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

October 15, 2012

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

RE: **EM-SPRINT-143-120925** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 136 Wright Road, Torrington, 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 Ryan J. Bingham, Mayor, City of Torrington
Martin Connor, City Planner, City of Torrington
Crown Castle USA, Inc.

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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www.ct.gov/csc

September 27, 2012

The Honorable Ryan J. Bingham
Mayor
Torrington Municipal Building
140 Main Street
Torrington, CT 06790-5245

RE: **EM-SPRINT-143-120925** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 136 Wright Road, Torrington, Connecticut.

Dear Mayor Bingham:

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 11, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/laf

Enclosure: Notice of Intent

c: Martin Connor, City Planner, City of Torrington

EM-SPRINT-143-120925

~ORIGINAL~

Sprint

Together with Nextel

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

September 19, 2012

Hand Delivered

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 136 Wright Road, Torrington, CT 06790. Known to Sprint Spectrum L.P. as site CT33XC078.

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: CT33XC078

Long Eddy / Wright Property
136 Wright Road
Torrington, CT 06790

August 30, 2012

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

EBI Consulting
environmental | engineering | due diligence

August 30, 2012

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

Re: Emissions Values for Site **CT33XC078 – Long Eddy / Wright Property**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 136 Wright Road, Torrington, 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 136 Wright Road, Torrington, 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 **147.4 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	CT33XC078 - Long Eddy / Wright Property
Site Addresss	136 Wright Road, Torrington, CT 06790
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	147.4	141.4	1/2 "	0.5	0	1386.9474	24.93832	2.49383%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147.4	141.4	1/2 "	0.5	0	389.96892	7.011923	1.23667%
														Sector total Power Density Value:		3.731%	

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	147.4	141.4	1/2 "	0.5	0	1386.9474	24.93832	2.49383%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147.4	141.4	1/2 "	0.5	0	389.96892	7.011923	1.23667%
														Sector total Power Density Value:		3.731%	

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	147.4	141.4	1/2 "	0.5	0	1386.9474	24.93832	2.49383%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147.4	141.4	1/2 "	0.5	0	389.96892	7.011923	1.23667%
														Sector total Power Density Value:		3.731%	

Site Composite MPE %	
Carrier	MPE %
Sprint	11.192%
Verizon Wireless	19.240%
Total Site MPE %	**30.432%**

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 **11.192% (3.731% 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 **30.432%** 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	☐	☐	☐

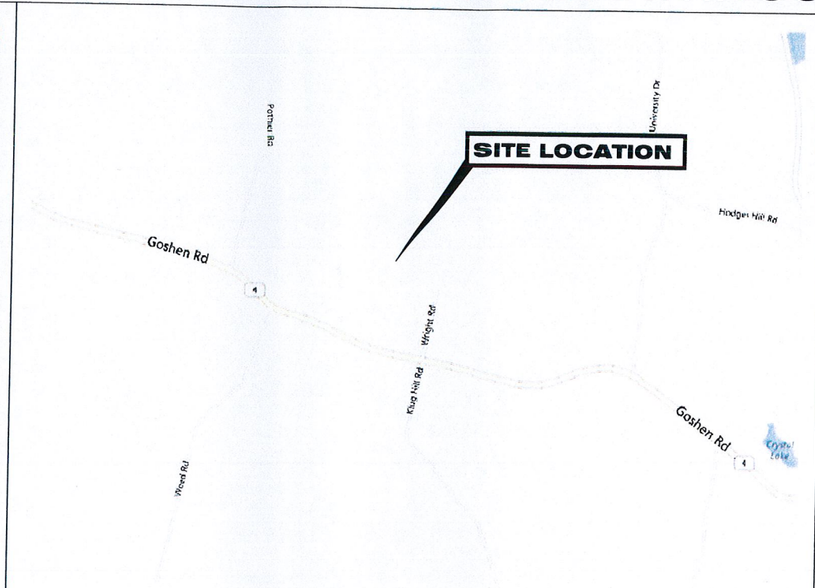
Sprint®

SITE ID: CT33XC078
SITE NAME: LONG EDDY / WRIGHT PROPERTY

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

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 PLANS & 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 - KEY & 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. TAKE 3RD EXIT FROM ROUNDABOUT INTERNATIONAL BLVD ONTO LEISURE LN.
3. TAKE RAMP ONTO STATE HIGHWAY 17 (RT-17 N).
4. CONTINUE ON I-287 N.
5. TAKE THE I-87 S/I-287/NEW YORK STATE THRUWAY SOUTH/TAPPAN ZEE BR/NEW YORK CITY EXIT ONTO NEW YORK STATE THRUWAY SOUTH (I-287 E, I-87 S) (PARTIAL TOLL ROAD).
6. KEEP RIGHT ONTO NEW YORK STATE THRUWAY SOUTH (I-87 S) TOWARD RT-119/SAW MILL PKWY NORTH/SAW MILL PKWY SOUTH/NEW YORK CITY/ELMSFORD.
7. TAKE EXIT #8A/RT-119/SAW MILL PKWY NORTH/ELMSFORD ONTO SAW MILL PKY NORTH, SAW MILL RIVER PKY N TOWARD SAW MILL RIVER PKWY NORTH/KATONAH.
8. TAKE LEFT RAMP ONTO I-684 N TOWARD BREWSTER.
9. TAKE EXIT #9E/I-84 E/DANBURY ONTO I-84 E.
10. TAKE EXIT #20/CT-8 N/TORRINGTON TO THE LEFT ONTO CT-8 N.
11. TAKE EXIT #44/CT-4/DOWNTOWN TORRINGTON/US-202.
12. CONTINUE ON CHRISTOPHER RD TOWARD CT-8 N/WINSTED.
13. TURN LEFT ONTO E ELM ST (CT-4).
14. TURN RIGHT ONTO WRIGHT RD.

SITE INFORMATION

BLOCK: 2
LOT: 5
MAP: 214
ZONING CLASSIFICATION: R-WP (WATERSHED PROTECTION ZONE)
ZONING JURISDICTION: TBD

PROJECT INFORMATION:

SITE ADDRESS:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

COORDINATES:
LATITUDE: 41° 49' 38.34"
LONGITUDE: -73° 10' 13.87"
DATUM : NAD 83

STRUCTURE HEIGHT:
±151'-6" (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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	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 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

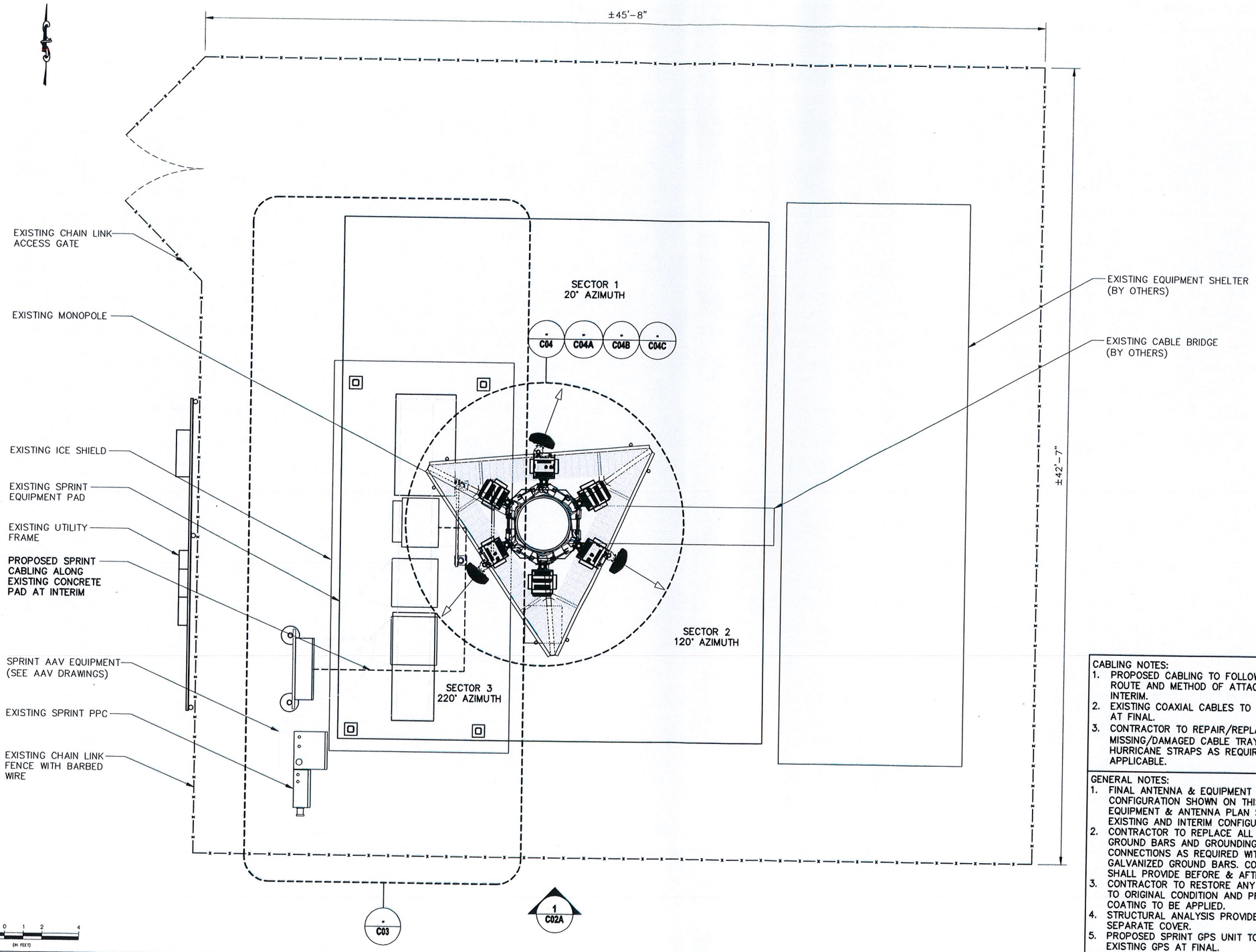
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: COVER SHEET

SHEET NUMBER: A01 REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1492_CT33XC078_136 Wright Road\332.1492_CAD\332.1492_Construction\332.1492_A01.dwg, 8/10/2012 11:17:54 AM, mduffy



