48 Spruce Street
Oakland, NJ 07436
Phone: (201)-951-3869
Tom Kincaid
Real Estate Consultant

August 14, 2013

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 1065 Wintergreen Avenue, Hamden, CT 06514. Known to Sprint Spectrum L.P. as site CT03XC003.

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

DETAILED STRUCTURAL ANALYSIS AND REVIEW OF AN EXISTING 120' SELF SUPPORT LATTICE TOWER AND ITS FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

Site I.D #: CT03XC003
Site Name: New Haven - State Police Tower #27
Address: 142 Baldwin Drive, New Haven, CT
(aka 1065 Wintergreen Avenue, Hamden, CT)

prepared for

Sprint

1 International Blvd.
Suite 800
Mahwah, NJ. 07495

prepared by

URS

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36922446.00000
TWS-009

July 17, 2013

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 120' self-supporting lattice tower structure located at 142 Baldwin Drive, New Haven; (aka 1065 Wintergreen Avenue, Hamden), Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code, the TIA/EIA-222-F standard, and the Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction of this report.

The proposed Sprint antenna modification is listed below:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
<u>On new Sprint mounts:-</u> **<u>Install:</u>** **(3) RFS APXVSPP18-C-A20** **(6) ALU RRH 4X45 65MHz** **(3) ALU RRH 800 MHz 2x50W** **(3) 800 MHz NOTCH FILTER** **(3) 1900 RRH COMBINER** **(3) HYBRIFLEX 1 -1/4" Coax**	**Sprint (Proposed)**	**@ 72'**

The results of the analysis indicates that the existing tower foundation and anchor bolts are in compliance with the proposed loading conditions without modification. **The modified tower structure is considered structurally adequate for the proposed antenna loading with the wind load classifications specified above.** The tower deflection (sway) is 0.33 degrees, and the tower rotation (twist) is 0.12 degrees. These figures are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).

1. EXECUTIVE SUMMARY - *continued*

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry and structural member sizes utilized in the preparation of this report were obtained from manufacturer's original design documents prepared by Stainless, Inc. report number 358810, noted as revision B, dated March 3, 1995.
3) Geotechnical engineering report prepared by Dr. Clarence Welti, P.E., P.C., dated December 29, 1993.
4) Tower reinforcement as detailed in prior structural analysis report prepared by URS Corporation on behalf of T-Mobile (formerly VoiceStream Wireless) signed and sealed October 8, 2001 was not installed and hence disregarded for the purpose of this report.
5) Tower reinforcement as detailed in prior structural analysis report prepared by URS Corporation on behalf of AT&T (formerly SNET Mobility Inc.) dated March 2000 was not installed and hence disregarded for the purpose of this report.
6) Previous structural analysis performed by URS Corporation on behalf of AT&T, project number SAI-062 / 36924423, signed and sealed January 24, 2011.
7) Antenna inventory provided by Connecticut State Police via e-mail on May 31, 2012.
8) Proposed inventory taken from AT&T RFDS, V02, received by URS on July 18, 2012.
9) Antenna and mount configuration as specified within Section 2 and 6 of this report.
10) Coax cable orientation as specified in section 6 of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/car

2. INTRODUCTION

The subject tower is located at 142 Baldwin Drive, New Haven; (aka 1065 Wintergreen Avenue, Hamden), Connecticut. The structure is an existing 120' self supporting steel tapered lattice tower, designed and manufactured by Stainless, Inc.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) 4' Lightning Rod	Tower (existing)	18' Pipe Mast on Top of Tower	138'	---
(1) RFS Celwave PD1142 -2B Omni	DOT – 1 (existing)	(3) Side Arms	120'	(1) 7/8"
(1) RFS Celwave PD458 Omni	CTT – 2 (existing)		120'	(1) 7/8"
(2) Katherein OGT9-806 Omni	CSP 8 & 9 (existing)		120'	(2) 1-5/8"
(1) 6' Dipole	CSP – 52 (existing)		120'	(1) 1-1/4"
(3) 6' Microwave Dishes	CSP (future)		120'	---
(1) Filter/Diplexer	CSP – 59 (existing)		120'	(1) 1/2"
(2) SC479-HF1DF	CSP 55 & 56 (existing)		120'	(2) 1-5/8"
(1) 6' Microwave Dish	CSP - 6 (existing)	(3) Dish Mounts	116'	(1) WE65
(1) 6' Microwave Dish	CSP - 4 (existing)		115'	(1) WE65
(1) 6' Microwave Dish	CSP - 7 (existing)		111'	(1) WE65
(1) Filter/Diplexer	CSP – 62 (existing)	(2) Side Arms	110'	(1) 1/2"
(1) Kathrein AP13-850/065 panel antennas	CSP – 41 (existing)		110'	(1) 1-5/8"
(1) BCD-80609	CSP – 54 (existing)		110'	(1) 1-5/8"
(3) SC479-HF1LDF	CSP – 60, 61 & 65 (existing)		110'	(3) 1-5/8"
(1) AP13-850/065/ADT	CSP – 42 (existing)	Leg Mounted	105'	(1) 1-5/8"
(1) Filter/Diplexer	DEHMS – 43 (existing)	Leg Mounted	105'	---
(2) Katherein OGT9-806 Omni	CSP 10 & 11 (existing)	(2) Pipe Mounts	103'	(2) 1-5/8"
(1) RFS Celwave PD458 Omni	CTT – 3 (existing)	Leg Mounted	100'	(1) 7/8"
(3) APX16DWV-16DWV panel antenna and (6) TMA's	T-Mobile (existing)	Wireless Frame/Leg	95'	(6) 1-5/8"
(1) 20' 4-Bay Dipole	USS – 24 (existing)	Side Arm	90'	(1) 7/8"

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) RFS Celwave PD1142 -2B Omni	DEHMS – 26 (existing)	Side Arm	85'	(1) 7/8"
(1) 3' Yagi antenna	CSP – 14 (existing)	Leg Mounted	85'	(1) 7/8"
(4) SBNH-1D6565C (2A & 2B) (2) AM-X-CD-16-65-00T (2C) (6) TMAs (12) Diplexers	AT&T (existing)	Frame Mount	80'	(8) 1-1/4" (4) 1-1/4"
(1) 20' 4-Bay Dipole	USS – 12 (existing)	Leg Mounted	78'	(1) 7/8"
(3) Decibel DB980H90E-M panel antennas	Sprint (existing)	Face Mount	72'	(2) 1 5/8" (2) 1 1/4" (2) 1/2" (see note below)
(3) RFS APXVSPP18-C-A20 (6) ALU RRH 4X45 65MHz (3) ALU RRH 800 MHz 2x50W (3) 800 MHz NOTCH FILTER (3) 1900 RRH COMBINER	**Sprint (proposed)**	**Pipe Mount**	**72'**	**(3) HYBRIFLEX 1 -1/4" Coax**
(1) 2' Microwave Panel	NHVN – 57 (existing)	Leg Mounted	70'	(1) CAT5
(1) DB212	DEHMS – 47 (existing)	(2) Stand-offs	60'	(1) 7/8"
(1) DB803M-Y	CSP – 53 (existing)		60'	(1) 1/2"
(1) GPS	AT&T – 25 (existing)		60'	(1) 7/8"
(1) GPS	Sprint (existing)		60'	(1) 1/2"
(1) BA6312 Omni	NHVN – 45 (existing)		60'	(1) 7/8"
(1) 4' Whip	NHVN – 46 (existing)		60'	(1) 7/8"
(1) 20' Dipole	USS – 13 (existing)	2' Side Arm	56'	(1) 7/8"
(1) Decibel DB-264	CSP – 5 (existing)	Leg Mounted	55'	(1) 7/8"
(1) 1' Microwave Panel	NHVN – 58 (existing)	Leg Mounted	50'	(1) CAT5
(1) 4' Dish	NHVN – 44 (existing)	3' Side Arm	40'	(2) 1/2"
(1) 3' Microwave Panel	FBI –51 (existing)	Leg Mount	40'	(1) 1/2"
(1) 1' Whip	FBI – 50 (existing)	Leg Mount	35'	(1) 1/2"
(1) 3' Whip	CSP – 48 (existing)	Leg Mount	30'	(1) 1/2"

Notes: Refer to coax feed-line plan within Section 6 of this report for coax locations.

This structural analysis of the communications tower was performed by URS Corporation (URS) for AT&T. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing, future and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection), and stress on the tower and the effect of forces.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction - Allowable Stress Design (ASD).

The analysis was conducted using TNX Tower 6.0.0.8. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 90 mph (fastest mile) Wind Load + Tower Dead Load
Load Condition 2 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

Stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The results of the analysis indicate that the existing tower foundation and anchor bolts are in compliance with the proposed loading conditions without modification (see tables below). **The modified tower structure is considered structurally adequate for the proposed antenna loading with the wind load classifications specified in Section 3.** The tower deflection (sway) is 0.33 degrees, and the tower rotation (twist) is 0.12 degrees. These figures are within the Connecticut State Police specification of 0.75 degrees for deflection (sway) and rotation (twist).

TABLE 1: Tower Deflection (Sway) and Rotation (Twist) at the top of the tower (degrees):

Description	Current	Allowable
Tower Sway (degrees)	0.3270	N/A
Tower Twist (degrees)	0.1252	
Total (degrees)	0.4522	0.750

TABLE 2: Tower Base Reactions:

Base Reactions	Proposed Tower Reactions
Axial Load (kips)	51
Shear per Leg (kips)	31
Total Shear (kips)	56
Uplift per Leg (kips)	203
Comp.per Leg (kips)	244
O.T. Moment (ft-kips)	4134

For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

TABLE 3: Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing Component Size	Controlling Component/Elevation	Stress (% capacity)	Pass/Fail
Tower Leg (T8)	P5x0.4	Compression/25'-50'	84.0%	**Pass**
Diagonal (T9)	2L3-1/2x3x1/4	Compression/0'-25'	99.7%	**Pass**
Horizontal (T7)	L3x3x1/4	Compression/50'-75'	83.9%	**Pass**
Top Girt (T8)	L3x3x1/4	Compression/25'-50'	94.6%	**Pass**
Inner Bracing (T8)	L2-1/2x2x3/16	Compression/25'-50'	7.3%	**Pass**
Bolt Checks	(1) 3/4" A325X Diagonal Bolt	Member Bearing/50'	71.3%	**Pass**
Anchor Bolts	1 1/2" dia. A36	Tension & Shear	89%	**Pass**
Foundation	Rock Anchors	Tension	72%	**Pass**

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicates that the existing tower foundation and anchor bolts are in compliance with the proposed loading conditions without modification. **The tower structure is considered structurally adequate for the proposed antenna loading with the wind load classifications specified above.** The tower deflection (sway) is 0.33 degrees, and the tower rotation (twist) is 0.12 degrees. These figures are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

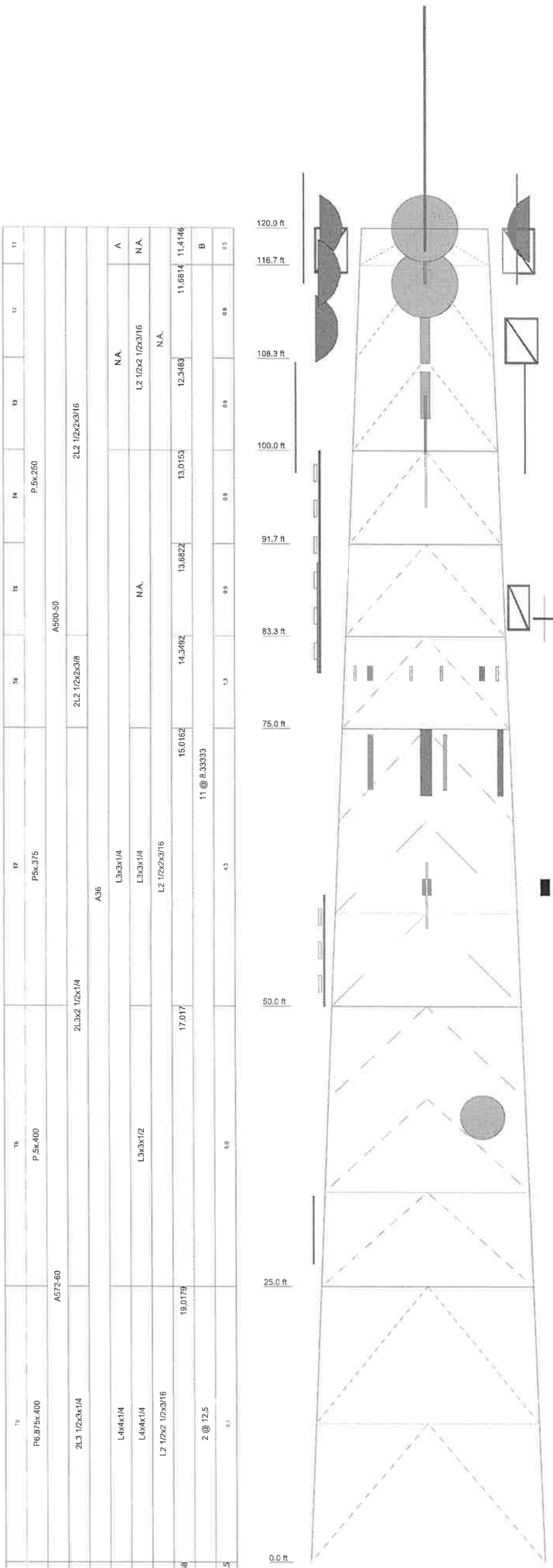
Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading condition.

6. DRAWINGS AND DATA

TNX TOWER INPUT / OUTPUT SUMMARY



Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P6.875x.400	P.5x.400	P5x.375	2L2 1/2x2x3/8	2L2 1/2x2x3/16	P.5x.250			
Leg Grade	A572-60		A500-50						
Diagonals	2L3 1/2x3x1/4	2L3x2 1/2x1/4	A36						
Diagonal Grade									
Top Girts	L4x4x1/4	L3x3x1/2	L3x3x1/4	N.A.		N.A.	L2 1/2x2 1/2x3/16	N.A.	A
Horizontals	L4x4x1/4		L3x3x1/4						N.A.
Inner Bracing	L2 1/2x2 1/2x3/16		L2 1/2x2x3/16						
Face Width (ft)	21.0188	19.0179	17.017	15.0162	14.3492	13.6822	13.0153	12.3483	11.6814
# Panels @ (ft)	2 @ 12.5	11 @ 8.33333							B
Weight (K)	19.5	5.1	5.0	4.3	1.3	0.9	0.9	0.8	0.5

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4' (Tower)	138	(2) SBNH-1D6565C (ATT)	80
16'x2.5" Pipe Mount (Tower)	128	(2) AM-X-CD-16-65-00T-RET (6') (ATT)	80
1142-2B (DOT - 1)	120	(2) TMA (ATT)	80
PD458-1 (CTT - 2)	120	(2) TMA (ATT)	80
OGT9-806 (CSP - 9)	120	(2) TMA (ATT)	80
OGT9-806 (CSP - 8)	120	Mount (ATT)	80
Filter/Diplexer (CSP - 59)	120	Mount (ATT)	80
6' Dipole (CSP - 52)	120	Mount (ATT)	80
(2) SC479-HF1LDF (CSP - 55 ,56)	120	(4) Diplexer (ATT)	80
6FT DISH (CSP - 66)	120	(4) Diplexer (ATT)	80
6FT DISH (CSP - 67)	120	(4) Diplexer (ATT)	80
6FT DISH (CSP - 68)	120	20' 4-Bay Dipole (USS - 12)	78
6' Side-Arm	118	Mount (Sprint/Nextel)	72
6' Side-Arm	118	Mount (Sprint/Nextel)	72
6' Side-Arm	118	Mount (Sprint/Nextel)	72
5'x4" Pipe Mount (Dish Mount)	116	DB980H90E-M (Sprint/Nextel)	72
6FT DISH (CSP - 6)	116	APXVSPP18-C-A20 (Sprint)	72
10'0"x4" Pipe Mount (Dish Mount)	115	APXVSPP18-C-A20 (Sprint)	72
6FT DISH (CSP - 4)	115	APXVSPP18-C-A20 (Sprint)	72
5'x4" Pipe Mount (Dish Mount)	111	(2) ALU RRH 1900 4X45 65MHz (Sprint)	72
6FT DISH (CSP - 7)	111	(2) ALU RRH 1900 4X45 65MHz (Sprint)	72
Filter/Diplexer (CSP - 62)	110	(2) ALU RRH 1900 4X45 65MHz (Sprint)	72
AP13-850/065/ADT w/Mount Pipe (CSP - 41)	110	ALU RRH 800 MHz 2x50W (Sprint)	72
BCD-80609 (CSP - 54)	110	ALU RRH 800 MHz 2x50W (Sprint)	72
(2) SC479-HF1LDF (CSP - 60 ,61)	110	ALU RRH 800 MHz 2x50W (Sprint)	72
SC479-HF1LDF (CSP - 65)	110	800 MHz NOTCH FILTER (Sprint)	72
6' Side-Arm	110	800 MHz NOTCH FILTER (Sprint)	72
6' Side-Arm	110	800 MHz NOTCH FILTER (Sprint)	72
AP13-850/065/ADT w/Mount Pipe (CSP - 42)	105	1900 RRH COMBINER (Sprint)	72
Diplexer (DEHMS - 43)	105	1900 RRH COMBINER (Sprint)	72
OGT9-806 (CSP - 11)	103	1900 RRH COMBINER (Sprint)	72
OGT9-806 (CSP - 10)	103	DB980H90E-M (Sprint/Nextel)	72
3'4"x4" Pipe Mount (CSP - 11)	103	DB980H90E-M (Sprint/Nextel)	72
3'4"x4" Pipe Mount (CSP - 10)	103	2' Microwave Panel (NHVN - 57)	70
PD458-1 (CTT - 3)	100	DB803M-Y (CSP - 53)	60
(2) TMA 10"x8"x3" (T-Mobile)	95	GPS (ATT - 25)	60
(2) TMA 10"x8"x3" (T-Mobile)	95	DB212-1 (DEHMS - 47)	60
(2) TMA 10"x8"x3" (T-Mobile)	95	Mount (ATT)	60
Mount (T-Mobile)	95	4' Whip (NHVN - 46)	60
Mount (T-Mobile)	95	GPS (Sprint/Nextel - 18)	60
Mount (T-Mobile)	95	Mount (Sprint/Nextel)	60
APX16DWV-16DWV-S-E-ACU w/ Mount (T-Mobile)	95	BA6312 (NHVN - 45)	60
		20' 4-Bay Dipole (USS - 13)	56
APX16DWV-16DWV-S-E-ACU w/ Mount (T-Mobile)	95	2' Sidearm	56
		Mount	56
APX16DWV-16DWV-S-E-ACU w/ Mount (T-Mobile)	95	DB264-A (CSP - 5)	55
		1' Microwave Panel (NHVN - 58)	50
20' 4-Bay Dipole (USS - 24)	90	5'0"x3" Pipe Mount	44
Mount	88	3' Side arm	44
Mount	86	3' Panel (FBI - 51)	40
PD1142-1 (DEHMS - 26)	85	4 FT DISH (NHVN - 44)	40
3' Yagi (CSP - 14)	85	1' Omni (FBI - 50)	35
(2) SBNH-1D6565C (ATT)	80	4' Whip (CSP - 48)	30

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	B	1 @ 3.33333

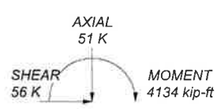
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi			

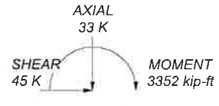
TOWER DESIGN NOTES

1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. TOWER RATING: 99.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 244 K
UPLIFT: -203 K
SHEAR: 31 K



TORQUE 87 kip-ft
90 mph WIND - 0.5000 in ICE



TORQUE 63 kip-ft
REACTIONS - 90 mph WIND

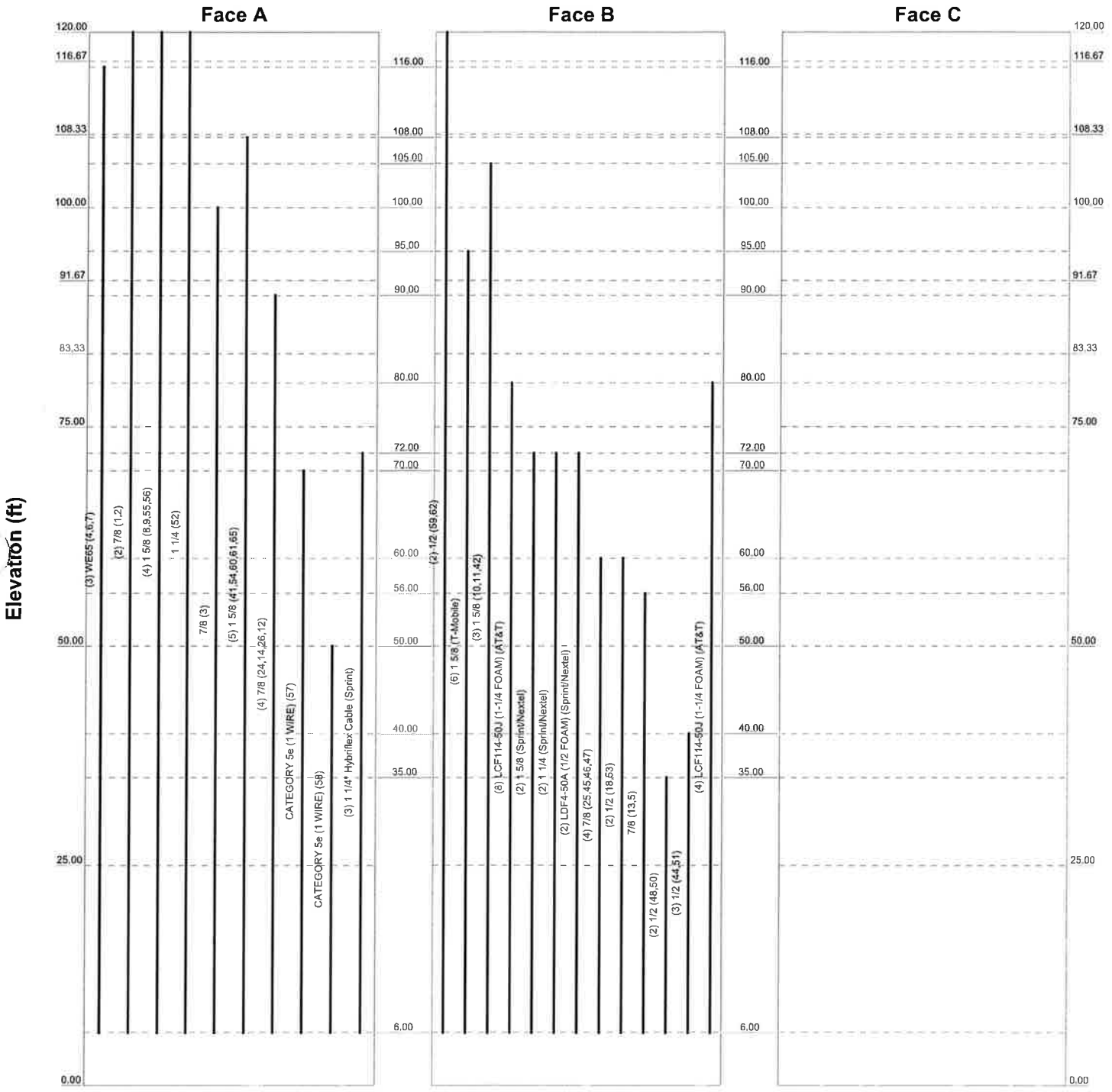
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job:	*120' Self-Supporting Lattice Tower*
Project:	*Connecticut State Police Tower - West Rock*
Client:	Sprint / TWS-009
Drawn by:	Christopher_Russo
App'd:	
Code:	TIA/EIA-222-F
Date:	07/17/13
Scale:	NTS
Path:	
Dwg No.	E-1

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feedline Distribution Chart
0' - 120'

_____ Round _____ Flat _____ App In Face _____ App Out Face _____ Truss Leg



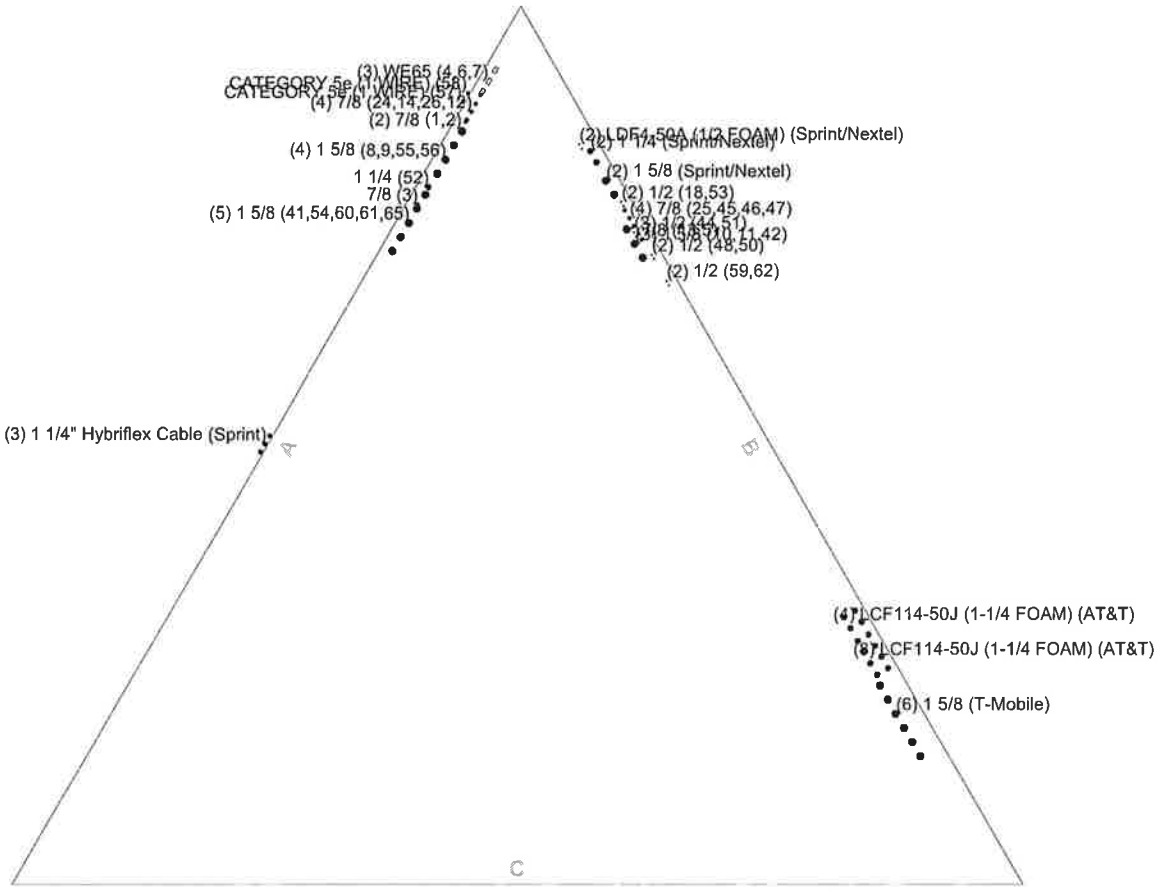
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***120' Self-Supporting Lattice Tower***			
Project: ***Connecticut State Police Tower - West Rock***			
Client: Sprint / TWS-009	Drawn by: Christopher_Russo	App'd:	
Code: TIA/EIA-222-F	Date: 07/17/13	Scale: NTS	
Path:		Dwg No. E-7	

TNX TOWER FEEDLINE PLAN

Feedline Plan

Round _____ Flat _____ App In Face _____ App Out Face _____



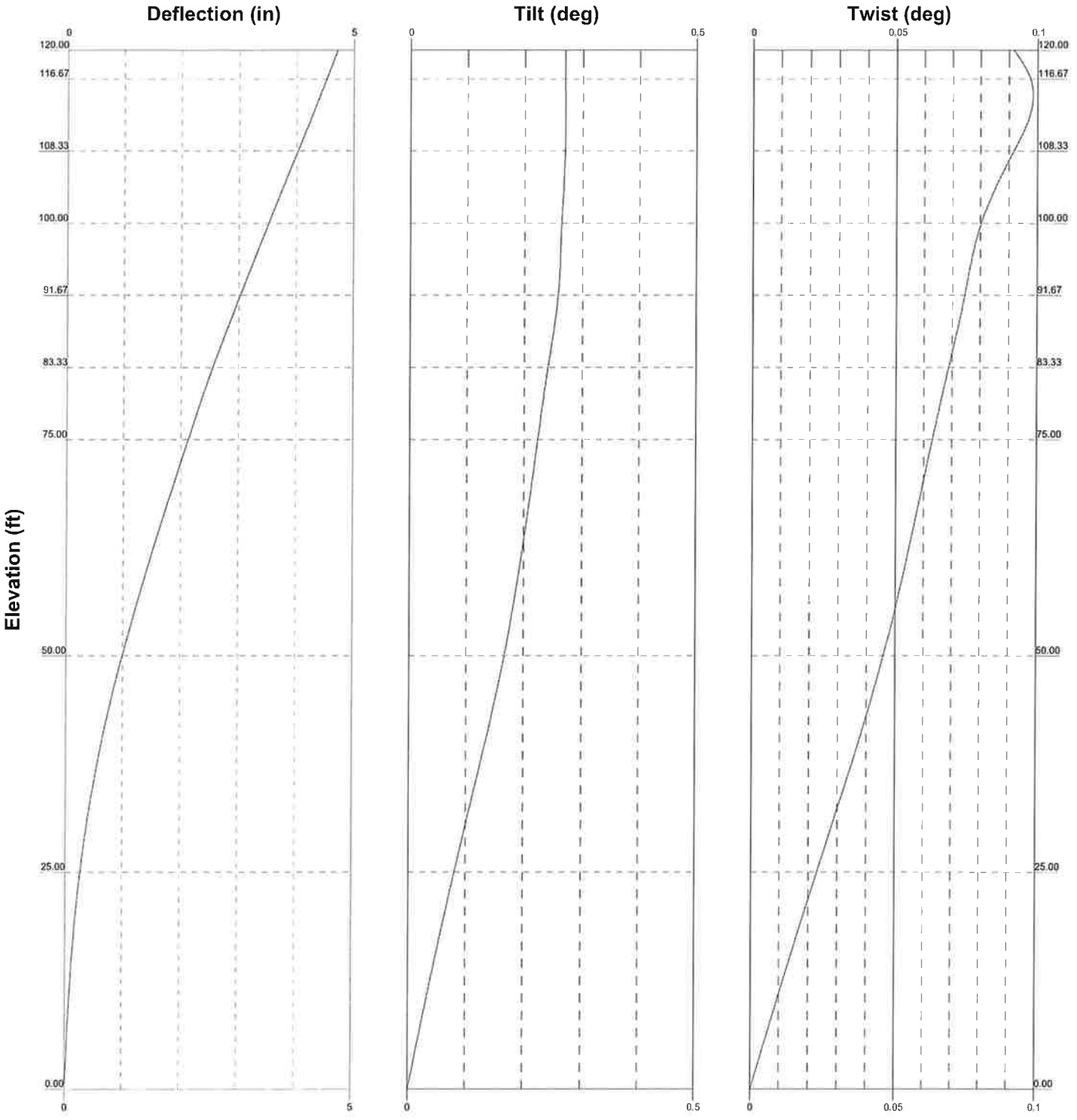
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***120' Self-Supporting Lattice Tower***		
Project:	***Connecticut State Police Tower - West Rock***		
Client: Sprint / TWS-009	Drawn by: Christopher_Russo	App'd:	
Code: TIA/EIA-222-F	Date: 07/17/13	Scale: NTS	
Path:		Dwg No. E-7	

