAL VIEW
SCALE: NTS

LOCATION MAP
SCALE: NTS

SITE INFORMATION

BLOCK: TBD
LOT: TBD
MAP: TBD
ZONING CLASSIFICATION: TBD
ZONING JURISDICTION: TBD

PROJECT INFORMATION:

SITE ADDRESS:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

COORDINATES:
LATITUDE: 41° 21' 20.66"
LONGITUDE: -73° 15' 47.60"
DATUM : NAD 83

STRUCTURE HEIGHT:
±150'-0" (TOP OF EXISTING MONOPOLE)

PROJECT DIRECTORY:

PROPERTY OWNER:
GLOBAL SIGNAL ACQUISITIONS II LLC

APPLICANT:
SPRINT-NEXTEL
6200 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ENGINEER:
KMB DESIGN GROUP, LLC
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
KEITH DRENNAN - PROJECT MANAGER
(732) 280-5623

POWER COMPANY:
CONNECTICUT LIGHT & POWER
P.O. BOX 270
HARTFORD, CT 06141-0270
(800) 286-2000

CONSTRUCTION MANAGER:
TODD AMANN
(914) 715-9363

DRAWING INDEX

DWG #	DRAWING TITLES
A01	COVER SHEET
C01	GENERAL NOTES 1 OF 2
C01A	GENERAL NOTES 2 OF 2
C02	COMPOUND PLAN
C02A	ELEVATION
C03	EQUIPMENT PLANS
C03A	EQUIPMENT & ANTENNA SPECIFICATIONS
C04	EXISTING ANTENNA PLAN (ALL SECTORS)
C04A	INTERIM ANTENNA PLAN (ALL SECTORS)
C04B	FINAL ANTENNA PLAN (ALL SECTORS)
C04C	RRH MOUNT DETAILS (ALL SECTORS)
C05	SITE DETAILS
C06	RF SCHEDULE
C06A	RF DATA SHEET
C07	AAV DRAWINGS - COVER SHEET
C07A	AAV DRAWINGS - SITE PHOTOS
C07B	AAV DRAWINGS - EQUIPMENT PLAN
C07C	AAV DRAWINGS - DETAILS
E01	ELECTRICAL NOTES
E02	ELECTRICAL & GROUNDING DETAILS

CODES & STANDARDS

These documents are in compliance & all construction to be in accordance with the following codes & standards as applicable:

State Building Code: 2005 Connecticut Supplement

2003 International Building Code
2003 International Residential Code
2003 International Existing Building Code
2003 International Mechanic Code
2003 International Plumbing Code
2003 International Energy Conservation Code (re-adopted with changes)
ICC/ANSI A117.1-2003 Assessible and Usable Buildings and Facilities

2005 National Electrical Code (NFPA-70)

DRIVING DIRECTIONS

1. DEPART 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495
2. EXIT ROUNDABOUT AT 3RD EXIT ONTO LEISURE LN
3. TAKE RAMP RIGHT AND FOLLOW SIGNS FOR RT-17 NORTH
4. BEAR RIGHT ONTO I-287 NORTH / RT-17 NORTH / STATE HIGHWAY 17
5. TAKE RAMP RIGHT FOR I-87 SOUTH / I-287 TOWARD NEW YORK CITY / TAPPAN ZEE BR
6. KEEP LEFT ONTO I-287 EAST / CROSS WESTCHESTER EXPY
7. TAKE RAMP AND FOLLOW SIGNS FOR I-95 NORTH
8. AT EXIT 27A, TAKE RAMP RIGHT FOR CT-8 / CT-25 TOWARD TRUMBULL / WATERBURY
9. KEEP LEFT ONTO CT-25 NORTH
10. ARRIVE AT 352 S MAIN ST, NEWTOWN, CT 06470

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	08-06-12	ISSUED FOR CONSTRUCTION	JRF	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 26657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 8/9/12

PROJECT NUMBER:
332.1471

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

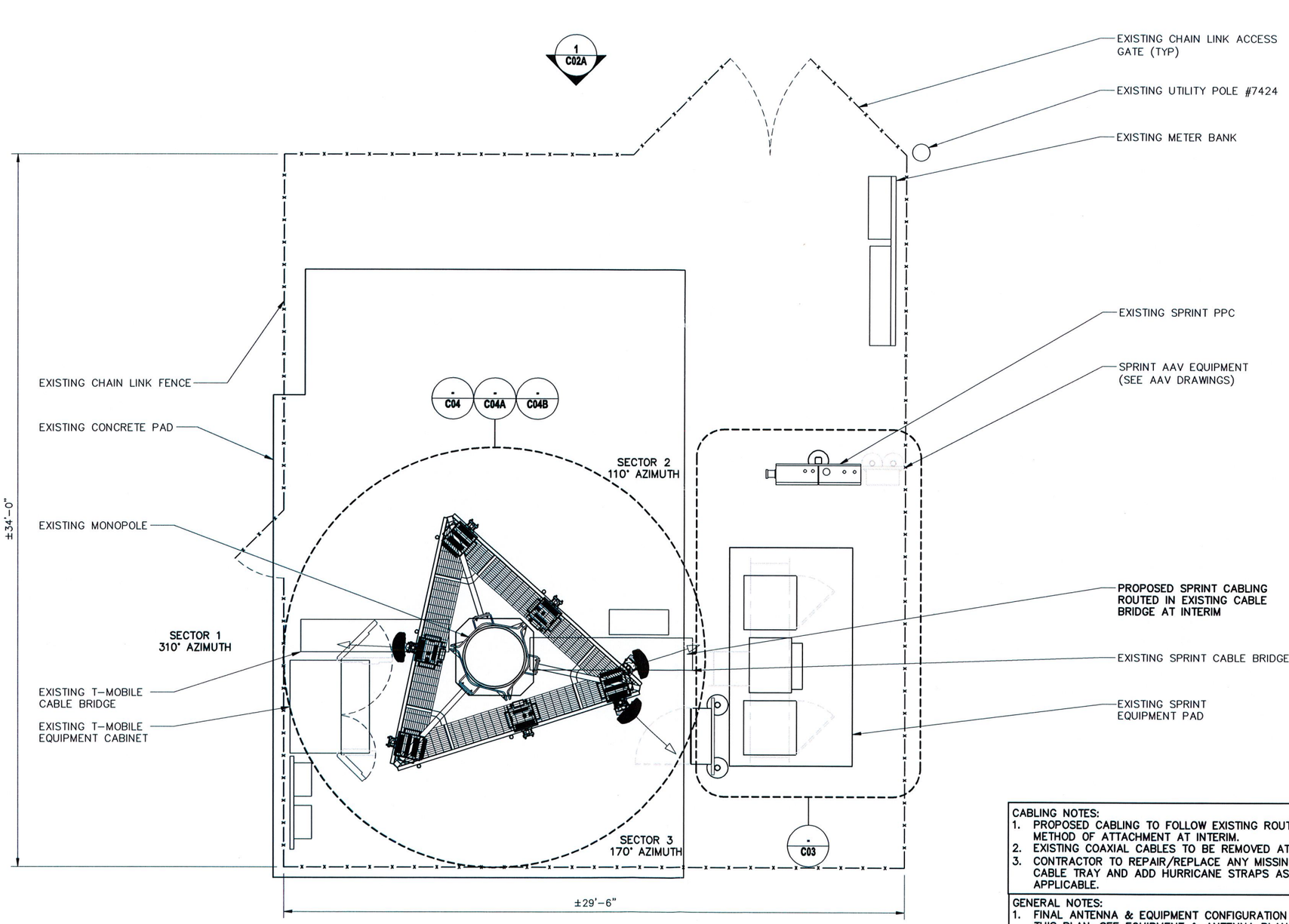
CT03XC340

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
COVER SHEET

SHEET NUMBER:	REV.:
A01	0



CABLING NOTES:
1. PROPOSED CABLING TO FOLLOW EXISTING ROUTE AND METHOD OF ATTACHMENT AT INTERIM.
2. EXISTING COAXIAL CABLES TO BE REMOVED AT FINAL.
3. CONTRACTOR TO REPAIR/REPLACE ANY MISSING/DAMAGED CABLE TRAY AND ADD HURRICANE STRAPS AS REQUIRED IF APPLICABLE.

GENERAL NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.
2. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.
3. CONTRACTOR TO RESTORE ANY RUST AREA TO ORIGINAL CONDITION AND PROTECTIVE COATING TO BE APPLIED.
4. STRUCTURAL ANALYSIS PROVIDED UNDER SEPARATE COVER.
5. PROPOSED SPRINT GPS UNIT TO REPLACE EXISTING GPS AT FINAL.

2 0 1 2 4
(IN FEET)

1 COMPOUND PLAN

11x17 SCALE: 3/16" = 1'-0" | 24x36 SCALE: 3/8" = 1'-0"

Sprint

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	08-06-12	ISSUED FOR CONSTRUCTION	JRF	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER

STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 26657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 8/9/12

PROJECT NUMBER:
332.1471

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

CT03XC340

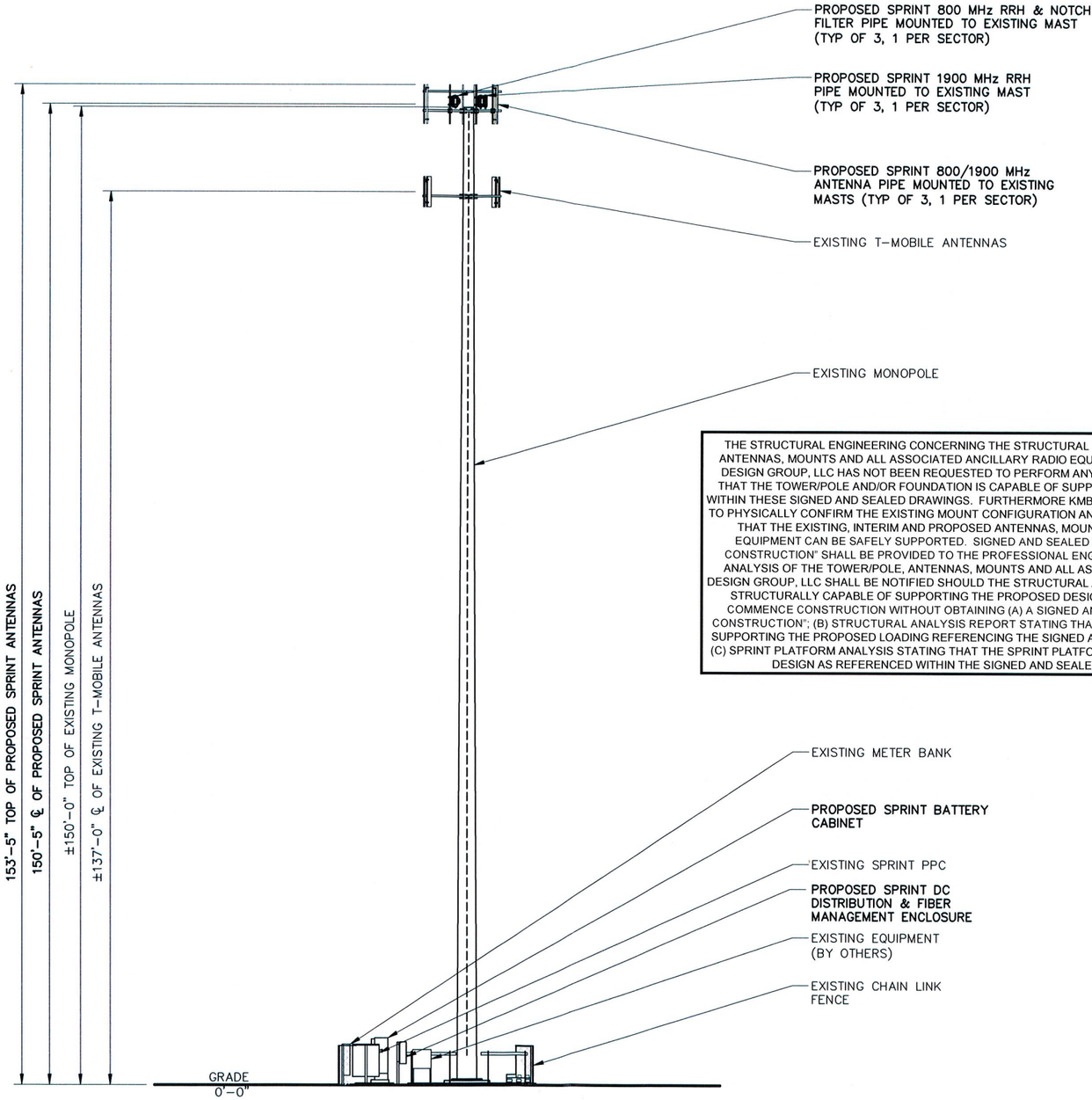
PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
COMPOUND PLAN

SHEET NUMBER:	REV.:
C02	0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1471_CT03XC340_352 South Main Street\332.1471_CAD\332.1471_Construction\332.1471_C02.dwg, 8/9/2012 11:17:32 PM, mduffy



THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE AND/OR FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT DEPICTED WITHIN THESE SIGNED AND SEALED DRAWINGS. FURTHERMORE KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PHYSICALLY CONFIRM THE EXISTING MOUNT CONFIGURATION AND PERFORM A STRUCTURAL ANALYSIS TO VERIFY THAT THE EXISTING, INTERIM AND PROPOSED ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT CAN BE SAFELY SUPPORTED. SIGNED AND SEALED DRAWINGS REVISED TO STATE "ISSUED FOR CONSTRUCTION" SHALL BE PROVIDED TO THE PROFESSIONAL ENGINEERS RESPONSIBLE FOR THE STRUCTURAL ANALYSIS OF THE TOWER/POLE, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT. KMB DESIGN GROUP, LLC SHALL BE NOTIFIED SHOULD THE STRUCTURAL ANALYSIS RESULT IN SOME ELEMENTS NOT BEING STRUCTURALLY CAPABLE OF SUPPORTING THE PROPOSED DESIGN DEPICTED. THE CONTRACTOR SHALL NOT COMMENCE CONSTRUCTION WITHOUT OBTAINING (A) A SIGNED AND SEALED COPY OF THE PLANS "ISSUED FOR CONSTRUCTION"; (B) STRUCTURAL ANALYSIS REPORT STATING THAT THE TOWER/POLE/FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED LOADING REFERENCING THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC; (C) SPRINT PLATFORM ANALYSIS STATING THAT THE SPRINT PLATFORM IS CAPABLE OF SUPPORTING THE PROPOSED DESIGN AS REFERENCED WITHIN THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC.

NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.