1 **COMPOUND PLAN**

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5622

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

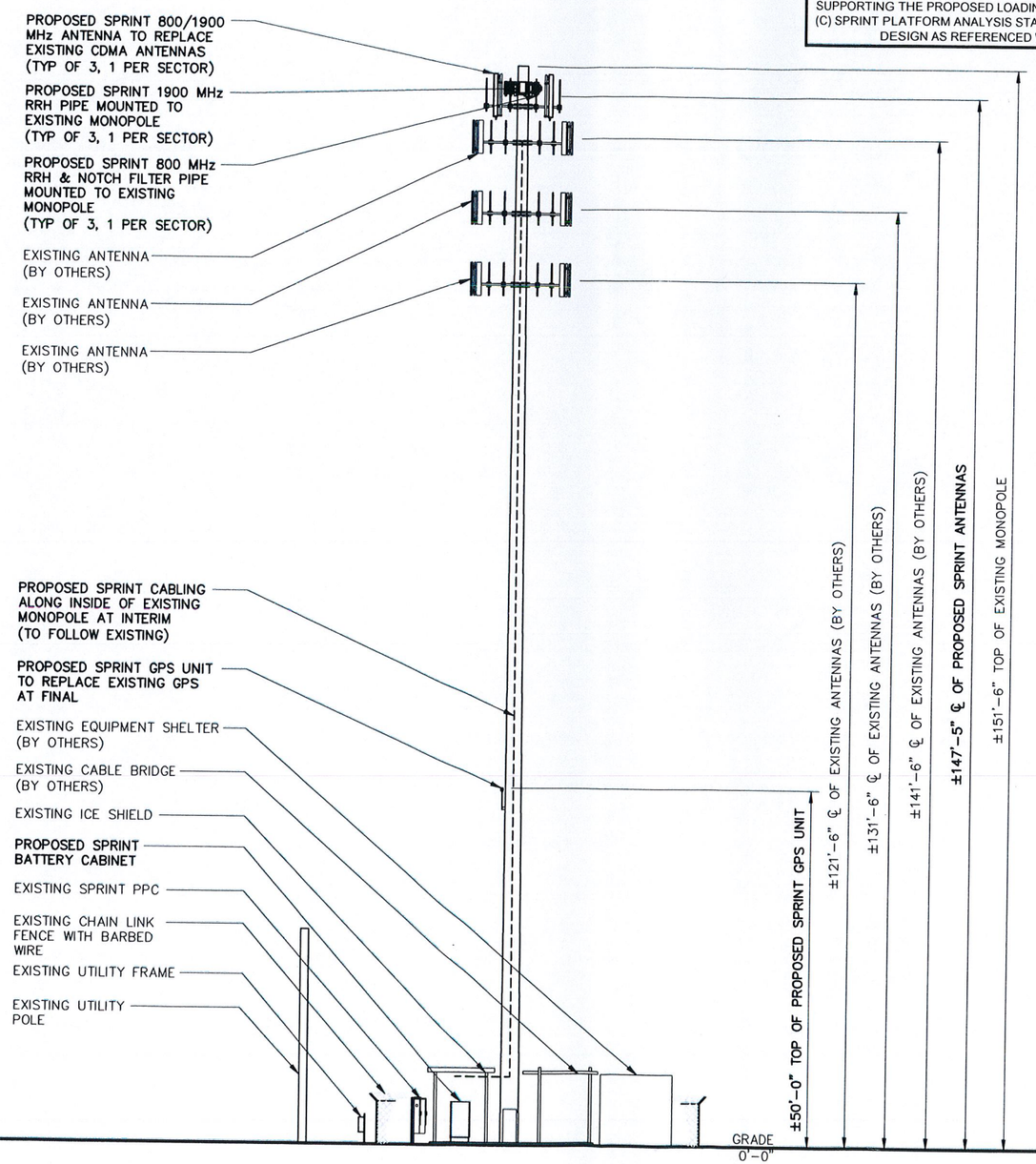
DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C02 | REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1492_CT33XC078_136 Wright Road\332.1492_CAD\332.1492_Construction\332.1492.C02.dwg, 8/10/2012 11:18:03 AM, 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.

1 **SOUTH ELEVATION**

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

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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 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

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JLS		04-02-12

SHEET TITLE: ELEVATION

SHEET NUMBER: **C02A** REV.: **0**

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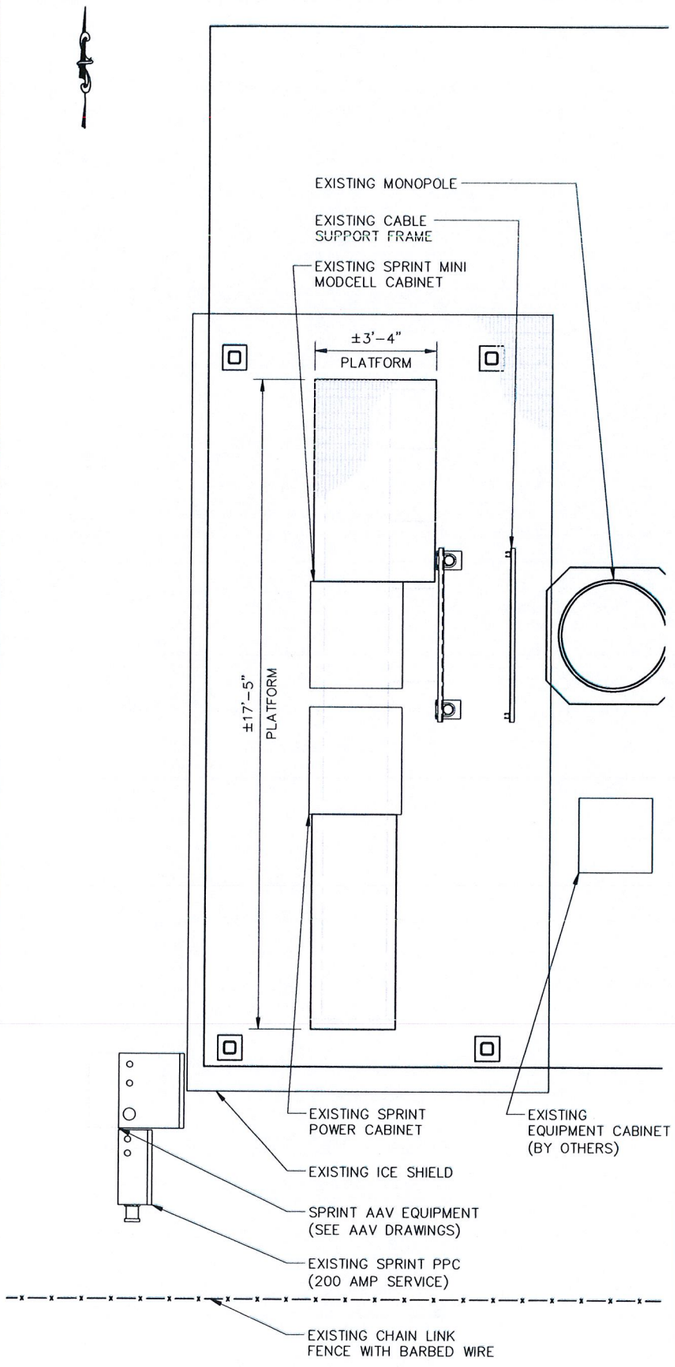
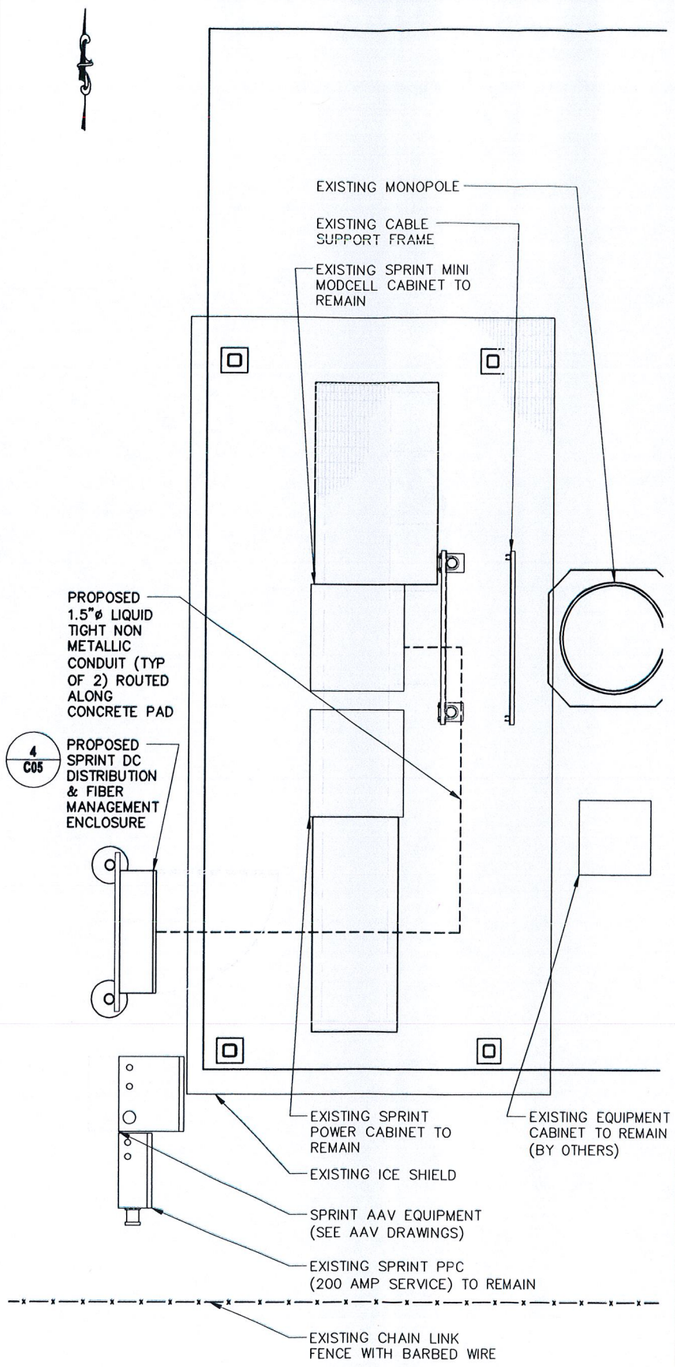


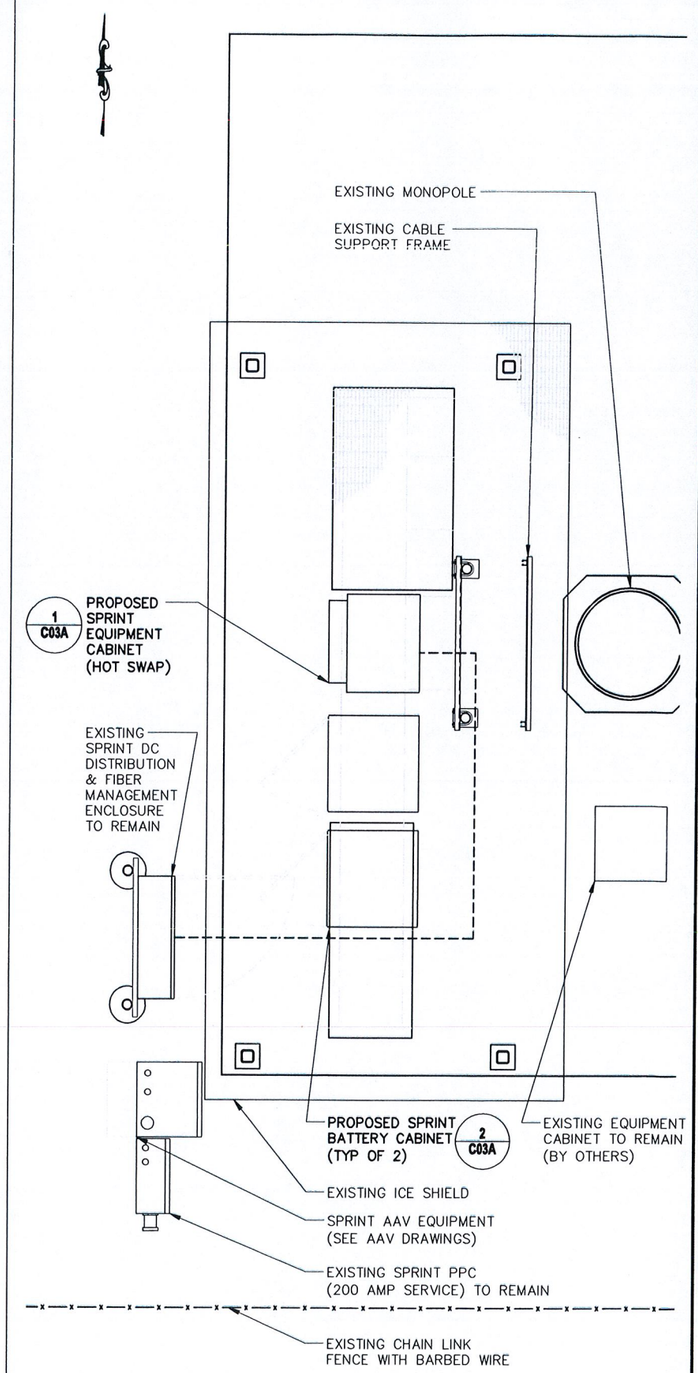
1 EXISTING EQUIPMENT PLAN

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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136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: EQUIPMENT PLANS