TNX DEFLECTION, TILT AND TWIST

TIA/EIA-222-F - Service - 90 mph

Maximum Values



URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job: *120' Self-Supporting Lattice Tower*			
Project: *Connecticut State Police Tower - West Rock*			
Client: Sprint / TWS-009	Drawn by: Christopher_Russo	App'd:	
Code: TIA/EIA-222-F	Date: 07/17/13	Scale: NTS	
Path:		Dwg No. E-5	

TNX TOWER DETAILED OUTPUT

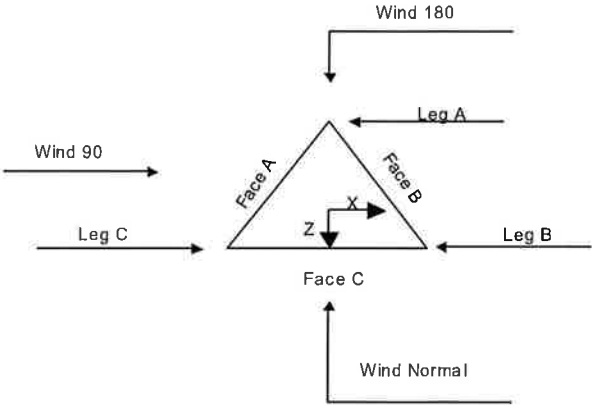
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 11.41 ft at the top and 21.02 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 90 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	120.00-116.67			11.41	1	3.33
T2	116.67-108.33			11.68	1	8.33
T3	108.33-100.00			12.35	1	8.33
T4	100.00-91.67			13.02	1	8.33
T5	91.67-83.33			13.68	1	8.33
T6	83.33-75.00			14.35	1	8.33
T7	75.00-50.00			15.02	1	25.00
T8	50.00-25.00			17.02	1	25.00
T9	25.00-0.00			19.02	1	25.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	120.00-116.67	3.33	K Brace Down	No	Yes	0.0000	0.0000
T2	116.67-108.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	108.33-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-91.67	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	91.67-83.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T6	83.33-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	75.00-50.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T8	50.00-25.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T9	25.00-0.00	12.50	K Brace Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-116.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T2 116.67-108.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T3 108.33-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T4 100.00-91.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T7 75.00-50.00	Pipe	P5x.375	A500-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4	A36 (36 ksi)
T8 50.00-25.00	Pipe	P.5x.400	A572-60 (60 ksi)	Double Angle	2L3x2 1/2x1/4	A36 (36 ksi)
T9 25.00-0.00	Pipe	P6.875x.400	A572-60 (60 ksi)	Double Angle	2L3 1/2x3x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 120.00-116.67	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 100.00-91.67	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 91.67-83.33	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 83.33-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 75.00-50.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 50.00-25.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T9 25.00-0.00	Single Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-116.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 116.67-108.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 108.33-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-91.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 91.67-83.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T6 83.33-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 75.00-50.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T8 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T9 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 100.00-91.67	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 75.00-50.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-25.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 25.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 120.00-116.67	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T2	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000

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
116.67-108.33			(36 ksi)					
T3	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
108.33-100.00			(36 ksi)					
T4	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
100.00-91.67			(36 ksi)					
T5 91.67-83.33	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
			(36 ksi)					
T6 83.33-75.00	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
			(36 ksi)					
T7 75.00-50.00	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
			(36 ksi)					
T8 50.00-25.00	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
			(36 ksi)					
T9 25.00-0.00	0.00	0.0000	A36	1	1	1	Mid-Pt	36.0000
			(36 ksi)					

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft															
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-116.67				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
116.67-108.33				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
108.33-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-91.67				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
91.67-83.33				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
83.33-75.00				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
75.00-50.00				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
50.00-25.00				1	1	1	1	1	1	1	1	1	1	1	1
T9 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-116.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 116.67-108.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 108.33-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 100.00-91.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 91.67-83.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 83.33-75.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 25.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-116.67	Flange	0.0000 A325X	0	0.7500 A325X	1	0.6250 A325X	2	0.0000 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T2 116.67-108.33	Flange	0.0000 A325X	0	0.7500 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T3 108.33-100.00	Flange	0.0000 A325X	0	0.7500 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T4 100.00-91.67	Flange	0.7500 A325X	6	0.7500 A325X	1	0.6250 A325X	2	0.0000 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T5 91.67-83.33	Flange	0.7500 A325X	0	0.7500 A325X	1	0.6250 A325X	2	0.0000 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T6 83.33-75.00	Flange	0.7500 A325X	0	0.7500 A325X	1	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T7 75.00-50.00	Flange	0.7500 A325X	6	0.7500 A325X	1	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T8 50.00-25.00	Flange	0.7500 A325X	6	0.7500 A325X	1	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T9 25.00-0.00	Flange	1.0000 A325X	8	1.0000 A325X	1	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
WE65 (4,6,7)	A	Yes	Af (CfAe)	116.00 - 6.00	-2.0000	0.42	3	3	1.5836	1.5836	5.1284	0.53
7/8	A	Yes	Ar (CfAe)	120.00 - 6.00	-2.0000	0.37	2	2	1.1100	1.1100		0.54

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1,2)												
1 5/8	A	Yes	Ar (CfAe)	120.00 - 6.00	-2.0000	0.34	4	4	1.9800	1.9800		1.04
(8,9,55,56)												
1 1/4	A	Yes	Ar (CfAe)	120.00 - 6.00	-2.0000	0.3	1	1	1.5500	1.5500		0.66
(52)												
7/8	A	Yes	Ar (CfAe)	100.00 - 6.00	-2.0000	0.28	1	1	1.1100	1.1100		0.54
(3)												
1 5/8	A	Yes	Ar (CfAe)	108.00 - 6.00	-2.0000	0.26	5	5	1.9800	1.9800		1.04
(41,54,60,61,65)												
1/2	B	Yes	Ar (CfAe)	120.00 - 6.00	-2.0000	-0.19	2	2	0.5800	0.5800		0.25
(59,62)												
1 5/8	B	Yes	Ar (CfAe)	95.00 - 6.00	-5.0000	0.3	6	6	1.9800	1.9800		1.04
(T-Mobile)												
1 5/8	B	Yes	Ar (CfAe)	105.00 - 6.00	-3.5000	-0.24	3	3	1.9800	1.9800		1.04
(10,11,42)												
LCF114-50J (1-1/4 FOAM) (AT&T)	B	Yes	Ar (CfAe)	80.00 - 6.00	-4.5000	0.23	8	4	1.5800	1.5800		0.70
1 5/8	B	Yes	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.3	2	2	1.9800	1.9800		1.04
(Sprint/Nextel)												
1 1/4	B	Yes	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.335	2	2	1.5500	1.5500		0.66
(Sprint/Nextel)												
LDF4-50A (1/2 FOAM) (Sprint/Nextel)	B	Yes	Ar (CfAe)	72.00 - 6.00	-4.0000	-0.35	2	2	0.6300	0.6300		0.15
7/8	B	Yes	Ar (CfAe)	60.00 - 6.00	-2.0000	-0.26	4	4	1.1100	1.1100		0.54
(25,45,46,47)												
1/2	B	Yes	Ar (CfAe)	60.00 - 6.00	-2.0000	-0.28	2	2	0.5800	0.5800		0.25
(18,53)												
7/8	B	Yes	Ar (CfAe)	56.00 - 6.00	-2.0000	-0.24	1	1	1.1100	1.1100		0.54
(13,5)												
1/2	B	Yes	Ar (CfAe)	35.00 - 6.00	-2.0000	-0.22	2	2	0.5800	0.5800		0.25
(48,50)												
1/2	B	Yes	Ar (CfAe)	40.00 - 6.00	-3.0000	-0.25	3	3	0.5800	0.5800		0.25
(44,51)												
7/8	A	Yes	Ar (CfAe)	90.00 - 6.00	-2.0000	0.39	4	4	1.1100	1.1100		0.54
(24,14,26,12)												
CATEGORY 5e (1 WIRE)	A	Yes	Ar (CfAe)	70.00 - 6.00	0.0000	0.39	1	1	1.0000	1.0000		0.21
(57)												
CATEGORY 5e (1 WIRE)	A	Yes	Ar (CfAe)	50.00 - 6.00	0.0000	0.4	1	1	1.0000	1.0000		0.21
(58)												
LCF114-50J (1-1/4 FOAM) (AT&T)	B	Yes	Ar (CfAe)	80.00 - 6.00	-4.5000	0.19	4	2	1.5800	1.5800		0.70
1 1/4" Hybriflex Cable (Sprint)	A	Yes	Ar (CfAe)	72.00 - 6.00	0.0000	0	3	3	1.0000	1.2500		0.42

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-116.67	A	3.247	0.000	0.000	0.000	0.02
		B	0.322	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	8.118	3.035	0.000	0.000	0.06
		B	0.806	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	14.718	3.299	0.000	0.000	0.10
		B	3.281	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	15.764	3.299	0.000	0.000	0.11
		B	8.231	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	18.231	3.299	0.000	0.000	0.12
		B	13.181	0.000	0.000	0.000	0.08
		C	0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	18.847	3.299	0.000	0.000	0.13
		B	17.131	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	65.083	9.897	0.000	0.000	0.42
		B	79.767	0.000	0.000	0.000	0.57
		C	0.000	0.000	0.000	0.000	0.00
T8	50.00-25.00	A	68.521	9.897	0.000	0.000	0.43
		B	93.746	0.000	0.000	0.000	0.65
		C	0.000	0.000	0.000	0.000	0.00
T9	25.00-0.00	A	52.076	7.522	0.000	0.000	0.32
		B	73.451	0.000	0.000	0.000	0.50
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-116.67	A	0.500	5.192	0.000	0.000	0.000	0.05
		B		0.439	0.322	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	0.500	12.979	4.313	0.000	0.000	0.17
		B		1.097	0.806	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	0.500	22.912	4.688	0.000	0.000	0.28
		B		4.822	0.806	0.000	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	0.500	24.792	4.688	0.000	0.000	0.29
		B		12.272	0.806	0.000	0.000	0.13
		C		0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	0.500	29.481	4.688	0.000	0.000	0.33
		B		19.722	0.806	0.000	0.000	0.21
		C		0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	0.500	30.653	4.688	0.000	0.000	0.34
		B		26.172	0.806	0.000	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	0.500	99.417	22.314	0.000	0.000	1.17
		B		124.087	5.693	0.000	0.000	1.53
		C		0.000	0.000	0.000	0.000	0.00
T8	50.00-25.00	A	0.500	104.979	23.439	0.000	0.000	1.22
		B		146.417	11.325	0.000	0.000	1.77
		C		0.000	0.000	0.000	0.000	0.00
T9	25.00-0.00	A	0.500	79.784	17.814	0.000	0.000	0.93

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		113.778	11.178	0.000	0.000	1.38
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	120.00-116.67	A	0.000	0.279	0.437	0.698
		B	0.000	0.041	0.043	0.102
		C	0.000	0.000	0.000	0.000
T2	116.67-108.33	A	0.000	0.480	0.747	1.201
		B	0.000	0.051	0.054	0.127
		C	0.000	0.000	0.000	0.000
T3	108.33-100.00	A	0.000	0.743	1.182	1.856
		B	0.000	0.148	0.215	0.369
		C	0.000	0.000	0.000	0.000
T4	100.00-91.67	A	0.000	0.777	1.323	2.094
		B	0.000	0.337	0.571	0.907
		C	0.000	0.000	0.000	0.000
T5	91.67-83.33	A	0.000	0.883	1.471	2.381
		B	0.000	0.520	0.900	1.402
		C	0.000	0.000	0.000	0.000
T6	83.33-75.00	A	0.000	0.899	1.491	2.427
		B	0.000	0.673	1.154	1.817
		C	0.000	0.000	0.000	0.000
T7	75.00-50.00	A	0.000	3.007	5.463	9.021
		B	0.000	3.152	5.812	9.456
		C	0.000	0.000	0.000	0.000
T8	50.00-25.00	A	0.000	3.069	5.532	9.206
		B	0.000	3.709	6.613	11.128
		C	0.000	0.000	0.000	0.000
T9	25.00-0.00	A	0.000	1.704	3.782	6.293
		B	0.000	2.146	4.661	7.929
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-116.67	-0.7056	-6.7622	-0.9046	-7.2131
T2	116.67-108.33	-1.2256	-13.6796	-1.5276	-14.8249
T3	108.33-100.00	-2.1078	-20.0463	-2.4317	-21.4405
T4	100.00-91.67	0.8386	-19.7252	0.6815	-21.2237
T5	91.67-83.33	4.2753	-19.7405	4.2383	-21.6029
T6	83.33-75.00	6.8894	-19.5949	7.1611	-21.3828
T7	75.00-50.00	7.6743	-23.3095	8.3405	-24.9626
T8	50.00-25.00	8.9376	-28.9851	9.4847	-30.5109
T9	25.00-0.00	8.0469	-25.9457	8.9247	-28.6339

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
Lightning Rod 5/8x4'	C	None			0.0000	138.00	No Ice	0.25	0.25	0.03
(Tower)							1/2" Ice	0.66	0.66	0.03
16'x2.5" Pipe Mount	C	None			0.0000	128.00	No Ice	4.00	4.00	0.09
(Tower)							1/2" Ice	4.80	4.80	0.09
1142-2B	B	From Leg	6.00		0.0000	120.00	No Ice	1.12	1.12	0.01
(DOT - 1)			0.00				1/2" Ice	2.54	2.54	0.02
			0.00							
PD458-1	A	From Leg	0.00		0.0000	120.00	No Ice	2.88	2.88	0.02
(CTT - 2)			0.00				1/2" Ice	4.34	4.34	0.05
			0.00							
OGT9-806	B	From Leg	3.00		0.0000	120.00	No Ice	3.00	3.00	0.03
(CSP - 9)			0.00				1/2" Ice	4.03	4.03	0.05
			0.00							
OGT9-806	C	From Leg	6.00		0.0000	120.00	No Ice	3.00	3.00	0.03
(CSP - 8)			0.00				1/2" Ice	4.03	4.03	0.05
			0.00							
PD458-1	A	From Leg	6.00		0.0000	100.00	No Ice	2.88	2.88	0.02
(CTT - 3)			0.00				1/2" Ice	4.34	4.34	0.05
			0.00							
OGT9-806	B	From Leg	3.00		0.0000	103.00	No Ice	2.15	2.15	0.02
(CSP - 11)			0.00				1/2" Ice	3.25	3.25	0.03
			0.00							
OGT9-806	C	From Leg	6.00		0.0000	103.00	No Ice	2.15	2.15	0.02
(CSP - 10)			0.00				1/2" Ice	3.25	3.25	0.03
			0.00							
APX16DWV-16DWV-S-E-A	B	From Face	0.50		0.0000	95.00	No Ice	6.70	3.27	0.07
CU w/ Mount			0.00				1/2" Ice	7.13	3.86	0.12
(T-Mobile)			0.00							
APX16DWV-16DWV-S-E-A	C	From Face	0.50		0.0000	95.00	No Ice	6.70	3.27	0.07
CU w/ Mount			0.00				1/2" Ice	7.13	3.86	0.12
(T-Mobile)			0.00							
APX16DWV-16DWV-S-E-A	C	From Leg	1.50		0.0000	95.00	No Ice	6.70	3.27	0.07
CU w/ Mount			0.00				1/2" Ice	7.13	3.86	0.12
(T-Mobile)			0.00							
(2) TMA 10"x8"x3"	B	From Face	0.00		0.0000	95.00	No Ice	0.78	0.29	0.02
(T-Mobile)			0.00				1/2" Ice	0.90	0.38	0.02
			0.00							
(2) TMA 10"x8"x3"	C	From Face	0.00		0.0000	95.00	No Ice	0.78	0.29	0.02
(T-Mobile)			0.00				1/2" Ice	0.90	0.38	0.02
			0.00							
(2) TMA 10"x8"x3"	C	From Leg	0.00		0.0000	95.00	No Ice	0.78	0.29	0.02
(T-Mobile)			0.00				1/2" Ice	0.90	0.38	0.02
			0.00							
Mount	A	From Face	0.50		0.0000	95.00	No Ice	7.48	7.48	0.25
(T-Mobile)			0.00				1/2" Ice	10.14	10.14	0.33
			0.00							
Mount	B	From Face	0.50		0.0000	95.00	No Ice	7.48	7.48	0.25
(T-Mobile)			0.00				1/2" Ice	10.14	10.14	0.33
			0.00							
Mount	C	From Face	0.50		0.0000	95.00	No Ice	7.48	7.48	0.25
(T-Mobile)			0.00				1/2" Ice	10.14	10.14	0.33
			0.00							

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
20' 4-Bay Dipole	A	From Leg	2.00	0.0000	78.00	No Ice	4.00	4.00	0.06
(USS - 12)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00						
DB980H90E-M	B	From Face	0.50	0.0000	72.00	No Ice	3.80	2.19	0.01
(Sprint/Nextel)			5.00			1/2" Ice	4.18	2.56	0.03
			0.00						
DB980H90E-M	B	From Face	0.50	0.0000	72.00	No Ice	3.80	2.19	0.01
(Sprint/Nextel)			-5.00			1/2" Ice	4.18	2.56	0.03
			0.00						
DB980H90E-M	C	From Face	0.50	0.0000	72.00	No Ice	3.80	2.19	0.01
(Sprint/Nextel)			5.00			1/2" Ice	4.18	2.56	0.03
			0.00						
Mount	A	From Face	0.50	0.0000	72.00	No Ice	9.73	9.73	0.31
(Sprint/Nextel)			0.00			1/2" Ice	13.12	13.12	0.42
			0.00						
Mount	B	From Face	0.50	0.0000	72.00	No Ice	9.73	9.73	0.31
(Sprint/Nextel)			0.00			1/2" Ice	13.12	13.12	0.42
			0.00						
Mount	C	From Face	0.50	0.0000	72.00	No Ice	9.73	9.73	0.31
(Sprint/Nextel)			0.00			1/2" Ice	13.12	13.12	0.42
			0.00						
20' 4-Bay Dipole	C	From Leg	3.00	0.0000	90.00	No Ice	4.00	4.00	0.06
(USS - 24)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00						
3' Yagi	B	From Leg	3.00	0.0000	85.00	No Ice	1.80	1.80	0.01
(CSP - 14)			0.00			1/2" Ice	3.24	3.24	0.02
			0.00						
GPS	A	From Leg	3.00	0.0000	60.00	No Ice	1.00	1.00	0.01
(Sprint/Nextel - 18)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
Mount	A	From Leg	1.50	0.0000	60.00	No Ice	2.72	2.72	0.05
(Sprint/Nextel)			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
BA6312	A	From Leg	3.00	0.0000	60.00	No Ice	0.45	0.45	0.00
(NHVN - 45)			0.00			1/2" Ice	1.09	1.09	0.01
			0.00						
2' Sidearm	A	From Leg	1.00	0.0000	56.00	No Ice	3.90	3.90	0.09
			0.00			1/2" Ice	4.40	4.40	0.10
			0.00						
5'0"x3" Pipe Mount	A	From Face	1.50	0.0000	44.00	No Ice	1.36	1.36	0.03
			5.00			1/2" Ice	1.67	1.67	0.04
			0.00						
3' Side arm	A	From Leg	1.50	0.0000	44.00	No Ice	5.90	5.90	0.13
			0.00			1/2" Ice	6.60	6.60	0.15
			0.00						
Filter/Diplexer	A	From Leg	0.50	0.0000	110.00	No Ice	3.15	1.05	0.02
(CSP - 62)			0.00			1/2" Ice	3.39	1.21	0.04
			0.00						
Filter/Diplexer	C	From Leg	3.00	0.0000	120.00	No Ice	3.15	1.05	0.02
(CSP - 59)			0.00			1/2" Ice	3.39	1.21	0.04
			0.00						
6' Side-Arm	A	From Leg	3.00	0.0000	118.00	No Ice	13.04	14.60	0.14
			0.00			1/2" Ice	18.07	19.40	0.15
			0.00						
6' Side-Arm	B	From Leg	3.00	0.0000	118.00	No Ice	13.04	14.60	0.14
			0.00			1/2" Ice	18.07	19.40	0.15
			0.00						

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
6' Side-Arm	C	From Leg	3.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice	13.04 18.07	14.60 19.40	0.14 0.15
10'0"x4" Pipe Mount (Dish Mount)	A	From Leg	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice	4.50 5.24	4.50 5.24	0.11 0.14
6'x4" Pipe Mount (Dish Mount)	C	From Leg	0.50 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice	2.09 2.46	2.09 2.46	0.05 0.07
6'x4" Pipe Mount (Dish Mount)	C	From Leg	0.50 0.00 0.00	0.0000	111.00	No Ice 1/2" Ice	2.09 2.46	2.09 2.46	0.05 0.07
Mount	C	From Leg	1.50 0.00 0.00	0.0000	88.00	No Ice 1/2" Ice	0.77 1.03	0.77 1.03	0.03 0.04
Mount	C	From Leg	1.50 0.00 0.00	0.0000	56.00	No Ice 1/2" Ice	1.63 2.45	1.63 2.45	0.03 0.40
Mount	B	From Leg	1.50 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice	5.65 7.58	5.65 7.58	0.11 0.14
PD1142-1 (DEHMS - 26)	C	From Leg	3.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice	1.32 3.21	1.32 3.21	0.01 0.02
6' Dipole (CSP - 52)	A	From Leg	6.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	2.70 3.70	2.70 3.70	0.02 0.07
4' Whip (CSP - 48)	C	From Leg	1.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice	1.13 1.50	1.13 1.50	0.03 0.04
4' Whip (NHVN - 46)	A	From Leg	1.00 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice	1.13 1.50	1.13 1.50	0.03 0.04
1' Microwave Panel (NHVN - 58)	A	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.40 1.56	0.70 0.82	0.01 0.02
DB264-A (CSP - 5)	C	From Leg	1.00 0.00 0.00	0.0000	55.00	No Ice 1/2" Ice	3.16 5.69	3.16 5.69	0.04 0.05
(2) SBNH-1D6565C (ATT)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.41 12.02	7.70 8.29	0.06 0.13
(2) SBNH-1D6565C (ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.41 12.02	7.70 8.29	0.06 0.13
(2) AM-X-CD-16-65-00T-RET (6') (ATT)	C	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	0.05 0.10
(2) TMA (ATT)	A	From Face	0.25 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	0.00 0.01
(2) TMA (ATT)	B	From Face	0.25 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	0.00 0.01
(2) TMA (ATT)	C	From Face	0.25 0.00	0.0000	80.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	0.00 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				0.00						
Mount	A	From Face	0.50		0.0000	80.00	No Ice	7.86	7.86	0.24
(ATT)			0.00				1/2" Ice	10.66	10.66	0.34
			0.00							
Mount	B	From Face	0.50		0.0000	80.00	No Ice	7.86	7.86	0.24
(ATT)			0.00				1/2" Ice	10.66	10.66	0.34
			0.00							
Mount	C	From Face	0.50		0.0000	80.00	No Ice	7.86	7.86	0.24
(ATT)			0.00				1/2" Ice	10.66	10.66	0.34
			0.00							
(4) Diplexer	A	From Face	0.25		0.0000	80.00	No Ice	0.47	0.12	0.01
(ATT)			0.00				1/2" Ice	0.56	0.17	0.01
			0.00							
(4) Diplexer	B	From Face	0.25		0.0000	80.00	No Ice	0.47	0.12	0.01
(ATT)			0.00				1/2" Ice	0.56	0.17	0.01
			0.00							
(4) Diplexer	C	From Face	0.25		0.0000	80.00	No Ice	0.47	0.12	0.01
(ATT)			0.00				1/2" Ice	0.56	0.17	0.01
			0.00							
20' 4-Bay Dipole	A	From Leg	2.00		0.0000	56.00	No Ice	4.00	4.00	0.06
(USS - 13)			0.00				1/2" Ice	6.00	6.00	0.10
			0.00							
GPS	B	From Leg	3.00		0.0000	60.00	No Ice	1.00	1.00	0.01
(ATT - 25)			0.00				1/2" Ice	1.50	1.50	0.01
			0.00							
Mount	B	From Leg	1.50		0.0000	60.00	No Ice	2.72	2.72	0.05
(ATT)			0.00				1/2" Ice	4.91	4.91	0.09
			0.00							
AP13-850/065/ADT w/Mount Pipe	A	From Leg	1.00		0.0000	110.00	No Ice	5.61	3.92	0.04
			0.00				1/2" Ice	6.30	4.96	0.08
(CSP - 41)			0.00							
AP13-850/065/ADT w/Mount Pipe	A	From Leg	1.00		0.0000	105.00	No Ice	5.61	3.92	0.04
			0.00				1/2" Ice	6.30	4.96	0.08
(CSP - 42)			0.00							
Diplexer	A	From Leg	1.00		0.0000	105.00	No Ice	0.47	0.12	0.01
(DEHMS - 43)			0.00				1/2" Ice	0.56	0.17	0.01
			0.00							
DB212-1	A	From Leg	1.00		0.0000	60.00	No Ice	4.40	4.40	0.03
(DEHMS - 47)			0.00				1/2" Ice	8.42	8.42	0.07
			0.00							
1' Omni	A	From Leg	1.00		0.0000	35.00	No Ice	0.20	0.20	0.01
(FBI - 50)			0.00				1/2" Ice	0.29	0.29	0.01
			0.00							
DB803M-Y	C	From Leg	1.00		0.0000	60.00	No Ice	0.50	0.50	0.00
(CSP - 53)			0.00				1/2" Ice	0.68	0.68	0.01
			0.00							
BCD-80609	A	From Leg	1.00		0.0000	110.00	No Ice	2.95	2.95	0.03
(CSP - 54)			0.00				1/2" Ice	4.11	4.11	0.05
			0.00							
(2) SC479-HF1LDF	C	From Leg	1.00		0.0000	120.00	No Ice	5.06	5.06	0.03
(CSP - 55 & 56)			0.00				1/2" Ice	6.54	6.54	0.07
			0.00							
2' Microwave Panel	B	From Leg	1.00		0.0000	70.00	No Ice	5.60	1.40	0.05
(NHVN - 57)			0.00				1/2" Ice	5.92	1.60	0.08
			0.00							
(2) SC479-HF1LDF	A	From Leg	1.00		0.0000	110.00	No Ice	5.06	5.06	0.03
(CSP - 60 & 61)			0.00				1/2" Ice	6.54	6.54	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
SC479-HF1LDF	B	From Leg	1.00	0.0000	110.00	No Ice	5.06	5.06	0.03
(CSP - 65)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00						
3' Panel	A	From Leg	1.00	0.0000	40.00	No Ice	4.20	2.10	0.05
(FBI - 51)			0.00			1/2" Ice	4.52	2.38	0.08
			0.00						
6' Side-Arm	A	From Leg	3.00	0.0000	110.00	No Ice	13.04	14.60	0.14
			0.00			1/2" Ice	18.07	19.40	0.15
			0.00						
6' Side-Arm	B	From Leg	3.00	0.0000	110.00	No Ice	13.04	14.60	0.14
			0.00			1/2" Ice	18.07	19.40	0.15
			0.00						
3'4"x4" Pipe Mount	B	From Leg	3.00	0.0000	103.00	No Ice	1.05	1.05	0.04
(CSP - 11)			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						
3'4"x4" Pipe Mount	C	From Leg	6.00	0.0000	103.00	No Ice	1.05	1.05	0.04
(CSP - 10)			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						
APXVSPP18-C-A20	A	From Leg	0.00	0.0000	72.00	No Ice	8.26	5.28	0.06
(Sprint)			0.00			1/2" Ice	8.81	5.74	0.11
			0.00						
APXVSPP18-C-A20	B	From Leg	0.00	0.0000	72.00	No Ice	8.26	5.28	0.06
(Sprint)			2.00			1/2" Ice	8.81	5.74	0.11
			0.00						
APXVSPP18-C-A20	C	From Face	0.00	0.0000	72.00	No Ice	8.26	5.28	0.06
(Sprint)			0.00			1/2" Ice	8.81	5.74	0.11
			0.00						
(2) ALU RRH 1900 4X45	A	From Leg	0.00	0.0000	72.00	No Ice	2.71	2.98	0.07
65MHz			0.00			1/2" Ice	2.95	3.35	0.10
(Sprint)			0.50						
(2) ALU RRH 1900 4X45	B	From Leg	0.00	0.0000	72.00	No Ice	2.71	2.98	0.07
65MHz			2.00			1/2" Ice	2.95	3.35	0.10
(Sprint)			0.50						
(2) ALU RRH 1900 4X45	C	From Face	0.00	0.0000	72.00	No Ice	2.71	2.98	0.07
65MHz			0.00			1/2" Ice	2.95	3.35	0.10
(Sprint)			0.50						
ALU RRH 800 MHz 2x50W	A	From Leg	0.00	0.0000	72.00	No Ice	2.00	1.89	0.06
(Sprint)			0.00			1/2" Ice	2.19	2.17	0.09
			3.00						
ALU RRH 800 MHz 2x50W	B	From Leg	0.00	0.0000	72.00	No Ice	2.00	1.89	0.06
(Sprint)			2.00			1/2" Ice	2.19	2.17	0.09
			3.00						
ALU RRH 800 MHz 2x50W	C	From Face	0.00	0.0000	72.00	No Ice	2.00	1.89	0.06
(Sprint)			0.00			1/2" Ice	2.19	2.17	0.09
			3.00						
800 MHz NOTCH FILTER	A	From Leg	0.00	0.0000	72.00	No Ice	0.87	0.49	0.01
(Sprint)			0.00			1/2" Ice	0.99	0.65	0.02
			3.00						
800 MHz NOTCH FILTER	B	From Leg	0.00	0.0000	72.00	No Ice	0.87	0.49	0.01
(Sprint)			2.00			1/2" Ice	0.99	0.65	0.02
			3.00						
800 MHz NOTCH FILTER	C	From Face	0.00	0.0000	72.00	No Ice	0.87	0.49	0.01
(Sprint)			0.00			1/2" Ice	0.99	0.65	0.02
			3.00						
1900 RRH COMBINER	A	From Leg	0.00	0.0000	72.00	No Ice	1.31	0.42	0.04
(Sprint)			0.00			1/2" Ice	1.48	0.56	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.50						
1900 RRH COMBINER (Sprint)	B	From Leg	0.00 2.00 0.50	0.0000	72.00	No Ice 1/2" Ice	1.31 1.48	0.42 0.56	0.04 0.05
1900 RRH COMBINER (Sprint)	C	From Face	0.00 0.00 0.50	0.0000	72.00	No Ice 1/2" Ice	1.31 1.48	0.42 0.56	0.04 0.05