5 0 5 10 20
(IN FEET)

1 NORTHEAST ELEVATION

11x17 SCALE: 1" = 20' | 24x36 SCALE: 1" = 10'

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	08-06-12	ISSUED FOR CONSTRUCTION	JRF	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · NO. 26657 · LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 8/9/12

PROJECT NUMBER: 332.1471

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

CT03XC340

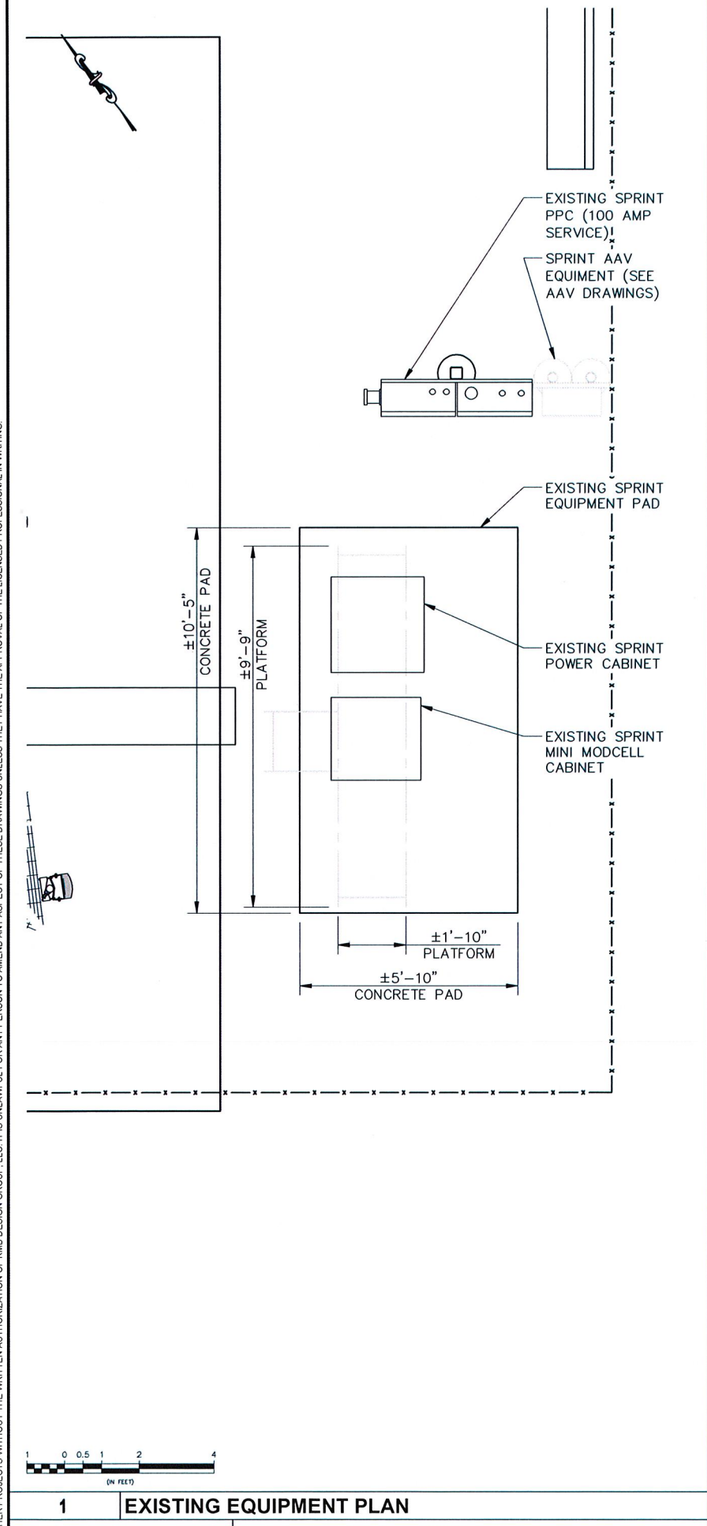
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE: ELEVATION

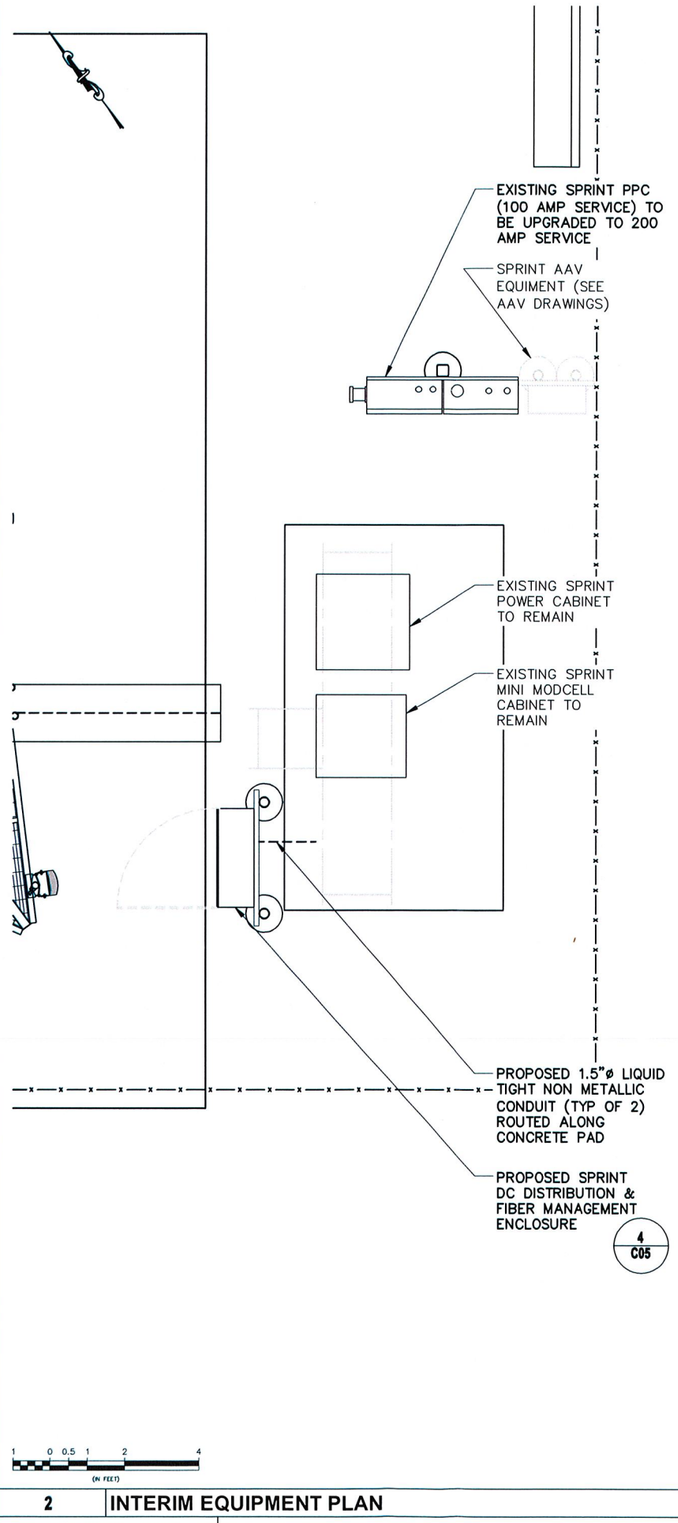
SHEET NUMBER: C02A | REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1471_CT03XC340_352 South Main Street\332.1471_CAD\332.1471_Construction\332.1471.C02A.dwg, 8/9/2012 1:17:35 PM, mduffy



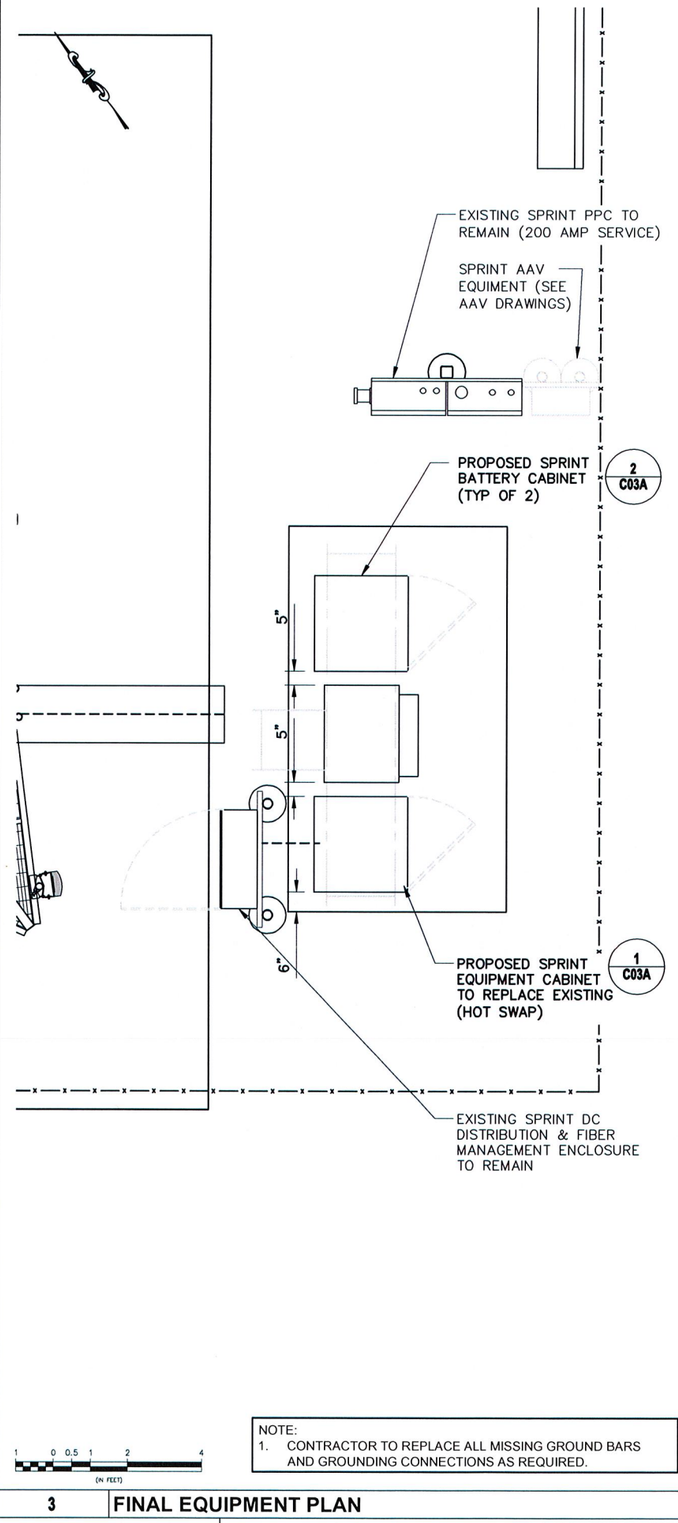
1 EXISTING EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"



2 INTERIM EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"



3 FINAL EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED.

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CT LICENSE: 26657 8/9/12

PROJECT NUMBER: **332.1471**

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

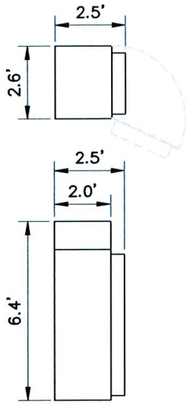
CT03XC340

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE: EQUIPMENT PLANS

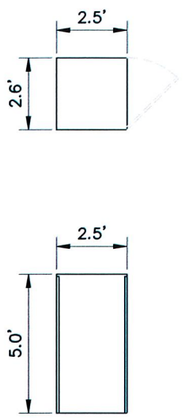
SHEET NUMBER: C03 | REV.: 0



9927
EQUIPMENT CABINET
CABINET WEIGHT: 1020 lbs
FOOTPRINT: 5.3 SF

1 EQUIPMENT CABINET SPECIFICATIONS

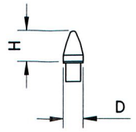
11x17 SCALE: 3/16" = 1'-0" | 24x36 SCALE: 3/8" = 1'-0"



AVAYA 60ECv2
BATTERY CABINET
CABINET WEIGHT: 1625 lbs
FOOTPRINT: 6.5 SF

2 BATTERY CABINET SPECIFICATION

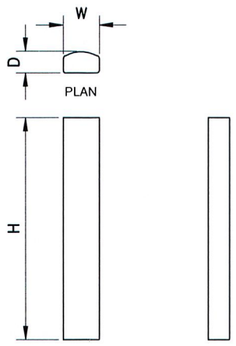
11x17 SCALE: 3/16" = 1'-0" | 24x36 SCALE: 3/8" = 1'-0"



MANUF.: PCTEL
MODEL #: GPS-TMG-HR-26NCM
HEIGHT: 5.0"
DIAMETER: 3.2"
WEIGHT: 0.6 lbs

3 GPS UNIT SPECIFICATIONS

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"



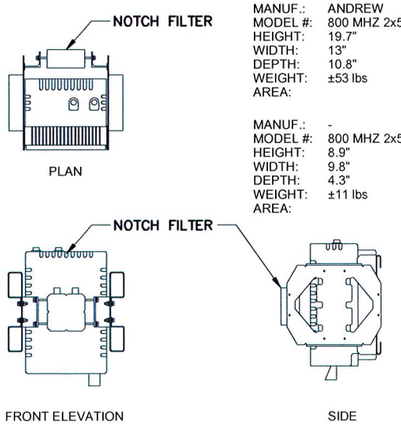
MANUF.: RFS
MODEL: APXVSPP18-C-A20
LENGTH 72.0"
WIDTH: 11.8"
DEPTH: 7.0"
WEIGHT: 64.5 lbs
AREA: 5.9 SF

7 ANTENNA SPECIFICATIONS - 800/1900 MHz

SCALE: NTS

4

5



MANUF.: ANDREW
MODEL #: 800 MHZ 2x50W
HEIGHT: 19.7"
WIDTH: 13"
DEPTH: 10.8"
WEIGHT: ±53 lbs
AREA:

MANUF.: -
MODEL #: 800 MHZ 2x50W
HEIGHT: 8.9"
WIDTH: 9.8"
DEPTH: 4.3"
WEIGHT: ±11 lbs
AREA:

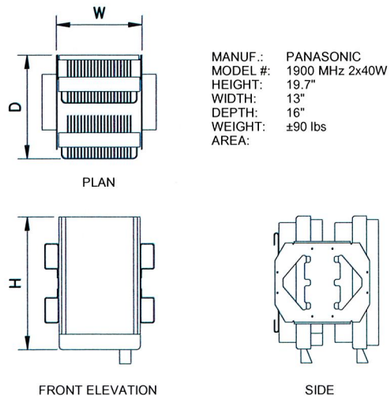
9 RRH SPECIFICATIONS - 800 MHz

11x17 SCALE: 1/2" = 1'-0" | 24x36 SCALE: 1" = 1'-0"

6

10 RRH SPECIFICATIONS - 1900 MHz

11x17 SCALE: 1/2" = 1'-0" | 24x36 SCALE: 1" = 1'-0"



MANUF.: PANASONIC
MODEL #: 1900 MHz 2x40W
HEIGHT: 19.7"
WIDTH: 13"
DEPTH: 16"
WEIGHT: ±90 lbs
AREA:

11

8

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LICENSED
PROFESSIONAL ENGINEER

CT LICENSE: 26657 8/9/12

PROJECT NUMBER:
332.1471

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

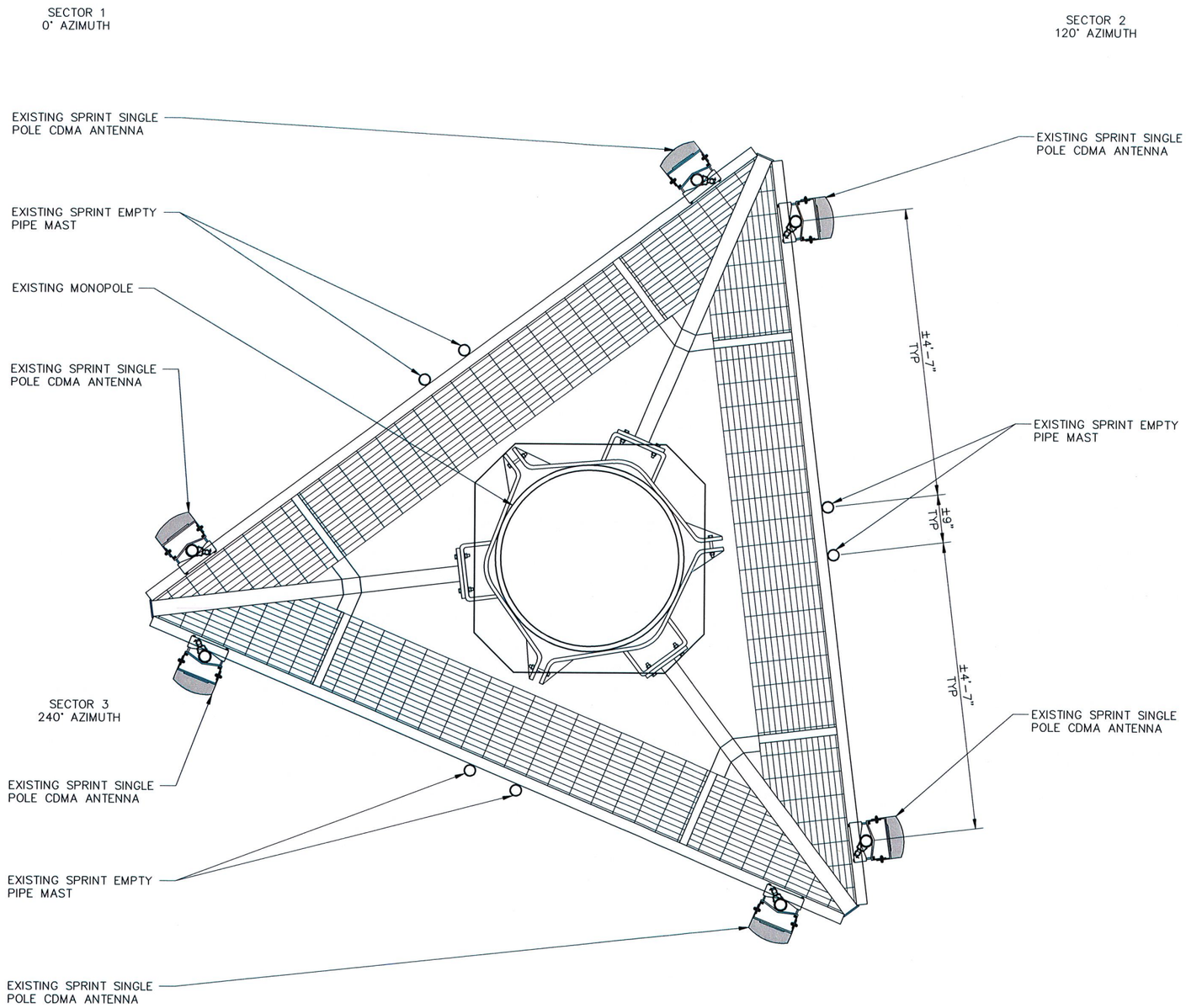
CT03XC340

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
EQUIPMENT & ANTENNA SPECIFICATIONS