SHEET NUMBER: C03 | REV.: 0

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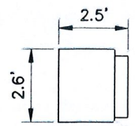
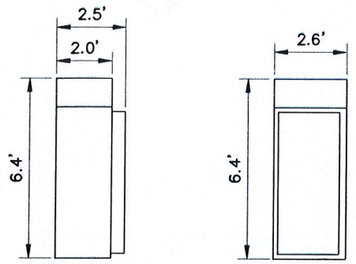
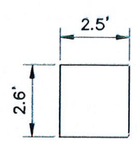


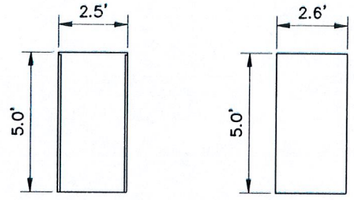
9927
EQUIPMENT CABINET
CABINET WEIGHT: 1020 lbs
FOOTPRINT: 5.3 SF



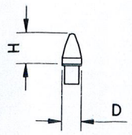
1	EQUIPMENT CABINET SPECIFICATIONS		
11x17 SCALE: 3/16" = 1'-0"	24x36 SCALE: 3/8" = 1'-0"		



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

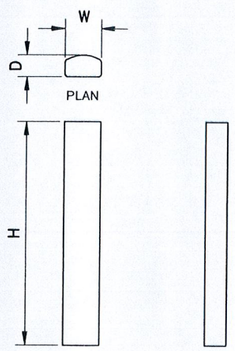


2	BATTERY CABINET SPECIFICATION		
11x17 SCALE: 3/16" = 1'-0"	24x36 SCALE: 3/8" = 1'-0"		



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

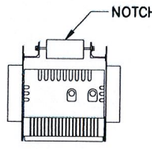
4			

5			

6			

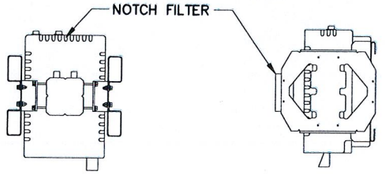
7	ANTENNA SPECIFICATIONS - 800/1900 MHz		
SCALE: NTS			

8			

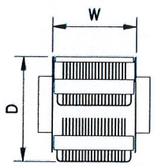


MANUF.: ANDREW
MODEL #: 800 MHZ 2x50W
HEIGHT: 19.7"
WIDTH: 13"
DEPTH: 10.8"
WEIGHT: ±53 lbs
AREA:

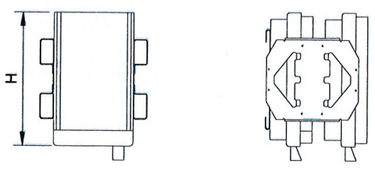
MANUF.: -
MODEL #: 800 MHZ 2x50W
HEIGHT: 8.9"
WIDTH: 9.8"
DEPTH: 4.3"
WEIGHT: ±11 lbs
AREA:



9	RRH SPECIFICATIONS - 800 MHz		
11x17 SCALE: 1/2" = 1'-0"	24x36 SCALE: 1" = 1'-0"		



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



10	RRH SPECIFICATIONS - 1900 MHz		
11x17 SCALE: 1/2" = 1'-0"	24x36 SCALE: 1" = 1'-0"		

11			

DETAIL NOT USED

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

CT LICENSE: 26657 8/10/12

PROJECT NUMBER:
332.1492

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE:
EQUIPMENT & ANTENNA SPECIFICATIONS

SHEET NUMBER:	REV.:
C03A	0

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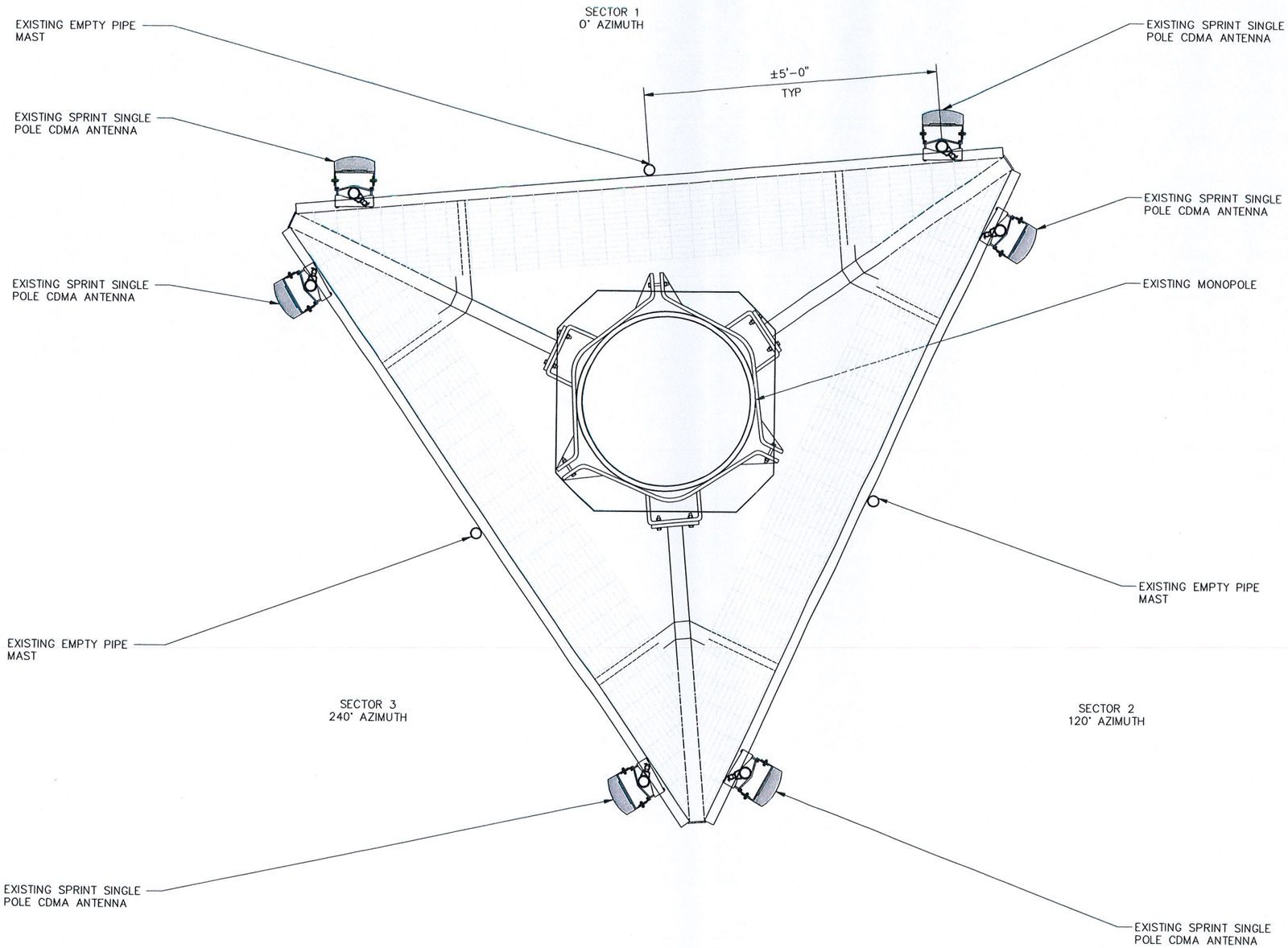

1 0 1 2
(IN FEET)

1 EXISTING ANTENNA PLAN @ ±147'-5" AGL (ALL SECTORS)

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

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Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: EXISTING ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04 REV.: 0

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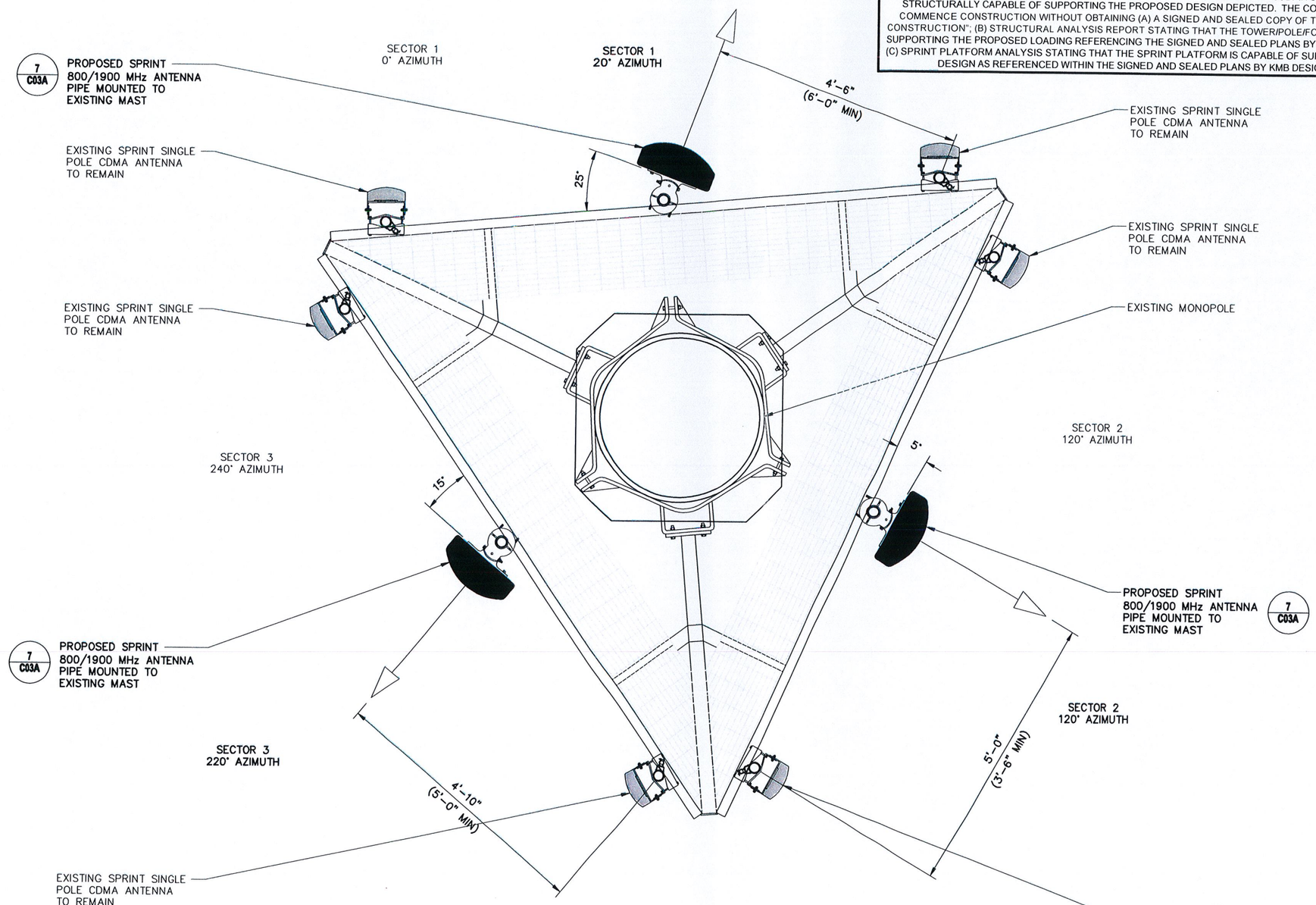
THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE 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.