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
4 FT DISH (NHVN - 44)	A	Paraboloid w/Radome	From Leg	1.50 5.00 0.00	0.0000		40.00	4.00	No Ice 1/2" Ice	12.57 13.10	0.14 0.28
6FT DISH (CSP - 4)	A	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	30.0000		115.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59
6FT DISH (CSP - 6)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	-30.0000		116.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59
6FT DISH (CSP - 7)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	60.0000		111.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59
6FT DISH (CSP - 66)	A	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	0.0000		120.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59
6FT DISH (CSP - 67)	B	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	0.0000		120.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59
6FT DISH (CSP - 68)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	0.0000		120.00	6.00	No Ice 1/2" Ice	28.30 29.05	0.44 0.59

Tower Pressures - No Ice

$G_H = 1.149$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 120.00-116.67	118.33	1.44	30	39.883	A B	4.557 4.950	6.028 3.103	2.781	26.27 34.53	0.000 0.000	0.000 0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	4.994	2.781		35.77	0.000	0.000
T2	112.50	1.42	29	103.599	A	8.811	15.070	6.952	29.11	0.000	0.000
116.67-108.33					B	6.469	7.757		48.87	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3	104.17	1.389	29	109.157	A	8.868	21.670	6.952	22.76	0.000	0.000
108.33-100.00					B	6.536	10.232		41.46	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4	95.83	1.356	28	114.715	A	9.482	22.716	6.952	21.59	0.000	0.000
100.00-91.67					B	6.935	15.182		31.43	0.000	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	120.273	A	9.594	25.182	6.952	19.99	0.000	0.000
					B	6.866	20.132		25.75	0.000	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	125.831	A	9.836	25.799	6.952	19.51	0.000	0.000
					B	6.874	24.082		22.46	0.000	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	412.014	A	32.879	88.287	23.204	19.15	0.000	0.000
					B	22.633	102.971		18.47	0.000	0.000
					C	28.445	23.204		44.93	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	460.861	A	35.479	89.376	20.856	16.70	0.000	0.000
					B	24.500	114.601		14.99	0.000	0.000
					C	31.113	20.856		40.13	0.000	0.000
T9 25.00-0.00	12.50	1	21	514.792	A	34.766	80.752	28.676	24.82	0.000	0.000
					B	26.365	102.127		22.32	0.000	0.000
					C	31.026	28.676		48.03	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.149$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	118.33	1.44	30	0.5000	40.161	A	4.295	10.247	3.337	22.95	0.000	0.000
120.00-116.67						B	5.213	5.732		30.49	0.000	0.000
						C	4.994	5.334		32.31	0.000	0.000
T2	112.50	1.42	29	0.5000	104.294	A	9.635	23.450	8.342	25.21	0.000	0.000
116.67-108.33						B	7.201	11.998		43.45	0.000	0.000
						C	6.523	10.951		47.74	0.000	0.000
T3	104.17	1.389	29	0.5000	109.852	A	9.583	33.213	8.342	19.49	0.000	0.000
108.33-100.00						B	7.187	15.717		36.42	0.000	0.000
						C	6.751	11.043		46.88	0.000	0.000
T4 100.00-91.67	95.83	1.356	28	0.5000	115.410	A	10.100	35.149	8.342	18.44	0.000	0.000
						B	7.404	23.070		27.37	0.000	0.000
						C	7.506	11.135		44.75	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	0.5000	120.968	A	10.072	39.825	8.342	16.72	0.000	0.000
						B	7.169	30.430		22.19	0.000	0.000
						C	7.766	11.227		43.92	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	0.5000	126.526	A	10.289	41.075	8.342	16.24	0.000	0.000
						B	7.017	36.821		19.03	0.000	0.000
						C	8.028	11.321		43.11	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	0.5000	414.099	A	41.737	133.266	27.375	15.64	0.000	0.000
						B	24.682	157.791		15.00	0.000	0.000
						C	28.445	36.857		41.92	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	0.5000	462.946	A	45.346	137.308	25.027	13.70	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	31.311	178.105		11.95	0.000	0.000
						C	31.113	35.398		37.63	0.000	0.000
T9 25.00-0.00	12.50	1	21	0.5000	516.877	A	42.546	119.340	32.848	20.29	0.000	0.000
						B	34.275	152.891		17.55	0.000	0.000
						C	31.026	41.259		45.44	0.000	0.000

Tower Pressure - Service

$G_H = 1.149$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	118.33	1.44	30	39.883	A	4.557	6.028	2.781	26.27	0.000	0.000
120.00-116.67					B	4.950	3.103		34.53	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2	112.50	1.42	29	103.599	A	8.811	15.070	6.952	29.11	0.000	0.000
116.67-108.33					B	6.469	7.757		48.87	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3	104.17	1.389	29	109.157	A	8.868	21.670	6.952	22.76	0.000	0.000
108.33-100.00					B	6.536	10.232		41.46	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4	95.83	1.356	28	114.715	A	9.482	22.716	6.952	21.59	0.000	0.000
100.00-91.67					B	6.935	15.182		31.43	0.000	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	120.273	A	9.594	25.182	6.952	19.99	0.000	0.000
					B	6.866	20.132		25.75	0.000	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	125.831	A	9.836	25.799	6.952	19.51	0.000	0.000
					B	6.874	24.082		22.46	0.000	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	412.014	A	32.879	88.287	23.204	19.15	0.000	0.000
					B	22.633	102.971		18.47	0.000	0.000
					C	28.445	23.204		44.93	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	460.861	A	35.479	89.376	20.856	16.70	0.000	0.000
					B	24.500	114.601		14.99	0.000	0.000
					C	31.113	20.856		40.13	0.000	0.000
T9 25.00-0.00	12.50	1	21	514.792	A	34.766	80.752	28.676	24.82	0.000	0.000
					B	26.365	102.127		22.32	0.000	0.000
					C	31.026	28.676		48.03	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	1	1	8.209	0.67	202.16	A
120.00-116.67			B	0.202	2.59	0.591	1	1	6.783			
			C	0.195	2.613	0.589	1	1	6.632			
T2	0.07	0.77	A	0.231	2.497	0.597	1	1	17.810	1.50	180.51	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
116.67-108.33			B	0.137	2.819	0.58	1	1	10.966			
			C	0.13	2.846	0.579	1	1	10.546			
T3	0.12	0.78	A	0.28	2.351	0.61	1	1	22.085	1.72	206.17	A
108.33-100.00			B	0.154	2.758	0.582	1	1	12.491			
			C	0.126	2.864	0.578	1	1	10.769			
T4	0.16	0.92	A	0.281	2.349	0.61	1	1	23.343	1.77	212.55	A
100.00-91.67			B	0.193	2.62	0.589	1	1	15.877			
			C	0.126	2.862	0.578	1	1	11.525			
T5	0.21	0.94	A	0.289	2.325	0.613	1	1	25.022	1.83	219.79	A
91.67-83.33			B	0.224	2.516	0.596	1	1	18.858			
			C	0.122	2.876	0.578	1	1	11.782			
T6	0.25	1.30	A	0.283	2.342	0.611	1	1	25.596	1.83	220.03	A
83.33-75.00			B	0.246	2.449	0.601	1	1	21.345			
			C	0.119	2.889	0.577	1	1	12.041			
T7	0.98	4.33	A	0.294	2.312	0.614	1	1	87.097	5.76	230.30	A
75.00-50.00			B	0.305	2.283	0.617	1	1	86.207			
			C	0.125	2.864	0.578	1	1	41.857			
T8	1.07	4.95	A	0.271	2.376	0.607	1	1	89.769	5.39	215.48	B
50.00-25.00			B	0.302	2.291	0.616	1	1	95.147			
			C	0.113	2.913	0.576	1	1	43.136			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	1	1	82.869	5.10	204.10	B
			B	0.25	2.439	0.602	1	1	87.823			
			C	0.116	2.901	0.577	1	1	47.568			
Sum Weight:	3.71	19.54						OTM	1528.74 kip-ft	25.58		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.825	1	7.412	0.61	182.52	A
120.00-116.67			B	0.202	2.59	0.591	0.825	1	5.917			
			C	0.195	2.613	0.589	0.825	1	5.759			
T2	0.07	0.77	A	0.231	2.497	0.597	0.825	1	16.268	1.37	164.88	A
116.67-108.33			B	0.137	2.819	0.58	0.825	1	9.833			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3	0.12	0.78	A	0.28	2.351	0.61	0.825	1	20.533	1.60	191.68	A
108.33-100.00			B	0.154	2.758	0.582	0.825	1	11.348			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4	0.16	0.92	A	0.281	2.349	0.61	0.825	1	21.684	1.65	197.44	A
100.00-91.67			B	0.193	2.62	0.589	0.825	1	14.663			
			C	0.126	2.862	0.578	0.825	1	10.211			
T5	0.21	0.94	A	0.289	2.325	0.613	0.825	1	23.343	1.71	205.04	A
91.67-83.33			B	0.224	2.516	0.596	0.825	1	17.657			
			C	0.122	2.876	0.578	0.825	1	10.423			
T6	0.25	1.30	A	0.283	2.342	0.611	0.825	1	23.875	1.71	205.24	A
83.33-75.00			B	0.246	2.449	0.601	0.825	1	20.142			
			C	0.119	2.889	0.577	0.825	1	10.636			
T7	0.98	4.33	A	0.294	2.312	0.614	0.825	1	81.343	5.38	215.09	A
75.00-50.00			B	0.305	2.283	0.617	0.825	1	82.246			
			C	0.125	2.864	0.578	0.825	1	36.879			
T8	1.07	4.95	A	0.271	2.376	0.607	0.825	1	83.560	5.14	205.77	B
50.00-25.00			B	0.302	2.291	0.616	0.825	1	90.860			
			C	0.113	2.913	0.576	0.825	1	37.691			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.825	1	76.785	4.83	193.38	B
			B	0.25	2.439	0.602	0.825	1	83.209			
			C	0.116	2.901	0.577	0.825	1	42.139			
Sum Weight:	3.71	19.54						OTM	1424.96 kip-ft	24.00		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.8	1	7.298	0.60	179.72	A
120.00-116.67			B	0.202	2.59	0.591	0.8	1	5.793			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2	0.07	0.77	A	0.231	2.497	0.597	0.8	1	16.047	1.36	162.65	A
116.67-108.33			B	0.137	2.819	0.58	0.8	1	9.672			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3	0.12	0.78	A	0.28	2.351	0.61	0.8	1	20.311	1.58	189.61	A
108.33-100.00			B	0.154	2.758	0.582	0.8	1	11.184			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4	0.16	0.92	A	0.281	2.349	0.61	0.8	1	21.446	1.63	195.29	A
100.00-91.67			B	0.193	2.62	0.589	0.8	1	14.490			
			C	0.126	2.862	0.578	0.8	1	10.024			
T5	0.21	0.94	A	0.289	2.325	0.613	0.8	1	23.103	1.69	202.93	A
91.67-83.33			B	0.224	2.516	0.596	0.8	1	17.485			
			C	0.122	2.876	0.578	0.8	1	10.228			
T6	0.25	1.30	A	0.283	2.342	0.611	0.8	1	23.629	1.69	203.12	A
83.33-75.00			B	0.246	2.449	0.601	0.8	1	19.970			
			C	0.119	2.889	0.577	0.8	1	10.435			
T7	0.98	4.33	A	0.294	2.312	0.614	0.8	1	80.521	5.33	213.30	B
75.00-50.00			B	0.305	2.283	0.617	0.8	1	81.680			
			C	0.125	2.864	0.578	0.8	1	36.168			
T8	1.07	4.95	A	0.271	2.376	0.607	0.8	1	82.673	5.11	204.38	B
50.00-25.00			B	0.302	2.291	0.616	0.8	1	90.247			
			C	0.113	2.913	0.576	0.8	1	36.913			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.8	1	75.916	4.80	191.85	B
			B	0.25	2.439	0.602	0.8	1	82.550			
			C	0.116	2.901	0.577	0.8	1	41.363			
Sum Weight:	3.71	19.54						OTM	1410.74 kip-ft	23.78		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.85	1	7.526	0.62	185.33	A
120.00-116.67			B	0.202	2.59	0.591	0.85	1	6.041			
			C	0.195	2.613	0.589	0.85	1	5.883			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.07	0.77	A	0.231	2.497	0.597	0.85	1	16.488	1.39	167.11	A
116.67-108.33			B	0.137	2.819	0.58	0.85	1	9.995			
			C	0.13	2.846	0.579	0.85	1	9.567			
T3	0.12	0.78	A	0.28	2.351	0.61	0.85	1	20.755	1.61	193.75	A
108.33-100.00			B	0.154	2.758	0.582	0.85	1	11.511			
			C	0.126	2.864	0.578	0.85	1	9.757			
T4	0.16	0.92	A	0.281	2.349	0.61	0.85	1	21.921	1.66	199.60	A
100.00-91.67			B	0.193	2.62	0.589	0.85	1	14.836			
			C	0.126	2.862	0.578	0.85	1	10.399			
T5	0.21	0.94	A	0.289	2.325	0.613	0.85	1	23.583	1.73	207.15	A
91.67-83.33			B	0.224	2.516	0.596	0.85	1	17.829			
			C	0.122	2.876	0.578	0.85	1	10.617			
T6	0.25	1.30	A	0.283	2.342	0.611	0.85	1	24.121	1.73	207.35	A
83.33-75.00			B	0.246	2.449	0.601	0.85	1	20.313			
			C	0.119	2.889	0.577	0.85	1	10.836			
T7	0.98	4.33	A	0.294	2.312	0.614	0.85	1	82.165	5.43	217.26	A
75.00-50.00			B	0.305	2.283	0.617	0.85	1	82.812			
			C	0.125	2.864	0.578	0.85	1	37.590			
T8	1.07	4.95	A	0.271	2.376	0.607	0.85	1	84.447	5.18	207.15	B
50.00-25.00			B	0.302	2.291	0.616	0.85	1	91.472			
			C	0.113	2.913	0.576	0.85	1	38.469			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.85	1	77.654	4.87	194.91	B
			B	0.25	2.439	0.602	0.85	1	83.868			
			C	0.116	2.901	0.577	0.85	1	42.914			
Sum Weight:	3.71	19.54						OTM	1439.79 kip-ft	24.23		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.06	0.69	A	0.362	2.144	0.637	1	1	10.821	0.80	238.83	A
120.00-116.67			B	0.273	2.372	0.608	1	1	8.698			
			C	0.257	2.416	0.604	1	1	8.214			
T2	0.18	1.12	A	0.317	2.251	0.621	1	1	24.205	1.84	221.16	A
116.67-108.33			B	0.184	2.65	0.587	1	1	14.247			
			C	0.168	2.708	0.584	1	1	12.922			
T3	0.33	1.14	A	0.39	2.085	0.647	1	1	31.085	2.14	257.33	A
108.33-100.00			B	0.209	2.568	0.592	1	1	16.495			
			C	0.162	2.728	0.583	1	1	13.193			
T4	0.42	1.34	A	0.392	2.08	0.648	1	1	32.891	2.21	265.22	A
100.00-91.67			B	0.264	2.396	0.606	1	1	21.374			
			C	0.162	2.73	0.583	1	1	14.001			
T5	0.54	1.38	A	0.412	2.04	0.657	1	1	36.229	2.33	279.15	A
91.67-83.33			B	0.311	2.268	0.619	1	1	26.014			
			C	0.157	2.746	0.583	1	1	14.307			
T6	0.67	1.74	A	0.406	2.052	0.654	1	1	37.154	2.33	279.93	A
83.33-75.00			B	0.346	2.18	0.631	1	1	30.259			
			C	0.153	2.761	0.582	1	1	14.616			
T7	2.70	5.89	A	0.423	2.021	0.661	1	1	129.838	7.50	300.12	A
75.00-50.00			B	0.441	1.989	0.669	1	1	130.249			
			C	0.158	2.743	0.583	1	1	49.921			
T8	2.99	6.61	A	0.395	2.075	0.649	1	1	134.513	7.37	294.79	B
50.00-25.00			B	0.452	1.97	0.674	1	1	151.417			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.144	2.795	0.581	1	1	51.662			
T9 25.00-0.00	2.31	6.79	A	0.313	2.261	0.62	1	1	116.540	6.72	268.97	B
			B	0.362	2.144	0.637	1	1	131.648			
			C	0.14	2.809	0.58	1	1	54.955			
Sum Weight:	10.20	26.70						OTM	1954.31 kip-ft	33.25		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.06	0.69	A	0.362	2.144	0.637	0.825	1	10.070	0.74	222.24	A
120.00-116.67			B	0.273	2.372	0.608	0.825	1	7.786			
			C	0.257	2.416	0.604	0.825	1	7.340			
T2	0.18	1.12	A	0.317	2.251	0.621	0.825	1	22.519	1.71	205.75	A
116.67-108.33			B	0.184	2.65	0.587	0.825	1	12.987			
			C	0.168	2.708	0.584	0.825	1	11.781			
T3	0.33	1.14	A	0.39	2.085	0.647	0.825	1	29.408	2.03	243.45	A
108.33-100.00			B	0.209	2.568	0.592	0.825	1	15.237			
			C	0.162	2.728	0.583	0.825	1	12.012			
T4	0.42	1.34	A	0.392	2.08	0.648	0.825	1	31.123	2.09	250.97	A
100.00-91.67			B	0.264	2.396	0.606	0.825	1	20.079			
			C	0.162	2.73	0.583	0.825	1	12.687			
T5	0.54	1.38	A	0.412	2.04	0.657	0.825	1	34.466	2.21	265.57	A
91.67-83.33			B	0.311	2.268	0.619	0.825	1	24.759			
			C	0.157	2.746	0.583	0.825	1	12.948			
T6	0.67	1.74	A	0.406	2.052	0.654	0.825	1	35.354	2.22	266.36	A
83.33-75.00			B	0.346	2.18	0.631	0.825	1	29.031			
			C	0.153	2.761	0.582	0.825	1	13.211			
T7	2.70	5.89	A	0.423	2.021	0.661	0.825	1	122.534	7.16	286.50	B
75.00-50.00			B	0.441	1.989	0.669	0.825	1	125.930			
			C	0.158	2.743	0.583	0.825	1	44.943			
T8	2.99	6.61	A	0.395	2.075	0.649	0.825	1	126.577	7.10	284.12	B
50.00-25.00			B	0.452	1.97	0.674	0.825	1	145.938			
			C	0.144	2.795	0.581	0.825	1	46.218			
T9 25.00-0.00	2.31	6.79	A	0.313	2.261	0.62	0.825	1	109.095	6.42	256.72	B
			B	0.362	2.144	0.637	0.825	1	125.649			
			C	0.14	2.809	0.58	0.825	1	49.526			
Sum Weight:	10.20	26.70						OTM	1855.93 kip-ft	31.69		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.06	0.69	A	0.362	2.144	0.637	0.8	1	9.962	0.73	219.87	A
120.00-116.67			B	0.273	2.372	0.608	0.8	1	7.655			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.257	2.416	0.604	0.8	1	7.215			
T2	0.18	1.12	A	0.317	2.251	0.621	0.8	1	22.278	1.70	203.55	A
116.67-108.33			B	0.184	2.65	0.587	0.8	1	12.807			
			C	0.168	2.708	0.584	0.8	1	11.618			
T3	0.33	1.14	A	0.39	2.085	0.647	0.8	1	29.168	2.01	241.47	A
108.33-100.00			B	0.209	2.568	0.592	0.8	1	15.057			
			C	0.162	2.728	0.583	0.8	1	11.843			
T4	0.42	1.34	A	0.392	2.08	0.648	0.8	1	30.871	2.07	248.93	A
100.00-91.67			B	0.264	2.396	0.606	0.8	1	19.893			
			C	0.162	2.73	0.583	0.8	1	12.500			
T5	0.54	1.38	A	0.412	2.04	0.657	0.8	1	34.214	2.20	263.63	A
91.67-83.33			B	0.311	2.268	0.619	0.8	1	24.580			
			C	0.157	2.746	0.583	0.8	1	12.754			
T6	0.67	1.74	A	0.406	2.052	0.654	0.8	1	35.097	2.20	264.42	A
83.33-75.00			B	0.346	2.18	0.631	0.8	1	28.855			
			C	0.153	2.761	0.582	0.8	1	13.010			
T7	2.70	5.89	A	0.423	2.021	0.661	0.8	1	121.491	7.13	285.10	B
75.00-50.00			B	0.441	1.989	0.669	0.8	1	125.313			
			C	0.158	2.743	0.583	0.8	1	44.232			
T8	2.99	6.61	A	0.395	2.075	0.649	0.8	1	125.444	7.06	282.60	B
50.00-25.00			B	0.452	1.97	0.674	0.8	1	145.155			
			C	0.144	2.795	0.581	0.8	1	45.440			
T9 25.00-0.00	2.31	6.79	A	0.313	2.261	0.62	0.8	1	108.031	6.37	254.96	B
			B	0.362	2.144	0.637	0.8	1	124.793			
			C	0.14	2.809	0.58	0.8	1	48.750			
Sum Weight:	10.20	26.70						OTM	1842.72 kip-ft	31.48		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.06	0.69	A	0.362	2.144	0.637	0.85	1	10.177	0.75	224.61	A
120.00-116.67			B	0.273	2.372	0.608	0.85	1	7.916			
			C	0.257	2.416	0.604	0.85	1	7.465			
T2	0.18	1.12	A	0.317	2.251	0.621	0.85	1	22.760	1.73	207.96	A
116.67-108.33			B	0.184	2.65	0.587	0.85	1	13.167			
			C	0.168	2.708	0.584	0.85	1	11.944			
T3	0.33	1.14	A	0.39	2.085	0.647	0.85	1	29.647	2.05	245.43	A
108.33-100.00			B	0.209	2.568	0.592	0.85	1	15.417			
			C	0.162	2.728	0.583	0.85	1	12.180			
T4	0.42	1.34	A	0.392	2.08	0.648	0.85	1	31.376	2.11	253.01	A
100.00-91.67			B	0.264	2.396	0.606	0.85	1	20.264			
			C	0.162	2.73	0.583	0.85	1	12.875			
T5	0.54	1.38	A	0.412	2.04	0.657	0.85	1	34.718	2.23	267.51	A
91.67-83.33			B	0.311	2.268	0.619	0.85	1	24.938			
			C	0.157	2.746	0.583	0.85	1	13.142			
T6	0.67	1.74	A	0.406	2.052	0.654	0.85	1	35.611	2.24	268.30	A
83.33-75.00			B	0.346	2.18	0.631	0.85	1	29.206			
			C	0.153	2.761	0.582	0.85	1	13.412			
T7	2.70	5.89	A	0.423	2.021	0.661	0.85	1	123.577	7.20	287.90	B
75.00-50.00			B	0.441	1.989	0.669	0.85	1	126.547			
			C	0.158	2.743	0.583	0.85	1	45.654			
T8	2.99	6.61	A	0.395	2.075	0.649	0.85	1	127.711	7.14	285.65	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
50.00-25.00			B	0.452	1.97	0.674	0.85	1	146.721			
			C	0.144	2.795	0.581	0.85	1	46.995			
T9 25.00-0.00	2.31	6.79	A	0.313	2.261	0.62	0.85	1	110.158	6.46	258.47	B
			B	0.362	2.144	0.637	0.85	1	126.506			
			C	0.14	2.809	0.58	0.85	1	50.301			
Sum Weight:	10.20	26.70						OTM	1869.13 kip-ft	31.90		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	1	1	8.209	0.67	202.16	A
120.00-116.67			B	0.202	2.59	0.591	1	1	6.783			
			C	0.195	2.613	0.589	1	1	6.632			
T2	0.07	0.77	A	0.231	2.497	0.597	1	1	17.810	1.50	180.51	A
116.67-108.33			B	0.137	2.819	0.58	1	1	10.966			
			C	0.13	2.846	0.579	1	1	10.546			
T3	0.12	0.78	A	0.28	2.351	0.61	1	1	22.085	1.72	206.17	A
108.33-100.00			B	0.154	2.758	0.582	1	1	12.491			
			C	0.126	2.864	0.578	1	1	10.769			
T4	0.16	0.92	A	0.281	2.349	0.61	1	1	23.343	1.77	212.55	A
100.00-91.67			B	0.193	2.62	0.589	1	1	15.877			
			C	0.126	2.862	0.578	1	1	11.525			
T5	0.21	0.94	A	0.289	2.325	0.613	1	1	25.022	1.83	219.79	A
91.67-83.33			B	0.224	2.516	0.596	1	1	18.858			
			C	0.122	2.876	0.578	1	1	11.782			
T6	0.25	1.30	A	0.283	2.342	0.611	1	1	25.596	1.83	220.03	A
83.33-75.00			B	0.246	2.449	0.601	1	1	21.345			
			C	0.119	2.889	0.577	1	1	12.041			
T7	0.98	4.33	A	0.294	2.312	0.614	1	1	87.097	5.76	230.30	A
75.00-50.00			B	0.305	2.283	0.617	1	1	86.207			
			C	0.125	2.864	0.578	1	1	41.857			
T8	1.07	4.95	A	0.271	2.376	0.607	1	1	89.769	5.39	215.48	B
50.00-25.00			B	0.302	2.291	0.616	1	1	95.147			
			C	0.113	2.913	0.576	1	1	43.136			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	1	1	82.869	5.10	204.10	B
			B	0.25	2.439	0.602	1	1	87.823			
			C	0.116	2.901	0.577	1	1	47.568			
Sum Weight:	3.71	19.54						OTM	1528.74 kip-ft	25.58		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.825	1	7.412	0.61	182.52	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
120.00-116.67			B	0.202	2.59	0.591	0.825	1	5.917			
			C	0.195	2.613	0.589	0.825	1	5.759			
T2	0.07	0.77	A	0.231	2.497	0.597	0.825	1	16.268	1.37	164.88	A
116.67-108.33			B	0.137	2.819	0.58	0.825	1	9.833			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3	0.12	0.78	A	0.28	2.351	0.61	0.825	1	20.533	1.60	191.68	A
108.33-100.00			B	0.154	2.758	0.582	0.825	1	11.348			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4	0.16	0.92	A	0.281	2.349	0.61	0.825	1	21.684	1.65	197.44	A
100.00-91.67			B	0.193	2.62	0.589	0.825	1	14.663			
			C	0.126	2.862	0.578	0.825	1	10.211			
T5	0.21	0.94	A	0.289	2.325	0.613	0.825	1	23.343	1.71	205.04	A
91.67-83.33			B	0.224	2.516	0.596	0.825	1	17.657			
			C	0.122	2.876	0.578	0.825	1	10.423			
T6	0.25	1.30	A	0.283	2.342	0.611	0.825	1	23.875	1.71	205.24	A
83.33-75.00			B	0.246	2.449	0.601	0.825	1	20.142			
			C	0.119	2.889	0.577	0.825	1	10.636			
T7	0.98	4.33	A	0.294	2.312	0.614	0.825	1	81.343	5.38	215.09	A
75.00-50.00			B	0.305	2.283	0.617	0.825	1	82.246			
			C	0.125	2.864	0.578	0.825	1	36.879			
T8	1.07	4.95	A	0.271	2.376	0.607	0.825	1	83.560	5.14	205.77	B
50.00-25.00			B	0.302	2.291	0.616	0.825	1	90.860			
			C	0.113	2.913	0.576	0.825	1	37.691			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.825	1	76.785	4.83	193.38	B
			B	0.25	2.439	0.602	0.825	1	83.209			
			C	0.116	2.901	0.577	0.825	1	42.139			
Sum Weight:	3.71	19.54						OTM	1424.96 kip-ft	24.00		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.8	1	7.298	0.60	179.72	A
120.00-116.67			B	0.202	2.59	0.591	0.8	1	5.793			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2	0.07	0.77	A	0.231	2.497	0.597	0.8	1	16.047	1.36	162.65	A
116.67-108.33			B	0.137	2.819	0.58	0.8	1	9.672			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3	0.12	0.78	A	0.28	2.351	0.61	0.8	1	20.311	1.58	189.61	A
108.33-100.00			B	0.154	2.758	0.582	0.8	1	11.184			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4	0.16	0.92	A	0.281	2.349	0.61	0.8	1	21.446	1.63	195.29	A
100.00-91.67			B	0.193	2.62	0.589	0.8	1	14.490			
			C	0.126	2.862	0.578	0.8	1	10.024			
T5	0.21	0.94	A	0.289	2.325	0.613	0.8	1	23.103	1.69	202.93	A
91.67-83.33			B	0.224	2.516	0.596	0.8	1	17.485			
			C	0.122	2.876	0.578	0.8	1	10.228			
T6	0.25	1.30	A	0.283	2.342	0.611	0.8	1	23.629	1.69	203.12	A
83.33-75.00			B	0.246	2.449	0.601	0.8	1	19.970			
			C	0.119	2.889	0.577	0.8	1	10.435			
T7	0.98	4.33	A	0.294	2.312	0.614	0.8	1	80.521	5.33	213.30	B
75.00-50.00			B	0.305	2.283	0.617	0.8	1	81.680			
			C	0.125	2.864	0.578	0.8	1	36.168			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T8	1.07	4.95	A	0.271	2.376	0.607	0.8	1	82.673	5.11	204.38	B
50.00-25.00			B	0.302	2.291	0.616	0.8	1	90.247			
			C	0.113	2.913	0.576	0.8	1	36.913			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.8	1	75.916	4.80	191.85	B
			B	0.25	2.439	0.602	0.8	1	82.550			
			C	0.116	2.901	0.577	0.8	1	41.363			
Sum Weight:	3.71	19.54						OTM	1410.74 kip-ft	23.78		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.02	0.45	A	0.265	2.392	0.606	0.85	1	7.526	0.62	185.33	A
120.00-116.67			B	0.202	2.59	0.591	0.85	1	6.041			
			C	0.195	2.613	0.589	0.85	1	5.883			
T2	0.07	0.77	A	0.231	2.497	0.597	0.85	1	16.488	1.39	167.11	A
116.67-108.33			B	0.137	2.819	0.58	0.85	1	9.995			
			C	0.13	2.846	0.579	0.85	1	9.567			
T3	0.12	0.78	A	0.28	2.351	0.61	0.85	1	20.755	1.61	193.75	A
108.33-100.00			B	0.154	2.758	0.582	0.85	1	11.511			
			C	0.126	2.864	0.578	0.85	1	9.757			
T4	0.16	0.92	A	0.281	2.349	0.61	0.85	1	21.921	1.66	199.60	A
100.00-91.67			B	0.193	2.62	0.589	0.85	1	14.836			
			C	0.126	2.862	0.578	0.85	1	10.399			
T5	0.21	0.94	A	0.289	2.325	0.613	0.85	1	23.583	1.73	207.15	A
91.67-83.33			B	0.224	2.516	0.596	0.85	1	17.829			
			C	0.122	2.876	0.578	0.85	1	10.617			
T6	0.25	1.30	A	0.283	2.342	0.611	0.85	1	24.121	1.73	207.35	A
83.33-75.00			B	0.246	2.449	0.601	0.85	1	20.313			
			C	0.119	2.889	0.577	0.85	1	10.836			
T7	0.98	4.33	A	0.294	2.312	0.614	0.85	1	82.165	5.43	217.26	A
75.00-50.00			B	0.305	2.283	0.617	0.85	1	82.812			
			C	0.125	2.864	0.578	0.85	1	37.590			
T8	1.07	4.95	A	0.271	2.376	0.607	0.85	1	84.447	5.18	207.15	B
50.00-25.00			B	0.302	2.291	0.616	0.85	1	91.472			
			C	0.113	2.913	0.576	0.85	1	38.469			
T9 25.00-0.00	0.83	5.10	A	0.224	2.517	0.596	0.85	1	77.654	4.87	194.91	B
			B	0.25	2.439	0.602	0.85	1	83.868			
			C	0.116	2.901	0.577	0.85	1	42.914			
Sum Weight:	3.71	19.54						OTM	1439.79 kip-ft	24.23		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	6.83					
Bracing Weight	12.71					
Total Member Self-Weight	19.54			-20.93	-2.28	
Total Weight	32.69			-20.93	-2.28	
Wind 0 deg - No Ice		0.78	-44.81	-3437.72	-93.62	5.31
Wind 30 deg - No Ice		22.07	-36.92	-2819.16	-1715.35	-29.12
Wind 45 deg - No Ice		31.04	-29.68	-2263.88	-2408.98	-37.92
Wind 60 deg - No Ice		37.24	-21.22	-1645.48	-2867.67	-45.72
Wind 90 deg - No Ice		42.64	-1.48	-202.38	-3248.60	-60.74
Wind 120 deg - No Ice		37.96	22.04	1641.51	-2871.16	-52.11
Wind 135 deg - No Ice		29.27	30.84	2347.84	-2196.69	-35.72
Wind 150 deg - No Ice		20.07	37.97	2893.76	-1470.44	-22.25
Wind 180 deg - No Ice		0.31	43.14	3285.00	-32.46	9.78
Wind 210 deg - No Ice		-20.83	37.73	2868.42	1558.78	28.88
Wind 225 deg - No Ice		-30.04	30.75	2340.48	2285.09	36.65
Wind 240 deg - No Ice		-38.23	23.10	1766.39	2902.11	51.32
Wind 270 deg - No Ice		-42.20	0.78	62.85	3194.24	63.00
Wind 300 deg - No Ice		-35.67	-20.67	-1575.96	2684.26	51.78
Wind 315 deg - No Ice		-29.08	-29.97	-2293.61	2179.40	39.98
Wind 330 deg - No Ice		-20.48	-37.12	-2841.20	1524.81	30.53
Member Ice	7.16					
Total Weight Ice	50.86			-50.84	-7.61	
Wind 0 deg - Ice		0.79	-56.30	-4250.96	-100.70	11.19
Wind 30 deg - Ice		27.84	-46.85	-3528.16	-2116.49	-36.11
Wind 45 deg - Ice		39.21	-37.80	-2848.36	-2975.39	-50.67
Wind 60 deg - Ice		47.24	-26.97	-2068.99	-3559.46	-63.39
Wind 90 deg - Ice		54.15	-1.51	-236.41	-4041.92	-84.66
Wind 120 deg - Ice		47.92	27.78	2002.64	-3555.48	-75.82
Wind 135 deg - Ice		37.41	38.99	2876.83	-2758.46	-56.49
Wind 150 deg - Ice		25.80	47.94	3546.74	-1866.27	-38.94
Wind 180 deg - Ice		0.32	54.67	4045.06	-39.25	4.33
Wind 210 deg - Ice		-26.57	47.69	3520.05	1945.27	35.86
Wind 225 deg - Ice		-38.19	38.89	2868.33	2837.74	49.37
Wind 240 deg - Ice		-48.20	28.86	2129.67	3576.05	69.26
Wind 270 deg - Ice		-53.70	0.80	34.51	3975.59	86.97
Wind 300 deg - Ice		-45.64	-26.41	-1998.79	3361.33	75.31
Wind 315 deg - Ice		-37.21	-38.10	-2879.83	2730.15	60.85
Wind 330 deg - Ice		-26.22	-47.07	-3551.45	1911.52	47.43
Total Weight	32.69			-20.93	-2.28	
Wind 0 deg - Service		0.78	-44.81	-3422.84	-87.21	5.31
Wind 30 deg - Service		22.07	-36.92	-2804.28	-1708.94	-29.12
Wind 45 deg - Service		31.04	-29.68	-2249.00	-2402.57	-37.92
Wind 60 deg - Service		37.24	-21.22	-1630.60	-2861.26	-45.72
Wind 90 deg - Service		42.64	-1.48	-187.50	-3242.19	-60.74
Wind 120 deg - Service		37.96	22.04	1656.39	-2864.75	-52.11
Wind 135 deg - Service		29.27	30.84	2362.72	-2190.28	-35.72
Wind 150 deg - Service		20.07	37.97	2908.64	-1464.03	-22.25
Wind 180 deg - Service		0.31	43.14	3299.88	-26.05	9.78
Wind 210 deg - Service		-20.83	37.73	2883.30	1565.19	28.88
Wind 225 deg - Service		-30.04	30.75	2355.36	2291.50	36.65
Wind 240 deg - Service		-38.23	23.10	1781.27	2908.52	51.32
Wind 270 deg - Service		-42.20	0.78	77.72	3200.65	63.00
Wind 300 deg - Service		-35.67	-20.67	-1561.08	2690.67	51.78
Wind 315 deg - Service		-29.08	-29.97	-2278.73	2185.81	39.98
Wind 330 deg - Service		-20.48	-37.12	-2826.32	1531.22	30.53