SHEET NUMBER: C03A | REV.: 0



1 0 1 2
(IN FEET)

1 EXISTING ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'- 0" | 24x36 SCALE: 1" = 1'- 0"

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FAIRFIELD COUNTY

CT03XC340

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
EXISTING ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04	0

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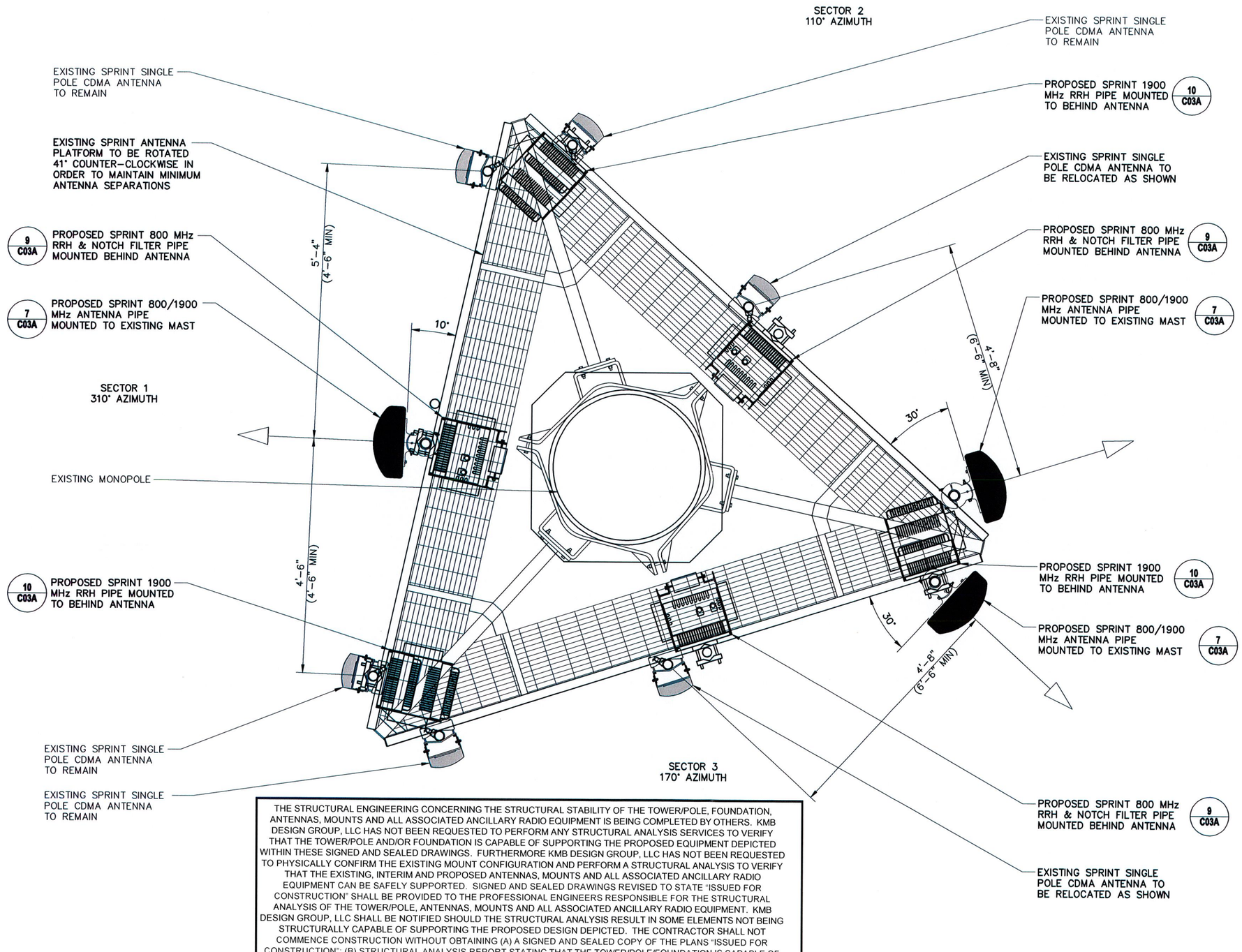

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1 0 1 2
(IN FEET)

1 INTERIM ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'- 0" | 24x36 SCALE: 1" = 1'- 0"

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0	08-06-12	ISSUED FOR CONSTRUCTION	JRF	KCD

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PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · NO. 26657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 8/9/12

PROJECT NUMBER:
332.1471

SITE INFORMATION:
352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY
CT03XC340

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
INTERIM ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04A	0

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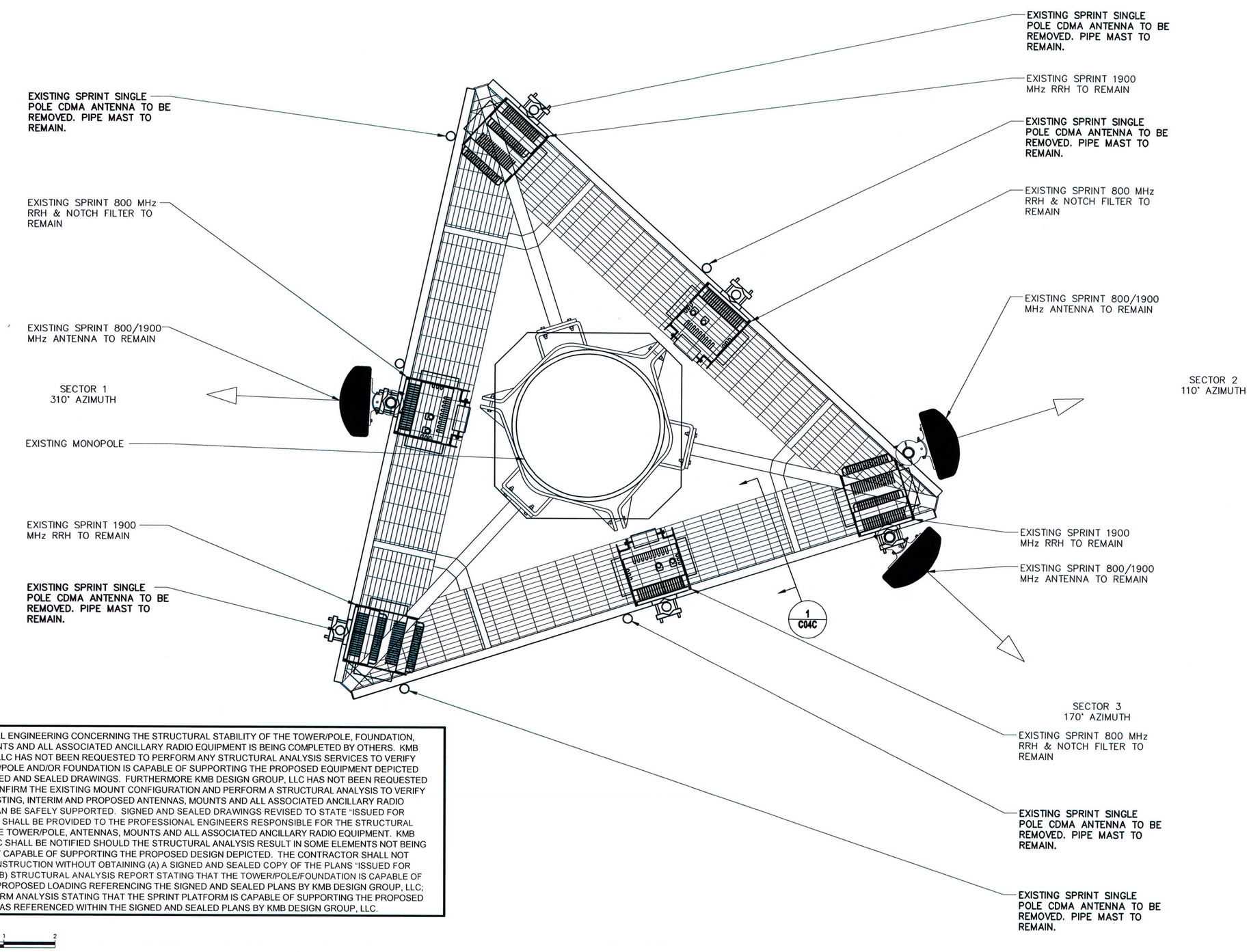

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1 0 1 2
(IN FEET)

1 FINAL ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'- 0" | 24x36 SCALE: 1" = 1'- 0"

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352 SOUTH MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

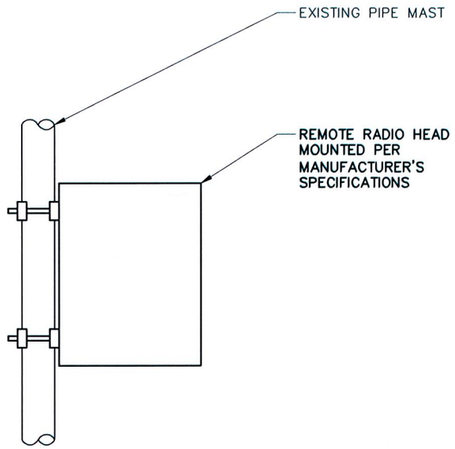
CT03XC340

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE: FINAL ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04B | REV.: 0



1 **RRH MOUNT DETAIL**

SCALE: NTS

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FAIRFIELD COUNTY

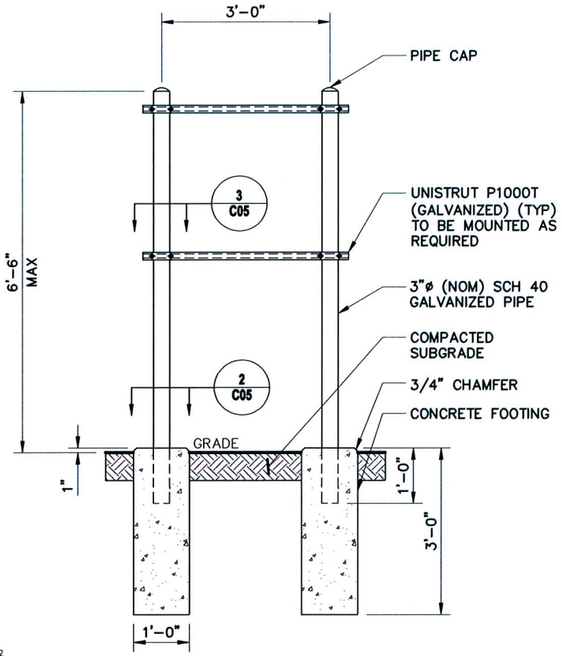
CT03XC340

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

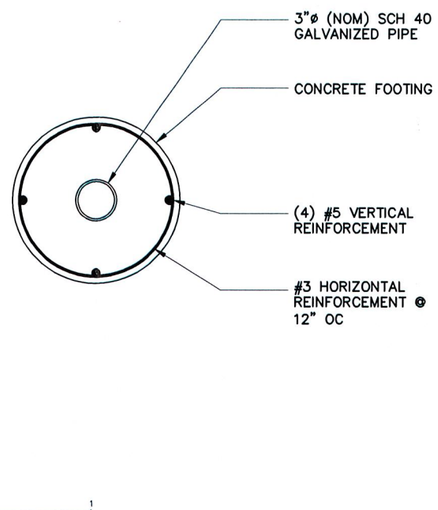
SHEET TITLE:
RRH MOUNT DETAILS
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04C	0



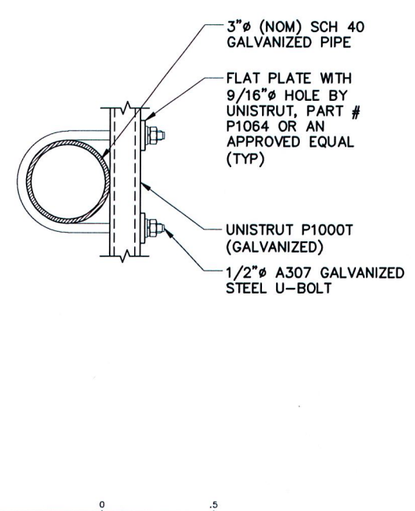
1 UNISTRUT BACKBOARD SECTION

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"



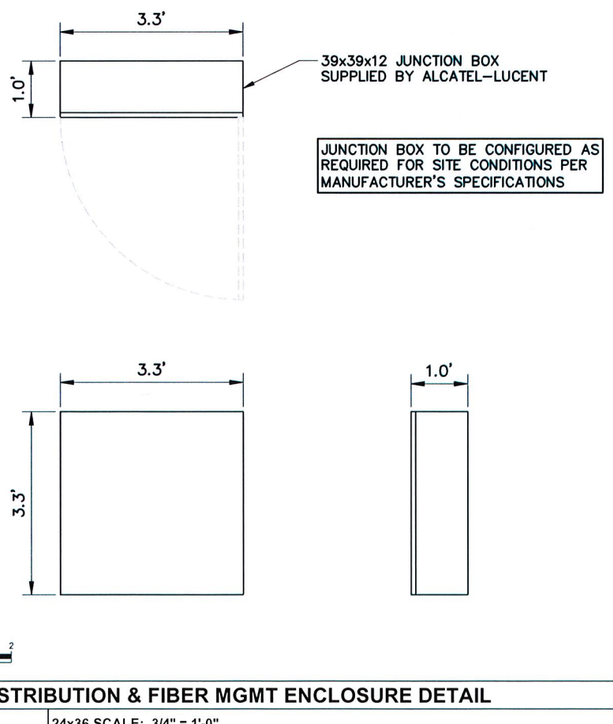
2 CONCRETE PIER DETAIL

11x17 SCALE: 3/4" = 1'-0" | 24x36 SCALE: 1 1/2" = 1'-0"



3 UNISTRUT CONNECTION DETAIL

11x17 SCALE: 1 1/2" = 1'-0" | 24x36 SCALE: 3" = 1'-0"



4 DC DISTRIBUTION & FIBER MGMT ENCLOSURE DETAIL

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"

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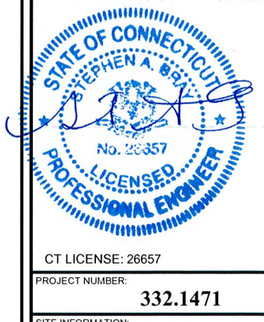

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DRAWN BY:	CHECKED BY:	DATE:
MCD		05-11-12

SHEET TITLE:
SITE DETAILS

SHEET NUMBER:	REV.:
C05	0

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Date: **June 4, 2012**

Cheryl Shultz
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6632

Tower Engineering Professionals
3703 Junction Blvd.
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate *SNV* Final**	
	Carrier Site Number:	CT03XC340
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876353
	Crown Castle Site Name:	352 S. Main St, New Town, CT
	Crown Castle JDE Job Number:	189044
	Crown Castle Work Order Number:	498866
	Crown Castle Application Number:	151558 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	123586
Site Data:	**352 S. Main Street, Newtown, Fairfield County, CT 06470** **Latitude *41° 21' 20.64"*, Longitude *-73° 15' 47.57"*** **150 Foot - Monopole Tower**	

Dear Cheryl Schultz,

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 467686, in accordance with application 151558, 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 based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the 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: John S. Coppedge, E.I.

Respectfully submitted by:

Andrew T. Haldane, P.E.