NOTE:
SEE DETAIL 1/C04C FOR RRH MOUNT DETAILS.

1 **INTERIM ANTENNA PLAN @ ±147'-5" AGL (ALL SECTORS)**

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

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Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY NO. 26657 LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: INTERIM ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04A | REV.: 0

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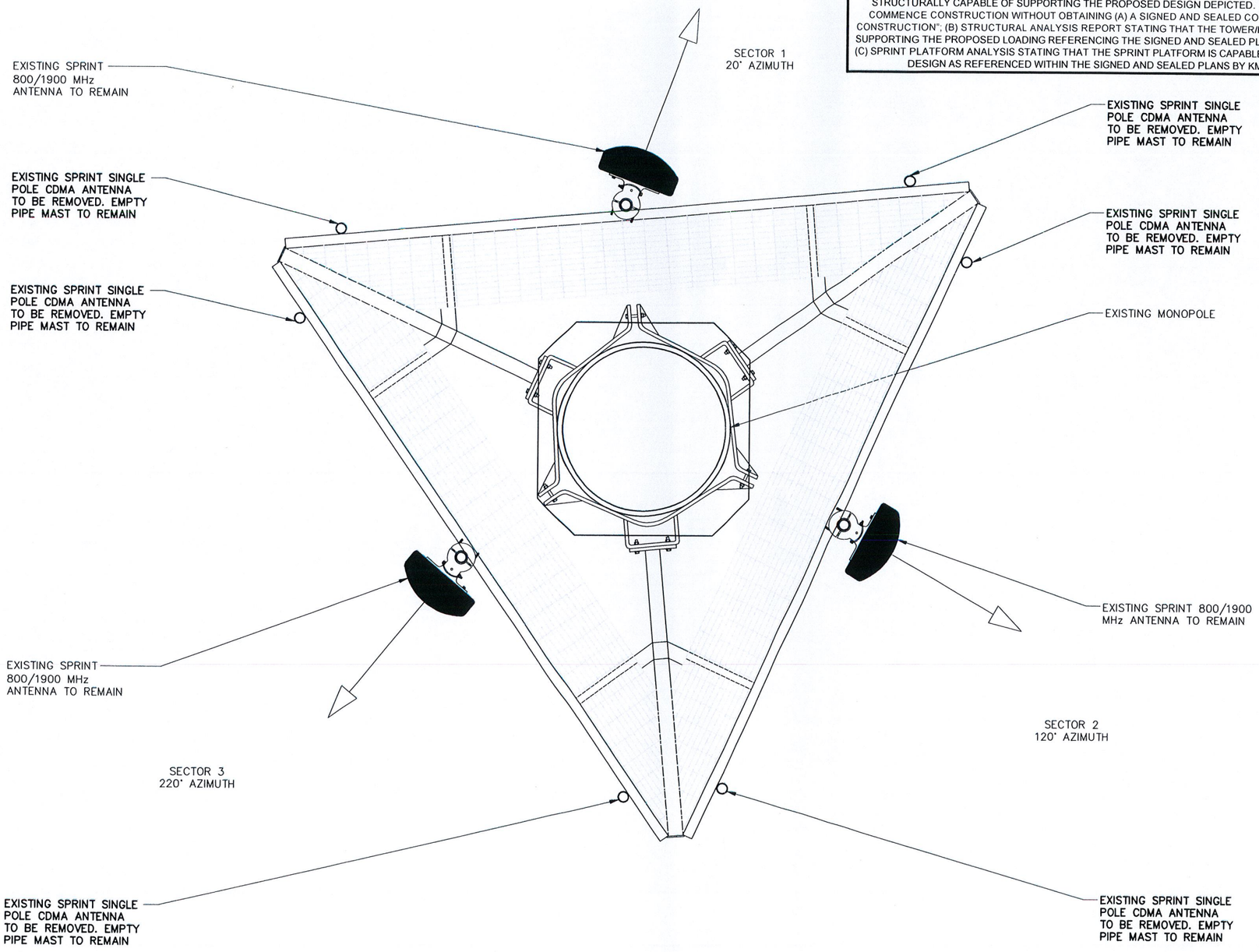

NOTE:
SEE DETAIL 2/C04C FOR RRH MOUNT DETAILS.

1 0 1 2
(IN FEET)

1 FINAL ANTENNA PLAN @ ±147'-5" AGL (ALL SECTORS)

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

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CT LICENSE: 26657 8/10/12

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332.1492

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE:
FINAL ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER: C04B | REV.: 0

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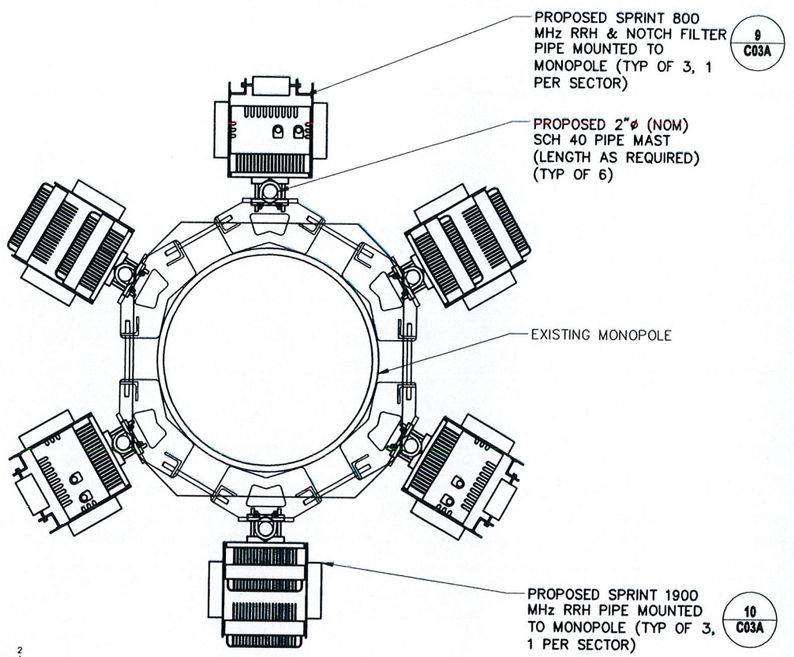
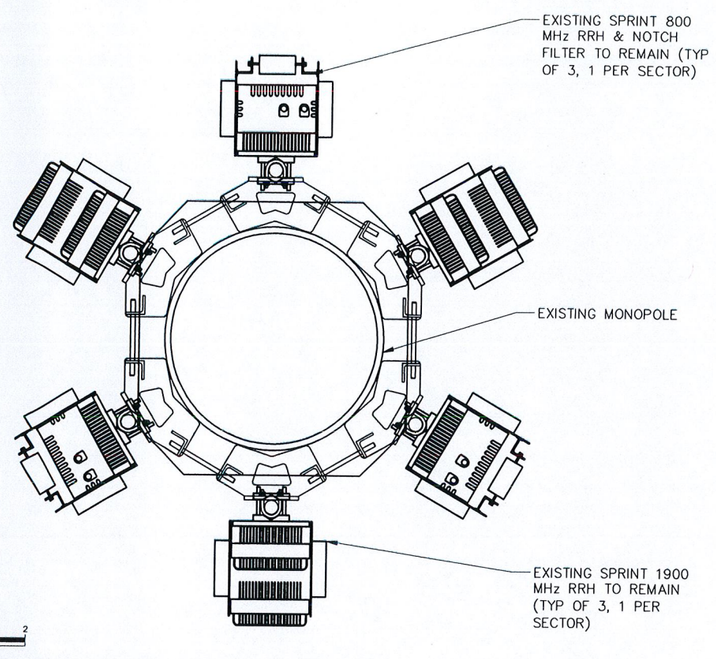


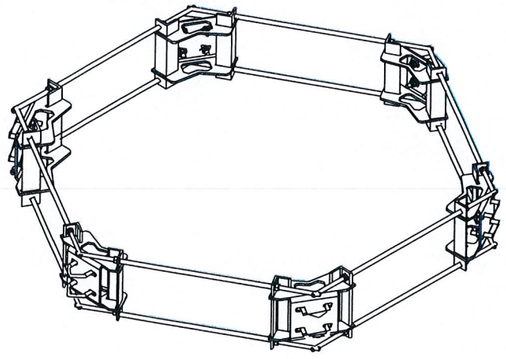
1 INTERIM RRH PLAN @ ±147'-4" AGL (ALL SECTORS)

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



2 FINAL RRH PLAN @ ±147'-4" AGL (ALL SECTORS)

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



NOTE:
RRHs NOT SHOWN FOR CLARITY.

SIX SECTOR PIPE RING MOUNT KIT
BY COMMSCOPE, PART # RR-RM1560
OR AN APPROVED EQUAL
KIT INCLUDES:
MOUNT, THREADED ROD & (12)
2-3/8" U-BOLTS

3 RRH MOUNT DETAIL

SCALE: NTS

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.

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0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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LITCHFIELD COUNTY

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PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE:
RRH PLANS & DETAILS
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04C	0

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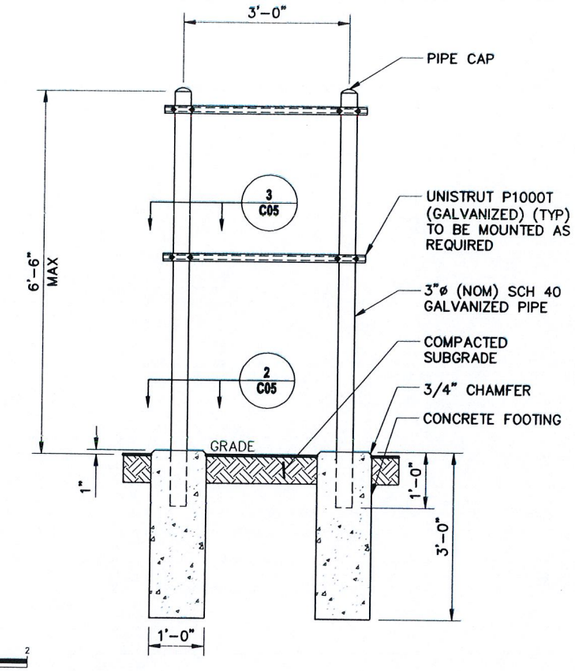
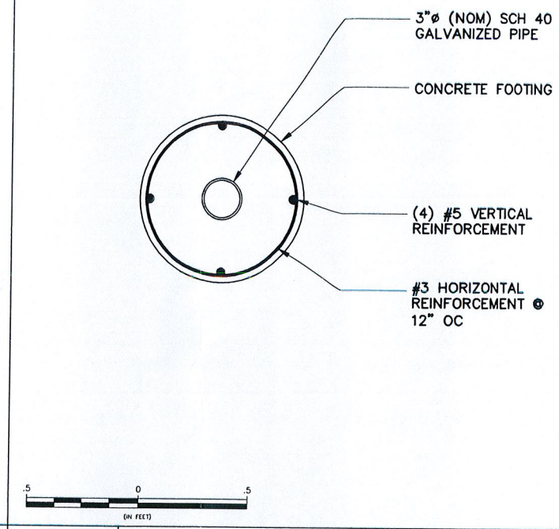