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 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	120 - 116.667	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-1.30	1.04	-0.46
			Max. Mx	27	-0.78	-1.20	-0.52
			Max. My	27	-1.20	0.49	-1.59
			Max. Vy	27	0.78	-1.20	-0.52
			Max. Vx	26	0.85	0.14	-1.48
		Diagonal	Max Tension	31	1.58	0.00	0.00
			Max. Compression	31	-1.78	0.00	0.00
			Max. Mx	20	1.39	0.04	0.00
			Max. My	30	-0.11	0.00	-0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	32	1.76	0.02	0.01
			Max. Compression	24	-1.86	0.02	0.01
			Max. Mx	27	-0.73	0.03	0.00
			Max. My	34	1.60	0.02	0.01
			Max. Vy	27	0.02	0.03	0.00
			Max. Vx	19	-0.00	0.00	0.00
T2	116.667 - 108.333	Leg	Max Tension	15	0.51	-0.75	-0.02
			Max. Compression	30	-4.49	0.74	-0.30
			Max. Mx	27	0.25	-1.20	-0.52
			Max. My	27	-2.03	0.49	1.82
			Max. Vy	22	-1.13	-1.14	-0.05
			Max. Vx	27	-1.67	0.49	-1.59
		Diagonal	Max Tension	20	6.67	0.00	0.00
			Max. Compression	20	-6.83	0.00	0.00
			Max. Mx	20	6.67	0.07	0.00
			Max. My	30	0.23	0.00	-0.00
			Max. Vy	20	0.03	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Horizontal	Max Tension	27	4.45	0.00	0.00
			Max. Compression	19	-3.98	0.03	0.01
			Max. Mx	32	0.06	0.03	0.01
			Max. My	27	0.02	0.02	0.01
			Max. Vy	32	0.02	0.03	0.01
			Max. Vx	27	-0.00	0.00	0.00
T3	108.333 - 100	Leg	Max Tension	32	6.72	-0.77	-0.13
			Max. Compression	19	-12.93	0.40	0.04
			Max. Mx	27	6.30	-0.89	-0.17
			Max. My	27	-7.97	0.23	-1.20
			Max. Vy	27	-0.22	-0.89	-0.17
			Max. Vx	31	-0.30	-0.11	-1.05
		Diagonal	Max Tension	20	8.84	0.00	0.00
			Max. Compression	20	-9.00	0.00	0.00
			Max. Mx	20	8.84	0.07	0.00
			Max. My	30	0.73	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Horizontal	Max Tension	27	5.93	0.00	0.00
			Max. Compression	20	-5.46	0.03	0.02
			Max. Mx	32	0.13	0.03	0.01
			Max. My	27	0.02	0.03	0.02
			Max. Vy	32	0.02	0.03	0.01
			Max. Vx	27	-0.00	0.00	0.00
T4	100 - 91.6667	Leg	Max Tension	22	16.39	-0.41	0.19
			Max. Compression	19	-24.77	0.45	0.03
			Max. Mx	22	15.79	0.88	-0.00
			Max. My	31	-3.81	-0.05	0.84
			Max. Vy	22	0.44	-0.51	-0.00
			Max. Vx	31	0.45	-0.05	-0.47

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	20	9.87	0.00	0.00
			Max. Compression	20	-10.11	0.00	0.00
			Max. Mx	20	9.87	0.08	0.00
			Max. My	30	0.91	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	20	6.35	0.04	-0.00
			Max. Compression	28	-6.28	0.04	-0.00
			Max. Mx	22	0.31	0.06	0.02
			Max. My	30	1.26	0.03	-0.02
			Max. Vy	22	0.03	0.06	0.02
			Max. Vx	30	0.00	0.03	-0.02
		Inner Bracing	Max Tension	28	0.11	0.00	0.00
			Max. Compression	28	-0.11	0.00	0.00
			Max. Mx	18	-0.00	-0.03	0.00
			Max. My	19	0.10	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T5	91.6667 - 83.3333	Leg	Max Tension	22	27.00	-0.51	-0.00
			Max. Compression	19	-37.33	0.83	-0.03
			Max. Mx	27	26.50	-0.86	0.02
			Max. My	23	-8.83	-0.00	0.97
			Max. Vy	32	0.24	-0.85	-0.12
			Max. Vx	20	0.27	-0.01	-0.80
		Diagonal	Max Tension	20	10.92	0.00	0.00
			Max. Compression	20	-11.17	0.00	0.00
			Max. Mx	20	10.92	0.08	0.00
			Max. My	30	0.92	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	20	7.23	0.05	-0.00
			Max. Compression	28	-7.14	0.05	-0.00
			Max. Mx	22	0.28	0.07	0.02
			Max. My	30	1.37	0.03	-0.02
			Max. Vy	22	0.04	0.07	0.02
			Max. Vx	30	0.00	0.03	-0.02
		Inner Bracing	Max Tension	28	0.12	0.00	0.00
			Max. Compression	28	-0.12	0.00	0.00
			Max. Mx	18	-0.00	-0.03	0.00
			Max. My	19	0.11	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T6	83.3333 - 75	Leg	Max Tension	22	39.11	-0.85	0.09
			Max. Compression	19	-51.88	1.30	-0.09
			Max. Mx	27	37.75	-1.41	0.10
			Max. My	23	-11.29	-0.06	1.49
			Max. Vy	27	-0.64	-0.86	0.02
			Max. Vx	23	0.74	-0.00	0.97
		Diagonal	Max Tension	28	12.31	0.00	0.00
			Max. Compression	28	-12.66	0.00	0.00
			Max. Mx	20	12.30	0.14	0.00
			Max. My	30	0.95	0.00	-0.01
			Max. Vy	20	-0.05	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	28	8.35	0.05	-0.00
			Max. Compression	28	-8.27	0.05	-0.00
			Max. Mx	22	0.12	0.08	0.02
			Max. My	30	1.64	0.03	-0.02
			Max. Vy	22	0.04	0.08	0.02
			Max. Vx	30	0.00	0.03	-0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Inner Bracing	Max Tension	28	0.14	0.00	0.00
			Max. Compression	28	-0.14	0.00	0.00
			Max. Mx	18	-0.00	-0.03	0.00
			Max. My	19	0.13	0.00	-0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T7	75 - 50	Leg	Max Tension	22	84.65	-0.44	0.20
			Max. Compression	19	-106.56	0.34	0.01
			Max. Mx	27	51.48	-1.41	0.10
			Max. My	23	-12.79	-0.06	1.49
			Max. Vy	27	-0.85	-1.41	0.10
			Max. Vx	31	-0.86	-0.05	-1.49
		Diagonal	Max Tension	28	15.90	0.00	0.00
			Max. Compression	28	-16.29	0.00	0.00
			Max. Mx	20	15.84	0.16	0.00
			Max. My	30	1.42	0.00	-0.01
			Max. Vy	20	-0.05	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Horizontal	Max Tension	28	11.53	0.00	0.00
			Max. Compression	28	-11.39	0.07	-0.00
			Max. Mx	22	0.97	0.09	0.02
			Max. My	30	1.86	0.04	-0.03
			Max. Vy	22	0.04	0.09	0.02
			Max. Vx	19	0.00	0.04	-0.03
		Top Girt	Max Tension	28	10.00	0.06	-0.00
			Max. Compression	28	-9.85	0.06	-0.00
			Max. Mx	22	-0.08	0.08	0.02
			Max. My	19	1.24	0.04	-0.03
			Max. Vy	22	0.04	0.08	0.02
			Max. Vx	30	0.00	0.04	-0.03
		Inner Bracing	Max Tension	28	0.17	0.00	0.00
			Max. Compression	28	-0.17	0.00	0.00
			Max. Mx	18	-0.00	-0.04	0.00
			Max. My	19	0.01	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T8	50 - 25	Leg	Max Tension	22	135.93	-0.50	0.10
			Max. Compression	19	-166.64	0.36	-0.03
			Max. Mx	27	132.11	-0.50	0.04
			Max. My	23	-20.22	-0.02	0.68
			Max. Vy	27	-0.20	-0.50	0.07
			Max. Vx	24	0.32	-0.26	0.64
		Diagonal	Max Tension	28	17.03	0.00	0.00
			Max. Compression	28	-17.57	0.00	0.00
			Max. Mx	20	16.87	0.19	0.00
			Max. My	30	1.79	0.00	-0.01
			Max. Vy	20	-0.06	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Horizontal	Max Tension	28	13.06	0.00	0.00
			Max. Compression	28	-12.87	0.13	-0.00
			Max. Mx	22	1.50	0.20	0.02
			Max. My	30	2.11	0.07	-0.03
			Max. Vy	22	0.08	0.20	0.02
			Max. Vx	30	0.00	0.07	-0.03
		Top Girt	Max Tension	28	12.02	0.07	-0.00
			Max. Compression	28	-11.87	0.07	-0.00
			Max. Mx	22	1.05	0.10	0.02
			Max. My	30	1.86	0.04	-0.03
			Max. Vy	22	0.04	0.10	0.02
			Max. Vx	30	0.00	0.04	-0.03
		Inner Bracing	Max Tension	28	0.21	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	28	-0.21	0.00	0.00
			Max. Mx	18	-0.00	-0.05	0.00
			Max. My	19	0.17	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T9	25 - 0	Leg	Max Tension	22	178.20	-0.73	0.21
			Max. Compression	19	-216.01	0.00	-0.00
			Max. Mx	30	-182.27	1.42	-0.23
			Max. My	23	-26.23	0.35	1.30
			Max. Vy	30	0.21	1.42	-0.23
			Max. Vx	23	0.31	0.35	1.30
		Diagonal	Max Tension	25	21.52	0.00	0.00
			Max. Compression	25	-22.09	0.00	0.00
			Max. Mx	25	21.52	0.32	0.00
			Max. My	30	-2.77	0.00	0.01
			Max. Vy	25	-0.08	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Horizontal	Max Tension	33	14.03	0.00	0.00
			Max. Compression	25	-14.10	0.11	0.01
			Max. Mx	22	1.94	0.18	0.04
			Max. My	30	-0.77	-0.00	-0.05
			Max. Vy	22	0.07	0.18	0.04
			Max. Vx	30	0.01	-0.00	-0.05
		Top Girt	Max Tension	28	13.42	0.13	-0.00
			Max. Compression	29	-13.33	0.15	0.01
			Max. Mx	22	1.52	0.22	0.04
			Max. My	30	2.23	0.03	-0.05
			Max. Vy	22	0.07	0.22	0.04
			Max. Vx	30	0.01	0.03	-0.05
		Inner Bracing	Max Tension	29	0.23	0.00	0.00
			Max. Compression	29	-0.23	0.00	0.00
			Max. Mx	18	-0.01	-0.07	0.00
			Max. My	19	0.19	0.00	-0.00
			Max. Vy	18	-0.03	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	239.11	25.94	-17.27
	Max. H_x	30	239.11	25.94	-17.27
	Max. H_z	21	-196.88	-22.33	16.52
	Min. Vert	22	-203.09	-23.76	15.70
	Min. H_x	22	-203.09	-23.76	15.70
	Min. H_z	29	224.78	23.66	-17.34
Leg B	Max. Vert	24	234.63	-25.50	-17.15
	Max. H_x	32	-191.71	22.74	15.53
	Max. H_z	33	-186.05	21.33	16.40
	Min. Vert	32	-191.71	22.74	15.53
	Min. H_x	24	234.63	-25.50	-17.15
	Min. H_z	25	221.23	-23.23	-17.37
Leg A	Max. Vert	19	244.02	0.24	31.22
	Max. H_x	31	15.06	9.32	0.56
	Max. H_z	19	244.02	0.24	31.22
	Min. Vert	27	-199.13	0.09	-28.52

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_x	23	29.98	-9.28	1.90
	Min. H_z	27	-199.13	0.09	-28.52

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	32.69	0.00	0.00	-20.93	-2.28	0.00
Dead+Wind 0 deg - No Ice	32.69	0.78	-44.81	-3350.66	-93.78	5.29
Dead+Wind 30 deg - No Ice	32.69	22.07	-36.92	-2747.65	-1674.18	-29.15
Dead+Wind 45 deg - No Ice	32.69	31.04	-29.68	-2206.01	-2351.29	-37.96
Dead+Wind 60 deg - No Ice	32.69	37.24	-21.22	-1604.97	-2797.43	-45.76
Dead+Wind 90 deg - No Ice	32.69	42.64	-1.48	-202.82	-3166.00	-60.79
Dead+Wind 120 deg - No Ice	32.69	37.96	22.04	1597.80	-2795.62	-52.15
Dead+Wind 135 deg - No Ice	32.69	29.27	30.84	2290.07	-2138.69	-35.76
Dead+Wind 150 deg - No Ice	32.69	20.07	37.97	2822.37	-1428.86	-22.27
Dead+Wind 180 deg - No Ice	32.69	0.31	43.14	3203.88	-32.46	9.78
Dead+Wind 210 deg - No Ice	32.69	-20.83	37.73	2796.96	1517.42	28.91
Dead+Wind 225 deg - No Ice	32.69	-30.04	30.75	2282.68	2227.28	36.70
Dead+Wind 240 deg - No Ice	32.69	-38.23	23.10	1722.89	2826.65	51.37
Dead+Wind 270 deg - No Ice	32.69	-42.20	0.78	62.88	3111.57	63.06
Dead+Wind 300 deg - No Ice	32.69	-35.67	-20.67	-1535.32	2613.71	51.82
Dead+Wind 315 deg - No Ice	32.69	-29.08	-29.97	-2235.78	2121.33	40.01
Dead+Wind 330 deg - No Ice	32.69	-20.48	-37.12	-2769.72	1483.32	30.54
Dead+Ice+Temp	50.86	0.00	0.00	-50.83	-7.60	-0.00
Dead+Wind 0 deg+Ice+Temp	50.86	0.79	-56.30	-4133.16	-100.92	11.17
Dead+Wind 30 deg+Ice+Temp	50.86	27.84	-46.85	-3430.04	-2059.97	-36.18
Dead+Wind 45 deg+Ice+Temp	50.86	39.21	-37.80	-2768.77	-2896.01	-50.76
Dead+Wind 60 deg+Ice+Temp	50.86	47.24	-26.97	-2013.28	-3462.74	-63.50
Dead+Wind 90 deg+Ice+Temp	50.86	54.15	-1.51	-237.09	-3928.55	-84.77
Dead+Wind 120 deg+Ice+Temp	50.86	47.92	27.78	1943.38	-3453.24	-75.92
Dead+Wind 135 deg+Ice+Temp	50.86	37.41	38.99	2797.22	-2678.68	-56.59
Dead+Wind 150 deg+Ice+Temp	50.86	25.80	47.94	3448.65	-1809.23	-39.00
Dead+Wind 180 deg+Ice+Temp	50.86	0.32	54.67	3933.28	-39.26	4.33
Dead+Wind 210 deg+Ice+Temp	50.86	-26.57	47.69	3421.89	1888.51	35.92
Dead+Wind 225 deg+Ice+Temp	50.86	-38.19	38.89	2788.69	2758.20	49.48
Dead+Wind 240 deg+Ice+Temp	50.86	-48.20	28.86	2070.71	3473.92	69.37
Dead+Wind 270 deg+Ice+Temp	50.86	-53.70	0.80	34.48	3862.13	87.10
Dead+Wind 300 deg+Ice+Temp	50.86	-45.64	-26.41	-1942.90	3264.19	75.41
Dead+Wind 315 deg+Ice+Temp	50.86	-37.21	-38.10	-2800.29	2650.23	60.93
Dead+Wind 330 deg+Ice+Temp	50.86	-26.22	-47.07	-3453.38	1854.57	47.48
Dead+Wind 0 deg - Service	32.69	0.78	-44.81	-3350.66	-93.78	5.29
Dead+Wind 30 deg - Service	32.69	22.07	-36.92	-2747.65	-1674.18	-29.15
Dead+Wind 45 deg - Service	32.69	31.04	-29.68	-2206.01	-2351.29	-37.96
Dead+Wind 60 deg - Service	32.69	37.24	-21.22	-1604.97	-2797.43	-45.76
Dead+Wind 90 deg - Service	32.69	42.64	-1.48	-202.82	-3166.00	-60.79
Dead+Wind 120 deg - Service	32.69	37.96	22.04	1597.80	-2795.62	-52.15
Dead+Wind 135 deg - Service	32.69	29.27	30.84	2290.07	-2138.69	-35.76
Dead+Wind 150 deg - Service	32.69	20.07	37.97	2822.37	-1428.86	-22.27
Dead+Wind 180 deg - Service	32.69	0.31	43.14	3203.88	-32.46	9.78
Dead+Wind 210 deg - Service	32.69	-20.83	37.73	2796.96	1517.42	28.91
Dead+Wind 225 deg - Service	32.69	-30.04	30.75	2282.68	2227.28	36.70
Dead+Wind 240 deg - Service	32.69	-38.23	23.10	1722.89	2826.65	51.37
Dead+Wind 270 deg - Service	32.69	-42.20	0.78	62.88	3111.57	63.06
Dead+Wind 300 deg - Service	32.69	-35.67	-20.67	-1535.32	2613.71	51.82
Dead+Wind 315 deg - Service	32.69	-29.08	-29.97	-2235.78	2121.33	40.01

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 330 deg - Service	32.69	-20.48	-37.12	-2769.72	1483.32	30.54

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	-32.69	0.00	0.00	32.69	0.00	0.000%
2	0.78	-32.69	-44.81	-0.78	32.69	44.81	0.000%
3	22.07	-32.69	-36.92	-22.07	32.69	36.92	0.000%
4	31.04	-32.69	-29.68	-31.04	32.69	29.68	0.000%
5	37.24	-32.69	-21.22	-37.24	32.69	21.22	0.000%
6	42.64	-32.69	-1.48	-42.64	32.69	1.48	0.000%
7	37.96	-32.69	22.04	-37.96	32.69	-22.04	0.000%
8	29.27	-32.69	30.84	-29.27	32.69	-30.84	0.000%
9	20.07	-32.69	37.97	-20.07	32.69	-37.97	0.000%
10	0.31	-32.69	43.14	-0.31	32.69	-43.14	0.000%
11	-20.83	-32.69	37.73	20.83	32.69	-37.73	0.000%
12	-30.04	-32.69	30.75	30.04	32.69	-30.75	0.000%
13	-38.23	-32.69	23.10	38.23	32.69	-23.10	0.000%
14	-42.20	-32.69	0.78	42.20	32.69	-0.78	0.000%
15	-35.67	-32.69	-20.67	35.67	32.69	20.67	0.000%
16	-29.08	-32.69	-29.97	29.08	32.69	29.97	0.000%
17	-20.48	-32.69	-37.12	20.48	32.69	37.12	0.000%
18	0.00	-50.86	0.00	0.00	50.86	0.00	0.000%
19	0.79	-50.86	-56.30	-0.79	50.86	56.30	0.000%
20	27.84	-50.86	-46.85	-27.84	50.86	46.85	0.000%
21	39.21	-50.86	-37.80	-39.21	50.86	37.80	0.000%
22	47.24	-50.86	-26.97	-47.24	50.86	26.97	0.000%
23	54.15	-50.86	-1.51	-54.15	50.86	1.51	0.000%
24	47.92	-50.86	27.78	-47.92	50.86	-27.78	0.000%
25	37.41	-50.86	38.99	-37.41	50.86	-38.99	0.000%
26	25.80	-50.86	47.94	-25.80	50.86	-47.94	0.000%
27	0.32	-50.86	54.67	-0.32	50.86	-54.67	0.000%
28	-26.57	-50.86	47.69	26.57	50.86	-47.69	0.000%
29	-38.19	-50.86	38.89	38.19	50.86	-38.89	0.000%
30	-48.20	-50.86	28.86	48.20	50.86	-28.86	0.000%
31	-53.70	-50.86	0.80	53.70	50.86	-0.80	0.000%
32	-45.64	-50.86	-26.41	45.64	50.86	26.41	0.000%
33	-37.21	-50.86	-38.10	37.21	50.86	38.10	0.000%
34	-26.22	-50.86	-47.07	26.22	50.86	47.07	0.000%
35	0.78	-32.69	-44.81	-0.78	32.69	44.81	0.000%
36	22.07	-32.69	-36.92	-22.07	32.69	36.92	0.000%
37	31.04	-32.69	-29.68	-31.04	32.69	29.68	0.000%
38	37.24	-32.69	-21.22	-37.24	32.69	21.22	0.000%
39	42.64	-32.69	-1.48	-42.64	32.69	1.48	0.000%
40	37.96	-32.69	22.04	-37.96	32.69	-22.04	0.000%
41	29.27	-32.69	30.84	-29.27	32.69	-30.84	0.000%
42	20.07	-32.69	37.97	-20.07	32.69	-37.97	0.000%
43	0.31	-32.69	43.14	-0.31	32.69	-43.14	0.000%
44	-20.83	-32.69	37.73	20.83	32.69	-37.73	0.000%
45	-30.04	-32.69	30.75	30.04	32.69	-30.75	0.000%
46	-38.23	-32.69	23.10	38.23	32.69	-23.10	0.000%
47	-42.20	-32.69	0.78	42.20	32.69	-0.78	0.000%
48	-35.67	-32.69	-20.67	35.67	32.69	20.67	0.000%
49	-29.08	-32.69	-29.97	29.08	32.69	29.97	0.000%
50	-20.48	-32.69	-37.12	20.48	32.69	37.12	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	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	4.713	35	0.2701	0.0938
T2	116.667 - 108.333	4.518	35	0.2703	0.0947
T3	108.333 - 100	4.016	35	0.2703	0.0906
T4	100 - 91.6667	3.510	35	0.2662	0.0824
T5	91.6667 - 83.3333	3.020	35	0.2569	0.0746
T6	83.3333 - 75	2.551	35	0.2426	0.0673
T7	75 - 50	2.128	35	0.2228	0.0624
T8	50 - 25	0.990	35	0.1681	0.0430
T9	25 - 0	0.261	35	0.0788	0.0215