STATE OF CONNECTICUT
ANDREW T. HALDANE
No. 26583
LICENSED PROFESSIONAL ENGINEER
06/04/12

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1) INTRODUCTION

This tower is a 150-ft monopole tower designed by Rohn in January of 1997. The tower was originally designed for a wind speed of 85 mph per ANSI/EIA-222-E for the appurtenances listed in Table 3. TEP did not visit the site. 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 85 mph with no ice, 37.6 mph with 0.75 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
148	150	3	Alcatel Lucent	1900MHz RRH (65MHz)	3	1-1/4	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
		9	RFS Celwave	ACU-A20-N			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			

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
148	153	1	Decibel	DB222-A	6 1	1-5/8 1/2	1
	148	6	Decibel	DB980H90E-M w/ Mount Pipe			
		1	Tower Mounts	Platform Mount [LP 502-1]	-	-	2
135	135	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	6	1-5/8	2
		1	Tower Mounts	Platform Mount [LP 712-1]			
130	131	1	GPS	GPS_A	1	1/2	2
	130	1	Tower Mounts	Side Arm Mount [SO 702-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	Swedcom	ALP9212	12	1-5/8
		1	-	Cellular Platform	-	-
130	130	12	Swedcom	ALP9212	12	1-5/8
		1	-	Cellular Platform	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	Goodkind and O'Dea, Inc.	1531889	CCIsites
Tower Foundation Drawings/Design/Specs	Rohn	1619496	CCIsites
Tower Manufacturer Drawings	Rohn	2047929	CCIsites
Tower Structural Analysis Reports	Tower Engineering Professionals	2064114	CCIsites

3.1) Analysis Method

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

3.2) Assumptions

1) 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	150 - 120	Pole	P24x1/4	1	-4.78	589.19	62.9	Pass
L2	120 - 90	Pole	P30x3/8	2	-8.62	1166.57	63.8	Pass
L3	90 - 60	Pole	P36x3/8	3	-13.24	1325.68	81.4	Pass
L4	60 - 30	Pole	P42x3/8	4	-18.65	1484.55	93.9	Pass
L5	30 - 0	Pole	P42x1/2	5	-25.79	2144.66	90.6	Pass
							Summary	
						Pole (L4)	93.9	Pass
						Rating =	93.9	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	94.1	Pass
1	Base Plate	-	84.5	Pass
1	Flange Connection	30	63.7	Pass
1	Flange Connection	60	78.5	Pass
1	Flange Connection	90	62.5	Pass
1	Flange Connection	120	36.0	Pass
1	Base Foundation Structural	-	51.2	Pass
1	Base Foundation Soil Interaction	-	46.4	Pass

Structure Rating (max from all components) =	94.1%

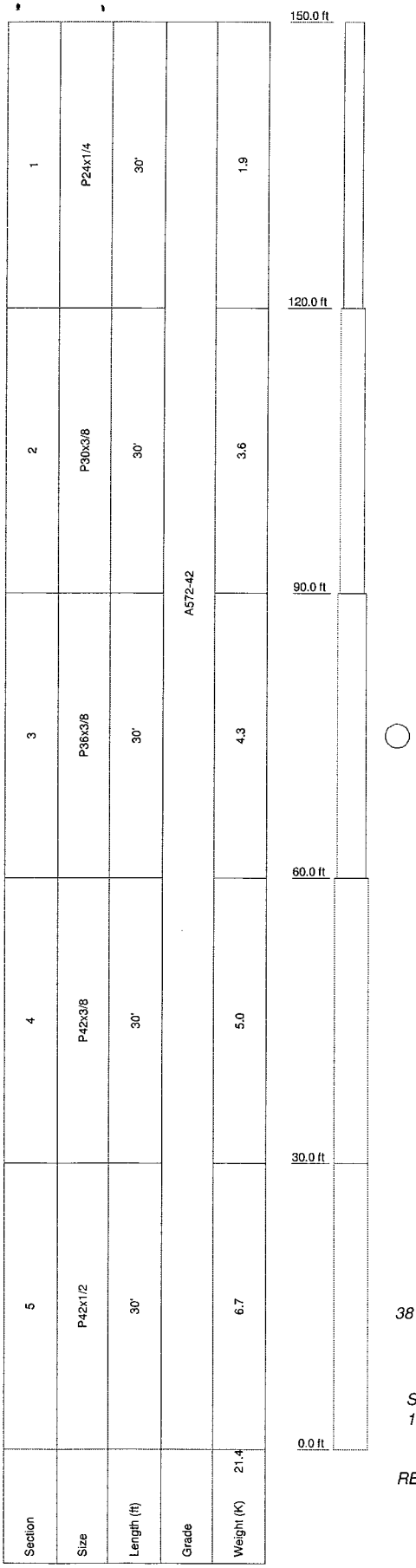
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

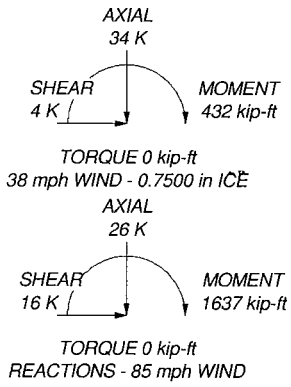
4.1) Recommendations

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
(2) 2.4" Dia x 4-ft Mount Pipe	148	(2) 2.4" Dia x 4-ft Mount Pipe	148
1900MHz RRH (65MHz)	148	APXVSPP18-C-A20 w/ Mount Pipe	148
800 EXTERNAL NOTCH FILTER	148	1900MHz RRH (65MHz)	148
800MHZ RRH	148	800 EXTERNAL NOTCH FILTER	148
(3) ACU-A20-N	148	800MHZ RRH	148
APXVSPP18-C-A20 w/ Mount Pipe	148	(3) ACU-A20-N	148
(2) 2.4" Dia x 4-ft Mount Pipe	148	(2) 2.4" Dia x 4-ft Mount Pipe	148
2.4" Dia x 4-ft Mount Pipe	148	Platform Mount [LP 502-1]	148
(2) 2.4" Dia x 4-ft Mount Pipe	148	RR90-17-02DP w/ Mount Pipe	135
1900MHz RRH (65MHz)	148	RR90-17-02DP w/ Mount Pipe	135
800 EXTERNAL NOTCH FILTER	148	RR90-17-02DP w/ Mount Pipe	135
800MHZ RRH	148	Platform Mount [LP 712-1]	135
(3) ACU-A20-N	148	GPS_A	130
APXVSPP18-C-A20 w/ Mount Pipe	148	Side Arm Mount [SO 702-1]	130
(2) 2.4" Dia x 4-ft Mount Pipe	148		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-42	42 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 93.9%

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

Job: New Town - Main St.			
Project: TEP 123586			
Client: CCI 876353	Drawn by: JSC		App'd:
Code: TIA/EIA-222-F	Date: 06/04/12		Scale: NTS
Path: O:\3586_352 S Main St, New Town, CT\Structural\tnxTower\Final\876353_LC5_Final.er			Dwg No. E-1

tnxTower	Job	Page
	New Town - Main St.	1 of 13
Tower Engineering Professionals 3703 Junction Blvd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Project TEP 123586	Date 14:37:17 06/04/12
	Client CCI 876353	Designed by JSC

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	150'-120'	30'	P24x1/4	A572-42 (42 ksi)	
L2	120'-90'	30'	P30x3/8	A572-42 (42 ksi)	
L3	90'-60'	30'	P36x3/8	A572-42 (42 ksi)	
L4	60'-30'	30'	P42x3/8	A572-42 (42 ksi)	
L5	30'-0'	30'	P42x1/2	A572-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	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 150'-120'				1	1	1		
L2 120'-90'				1	1	1		
L3 90'-60'				1	1	1		
L4 60'-30'				1	1	1		
L5 30'-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	148' - 0'	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20
LDF7-50A(1-5/8")	C	No	Inside Pole	135' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF4-50A(1/2")	C	No	Inside Pole	130' - 0'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
Step Pegs (3/4" SR) 7-in. w/30" step	C	No	CaAa (Out Of Face)	135' - 0'	1	No Ice	0.03	0.17
						1/2" Ice	0.14	0.85
						1" Ice	0.23	1.98
						2" Ice	0.43	6.08
						4" Ice	0.83	21.59
Safety Line 3/8	C	No	CaAa (Out Of Face)	135' - 0'	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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	150'-120'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.087	0.18
L2	120'-90'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.27
L3	90'-60'	A	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.27
L4	60'-30'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.27
L5	30'-0'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.27

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150'-120'	A	0.888	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.416	0.22
L2	120'-90'	A	0.862	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.516	0.34
L3	90'-60'	A	0.828	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.107	0.34
L4	60'-30'	A	0.778	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.516	0.34
L5	30'-0'	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.175	0.33

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150'-120'	-0.0463	0.0267	-0.2353	0.1358
L2	120'-90'	-0.0915	0.0528	-0.4427	0.2556
L3	90'-60'	-0.0920	0.0531	-0.4441	0.2564
L4	60'-30'	-0.0923	0.0533	-0.4349	0.2511
L5	30'-0'	-0.0923	0.0533	-0.4237	0.2446

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 2.4" Dia x 4-ft Mount Pipe	A	From Centroid-Leg	4.00 0' 0'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
1900MHz RRH (65MHz)	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800 EXTERNAL NOTCH FILTER	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.22
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
(2) 2.4" Dia x 4-ft Mount Pipe	A	From Centroid-Leg	4.00 0' 2'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
2.4" Dia x 4-ft Mount Pipe	B	From Centroid-Leg	4.00 6' 5'	60.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
(2) 2.4" Dia x 4-ft Mount Pipe	B	From Centroid-Leg	4.00 0' 0'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
1900MHz RRH (65MHz)	B	From Centroid-Leg	4.00 -2' 2'	-10.0000	148'	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800 EXTERNAL NOTCH FILTER	B	From Centroid-Leg	4.00 -2' 2'	-10.0000	148'	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	B	From Centroid-Leg	4.00 -2'	-10.0000	148'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	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
		g	2'			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	B	From Centroid-Le g	4.00 -2' 2'	-10.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Le g	4.00 -2' 2'	-10.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
(2) 2.4" Dia x 4-ft Mount Pipe	B	From Centroid-Le g	4.00 0' 2'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.12 1.37 1.91 3.24	0.87 1.12 1.37 1.91 3.24	0.01 0.02 0.03 0.06 0.16
(2) 2.4" Dia x 4-ft Mount Pipe	C	From Centroid-Le g	4.00 0' 0'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.12 1.37 1.91 3.24	0.87 1.12 1.37 1.91 3.24	0.01 0.02 0.03 0.06 0.16
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	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
1900MHz RRH (65MHz)	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
(3) ACU-A20-N	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(2) 2.4" Dia x 4-ft Mount Pipe	C	From Centroid-Le g	4.00 0' 2'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.12 1.37 1.91 3.24	0.87 1.12 1.37 1.91 3.24	0.01 0.02 0.03 0.06 0.16
Platform Mount [LP 502-1]	C	None		0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	32.35 45.67 58.99 85.63	32.35 45.67 58.99 85.63	0.93 1.19 1.46 2.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	138.91	138.91	3.07
***									
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.11
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.11
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.11
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
Platform Mount [LP 712-1]	C	None		0.0000	135'	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
***									
GPS_A	C	From Face	3.00 0' 1'	0.0000	130'	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 702-1]	C	From Face	1.50 0' 0'	0.0000	130'	No Ice	1.00	1.43	0.03
						1/2" Ice	1.00	2.05	0.04
						1" Ice	1.00	2.67	0.05
						2" Ice	1.00	3.91	0.07
						4" Ice	1.00	6.39	0.12

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice

Comb. No.	Description
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	150 - 120	Pole	Max Tension	11	0.00	-0.00	0.00
			Max. Compression	14	-8.31	0.02	-0.39
			Max. Mx	11	-4.79	175.99	2.95
			Max. My	8	-4.79	-3.09	-175.93
			Max. Vy	11	-7.82	175.99	2.95
			Max. Vx	8	7.80	-3.09	-175.93
			Max. Torque	12			0.34
L2	120 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.20	0.11	-0.44
			Max. Mx	11	-8.63	442.90	6.07
			Max. My	8	-8.63	-6.21	-442.22
			Max. Vy	11	-9.95	442.90	6.07
			Max. Vx	8	9.93	-6.21	-442.22
			Max. Torque	12			0.36
L3	90 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.94	0.22	-0.50
			Max. Mx	11	-13.25	774.68	9.21
			Max. My	8	-13.25	-9.34	-773.38
			Max. Vy	11	-12.15	774.68	9.21
			Max. Vx	8	12.12	-9.34	-773.38
			Max. Torque	12			0.38
L4	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.50	0.33	-0.57
			Max. Mx	11	-18.66	1170.77	12.32
			Max. My	8	-18.66	-12.45	-1168.85
			Max. Vy	11	-14.23	1170.77	12.32
			Max. Vx	8	14.21	-12.45	-1168.85
			Max. Torque	12			0.39

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	30 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.66	0.45	-0.63
			Max. Mx	11	-25.79	1624.27	15.38
			Max. My	8	-25.79	-15.50	-1621.74
			Max. Vy	11	-15.96	1624.27	15.38
			Max. Vx	8	15.94	-15.50	-1621.74
			Max. Torque	12			0.41

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	25	33.66	3.50	2.02
	Max. H_x	11	25.80	15.95	0.10
	Max. H_z	2	25.80	0.10	15.93
	Max. M_x	2	1621.36	0.10	15.93
	Max. M_z	5	1624.14	-15.95	-0.10
	Max. Torsion	12	0.41	13.87	8.05
	Min. Vert	1	25.80	0.00	0.00
	Min. H_x	5	25.80	-15.95	-0.10
	Min. H_z	8	25.80	-0.10	-15.93
	Min. M_x	8	-1621.74	-0.10	-15.93
	Min. M_z	11	-1624.27	15.95	0.10
	Min. Torsion	6	-0.40	-13.87	-8.05

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	25.80	0.00	0.00	0.18	0.06	0.00
Dead+Wind 0 deg - No Ice	25.80	-0.10	-15.93	-1621.36	15.63	-0.20
Dead+Wind 30 deg - No Ice	25.80	7.89	-13.75	-1396.35	-798.57	0.01
Dead+Wind 60 deg - No Ice	25.80	13.77	-7.88	-797.11	-1398.77	0.21
Dead+Wind 90 deg - No Ice	25.80	15.95	0.10	15.76	-1624.14	0.35
Dead+Wind 120 deg - No Ice	25.80	13.87	8.05	824.43	-1414.31	0.40
Dead+Wind 150 deg - No Ice	25.80	8.06	13.85	1412.26	-825.51	0.35
Dead+Wind 180 deg - No Ice	25.80	0.10	15.93	1621.74	-15.50	0.20
Dead+Wind 210 deg - No Ice	25.80	-7.89	13.75	1396.73	798.70	-0.00
Dead+Wind 240 deg - No Ice	25.80	-13.77	7.88	797.49	1398.90	-0.21
Dead+Wind 270 deg - No Ice	25.80	-15.95	-0.10	-15.38	1624.27	-0.36
Dead+Wind 300 deg - No Ice	25.80	-13.87	-8.05	-824.06	1414.44	-0.41
Dead+Wind 330 deg - No Ice	25.80	-8.06	-13.85	-1411.88	825.64	-0.35
Dead+Ice+Temp	33.66	0.00	0.00	0.63	0.45	0.00
Dead+Wind 0 deg+Ice+Temp	33.66	-0.01	-4.02	-427.74	2.50	-0.09
Dead+Wind 30 deg+Ice+Temp	33.66	2.01	-3.48	-369.33	-212.92	0.01
Dead+Wind 60 deg+Ice+Temp	33.66	3.49	-2.00	-211.77	-371.16	0.11
Dead+Wind 90 deg+Ice+Temp	33.66	4.03	0.01	2.71	-429.83	0.18
Dead+Wind 120 deg+Ice+Temp	33.66	3.50	2.02	216.64	-373.20	0.20
Dead+Wind 150 deg+Ice+Temp	33.66	2.03	3.49	372.71	-216.44	0.17
Dead+Wind 180 deg+Ice+Temp	33.66	0.01	4.02	429.09	-1.57	0.09
Dead+Wind 210 deg+Ice+Temp	33.66	-2.01	3.48	370.67	213.85	-0.01

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 240 deg+Ice+Temp	33.66	-3.49	2.00	213.12	372.09	-0.11
Dead+Wind 270 deg+Ice+Temp	33.66	-4.03	-0.01	-1.36	430.75	-0.18
Dead+Wind 300 deg+Ice+Temp	33.66	-3.50	-2.02	-215.30	374.12	-0.20
Dead+Wind 330 deg+Ice+Temp	33.66	-2.03	-3.49	-371.36	217.37	-0.17
Dead+Wind 0 deg - Service	25.80	-0.03	-5.51	-561.19	5.46	-0.07
Dead+Wind 30 deg - Service	25.80	2.73	-4.76	-483.29	-276.42	0.00
Dead+Wind 60 deg - Service	25.80	4.76	-2.73	-275.83	-484.21	0.07
Dead+Wind 90 deg - Service	25.80	5.52	0.03	5.58	-562.24	0.12
Dead+Wind 120 deg - Service	25.80	4.80	2.79	285.55	-489.60	0.14
Dead+Wind 150 deg - Service	25.80	2.79	4.79	489.06	-285.76	0.12
Dead+Wind 180 deg - Service	25.80	0.03	5.51	561.57	-5.33	0.07
Dead+Wind 210 deg - Service	25.80	-2.73	4.76	483.67	276.55	-0.00
Dead+Wind 240 deg - Service	25.80	-4.76	2.73	276.21	484.34	-0.07
Dead+Wind 270 deg - Service	25.80	-5.52	-0.03	-5.20	562.37	-0.12
Dead+Wind 300 deg - Service	25.80	-4.80	-2.79	-285.17	489.73	-0.14
Dead+Wind 330 deg - Service	25.80	-2.79	-4.79	-488.68	285.88	-0.12