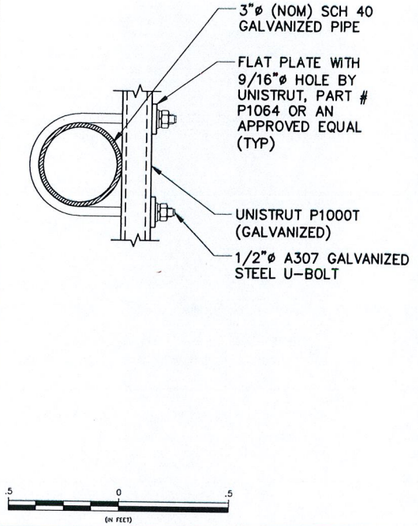
1 UNISTRUT FRAME DETAIL

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



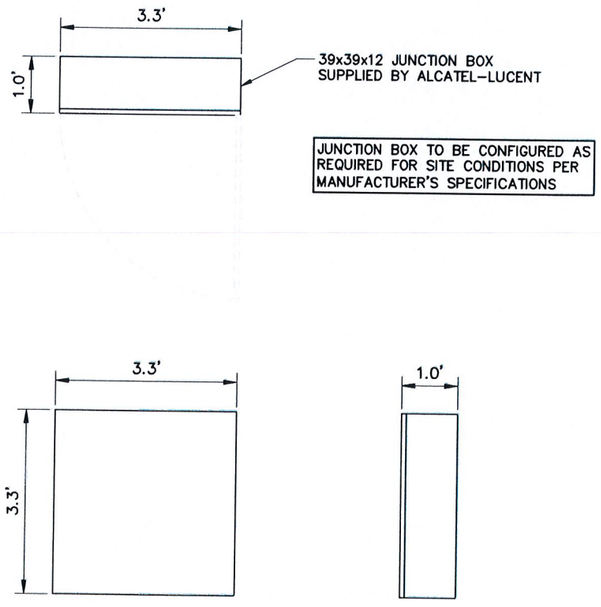
2 CONCRETE PIER DETAIL

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	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 8/10/12

PROJECT NUMBER: **332.1492**

SITE INFORMATION:
136 WRIGHT ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY

CT33XC078

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-02-12

SHEET TITLE: SITE DETAILS

SHEET NUMBER:	REV.:
C05	0

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Date: **June 06, 2012**

James Williams
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate – *Interim Load***	
	Carrier Site Number:	CT33XC078
Crown Castle Designation:	**Crown Castle BU Number:**	876373
	Crown Castle Site Name:	LONG EDDY / WRIGHT PROPERTY
	Crown Castle JDE Job Number:	189144
	Crown Castle Work Order Number:	498952
	Crown Castle Application Number:	151573 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	498952
Site Data:	**136 Wright Rd., TORRINGTON, Litchfield County, CT**	
	Latitude *41° 49' 38.34"*, Longitude *-73° 10' 13.97"*	
	148 Foot - Monopole Tower	

Dear James Williams,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 498952, in accordance with application 151573, 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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code requirements based upon a wind speed of 80 mph fastest mile.

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

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

Structural analysis prepared by: Jesse J. Fresch, EIT / MRC

Respectfully submitted by:

RJenabzadeh

Reza Jenabzadeh, P.E.
Engineer II

STATE OF CONNECTICUT
REZA JENABZADEH
No. 28556
LICENSED
PROFESSIONAL ENGINEER
6/6/12

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 148 ft Monopole tower designed by SUMMIT in June of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	147.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	3	1-1/4	-
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
145.0	145.0	3	alcatel lucent	1900MHz RRH (25MHz)	-	-	-
		3	alcatel lucent	800MHZ RRH			
		1	tower mounts	Collar Mount [SO 102-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 601-1]			
138.0	138.0	1	antel	BXA-171063-8BF-2 w/ Mount Pipe	6	1-5/8	2
		2	antel	BXA-171085-8BF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		2	antel	LPA-80063/6CF w/ Mount Pipe			
		4	antel	LPA-80080/6CF w/ Mount Pipe	12	1-5/8	1
		1	tower mounts	Platform Mount [LP 601-1]			
79.0	84.0	1	rfs celwave	PD1109E	1	1/2	1
	79.0	1	tower mounts	Side Arm Mount [SO 701-1]			
45.0	45.0	1	gps	GPS_A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	gps	GPS_A			
16.0	16.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1

Notes:
1) Existing Equipment
2) Reserved 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)
148	148	12	dapa	48000 PCS Panel	-	-
140	140	12	dapa	48000 PCS Panel	-	-
130	130	12	dapa	48000 PCS Panel	-	-
120	120	12	dapa	48000 PCS Panel	-	-
76	76	1	generic	GPS Antenna	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Associates, Inc.	1531964	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit Manufacturing, LLC	1634518	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, LLC	1631601	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Paul J. Ford and Company	1533032	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	148 - 116.5	Pole	TP29.481x24x0.2188	1	-4.98	953.24	43.1	Pass
L2	116.5 - 80.25	Pole	TP35.351x28.391x0.25	2	-9.13	1415.67	72.3	Pass
L3	80.25 - 39.75	Pole	TP41.898x34.068x0.3125	3	-15.89	2097.24	80.3	Pass
L4	39.75 - 0	Pole	TP48.19x40.3595x0.375	4	-26.37	2958.67	80.9	Pass
							Summary	
						Pole (L4)	80.9	Pass
						Rating =	80.9	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	64.2	Pass
1	Base Plate	0	66.6	Pass
1	Base Foundation Soil Interaction	0	71.7	Pass

Structure Rating (max from all components) =	80.9%

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

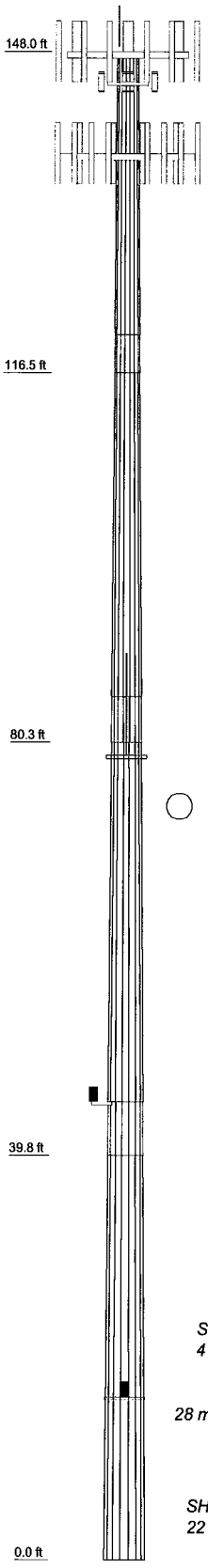
4.1) Recommendations

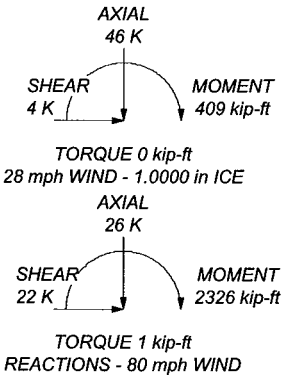
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	31.50	40.00	45.00	45.00
Number of Sides	18	18	18	18
Thickness (in)	0.2188	0.2500	0.3125	0.3750
Socket Length (ft)	3.75	4.50	5.25	
Top Dia (in)	24.0000	28.3910	34.0680	40.3595
Bot Dia (in)	29.4810	35.3510	41.8980	48.1900
Grade	A607-60		A607-65	
Weight (K)	2.0	3.4	5.7	8.0





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 1" x 5'	148	Collar Mount [SO 102-3]	145
(2) DB980H90E-M w/ Mount Pipe	148	(2) LPA-80063/6CF w/ Mount Pipe	138
(2) DB980H90E-M w/ Mount Pipe	148	(2) LPA-80080/6CF w/ Mount Pipe	138
(2) DB980H90E-M w/ Mount Pipe	148	(2) LPA-80080/6CF w/ Mount Pipe	138
APXVSPP18-C-A20 w/ Mount Pipe	148	BXA-70063-6CF-2 w/ Mount Pipe	138
800 EXTERNAL NOTCH FILTER	148	BXA-171085-8BF-EDIN-2 w/ Mount Pipe	138
(3) ACU-A20-N	148	BXA-70063-6CF-2 w/ Mount Pipe	138
APXVSPP18-C-A20 w/ Mount Pipe	148	BXA-171085-8BF-EDIN-2 w/ Mount Pipe	138
800 EXTERNAL NOTCH FILTER	148	BXA-70063-6CF-2 w/ Mount Pipe	138
(3) ACU-A20-N	148	BXA-171063-8BF-2 w/ Mount Pipe	138
APXVSPP18-C-A20 w/ Mount Pipe	148	Platform Mount [LP 601-1]	138
800 EXTERNAL NOTCH FILTER	148	PD1109E	79
(3) ACU-A20-N	148	Side Arm Mount [SO 701-1]	79
Platform Mount [LP 601-1]	148	GPS_A	45
1900MHz RRH (25MHz)	145	Side Arm Mount [SO 701-1]	45
800MHZ RRH	145	GPS_A	16
1900MHz RRH (25MHz)	145	Side Arm Mount [SO 701-1]	16
800MHZ RRH	145		
1900MHz RRH (25MHz)	145		
800MHZ RRH	145		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 80.9%

CROWN CASTLE
We Are Solutions
Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-4425

Job: **BU #876373**			
Project:			
Client: Crown Castle	Drawn by: Jesse Fresch	App'd:	
Code: TIA/EIA-222-F	Date: 06/01/12	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\JFresch\876373-WO498952\876373.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:

3) Tower is located in Litchfield County, Connecticut.
4) Basic wind speed of 80 mph.
5) Nominal ice thickness of 1.0000 in.
6) Ice thickness is considered to increase with height.
7) Ice density of 56.00 pcf.
8) A wind speed of 28 mph is used in combination with ice.
9) Temperature drop of 50 °F.
10) Deflections calculated using a wind speed of 50 mph.
11) A non-linear (P-delta) analysis was used.
12) Pressures are calculated at each section.
13) Stress ratio used in pole design is 1.333.
14) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	148.00-116.50	31.50	3.75	18	24.0000	29.4810	0.2188	0.8750	A607-60 (60 ksi)
L2	116.50-80.25	40.00	4.50	18	28.3910	35.3510	0.2500	1.0000	A607-65 (65 ksi)
L3	80.25-39.75	45.00	5.25	18	34.0680	41.8980	0.3125	1.2500	A607-65 (65 ksi)
L4	39.75-0.00	45.00		18	40.3595	48.1900	0.3750	1.5000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3702	16.5116	1179.7676	8.4423	12.1920	96.7657	2361.0876	8.2574	3.8390	17.55
	29.9358	20.3171	2197.9387	10.3881	14.9763	146.7607	4398.7696	10.1605	4.8037	21.96
L2	29.4915	22.3299	2234.1018	9.9901	14.4226	154.9025	4471.1433	11.1671	4.5568	18.227
	35.8963	27.8526	4335.5365	12.4609	17.9583	241.4223	8676.7779	13.9290	5.7818	23.127
L3	35.3886	33.4812	4819.7890	11.9832	17.3065	278.4952	9645.9201	16.7438	5.4460	17.427
	42.5443	41.2476	9011.9791	14.7629	21.2842	423.4120	18035.8164	20.6277	6.8240	21.837
L4	41.9098	47.5916	9612.8164	14.1945	20.5026	468.8578	19238.2817	23.8003	6.4433	17.182
	48.9334	56.9118	16438.7246	16.9743	24.4805	671.5023	32899.0798	28.4613	7.8214	20.857