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	35	4.713	0.2701	0.0938	31237
128.00	16'x2.5" Pipe Mount	35	4.713	0.2701	0.0938	31237
120.00	6FT DISH	35	4.713	0.2701	0.0938	31237
118.00	6' Side-Arm	35	4.597	0.2702	0.0945	31237
116.00	6FT DISH	35	4.479	0.2704	0.0947	31237
115.00	6FT DISH	35	4.420	0.2704	0.0946	31237
111.00	6FT DISH	35	4.179	0.2706	0.0927	51099
110.00	Filter/Diplexer	35	4.118	0.2705	0.0919	60392
105.00	AP13-850/065/ADT w/Mount Pipe	35	3.812	0.2693	0.0874	107357
103.00	OGT9-806	35	3.691	0.2683	0.0854	59082
100.00	PD458-1	35	3.510	0.2662	0.0824	41558
95.00	APX16DWV-16DWV-S-E-ACU w/ Mount	35	3.214	0.2612	0.0777	56484
90.00	20' 4-Bay Dipole	35	2.924	0.2545	0.0731	38430
88.00	Mount	35	2.809	0.2514	0.0712	24754
86.00	Mount	35	2.697	0.2479	0.0694	17941
85.00	3' Yagi	35	2.641	0.2460	0.0686	16277
80.00	(2) SBNH-1D6565C	35	2.377	0.2349	0.0651	19979
78.00	20' 4-Bay Dipole	35	2.276	0.2301	0.0640	29766
72.00	DB980H90E-M	35	1.981	0.2161	0.0605	73544
70.00	2' Microwave Panel	35	1.884	0.2119	0.0592	57818
60.00	GPS	35	1.414	0.1920	0.0516	25750
56.00	2' Sidearm	35	1.237	0.1833	0.0482	21074
55.00	DB264-A	35	1.194	0.1810	0.0473	20159
50.00	1' Microwave Panel	35	0.990	0.1681	0.0430	16895
44.00	5'0"x3" Pipe Mount	35	0.769	0.1493	0.0378	15441
40.00	4 FT DISH	35	0.636	0.1351	0.0343	14773
35.00	1' Omni	35	0.489	0.1164	0.0300	14016
30.00	4' Whip	35	0.364	0.0974	0.0257	13333

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	5.731	19	0.3268	0.1241
T2	116.667 - 108.333	5.496	19	0.3270	0.1252
T3	108.333 - 100	4.891	19	0.3269	0.1206
T4	100 - 91.6667	4.280	19	0.3221	0.1105
T5	91.6667 - 83.3333	3.688	19	0.3112	0.1006
T6	83.3333 - 75	3.120	19	0.2943	0.0911
T7	75 - 50	2.606	19	0.2708	0.0848
T8	50 - 25	1.220	19	0.2052	0.0588
T9	25 - 0	0.324	19	0.0967	0.0295

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	19	5.731	0.3268	0.1241	27632
128.00	16'x2.5" Pipe Mount	19	5.731	0.3268	0.1241	27632
120.00	6FT DISH	19	5.731	0.3268	0.1241	27632
118.00	6' Side-Arm	19	5.590	0.3269	0.1249	27632
116.00	6FT DISH	19	5.448	0.3271	0.1252	27632
115.00	6FT DISH	19	5.377	0.3271	0.1251	27632
111.00	6FT DISH	19	5.087	0.3272	0.1230	41965
110.00	Filter/Diplexer	19	5.013	0.3272	0.1222	48656
105.00	AP13-850/065/ADT w/Mount Pipe	19	4.645	0.3257	0.1168	106979
103.00	OGT9-806	19	4.498	0.3245	0.1143	53631
100.00	PD458-1	19	4.280	0.3221	0.1105	36273
95.00	APX16DWV-16DWV-S-E-ACU w/ Mount	19	3.923	0.3162	0.1045	50320
90.00	20' 4-Bay Dipole	19	3.572	0.3083	0.0985	33499
88.00	Mount	19	3.433	0.3047	0.0961	21188
86.00	Mount	19	3.297	0.3006	0.0938	15236
85.00	3' Yagi	19	3.230	0.2983	0.0928	13798
80.00	(2) SBNH-1D6565C	19	2.909	0.2852	0.0884	16937
78.00	20' 4-Bay Dipole	19	2.787	0.2794	0.0869	25353
72.00	DB980H90E-M	19	2.428	0.2629	0.0824	63183
70.00	2' Microwave Panel	19	2.309	0.2579	0.0807	49212
60.00	GPS	19	1.737	0.2340	0.0704	21612
56.00	2' Sidearm	19	1.522	0.2236	0.0659	17652
55.00	DB264-A	19	1.470	0.2208	0.0647	16879
50.00	1' Microwave Panel	19	1.220	0.2052	0.0588	14113
44.00	5'0"x3" Pipe Mount	19	0.949	0.1824	0.0518	12825
40.00	4 FT DISH	19	0.787	0.1652	0.0471	12223
35.00	1' Omni	19	0.606	0.1425	0.0412	11546
30.00	4' Whip	19	0.452	0.1193	0.0354	10941

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	120	Diagonal	A325X	0.7500	1	1.58	13.59	0.116 ✔	1.333	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A325X	0.6250	2	0.93	8.16	0.114 ✓	1.333	Member Bearing
T2	116.667	Diagonal	A325X	0.7500	1	6.67	13.59	0.491 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	2.22	8.16	0.273 ✓	1.333	Member Bearing
T3	108.333	Diagonal	A325X	0.7500	1	8.84	13.59	0.650 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	2.96	8.16	0.363 ✓	1.333	Member Bearing
T4	100	Leg	A325X	0.7500	6	2.73	19.44	0.141 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.87	13.59	0.726 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	3.17	9.20	0.345 ✓	1.333	Bolt Shear
T5	91.6667	Diagonal	A325X	0.7500	1	10.92	13.59	0.803 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	3.62	9.20	0.393 ✓	1.333	Bolt Shear
T6	83.3333	Diagonal	A325X	0.7500	1	12.66	26.51	0.478 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	4.18	9.20	0.454 ✓	1.333	Bolt Shear
T7	75	Leg	A325X	0.7500	6	8.72	19.44	0.449 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	15.90	18.13	0.877 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	5.76	9.20	0.626 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	5.00	9.20	0.543 ✓	1.333	Bolt Shear
T8	50	Leg	A325X	0.7500	6	16.91	19.44	0.870 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	17.03	18.13	0.940 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	6.53	9.20	0.710 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	6.01	9.20	0.653 ✓	1.333	Bolt Shear
T9	25	Leg	A325X	1.0000	8	19.12	34.56	0.553 ✓	1.333	Bolt Tension
		Diagonal	A325X	1.0000	1	21.52	25.38	0.848 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	7.05	9.20	0.766 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	6.71	9.20	0.729 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 116.667	P.5x.250	3.34	3.34	23.8 K=1.00	27.884	3.7306	-1.10	104.03	0.011* ✓
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5 K=1.00	22.798	3.7306	-4.49	85.05	0.053 ✓
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5 K=1.00	22.798	3.7306	-12.93	85.05	0.152 ✓
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5	22.798	3.7306	-24.77	85.05	0.291

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 $\frac{P}{P_a}$
					K=1.00					✓
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5 K=1.00	22.798	3.7306	-37.33	85.05	0.439 ✓
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5 K=1.00	22.798	3.7306	-51.88	85.05	0.610 ✓
T7	75 - 50	P5x.375	25.03	8.34	54.4 K=1.00	23.645	6.1120	-106.56	144.52	0.737 ✓
T8	50 - 25	P.5x.400	25.03	8.34	61.3 K=1.00	25.746	5.7805	-166.64	148.83	1.120 ✓
T9	25 - 0	P6.875x.400	25.03	12.51	65.5 K=1.00	24.741	8.1367	-216.01	201.31	1.073 ✓

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 116.667	2L2 1/2x2x3/16	6.73	6.19	106.9 K=1.14	12.090	1.6200	-1.78	19.59	0.091 ✓
T2	116.667 - 108.333	2L2 1/2x2x3/16	10.37	9.73	147.8 K=1.00	6.834	1.6200	-6.83	11.07	0.617 ✓
T3	108.333 - 100	2L2 1/2x2x3/16	10.58	9.94	151.1 K=1.00	6.544	1.6200	-9.00	10.60	0.849 ✓
T4	100 - 91.6667	2L2 1/2x2x3/16	10.78	10.16	154.4 K=1.00	6.266	1.6200	-10.11	10.15	0.996 ✓
T5	91.6667 - 83.3333	2L2 1/2x2x3/16	11.00	10.39	157.8 K=1.00	5.999	1.6200	-11.17	9.72	1.150 ✓
T6	83.3333 - 75	2L2 1/2x2x3/8	11.22	10.62	165.9 K=1.00	5.428	3.0900	-12.66	16.77	0.755 ✓
T7	75 - 50	2L3x2 1/2x1/4	11.91	11.30	143.4 K=1.00	7.259	2.6300	-16.29	19.09	0.853 ✓
T8	50 - 25	2L3x2 1/2x1/4	12.65	12.08	153.4 K=1.00	6.350	2.6300	-17.57	16.70	1.052 ✓
T9	25 - 0	2L3 1/2x3x1/4	16.33	15.51	167.7 K=1.00	5.309	3.1300	-22.09	16.62	1.329 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	116.667 - 108.333	L2 1/2x2 1/2x3/16	11.68	10.84	149.0 K=0.89	6.726	0.9020	-3.98	6.07	0.656 ✓
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	11.50	155.3 K=0.88	6.189	0.9020	-5.46	5.58	0.978 ✓

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 $\frac{P}{P_a}$
T7	75 - 50	L3x3x1/4	16.35	7.73	145.4 K=0.93	7.068	1.4400	-11.39	10.18	1.119 ✓
T8	50 - 25	L3x3x1/2	18.35	8.75	165.3 K=0.92	5.466	2.7500	-12.87	15.03	0.857 ✓
T9	25 - 0	L4x4x1/4	20.02	9.51	134.1 K=0.93	8.306	1.9400	-14.10	16.11	0.875 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	10.57	146.5 K=0.90	6.960	0.9020	-1.86	6.28	0.296 ✓
T4	100 - 91.6667	L3x3x1/4	13.02	6.09	116.6 K=0.95	10.761	1.4400	-6.28	15.50	0.405 ✓
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.42	122.5 K=0.94	9.920	1.4400	-7.14	14.28	0.500 ✓
T6	83.3333 - 75	L3x3x1/4	14.35	6.75	128.4 K=0.94	9.063	1.4400	-8.27	13.05	0.634 ✓
T7	75 - 50	L3x3x1/4	15.02	7.09	134.2 K=0.93	8.293	1.4400	-9.85	11.94	0.825 ✓
T8	50 - 25	L3x3x1/4	17.02	8.06	151.1 K=0.92	6.540	1.4400	-11.87	9.42	1.261 ✓
T9	25 - 0	L4x4x1/4	19.02	9.09	128.6 K=0.94	9.030	1.9400	-13.33	17.52	0.761 ✓

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	182.9 K=1.00	4.465	0.8090	-0.11	3.61	0.030 ✓
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	192.3 K=1.00	4.040	0.8090	-0.12	3.27	0.038 ✓
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	201.6 K=1.00	3.673	0.8090	-0.14	2.97	0.048 ✓
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	211.0 K=1.00	3.354	0.8090	-0.17	2.71	0.063 ✓
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	239.1 K=1.00	2.612	0.8090	-0.21	2.11	0.097 ✓
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	230.5 K=1.00	2.810	0.9020	-0.23	2.53	0.091 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5	30.000	3.7306	0.51	111.92	0.005 ✓
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5	30.000	3.7306	6.72	111.92	0.060 ✓
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5	30.000	3.7306	16.39	111.92	0.146 ✓
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5	30.000	3.7306	27.00	111.92	0.241 ✓
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5	30.000	3.7306	39.11	111.92	0.349 ✓
T7	75 - 50	P5x.375	25.03	8.34	54.4	30.000	6.1120	84.65	183.36	0.462 ✓
T8	50 - 25	P.5x.400	25.03	8.34	61.3	36.000	5.7805	135.93	208.10	0.653 ✓
T9	25 - 0	P6.875x.400	25.03	12.51	65.5	36.000	8.1367	178.20	292.92	0.608 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 116.667	2L2 1/2x2x3/16	6.73	6.19	98.5	29.000	0.9689	1.58	28.10	0.056 ✓
T2	116.667 - 108.333	2L2 1/2x2x3/16	10.37	9.73	152.3	29.000	0.9689	6.67	28.10	0.237 ✓
T3	108.333 - 100	2L2 1/2x2x3/16	10.58	9.94	155.5	29.000	0.9689	8.84	28.10	0.315 ✓
T4	100 - 91.6667	2L2 1/2x2x3/16	10.78	10.16	158.8	29.000	0.9689	9.87	28.10	0.351 ✓
T5	91.6667 - 83.3333	2L2 1/2x2x3/16	11.00	10.39	162.2	29.000	0.9689	10.92	28.10	0.389 ✓
T6	83.3333 - 75	2L2 1/2x2x3/8	11.22	10.62	170.4	29.000	1.8253	12.31	52.93	0.233 ✓
T7	75 - 50	2L3x2 1/2x1/4	11.91	11.30	147.1	29.000	1.6444	15.90	47.69	0.333 ✓
T8	50 - 25	2L3x2 1/2x1/4	12.65	12.08	157.1	29.000	1.6444	17.03	47.69	0.357 ✓
T9	25 - 0	2L3 1/2x3x1/4	16.33	15.51	171.8	29.000	1.9256	21.52	55.84	0.385 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	116.667 - 108.333	L2 1/2x2 1/2x3/16	11.68	10.84	173.7	29.000	0.5710	4.45	16.56	0.268 ✓
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	11.50	184.0	29.000	0.5710	5.93	16.56	0.358 ✓
T7	75 - 50	L3x3x1/4	16.35	7.73	102.5	29.000	0.9394	11.53	27.24	0.423 ✓
T8	50 - 25	L3x3x1/2	18.35	8.75	119.8	29.000	1.7813	13.06	51.66	0.253 ✓
T9	25 - 0	L4x4x1/4	20.02	9.51	93.3	29.000	1.3144	14.03	38.12	0.368 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	10.57	169.6	29.000	0.5710	1.76	16.56	0.106 ✓
T4	100 - 91.6667	L3x3x1/4	13.02	6.09	81.3	29.000	0.9394	6.35	27.24	0.233 ✓
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.42	85.6	29.000	0.9394	7.23	27.24	0.266 ✓
T6	83.3333 - 75	L3x3x1/4	14.35	6.75	89.9	29.000	0.9394	8.35	27.24	0.307 ✓
T7	75 - 50	L3x3x1/4	15.02	7.09	94.2	29.000	0.9394	10.00	27.24	0.367 ✓
T8	50 - 25	L3x3x1/4	17.02	8.06	106.8	29.000	0.9394	12.02	27.24	0.441 ✓
T9	25 - 0	L4x4x1/4	19.02	9.09	89.3	29.000	1.3144	13.42	38.12	0.352 ✓

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	130.2	21.600	0.8090	0.11	17.47	0.006 ✓
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	136.9	21.600	0.8090	0.12	17.47	0.007 ✓
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	143.6	21.600	0.8090	0.14	17.47	0.008 ✓
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	150.2	21.600	0.8090	0.17	17.47	0.010 ✓
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	170.2	21.600	0.8090	0.21	17.47	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	146.7	21.600	0.9020	0.23	19.48	0.012

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	120 - 116.667	Leg	P.5x.250	1	-1.10	104.03	2.4	Pass
T2	116.667 - 108.333	Leg	P.5x.250	13	-4.49	113.37	4.0	Pass
T3	108.333 - 100	Leg	P.5x.250	27	-12.93	113.37	11.4	Pass
T4	100 - 91.6667	Leg	P.5x.250	39	-24.77	113.37	21.9	Pass
T5	91.6667 - 83.3333	Leg	P.5x.250	54	-37.33	113.37	32.9	Pass
T6	83.3333 - 75	Leg	P.5x.250	69	-51.88	113.37	45.8	Pass
T7	75 - 50	Leg	P5x.375	84	-106.56	192.64	55.3	Pass
T8	50 - 25	Leg	P.5x.400	123	-166.64	198.39	84.0	Pass
T9	25 - 0	Leg	P6.875x.400	162	-216.01	268.35	80.5	Pass
T1	120 - 116.667	Diagonal	2L2 1/2x2x3/16	7	-1.78	26.11	6.8 8.7 (b)	Pass
T2	116.667 - 108.333	Diagonal	2L2 1/2x2x3/16	23	-6.83	14.76	46.3	Pass
T3	108.333 - 100	Diagonal	2L2 1/2x2x3/16	35	-9.00	14.13	63.7	Pass
T4	100 - 91.6667	Diagonal	2L2 1/2x2x3/16	47	-10.11	13.53	74.7	Pass
T5	91.6667 - 83.3333	Diagonal	2L2 1/2x2x3/16	62	-11.17	12.95	86.2	Pass
T6	83.3333 - 75	Diagonal	2L2 1/2x2x3/8	78	-12.66	22.36	56.6	Pass
T7	75 - 50	Diagonal	2L3x2 1/2x1/4	96	-16.29	25.45	64.0 65.8 (b)	Pass
T8	50 - 25	Diagonal	2L3x2 1/2x1/4	135	-17.57	22.26	78.9	Pass
T9	25 - 0	Diagonal	2L3 1/2x3x1/4	170	-22.09	22.15	99.7	Pass
T2	116.667 - 108.333	Horizontal	L2 1/2x2 1/2x3/16	22	-3.98	8.09	49.2	Pass
T3	108.333 - 100	Horizontal	L2 1/2x2 1/2x3/16	34	-5.46	7.44	73.3	Pass
T7	75 - 50	Horizontal	L3x3x1/4	94	-11.39	13.57	83.9	Pass
T8	50 - 25	Horizontal	L3x3x1/2	133	-12.87	20.04	64.3	Pass
T9	25 - 0	Horizontal	L4x4x1/4	169	-14.10	21.48	65.6	Pass
T1	120 - 116.667	Top Girt	L2 1/2x2 1/2x3/16	4	-1.86	8.37	22.2	Pass
T4	100 - 91.6667	Top Girt	L3x3x1/4	42	-6.28	20.66	30.4	Pass
T5	91.6667 - 83.3333	Top Girt	L3x3x1/4	57	-7.14	19.04	37.5	Pass
T6	83.3333 - 75	Top Girt	L3x3x1/4	72	-8.27	17.40	47.6	Pass
T7	75 - 50	Top Girt	L3x3x1/4	87	-9.85	15.92	61.9	Pass
T8	50 - 25	Top Girt	L3x3x1/4	126	-11.87	12.55	94.6	Pass
T9	25 - 0	Top Girt	L4x4x1/4	165	-13.33	23.35	57.1	Pass
T4	100 - 91.6667	Inner Bracing	L2 1/2x2x3/16	50	-0.11	4.81	2.3	Pass
T5	91.6667 - 83.3333	Inner Bracing	L2 1/2x2x3/16	65	-0.12	4.36	2.8	Pass
T6	83.3333 - 75	Inner Bracing	L2 1/2x2x3/16	80	-0.14	3.96	3.6	Pass
T7	75 - 50	Inner Bracing	L2 1/2x2x3/16	119	-0.17	3.62	4.7	Pass
T8	50 - 25	Inner Bracing	L2 1/2x2x3/16	159	-0.21	2.82	7.3	Pass
T9	25 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	186	-0.23	3.38	6.8	Pass
							Summary	
						Leg (T8)	84.0	Pass
						Diagonal	99.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						(T9) Horizontal	83.9	Pass
						(T7) Top Girt	94.6	Pass
						(T8) Inner Bracing (T8)	7.3	Pass
						Bolt Checks	70.5	Pass
						RATING =	**99.7**	**Pass**

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Max Corner Reactions:

Uplift:	Uplift := 203 kips	*user input*
Shear:	Shear := 31 kips	*user input*
Compression:	Compression := 244 kips	*user input*

Anchor Bolt Data:

Use ASTM A36 (actual material strength unknown therefore assume min design values)

Number of Anchor Bolts = N	N := 6	*user input*	
Bolt Ultimate Strength:	F_u := 58 ksi	*user input*	
Bolt Yield Strength:	Fy := 36 ksi	*user input*	
Bolt Modulus:	E := 29000 ksi	*user input*	
Thickness of Anchor Bolts	D := 1.5in	*user input*	
Threads per Inch:	n := 6.0	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-97)

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 1.767 \cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 \qquad A_n = 1.405 \cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.333 \cdot \left(0.33 \cdot A_g \cdot F_u \right) \qquad AllowableTension = 45.1 \cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.333 \cdot \left(0.60 \cdot A_n \cdot Fy \right) \qquad F_{net.area} = 40.5 \cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 33.8 \cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.84$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed" \right)$$

$$Condition1 = "OK"$$

URS

				Page	of
Job	120' Stainless Lattice Tower - New Haven, CT	Project No.	TWS-009	Sheet 3	of 3
Description	Anchor Bolt Analysis	Computed by	CAR	Date	07/17/13
		Checked by		Date	

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 7.5 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 2.5 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 8.4 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.89$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.30$$

Condition3 = "OK"

FOUNDATION ANALYSIS

URS

Job	120' Stainless Tower - New Haven, CT	Project No.	TWS-009	Page	of
Description	Foundation with Rock Anchors	Computed by	CAR	Sheet 1	of 4
		Checked by		Date	07/17/13
				Date	

FOUNDATION CHECK

INPUT DATA

Max Pier Reactions:

Uplift:	$Uplift := 203\,kips$	*user input*
Shear:	$Shear := 31\,kips$	*user input*
Compression:	$Compression := 244\,kips$	*user input*

Structure

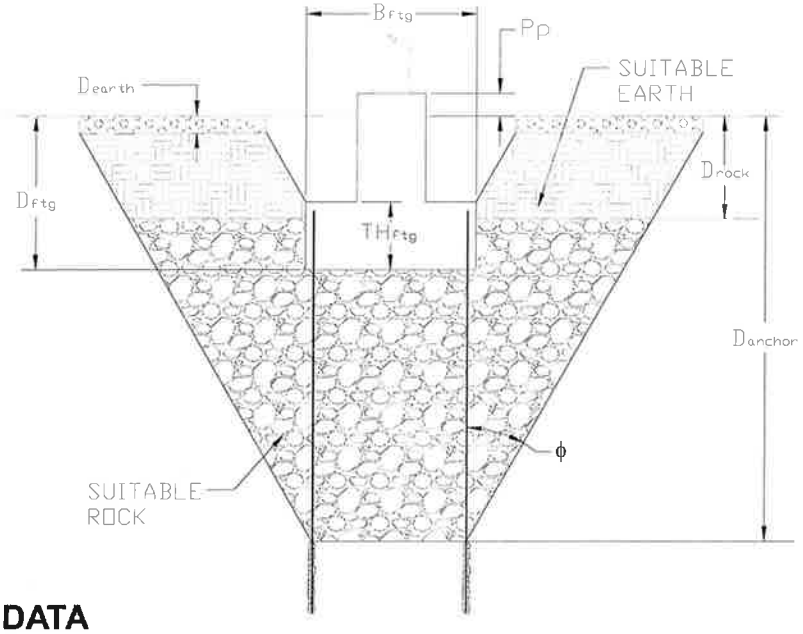
Footing Width:	$B_{ftg} := 6ft$	*user input*
Footing Length:	$L_{ftg} := 6ft$	*user input*
Footing Thickness:	$TH_{ftg} := 2.5ft$	*user input*

Depths:

Depth to Bottom of Footing: (from grade line)	$D_{ftg} := 4.0ft$	*user input*
Depth to Suitable Rock: (from grade line)	$D_{rock} := 2.0ft$	*user input*
Depth to Suitable Earth: (from grade line)	$D_{earth} := 0ft$	*user input*
Anchor Depth:	$D_{anchor} := 24.0ft$	*user input*

Soil Properties:

Internal Friction Angle:	$\phi := 45deg$	*user input*
Unit Weight of Earth:	$\gamma_{earth} := 100\frac{lb}{ft^3}$	*user input*
Unit Weight of Rock:	$\gamma_{rock} := 178\frac{lb}{ft^3}$	*user input*
Allowable Bearing:	$Bearing := 50000\,psf$	*user input*
Pier Projection Above Grade:	$P_p := 0.5\,ft$	*user input*



ROCK ANCHOR DATA

Anchors:

Number of Anchors (along width):	$NW_{anchor} := 2$	*user input*
Number of Anchors (along length):	$NL_{anchor} := 2$	*user input*
Hole Diameter:	$hole_d := 2.5in$	*user input*
Allowable Bond Stress:	$\sigma_{bond} := 100 \cdot psi$	*user input*
Anchor Spacing* (along length):	$SL_{anchor} := 3ft$	*user input*
Anchor Spacing* (along width):	$SW_{anchor} := 3ft$	*user input*
Rock Anchor Yield Strength:	$Fy_{anchor} := 150ksi$	*user input*
Rock Anchor Diameter:	$Anchor_{Dia} := 1.00in$	*user input*

Check Tensile Forces:

Force (per anchor):

$$P_{design} := \frac{Uplift}{NW_{anchor} + NL_{anchor}} \qquad P_{design} = 50.75 \cdot kips$$

Rock Anchor Allowble Tension:

$$T_{allowable} := \frac{0.6 \cdot Fy_{anchor} \cdot Anchor_{Dia}^{2} \cdot \pi}{4} \qquad T_{allowable} = 70.69 \cdot kips$$

$$TensionCheck := if\left(\frac{P_{design}}{T_{allowable}} \le 1.00, "OK", "Overstressed"\right) \qquad \frac{P_{design}}{T_{allowable}} = 0.72$$

TensionCheck = "OK"

CALCULATE RESISTANCE

Intermediate Dimensions:

Suitable Earth Height: $H := D_{rock} - D_{earth}$ $H = 2.00\ ft$

Suitable Rock Height: $Z := D_{anchor} - D_{earth} - D_{rock}$ $Z = 22.00\ ft$

Total Anchor Width: $W := (NW_{anchor} - 1) \cdot SW_{anchor}$ $W = 3.00\ ft$

Total Anchor Length: $L := (NL_{anchor} - 1) \cdot SL_{anchor}$ $L = 3.00\ ft$

Earth Above Footing: $PD := D_{ftg} - D_{earth} - TH_{ftg}$ $PD = 1.50\ ft$

Volumes:

Gross Volume:

$GV_1 := W \cdot L \cdot (Z + H)$ $GV_1 = 216.00 \cdot ft^3$

$GV_2 := \left[\frac{1}{2} \cdot (Z + H) \cdot \tan(\phi) \cdot (Z + H)\right] \cdot (W + L) \cdot 2$ $GV_2 = 3456.00 \cdot ft^3$

$GV_3 := \frac{1}{3} \cdot \pi \cdot [(Z + H) \cdot \tan(\phi)]^2 \cdot (Z + H)$ $GV_3 = 14476.46 \cdot ft^3$

$GV := GV_1 + GV_2 + GV_3$ $GV = 18148.46 \cdot ft^3$

Rock Volume:

$RV_1 := W \cdot L \cdot (H)$ $RV_1 = 18.00 \cdot ft^3$

$RV_2 := \left[\frac{1}{2} \cdot (Z) \cdot \tan(\phi) \cdot (Z)\right] \cdot (W + L) \cdot 2$ $RV_2 = 2904.00 \cdot ft^3$

$RV_3 := \frac{1}{3} \cdot \pi \cdot [(Z) \cdot \tan(\phi)]^2 \cdot (Z)$ $RV_3 = 11150.56 \cdot ft^3$

$RV := RV_1 + RV_2 + RV_3$ $RV = 14072.56 \cdot ft^3$

Volume of Neglect Above Footing:

$NV_1 := B_{ftg} \cdot L_{ftg} \cdot H$ $NV_1 = 72.00 \cdot ft^3$

$NV_2 := \left[\frac{1}{2} \cdot (PD) \cdot \tan(\phi) \cdot (PD)\right] \cdot (B_{ftg} + L_{ftg}) \cdot 2$ $NV_2 = 27.00 \cdot ft^3$

$NV_3 := \frac{1}{3} \cdot \pi \cdot [(PD) \cdot \tan(\phi)]^2 \cdot (PD)$ $NV_3 = 3.53 \cdot ft^3$

$NV := NV_1 + NV_2 + NV_3$ $NV = 102.53 \cdot ft^3$

Total Suitable Earth Volume: $EV := GV - RV - NV$ $EV = 3973.37 \cdot ft^3$

Resisting Forces:

Resisting Rock Force: $F_{rock} := RV \cdot \gamma_{rock}$ $F_{rock} = 2504.92 \cdot kips$

Resisting Earth Force: $F_{earth} := EV \cdot \gamma_{earth}$ $F_{earth} = 397.34 \cdot kips$

Total Resisting Force: $F_{total} := F_{rock} + F_{earth}$ $F_{total} = 2902.25 \cdot kips$

Check Uplift:

$$Condition1 := if\left(\frac{F_{total}}{Uplift} \geq 2.00, "OK", "Overstressed"\right) \qquad \frac{F_{total}}{Uplift} = 14.30$$

Condition1 = "OK"

Embedment Length:

$$L_b := \frac{P_{design}}{\pi \cdot hole_d \cdot \sigma_{bond}} \qquad L_b = 5.38\,ft$$

$$Condition2 := if\left(\frac{Z}{L_b} \geq 2.00, "OK", "Overstressed"\right) \qquad \frac{Z}{L_b} = 4.09$$

Condition2 = "OK"

Check Bearing (with Post tension Force included):

$$MaxBearing := \left[\frac{Compression + \left(NW_{anchor} + NL_{anchor}\right)\left(P_{design}\right)}{B_{ftg} \cdot L_{ftg}}\right] + \frac{Shear \cdot \left(D_{ftg} + P_p\right)}{\left(\frac{B_{ftg} \cdot L_{ftg}^{\,2}}{6}\right)} \qquad MaxBearing = 16291.67 \cdot psf$$

$$Condition3 := if\left(\frac{MaxBearing}{Bearing} \leq 1.00, "OK", "Overstressed"\right) \qquad \frac{MaxBearing}{Bearing} = 0.33$$

Condition3 = "OK"

SHEET INDEX

DRIVING DIRECTIONS

DEPART FROM SPRINT:
1 INTERNATIONAL BLVD. MAHWAH, NJ 07495

1. HEAD SOUTH ON INTERNATIONAL BLVD TOWARD AVE OF AMERICAS 0.1 MI 2. TURN RIGHT ONTO PARK LN 197 FT 3. CONTINUE STRAIGHT ONTO LEISURE LN 0.1 MI 4. SLIGHT RIGHT ONTO NJ-17 N 0.3 MI 5. MERGE ONTO I-287 N/NJ-17 N VIA THE RAMP ON THE LEFT TO I-87/N Y. THRUWAY ENTERING NEW YORK 0.6 MI 6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 N CONTINUE TO FOLLOW I-287 E PARTIAL TOLL ROAD 26.3 MI 7. TAKE EXIT 9N-9S FOR HUTCHINSON PKWY TOWARD WHITESTONE BRIDGE/MERRITT PKWY 0.2 MI 8. MERGE ONTO WESTCHESTER AVE E 0.3 MI 9. TAKE THE HUTCHINSON PKWY N RAMP TO MERRITT PKWY 0.2 MI 10. MERGE ONTO HUTCHINSON RIVER PKWY N, ENTERING CONNECTICUT 3.1 MI 11. CONTINUE ONTO CT-15 N 46.5 MI 12. TAKE EXIT 59 FOR CT-69 TOWARD CT-63/NEW HAVEN/WOODBRIDGE 0.1 MI 13. TURN RIGHT ONTO CT-69 S/WHALLEY AVE CONTINUE TO FOLLOW WHALLEY AVE 1.3 MI 14. TURN LEFT ONTO BLAKE ST 0.3 MI 15. TURN LEFT ONTO SPRINGSIDE AVE 0.2 MI 16. TURN RIGHT TO STAY ON SPRINGSIDE AVE 0.6 MI 17. CONTINUE ONTO WINTERGREEN AVE 0.3 MI 18. TURN LEFT TO STAY ON WINTERGREEN AVE. DESTINATION WILL BE ON THE LEFT 0.6 MI.