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-25.80	0.00	0.00	25.80	0.00	0.000%
2	-0.10	-25.80	-15.93	0.10	25.80	15.93	0.000%
3	7.89	-25.80	-13.75	-7.89	25.80	13.75	0.000%
4	13.77	-25.80	-7.88	-13.77	25.80	7.88	0.000%
5	15.95	-25.80	0.10	-15.95	25.80	-0.10	0.000%
6	13.87	-25.80	8.05	-13.87	25.80	-8.05	0.000%
7	8.06	-25.80	13.85	-8.06	25.80	-13.85	0.000%
8	0.10	-25.80	15.93	-0.10	25.80	-15.93	0.000%
9	-7.89	-25.80	13.75	7.89	25.80	-13.75	0.000%
10	-13.77	-25.80	7.88	13.77	25.80	-7.88	0.000%
11	-15.95	-25.80	-0.10	15.95	25.80	0.10	0.000%
12	-13.87	-25.80	-8.05	13.87	25.80	8.05	0.000%
13	-8.06	-25.80	-13.85	8.06	25.80	13.85	0.000%
14	0.00	-33.66	0.00	0.00	33.66	0.00	0.000%
15	-0.01	-33.66	-4.02	0.01	33.66	4.02	0.000%
16	2.01	-33.66	-3.48	-2.01	33.66	3.48	0.000%
17	3.49	-33.66	-2.00	-3.49	33.66	2.00	0.000%
18	4.03	-33.66	0.01	-4.03	33.66	-0.01	0.000%
19	3.50	-33.66	2.02	-3.50	33.66	-2.02	0.000%
20	2.03	-33.66	3.49	-2.03	33.66	-3.49	0.000%
21	0.01	-33.66	4.02	-0.01	33.66	-4.02	0.000%
22	-2.01	-33.66	3.48	2.01	33.66	-3.48	0.000%
23	-3.49	-33.66	2.00	3.49	33.66	-2.00	0.000%
24	-4.03	-33.66	-0.01	4.03	33.66	0.01	0.000%
25	-3.50	-33.66	-2.02	3.50	33.66	2.02	0.000%
26	-2.03	-33.66	-3.49	2.03	33.66	3.49	0.000%
27	-0.03	-25.80	-5.51	0.03	25.80	5.51	0.000%
28	2.73	-25.80	-4.76	-2.73	25.80	4.76	0.000%
29	4.76	-25.80	-2.73	-4.76	25.80	2.73	0.000%
30	5.52	-25.80	0.03	-5.52	25.80	-0.03	0.000%
31	4.80	-25.80	2.79	-4.80	25.80	-2.79	0.000%
32	2.79	-25.80	4.79	-2.79	25.80	-4.79	0.000%
33	0.03	-25.80	5.51	-0.03	25.80	-5.51	0.000%
34	-2.73	-25.80	4.76	2.73	25.80	-4.76	0.000%
35	-4.76	-25.80	2.73	4.76	25.80	-2.73	0.000%
36	-5.52	-25.80	-0.03	5.52	25.80	0.03	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
37	-4.80	-25.80	-2.79	4.80	25.80	2.79	0.000%
38	-2.79	-25.80	-4.79	2.79	25.80	4.79	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00030779
3	Yes	5	0.00000001	0.00021398
4	Yes	5	0.00000001	0.00021162
5	Yes	4	0.00000001	0.00041611
6	Yes	5	0.00000001	0.00023074
7	Yes	5	0.00000001	0.00022333
8	Yes	4	0.00000001	0.00011616
9	Yes	5	0.00000001	0.00021372
10	Yes	5	0.00000001	0.00021633
11	Yes	4	0.00000001	0.00009836
12	Yes	5	0.00000001	0.00022265
13	Yes	5	0.00000001	0.00022980
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00009812
16	Yes	5	0.00000001	0.00010883
17	Yes	5	0.00000001	0.00010889
18	Yes	5	0.00000001	0.00009876
19	Yes	5	0.00000001	0.00011114
20	Yes	5	0.00000001	0.00011060
21	Yes	5	0.00000001	0.00009863
22	Yes	5	0.00000001	0.00010947
23	Yes	5	0.00000001	0.00010984
24	Yes	5	0.00000001	0.00009895
25	Yes	5	0.00000001	0.00011048
26	Yes	5	0.00000001	0.00011058
27	Yes	4	0.00000001	0.00004657
28	Yes	4	0.00000001	0.00040714
29	Yes	4	0.00000001	0.00039662
30	Yes	4	0.00000001	0.00005869
31	Yes	4	0.00000001	0.00045637
32	Yes	4	0.00000001	0.00042259
33	Yes	4	0.00000001	0.00003847
34	Yes	4	0.00000001	0.00040636
35	Yes	4	0.00000001	0.00041827
36	Yes	4	0.00000001	0.00004526
37	Yes	4	0.00000001	0.00041928
38	Yes	4	0.00000001	0.00045162

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	21.883	31	1.2476	0.0014

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	120 - 90	14.368	31	1.0764	0.0008
L3	90 - 60	8.244	31	0.8384	0.0005
L4	60 - 30	3.750	31	0.5676	0.0002
L5	30 - 0	0.979	31	0.2958	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148'	(2) 2.4" Dia x 4-ft Mount Pipe	31	21.363	1.2372	0.0014	38542
135'	RR90-17-02DP w/ Mount Pipe	31	18.020	1.1678	0.0011	12847
130'	GPS_A	31	16.769	1.1392	0.0010	9635

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	63.138	6	3.6006	0.0038
L2	120 - 90	41.468	6	3.1072	0.0022
L3	90 - 60	23.800	6	2.4206	0.0013
L4	60 - 30	10.828	6	1.6389	0.0007
L5	30 - 0	2.829	6	0.8542	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148'	(2) 2.4" Dia x 4-ft Mount Pipe	6	61.639	3.5706	0.0041	13482
135'	RR90-17-02DP w/ Mount Pipe	6	52.001	3.3707	0.0033	4493
130'	GPS_A	6	48.393	3.2882	0.0030	3369

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	150 - 120 (1)	P24x1/4	30'	0'	0.0	23.696	18.6532	-4.78	442.00	0.011

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 $\frac{P}{P_a}$
L2	120 - 90 (2)	P30x3/8	30'	0'	0.0	25.075	34.9011	-8.62	875.15	0.010
L3	90 - 60 (3)	P36x3/8	30'	0'	0.0	23.696	41.9697	-13.24	994.51	0.013
L4	60 - 30 (4)	P42x3/8	30'	0'	0.0	22.711	49.0383	-18.65	1113.69	0.017
L5	30 - 0 (5)	P42x1/2	30'	0'	0.0	24.681	65.1880	-25.79	1608.90	0.016

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	150 - 120 (1)	P24x1/4	178.68	19.562	23.696	0.826	0.00	0.000	23.696	0.000
L2	120 - 90 (2)	P30x3/8	448.13	21.064	25.075	0.840	0.00	0.000	25.075	0.000
L3	90 - 60 (3)	P36x3/8	782.46	25.381	23.696	1.071	0.00	0.000	23.696	0.000
L4	60 - 30 (4)	P42x3/8	1181.08	28.021	22.711	1.234	0.00	0.000	22.711	0.000
L5	30 - 0 (5)	P42x1/2	1637.06	29.392	24.681	1.191	0.00	0.000	24.681	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	150 - 120 (1)	P24x1/4	7.91	0.848	16.800	0.050	0.34	0.019	11.901	0.002
L2	120 - 90 (2)	P30x3/8	10.03	0.575	16.800	0.034	0.36	0.008	15.644	0.001
L3	90 - 60 (3)	P36x3/8	12.23	0.583	16.800	0.035	0.37	0.006	11.901	0.001
L4	60 - 30 (4)	P42x3/8	14.32	0.584	16.800	0.035	0.39	0.005	9.978	0.000
L5	30 - 0 (5)	P42x1/2	16.05	0.492	16.800	0.029	0.40	0.004	14.540	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.011	0.826	0.000	0.050	0.002	0.839 ✔	1.333	H1-3+VT ✔
L2	120 - 90 (2)	0.010	0.840	0.000	0.034	0.001	0.851 ✔	1.333	H1-3+VT ✔
L3	90 - 60 (3)	0.013	1.071	0.000	0.035	0.001	1.086 ✔	1.333	H1-3+VT ✔
L4	60 - 30 (4)	0.017	1.234	0.000	0.035	0.000	1.252 ✔	1.333	H1-3+VT ✔
L5	30 - 0 (5)	0.016	1.191	0.000	0.029	0.000	1.208 ✔	1.333	H1-3+VT ✔

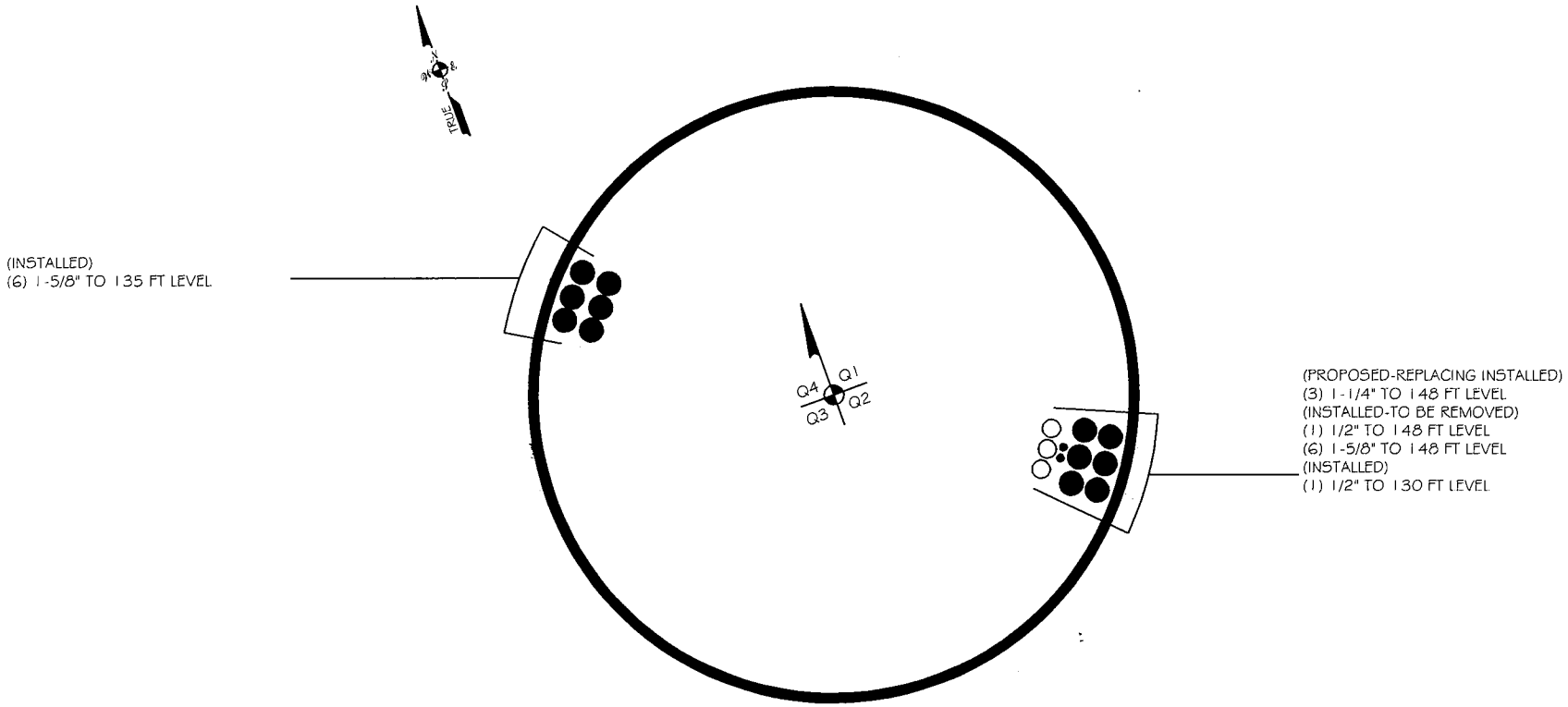
tnxTower	Job	Page
	New Town - Main St.	13 of 13
Tower Engineering Professionals 3703 Junction Blvd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Project TEP 123586	Date 14:37:17 06/04/12
	Client CCI 876353	Designed by JSC

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 120	Pole	P24x1/4	1	-4.78	589.19	62.9	Pass
L2	120 - 90	Pole	P30x3/8	2	-8.62	1166.57	63.8	Pass
L3	90 - 60	Pole	P36x3/8	3	-13.24	1325.68	81.4	Pass
L4	60 - 30	Pole	P42x3/8	4	-18.65	1484.55	93.9	Pass
L5	30 - 0	Pole	P42x1/2	5	-25.79	2144.66	90.6	Pass
							Summary	
						Pole (L4)	93.9	Pass
						RATING =	**93.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


TRUE
(INSTALLED)
(6) 1-5/8" TO 135 FT LEVEL
Q4
Q1
Q3
Q2
(PROPOSED-REPLACING INSTALLED)
(3) 1-1/4" TO 148 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1/2" TO 148 FT LEVEL
(6) 1-5/8" TO 148 FT LEVEL
(INSTALLED)
(1) 1/2" TO 130 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *876353*
Site Name: *352 S. Main St.*
App #: *151558*

Pole Manufacturer:	*Other*

Reactions		
Moment:	1637	ft-kips
Axial:	26	kips
Shear:	16	kips

Anchor Rod Data		
Qty:	18	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

Plate Data		
Diam:	53	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.33	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:	42	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	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

Maximum Rod Tension:	91.4 Kips	Rigid
Allowable Tension:	97.2 Kips	Service, ASD
Anchor Rod Stress Ratio:	94.1% **Pass**	Fty*ASIF

Base Plate Results

	Flexural Check	
Base Plate Stress:	30.4 ksi	Rigid
Allowable Plate Stress:	36.0 ksi	Service ASD
Base Plate Stress Ratio:	84.5% **Pass**	0.75*Fy*ASIF
		Y.L. Length: 21.10

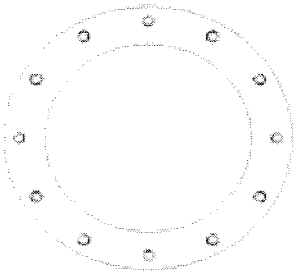
n/a

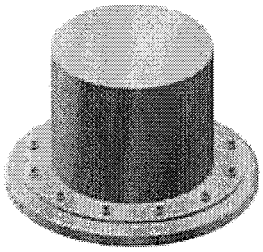
Stiffener Results

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

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

Site Data

BU#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 1*

Pole Manufacturer:	Rohn

Reactions		
Moment:	1181.08	ft-kips
Axial:	18.65	kips
Shear:	14.32	kips
Elevation:	30	feet

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

Bolt Data			
Qty:	18		
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.):	47		

Plate Data		
Diam:	53	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.33	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:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	65.98 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	2.031 in	
Min PL "treq" for actual **T w/ Pry:**	1.212 in	
Min PL "t1" for actual **T w/o Pry:**	1.620 in	
T allowable with Prying:	102.65 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	65.98 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	63.7% **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		21.10
Tension Side Stress Ratio, (treq/t)^2:	36.7% **Pass**	

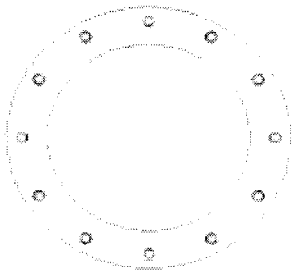
n/a

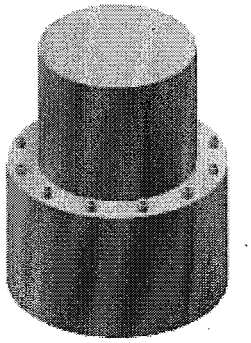
Stiffener Results N/A for Rohn / Pirod

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#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 1*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	18		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	47		

Plate Data		
Diam:	53	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:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	782.46	ft-kips
Axial:	13.24	kips
Shear:	12.23	kips
Elevation:	60	feet

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

Flange Bolt Results | Rigid

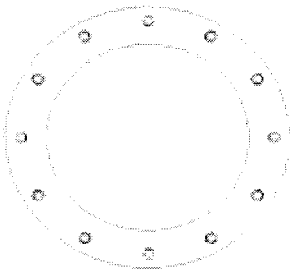
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	43.66 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.614 in	
Min PL "treq" for actual **T w/ Pry:**	1.773 in	
Min PL "t1" for actual **T w/o Pry:**	2.346 in	
T allowable with Prying:	55.58 kips	α'>1 case
Prying Force, Q:	15.10 kips	
Total Bolt Tension=T+Q:	58.76 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	56.7% **Pass**	

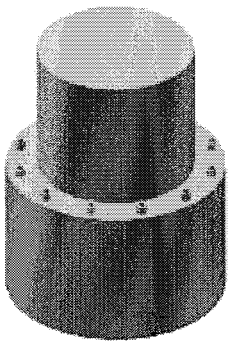
Exterior Flange Plate Results | Flexural Check | Rigid

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:
Prying Occurs, PL Check:		30.22
Tension Side Stress Ratio, (treq/t)^2:	78.5% **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#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 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		

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	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	448.13	ft-kips
Axial:	8.62	kips
Shear:	10.03	kips
Elevation:	90	feet