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 148.00-116.50				1	1	1		
L2 116.50-80.25				1	1	1		
L3 80.25-39.75				1	1	1		
L4 39.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	Inside Pole	148.00 - 0.00	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")	A	No	CaAa (Out Of Face)	148.00 - 0.00	1	No Ice	0.00	1.20
						1/2" Ice	0.00	2.45
						1" Ice	0.00	4.30
						2" Ice	0.00	9.85
						4" Ice	0.00	28.27
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	148.00 - 0.00	2	No Ice	0.15	1.20
						1/2" Ice	0.25	2.45
						1" Ice	0.35	4.30
						2" Ice	0.55	9.85
						4" Ice	0.95	28.27
*								
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	138.00 - 0.00	4	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	138.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	B	No	Inside Pole	138.00 - 0.00	12	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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*								
LDF4-50A(1/2")	C	No	Inside Pole	79.00 - 0.00	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
*								
LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	45.00 - 0.00	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.84
						1" Ice	0.26	2.14
						2" Ice	0.46	6.58
						4" Ice	0.86	22.78
*								
LDF4-50A(1/2")	B	No	Inside Pole	16.00 - 0.00	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

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	148.00-116.50	A	0.000	0.000	0.000	9.702	0.27
		B	0.000	0.000	0.000	8.514	0.32
		C	0.000	0.000	0.000	0.000	0.00
L2	116.50-80.25	A	0.000	0.000	0.000	11.165	0.31
		B	0.000	0.000	0.000	14.355	0.54
		C	0.000	0.000	0.000	0.000	0.00
L3	80.25-39.75	A	0.000	0.000	0.000	12.804	0.35
		B	0.000	0.000	0.000	16.038	0.60
		C	0.000	0.000	0.000	0.000	0.01
L4	39.75-0.00	A	0.000	0.000	0.000	14.747	0.34
		B	0.000	0.000	0.000	15.741	0.59
		C	0.000	0.000	0.000	0.000	0.01

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	148.00-116.50	A	1.181	0.000	0.000	0.000	24.580	0.66
		B		0.000	0.000	0.000	18.669	0.93
		C		0.000	0.000	0.000	0.000	0.00
L2	116.50-80.25	A	1.140	0.000	0.000	0.000	28.287	0.76
		B		0.000	0.000	0.000	31.477	1.57
		C		0.000	0.000	0.000	0.000	0.00
L3	80.25-39.75	A	1.074	0.000	0.000	0.000	32.462	0.83
		B		0.000	0.000	0.000	34.499	1.69
		C		0.000	0.000	0.000	0.000	0.01
L4	39.75-0.00	A	1.000	0.000	0.000	0.000	40.365	0.86
		B		0.000	0.000	0.000	32.820	1.56
		C		0.000	0.000	0.000	0.000	0.01

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	148.00-116.50	0.2878	-0.2006	0.4664	-0.4175
L2	116.50-80.25	0.4075	-0.1307	0.6683	-0.3076
L3	80.25-39.75	0.4207	-0.1458	0.7019	-0.3603
L4	39.75-0.00	0.4266	-0.2152	0.6956	-0.5863

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 1" x 5'	C	From Leg	0.00 0.00 2.50	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.50 1.02 1.43 2.06 3.45	0.50 1.02 1.43 2.06 3.45	0.03 0.03 0.04 0.07 0.17
***									
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 -1.00	0.0000	148.00	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
(3) ACU-A20-N	A	From Leg	4.00 0.00 -1.00	0.0000	148.00	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 Leg	4.00 0.00 -1.00	0.0000	148.00	No Ice 1/2" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	11.03	10.84	0.41
							2" Ice	13.68	14.85	0.91
							4" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.00	0.0000	148.00	No Ice	0.77	0.37	0.01
			0.00				1/2"	0.89	0.46	0.02
			-1.00				Ice	1.02	0.56	0.02
							1" Ice	1.30	0.79	0.04
							2" Ice	1.97	1.34	0.11
							4" Ice			
(3) ACU-A20-N	B	From Leg	4.00	0.00	0.0000	148.00	No Ice	0.08	0.14	0.00
			0.00				1/2"	0.12	0.19	0.00
			-1.00				Ice	0.17	0.25	0.00
							1" Ice	0.30	0.40	0.01
							2" Ice	0.67	0.80	0.04
							4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	148.00	No Ice	8.50	6.95	0.08
			0.00				1/2"	9.15	8.13	0.15
			-1.00				Ice	9.77	9.02	0.22
							1" Ice	11.03	10.84	0.41
							2" Ice	13.68	14.85	0.91
							4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.00	0.0000	148.00	No Ice	0.77	0.37	0.01
			0.00				1/2"	0.89	0.46	0.02
			-1.00				Ice	1.02	0.56	0.02
							1" Ice	1.30	0.79	0.04
							2" Ice	1.97	1.34	0.11
							4" Ice			
(3) ACU-A20-N	C	From Leg	4.00	0.00	0.0000	148.00	No Ice	0.08	0.14	0.00
			0.00				1/2"	0.12	0.19	0.00
			-1.00				Ice	0.17	0.25	0.00
							1" Ice	0.30	0.40	0.01
							2" Ice	0.67	0.80	0.04
							4" Ice			
Platform Mount [LP 601-1]	C	None			0.0000	148.00	No Ice	28.47	28.47	1.12
							1/2"	33.59	33.59	1.51
							Ice	38.71	38.71	1.91
							1" Ice	48.95	48.95	2.69
							2" Ice	69.43	69.43	4.26
							4" Ice			
***										
1900MHz RRH (25MHz)	A	From Leg	2.00	0.00	0.0000	145.00	No Ice	2.91	3.80	0.09
			0.00				1/2"	3.14	4.06	0.12
			0.00				Ice	3.39	4.34	0.15
							1" Ice	3.91	4.91	0.24
							2" Ice	5.05	6.15	0.45
							4" Ice			
800MHZ RRH	A	From Leg	2.00	0.00	0.0000	145.00	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			0.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
1900MHz RRH (25MHz)	B	From Leg	2.00	0.00	0.0000	145.00	No Ice	2.91	3.80	0.09
			0.00				1/2"	3.14	4.06	0.12
			0.00				Ice	3.39	4.34	0.15
							1" Ice	3.91	4.91	0.24
							2" Ice	5.05	6.15	0.45
							4" Ice			
800MHZ RRH	B	From Leg	2.00	0.00	0.0000	145.00	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			0.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
1900MHz RRH (25MHz)	C	From Leg	2.00	0.00	0.0000	145.00	No Ice	2.91	3.80	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2"	3.14	4.06	0.12
			0.00				Ice	3.39	4.34	0.15
							1" Ice	3.91	4.91	0.24
							2" Ice	5.05	6.15	0.45
							4" Ice			
800MHZ RRH	C	From Leg	2.00		0.0000	145.00	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			0.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
Collar Mount [SO 102-3]	C	None			0.0000	145.00	No Ice	3.00	3.00	0.08
							1/2"	3.48	3.48	0.11
							Ice	3.96	3.96	0.14
							1" Ice	4.92	4.92	0.20
							2" Ice	6.84	6.84	0.32
							4" Ice			
***										
(2) LPA-80063/6CF w/ Mount Pipe	A	From Leg	4.00		0.0000	138.00	No Ice	10.58	10.67	0.05
			0.00				1/2"	11.24	11.93	0.14
			0.00				Ice	11.87	12.91	0.24
							1" Ice	13.16	14.92	0.48
							2" Ice	15.87	19.16	1.09
							4" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00		0.0000	138.00	No Ice	4.56	10.73	0.05
			0.00				1/2"	5.11	11.99	0.11
			0.00				Ice	5.61	12.97	0.19
							1" Ice	6.65	14.98	0.36
							2" Ice	8.83	19.22	0.86
							4" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00		0.0000	138.00	No Ice	4.56	10.73	0.05
			0.00				1/2"	5.11	11.99	0.11
			0.00				Ice	5.61	12.97	0.19
							1" Ice	6.65	14.98	0.36
							2" Ice	8.83	19.22	0.86
							4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00		0.0000	138.00	No Ice	7.97	5.80	0.04
			0.00				1/2"	8.61	6.95	0.10
			0.00				Ice	9.22	7.82	0.17
							1" Ice	10.46	9.60	0.34
							2" Ice	13.07	13.37	0.80
							4" Ice			
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00		0.0000	138.00	No Ice	3.18	3.35	0.03
			0.00				1/2"	3.56	3.97	0.06
			0.00				Ice	3.96	4.60	0.10
							1" Ice	4.85	5.89	0.19
							2" Ice	6.77	8.89	0.49
							4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00		0.0000	138.00	No Ice	7.97	5.80	0.04
			0.00				1/2"	8.61	6.95	0.10
			0.00				Ice	9.22	7.82	0.17
							1" Ice	10.46	9.60	0.34
							2" Ice	13.07	13.37	0.80
							4" Ice			
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00		0.0000	138.00	No Ice	3.18	3.35	0.03
			0.00				1/2"	3.56	3.97	0.06
			0.00				Ice	3.96	4.60	0.10
							1" Ice	4.85	5.89	0.19
							2" Ice	6.77	8.89	0.49
							4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00		0.0000	138.00	No Ice	7.97	5.80	0.04
			0.00				1/2"	8.61	6.95	0.10
			0.00				Ice	9.22	7.82	0.17
							1" Ice	10.46	9.60	0.34
							2" Ice	13.07	13.37	0.80

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
Platform Mount [LP 601-1]	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
***									
PD1109E	A	From Leg	2.00 0.00 5.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.85 3.92 5.01 6.43 9.09	2.85 3.92 5.01 6.43 9.09	0.02 0.04 0.07 0.14 0.38
Side Arm Mount [SO 701-1]	A	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
***									
GPS_A	C	From Leg	2.00 0.00 0.00	0.0000	45.00	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 701-1]	C	From Leg	1.00 0.00 0.00	0.0000	45.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
***									
GPS_A	A	From Leg	2.00 0.00 0.00	0.0000	16.00	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 701-1]	A	From Leg	1.00 0.00 0.00	0.0000	16.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
*									

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	148 - 116.5	Pole	Max Tension	14	0.00	0.00	-0.00
			Max. Compression	14	-13.49	-0.66	0.84
			Max. Mx	5	-5.06	-229.30	0.05
			Max. My	2	-4.98	-0.07	238.53
			Max. Vy	5	11.26	-229.30	0.05
			Max. Vx	2	-11.78	-0.07	238.53
			Max. Torque	8			0.03
L2	116.5 - 80.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.77	-2.10	0.87
			Max. Mx	5	-9.19	-688.62	0.12
			Max. My	2	-9.13	-0.27	716.27
			Max. Vy	5	14.61	-688.62	0.12
			Max. Vx	2	-15.14	-0.27	716.27
			Max. Torque	13			-0.14
L3	80.25 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.14	-3.93	1.38
			Max. Mx	5	-15.92	-1348.34	0.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-15.89	-0.54	1395.88
			Max. Vy	5	18.34	-1348.34	0.41
			Max. Vx	2	-18.83	-0.54	1395.88
			Max. Torque	12			-0.64
L4	39.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.64	-5.80	1.68
			Max. Mx	5	-26.38	-2256.82	0.13
			Max. My	2	-26.37	-0.25	2326.45
			Max. Vy	5	21.96	-2256.82	0.13
			Max. Vx	2	-22.43	-0.25	2326.45
			Max. Torque	12			-0.76

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	16	45.64	-1.87	3.29
	Max. H_x	11	26.39	21.94	0.01
	Max. H_z	2	26.39	0.01	22.41
	Max. M_x	2	2326.45	0.01	22.41
	Max. M_z	5	2256.82	-21.94	-0.01
	Max. Torsion	6	0.75	-19.01	-11.21
	Min. Vert	1	26.39	0.00	0.00
	Min. H_x	5	26.39	-21.94	-0.01
	Min. H_z	8	26.39	-0.01	-22.41
	Min. M_x	8	-2325.21	-0.01	-22.41
	Min. M_z	11	-2255.33	21.94	0.01
	Min. Torsion	12	-0.76	19.01	11.21