Sprint

NETWORK VISION MMBTS LAUNCH

CONNECTICUT MARKET

SITE NAME

WEST ROCK RIDGE- CONNECTICUT STATE POLICE SITE

SITE NUMBER

CT03XC003

SITE ADDRESS

1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

STRUCTURE TYPE

SELF SUPPORT TOWER

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

PROJECT SUMMARY

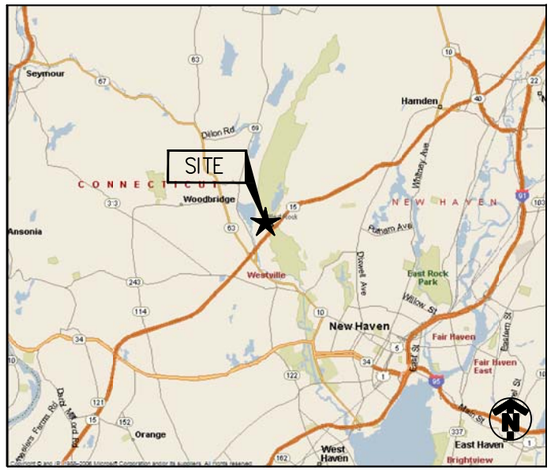
SITE NAME:	WEST ROCK RIDGE- CONNECTICUT STATE POLICE SITE
SITE NO.:	CT03XC003
SITE ADDRESS:	1065 WINTERGREEN AVENUE HAMDEN, CT 06514
COUNTY:	NEW HAVEN
SITE COORDINATES:	
LATITUDE:	41° 20' 43.56" N (NAD 83)
LONGITUDE:	72° 58' 14.57" W (NAD 83)
GROUND ELEV.:	±401' (AMSL)
JURISDICTION:	CONNECTICUT SITING COUNCIL, CITY OF NEW HAVEN
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495
LAND OWNER:	STATE OF CONNECTICUT, DEPARTMENT OF PUBLIC SAFETY DIVISION OF STATE POLICE 1111 COUNTRY CLUB ROAD MIDDLETOWN, CT 06457
CONSTRUCTION MANAGER:	TODD AMANN 914-715-9363
BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT
ELECTRICAL CODE:	2005 NATIONAL ELECTRIC CODE

ENGINEER'S LICENSE

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

LICENSED ENGINEER – STATE OF CONNECTICUT

VICINITY MAP



PROJECT TEAM

ALCATEL•LUCENT

808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

PROJECT MANAGER

infinigy engineering

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

ENGINEER

SCOPE OF WORK:

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

APPROVALS

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

A/E Consultant:

infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

UNAUTHORIZED ALTERATION OR ADDITION TO THESE DOCUMENTS IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS.

No.	Submittal / Revision	App'd	Date
5	FINAL CD'S	MJB	9/10/13
4	REVISED PER COMMENTS	MJB	8/19/13
3	REVISED PER COMMENTS	EKM	5/23/12
2	REVISED PER COMMENTS	EKM	5/21/12
1	REVISED PER COMMENTS	EKM	5/08/12
0	ISSUED FOR REVIEW	EKM	4/24/12

Drawn: MJB Date: 4/24/12
Designed: EKM Date: 4/24/12
Checked: AJD Date: 4/24/12

Project Number
286-002

Project Title
CT03XC003
WEST ROCK RIDGE-
CONNECTICUT
STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

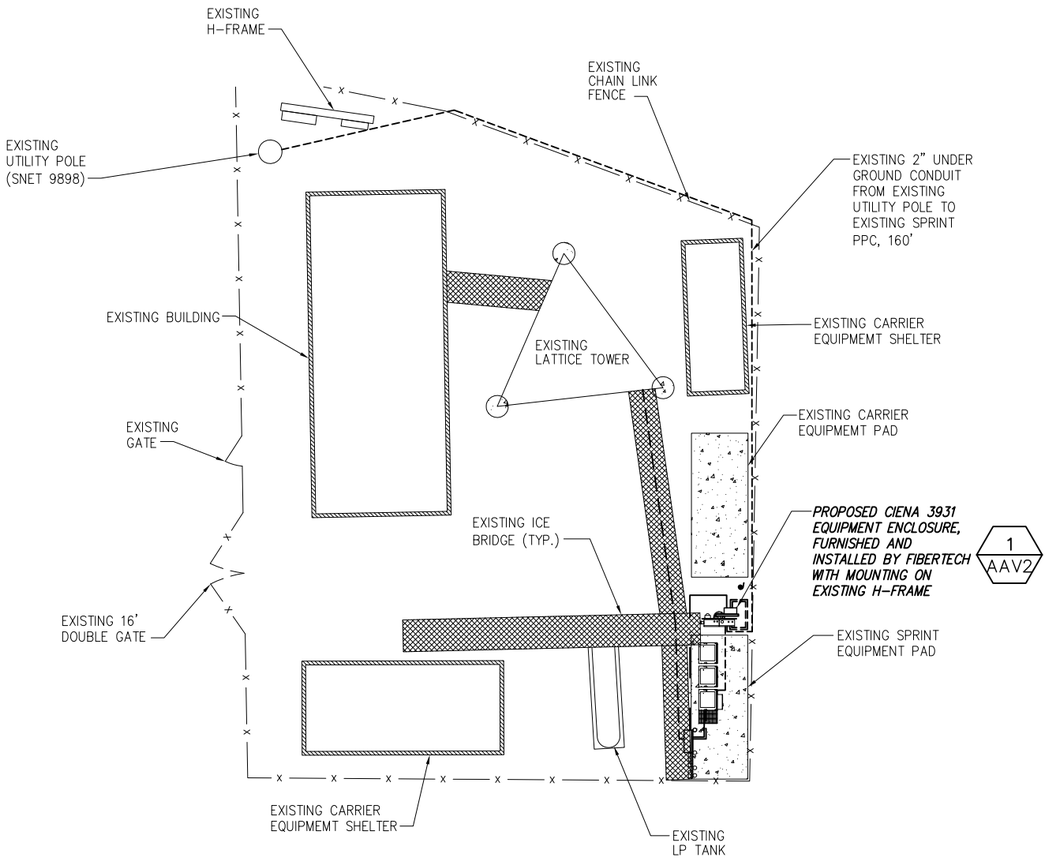
Implementation Team:
ALCATEL•LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

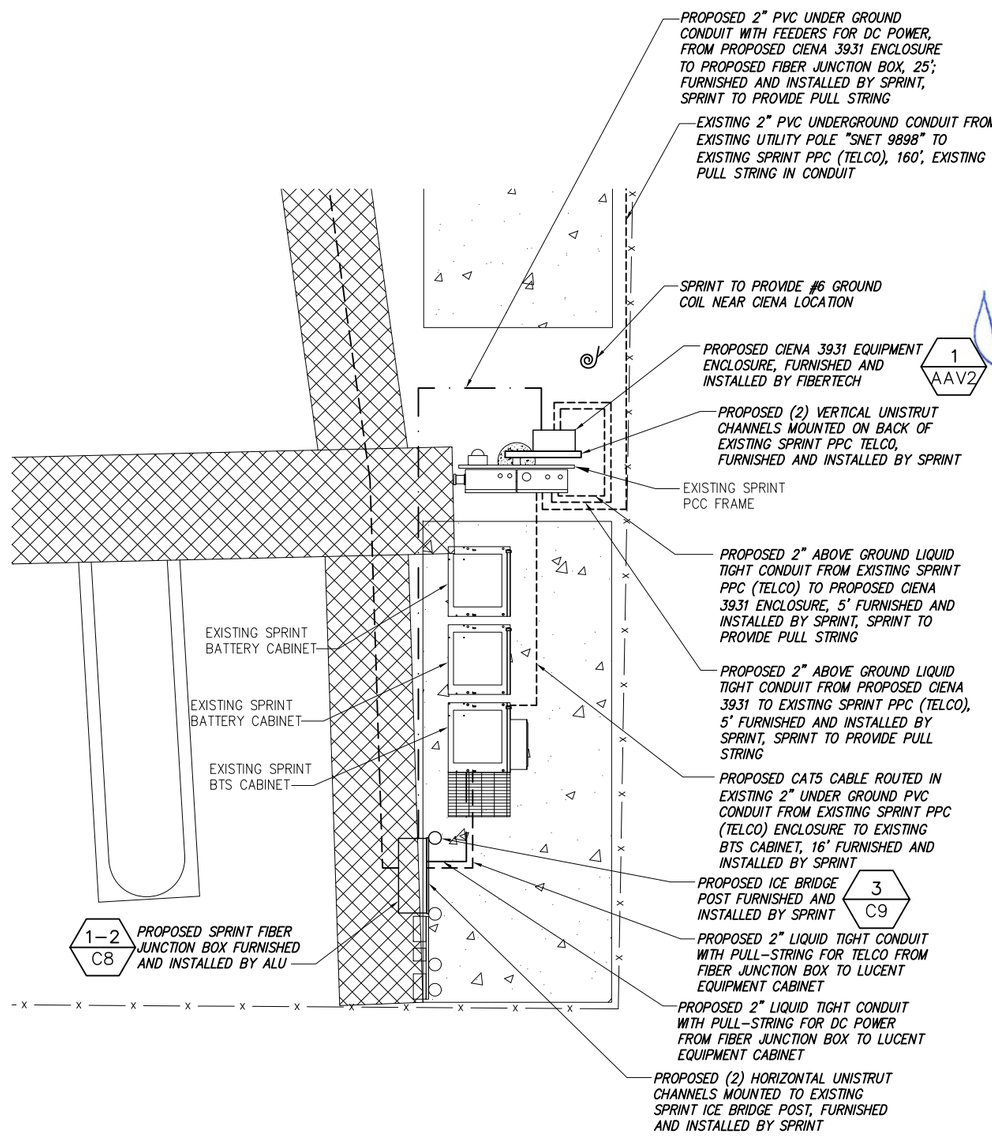
Drawing Scale:
AS NOTED

Date:
9/10/13

Drawing Title
TITLE SHEET

Drawing Number
T1





1 -- OVERALL SITE PLAN
SCALE:

CALLED NORTH

5' 0 5' 10' 20'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 10'
SCALE: 11"X 17" SHEET 1"= 20'

1 -- EQUIPMENT AREA
SCALE:

CALLED NORTH

1' 0 1' 2' 4'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 2'
SCALE: 11"X 17" SHEET 1"= 4'

BASEMAPPING PREPARED FROM A SITE VISIT PERFORMED BY INFINIGY ENGINEERING, AND INFORMATION PROVIDED BY SPRINT NEXTEL, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

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(518) 690-0790

STATE OF CONNECTICUT
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LICENSED PROFESSIONAL ENGINEER

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No.	Submittal / Revision	App'd	Date
5	FINAL CD'S	MJB	9/10/13
4	REVISED PER COMMENTS	MJB	8/19/13
3	REVISED PER COMMENTS	EKM	5/23/12
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Drawn: MJB Date: 4/24/12
Designed: EKM Date: 4/24/12
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Project Number
286-002

Project Title
CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

Implementation Team:
ALCATEL•LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED
Date:
9/10/13

Drawing Title
OVERALL & ENLARGED SITE PLANS

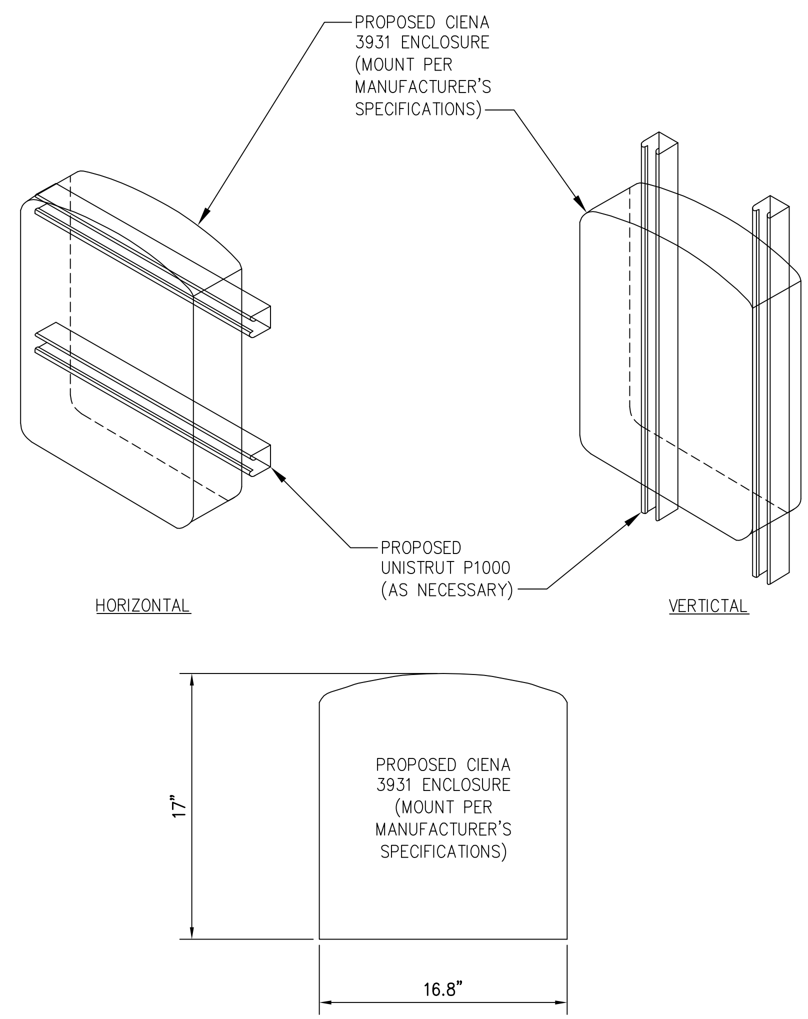
Drawing Number
AAV1

GENERAL NOTES:

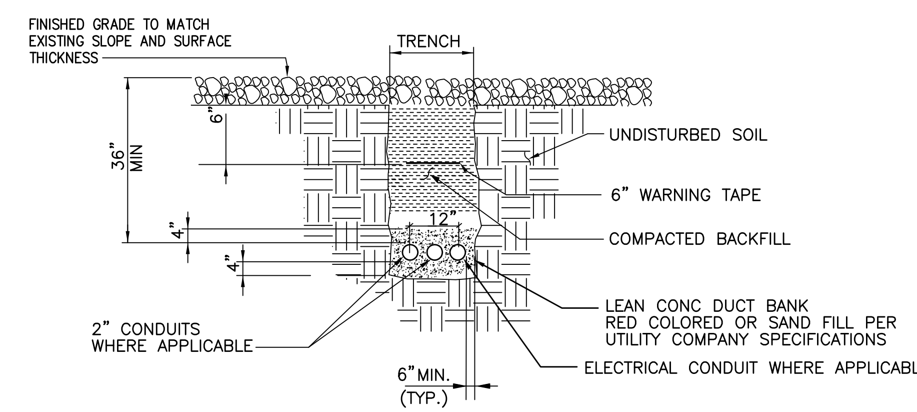
1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
4. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OF PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDORS SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
7. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
8. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
10. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
11. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
12. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
13. THE CONTRACTOR SHALL NOTIFY THE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE REPRESENTATIVE.
14. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
15. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD OR VIA A REPRESENTATIVE. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. SEE UNDERGROUND UTILITY COMPANY SHEET T-1 (DIG SAFE, MISS UTILITY, ETC.)
16. IF ASSUMED EXISTING CONDITION DIFFERS, ENGINEER MUST BE INFORMED OF ACTUAL FIELD CONDITION.
17. REFER TO THE SITE PLAN FOR APPROXIMATE LENGTH OF ALL U/G WORK AND LOCATION. FINAL LOCATION TO BE DETERMINED BY CLIENT. ALL MATERIALS TO BE USED AS ACCORDING TO DETAIL INSTRUCTIONS. ALL MATERIALS NOT INCLUDED IN THE DETAILS SHALL BE USED ACCORDING TO CODE AND/OR LOCAL JURISDICTION REGULATIONS INCLUDING MATERIALS, PREPARATION, EXACERBATION, EQUIPMENT AND INSTALLATION FOR UNDERGROUND WORK.
18. CONTRACTOR TO COORDINATE WITH SPRINT & PROVIDE GROUND BOND PER NE-250 & SPRINT STANDARDS FOR CLIENT EQUIPMENT AS REQUIRED.
19. ALL ELECTRICAL SPECIFICATIONS SHALL BE IN STRICT ACCORDANCE TO SECTIONS 16010, 16075, 16110, 16120, 16410 AND 16450 OF THE N.E.C.

ELECTRICAL AND GROUNDING NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AN PROCURED PER SPECIFICATION REQUIREMENTS. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIREMENT IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS
4. PROVISION OF AC/DC POWER IS UNDER SEPARATE SCOPE OF WORK
5. GROUNDING SHALL COMPLY WITH NEC ART. 250. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION FITTINGS. TEST COMPLETED GROUND SYSTEM AND ENSURE ADEQUACY.
6. CONTRACTOR TO PROVIDE GALV. P1000 UNISTRUT FRAMING AND 3/8" GALV. U-BOLTS/BOLTS AS NECESSARY FOR EXISTING CONDITIONS AND TO VERIFY SPACE IS APPROVED BY ALL NECESSARY PARTIES.



1 — TYPICAL CIENA 3931 MOUNTING DETAIL
SCALE: NOT TO SCALE



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

2 — UNDERGROUND CONDUIT(S) ELECTRIC/TELEPHONE
NOT TO SCALE

A/E Consultant:

infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

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NOTES & DETAILS

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AAV2

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
D. AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:

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

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

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

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

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

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

1.7 NOTICE TO PROCEED:

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

PART 2 – EXECUTION

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

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

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

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY SPRINT NEXTEL TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

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

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

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:
CONTRACTOR IS RESPONSIBLE FOR SPRINT NEXTEL PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

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

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

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

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

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

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

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

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.
G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

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

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.
B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.
C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.
E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.
F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.
G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

PROJECT INFORMATION

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

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

NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.

NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

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

LEGEND

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

ABBREVIATIONS

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

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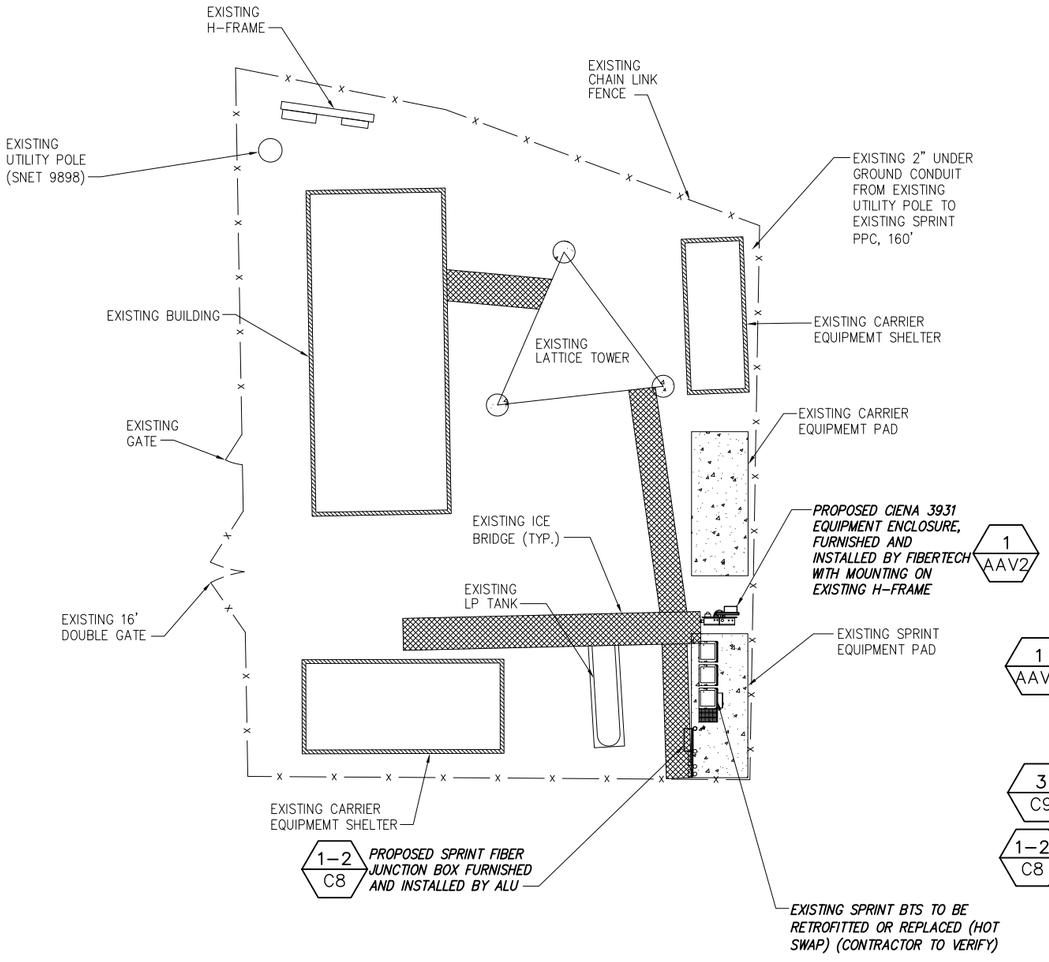
C1



CALLED NORTH

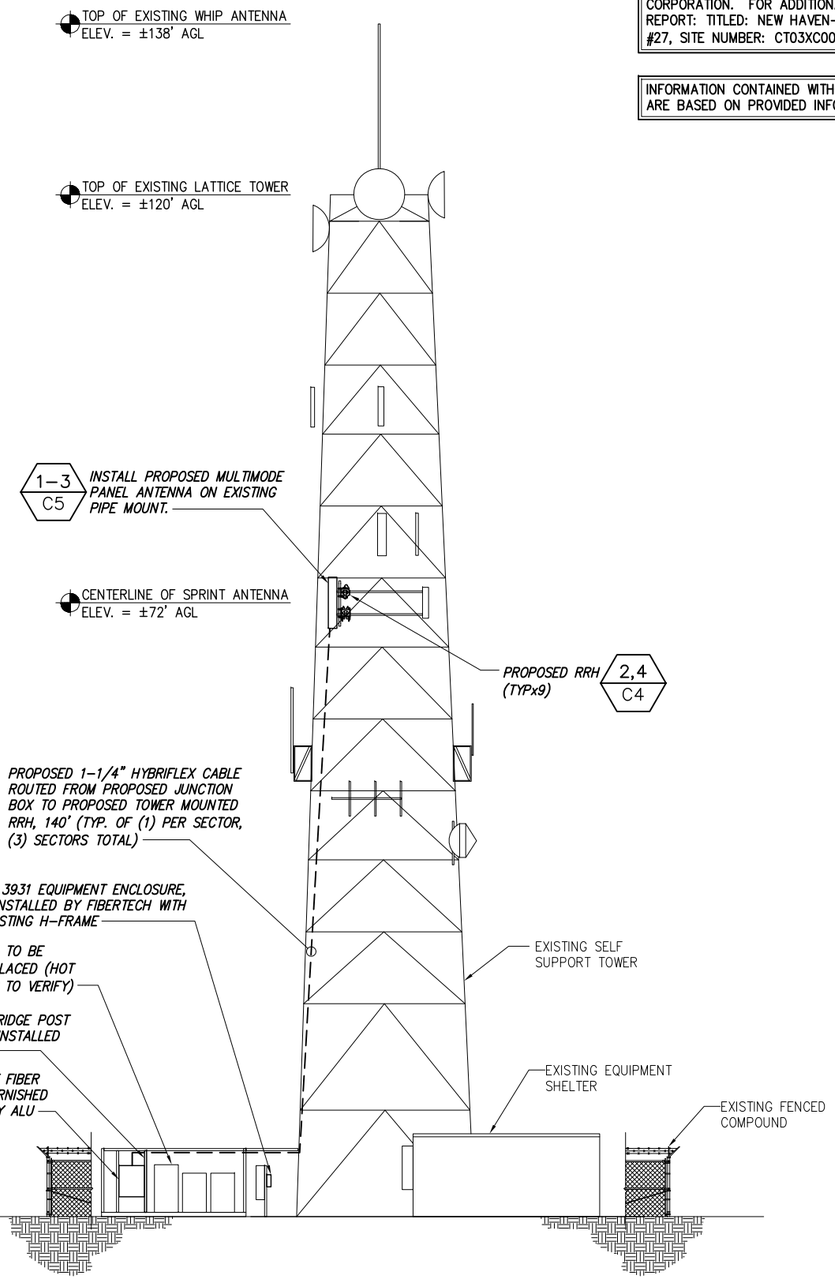
1 / -- COMPOUND SITE PLAN
SCALE:

5' 0 5' 10' 20'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 10'
SCALE: 11"X 17" SHEET 1"= 20'

BASEMAPPING PREPARED FROM A SITE VISIT PERFORMED BY INFINIGY ENGINEERING, AND INFORMATION PROVIDED BY SPRINT NEXTEL, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

STRUCTURAL ANALYSIS COMPLETED BY URS CORPORATION. FOR ADDITIONAL INFORMATION, SEE REPORT: TITLED: NEW HAVEN-STATE POLICE TOWER #27, SITE NUMBER: CT03XC003 DATED: 7/17/13.

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.



2 / -- SITE ELEVATION
NOT TO SCALE

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

UNAUTHORIZED ALTERATION OR ADDITION TO THESE DOCUMENTS, VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS.