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

Flange Bolt Results | Rigid

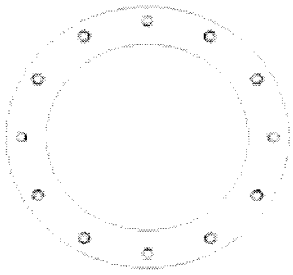
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	32.25 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.733 in	
Min PL "treq" for actual **T w/ Pry**:	1.581 in	
Min PL "t1" for actual **T w/o Pry**:	2.082 in	
T allowable with Prying:	51.62 kips	α'>1 case
Prying Force, Q:	3.16 kips	
Total Bolt Tension=T+Q:	35.41 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	34.2% **Pass**	

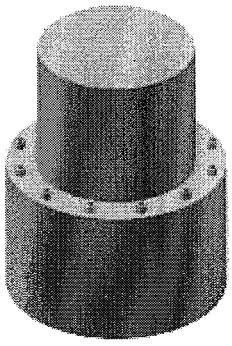
Exterior Flange Plate Results | Flexural Check | Rigid

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:
Prying Occurs, PL Check:		27.95
Tension Side Stress Ratio, (treq/t)^2:	62.5% **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#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 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:
N/A:		<-- Disregard	44.00
Circle (in.):	35		

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:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	178.68	ft-kips
Axial:	4.78	kips
Shear:	7.91	kips
Elevation:	120	feet

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

Flange Bolt Results | Rigid

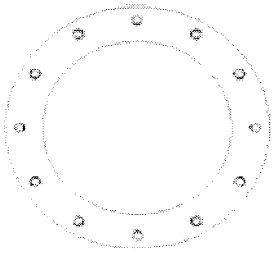
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	20.02 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.614 in	
Min PL "treq" for actual **T w/ Pry:**	1.200 in	
Min PL "t1" for actual **T w/o Pry:**	1.589 in	
T allowable with Prying:	55.58 kips	α'>1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	20.02 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	19.3% **Pass**	

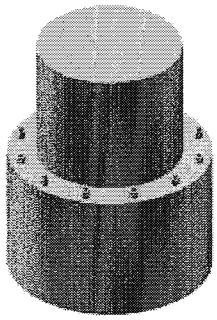
Exterior Flange Plate Results Flexural Check | Rigid

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		25.48
Tension Side Stress Ratio, (treq/t)^2:	36.0% **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

JOB:	352 S. Main St. (BU# 876353) - TEP# 123586		
SHEET NUMBER:	1	OF	2
CALCULATED BY:	JSC	DATE	6/1/2012
CHECKED BY:		DATE	

Pad and Pier Foundation for Monopole - TIA-222-F

Q_a, ALLOWABLE SOIL PRESS. (ksf)	5
NET or GROSS	NET
SOIL DENSITY (pcf)	100

F'c (ksi)	3
F'y (ksi)	60

Base Reactions LC1: Maximum Wind

M, MOMENT (k-ft)	1637.0
P_t, TOTAL DOWNLOAD (k)	26.0
H, HORIZONTAL SHEAR (k)	16.0

Base Reaction LC 2: Ice Wind + Ice

M (k-ft)	432.0
P_t (k)	34.0
H (k)	4.0

Try:	L (ft.)	B (ft.)	t (ft.)	Soil depth to TOP of mat (ft.)	Soil depth to BOT. of mat (ft.)	Pier dia./width (ft.)	Pier Height, h (cu.ft.)	Pier Shape
	22	22	6	0	5.5	3.92	0.00	Round

W_m, Weight of Mat (k) =	435.6
W_p, Weight of Pier (k) =	0.0
Ws, WEIGHT OF SOIL (k) =	0.0

Concrete Vol. (cu ft) 107.56

CHECK DESIGN CRITERIA

CHECK STABILITY:	LC1	LC2		
Mst= P * (L/2) + (Vf+s * L/2) =	5077.6 k-ft	5165.6 k-ft		
Mot = M+H*(t+h) =	1733.0 k-ft	456 k-ft		
SF =Mot/Mst =	2.93 > 1.5	11.33 > 1.5	**Capacity:**	51.2%

CHECK BEARING PRESSURE	LC1	LC2		
P = P_t + Wf + Ws =	461.6 k	469.6 k		
e = M / P =	3.75 ft	0.97 ft		
L/6 =	3.67 ft	3.67 ft		
Width of Wedge, L' =	21.74 ft	22.00 ft		
0 Deg Wind: Qmax =	1.38 ksf	0.68 ksf		
45 Deg Wind: Qmax =	1.82 ksf	0.78 ksf	**Capacity:**	36.5%

JOB:	352 S. Main St. (BU# 876353) - TEP# 123586		
SHEET NUMBER:	2	OF	2
CALCULATED BY:	JSC	DATE	6/1/2012
CHECKED BY:		DATE	

CHECK ONE WAY SHEAR

Vu = 173.8 k
Vc = 1474.9 k

Capacity: 11.78%

CHECK TWO WAY SHEAR: PUNCHING + UNBALANCED MOMENT

v_u = 6.7 psi
φv_c = 164.3 psi

Capacity: 4.06%

CALCULATE REINFORCING REQUIRED

F'c = 3.0 ksi F'y = 60.0 ksi

Temp & Shrinkage reinforcing, $A_{s,\,temp}$ = 0.40 in^2/ft (ACI 318 Sec. 10.5.4)

BOTTOM REINFORCING

Bar Size = 8
Bar Spacing, c-c: 11.0
d = 67.5 in.
Mu= 125.6 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.03 in^2/ft

Check, As = 0.86 in^2/ft

Capacity: 46.41%
As,temp controls

TOP REINFORCING

Bar Size = 8
Bar Spacing, c-c: 11.0
d= 67.5 in.
Mu= 520.5 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.14 in^2/ft **As,req < As,t, Use As,t**

Bar Spacing, c-c:

Check, As = 0.86 in^2/ft **Top Reinforcing O.K.**

Capacity: 46.41%
As,temp controls

Date: **June 4, 2012**

Cheryl Shultz
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Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate *SNV* Interim**	
	Carrier Site Number:	CT03XC340
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876353
	Crown Castle Site Name:	352 S. Main St, New Town, CT
	Crown Castle JDE Job Number:	189044
	Crown Castle Work Order Number:	498866
	Crown Castle Application Number:	151558 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	123586
Site Data:	**352 S. Main Street, Newtown, Fairfield County, CT 06470** **Latitude *41° 21' 20.64"*, Longitude *-73° 15' 47.57"*** **150 Foot - Monopole Tower**	

Dear Cheryl Schultz,

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 467686, in accordance with application 151558, 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 + Interim Equipment (Existing + Proposed) **Insufficient 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 based upon a wind speed of 85 mph fastest mile.

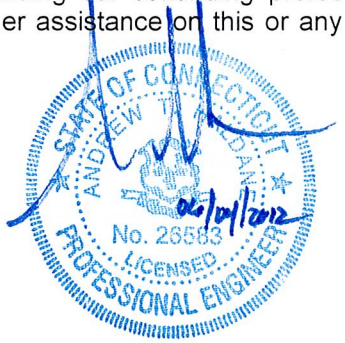
All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

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: John S. Coppedge, E.I.

Respectfully submitted by:

Andrew T. Haldane, P.E.



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7) APPENDIX C
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1) INTRODUCTION

This tower is a 150-ft monopole tower designed by Rohn in January of 1997. The tower was originally designed for a wind speed of 85 mph per ANSI/EIA-222-E for the appurtenances listed in Table 3. TEP did not visit the site. 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 85 mph with no ice, 37.6 mph with 0.75 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
148	150	3	Alcatel Lucent	1900MHz RRH (25MHz)	3	1-1/4	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
		9	RFS Celwave	ACU-A20-N			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			

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
148	153	1	Decibel	DB222-A	6 1	1-5/8 1/2	1
	148	6	Decibel	DB980H90E-M w/ Mount Pipe			
		1	Tower Mounts	Platform Mount [LP 502-1]	-	-	2
135	135	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	6	1-5/8	2
		1	Tower Mounts	Platform Mount [LP 712-1]			
130	131	1	GPS	GPS_A	1	1/2	2
	130	1	Tower Mounts	Side Arm Mount [SO 702-1]			

Notes:
1) Existing equipment to remain temporarily
2) Existing equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	Swedcom	ALP9212	12	1-5/8
		1	-	Cellular Platform	-	-
130	130	12	Swedcom	ALP9212	12	1-5/8
		1	-	Cellular Platform	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	Goodkind and O'Dea, Inc.	1531889	CCIsites
Tower Foundation Drawings/Design/Specs	Rohn	1619496	CCIsites
Tower Manufacturer Drawings	Rohn	2047929	CCIsites
Tower Structural Analysis Reports	Tower Engineering Professionals	2064114	CCIsites

3.1) Analysis Method

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

3.2) Assumptions

1) 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	150 - 120	Pole	P24x1/4	1	-5.84	589.19	73.7	Pass
L2	120 - 90	Pole	P30x3/8	2	-9.84	1166.57	72.5	Pass
L3	90 - 60	Pole	P36x3/8	3	-14.64	1325.68	90.6	Pass
L4	60 - 30	Pole	P42x3/8	4	-20.22	1484.55	102.8	Fail
L5	30 - 0	Pole	P42x1/2	5	-27.52	2144.66	98.0	Pass
							Summary	
						Pole (L4)	102.8	Fail
						Rating =	102.8	Fail

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	103.3	Fail
1	Base Plate	-	92.6	Pass
1	Flange Connection	30	70.6	Pass
1	Flange Connection	60	88.2	Pass
1	Flange Connection	90	71.3	Pass
1	Flange Connection	120	42.2	Pass
1	Base Foundation Structural	-	46.4	Pass
1	Base Foundation Soil Interaction	-	55.9	Pass

Structure Rating (max from all components) =	103.3%

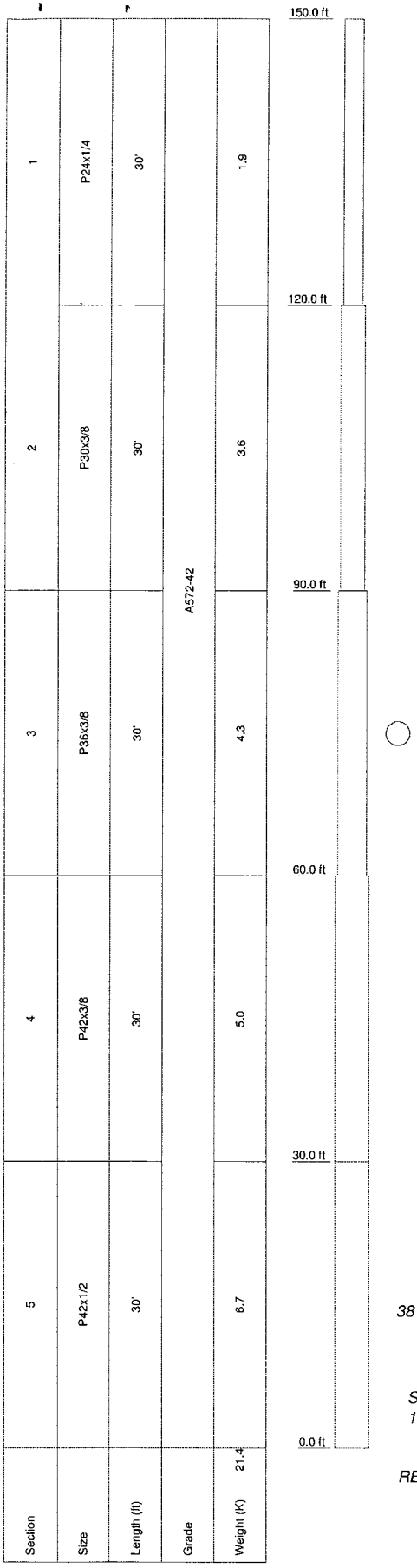
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

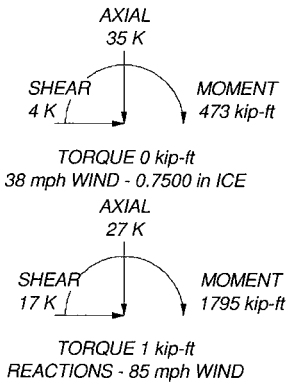
4.1) Recommendations

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 does not have sufficient capacity to carry the existing, reserved, and proposed loads. Modifications will be required to bring the tower into compliance with the TIA-222-F standard for the proposed and existing loading. The following components require modifications:
   a) Pole section from 30 to 60-ft.
   b) Anchor rods.
   Further engineering and detailing is required to design the necessary modifications. Base plate and foundation are sufficient.
3) A Professional Engineer licensed in the state of Connecticut shall issue design drawings for the above modifications. This analysis report is not a construction document.

APPENDIX A

TNXTOWER OUTPUT





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/ Mount Pipe	148	(2) DB980H90E-M w/ Mount Pipe	148
1900MHz RRH (25MHz)	148	APXVSPP18-C-A20 w/ Mount Pipe	148
800 EXTERNAL NOTCH FILTER	148	1900MHz RRH (25MHz)	148
800MHZ RRH	148	800 EXTERNAL NOTCH FILTER	148
(3) ACU-A20-N	148	800MHZ RRH	148
APXVSPP18-C-A20 w/ Mount Pipe	148	(3) ACU-A20-N	148
(2) 2.4" Dia x 4-ft Mount Pipe	148	(2) 2.4" Dia x 4-ft Mount Pipe	148
DB222-A	148	Platform Mount [LP 502-1]	148
(2) DB980H90E-M w/ Mount Pipe	148	RR90-17-02DP w/ Mount Pipe	135
1900MHz RRH (25MHz)	148	RR90-17-02DP w/ Mount Pipe	135
800 EXTERNAL NOTCH FILTER	148	RR90-17-02DP w/ Mount Pipe	135
800MHZ RRH	148	Platform Mount [LP 712-1]	135
(3) ACU-A20-N	148	GPS_A	130
APXVSPP18-C-A20 w/ Mount Pipe	148	Side Arm Mount [SO 702-1]	130
(2) 2.4" Dia x 4-ft Mount Pipe	148		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-42	42 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 103.9%

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Phone: (919) 661-6351
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Tower Engineering Professionals

Job: ***New Town - Main St.***		
Project: ***TEP 123586***		
Client: CCI 876353	Drawn by: JSC	App'd:
Code: TIA/EIA-222-F	Date: 06/04/12	Scale: NTS
Path: O:\3586_352 S Main St, New Town, CT\Structural\tnxTower\Interim\876353_LC5_Interim.eri		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 Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	150'-120'	30'	P24x1/4	A572-42 (42 ksi)	
L2	120'-90'	30'	P30x3/8	A572-42 (42 ksi)	
L3	90'-60'	30'	P36x3/8	A572-42 (42 ksi)	
L4	60'-30'	30'	P42x3/8	A572-42 (42 ksi)	
L5	30'-0'	30'	P42x1/2	A572-42 (42 ksi)	

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 150'-120'				1	1	1		
L2 120'-90'				1	1	1		
L3 90'-60'				1	1	1		
L4 60'-30'				1	1	1		
L5 30'-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	plf
LDF4-50A(1/2")	C	No	Inside Pole	148' - 0'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A(1-5/8")	C	No	Inside Pole	148' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	148' - 0'	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20
LDF7-50A(1-5/8")	C	No	Inside Pole	135' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF4-50A(1/2")	C	No	Inside Pole	130' - 0'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
Step Pegs (3/4" SR) 7-in. w/30" step	C	No	CaAa (Out Of Face)	135' - 0'	1	No Ice	0.03	0.17
						1/2" Ice	0.14	0.85
						1" Ice	0.23	1.98
						2" Ice	0.43	6.08
						4" Ice	0.83	21.59
Safety Line 3/8	C	No	CaAa (Out Of Face)	135' - 0'	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

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	150'-120'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.087	0.32
L2	120'-90'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.42
L3	90'-60'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.42
L4	60'-30'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.42
L5	30'-0'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.175	0.42

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	150'-120'	A	0.888	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.416	0.36
L2	120'-90'	A	0.862	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.516	0.50
L3	90'-60'	A	0.828	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.107	0.49
L4	60'-30'	A	0.778	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.516	0.49
L5	30'-0'	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.175	0.49

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150'-120'	-0.0463	0.0267	-0.2353	0.1358
L2	120'-90'	-0.0915	0.0528	-0.4427	0.2556
L3	90'-60'	-0.0920	0.0531	-0.4441	0.2564
L4	60'-30'	-0.0923	0.0533	-0.4349	0.2511
L5	30'-0'	-0.0923	0.0533	-0.4237	0.2446

Discrete Tower Loads

tnxTower	Job	Page
	New Town - Main St.	4 of 13
Tower Engineering Professionals 3703 Junction Blvd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	**Project** TEP 123586	**Date** 12:23:26 06/04/12
	Client CCI 876353	**Designed by** JSC