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	26.39	0.00	0.00	-0.61	-0.72	0.00
Dead+Wind 0 deg - No Ice	26.39	-0.01	-22.41	-2326.45	-0.25	0.26
Dead+Wind 30 deg - No Ice	26.39	10.96	-19.40	-2014.66	-1128.28	-0.14
Dead+Wind 60 deg - No Ice	26.39	19.00	-11.19	-1163.20	-1954.27	-0.50
Dead+Wind 90 deg - No Ice	26.39	21.94	0.01	-0.13	-2256.82	-0.72
Dead+Wind 120 deg - No Ice	26.39	19.01	11.21	1162.80	-1954.76	-0.75
Dead+Wind 150 deg - No Ice	26.39	10.98	19.41	2013.90	-1129.12	-0.58
Dead+Wind 180 deg - No Ice	26.39	0.01	22.41	2325.21	-1.23	-0.26
Dead+Wind 210 deg - No Ice	26.39	-10.96	19.40	2013.41	1126.79	0.14
Dead+Wind 240 deg - No Ice	26.39	-19.00	11.19	1161.95	1952.78	0.50
Dead+Wind 270 deg - No Ice	26.39	-21.94	-0.01	-1.11	2255.33	0.72
Dead+Wind 300 deg - No Ice	26.39	-19.01	-11.21	-1164.05	1953.27	0.76
Dead+Wind 330 deg - No Ice	26.39	-10.98	-19.41	-2015.15	1127.64	0.59
Dead+Ice+Temp	45.64	0.00	-0.00	-1.68	-5.80	0.00
Dead+Wind 0 deg+Ice+Temp	45.64	-0.00	-3.80	-408.38	-5.77	0.08
Dead+Wind 30 deg+Ice+Temp	45.64	1.87	-3.29	-353.84	-204.55	-0.03
Dead+Wind 60 deg+Ice+Temp	45.64	3.25	-1.90	-204.94	-350.10	-0.13
Dead+Wind 90 deg+Ice+Temp	45.64	3.75	0.00	-1.58	-403.42	-0.20
Dead+Wind 120 deg+Ice+Temp	45.64	3.25	1.90	201.74	-350.22	-0.22
Dead+Wind 150 deg+Ice+Temp	45.64	1.88	3.30	350.55	-204.76	-0.17

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 180 deg+Ice+Temp	45.64	0.00	3.80	404.97	-6.01	-0.08
Dead+Wind 210 deg+Ice+Temp	45.64	-1.87	3.29	350.43	192.77	0.03
Dead+Wind 240 deg+Ice+Temp	45.64	-3.25	1.90	201.53	338.32	0.13
Dead+Wind 270 deg+Ice+Temp	45.64	-3.75	-0.00	-1.82	391.64	0.20
Dead+Wind 300 deg+Ice+Temp	45.64	-3.25	-1.90	-205.15	338.44	0.22
Dead+Wind 330 deg+Ice+Temp	45.64	-1.88	-3.30	-353.96	192.98	0.17
Dead+Wind 0 deg - Service	26.39	-0.00	-8.75	-910.23	-0.55	0.10
Dead+Wind 30 deg - Service	26.39	4.28	-7.58	-788.27	-441.70	-0.06
Dead+Wind 60 deg - Service	26.39	7.42	-4.37	-455.27	-764.69	-0.20
Dead+Wind 90 deg - Service	26.39	8.57	0.00	-0.43	-882.99	-0.28
Dead+Wind 120 deg - Service	26.39	7.42	4.38	454.35	-764.89	-0.30
Dead+Wind 150 deg - Service	26.39	4.29	7.58	787.21	-442.03	-0.23
Dead+Wind 180 deg - Service	26.39	0.00	8.75	908.98	-0.94	-0.10
Dead+Wind 210 deg - Service	26.39	-4.28	7.58	787.02	440.21	0.05
Dead+Wind 240 deg - Service	26.39	-7.42	4.37	454.02	763.20	0.20
Dead+Wind 270 deg - Service	26.39	-8.57	-0.00	-0.82	881.50	0.28
Dead+Wind 300 deg - Service	26.39	-7.42	-4.38	-455.60	763.39	0.30
Dead+Wind 330 deg - Service	26.39	-4.29	-7.58	-788.46	440.54	0.23

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-26.39	0.00	0.00	26.39	0.00	0.000%
2	-0.01	-26.39	-22.41	0.01	26.39	22.41	0.000%
3	10.96	-26.39	-19.40	-10.96	26.39	19.40	0.000%
4	19.00	-26.39	-11.19	-19.00	26.39	11.19	0.000%
5	21.94	-26.39	0.01	-21.94	26.39	-0.01	0.000%
6	19.01	-26.39	11.21	-19.01	26.39	-11.21	0.000%
7	10.98	-26.39	19.41	-10.98	26.39	-19.41	0.000%
8	0.01	-26.39	22.41	-0.01	26.39	-22.41	0.000%
9	-10.96	-26.39	19.40	10.96	26.39	-19.40	0.000%
10	-19.00	-26.39	11.19	19.00	26.39	-11.19	0.000%
11	-21.94	-26.39	-0.01	21.94	26.39	0.01	0.000%
12	-19.01	-26.39	-11.21	19.01	26.39	11.21	0.000%
13	-10.98	-26.39	-19.41	10.98	26.39	19.41	0.000%
14	0.00	-45.64	0.00	-0.00	45.64	0.00	0.000%
15	-0.00	-45.64	-3.80	0.00	45.64	3.80	0.000%
16	1.87	-45.64	-3.29	-1.87	45.64	3.29	0.000%
17	3.25	-45.64	-1.90	-3.25	45.64	1.90	0.000%
18	3.75	-45.64	0.00	-3.75	45.64	-0.00	0.000%
19	3.25	-45.64	1.90	-3.25	45.64	-1.90	0.000%
20	1.88	-45.64	3.30	-1.88	45.64	-3.30	0.000%
21	0.00	-45.64	3.80	-0.00	45.64	-3.80	0.000%
22	-1.87	-45.64	3.29	1.87	45.64	-3.29	0.000%
23	-3.25	-45.64	1.90	3.25	45.64	-1.90	0.000%
24	-3.75	-45.64	-0.00	3.75	45.64	0.00	0.000%
25	-3.25	-45.64	-1.90	3.25	45.64	1.90	0.000%
26	-1.88	-45.64	-3.30	1.88	45.64	3.30	0.000%
27	-0.00	-26.39	-8.75	0.00	26.39	8.75	0.000%
28	4.28	-26.39	-7.58	-4.28	26.39	7.58	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
29	7.42	-26.39	-4.37	-7.42	26.39	4.37	0.000%
30	8.57	-26.39	0.00	-8.57	26.39	-0.00	0.000%
31	7.42	-26.39	4.38	-7.42	26.39	-4.38	0.000%
32	4.29	-26.39	7.58	-4.29	26.39	-7.58	0.000%
33	0.00	-26.39	8.75	-0.00	26.39	-8.75	0.000%
34	-4.28	-26.39	7.58	4.28	26.39	-7.58	0.000%
35	-7.42	-26.39	4.37	7.42	26.39	-4.37	0.000%
36	-8.57	-26.39	-0.00	8.57	26.39	0.00	0.000%
37	-7.42	-26.39	-4.38	7.42	26.39	4.38	0.000%
38	-4.29	-26.39	-7.58	4.29	26.39	7.58	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	0.00017830
3	Yes	5	0.00000001	0.00064784
4	Yes	5	0.00000001	0.00064667
5	Yes	4	0.00000001	0.00028708
6	Yes	5	0.00000001	0.00063815
7	Yes	5	0.00000001	0.00065266
8	Yes	4	0.00000001	0.00018502
9	Yes	5	0.00000001	0.00064726
10	Yes	5	0.00000001	0.00063973
11	Yes	4	0.00000001	0.00029449
12	Yes	5	0.00000001	0.00064848
13	Yes	5	0.00000001	0.00064268
14	Yes	4	0.00000001	0.00003381
15	Yes	5	0.00000001	0.00017045
16	Yes	5	0.00000001	0.00020109
17	Yes	5	0.00000001	0.00019946
18	Yes	5	0.00000001	0.00016755
19	Yes	5	0.00000001	0.00019642
20	Yes	5	0.00000001	0.00019892
21	Yes	5	0.00000001	0.00016826
22	Yes	5	0.00000001	0.00019284
23	Yes	5	0.00000001	0.00019056
24	Yes	5	0.00000001	0.00016231
25	Yes	5	0.00000001	0.00019364
26	Yes	5	0.00000001	0.00019509
27	Yes	4	0.00000001	0.00006109
28	Yes	5	0.00000001	0.00007543
29	Yes	5	0.00000001	0.00007498
30	Yes	4	0.00000001	0.00007923
31	Yes	5	0.00000001	0.00007300
32	Yes	5	0.00000001	0.00007646
33	Yes	4	0.00000001	0.00006144
34	Yes	5	0.00000001	0.00007507
35	Yes	5	0.00000001	0.00007322
36	Yes	4	0.00000001	0.00007966
37	Yes	5	0.00000001	0.00007528
38	Yes	5	0.00000001	0.00007413

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116.5	36.292	27	2.0891	0.0008
L2	120.25 - 80.25	24.455	27	1.9202	0.0008
L3	84.75 - 39.75	12.035	27	1.3557	0.0007
L4	45 - 0	3.370	27	0.6832	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	Lightning Rod 1" x 5'	27	36.292	2.0891	0.0008	25157
145.00	1900MHz RRH (25MHz)	27	34.976	2.0774	0.0008	25157
138.00	(2) LPA-80063/6CF w/ Mount Pipe	27	31.919	2.0476	0.0009	12578
79.00	PD1109E	27	10.411	1.2530	0.0007	3320
45.00	GPS_A	27	3.370	0.6832	0.0003	2893
16.00	GPS_A	27	0.754	0.2380	0.0001	7956

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116.5	92.616	2	5.3335	0.0019
L2	120.25 - 80.25	62.429	2	4.9029	0.0019
L3	84.75 - 39.75	30.739	2	3.4626	0.0018
L4	45 - 0	8.611	2	1.7459	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	Lightning Rod 1" x 5'	2	92.616	5.3335	0.0023	10004
145.00	1900MHz RRH (25MHz)	2	89.260	5.3038	0.0023	10004
138.00	(2) LPA-80063/6CF w/ Mount Pipe	2	81.466	5.2279	0.0023	5001
79.00	PD1109E	2	26.593	3.2005	0.0018	1308
45.00	GPS_A	2	8.611	1.7459	0.0007	1134
16.00	GPS_A	2	1.926	0.6083	0.0002	3116

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	148 - 116.5 (1)	TP29.481x24x0.2188	31.50	0.00	0.0	36.000	19.8641	-4.98	715.11	0.007
L2	116.5 - 80.25 (2)	TP35.351x28.391x0.25	40.00	0.00	0.0	39.000	27.2313	-9.13	1062.02	0.009
L3	80.25 - 39.75 (3)	TP41.898x34.068x0.3125	45.00	0.00	0.0	39.000	40.3415	-15.89	1573.32	0.010
L4	39.75 - 0 (4)	TP48.19x40.3595x0.375	45.00	0.00	0.0	39.000	56.9118	-26.37	2219.56	0.012