No.	Submittal / Revision	App'd	Date
5	FINAL CD'S	MJB	9/10/13
4	REVISED PER COMMENTS	MJB	8/19/13
3	REVISED PER COMMENTS	EKM	5/23/12
2	REVISED PER COMMENTS	EKM	5/21/12
1	REVISED PER COMMENTS	EKM	5/08/12
0	ISSUED FOR REVIEW	EKM	4/24/12

Drawn: MJB Date: 4/24/12
Designed: EKM Date: 4/24/12
Checked: AJD Date: 4/24/12

Project Number
286-002

Project Title
CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

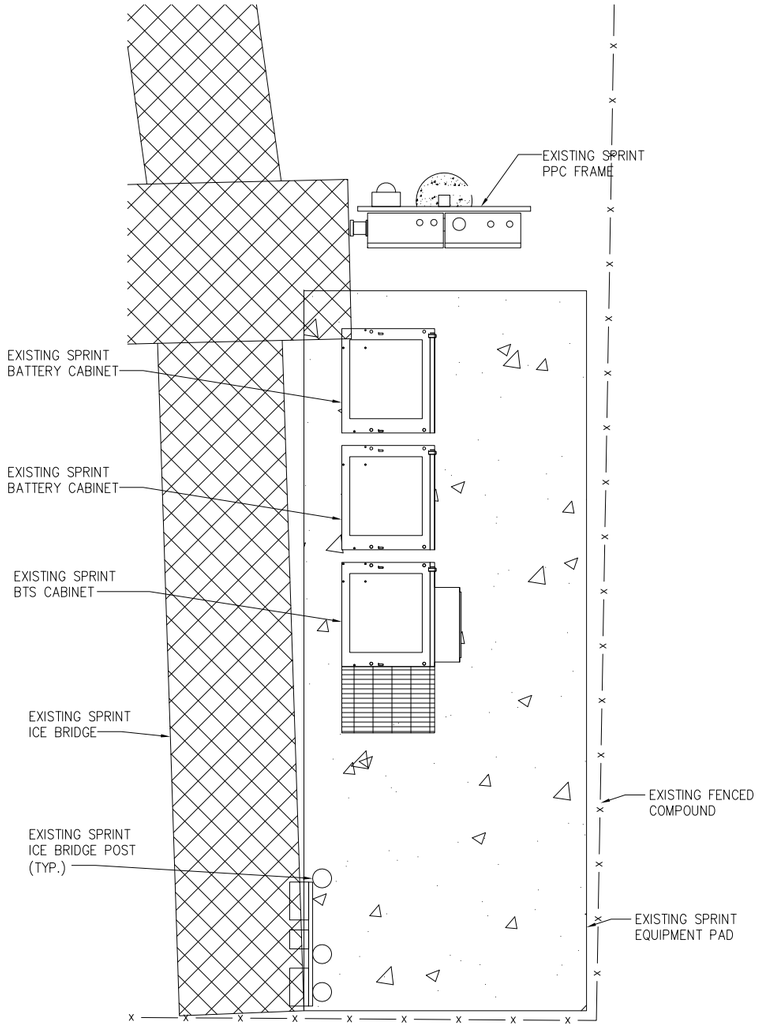
Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

Date:
9/10/13

Drawing Title
COMPOUND SITE PLAN

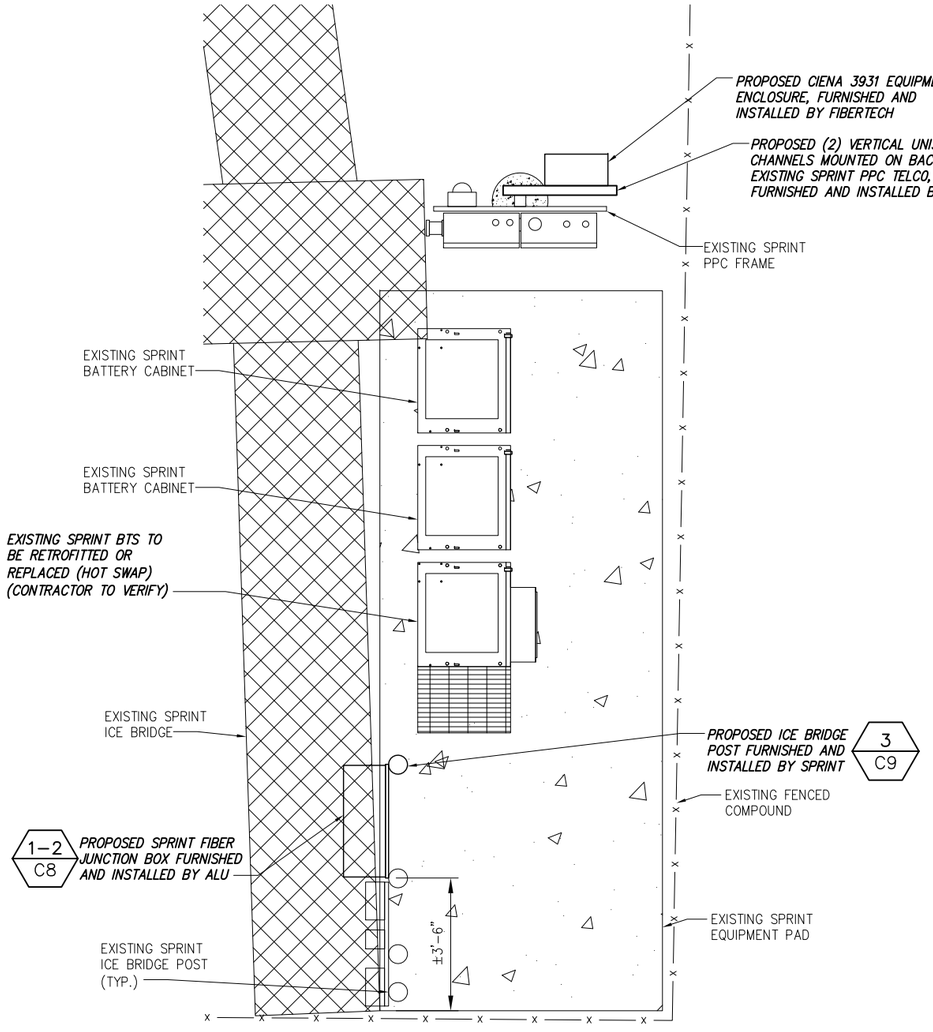
Drawing Number
C2



1 EQUIPMENT SITE PLAN (EXISTING)
SCALE:

CALLED NORTH

1' 0 1' 2' 4'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 2'
SCALE: 11"X 17" SHEET 1"= 4'



2 EQUIPMENT SITE PLAN (FINAL/PERMANENT)
SCALE:

CALLED NORTH

1' 0 1' 2' 4'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 2'
SCALE: 11"X 17" SHEET 1"= 4'

A/E Consultant:
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HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

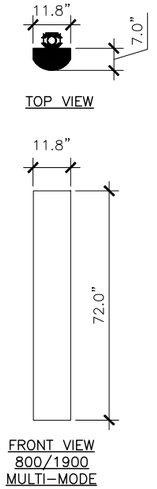
Implementation Team:
ALCATEL•LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

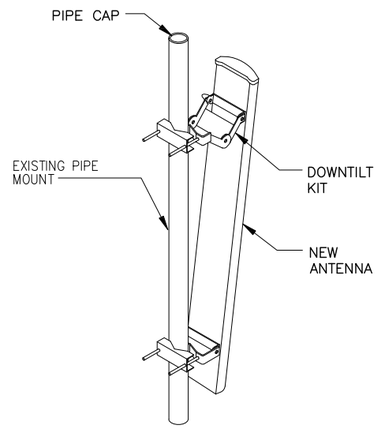
Date:
9/10/13

Drawing Title
EQUIPMENT SITE PLANS

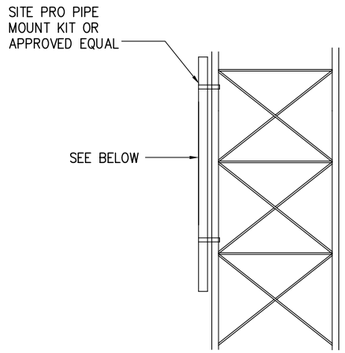
Drawing Number
C3

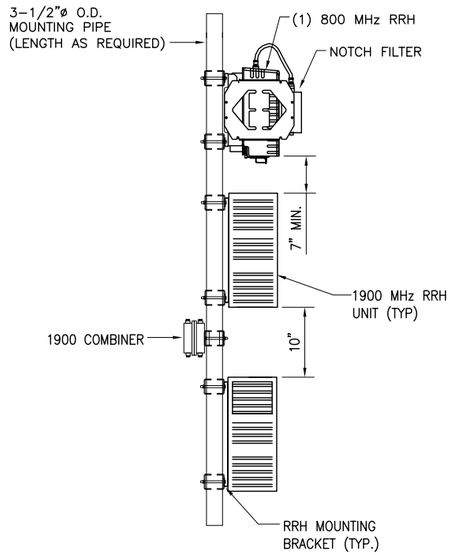


1 ANTENNA DETAILS
NOT TO SCALE

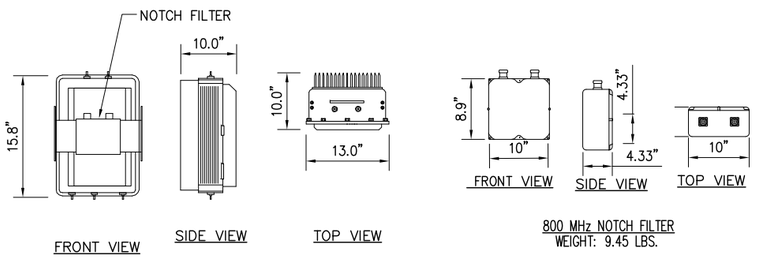


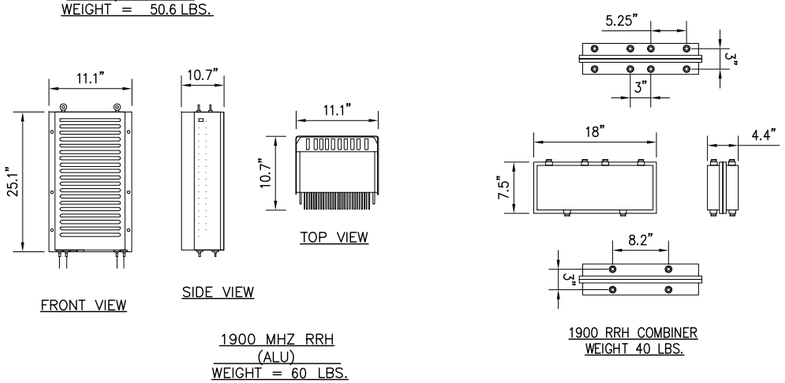
3 PANEL ANTENNA MOUNT DETAIL
NOT TO SCALE





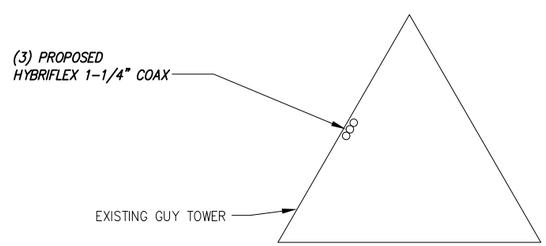
4 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE





2 RRH EQUIPMENT DETAILS
NOT TO SCALE

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



5 COAX ROUTING DETAIL
NOT TO SCALE

NOTE:
1. SUBCONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.

A/E Consultant:
infinigy engineering
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(518) 690-0790

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Project Title
CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

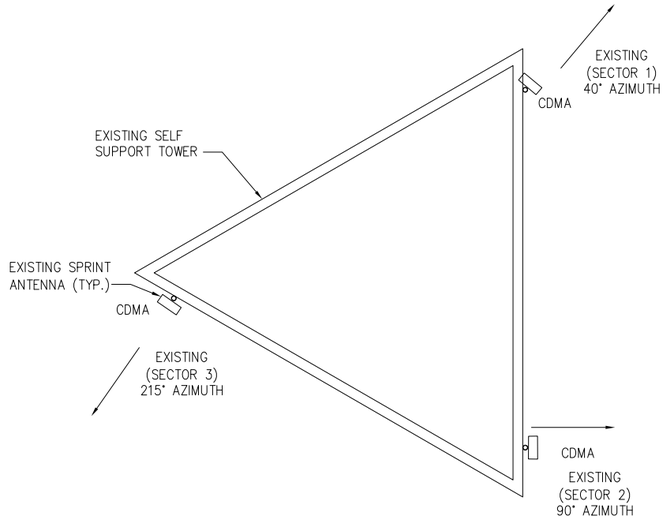
Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

Date:
9/10/13

Drawing Title
SITE ELEVATION & ANTENNA/RRH DETAILS

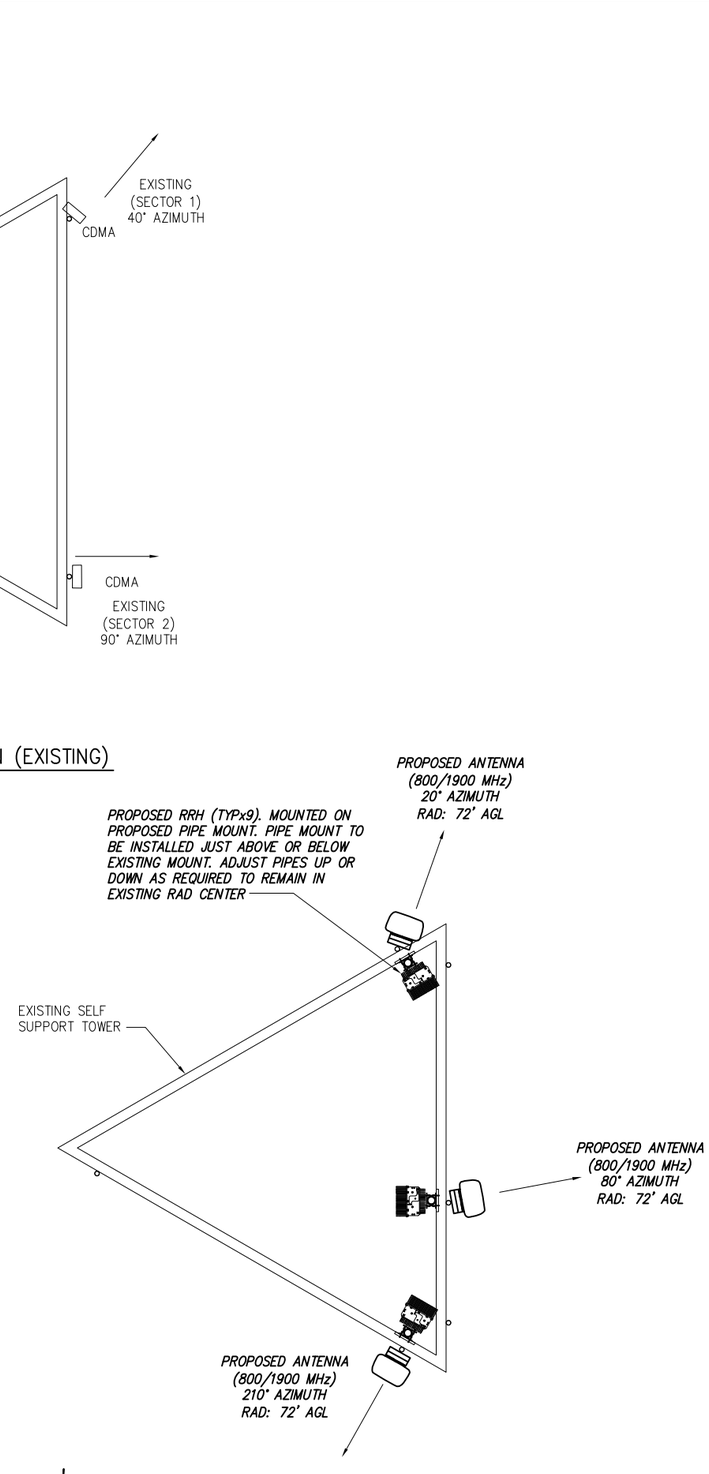
Drawing Number
C4



CALLED NORTH

1 / -- ANTENNA CONFIGURATION (EXISTING)

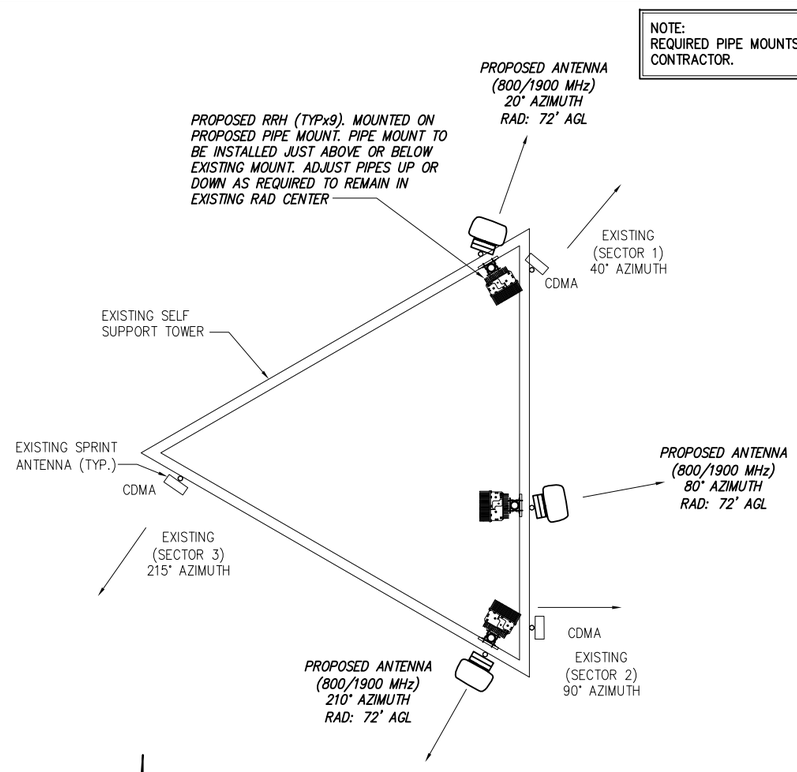
NOT TO SCALE



CALLED NORTH

3 / -- ANTENNA CONFIGURATION (FINAL/PERMANENT)

NOT TO SCALE



CALLED NORTH

2 / -- ANTENNA CONFIGURATION (INTERIM/TEMPORARY)

NOT TO SCALE

NOTE:
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

NOTES:

EXISTING RF DATA PROVIDED BY SPRINT SIOP RF DATA SHEET, DATED MAY 2012.

RRH NOTES:

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

GENERAL NOTES:

1. NEW SPRINT PANEL ANTENNAS TO MEET RF DESIGN REQUIREMENTS PER EBTS, PER APPROVED STRUCTURAL ANALYSIS.
2. CONTRACTOR TO PROVIDE EXISTING ANTENNA VERIFICATION AND TO INCLUDE MOUNTING HEIGHT, RAD CENTER, TOP AND BOTTOM OF ANTENNA AND AZIMUTHS FOR ALL ANTENNAS.
3. CONTRACTOR SHALL VERIFY NEW PARTS BEFORE ORDERING.
4. REFER TO SHEET C7 FOR ANTENNAS SPECS.
5. CONTRACTOR TO USE PROPER TORQUE WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.
6. ALL HYBRID CABLES SHALL BE MARKED WITHIN 24" OF THE END OF EACH CABLE WITH 2" WIDE VINYL TAPE. THIS INCLUDES ALL JUMPERS AND MAIN LINE HYBRID CABLE.
7. CDMA ANTENNAS SHALL NOT BE REMOVED UNTIL ALL NEW MULTI-MODE ANTENNAS ARE INSTALLED AND ON-AIR.

A/E Consultant:
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(518) 690-0790

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WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

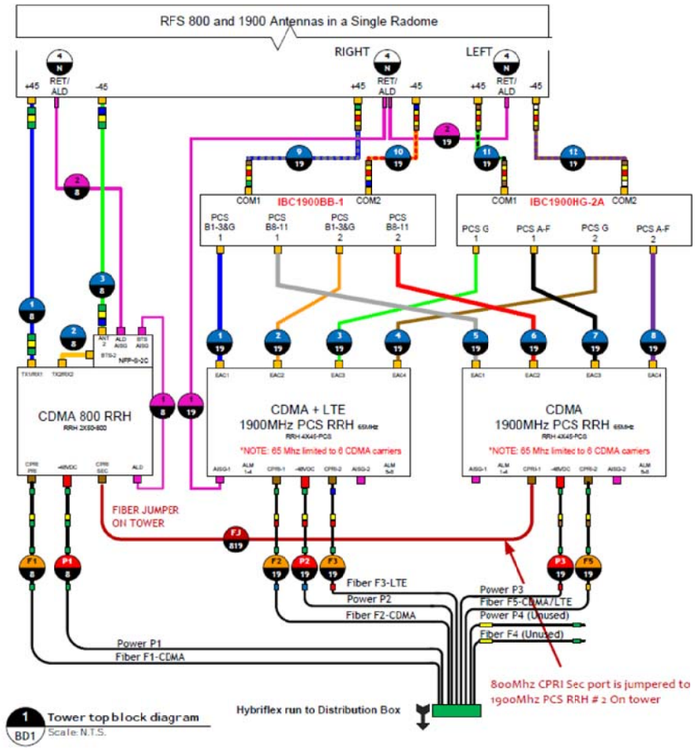
Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

Date:
9/10/13

Drawing Title
ANTENNA PLANS

Drawing Number
C5



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

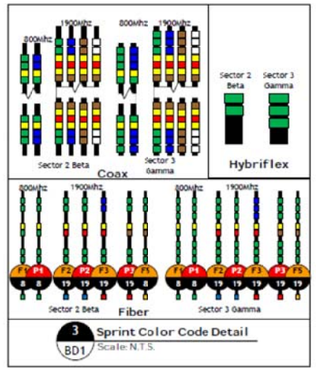
Power Feed Polarity Definition:
IF wires are BLACK AND BLACK/ WHITE STRIPE:
- Black= -48VDC Feed (Battery)
- Black/White Stripe= Return

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

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

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

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



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

NOTES:
CONTRACTOR TO FIELD VERIFY GPS LOCATION.

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

SCENARIO 128 v2.4

WEATHERPROOFING CONNECTORS AND GROUND KITS NOTE:

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

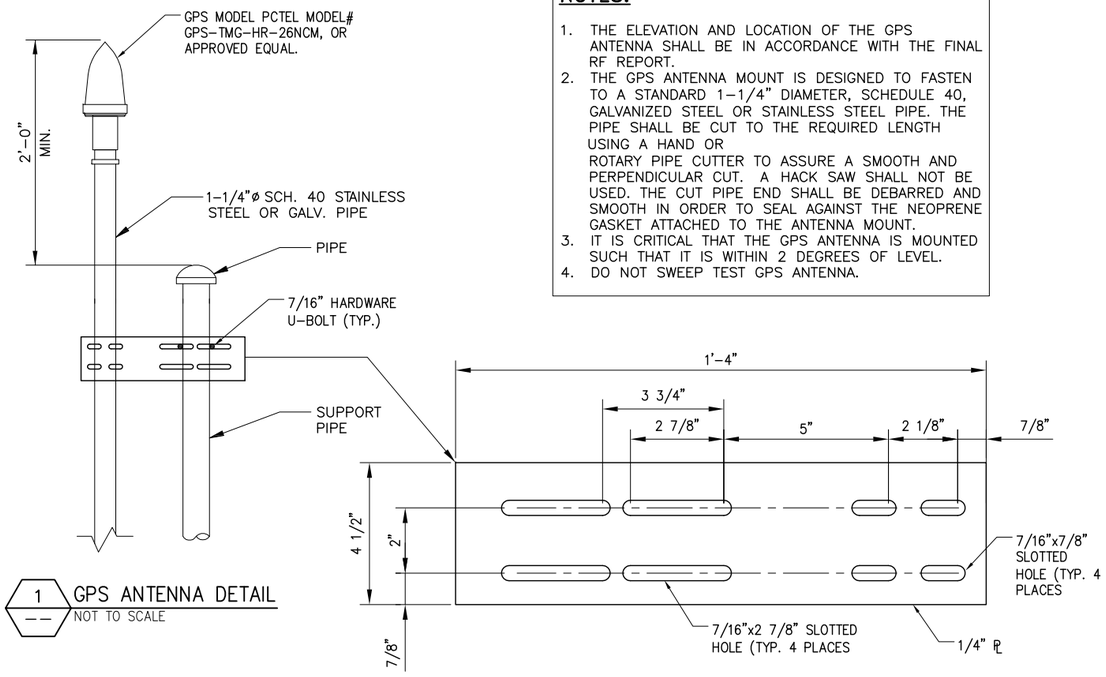
RRH JUMPERS NOTES:

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

GPS MINIMUM SKY VIEW REQUIREMENTS

NOTES:

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



1 GPS ANTENNA DETAIL
NOT TO SCALE

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

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Project Number: 286-002

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CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client: Sprint, 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495

Implementation Team: ALCATEL-LUCENT, 808 AVIATION PARKWAY SUITE 700 MORRISVILLE, NC 27650

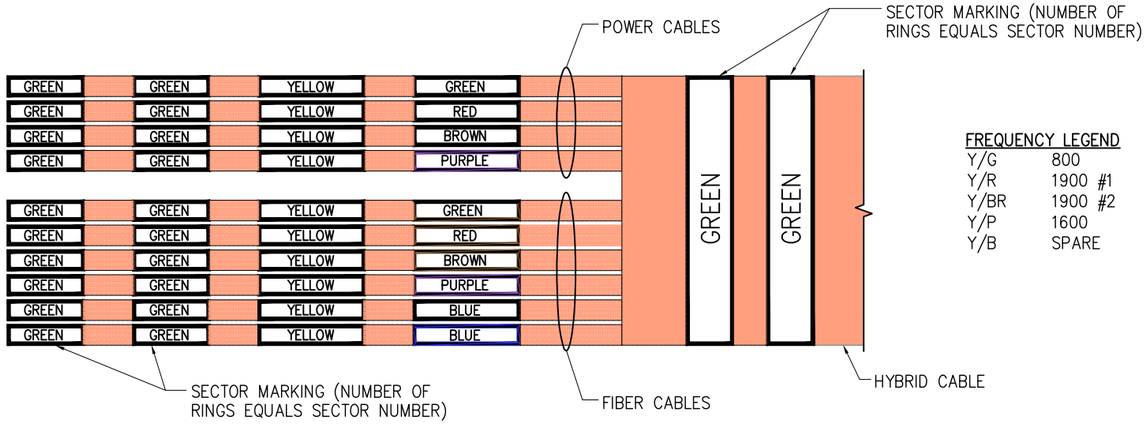
Drawing Scale: AS NOTED
Date: 9/10/13

Drawing Title:
ANTENNA CABLE RISER AND H-FRAME DETAILS

Drawing Number:
C6

		Market	Southern Connecticut		
		Cascade ID	CT03XC003		
			SECTOR 1	SECTOR 2	SECTOR 3
	Split sector present		No	No	No
1900	1900MHz_Azimuth		20	80	210
	1900MHz_No_of_Antennas		1	1	1
	1900MHz_RADCenter(ft)		71.2	71.2	71.2
	1900MHz_Antenna Make		RFS	RFS	RFS
	1900MHz_Antenna Model		APXVSPP18-C-A20	APXVSPP18-C-A20	APXVSPP18-C-A20
	1900MHz_Horizontal_Beamwidth		65	65	65
	1900MHz_Vertical_Beamwidth		5.5	5.5	5.5
	1900MHz_AntennaHeight (ft)		6	6	6
	1900MHz_AntennaGain(dBd)		15.9	15.9	15.9
	1900MHz_E_Tilt		0	-3	-2
	1900MHz _M_Tilt		0	0	0
	1900MHz_Carrier_Forecast_Year_2013		7	7	7
	1900MHz_RRH Manufacturer		ALU	ALU	ALU
	1900MHz_RRH Model		RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count		2	2	2
	1900MHz_RRH Location		Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model		IBC1900BB-1 and IBC1900HG-2A	IBC1900BB-1 and IBC1900HG-2A	IBC1900BB-1 and IBC1900HG-2A
	Antenna for Ground Mount, ft)		10	10	10
	Coax to Antenna for Ground Mount)		LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)		6	6	6
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)		LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Main_Coax_Cable_Length (ft)		N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Model		N/A	N/A	N/A
	ft)		N/A	N/A	N/A
	Coax)		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)		N/A	N/A	N/A
800	800MHz_Azimuth		20	80	210
	800MHz_No_of_Antennas		0	0	0
	800MHz_RADCenter(ft)		71.2	71.2	71.2
	800MHz_AntennaMake		RFS	RFS	RFS
	800MHz_AntennaModel		APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth		65	65	65
	800MHz_Vertical_Beamwidth		11.5	11.5	11.5
	800MHz_AntennaHeight (ft)		6	6	6
	800MHz_AntennaGain (dBd)		13.4	13.4	13.4
	800MHz_E_Tilt		0	-8	-7
	800MHz_M_Tilt		0	0	0
	800MHz_RRH Manufacturer		ALU	ALU	ALU
	800MHz_RRH Model		RRH 800 MHz 2x50W	RRH 800 MHz 2x50W	RRH 800 MHz 2x50W
	800MHz_RRH Count		1	1	1
	800MHz_RRH Location		Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)		10	10	10
	GM)		LCF12-50J	LCF12-50J	LCF12-50J
	800MHz_Main_Coax_Cable_Length (ft)		N/A	N/A	N/A
	800MHz_Main_Coax_Cable_Model		N/A	N/A	N/A
	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)		N/A	N/A	N/A
	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)		N/A	N/A	N/A
	Plumbing Scenario *		128	128	128
Comments	* If plumbing scenario does not match the material received, please contact your Construction Manager				
	11/9/2012				

1 SPRINT RFDS
NOT TO SCALE



FREQUENCY LEGEND

Y/G	800
Y/R	1900 #1
Y/BR	1900 #2
Y/P	1600
Y/B	SPARE

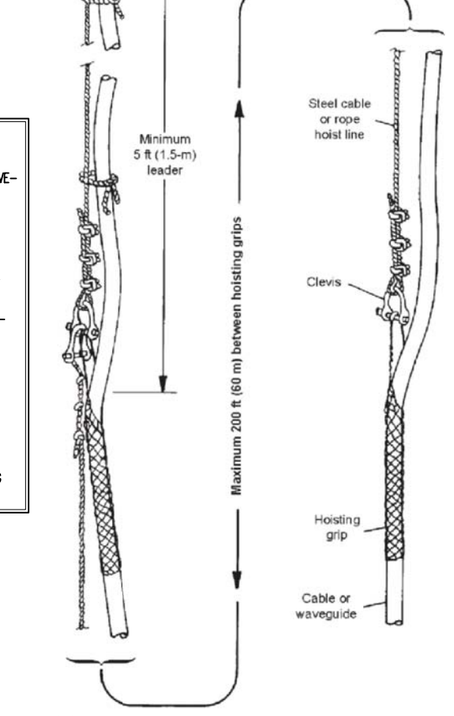
HYBRID CABLE WILL BE MARKED IN A SIMILAR MANNER AS COAX CABLES. THE MAIN TRUNK OF THE HYBRID CABLE IS TO BE MARKED WITH THE SECTOR MARKINGS ONLY. THE INDIVIDUAL POWER PAIRS AND FIBER CABLES WILL BE LABELED WITH BOTH THE SECTOR CABLE MARKINGS AND FREQUENCY (EXAMPLE ABOVE IS FOR SECTOR 2)

2 COLOR CODING
NOT TO SCALE

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

NOTE:
RFDS SHOWN PROVIDED BY SPRINT DATED 09/11/12.