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) DB980H90E-M w/ Mount Pipe	A	From Centroid-Leg	4.00 0' 0'	0.0000	148'	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.06
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
1900MHz RRH (25MHz)	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	3.80	2.91	0.09
						1/2" Ice	4.06	3.14	0.12
						1" Ice	4.34	3.39	0.15
						2" Ice	4.91	3.91	0.24
						4" Ice	6.15	5.05	0.45
800 EXTERNAL NOTCH FILTER	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2' 2'	-50.0000	148'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.22
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
(2) 2.4" Dia x 4-ft Mount Pipe	A	From Centroid-Leg	4.00 0' 2'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
DB222-A	B	From Centroid-Leg	4.00 6' 5'	60.0000	148'	No Ice	1.60	1.60	0.02
						1/2" Ice	2.88	2.88	0.02
						1" Ice	4.16	4.16	0.03
						2" Ice	6.72	6.72	0.04
						4" Ice	11.84	11.84	0.05
(2) DB980H90E-M w/ Mount Pipe	B	From Centroid-Leg	4.00 0' 0'	0.0000	148'	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.06
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
1900MHz RRH (25MHz)	B	From Centroid-Leg	4.00 -2' 2'	-10.0000	148'	No Ice	3.80	2.91	0.09
						1/2" Ice	4.06	3.14	0.12
						1" Ice	4.34	3.39	0.15
						2" Ice	4.91	3.91	0.24
						4" Ice	6.15	5.05	0.45
800 EXTERNAL NOTCH FILTER	B	From Centroid-Leg	4.00 -2' 2'	-10.0000	148'	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	B	From Centroid-Le	4.00 -2'	-10.0000	148'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		g	2'			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	B	From Centroid-Le g	4.00 -2' 2'	-10.0000	148'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Le g	4.00 -2' 2'	-10.0000	148'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.22
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
(2) 2.4" Dia x 4-ft Mount Pipe	B	From Centroid-Le g	4.00 0' 2'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
(2) DB980H90E-M w/ Mount Pipe	C	From Centroid-Le g	4.00 0' 0'	0.0000	148'	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.06
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.22
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
1900MHz RRH (25MHz)	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice	3.80	2.91	0.09
						1/2" Ice	4.06	3.14	0.12
						1" Ice	4.34	3.39	0.15
						2" Ice	4.91	3.91	0.24
						4" Ice	6.15	5.05	0.45
800 EXTERNAL NOTCH FILTER	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	C	From Centroid-Le g	4.00 -2' 2'	-70.0000	148'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(2) 2.4" Dia x 4-ft Mount Pipe	C	From Centroid-Le g	4.00 0' 2'	0.0000	148'	No Ice	0.87	0.87	0.01
						1/2" Ice	1.12	1.12	0.02
						1" Ice	1.37	1.37	0.03
						2" Ice	1.91	1.91	0.06
						4" Ice	3.24	3.24	0.16
Platform Mount [LP 502-1]	C	None		0.0000	148'	No Ice	32.35	32.35	0.93
						1/2" Ice	45.67	45.67	1.19
						1" Ice	58.99	58.99	1.46
						2" Ice	85.63	85.63	2.00

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
						4" Ice	138.91	138.91	3.07
***									
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Leg	4.00 -6' 0'	0.0000	135'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.11 0.22 0.56
Platform Mount [LP 712-1]	C	None		0.0000	135'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
***									
GPS_A	C	From Face	3.00 0' 1'	0.0000	130'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 702-1]	C	From Face	1.50 0' 0'	0.0000	130'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.00 1.00 1.00 1.00	1.43 2.05 2.67 3.91 6.39	0.03 0.04 0.05 0.07 0.12

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice

Comb. No.	Description
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	150 - 120	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	14	-8.98	0.03	-0.35
			Max. Mx	5	-5.03	-204.80	-4.68
			Max. My	8	-5.04	-4.51	-204.78
			Max. Vy	11	-8.85	204.80	4.33
			Max. Vx	8	8.83	-4.51	-204.78
			Max. Torque	12			0.51
L2	120 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.02	0.12	-0.40
			Max. Mx	11	-9.04	502.76	8.89
			Max. My	8	-9.04	-9.07	-502.13
			Max. Vy	11	-10.99	502.76	8.89
			Max. Vx	8	10.97	-9.07	-502.13
			Max. Torque	12			0.52
L3	90 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.91	0.22	-0.46
			Max. Mx	11	-13.84	865.73	13.47
			Max. My	8	-13.85	-13.65	-864.48
			Max. Vy	11	-13.18	865.73	13.47
			Max. Vx	8	13.16	-13.65	-864.48
			Max. Torque	12			0.54
L4	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.63	0.34	-0.53
			Max. Mx	11	-19.43	1292.68	18.01
			Max. My	8	-19.43	-18.19	-1290.81
			Max. Vy	11	-15.25	1292.68	18.01
			Max. Vx	8	15.23	-18.19	-1290.81
			Max. Torque	12			0.55

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	30 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.94	0.45	-0.59
			Max. Mx	11	-26.76	1776.17	22.47
			Max. My	8	-26.76	-22.65	-1773.69
			Max. Vy	11	-16.94	1776.17	22.47
			Max. Vx	8	16.92	-22.65	-1773.69
			Max. Torque	12			0.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	25	34.94	3.72	2.15
	Max. H_x	11	26.76	16.93	0.15
	Max. H_z	2	26.76	0.15	16.91
	Max. M_x	2	1773.22	0.15	16.91
	Max. M_z	5	1776.05	-16.93	-0.15
	Max. Torsion	12	0.57	14.73	8.58
	Min. Vert	1	26.76	0.00	0.00
	Min. H_x	5	26.76	-16.93	-0.15
	Min. H_z	8	26.76	-0.15	-16.91
	Min. M_x	8	-1773.69	-0.15	-16.91
	Min. M_z	11	-1776.17	16.93	0.15
	Min. Torsion	6	-0.56	-14.73	-8.58

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	26.76	0.00	0.00	0.23	0.06	0.00
Dead+Wind 0 deg - No Ice	26.76	-0.15	-16.91	-1773.22	22.77	-0.24
Dead+Wind 30 deg - No Ice	26.76	8.34	-14.57	-1524.30	-868.35	0.04
Dead+Wind 60 deg - No Ice	26.76	14.59	-8.33	-866.84	-1526.77	0.32
Dead+Wind 90 deg - No Ice	26.76	16.93	0.15	22.94	-1776.05	0.51
Dead+Wind 120 deg - No Ice	26.76	14.73	8.58	906.60	-1549.42	0.56
Dead+Wind 150 deg - No Ice	26.76	8.59	14.72	1547.41	-907.64	0.47
Dead+Wind 180 deg - No Ice	26.76	0.15	16.91	1773.69	-22.65	0.25
Dead+Wind 210 deg - No Ice	26.76	-8.34	14.57	1524.77	868.47	-0.04
Dead+Wind 240 deg - No Ice	26.76	-14.59	8.33	867.31	1526.90	-0.32
Dead+Wind 270 deg - No Ice	26.76	-16.93	-0.15	-22.47	1776.17	-0.52
Dead+Wind 300 deg - No Ice	26.76	-14.73	-8.58	-906.14	1549.54	-0.57
Dead+Wind 330 deg - No Ice	26.76	-8.59	-14.72	-1546.94	907.76	-0.47
Dead+Ice+Temp	34.94	0.00	0.00	0.59	0.45	0.00
Dead+Wind 0 deg+Ice+Temp	34.94	-0.02	-4.27	-467.65	4.00	-0.10
Dead+Wind 30 deg+Ice+Temp	34.94	2.12	-3.69	-403.14	-231.55	0.09
Dead+Wind 60 deg+Ice+Temp	34.94	3.70	-2.11	-230.45	-404.93	0.24
Dead+Wind 90 deg+Ice+Temp	34.94	4.28	0.02	4.16	-469.69	0.34
Dead+Wind 120 deg+Ice+Temp	34.94	3.72	2.15	237.83	-408.47	0.34
Dead+Wind 150 deg+Ice+Temp	34.94	2.16	3.71	407.94	-237.67	0.25
Dead+Wind 180 deg+Ice+Temp	34.94	0.02	4.27	468.91	-3.06	0.10
Dead+Wind 210 deg+Ice+Temp	34.94	-2.12	3.69	404.41	232.49	-0.09

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 240 deg+Ice+Temp	34.94	-3.70	2.11	231.71	405.87	-0.24
Dead+Wind 270 deg+Ice+Temp	34.94	-4.28	-0.02	-2.90	470.62	-0.34
Dead+Wind 300 deg+Ice+Temp	34.94	-3.72	-2.15	-236.56	409.40	-0.34
Dead+Wind 330 deg+Ice+Temp	34.94	-2.16	-3.71	-406.67	238.60	-0.25
Dead+Wind 0 deg - Service	26.76	-0.05	-5.85	-613.83	7.93	-0.09
Dead+Wind 30 deg - Service	26.76	2.89	-5.04	-527.63	-300.62	0.01
Dead+Wind 60 deg - Service	26.76	5.05	-2.88	-299.98	-528.60	0.11
Dead+Wind 90 deg - Service	26.76	5.86	0.05	8.10	-614.92	0.18
Dead+Wind 120 deg - Service	26.76	5.10	2.97	314.08	-536.46	0.20
Dead+Wind 150 deg - Service	26.76	2.97	5.09	535.96	-314.24	0.16
Dead+Wind 180 deg - Service	26.76	0.05	5.85	614.30	-7.80	0.09
Dead+Wind 210 deg - Service	26.76	-2.89	5.04	528.10	300.74	-0.01
Dead+Wind 240 deg - Service	26.76	-5.05	2.88	300.46	528.72	-0.11
Dead+Wind 270 deg - Service	26.76	-5.86	-0.05	-7.63	615.05	-0.18
Dead+Wind 300 deg - Service	26.76	-5.10	-2.97	-313.60	536.58	-0.20
Dead+Wind 330 deg - Service	26.76	-2.97	-5.09	-535.49	314.36	-0.16

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-26.76	0.00	0.00	26.76	0.00	0.000%
2	-0.15	-26.76	-16.91	0.15	26.76	16.91	0.000%
3	8.34	-26.76	-14.57	-8.34	26.76	14.57	0.000%
4	14.59	-26.76	-8.33	-14.59	26.76	8.33	0.000%
5	16.93	-26.76	0.15	-16.93	26.76	-0.15	0.000%
6	14.73	-26.76	8.58	-14.73	26.76	-8.58	0.000%
7	8.59	-26.76	14.72	-8.59	26.76	-14.72	0.000%
8	0.15	-26.76	16.91	-0.15	26.76	-16.91	0.000%
9	-8.34	-26.76	14.57	8.34	26.76	-14.57	0.000%
10	-14.59	-26.76	8.33	14.59	26.76	-8.33	0.000%
11	-16.93	-26.76	-0.15	16.93	26.76	0.15	0.000%
12	-14.73	-26.76	-8.58	14.73	26.76	8.58	0.000%
13	-8.59	-26.76	-14.72	8.59	26.76	14.72	0.000%
14	0.00	-34.94	0.00	0.00	34.94	0.00	0.000%
15	-0.02	-34.94	-4.27	0.02	34.94	4.27	0.000%
16	2.12	-34.94	-3.69	-2.12	34.94	3.69	0.000%
17	3.70	-34.94	-2.11	-3.70	34.94	2.11	0.000%
18	4.28	-34.94	0.02	-4.28	34.94	-0.02	0.000%
19	3.72	-34.94	2.15	-3.72	34.94	-2.15	0.000%
20	2.16	-34.94	3.71	-2.16	34.94	-3.71	0.000%
21	0.02	-34.94	4.27	-0.02	34.94	-4.27	0.000%
22	-2.12	-34.94	3.69	2.12	34.94	-3.69	0.000%
23	-3.70	-34.94	2.11	3.70	34.94	-2.11	0.000%
24	-4.28	-34.94	-0.02	4.28	34.94	0.02	0.000%
25	-3.72	-34.94	-2.15	3.72	34.94	2.15	0.000%
26	-2.16	-34.94	-3.71	2.16	34.94	3.71	0.000%
27	-0.05	-26.76	-5.85	0.05	26.76	5.85	0.000%
28	2.89	-26.76	-5.04	-2.89	26.76	5.04	0.000%
29	5.05	-26.76	-2.88	-5.05	26.76	2.88	0.000%
30	5.86	-26.76	0.05	-5.86	26.76	-0.05	0.000%
31	5.10	-26.76	2.97	-5.10	26.76	-2.97	0.000%
32	2.97	-26.76	5.09	-2.97	26.76	-5.09	0.000%
33	0.05	-26.76	5.85	-0.05	26.76	-5.85	0.000%
34	-2.89	-26.76	5.04	2.89	26.76	-5.04	0.000%
35	-5.05	-26.76	2.88	5.05	26.76	-2.88	0.000%
36	-5.86	-26.76	-0.05	5.86	26.76	0.05	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
37	-5.10	-26.76	-2.97	5.10	26.76	2.97	0.000%
38	-2.97	-26.76	-5.09	2.97	26.76	5.09	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00053278
3	Yes	5	0.00000001	0.00031890
4	Yes	5	0.00000001	0.00031395
5	Yes	4	0.00000001	0.00074586
6	Yes	5	0.00000001	0.00034967
7	Yes	5	0.00000001	0.00033667
8	Yes	4	0.00000001	0.00021676
9	Yes	5	0.00000001	0.00031767
10	Yes	5	0.00000001	0.00032301
11	Yes	4	0.00000001	0.00012600
12	Yes	5	0.00000001	0.00033527
13	Yes	5	0.00000001	0.00034786
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00012730
16	Yes	5	0.00000001	0.00014441
17	Yes	5	0.00000001	0.00014405
18	Yes	5	0.00000001	0.00012823
19	Yes	5	0.00000001	0.00014889
20	Yes	5	0.00000001	0.00014755
21	Yes	5	0.00000001	0.00012783
22	Yes	5	0.00000001	0.00014482
23	Yes	5	0.00000001	0.00014585
24	Yes	5	0.00000001	0.00012841
25	Yes	5	0.00000001	0.00014736
26	Yes	5	0.00000001	0.00014804
27	Yes	4	0.00000001	0.00006653
28	Yes	4	0.00000001	0.00059309
29	Yes	4	0.00000001	0.00057182
30	Yes	4	0.00000001	0.00009450
31	Yes	4	0.00000001	0.00068299
32	Yes	4	0.00000001	0.00062493
33	Yes	4	0.00000001	0.00004806
34	Yes	4	0.00000001	0.00058840
35	Yes	4	0.00000001	0.00061230
36	Yes	4	0.00000001	0.00006382
37	Yes	4	0.00000001	0.00061848
38	Yes	4	0.00000001	0.00067383

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	24.468	31	1.4115	0.0021

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	120 - 90	15.987	31	1.2083	0.0011
L3	90 - 60	9.134	31	0.9344	0.0006
L4	60 - 30	4.139	31	0.6286	0.0003
L5	30 - 0	1.077	31	0.3259	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148'	(2) DB980H90E-M w/ Mount Pipe	31	23.880	1.3991	0.0021	32679
135'	RR90-17-02DP w/ Mount Pipe	31	20.103	1.3161	0.0017	10893
130'	GPS_A	31	18.691	1.2821	0.0015	8169

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	70.563	6	4.0720	0.0059
L2	120 - 90	46.123	6	3.4867	0.0032
L3	90 - 60	26.361	6	2.6971	0.0018
L4	60 - 30	11.948	6	1.8148	0.0010
L5	30 - 0	3.111	6	0.9409	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148'	(2) DB980H90E-M w/ Mount Pipe	6	68.870	4.0362	0.0064	11464
135'	RR90-17-02DP w/ Mount Pipe	6	57.987	3.7972	0.0049	3820
130'	GPS_A	6	53.918	3.6995	0.0044	2864

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	150 - 120 (1)	P24x1/4	30'	0'	0.0	23.696	18.6532	-5.02	442.00	0.011

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 $\frac{P}{P_a}$
L2	120 - 90 (2)	P30x3/8	30'	0'	0.0	25.075	34.9011	-9.03	875.15	0.010
L3	90 - 60 (3)	P36x3/8	30'	0'	0.0	23.696	41.9697	-13.84	994.51	0.014
L4	60 - 30 (4)	P42x3/8 H1-3+VT (1.39 CR) - 4	30'	0'	0.0	22.711	49.0383	-19.43	1113.69	0.017
L5	30 - 0 (5)	P42x1/2	30'	0'	0.0	24.681	65.1880	-26.76	1608.90	0.017