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	148 - 116.5 (1)	TP29.481x24x0.2188	238.53	20.407	36.000	0.567	0.00	0.000	36.000	0.000
L2	116.5 - 80.25 (2)	TP35.351x28.391x0.25	716.27	37.252	39.000	0.955	0.00	0.000	39.000	0.000
L3	80.25 - 39.75 (3)	TP41.898x34.068x0.3125	1395.88	41.365	39.000	1.061	0.00	0.000	39.000	0.000
L4	39.75 - 0 (4)	TP48.19x40.3595x0.375	2326.46	41.575	39.000	1.066	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	148 - 116.5 (1)	TP29.481x24x0.2188	11.78	0.593	24.000	0.049	0.03	0.001	24.000	0.000
L2	116.5 - 80.25 (2)	TP35.351x28.391x0.25	15.14	0.556	26.000	0.043	0.14	0.004	26.000	0.000
L3	80.25 - 39.75 (3)	TP41.898x34.068x0.3125	18.83	0.467	26.000	0.036	0.27	0.004	26.000	0.000
L4	39.75 - 0 (4)	TP48.19x40.3595x0.375	22.43	0.394	26.000	0.031	0.26	0.002	26.000	0.000

Pole Interaction Design Data

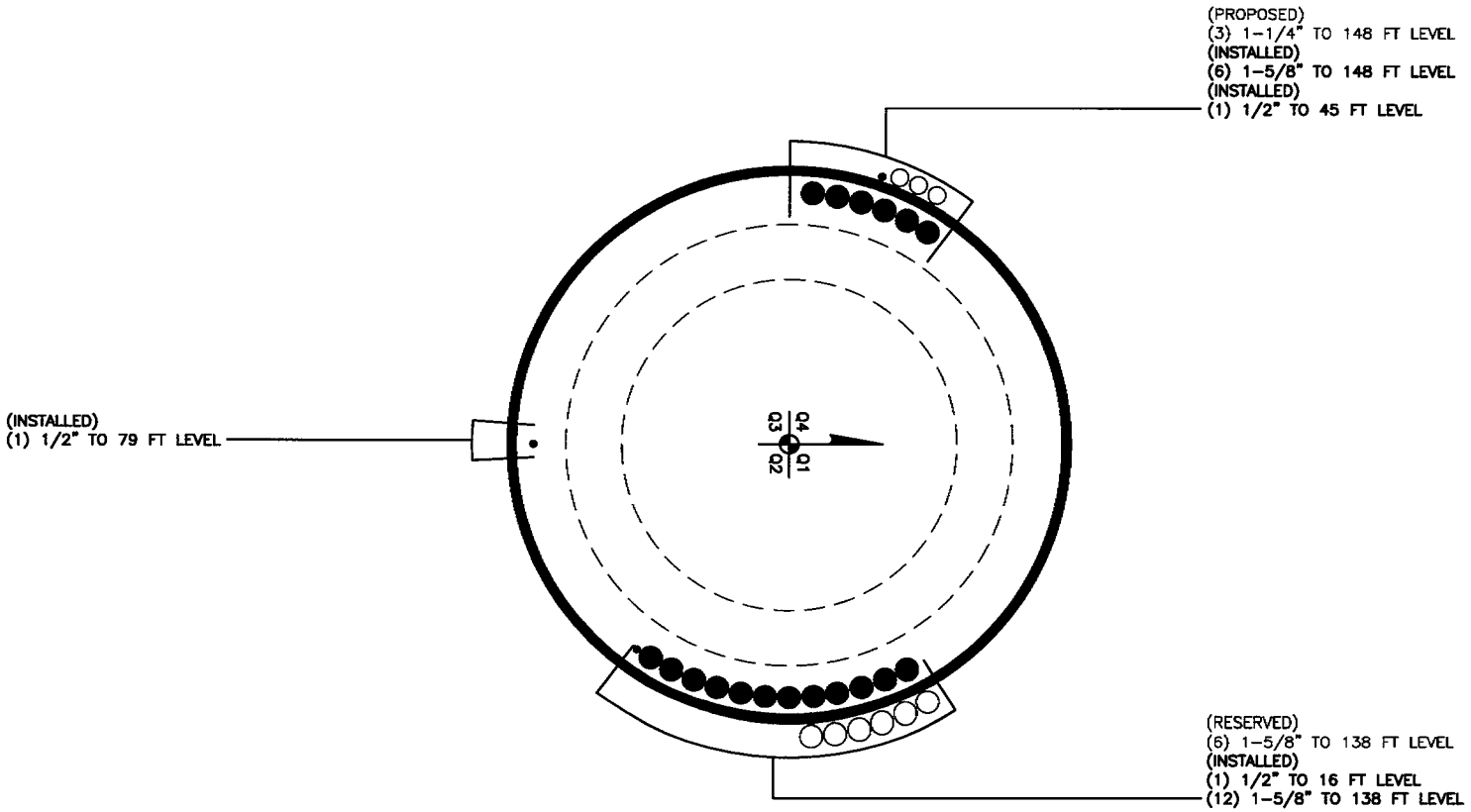
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 116.5 (1)	0.007	0.567	0.000	0.049	0.000	0.574 ✓	1.333	H1-3+VT ✓
L2	116.5 - 80.25 (2)	0.009	0.955	0.000	0.043	0.000	0.964 ✓	1.333	H1-3+VT ✓
L3	80.25 - 39.75 (3)	0.010	1.061	0.000	0.036	0.000	1.071 ✓	1.333	H1-3+VT ✓
L4	39.75 - 0 (4)	0.012	1.066	0.000	0.031	0.000	1.078 ✓	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	148 - 116.5	Pole	TP29.481x24x0.2188	1	-4.98	953.24	43.1	Pass
L2	116.5 - 80.25	Pole	TP35.351x28.391x0.25	2	-9.13	1415.67	72.3	Pass
L3	80.25 - 39.75	Pole	TP41.898x34.068x0.3125	3	-15.89	2097.24	80.3	Pass
L4	39.75 - 0	Pole	TP48.19x40.3595x0.375	4	-26.37	2958.67	80.9	Pass
							Summary	
						Pole (L4)	80.9	Pass
						RATING =	**80.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876373 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Block Foundation

Checks capacity of monolithic block foundation for a monopole tower per TIA/EIA-222-F

BU #: 876373
Site Name: LONG EDDY / WRIGHT PR(
App No.: 151573 rev1

Design Reactions		
Shear, **S**:	22.00	kips
Moment, **M**:	2326.00	ft*kips
Height, **H**:	148.00	ft
Weight, **Wt**:	26.00	kips
Base Diameter, **BD**:	48.19	in

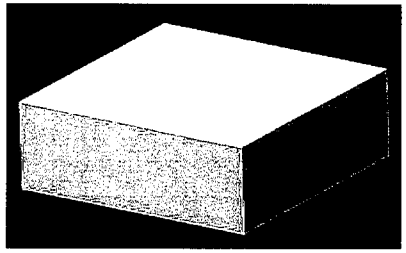
Foundation Dimensions		
Depth, **D**:	3.5	ft
Block Width, **W**:	24.5	ft
Neglected Depth, **N**:	3.5	ft
Ext. Above Grade, **E**:	0.5	ft
Anchor Steel Length, **Lst**:	84.0	in
Clear Cover, **cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.120	kcf
Allowable Bearing, **Bc**:	6.000	ksf
Int. Angle of Friction, **Φ**:	32.00	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	kcf
Base Friction, **μ**:	0.4	
Seismic Zone, **z**:	1	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δc**:	0.150	kcf

Rebar Properties		
Pad Rebar Size, **sp**:	8	
Rebar Quanity, **mp**:	27	17

Design Checks	Capacity/ Availability	Demands/ Limits	Check	%
Shear (ksf)	67.58	22.00	OK	32.6%
*Overturning (ft*kips)*:	3364.93	2414.00	OK	71.7%
Bearing (ksf):	6.00	1.75	OK	29.2%
Shear - 1-Way (kips):	1433.17	545.07	OK	38.0%
Pad Rebar Area (in²):	21.21	12.70	OK	N/A
Bar Spacing (in):	10.04	18 > Bs > 2	OK	N/A
Development Length (in):	144.00	42.72	OK	N/A



Modification Checks	Capacity/ Availibility	Demands/ Limits	Check
Minimum Extra Thickness (in):	0.00	0.00	Not Used
Pad Rebar Area-short (in²):	8.84	0.55	Not Used
Pad Rebar Area-long (in2):	2.21	0.55	Not Used
Pad Rebar Spacing-short (in2):	14.37	18 > Bs > 2	Not Used
Pad Rebar Spacing-long (in2):	71.06	18 > Bs > 2	Not Used
End Cap Width (in):	0.00	0.00	Not Used
End Cap Rebar Area (in2):	4.81	0.00	Not Used
EC Rebar Spacing (in):	-1.73	18 > Bs > 2	Not Used
Tie Spacing (in):	14.66	288 > s > 4.5	Not Used
Dowel Area (in2):	8.84	0.00	Not Used
Dowel Embedment (in):	15.00	6.00	Not Used
Shear Strength of Cone (kips):	59.53	23.86	Not Used
Dowel Edge Distance (in):	12.00	14.51	Not Used
Dowel Spacing (in):	30.00	30.00	Not Used
Dowel Edge Distance (vert) (in):	24.00	14.51	Not Used
Dowel Devel. Length (in):	-3.00	15.38	Not Used

Modifications					
Pad Thickness, Te:	0	in	**End Cap Width, Wec**:	0	in
Revised Pad Thickness, Tx:	4	ft	**Revised Width, Wx**:	24.5	ft
Pad Rebar Size, Se:	6		**EC Rebar Size, Sec**:	7	per side, top & bottom
Rebar Quanity (long), me:	20	2	**EC Rebar Quanity, mec**:	8	0
Rebar Quanity (short), mex:	5	2	**EC Tie Size, Sect**:	4	per side
Dowel Size, Sed:	7		**Tie Quanity, mect**:	20	0
Dowel Quanity, med:	20	0	**EC Dowel Size, Secd**:	6	per side
			Dowel Quanity, mecd:	20	0
			Rows of Dowels, Nd:	2	
			Dowel Depth, decd:	15	in
			Edge Distance, eecd:	12	in

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

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

Site Data

BU#: *876373*
Site Name: *LONG EDDY / WRIGHT P*
App #: *151573 rev1*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	55	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	54	in
Thick:	2.75	in
Grade:	55	ksi
Clip Distance:	4	in

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

Pole Data		
Diam:	48.19	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2326	ft-kips
Unfactored Axial, P:	26	kips
Unfactored Shear, V:	22	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	125.2 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	64.2%

Base Plate Results Flexural Check

Base Plate Stress:	36.6 ksi
Allowable PL Bending Stress:	55.0 ksi
Base Plate Stress Ratio:	66.6%

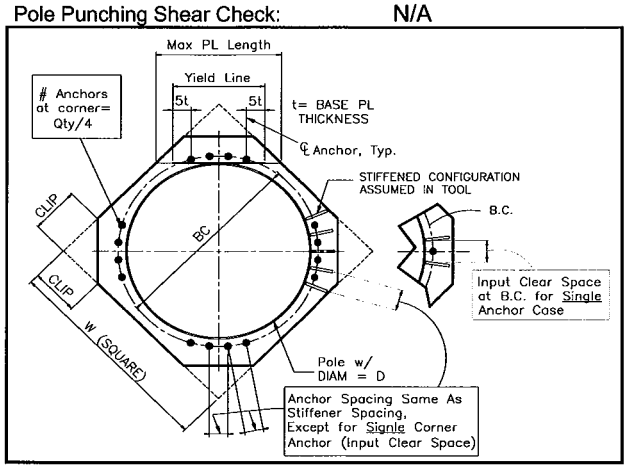
PL Ref. Data
Yield Line (in):
28.18
Max PL Length:
28.18

N/A - Unstiffened
Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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