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



2 HOIST GRIB DETAIL
NOT TO SCALE

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

UNAUTHORIZED ALTERATION OR ADDITION TO THESE DOCUMENTS, VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS.

No.	Submittal / Revision	App'd	Date
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0	ISSUED FOR REVIEW	EKM	4/24/12

Drawn: MJB Date: 4/24/12
Designed: EKM Date: 4/24/12
Checked: AJD Date: 4/24/12

Project Number
286-002

Project Title
CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

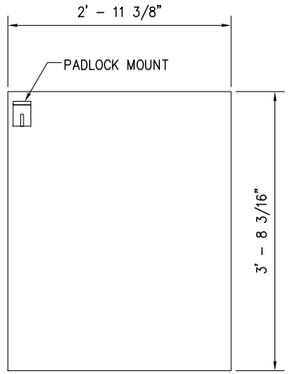
Implementation Team:
ALCATEL•LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

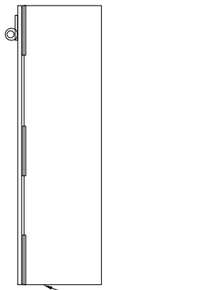
Date:
9/10/13

Drawing Title
RF AND CABLE DETAILS

Drawing Number
C7

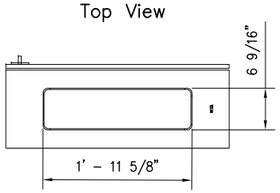


Front View

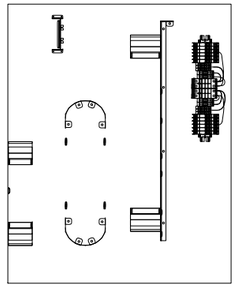


Side View

Top View



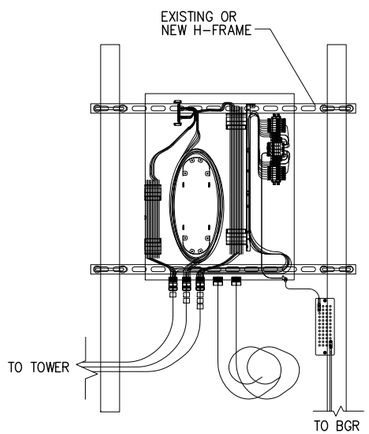
Bottom View



Front View with door removed to show detail

Side View cut away to show fiber bulkhead detail

1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



Front View with door removed to show detail

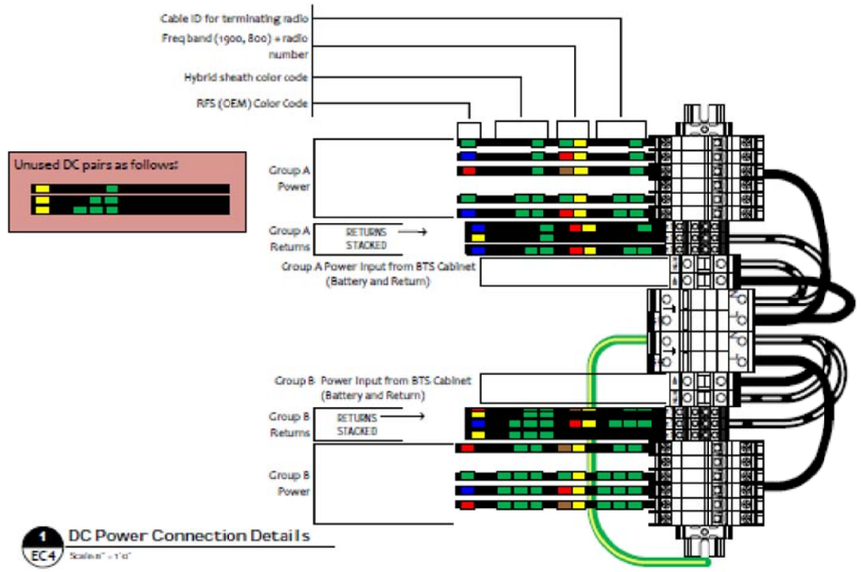
NOTES:

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

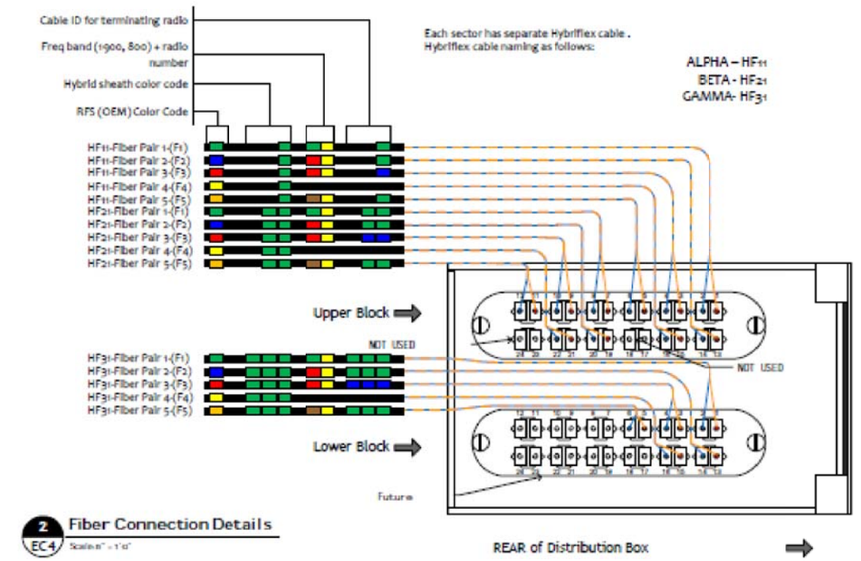
– DISTRIBUTION BOX IS KITTED WITH 24AWG, POWER CABLE 27' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.

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

2 DISTRIBUTION BOX INSTALL COMPLETE VIEW
NOT TO SCALE



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



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

SCENARIO 128 v2.4

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

3 FIBER & DC CONNECTION DETAILS
NOT TO SCALE

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

STATE OF CONNECTICUT
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HAMDEN, CT 06514

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Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

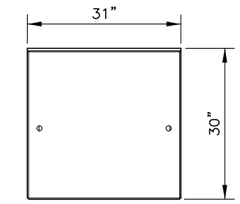
Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

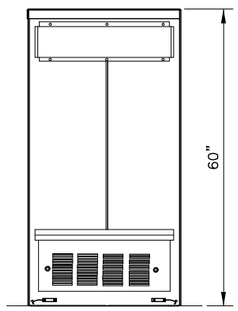
Date:
9/10/13

Drawing Title
JUNCTION BOX DETAILS

Drawing Number
C8

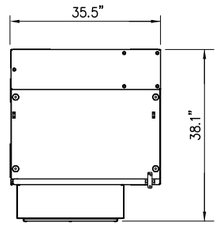


TOP VIEW

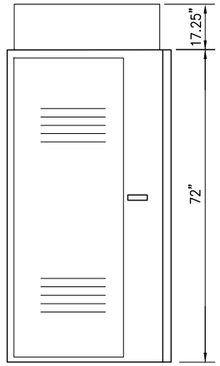


REAR VIEW

1 BATTERY CABINET PROFILE
NOT TO SCALE

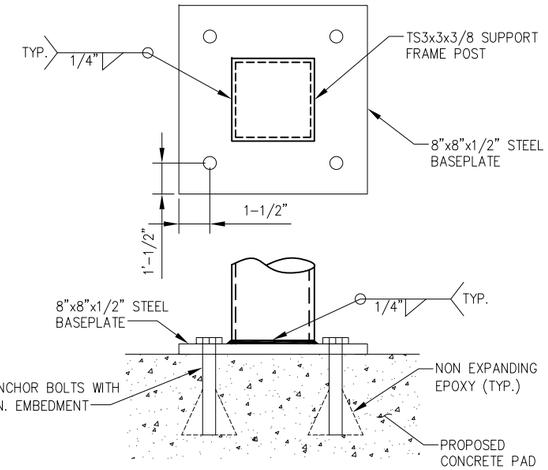


TOP VIEW



FRONT VIEW

2 BTS CABINET PROFILE
NOT TO SCALE



3 SUPPORT POST MOUNTING DETAIL
NOT TO SCALE

DESIGN CRITERIA:

2009 INTERNATIONAL BUILDING CODE W/ STATE MODIFICATION	
WIND SPEED (ASCE-7-05)	90 MPH
EXPOSURE B	
IMPORTANCE FACTOR	1.0
SEISMIC SITE CLASS	D
Ss=0.152 S1 = 0.050	
SEISMIC IMPORTANCE FACTOR	1.0
SEISMIC DESIGN CATEGORY	B
CABINET WEIGHT:	
9928 MM BTS CABINET	1625 lbs.
60EC V2 BATTERY CABINET	2830 lbs.

MATERIAL SPECIFICATIONS

C-, M-, AND ANGLE SHAPES:	ASTM A36
HIGH-STRENGTH BOLTS:	ASTM A325SC OR (A325N
STRUCTURAL WF SHAPES:	ASTM A572-GR50
TUBE STEEL & PIPE COLUMNS:	ASTM A500, GRADE B
WELDING ELECTRODES:	E70XX
W - SHAPES:	ASTM A992, GRADE 50
U-BOLTS:	ASTM A36

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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No. 24705
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CT03XC003
WEST ROCK RIDGE-
CONNECTICUT
STATE POLICE SITE

1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

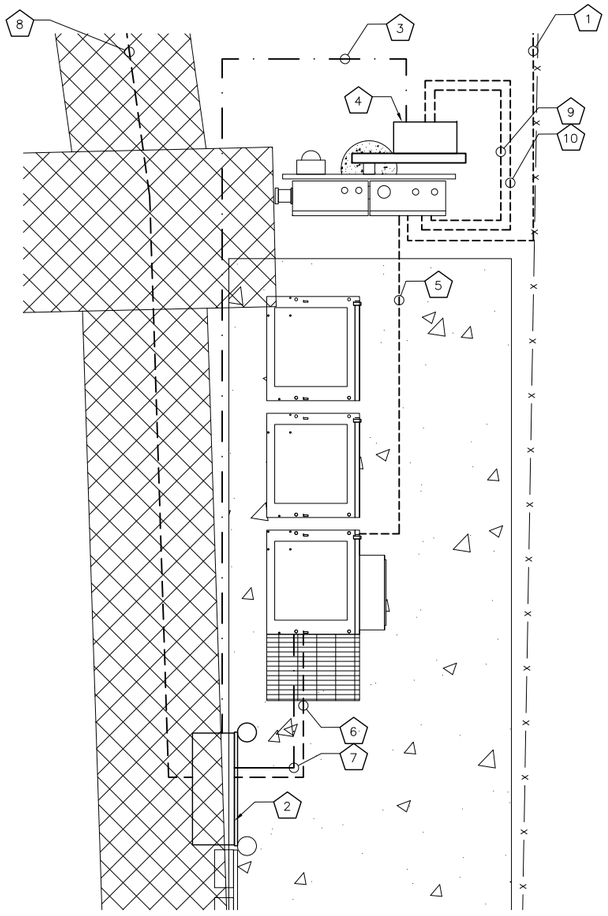
Date:
9/10/13

Drawing Title
DETAILS

Drawing Number
C9

CODED NOTES:

1. EXISTING 2" PVC UNDERGROUND CONDUIT FROM EXISTING UTILITY POLE "SNET 9898" TO EXISTING SPRINT PPC (TELCO), 160', EXISTING PULL STRING IN CONDUIT
2. PROPOSED SPRINT FIBER JUNCTION BOX FURNISHED AND INSTALLED BY ALU
3. PROPOSED 2" PVC UNDER GROUND CONDUIT WITH FEEDERS FOR DC POWER, FROM PROPOSED CIENA 3931 ENCLOSURE TO PROPOSED FIBER JUNCTION BOX, 25'; FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL STRING
4. PROPOSED CIENA EQUIPMENT ENCLOSURE, FURNISHED AND INSTALLED BY FIBERTECH
5. PROPOSED CAT5 CABLE ROUTED IN EXISTING 2" UNDER GROUND PVC CONDUIT FROM EXISTING SPRINT PPC (TELCO) ENCLOSURE TO EXISTING BTS CABINET, 16' FURNISHED AND INSTALLED BY SPRINT
6. PROPOSED 2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
7. PROPOSED 2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
8. PROPOSED 1-1/4" HYBRIFLEX CABLE ROUTED FROM PROPOSED JUNCTION BOX TO PROPOSED TOWER MOUNTED RRH, 140' (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)
9. PROPOSED 2" ABOVE GROUND LIQUID TIGHT CONDUIT FROM EXISTING SPRINT PPC (TELCO) TO PROPOSED CIENA 3931 ENCLOSURE, 5' FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL STRING
10. PROPOSED 2" ABOVE GROUND LIQUID TIGHT CONDUIT FROM PROPOSED CIENA 3931 TO EXISTING SPRINT PPC (TELCO), 5' FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL STRING



CALLED NORTH

1 UTILITY SITE PLAN
SCALE:
1' 0 1' 2' 4'
(IN FEET)
SCALE: 24"X 36" SHEET 1"= 2'
SCALE: 11"X 17" SHEET 1"= 4'

NOTES:
1. CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.
2. EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBTS EQUIPMENT IS INSTALLED.
3. REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE COILED (NOT ON WALKING SURFACE).
4. REMAINING UNUSED CONDUITS FROM EXISTING CABINETS TO BE COVERED WITH WATERPROOF CAPS (NOT DUCT TAPE).

ELECTRICAL NOTES:

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

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

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

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1065 WINTERGREEN AVENUE
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Client: Sprint, 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495

Implementation Team: ALCATEL-LUCENT, 808 AVIATION PARKWAY SUITE 700 MORRISVILLE, NC 27650

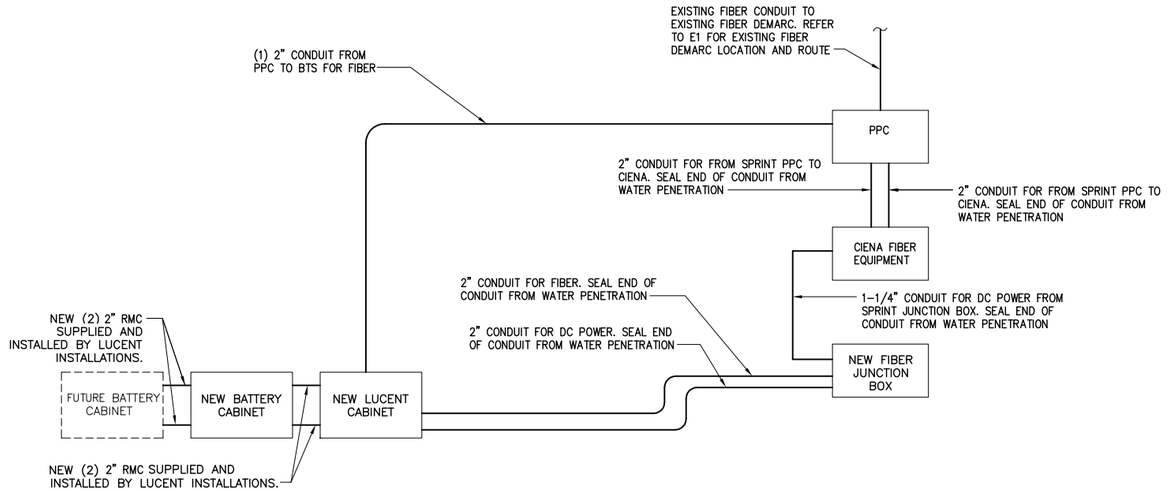
Drawing Scale: AS NOTED
Date: 9/10/13

Drawing Title:
UTILITY SITE PLAN

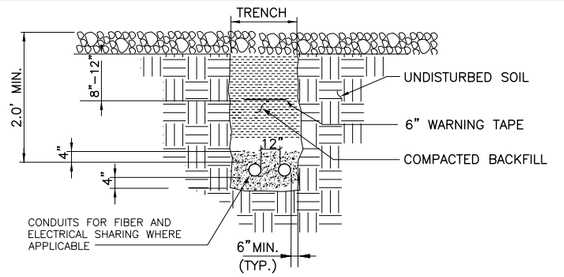
Drawing Number:
E1

GROUNDING NOTE:

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



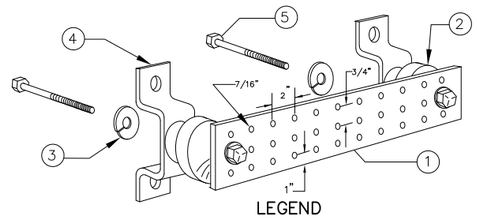
1 ONE-LINE DIAGRAM
NOT TO SCALE



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

*HAND DIG INSIDE COMPOUND

2 UTILITY TRENCH DETAIL
NOT TO SCALE

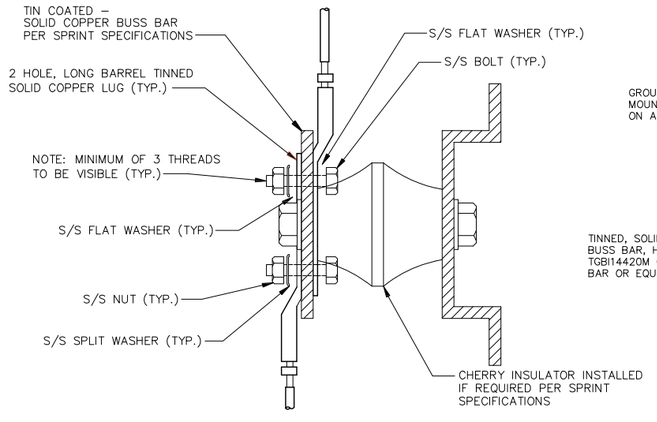


LEGEND

1. TINNED COPPER GROUND BAR, ¼" x 4" x 20", NEWTON INSTRUMENT Co., HARGER TGBI14420M, OR EQUIVALENT. HOLE CENTERS TO MATCH
2. NEMA DOUBLE LUG CONFIGURATION.
3. INSULATORS, NEWTON INSTRUMENT Co. CAT. NO. 3061-4 OR HARGER EQUIVALENT.
4. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUIVALENT.
   WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056 OR HARGER EQUIVALENT.
   5/8-11 x 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1 OR HARGER EQUIVALENT.

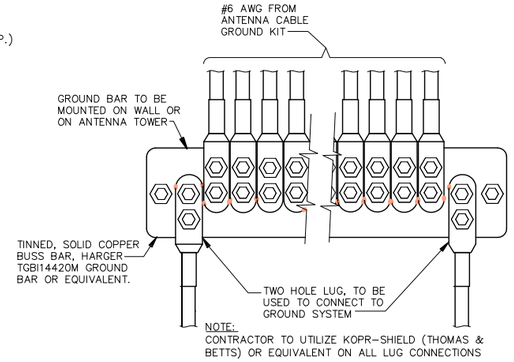
NOTE:
1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
2) ENTIRE ASSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGBI14420M.

GROUND BAR



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

GROUND LUG



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

ANTENNA GROUND BAR

3 GROUND BAR DETAILS
NOT TO SCALE

A/E Consultant:
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HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

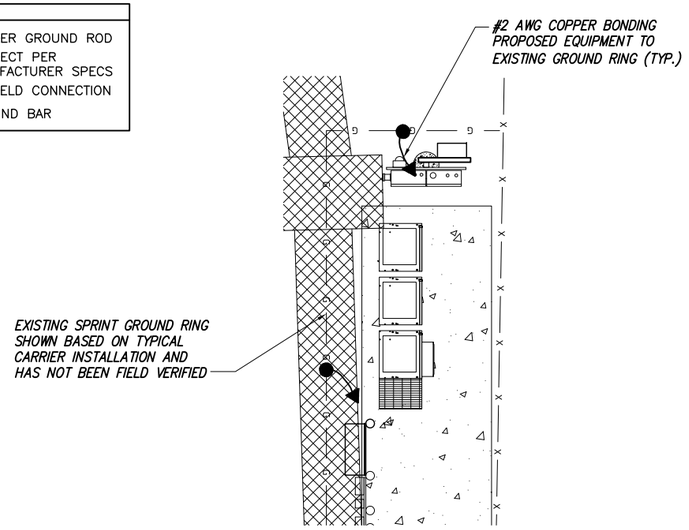
Date:
9/10/13

Drawing Title
ONE-LINE DIAGRAM AND DETAILS

Drawing Number
E2

SYMBOL

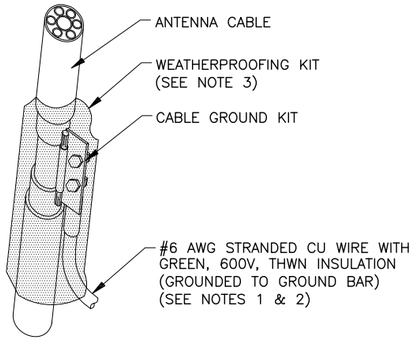
- COPPER GROUND ROD
- CONNECT PER MANUFACTURER SPECS
- CADWELD CONNECTION
- GROUND BAR



CALLED NORTH

1 EQUIPMENT GROUNDING PLAN
NOT TO SCALE

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



3 CONNECTION OF GROUND KIT TO ANTENNA CABLE
NOTE TO SCALE

GROUNDING NOTES:

1. ALL DOWN CONDUCTORS AND GROUND RING CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.

2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION–TYPE CLAMPS OR SPLIT–BOLT TYPE CONNECTORS SHALL BE USED.

3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE OR FOUNDATION, WHICHEVER IS HIGHER. COLD–GALV AFTER. EXOTHERMICALLY WELD OTHER END TO GROUND.

4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN 3/4" PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.

5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.

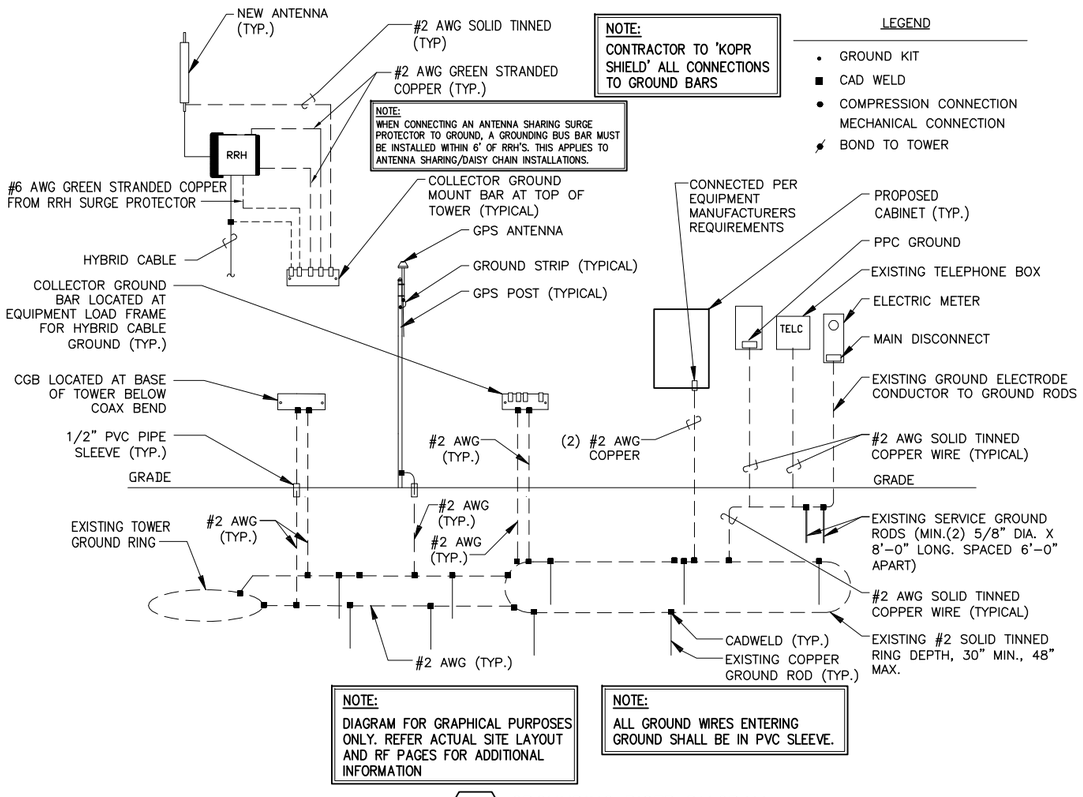
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.

7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.

8 UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT'S SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).

9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.

10. RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.



NOTE:
WHEN CONNECTING AN ANTENNA SHARING SURGE PROTECTOR TO GROUND, A GROUNDING BUS BAR MUST BE INSTALLED WITHIN 6' OF RRH'S. THIS APPLIES TO ANTENNA SHARING/DAISY CHAIN INSTALLATIONS.

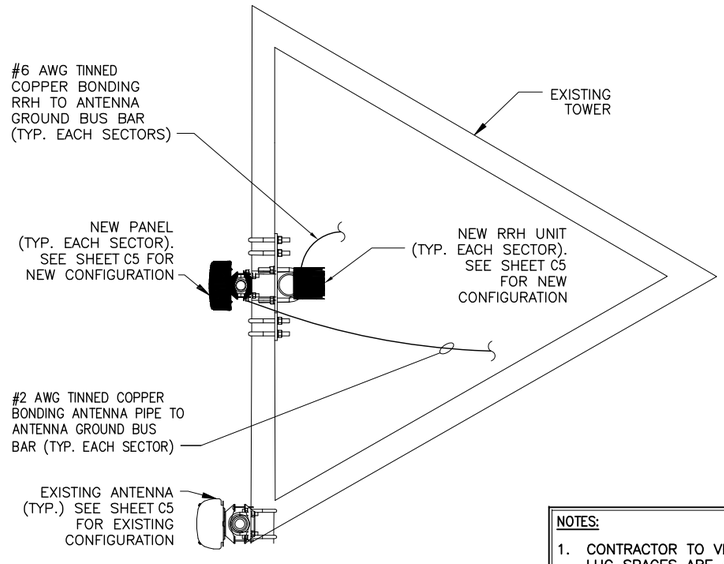
NOTE:
CONTRACTOR TO 'KOPR SHIELD' ALL CONNECTIONS TO GROUND BARS

LEGEND
- GROUND KIT
- CAD WELD
- COMPRESSION CONNECTION
- MECHANICAL CONNECTION
- BOND TO TOWER

NOTE:
DIAGRAM FOR GRAPHICAL PURPOSES ONLY. REFER ACTUAL SITE LAYOUT AND RF PAGES FOR ADDITIONAL INFORMATION

NOTE:
ALL GROUND WIRES ENTERING GROUND SHALL BE IN PVC SLEEVE.

2 GROUNDING RISER DIAGRAM
NOT TO SCALE



4 TYPICAL ANTENNA GROUNDING PLAN
NOT TO SCALE

NOTES:
1. CONTRACTOR TO VERIFY EXISTING LUG SPACES ARE AVAILABLE ON GROUND BAR. ADD ADDITIONAL BUS BAR IF NO LUG SPACES ARE AVAILABLE.
2. ANTENNA GROUNDING CONNECTIONS SHOWN ARE NOT EXACT TO THIS SITE. FOR EXACT ANTENNA LAYOUT REFER TO SHEET C5.

A/E Consultant:
infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

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

No.	Submittal / Revision	App'd	Date
5	FINAL CD'S	MJB	9/10/13
4	REVISED PER COMMENTS	MJB	8/19/13
3	REVISED PER COMMENTS	EKM	5/23/12
2	REVISED PER COMMENTS	EKM	5/21/12
1	REVISED PER COMMENTS	EKM	5/08/12
0	ISSUED FOR REVIEW	EKM	4/24/12

Drawn: MJB Date: 4/24/12
Designed: EKM Date: 4/24/12
Checked: AJD Date: 4/24/12

Project Number
286-002

Project Title
CT03XC003
WEST ROCK RIDGE-CONNECTICUT STATE POLICE SITE
1065 WINTERGREEN AVENUE
HAMDEN, CT 06514

Client:
Sprint
1 INTERNATIONAL BLVD.
MAHWAH, NJ 07495

Implementation Team:
ALCATEL•LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

Date:
9/10/13

Drawing Title
GROUNDING PLAN AND DETAILS

Drawing Number
E3

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

Sprint Existing Facility

Site ID: CT03XC003

West Rock Ridge – CT State Police
1065 Wintergreen Avenue
Hamden, CT 06514

August 11, 2012

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

EBI Consulting
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August 11, 2012

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

Re: Emissions Values for Site **CT03XC003 – West Rock Ridge – CT State Police**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 1065 Wintergreen Avenue, Hamden, 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 1065 Wintergreen Avenue, Hamden, 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 **71.2 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	CT03XC003 - West Rock Ridge CT State Police
Site Addresss	1065 Wintergreen Avenue, Hamden, CT 06514
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	71.2	65.2	1/2 "	0.5	0	1386.9474	117.2926	11.72926%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	71.2	65.2	1/2 "	0.5	0	389.96892	32.97925	5.81645%
														Sector total Power Density Value:		17.546%	

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	71.2	65.2	1/2 "	0.5	0	1386.9474	117.2926	11.72926%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	71.2	65.2	1/2 "	0.5	0	389.96892	32.97925	5.81645%
														Sector total Power Density Value:		17.546%	

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	71.2	65.2	1/2 "	0.5	0	1386.9474	117.2926	11.72926%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	71.2	65.2	1/2 "	0.5	0	389.96892	32.97925	5.81645%
														Sector total Power Density Value:		17.546%	

Site Composite MPE %

Carrier	MPE %
Sprint	52.637%
Total Site MPE %	**52.637%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **52.637% (17.546% 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 **52.637%** 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. Per the latest revision of the Connecticut Siting Council database for existing carrier emissions there were no other carriers or radio operators listed as having emissions data on record for this address. Therefore, the Sprint installation was modeled alone.

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

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