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	150 - 120 (1)	P24x1/4	208.75	22.853	23.696	0.964	0.00	0.000	23.696	0.000
L2	120 - 90 (2)	P30x3/8	510.49	23.995	25.075	0.957	0.00	0.000	25.075	0.000
L3	90 - 60 (3)	P36x3/8	877.27	28.456	23.696	1.201	0.00	0.000	23.696	0.000
L4	60 - 30 (4)	P42x3/8	1307.98	31.032	22.711	1.366	0.00	0.000	22.711	0.000
L5	30 - 0 (5)	P42x1/2	1795.17	32.231	24.681	1.306	0.00	0.000	24.681	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	150 - 120 (1)	P24x1/4	8.98	0.963	16.800	0.057	0.50	0.027	11.901	0.002
L2	120 - 90 (2)	P30x3/8	11.11	0.637	16.800	0.038	0.52	0.012	15.644	0.001
L3	90 - 60 (3)	P36x3/8	13.31	0.634	16.800	0.038	0.53	0.009	11.901	0.001
L4	60 - 30 (4)	P42x3/8	15.38	0.627	16.800	0.037	0.55	0.007	9.978	0.001
L5	30 - 0 (5)	P42x1/2	17.06	0.524	16.800	0.031	0.56	0.005	14.540	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.011	0.964	0.000	0.057	0.002	0.979 ✓	1.333	H1-3+VT ✓
L2	120 - 90 (2)	0.010	0.957	0.000	0.038	0.001	0.969 ✓	1.333	H1-3+VT ✓
L3	90 - 60 (3)	0.014	1.201	0.000	0.038	0.001	1.216 ✓	1.333	H1-3+VT ✓
L4	60 - 30 (4)	0.017	1.366	0.000	0.037	0.001	**1.385** ✗	1.333	H1-3+VT ✗
L5	30 - 0 (5)	0.017	1.306	0.000	0.031	0.000	1.324 ✓	1.333	H1-3+VT ✓

tnxTower	Job	Page
	New Town - Main St.	13 of 13
Tower Engineering Professionals 3703 Junction Blvd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Project TEP 123586	Date 12:23:26 06/04/12
	Client CCI 876353	Designed by JSC

Section Capacity Table

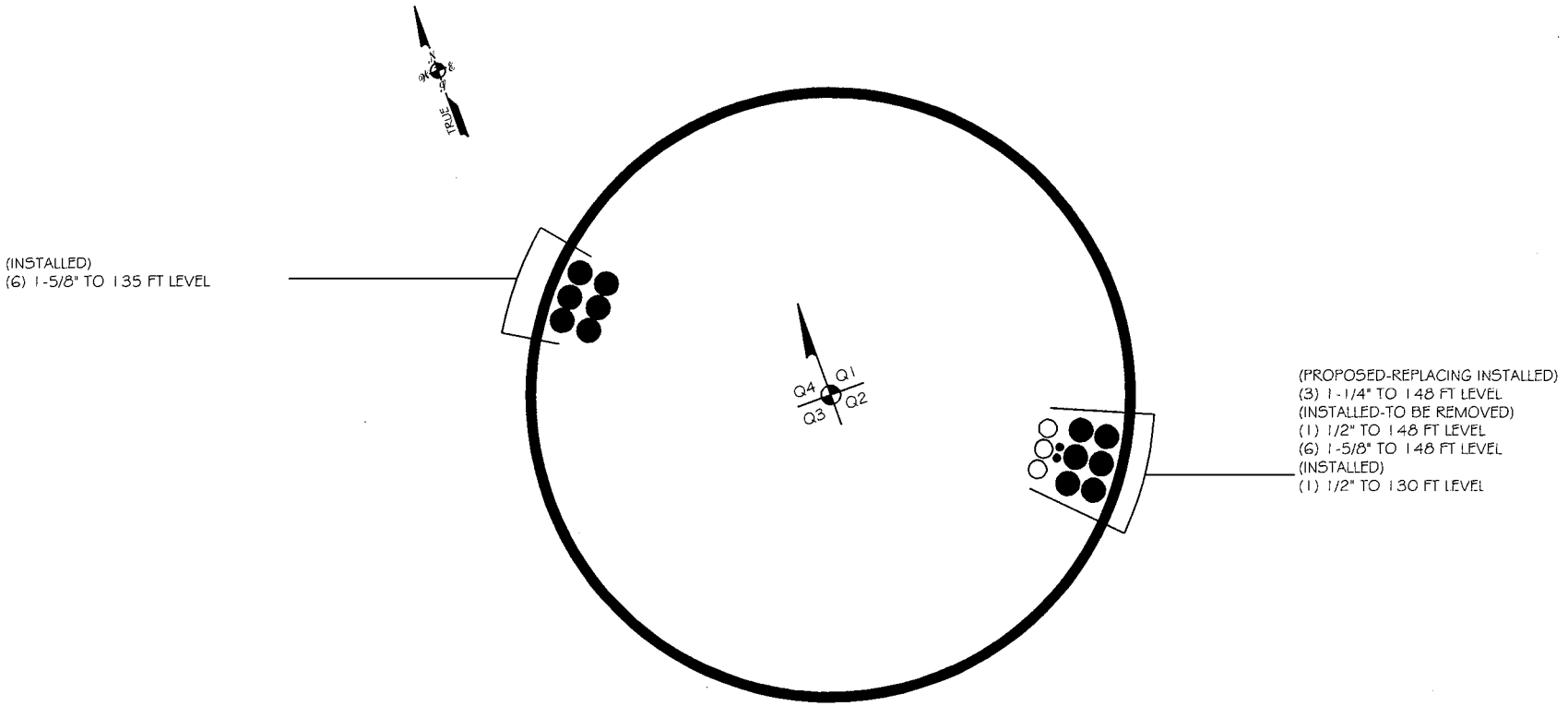
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 120	Pole	P24x1/4	1	-5.02	589.19	73.5	Pass
L2	120 - 90	Pole	P30x3/8	2	-9.03	1166.57	72.7	Pass
L3	90 - 60	Pole	P36x3/8	3	-13.84	1325.68	91.2	Pass
L4	60 - 30	Pole	P42x3/8	4	-19.43	1484.55	103.9	Fail ✗
L5	30 - 0	Pole	P42x1/2	5	-26.76	2144.66	99.3	Pass
							Summary	
						Pole (L4)	103.9	Fail ✗
						RATING =	**103.9**	**Fail ✗**

5.02

Program Version 6.0.4.0 - 1/27/2012 File:Q:/3586_352 S Main St, New Town, CT/Structural/tnxTower/Interim/876353_LC5_Interim.eri

APPENDIX B

BASE LEVEL DRAWING


TRUE
(INSTALLED)
(6) 1-5/8" TO 135 FT LEVEL
Q4
Q1
Q3
Q2
(PROPOSED-REPLACING INSTALLED)
(3) 1-1/4" TO 148 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1/2" TO 148 FT LEVEL
(6) 1-5/8" TO 148 FT LEVEL
(INSTALLED)
(1) 1/2" TO 130 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *876353*
Site Name: *352 S. Main St.*
App #: *151558*

Pole Manufacturer:	*Other*

Reactions		
Moment:	1795	ft-kips
Axial:	27	kips
Shear:	17	kips

Anchor Rod Data		
Qty:	18	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

Plate Data		
Diam:	53	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.33	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:	42	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	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

Maximum Rod Tension:	100.3 Kips	Rigid
Allowable Tension:	97.2 Kips	Service, ASD
Anchor Rod Stress Ratio:	103.3% **Pass**	Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	33.3 ksi	Rigid
Allowable Plate Stress:	36.0 ksi	Service ASD
Base Plate Stress Ratio:	92.6% **Pass**	0.75*Fy*ASIF
		Y.L. Length: 21.10

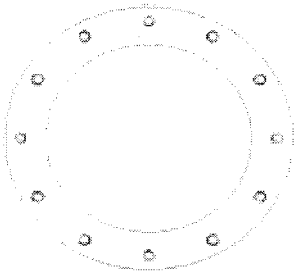
n/a

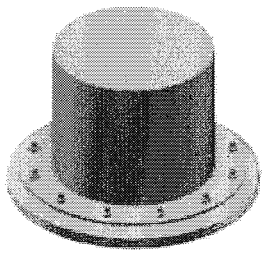
Stiffener Results

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

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

Site Data

BU#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 1*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	18		
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.):	47		

Plate Data		
Diam:	53	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.33	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:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	1307.98	ft-kips
Axial:	19.43	kips
Shear:	15.38	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:	73.13	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	2.031	in	
Min PL "treq" for actual **T w/ Pry**:	1.276	in	
Min PL "t1" for actual **T w/o Pry**:	1.706	in	
T allowable with Prying:	102.65	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	73.13	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	70.6%	**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		21.10
Tension Side Stress Ratio, (treq/t)^2:	40.7% **Pass**	

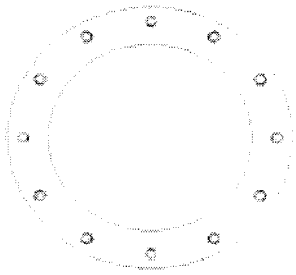
n/a

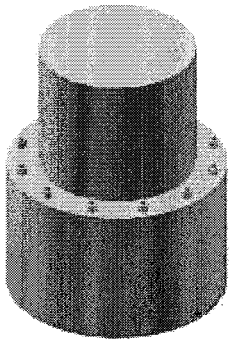
Stiffener Results N/A for Rohn / Pirod

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#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 1*

Pole Manufacturer:	Rohn

Reactions		
Moment:	877.27	ft-kips
Axial:	13.84	kips
Shear:	13.31	kips
Elevation:	60	feet

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

Bolt Data			
Qty:	18		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	47		

Plate Data		
Diam:	53	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:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

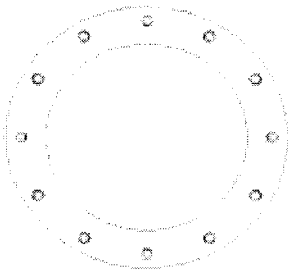
			Rigid
Bolt Tension Capacity, **B**:	103.65	kips	Service, ASD
Max Bolt directly applied T:	49.01	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.614	in	
Min PL "treq" for actual **T w/ Pry:**	1.878	in	
Min PL "t1" for actual **T w/o Pry:**	2.485	in	
T allowable with Prying:	55.58	kips	α'>1 case
Prying Force, Q:	21.87	kips	
Total Bolt Tension=T+Q:	70.88	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	68.4%	**Pass**	

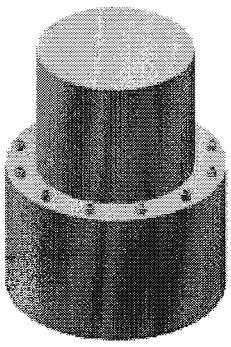
Exterior Flange Plate Results Flexural Check

		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:
Prying Occurs, PL Check:		30.22
Tension Side Stress Ratio, (treq/t)^2:	88.2% **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#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 1*

Pole Manufacturer:	Rohn

Reactions		
Moment:	510.49	ft-kips
Axial:	9.03	kips
Shear:	11.11	kips
Elevation:	90	feet

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

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		

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	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	103.65 kips	Service, ASD
Max Bolt directly applied T:	36.79 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.733 in	
Min PL "treq" for actual **T w/ Pry:**	1.688 in	
Min PL "t1" for actual **T w/o Pry:**	2.224 in	
T allowable with Prying:	51.62 kips	α'>1 case
Prying Force, Q:	8.91 kips	
Total Bolt Tension=T+Q:	45.70 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	44.1% **Pass**	

Exterior Flange Plate Results Flexural Check

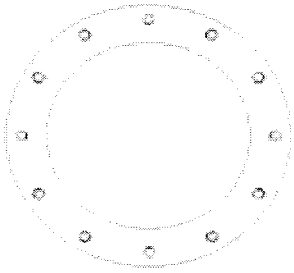
		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
Prying Occurs, PL Check:		27.95
Tension Side Stress Ratio, (treq/t)^2:	71.3% **Pass**	

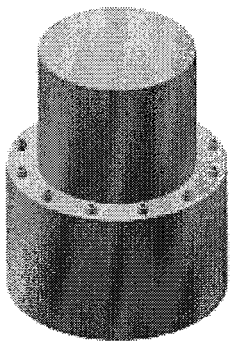
n/a

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

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

Site Data

BU#: *876353*
Site Name: *352 S. Main St.*
App #: *151558, Revision 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:
N/A:		<-- Disregard	44.00
Circle (in.):	35		

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:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	208.75	ft-kips
Axial:	5.02	kips
Shear:	8.98	kips
Elevation:	120	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:	23.44 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.614 in	
Min PL "treq" for actual **T w/ Pry**:	1.299 in	
Min PL "t1" for actual **T w/o Pry**:	1.719 in	
T allowable with Prying:	55.58 kips	α'>1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	23.44 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	22.6% **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		25.48
Tension Side Stress Ratio, (treq/t)^2:	42.2% **Pass**	

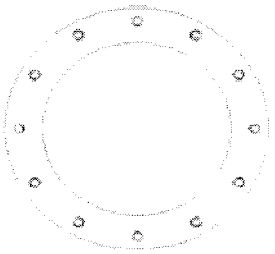
n/a

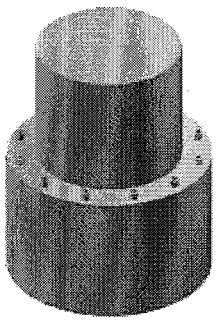
Stiffener Results N/A for Rohn / Pirod

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

JOB:	352 S. Main St. (BU# 876353) - TEP# 123586		
SHEET NUMBER:	1	OF	2
CALCULATED BY:	JSC	DATE	6/1/2012
CHECKED BY:		DATE	

Pad and Pier Foundation for Monopole - TIA-222-F

Q_a, ALLOWABLE SOIL PRESS. (ksf)	5
NET or GROSS	NET
SOIL DENSITY (pcf)	100

F'c (ksi)	3
F'y (ksi)	60

Base Reactions LC1: Maximum Wind

M, MOMENT (k-ft)	1795.0
P_t, TOTAL DOWNLOAD (k)	27.0
H, HORIZONTAL SHEAR (k)	17.0

Base Reaction LC 2: Ice Wind + Ice

M (k-ft)	473.0
P_t (k)	35.0
H (k)	4.0

Try:	L (ft.)	B (ft.)	t (ft.)	Soil depth to TOP of mat (ft.)	Soil depth to BOT. of mat (ft.)	Pier dia./width (ft.)	Pier Height, h (cu.ft.)	Pier Shape
	22	22	6	0	5.5	3.92	0.00	Round

W_m, Weight of Mat (k) =	435.6
W_p, Weight of Pier (k) =	0.0
W_s, WEIGHT OF SOIL (k) =	0.0

Concrete Vol. (cu ft) 107.56

CHECK DESIGN CRITERIA

CHECK STABILITY:	LC1	LC2		
Mst= P * (L/2) + (Vf+s * L/2) =	5088.6 k-ft	5176.6 k-ft		
Mot = M+H*(t+h) =	1897.0 k-ft	497 k-ft		
SF =Mot/Mst =	2.68 > 1.5	10.42 > 1.5	**Capacity:**	**55.9%**

CHECK BEARING PRESSURE	LC1	LC2		
P = P_t + W_f + Ws =	462.6 k	470.6 k		
e = M / P =	4.10 ft	1.06 ft		
L/6 =	3.67 ft	3.67 ft		
Width of Wedge, L' =	20.70 ft	22.00 ft		
0 Deg Wind: Qmax =	1.48 ksf	0.70 ksf		
45 Deg Wind: Qmax =	2.00 ksf	0.82 ksf	**Capacity:**	**40.0%**

JOB:	352 S. Main St. (BU# 876353) - TEP# 123586		
SHEET NUMBER:	2	OF	2
CALCULATED BY:	JSC	DATE	6/1/2012
CHECKED BY:		DATE	

CHECK ONE WAY SHEAR

Vu = 182.1 k
Vc = 1474.9 k

Capacity: 12.35%

CHECK TWO WAY SHEAR: PUNCHING + UNBALANCED MOMENT

v_u = 7.6 psi
φv_c = 164.3 psi

Capacity: 4.62%

CALCULATE REINFORCING REQUIRED

F'c = 3.0 ksi F'y = 60.0 ksi

Temp & Shrinkage reinforcing, $A_{s,\,temp}$ = 0.40 in^2/ft (ACI 318 Sec. 10.5.4)

BOTTOM REINFORCING

Bar Size = 8
Bar Spacing, c-c: 11.0
d = 67.5 in.
Mu= 232.9 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.06 in^2/ft

Check, As = 0.86 in^2/ft

Capacity: 46.41%
As,temp controls

TOP REINFORCING

Bar Size = 8
Bar Spacing, c-c: 11.0
d= 67.5 in.
Mu= 528.0 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.15 in^2/ft **As,req < As,t, Use As,t**
Bar Spacing, c-c:

Check, As = 0.86 in^2/ft **Top Reinforcing O.K.**

Capacity: 46.41%
As,temp controls